



Total Directional
Services, LLC

USA Operations

Final MWD Survey Certification

Lea County, New Mexico

Client: Centennial Resource Development Inc.

Well Name: Pirate State #401H

Total Job No: 2019-358-650

API No: 30-025-45778

Start Date: 5/25/2019

End Date: 6/03/2019

Measured Start Depth: 1,319.5 feet

Measured End Depth: 15,340.0 feet

Vertical Section from well center at TD: 4,884.73 feet

I, Chris Meredith, certify that; I am employed by Total Directional Services, LLC and we conducted or supervised the taking of these open hole MWD surveys at the request of this client. This data is true, correct, complete and within the limitations of the tool as set forth by Total Directional Services, LLC. I am authorized and qualified to make this report and have reviewed this report and find that it conforms to the principals and procedures as set forth by Total Directional Services, LLC.

Date: 6/04/2019

Signed: *Chris Meredith*

**CENTENNIAL RESOURCE
DEVELOPMENT, LLC**

LEA COUNTY, NM (NAD 83 - UTM ZONE 13 - TRUE)

NE NE SEC 16 T24S R34E

PIRATE STATE #401H

04 June, 2019

Survey: FINAL SURVEYS





Project: LEA COUNTY, NM (NAD 83 - UTM ZONE 13 - TRUE)
 Site: NE NE SEC 16 T24S R34E
 Well: PIRATE STATE #401H
 Wellbore: JOB # 2019-359-650
 Design: FINAL SURVEYS



ANNOTATIONS

TVD	MD	Inc	Azi	+N-S	+E-W	VSec	Departure	Annotation
1291.05	1291.10	0.20	343.85	7.23	1.48	-7.35	10.19	LAST INVICTUS SURVEY
1319.85	1320.00	0.10	25.14	7.23	1.43	-7.35	19.34	13 3/8" CASING
5422.85	5430.00	8.11	292.11	89.33	-229.71	-73.34	285.63	ICP
9734.38	9781.00	2.09	47.19	285.38	-547.69	-392.43	987.87	KOP
9923.23	9981.00	20.63	174.67	729.14	-538.37	-184.49	707.09	- CROSS SETBACK
10502.17	10582.00	87.09	181.41	-378.57	-541.80	438.79	1314.28	HZ LANDING PT
10502.94	10508.00	92.16	179.84	-4922.19	-545.85	4952.96	5789.22	LAST SURVEY JUNE 3, 2019
10502.74	10540.00	92.16	179.84	-4994.17	-545.85	4994.73	5791.20	PROJECTION TO TD

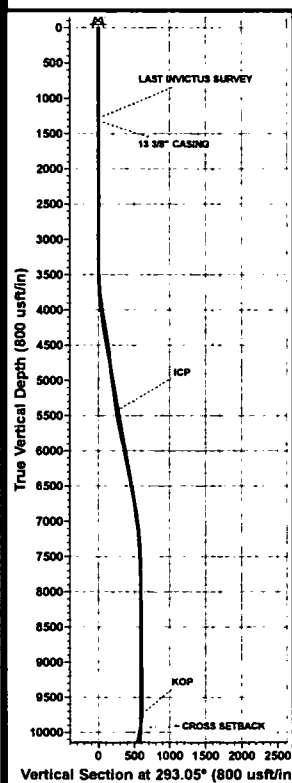
WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
BHL - PIRATE STATE #401H (P2)	10520.30	-4846.08	-545.58	11695524.41	2113505.98	32.210573	-103.469947
HZ LP - PIRATE STATE #401H	10496.70	-339.47	-542.09	11700020.96	2113445.22	32.222960	-103.469938
KOP - PIRATE STATE #401H (P2)	9923.75	230.49	-541.70	11700599.79	2113437.49	32.224527	-103.469934

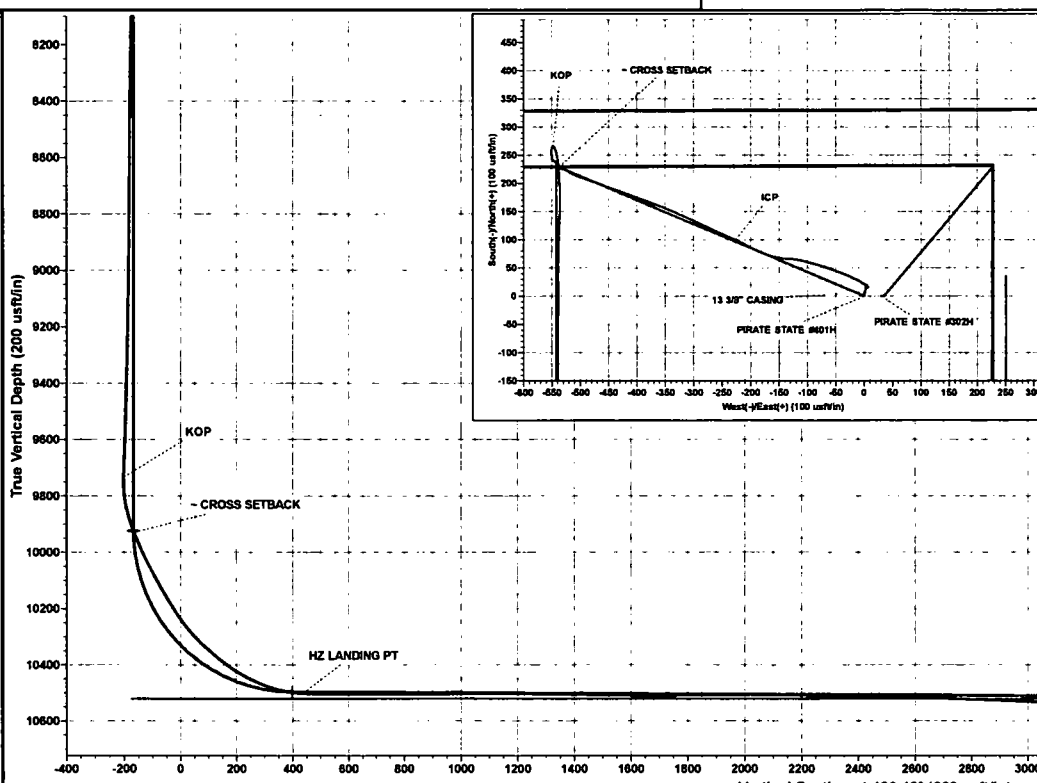


Azimuths to True North
 Magnetic North: 8.70°

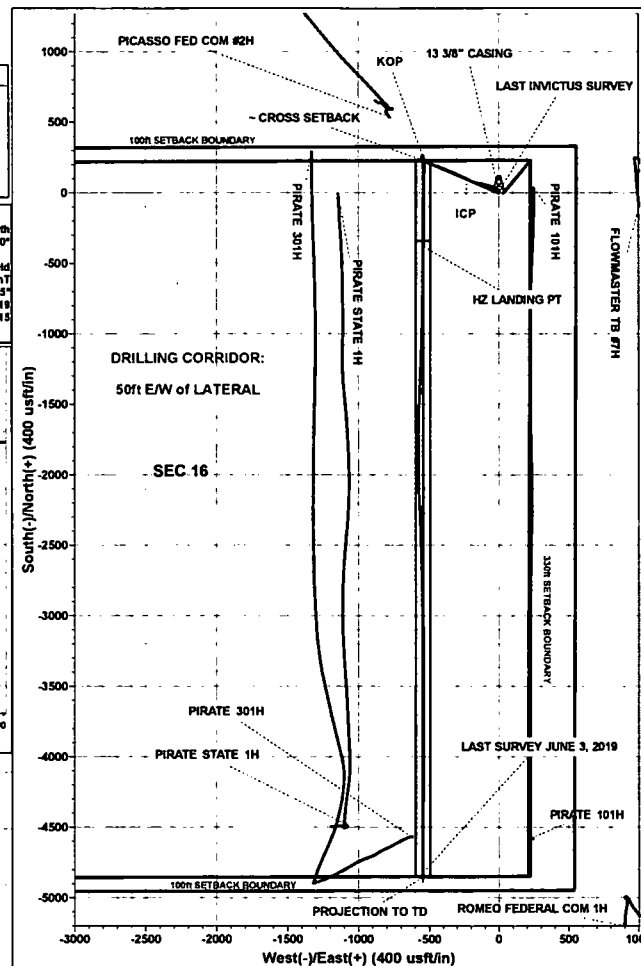
Magnetic Field
 Strength: 47753.0nT
 Dip Angle: 60.05°
 Date: 10/03/2019
 Model: IGRF2015



Vertical Section at 293.05° (800 usf/in)



Vertical Section at 186.42° (200 usf/in)



Vertical Section at 186.42° (200 usf/in)

Survey Report



Company:	CENTENNIAL RESOURCE DEVELOPME	Local Co-ordinate Reference:	Well PIRATE STATE #401H
Project:	LEA COUNTY, NM (NAD 83 - UTM ZONE	TVD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Site:	NE NE SEC 16 T24S R34E	MD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Well:	PIRATE STATE #401H	North Reference:	True
Wellbore:	JOB # 2019-359-650	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	Database 1

Project	LEA COUNTY, NM (NAD 83 - UTM ZONE 13 - TRUE)		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 13N (108 W to 102 W)		Using geodetic scale factor

Site	NE NE SEC 16 T24S R34E		
Site Position:		Northing:	11,700,377.48 usft
From:	Map	Easting:	2,114,012.32 usft
Position Uncertainty:	0.00 usft	Slot Radius:	1.10 ft
		Latitude:	32.223893
		Longitude:	-103.468086
		Grid Convergence:	0.82 °

Well	PIRATE STATE #401H		
Well Position	+N-S	0.00 usft	Northing: 11,700,377.08 usft
	+E-W	0.00 usft	Easting: 2,113,982.34 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32.223893
		Longitude:	-103.468183
		Ground Level:	3,529.10 usft

Wellbore	JOB # 2019-359-650		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	10/05/2019	6.70
			Dip Angle (°)
			60.05
			Field Strength (nT)
			47,753

Design	FINAL SURVEYS		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)
	0.00	0.00	0.00
		Direction (°)	186.42

Survey Program	Date 04/03/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
187.10	15,340.00	FINAL SURVEYS (JOB # 2019-359-650)	MWD+IFR1+MS
			Description
			OWSG MWD + IFR1 + Multi-Station Correction

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	3,555.60	0.00	0.00	0.00	0.00	0.00	0.00
187.10	0.10	282.65	187.10	3,368.50	0.04	-0.16	-0.02	0.05	0.05	0.00
275.10	0.40	344.65	275.10	3,280.50	0.35	-0.32	-0.31	0.41	0.34	70.45
362.10	0.30	262.65	362.10	3,193.50	0.61	-0.62	-0.54	0.53	-0.11	-94.25
452.10	0.90	27.65	452.09	3,103.51	1.21	-0.53	-1.14	1.22	0.67	138.89
546.10	0.40	34.65	546.09	3,009.51	2.13	0.00	-2.12	0.54	-0.53	7.45
640.10	1.00	23.65	640.08	2,915.52	3.15	0.52	-3.19	0.65	0.64	-11.70
733.10	0.70	31.65	733.07	2,822.53	4.38	1.14	-4.48	0.35	-0.32	8.60
826.10	0.10	4.65	826.07	2,729.53	4.95	1.45	-5.08	0.66	-0.65	-29.03
920.10	0.80	5.65	920.06	2,635.54	5.68	1.52	-5.81	0.74	0.74	1.06
1,013.10	0.90	352.65	1,013.05	2,542.55	7.05	1.49	-7.17	0.23	0.11	-13.98
1,106.10	0.20	66.65	1,106.05	2,449.55	7.84	1.54	-7.96	0.93	-0.75	79.57
1,198.10	0.40	187.65	1,198.05	2,357.55	7.58	1.65	-7.72	0.58	0.22	131.52

Survey Report



Company:	CENTENNIAL RESOURCE DEVELOPEME	Local Co-ordinate Reference:	Well PIRATE STATE #401H
Project:	LEA COUNTY, NM (NAD 83 - UTM ZONE	TVD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Site:	NE NE SEC 16 T24S R34E	MD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Well:	PIRATE STATE #401H	North Reference:	True
Wellbore:	JOB # 2019-359-650	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	Database 1

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
LAST INVICTUS SURVEY										
1,281.10	0.20	243.65	1,281.05	2,274.55	7.23	1.48	-7.35	0.40	-0.24	67.47
13 3/8" CASING										
1,320.00	0.10	20.14	1,319.95	2,235.65	7.23	1.43	-7.35	0.72	-0.26	350.86
1,339.00	0.23	37.14	1,338.95	2,216.65	7.28	1.46	-7.40	0.72	0.68	89.49
1,429.00	0.40	3.64	1,428.95	2,126.65	7.74	1.59	-7.87	0.27	0.19	-37.22
1,523.00	0.61	10.53	1,522.94	2,032.66	8.56	1.70	-8.69	0.23	0.22	7.33
1,618.00	0.67	11.53	1,617.94	1,937.66	9.60	1.90	-9.75	0.06	0.06	1.05
1,711.00	0.73	5.30	1,710.93	1,844.67	10.72	2.07	-10.89	0.10	0.06	-6.70
1,805.00	0.77	6.85	1,804.92	1,750.68	11.95	2.20	-12.12	0.05	0.04	1.65
1,899.00	0.69	10.73	1,898.91	1,656.69	13.13	2.38	-13.31	0.10	-0.09	4.13
1,993.00	0.63	18.71	1,992.91	1,562.69	14.17	2.65	-14.38	0.12	-0.06	8.49
2,087.00	0.66	13.77	2,086.90	1,468.70	15.19	2.94	-15.42	0.07	0.03	-5.26
2,181.00	0.71	4.93	2,180.90	1,374.70	16.30	3.12	-16.54	0.12	0.05	-9.40
2,276.00	0.84	0.16	2,275.89	1,279.71	17.58	3.18	-17.82	0.15	0.14	-5.02
2,369.00	0.96	354.10	2,368.88	1,186.72	19.03	3.10	-19.26	0.16	0.13	-6.52
2,463.00	0.91	351.27	2,462.86	1,092.74	20.56	2.90	-20.75	0.07	-0.05	-3.01
2,558.00	0.99	171.64	2,557.86	997.74	20.49	2.91	-20.69	2.00	0.08	-189.08
2,652.00	1.01	168.41	2,651.84	903.76	18.87	3.19	-19.11	0.06	0.02	-3.44
2,746.00	0.93	167.44	2,745.83	809.77	17.32	3.52	-17.60	0.09	-0.09	-1.03
2,840.00	0.75	160.11	2,839.82	715.78	16.00	3.90	-16.33	0.22	-0.19	-7.80
2,934.00	0.49	142.53	2,933.82	621.78	15.10	4.35	-15.49	0.34	-0.28	-18.70
3,028.00	0.36	106.36	3,027.81	527.79	14.70	4.88	-15.15	0.31	-0.14	-38.48
3,122.00	0.41	76.90	3,121.81	433.79	14.69	5.49	-15.21	0.21	0.05	-31.34
3,216.00	0.41	59.26	3,215.81	339.79	14.94	6.11	-15.53	0.13	0.00	-18.77
3,311.00	0.61	62.38	3,310.80	244.80	15.34	6.85	-16.01	0.21	0.21	3.28
3,405.00	0.74	318.20	3,404.80	150.80	16.03	6.89	-16.70	1.14	0.14	-110.83
3,499.00	2.30	304.94	3,498.76	56.84	17.56	4.94	-18.00	1.69	1.66	-14.11
3,593.00	3.37	303.75	3,592.65	-37.05	20.18	1.09	-20.17	1.14	1.14	-1.27
3,687.00	4.68	301.92	3,686.41	-130.81	23.74	-4.46	-23.09	1.40	1.39	-1.95
3,781.00	6.25	297.51	3,779.98	-224.38	28.13	-12.25	-26.58	1.73	1.67	-4.69
3,875.00	7.33	294.63	3,873.32	-317.72	32.99	-22.24	-30.30	1.20	1.15	-3.06
3,969.00	7.95	293.32	3,966.49	-410.89	38.07	-33.66	-34.06	0.69	0.66	-1.39
4,063.00	9.38	290.90	4,059.41	-503.81	43.37	-46.79	-37.87	1.57	1.52	-2.57
4,157.00	10.30	288.24	4,152.03	-596.43	48.74	-61.93	-41.50	1.09	0.98	-2.83
4,251.00	9.90	287.01	4,244.57	-688.97	53.73	-77.64	-44.71	0.48	-0.43	-1.31
4,345.00	9.67	285.56	4,337.21	-781.61	58.21	-92.97	-47.45	0.36	-0.24	-1.54
4,440.00	9.21	282.55	4,430.92	-875.32	62.00	-108.08	-49.52	0.71	-0.48	-3.17
4,534.00	8.03	278.48	4,523.86	-968.26	64.61	-121.91	-50.56	1.41	-1.26	-4.33
4,628.00	6.00	271.55	4,617.15	-1,061.55	65.71	-133.32	-50.38	2.34	-2.16	-7.37
4,722.00	4.56	270.94	4,710.75	-1,155.15	65.90	-141.97	-49.61	1.53	-1.53	-0.65
4,816.00	5.90	282.96	4,804.36	-1,248.76	67.05	-150.41	-49.80	1.83	1.43	12.79
4,910.00	6.96	285.16	4,897.77	-1,342.17	69.62	-160.62	-51.21	1.16	1.13	2.34
5,004.00	7.62	288.99	4,991.01	-1,435.41	73.14	-172.01	-53.44	0.87	0.70	4.07
5,098.00	8.17	293.76	5,084.12	-1,528.52	77.86	-184.01	-56.78	0.91	0.59	5.07
5,192.00	8.16	296.62	5,177.16	-1,621.56	83.54	-196.09	-61.08	0.43	-0.01	3.04
5,286.00	7.63	298.31	5,270.27	-1,714.67	89.49	-207.55	-65.70	0.62	-0.56	1.80
5,356.00	7.22	299.95	5,339.69	-1,784.09	93.89	-215.45	-69.19	0.66	-0.59	2.34
ICP										
5,450.00	8.11	292.11	5,432.85	-1,877.25	99.33	-226.71	-73.34	1.46	0.95	-8.34
5,544.00	9.90	293.47	5,525.69	-1,970.09	105.05	-240.27	-77.51	1.92	1.90	1.45
5,638.00	11.66	294.63	5,618.02	-2,062.42	112.22	-256.32	-82.84	1.89	1.87	1.23
5,732.00	12.20	295.92	5,709.99	-2,154.39	120.52	-273.88	-89.13	0.64	0.57	1.37

Survey Report



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Project:	LEA COUNTY, NM (NAD 83 - UTM ZONE	TVD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Site:	NE NE SEC 16 T24S R34E	MD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Well:	PIRATE STATE #401H	North Reference:	True
Wellbore:	JOB # 2019-359-650	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	Database 1

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,826.00	12.34	295.31	5,801.85	-2,246.25	129.16	-291.90	-95.69	0.20	0.15	-0.65
5,920.00	12.06	293.91	5,893.72	-2,338.12	137.43	-309.96	-101.89	0.43	-0.30	-1.49
6,014.00	11.97	294.52	5,985.66	-2,430.06	145.46	-327.80	-107.87	0.17	-0.10	0.65
6,108.00	11.95	292.95	6,077.62	-2,522.02	153.30	-345.63	-113.67	0.35	-0.02	-1.67
6,202.00	11.08	291.31	6,169.73	-2,614.13	160.38	-363.01	-118.76	0.99	-0.93	-1.74
6,296.00	10.79	290.54	6,262.02	-2,706.42	166.75	-379.66	-123.22	0.35	-0.31	-0.82
6,390.00	10.34	289.57	6,354.43	-2,798.83	172.66	-395.85	-127.29	0.51	-0.48	-1.03
6,484.00	10.13	290.24	6,446.93	-2,891.33	178.34	-411.56	-131.18	0.26	-0.22	0.71
6,578.00	9.77	289.70	6,539.52	-2,983.92	183.89	-426.82	-134.99	0.40	-0.38	-0.57
6,672.00	9.83	289.65	6,632.15	-3,076.55	189.28	-441.89	-138.65	0.06	0.06	-0.05
6,766.00	10.14	290.78	6,724.72	-3,169.12	194.91	-457.18	-142.54	0.39	0.33	1.20
6,860.00	8.17	290.21	6,817.52	-3,261.92	200.16	-471.19	-146.19	2.10	-2.10	-0.61
6,954.00	7.81	290.19	6,910.61	-3,355.01	204.67	-483.45	-149.30	0.38	-0.38	-0.02
7,048.00	7.81	290.55	7,003.74	-3,448.14	209.11	-495.42	-152.38	0.05	0.00	0.38
7,142.00	5.80	287.82	7,097.07	-3,541.47	212.81	-505.93	-154.87	2.17	-2.14	-2.90
7,237.00	4.68	300.82	7,191.68	-3,636.08	216.27	-513.82	-157.42	1.71	-1.18	13.68
7,331.00	4.20	303.04	7,285.39	-3,729.79	220.11	-520.00	-160.55	0.54	-0.51	2.36
7,425.00	2.98	296.38	7,379.21	-3,823.61	223.07	-525.08	-162.93	1.37	-1.30	-7.09
7,519.00	2.44	275.59	7,473.10	-3,917.50	224.35	-529.26	-163.73	1.18	-0.57	-22.12
7,613.00	2.03	303.04	7,567.04	-4,011.44	225.45	-532.65	-164.45	1.20	-0.44	29.20
7,707.00	1.70	327.81	7,660.99	-4,105.39	227.54	-534.78	-166.28	0.92	-0.35	26.35
7,802.00	1.58	320.25	7,755.95	-4,200.35	229.74	-536.37	-168.29	0.26	-0.13	-7.96
7,896.00	1.74	327.86	7,849.91	-4,294.31	231.94	-537.96	-170.30	0.29	0.17	8.10
7,990.00	1.71	314.17	7,943.87	-4,388.27	234.13	-539.73	-172.28	0.44	-0.03	-14.56
8,084.00	1.81	306.20	8,037.82	-4,482.22	235.98	-541.93	-173.87	0.28	0.11	-8.48
8,178.00	1.77	304.88	8,131.78	-4,576.18	237.69	-544.32	-175.30	0.06	-0.04	-1.40
8,272.00	2.22	304.25	8,225.72	-4,670.12	239.55	-547.01	-176.84	0.48	0.48	-0.67
8,366.00	1.11	343.56	8,319.68	-4,764.08	241.44	-548.78	-178.53	1.63	-1.18	41.82
8,460.00	0.53	314.90	8,413.67	-4,858.07	242.62	-549.34	-179.64	0.74	-0.62	-30.49
8,554.00	0.87	306.71	8,507.66	-4,952.06	243.36	-550.22	-180.27	0.38	0.36	-8.71
8,648.00	0.63	67.38	8,601.66	-5,046.06	243.98	-550.32	-180.88	1.39	-0.26	128.37
8,742.00	0.76	56.79	8,695.65	-5,140.05	244.52	-549.32	-181.53	0.19	0.14	-11.27
8,836.00	0.55	18.01	8,789.65	-5,234.05	245.29	-548.66	-182.37	0.51	-0.22	-41.26
8,931.00	0.30	353.04	8,884.64	-5,329.04	245.97	-548.55	-183.06	0.32	-0.26	-26.28
9,025.00	0.92	338.65	8,978.64	-5,423.04	246.92	-548.85	-183.97	0.67	0.66	-15.31
9,119.00	1.15	336.35	9,072.62	-5,517.02	248.49	-549.50	-185.45	0.25	0.24	-2.45
9,213.00	1.20	330.82	9,166.60	-5,611.00	250.21	-550.36	-187.07	0.13	0.05	-5.88
9,307.00	0.94	354.87	9,260.59	-5,704.99	251.84	-550.91	-188.62	0.55	-0.28	25.59
9,401.00	1.34	4.28	9,354.57	-5,798.97	253.70	-550.90	-190.48	0.47	0.43	10.01
9,495.00	1.51	6.33	9,448.54	-5,892.94	256.03	-550.68	-192.82	0.19	0.18	2.18
9,589.00	1.92	7.11	9,542.50	-5,986.90	258.82	-550.35	-195.63	0.44	0.44	0.83
9,683.00	2.15	23.40	9,636.44	-6,080.84	262.00	-549.45	-198.89	0.66	0.24	17.33
9,707.00	2.50	18.99	9,660.42	-6,104.82	262.91	-549.10	-199.83	1.64	1.46	-18.37
KOP										
9,781.00	2.09	47.19	9,734.36	-6,178.76	265.36	-547.59	-202.43	1.60	-0.55	38.11
9,812.00	3.47	138.78	9,765.34	-6,209.74	265.03	-546.56	-202.22	13.22	4.45	295.45
9,843.00	7.31	153.51	9,796.20	-6,240.60	262.56	-545.06	-199.94	13.07	12.39	47.52
9,875.00	11.08	161.03	9,827.78	-6,272.18	257.83	-543.15	-195.45	12.34	11.78	23.50
9,922.00	16.70	171.32	9,873.39	-6,317.79	246.87	-540.66	-184.84	13.02	11.96	21.89
9,969.00	19.82	173.91	9,918.02	-6,362.42	232.27	-538.79	-170.54	6.86	6.64	5.51
- CROSS SETBACK										
9,981.00	20.63	174.47	9,929.28	-6,373.68	228.14	-538.37	-166.48	6.98	6.79	4.70
10,016.00	23.02	175.90	9,961.77	-6,406.17	215.18	-537.29	-153.72	6.98	6.82	4.07

Survey Report



Company:	CENTENNIAL RESOURCE DEVELOPME	Local Co-ordinate Reference:	Well PIRATE STATE #401H
Project:	LEA COUNTY, NM (NAD 83 - UTM ZONE	TVD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Site:	NE NE SEC 16 T24S R34E	MD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Well:	PIRATE STATE #401H	North Reference:	True
Wellbore:	JOB # 2019-359-650	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	Database 1

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,063.00	25.49	177.25	10,004.62	-6,449.02	195.91	-536.15	-134.69	5.39	5.26	2.87
10,110.00	28.01	179.17	10,046.59	-6,490.99	174.77	-535.50	-113.76	5.67	5.36	4.09
10,157.00	28.63	181.62	10,087.96	-6,532.36	152.47	-535.66	-91.59	2.80	1.32	5.21
10,204.00	29.77	182.52	10,128.99	-6,573.39	129.56	-536.49	-68.73	2.60	2.43	1.91
10,251.00	31.60	182.83	10,169.41	-6,613.81	105.60	-537.61	-44.79	3.91	3.89	0.66
10,298.00	33.38	181.39	10,209.05	-6,653.45	80.38	-538.54	-19.62	4.13	3.79	-3.06
10,345.00	36.33	181.01	10,247.61	-6,692.01	53.52	-539.10	7.12	6.29	6.28	-0.81
10,377.00	39.81	179.86	10,272.80	-6,717.20	33.80	-539.24	26.74	11.10	10.87	-3.59
10,408.00	42.74	179.08	10,296.10	-6,740.50	13.35	-539.04	47.04	9.60	9.45	-2.52
10,440.00	45.41	180.38	10,319.09	-6,763.49	-8.91	-538.95	69.14	8.81	8.34	4.06
10,487.00	49.28	180.50	10,350.93	-6,795.33	-43.46	-539.21	103.52	8.24	8.23	0.26
10,534.00	51.61	180.52	10,380.85	-6,825.25	-79.70	-539.54	139.56	4.96	4.96	0.04
10,565.00	54.07	179.65	10,399.58	-6,843.98	-104.40	-539.57	164.11	8.24	7.94	-2.81
10,596.00	57.11	179.62	10,417.10	-6,861.50	-129.97	-539.41	189.50	9.81	9.81	-0.10
10,628.00	59.65	179.77	10,433.87	-6,878.27	-157.22	-539.26	216.56	7.95	7.94	0.47
10,675.00	64.65	180.59	10,455.82	-6,900.22	-198.76	-539.40	257.86	10.75	10.64	1.74
10,721.00	69.24	179.92	10,473.83	-6,918.23	-241.08	-539.58	299.93	10.07	9.98	-1.46
10,769.00	75.33	180.46	10,488.43	-6,932.83	-286.78	-539.74	345.36	12.73	12.69	1.12
10,815.00	81.70	181.37	10,497.58	-6,941.98	-331.83	-540.46	390.21	13.98	13.85	1.98
HZ LANDING PT										
10,882.00	87.09	181.41	10,502.17	-6,946.57	-378.57	-541.60	438.79	11.47	11.47	0.09
10,910.00	89.11	181.23	10,503.76	-6,948.16	-426.53	-542.70	484.57	4.22	4.21	-0.37
10,957.00	89.47	180.91	10,504.35	-6,948.75	-473.52	-543.58	531.36	1.02	0.77	-0.68
11,026.00	90.00	180.60	10,504.67	-6,949.07	-542.51	-544.49	600.02	0.89	0.77	-0.45
11,121.00	90.07	179.78	10,504.61	-6,949.01	-637.51	-544.80	694.46	0.87	0.07	-0.86
11,215.00	89.85	181.98	10,504.67	-6,949.07	-731.49	-546.25	788.01	2.35	-0.23	2.34
11,309.00	90.31	180.12	10,504.54	-6,948.94	-825.47	-547.97	881.59	2.04	0.49	-1.98
11,403.00	90.35	182.25	10,504.00	-6,948.40	-919.44	-549.91	975.19	2.27	0.04	2.27
11,497.00	90.46	180.67	10,503.34	-6,947.74	-1,013.41	-552.31	1,068.84	1.68	0.12	-1.68
11,591.00	89.78	182.85	10,503.14	-6,947.54	-1,107.36	-555.19	1,162.52	2.43	-0.72	2.32
11,685.00	89.47	181.45	10,503.75	-6,948.15	-1,201.29	-558.72	1,256.25	1.53	-0.33	-1.49
11,779.00	88.77	183.86	10,505.20	-6,949.60	-1,295.17	-563.07	1,350.03	2.67	-0.74	2.56
11,873.00	89.04	180.89	10,506.99	-6,951.39	-1,389.06	-566.97	1,443.77	3.17	0.29	-3.16
11,967.00	89.04	182.72	10,508.57	-6,952.97	-1,483.00	-569.93	1,537.45	1.95	0.00	1.95
12,061.00	89.64	180.50	10,509.65	-6,954.05	-1,576.95	-572.57	1,631.10	2.45	0.64	-2.36
12,156.00	90.19	182.41	10,509.79	-6,954.19	-1,671.91	-574.98	1,725.74	2.09	0.58	2.01
12,250.00	91.16	180.45	10,508.69	-6,953.09	-1,765.87	-577.33	1,819.37	2.33	1.03	-2.09
12,293.00	90.85	178.20	10,507.93	-6,952.33	-1,808.86	-576.82	1,862.03	5.28	-0.72	-5.23
12,343.00	90.76	177.87	10,507.23	-6,951.63	-1,858.82	-575.11	1,911.49	0.68	-0.18	-0.66
12,437.00	89.71	181.17	10,506.84	-6,951.24	-1,952.80	-574.32	2,004.80	3.68	-1.12	3.51
12,531.00	90.11	177.95	10,506.99	-6,951.39	-2,046.79	-573.60	2,098.11	3.45	0.43	-3.43
12,625.00	88.06	179.20	10,508.49	-6,952.89	-2,140.74	-571.26	2,191.21	2.55	-2.18	1.33
12,719.00	89.28	176.72	10,510.67	-6,955.07	-2,234.65	-567.91	2,284.15	2.94	1.30	-2.64
12,814.00	89.27	178.00	10,511.88	-6,956.28	-2,329.54	-563.54	2,377.96	1.35	-0.01	1.35
12,908.00	88.96	176.66	10,513.33	-6,957.73	-2,423.42	-559.16	2,470.76	1.46	-0.33	-1.43
13,002.00	89.01	179.15	10,514.99	-6,959.39	-2,517.34	-555.72	2,563.70	2.65	0.05	2.65
13,096.00	87.91	177.42	10,517.52	-6,961.92	-2,611.25	-552.91	2,656.72	2.18	-1.17	-1.84
13,190.00	88.10	179.96	10,520.79	-6,965.19	-2,705.17	-550.77	2,749.80	2.71	0.20	2.70
13,284.00	88.09	177.93	10,523.92	-6,968.32	-2,799.09	-549.04	2,842.94	2.16	-0.01	-2.16
13,378.00	87.30	180.06	10,527.70	-6,972.10	-2,893.00	-547.39	2,936.07	2.42	-0.84	2.27
13,472.00	87.87	177.78	10,531.66	-6,976.06	-2,986.89	-545.62	3,029.18	2.50	0.61	-2.43
13,567.00	87.98	179.44	10,535.10	-6,979.50	-3,081.80	-543.31	3,123.23	1.75	0.12	1.75
13,660.00	88.87	177.50	10,537.66	-6,982.06	-3,174.72	-540.83	3,215.30	2.29	0.96	-2.09

Survey Report



Company:	CENTENNIAL RESOURCE DEVELOPME	Local Co-ordinate Reference:	Well PIRATE STATE #401H
Project:	LEA COUNTY, NM (NAD 83 - UTM ZONE	TVD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Site:	NE NE SEC 16 T24S R34E	MD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Well:	PIRATE STATE #401H	North Reference:	True
Wellbore:	JOB # 2019-359-650	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	Database 1

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,755.00	90.80	180.87	10,537.93	-6,982.33	-3,269.69	-539.48	3,309.52	4.09	2.03	3.55
13,849.00	90.25	179.30	10,537.07	-6,981.47	-3,363.69	-539.62	3,402.94	1.77	-0.59	-1.67
13,943.00	91.78	181.19	10,535.40	-6,979.80	-3,457.66	-540.02	3,496.37	2.59	1.63	2.01
14,037.00	92.41	180.06	10,531.97	-6,976.37	-3,551.59	-541.05	3,589.83	1.38	0.67	-1.20
14,131.00	91.79	179.85	10,528.52	-6,972.92	-3,645.53	-540.97	3,683.17	0.70	-0.66	-0.22
14,225.00	91.30	180.18	10,525.99	-6,970.39	-3,739.49	-541.00	3,776.54	0.63	-0.52	0.35
14,319.00	90.89	180.09	10,524.19	-6,968.59	-3,833.48	-541.22	3,869.96	0.45	-0.44	-0.10
14,413.00	90.77	179.81	10,522.83	-6,967.23	-3,927.47	-541.14	3,963.35	0.32	-0.13	-0.30
14,507.00	90.99	180.25	10,521.39	-6,965.79	-4,021.46	-541.19	4,056.76	0.52	0.23	0.47
14,601.00	91.22	180.94	10,519.57	-6,963.97	-4,115.43	-542.16	4,150.25	0.77	0.24	0.73
14,696.00	90.87	180.18	10,517.84	-6,962.24	-4,210.41	-543.09	4,244.74	0.88	-0.37	-0.80
14,789.00	90.94	180.42	10,516.37	-6,960.77	-4,303.40	-543.58	4,337.20	0.27	0.08	0.26
14,885.00	90.57	181.83	10,515.11	-6,959.51	-4,399.37	-545.46	4,432.77	1.52	-0.39	1.47
14,977.00	90.79	179.37	10,514.02	-6,958.42	-4,491.35	-546.43	4,524.29	2.68	0.24	-2.67
15,072.00	91.79	179.84	10,511.88	-6,956.28	-4,586.32	-545.77	4,618.59	1.16	1.05	0.49
15,166.00	92.10	180.15	10,508.69	-6,953.09	-4,680.27	-545.76	4,711.94	0.47	0.33	0.33
15,260.00	91.71	179.86	10,505.56	-6,949.96	-4,774.22	-545.77	4,805.30	0.52	-0.41	-0.31
LAST SURVEY JUNE 3, 2019										
15,308.00	92.16	179.84	10,503.94	-6,948.34	-4,822.19	-545.65	4,852.96	0.94	0.94	-0.04
PROJECTION TO TD										
15,340.00	92.16	179.84	10,502.74	-6,947.14	-4,854.17	-545.56	4,884.73	0.00	0.00	0.00

Survey Report



Company:	CENTENNIAL RESOURCE DEVELOPME	Local Co-ordinate Reference:	Well PIRATE STATE #401H
Project:	LEA COUNTY, NM (NAD 83 - UTM ZONE	TVD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Site:	NE NE SEC 16 T24S R34E	MD Reference:	KB REV 26.5 @ 3555.60usft (H&P 650)
Well:	PIRATE STATE #401H	North Reference:	True
Wellbore:	JOB # 2019-359-650	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	Database 1

Targets									
Target Name									
- Hit/Miss target	Dip Angle	Dip Dir.	TVD	+N/S	+E/W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
BHL - PIRATE STATE #	0.00	0.00	10,520.30	-4,846.08	-545.58	11,695,524.41	2,113,505.98	32.210573	-103.469947
- survey misses target center by 17.25usft at 15331.26usft MD (10503.06 TVD, -4845.43 N, -545.58 E)									
- Rectangle (sides W5,076.63 H100.00 D0.00)									
PP/FTP - PIRATE STATI	0.00	0.00	10,493.71	230.49	-541.70	11,700,599.79	2,113,437.49	32.224527	-103.469934
- survey misses target center by 293.61usft at 10408.00usft MD (10296.10 TVD, 13.35 N, -539.04 E)									
- Point									
KOP - PIRATE STATE #	0.00	0.00	9,920.76	800.45	-541.30	11,701,169.62	2,113,429.76	32.226094	-103.469933
- survey misses target center by 550.53usft at 9875.00usft MD (9827.78 TVD, 257.83 N, -543.15 E)									
- Point									
HZ LP - PIRATE STATE	0.00	0.00	10,496.70	-339.47	-542.09	11,700,029.96	2,113,445.22	32.222960	-103.469936
- survey misses target center by 2.41usft at 10822.56usft MD (10498.62 TVD, -339.31 N, -540.64 E)									
- Point									
BHL - PIRATE STATE #	0.00	0.00	10,520.10	-4,846.08	-545.58	11,695,524.41	2,113,505.98	32.210573	-103.469947
- survey misses target center by 17.05usft at 15331.26usft MD (10503.06 TVD, -4845.43 N, -545.58 E)									
- Rectangle (sides W5,076.63 H100.00 D0.00)									
KOP - PIRATE STATE #	0.00	0.00	9,923.75	230.49	-541.70	11,700,599.79	2,113,437.49	32.224527	-103.469934
- survey misses target center by 3.13usft at 9974.89usft MD (9923.55 TVD, 230.27 N, -538.59 E)									
- Point									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/S (usft)	+E/W (usft)	
1,281.10	1,281.05	7.23	1.48	LAST INVICTUS SURVEY
1,320.00	1,319.95	7.23	1.43	13 3/8" CASING
5,450.00	5,432.85	99.33	-226.71	ICP
9,781.00	9,734.36	265.36	-547.59	KOP
9,981.00	9,929.28	228.14	-538.37	~ CROSS SETBACK
10,862.00	10,502.17	-378.57	-541.60	HZ LANDING PT
15,308.00	10,503.94	-4,822.19	-545.65	LAST SURVEY JUNE 3, 2019
15,340.00	10,502.74	-4,854.17	-545.56	PROJECTION TO TD

Checked By: _____ Approved By: _____ Date: _____