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PathFinder Energy Services, Inc.

Survey Report

JUL 18 2019

DISTRICT/ARTESIA/O.C.D.

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Tie-in Date: 04/09/2019

Date Completed: 05/20/2019

CAZA PETROLEUM, LLC
ALISA OGDEN 15 #4H
EDDY COUNTY, NM
Rig:
PathFinder Office Supervisor:
PathFinder Field Engineers:

Survey Horiz. Reference: WELLHEAD
Ref Coordinates: LAT: 32.18.5.2948 N LON: 104.10.13.0797 W
GRID Reference: NAD83 new mexico east Transverse Mercator
Ref GRID Coord: X: 591709.8811 Y: 473445.8848
North Aligned To: GRID NORTH
Total Magnetic Correction: 7.14° EAST TO GRID
Vertical Section Plane: 258.42
Survey Vert. Reference: 22.00' Rotary Table To Ground
Altitude: 3127.00' Ground To MSL

Survey Calculations by RX4 using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/30M)	TEH (F)
0.00	0.00	164.00	0.00	0.00	-0.00	0.00	0.00	0.00@	0.00	0.00	0
15.20	0.13	99.56	15.20	15.20	-0.02	0.00 S	0.02 E	0.02@	99.56	0.84	0
109.15	0.67	102.27	109.15	93.95	-0.62	0.14 S	0.66 E	0.67@	101.77	0.57	0
203.10	0.89	123.95	203.09	93.95	-1.63	0.66 S	1.80 E	1.92@	110.17	0.38	0
297.05	1.30	144.46	297.02	93.95	-2.58	1.94 S	3.03 E	3.59@	122.62	0.59	0
391.00	2.11	156.62	390.93	93.95	-3.36	4.39 S	4.33 E	6.17@	135.39	0.92	0
473.00	2.19	237.76	472.89	82.00	-2.20	6.61 S	3.61 E	7.53@	151.40	3.36	86
534.00	2.15	243.81	533.84	61.00	-0.01	7.74 S	1.59 E	7.90@	168.37	0.37	93
594.00	2.49	230.98	593.80	60.00	2.24	9.06 S	0.43 W	9.07@	182.72	1.01	97
620.00	2.75	220.83	619.77	26.00	3.23	9.88 S	1.28 W	9.97@	187.36	2.01	97
650.00	2.95	211.86	649.73	30.00	4.34	11.08 S	2.15 W	11.29@	191.00	1.60	97
743.00	5.45	184.49	742.48	93.00	7.20	17.52 S	3.76 W	17.92@	192.12	3.32	101
837.00	8.00	164.76	835.84	94.00	8.02	28.29 S	2.39 W	28.39@	184.84	3.57	104
931.00	7.48	165.09	928.98	94.00	7.25	40.51 S	0.90 E	40.52@	178.73	0.55	104
1025.00	6.87	166.09	1022.25	94.00	6.67	51.88 S	3.83 E	52.02@	175.78	0.65	104
1120.00	6.40	165.07	1116.61	95.00	6.13	62.51 S	6.56 E	62.85@	174.01	0.50	108
1214.00	5.84	165.93	1210.07	94.00	5.61	72.21 S	9.07 E	72.78@	172.84	0.59	111
1308.00	6.36	161.36	1303.54	94.00	4.76	81.78 S	11.90 E	82.64@	171.72	0.74	111
1403.00	7.29	154.78	1397.87	95.00	2.70	92.22 S	16.15 E	93.63@	170.07	1.26	111
1497.00	7.48	150.50	1491.09	94.00	-0.59	102.94 S	21.70 E	105.21@	168.10	0.61	111
1590.00	7.25	154.37	1583.32	93.00	-3.88	113.50 S	27.22 E	116.72@	166.51	0.58	108
1684.00	7.63	155.19	1676.53	94.00	-6.75	124.52 S	32.40 E	128.66@	165.41	0.41	108
1779.00	7.64	151.19	1770.69	95.00	-10.06	135.77 S	38.09 E	141.02@	164.33	0.55	108
1873.00	7.66	152.13	1863.85	94.00	-13.67	146.79 S	44.03 E	153.25@	163.30	0.13	108
1966.00	8.06	153.46	1955.98	93.00	-17.09	158.10 S	49.84 E	165.77@	162.50	0.47	108
2061.00	7.63	154.09	2050.09	95.00	-20.37	169.73 S	55.57 E	178.60@	161.87	0.45	108
2155.00	7.30	159.94	2143.30	94.00	-22.80	180.95 S	60.35 E	190.75@	161.56	0.87	108
2248.00	6.73	160.49	2235.60	93.00	-24.42	191.64 S	64.20 E	202.11@	161.48	0.61	108
2342.00	6.92	164.48	2328.93	94.00	-25.57	202.29 S	67.55 E	213.27@	161.53	0.53	108

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/30M)	TEH (F)
2436.00	6.80	163.62	2422.26	94.00	-26.42	213.08 S	70.64 E	224.49@	161.66	0.17	108
2530.00	6.35	162.91	2515.64	94.00	-27.39	223.39 S	73.73 E	235.25@	161.73	0.48	111
2624.00	6.21	161.51	2609.08	94.00	-28.50	233.18 S	76.87 E	245.53@	161.75	0.22	108
2718.00	6.64	161.82	2702.49	94.00	-29.74	243.17 S	80.18 E	256.05@	161.75	0.45	108
2813.00	6.37	163.88	2796.88	95.00	-30.79	253.45 S	83.36 E	266.80@	161.79	0.37	108
2907.00	6.06	164.07	2890.32	94.00	-31.57	263.23 S	86.17 E	276.97@	161.87	0.32	108
3002.00	5.49	162.45	2984.84	95.00	-32.43	272.38 S	88.91 E	286.53@	161.92	0.61	104
3096.00	6.41	163.59	3078.33	94.00	-33.34	281.70 S	91.75 E	296.27@	161.96	0.97	108
3191.00	6.09	163.32	3172.77	95.00	-34.23	291.62 S	94.70 E	306.61@	162.01	0.33	108
3284.00	6.30	164.40	3265.23	93.00	-35.03	301.26 S	97.49 E	316.64@	162.07	0.25	108
3378.00	7.12	166.43	3358.58	94.00	-35.59	311.89 S	100.24 E	327.60@	162.18	0.89	108
3472.00	6.64	166.31	3451.90	94.00	-35.99	322.83 S	102.89 E	338.83@	162.32	0.50	108
3566.00	7.75	165.24	3545.16	94.00	-36.55	334.24 S	105.79 E	350.59@	162.44	1.17	108
3661.00	8.64	165.37	3639.19	95.00	-37.28	347.34 S	109.23 E	364.11@	162.54	0.92	111
3755.00	8.71	164.47	3732.12	94.00	-38.15	361.03 S	112.92 E	378.28@	162.63	0.16	108
3849.00	8.44	164.94	3825.07	94.00	-39.06	374.55 S	116.61 E	392.28@	162.71	0.29	108
3943.00	8.09	164.23	3918.09	94.00	-39.96	387.58 S	120.20 E	405.79@	162.77	0.38	108
4038.00	7.68	164.71	4012.19	95.00	-40.86	400.13 S	123.70 E	418.82@	162.82	0.43	108
4133.00	7.83	164.71	4106.32	95.00	-41.69	412.50 S	127.08 E	431.63@	162.88	0.15	111
4228.00	7.43	165.25	4200.48	95.00	-42.44	424.68 S	130.35 E	444.23@	162.94	0.42	111
4322.00	6.75	166.96	4293.76	94.00	-42.92	435.94 S	133.14 E	455.82@	163.02	0.75	111
4417.00	6.46	167.83	4388.13	95.00	-43.12	446.60 S	135.53 E	466.71@	163.12	0.32	111
4511.00	6.53	166.22	4481.53	94.00	-43.38	456.96 S	137.91 E	477.32@	163.21	0.20	93
4606.00	6.66	166.73	4575.90	95.00	-43.75	467.57 S	140.47 E	488.21@	163.28	0.15	101
4699.00	6.90	167.76	4668.25	93.00	-43.97	478.28 S	142.89 E	499.17@	163.37	0.29	101
4793.00	7.09	167.12	4761.55	94.00	-44.17	489.45 S	145.38 E	510.59@	163.46	0.21	104
4887.00	6.67	166.78	4854.87	94.00	-44.46	500.42 S	147.92 E	521.83@	163.53	0.44	104
4982.00	5.95	166.88	4949.30	95.00	-44.75	510.59 S	150.30 E	532.25@	163.60	0.75	104
5076.00	5.73	169.24	5042.81	94.00	-44.81	519.94 S	152.28 E	541.79@	163.68	0.34	104
5171.00	5.44	169.18	5137.36	95.00	-44.68	529.03 S	154.01 E	550.99@	163.77	0.30	108
5265.00	5.22	169.81	5230.95	94.00	-44.52	537.61 S	155.60 E	559.68@	163.86	0.24	108
5360.00	5.33	169.48	5325.55	95.00	-44.33	546.20 S	157.17 E	568.37@	163.95	0.12	108
5455.00	4.98	169.01	5420.16	95.00	-44.21	554.59 S	158.77 E	576.87@	164.02	0.36	108
5544.00	4.86	165.75	5508.84	89.00	-44.35	562.03 S	160.43 E	584.48@	164.07	0.34	108
5677.00	4.71	164.65	5641.37	133.00	-44.97	572.76 S	163.26 E	595.58@	164.09	0.13	111
5770.00	4.17	166.90	5734.09	93.00	-45.31	579.74 S	165.04 E	602.77@	164.11	0.60	122
5864.00	3.93	166.79	5827.86	94.00	-45.49	586.20 S	166.55 E	609.40@	164.14	0.25	129

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5958.00	4.96	157.60	5921.58	94.00	-46.34	593.09 S	168.84 E	616.66@	164.11	1.31	140
6053.00	4.09	162.94	6016.28	95.00	-47.44	600.13 S	171.39 E	624.13@	164.06	1.00	140
6148.00	4.59	156.02	6111.01	95.00	-48.58	606.84 S	173.93 E	631.28@	164.01	0.75	148
6242.00	4.34	153.79	6204.72	94.00	-50.28	613.47 S	177.03 E	638.50@	163.90	0.32	148
6336.00	4.85	157.48	6298.42	94.00	-51.94	620.33 S	180.13 E	645.95@	163.81	0.62	148
6430.00	5.73	162.21	6392.02	94.00	-53.20	628.47 S	183.08 E	654.60@	163.76	1.03	144
6525.00	5.90	159.80	6486.53	95.00	-54.44	637.57 S	186.22 E	664.21@	163.72	0.31	151
6619.00	6.41	158.45	6579.99	94.00	-56.08	646.98 S	189.81 E	674.25@	163.65	0.56	151
6714.00	6.24	159.67	6674.41	95.00	-57.78	656.76 S	193.55 E	684.68@	163.58	0.23	151
6809.00	5.75	158.09	6768.89	95.00	-59.42	666.01 S	197.12 E	694.57@	163.51	0.54	151
6903.00	4.95	159.21	6862.48	94.00	-60.91	674.17 S	200.32 E	703.31@	163.45	0.84	151
6997.00	5.27	164.77	6956.11	94.00	-61.84	682.13 S	202.89 E	711.67@	163.44	0.62	155
7091.00	6.37	172.43	7049.62	94.00	-61.75	691.47 S	204.71 E	721.13@	163.51	1.41	155
7185.00	5.96	175.15	7143.08	94.00	-60.81	701.50 S	205.81 E	731.07@	163.65	0.53	158
7280.00	6.06	168.96	7237.56	95.00	-60.18	711.33 S	207.19 E	740.89@	163.76	0.68	166
7375.00	6.63	166.60	7331.97	95.00	-60.31	721.59 S	209.42 E	751.37@	163.82	0.65	158
7470.00	5.96	168.81	7426.40	95.00	-60.45	731.76 S	211.65 E	761.76@	163.87	0.74	162
7565.00	5.68	168.77	7520.91	95.00	-60.39	741.21 S	213.52 E	771.36@	163.93	0.29	162
7659.00	4.84	171.00	7614.51	94.00	-60.18	749.69 S	215.05 E	779.93@	163.99	0.91	162
7754.00	4.86	167.27	7709.17	95.00	-60.08	757.58 S	216.56 E	787.92@	164.05	0.33	162
7848.00	4.51	167.50	7802.86	94.00	-60.22	765.07 S	218.24 E	795.59@	164.08	0.37	162
7942.00	6.14	157.35	7896.45	94.00	-61.25	773.32 S	220.98 E	804.27@	164.05	1.96	158
8036.00	8.03	153.14	7989.73	94.00	-63.94	783.81 S	225.88 E	815.71@	163.92	2.05	162
8130.00	7.60	155.87	8082.86	94.00	-67.02	795.35 S	231.39 E	828.32@	163.78	0.59	169
8225.00	8.65	160.41	8176.91	95.00	-69.38	807.81 S	236.35 E	841.68@	163.69	1.27	166
8318.00	8.89	161.83	8268.82	93.00	-71.18	821.23 S	240.94 E	855.84@	163.65	0.34	166
8413.00	7.77	158.65	8362.82	95.00	-73.12	834.18 S	245.56 E	869.58@	163.60	1.25	162
8507.00	6.57	159.96	8456.08	94.00	-74.99	845.15 S	249.72 E	881.27@	163.54	1.27	166
8602.00	5.50	161.87	8550.55	95.00	-76.30	854.59 S	253.00 E	891.25@	163.51	1.13	166
8659.00	4.94	162.23	8607.31	57.00	-76.88	859.52 S	254.60 E	896.43@	163.50	0.97	162
8715.00	3.61	175.36	8663.16	56.00	-76.93	863.57 S	255.48 E	900.57@	163.52	2.89	133
8762.00	5.80	217.58	8710.01	47.00	-74.95	866.93 S	254.15 E	903.42@	163.66	8.28	137
8810.00	6.39	214.08	8757.74	48.00	-71.21	871.06 S	251.17 E	906.55@	163.92	1.43	140
8857.00	7.70	226.97	8804.39	47.00	-66.65	875.38 S	247.40 E	909.67@	164.22	4.28	144
8904.00	13.94	248.80	8850.54	47.00	-58.37	879.58 S	239.81 E	911.69@	164.75	15.41	144
8952.00	21.41	252.92	8896.25	48.00	-43.93	884.25 S	226.03 E	912.68@	165.66	15.52	148
8998.00	22.59	261.50	8938.91	46.00	-26.74	888.03 S	209.26 E	912.35@	166.74	7.32	148

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/30M)	TEN (F)
9046.00	29.19	263.65	8982.07	48.00	-5.86	890.69 S	188.49 E	910.41@	168.05	13.67	148
9093.00	34.27	269.37	9022.04	47.00	18.57	892.10 S	163.84 E	907.02@	169.59	12.35	151
9141.00	39.18	271.01	9060.50	48.00	46.65	891.98 S	135.15 E	902.16@	171.38	10.27	155
9188.00	43.51	269.57	9095.78	47.00	77.03	891.84 S	104.11 E	897.90@	173.34	9.28	151
9283.00	54.78	269.17	9157.82	95.00	147.47	892.65 S	32.38 E	893.24@	177.92	11.68	144
9330.00	62.34	269.07	9182.32	47.00	186.84	893.27 S	7.69 W	893.30@	180.49	15.83	144
9376.00	68.92	267.92	9201.29	46.00	228.08	894.38 S	49.55 W	895.75@	183.17	14.26	144
9424.00	75.88	267.86	9215.80	48.00	273.18	896.06 S	95.25 W	901.11@	186.07	14.27	148
9470.00	82.91	267.92	9224.26	46.00	317.75	897.73 S	140.40 W	908.64@	188.89	15.04	148
9535.00	90.39	269.96	9228.05	65.00	381.50	898.92 S	205.23 W	922.05@	192.86	11.74	151
9564.00	91.46	270.13	9227.58	29.00	409.90	898.90 S	234.23 W	928.91@	194.60	3.68	151
9658.00	92.53	269.74	9224.31	94.00	501.95	899.00 S	328.17 W	957.03@	200.05	1.19	151
9666.00	92.69	270.18	9223.95	8.00	509.78	899.01 S	336.16 W	959.80@	200.50	5.75	155
9761.00	91.12	272.76	9220.79	95.00	602.26	896.57 S	431.06 W	994.82@	205.68	3.13	166
9856.00	89.94	273.06	9219.91	95.00	694.24	891.75 S	525.94 W	1035.29@	210.53	1.26	169
9950.00	90.34	273.03	9219.68	94.00	785.19	886.76 S	619.80 W	1081.89@	214.95	0.42	173
10043.00	90.17	272.87	9219.27	93.00	875.21	881.97 S	712.68 W	1133.92@	218.94	0.25	169
10138.00	90.11	272.41	9219.04	95.00	967.30	877.60 S	807.58 W	1192.62@	222.62	0.48	173
10232.00	90.62	270.80	9218.44	94.00	1058.82	874.96 S	901.53 W	1256.31@	225.86	1.77	176
10327.00	91.01	269.26	9217.09	95.00	1151.86	874.91 S	996.52 W	1326.10@	228.72	1.64	176
10420.00	91.40	268.87	9215.13	93.00	1243.24	876.43 S	1089.49 W	1398.25@	231.19	0.58	173
10515.00	91.01	269.13	9213.13	95.00	1336.61	878.09 S	1184.45 W	1474.44@	233.45	0.49	176
10609.00	91.35	268.91	9211.20	94.00	1428.98	879.70 S	1278.42 W	1551.84@	235.47	0.42	180
10704.00	91.18	268.92	9209.10	95.00	1522.37	881.49 S	1373.38 W	1631.93@	237.31	0.18	180
10798.00	90.06	268.78	9208.08	94.00	1614.81	883.38 S	1467.35 W	1712.74@	238.95	1.18	180
10893.00	89.21	268.70	9208.69	95.00	1708.27	885.47 S	1562.33 W	1795.81@	240.46	0.89	180
10988.00	89.05	268.78	9210.13	95.00	1801.72	887.56 S	1657.29 W	1879.99@	241.83	0.19	180
11083.00	90.22	269.04	9210.73	95.00	1895.13	889.37 S	1752.27 W	1965.05@	243.09	1.24	184
11178.00	90.28	268.68	9210.32	95.00	1988.56	891.26 S	1847.25 W	2051.02@	244.24	0.38	184
11272.00	90.34	268.90	9209.81	94.00	2081.02	893.24 S	1941.23 W	2136.88@	245.29	0.24	180
11366.00	90.78	268.23	9208.89	94.00	2173.55	895.59 S	2035.19 W	2223.53@	246.25	0.84	176
11460.00	90.50	268.46	9207.84	94.00	2266.13	898.31 S	2129.15 W	2310.90@	247.12	0.38	184
11553.00	91.46	268.39	9206.25	93.00	2357.71	900.86 S	2222.10 W	2397.77@	247.93	1.02	184
11647.00	91.51	267.88	9203.82	94.00	2450.33	903.92 S	2316.02 W	2486.16@	248.68	0.54	187
11741.00	92.02	267.90	9200.92	94.00	2543.00	907.38 S	2409.91 W	2575.07@	249.37	0.53	187
11835.00	92.63	267.59	9197.11	94.00	2635.68	911.08 S	2503.76 W	2664.37@	250.00	0.72	184
11929.00	92.80	268.11	9192.65	94.00	2728.31	914.60 S	2597.59 W	2753.90@	250.60	0.57	184

PathFinder Energy Services, Inc.

Survey Report

CAZA PETROLEUM, LLC
ALISA OGDEN 15 #4H
EDDY COUNTY, NM
RIG:

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/30M)	TEH (F)
12024.00	90.22	268.95	9190.15	95.00	2821.79	917.04 S	2692.51 W	2844.40@	251.19	2.81	187
12118.00	90.28	268.69	9189.74	94.00	2914.25	918.97 S	2786.49 W	2934.12@	251.75	0.28	191
12212.00	90.00	267.94	9189.51	94.00	3006.85	921.74 S	2880.45 W	3024.33@	252.26	0.84	191
12307.00	90.17	267.78	9189.37	95.00	3100.56	925.28 S	2975.38 W	3115.94@	252.73	0.24	191
12401.00	90.50	267.29	9188.82	94.00	3193.37	929.33 S	3069.30 W	3206.90@	253.15	0.62	191
12495.00	90.45	267.06	9188.04	94.00	3286.27	933.96 S	3163.18 W	3298.18@	253.55	0.25	187
12590.00	91.29	267.33	9186.60	95.00	3380.15	938.61 S	3258.05 W	3390.56@	253.93	0.91	191
12684.00	91.06	267.47	9184.67	94.00	3472.98	942.87 S	3351.94 W	3482.02@	254.29	0.28	191
12779.00	91.68	268.66	9182.40	95.00	3566.60	946.08 S	3446.85 W	3574.33@	254.65	1.39	194
12873.00	91.07	268.02	9180.14	94.00	3659.17	948.80 S	3540.78 W	3665.70@	255.00	0.93	194
12967.00	91.01	267.56	9178.44	94.00	3751.90	952.42 S	3634.70 W	3757.41@	255.32	0.49	194
13062.00	91.01	267.25	9176.76	95.00	3845.72	956.72 S	3729.59 W	3850.34@	255.61	0.32	191
13157.00	91.18	268.84	9174.95	95.00	3939.36	959.96 S	3824.51 W	3943.15@	255.91	1.66	194
13252.00	91.12	268.25	9173.04	95.00	4032.87	962.38 S	3919.46 W	4035.88@	256.20	0.61	194
13345.00	90.00	268.89	9172.13	93.00	4124.40	964.70 S	4012.43 W	4126.77@	256.48	1.36	194
13440.00	90.00	268.55	9172.13	95.00	4217.87	966.82 S	4107.40 W	4219.66@	256.75	0.35	194
13535.00	90.11	268.14	9172.04	95.00	4311.45	969.56 S	4202.36 W	4312.76@	257.01	0.44	198
13630.00	90.06	267.68	9171.90	95.00	4405.15	973.03 S	4297.30 W	4406.08@	257.24	0.48	198
13725.00	90.00	267.08	9171.85	95.00	4498.99	977.37 S	4392.20 W	4499.63@	257.45	0.62	198
13818.00	90.34	266.42	9171.58	93.00	4591.01	982.64 S	4485.05 W	4591.43@	257.64	0.79	198
13913.00	91.35	265.62	9170.17	95.00	4685.16	989.24 S	4579.81 W	4685.42@	257.81	1.34	191
13990.00	90.62	264.74	9168.85	77.00	4761.61	995.70 S	4656.52 W	4761.79@	257.93	1.46	191
14075.00	90.00	264.00	9168.39	85.00	4846.15	1004.04 S	4741.11 W	4846.26@	258.04	1.12	0

This survey is true and accurate to the best of my knowledge.

