



Crestone Peak Resources

DJ BASIN

Kugel Pad Sec.18-T2N-R67W

Kugel 1M-18H-H267

Kugel 1M-18H-H267 Wellbore #1

Survey: Survey #1

Standard Survey Report

09 July, 2019



CRESTONE PEAK
RESOURCES

Company:	Crestone Peak Resources	Local Co-ordinate Reference:	Well Kugel 1M-18H-H267
Project:	DJ BASIN	TVD Reference:	WELL @ 4976.0ft (Ensign 153 RKB - 23')
Site:	Kugel Pad Sec.18-T2N-R67W	MD Reference:	WELL @ 4976.0ft (Ensign 153 RKB - 23')
Well:	Kugel 1M-18H-H267	North Reference:	True
Wellbore:	Kugel 1M-18H-H267 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Project		DJ BASIN	
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Kugel Pad Sec.18-T2N-R67W				
Site Position:		Northing:	1,294,300.39 usft	Latitude:	40.139825
From:	Lat/Long	Easting:	3,160,349.57 usft	Longitude:	-104.926457
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.37 °

Well	Kugel 1M-18H-H267					
Well Position	+N/-S	0.0 ft	Northing:	1,294,180.52 usft	Latitude:	40.139496
	+E/-W	0.0 ft	Easting:	3,160,350.35 usft	Longitude:	-104.926457
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,953.0 ft

Wellbore	Kugel 1M-18H-H267 Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/12/2019	8.30	66.52	52,045

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	164.09	

Survey Program		Date	7/9/2019		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
114.0	13,665.0	Survey #1 (Kugel 1M-18H-H267 Wellbore	MWD+HDGM	OWSG MWD + HDGM	

Survey										
	Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	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
	1.0	0.00	299.36	1.0	0.0	0.0	0.0	0.39	0.39	0.00
	SHL 2238°FNL & 682°FEL, Sec.18									
	114.0	0.44	299.36	114.0	0.2	-0.4	-0.3	0.39	0.39	0.00
	205.0	0.70	315.35	205.0	0.8	-1.1	-1.0	0.33	0.29	17.57
	297.0	2.11	345.94	297.0	2.8	-1.9	-3.2	1.68	1.53	33.25
	387.0	2.29	16.70	386.9	6.2	-1.8	-6.4	1.31	0.20	34.18
	470.0	1.85	59.77	469.9	8.4	-0.1	-8.1	1.90	-0.53	51.89
	552.0	3.87	34.98	551.7	11.4	2.6	-10.2	2.83	2.46	-30.23
	635.0	6.60	14.77	634.4	18.3	5.4	-16.1	3.92	3.29	-24.35
	717.0	9.50	11.07	715.6	29.5	7.9	-26.2	3.59	3.54	-4.51

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Wellbore:	Kugel 1M-18H-H267 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
780.0	11.28	12.59	777.5	40.6	10.3	-36.2	2.86	2.83	2.41
867.0	13.13	13.07	862.6	58.5	14.4	-52.3	2.13	2.13	0.55
950.0	13.29	17.11	943.4	76.8	19.3	-68.6	1.13	0.19	4.87
1,036.0	14.43	19.17	1,026.9	96.4	25.7	-85.6	1.44	1.33	2.40
1,126.0	16.46	16.16	1,113.6	119.2	32.9	-105.6	2.42	2.26	-3.34
1,216.0	19.49	11.03	1,199.2	146.2	39.4	-129.8	3.80	3.37	-5.70
1,306.0	21.82	7.73	1,283.4	177.5	44.5	-158.5	2.89	2.59	-3.67
1,396.0	23.91	8.83	1,366.4	212.1	49.5	-190.4	2.37	2.32	1.22
1,486.0	25.84	11.90	1,448.0	249.3	56.4	-224.3	2.58	2.14	3.41
1,576.0	27.70	13.55	1,528.4	288.9	65.3	-259.9	2.23	2.07	1.83
1,666.0	28.17	14.81	1,607.9	329.8	75.7	-296.4	0.84	0.52	1.40
1,755.0	29.48	11.34	1,685.9	371.5	85.3	-333.9	2.39	1.47	-3.90
1,845.0	30.60	11.46	1,763.8	415.7	94.3	-373.9	1.25	1.24	0.13
1,935.0	32.17	10.04	1,840.6	461.8	103.0	-415.8	1.93	1.74	-1.58
2,025.0	32.82	11.80	1,916.5	509.2	112.1	-459.0	1.27	0.72	1.96
2,115.0	33.33	10.55	1,991.9	557.4	121.7	-502.7	0.95	0.57	-1.39
2,205.0	32.77	8.56	2,067.4	605.8	129.8	-547.0	1.36	-0.62	-2.21
2,294.0	33.06	10.26	2,142.1	653.5	137.7	-590.7	1.09	0.33	1.91
2,326.0	33.50	10.21	2,168.8	670.8	140.8	-606.5	1.38	1.38	-0.16
2,464.0	31.74	9.88	2,285.1	744.0	153.8	-673.3	1.28	-1.28	-0.24
2,553.0	29.99	7.07	2,361.5	789.2	160.6	-714.9	2.55	-1.97	-3.16
2,643.0	30.25	6.19	2,439.3	834.0	165.8	-756.6	0.57	0.29	-0.98
2,732.0	30.69	8.83	2,516.0	878.8	171.7	-798.0	1.58	0.49	2.97
2,821.0	32.62	13.57	2,591.8	924.5	180.8	-839.5	3.54	2.17	5.33
2,910.0	34.12	14.28	2,666.1	972.1	192.6	-882.0	1.74	1.69	0.80
2,999.0	34.38	12.34	2,739.7	1,020.8	204.1	-925.7	1.26	0.29	-2.18
3,088.0	33.33	10.23	2,813.6	1,069.4	213.8	-969.8	1.77	-1.18	-2.37
3,177.0	31.83	8.48	2,888.6	1,116.7	221.6	-1,013.1	1.99	-1.69	-1.97
3,266.0	31.83	9.00	2,964.2	1,163.1	228.8	-1,055.8	0.31	0.00	0.58
3,355.0	32.10	9.18	3,039.7	1,209.6	236.2	-1,098.5	0.32	0.30	0.20
3,444.0	32.27	11.46	3,115.0	1,256.2	244.7	-1,141.0	1.38	0.19	2.56
3,555.0	29.37	9.71	3,210.3	1,312.1	255.2	-1,191.9	2.73	-2.61	-1.58
3,644.0	28.75	14.80	3,288.2	1,354.3	264.3	-1,229.9	2.86	-0.70	5.72
3,733.0	29.90	15.68	3,365.7	1,396.4	275.8	-1,267.2	1.38	1.29	0.99
3,822.0	31.92	15.68	3,442.1	1,440.4	288.2	-1,306.2	2.27	2.27	0.00
3,911.0	31.83	12.87	3,517.7	1,485.9	299.7	-1,346.8	1.67	-0.10	-3.16
4,001.0	30.60	9.88	3,594.7	1,531.6	309.0	-1,388.2	2.20	-1.37	-3.32
4,090.0	30.60	10.59	3,671.3	1,576.2	317.0	-1,428.9	0.41	0.00	0.80
4,179.0	30.78	9.35	3,747.8	1,621.0	324.9	-1,469.8	0.74	0.20	-1.39
4,268.0	32.45	10.06	3,823.6	1,666.9	332.7	-1,511.8	1.92	1.88	0.80
4,357.0	32.98	8.83	3,898.5	1,714.4	340.6	-1,555.3	0.96	0.60	-1.38
4,446.0	34.29	7.77	3,972.6	1,763.2	347.7	-1,600.2	1.61	1.47	-1.19
4,535.0	34.47	8.48	4,046.0	1,812.9	354.9	-1,646.1	0.49	0.20	0.80

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Wellbore:	Kugel 1M-18H-H267 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,624.0	34.82	8.48	4,119.2	1,863.0	362.3	-1,692.2	0.39	0.39	0.00	
4,713.0	31.92	5.84	4,193.6	1,911.5	368.5	-1,737.2	3.64	-3.26	-2.97	
4,802.0	30.86	8.83	4,269.5	1,957.5	374.4	-1,779.8	2.12	-1.19	3.36	
4,891.0	30.51	10.23	4,346.1	2,002.3	381.9	-1,820.8	0.89	-0.39	1.57	
4,980.0	32.10	12.87	4,422.1	2,047.6	391.1	-1,861.8	2.36	1.79	2.97	
5,069.0	34.91	13.75	4,496.3	2,095.4	402.5	-1,904.7	3.20	3.16	0.99	
5,158.0	33.94	12.52	4,569.7	2,144.4	413.9	-1,948.7	1.34	-1.09	-1.38	
5,247.0	32.45	11.11	4,644.2	2,192.0	423.9	-1,991.8	1.89	-1.67	-1.58	
5,336.0	30.78	11.11	4,720.0	2,237.8	432.9	-2,033.4	1.88	-1.88	0.00	
5,426.0	32.27	12.34	4,796.7	2,283.9	442.5	-2,075.0	1.80	1.66	1.37	
5,515.0	31.39	13.22	4,872.3	2,329.7	452.8	-2,116.2	1.12	-0.99	0.99	
5,604.0	30.25	12.17	4,948.8	2,374.1	462.9	-2,156.2	1.42	-1.28	-1.18	
5,693.0	29.99	10.94	5,025.8	2,417.9	471.8	-2,195.9	0.75	-0.29	-1.38	
5,782.0	29.55	10.23	5,103.0	2,461.3	479.9	-2,235.4	0.63	-0.49	-0.80	
5,871.0	28.84	11.82	5,180.7	2,503.9	488.2	-2,274.1	1.18	-0.80	1.79	
5,960.0	30.78	14.63	5,257.9	2,547.0	498.4	-2,312.7	2.69	2.18	3.16	
6,049.0	32.98	14.45	5,333.5	2,592.5	510.2	-2,353.3	2.47	2.47	-0.20	
6,139.0	31.04	10.06	5,409.8	2,639.1	520.3	-2,395.3	3.37	-2.16	-4.88	
6,228.0	29.46	9.71	5,486.7	2,683.2	528.0	-2,435.6	1.79	-1.78	-0.39	
6,317.0	31.92	9.00	5,563.2	2,728.1	535.4	-2,476.7	2.79	2.76	-0.80	
6,406.0	30.51	10.59	5,639.3	2,773.5	543.3	-2,518.3	1.83	-1.58	1.79	
6,495.0	30.51	11.29	5,716.0	2,817.9	551.8	-2,558.6	0.40	0.00	0.79	
6,584.0	31.74	10.59	5,792.2	2,863.0	560.6	-2,599.6	1.44	1.38	-0.79	
6,674.0	32.18	8.65	5,868.6	2,910.0	568.5	-2,642.6	1.24	0.49	-2.16	
6,763.0	31.92	9.53	5,944.0	2,956.6	576.0	-2,685.4	0.60	-0.29	0.99	
6,852.0	31.74	10.06	6,019.6	3,002.9	584.0	-2,727.7	0.37	-0.20	0.60	
6,941.0	31.92	10.06	6,095.2	3,049.1	592.2	-2,769.9	0.20	0.20	0.00	
7,030.0	30.43	8.65	6,171.4	3,094.6	599.7	-2,811.5	1.86	-1.67	-1.58	
7,119.0	22.86	18.85	6,250.9	3,133.3	608.6	-2,846.3	9.91	-8.51	11.46	
7,208.0	15.48	29.57	6,334.9	3,160.0	620.1	-2,868.9	9.15	-8.29	12.04	
7,298.0	8.44	35.72	6,422.9	3,175.8	629.9	-2,881.4	7.94	-7.82	6.83	
7,387.0	7.56	67.71	6,511.1	3,183.4	639.1	-2,886.1	5.03	-0.99	35.94	
7,476.0	8.79	103.40	6,599.3	3,184.0	651.2	-2,883.4	5.76	1.38	40.10	
7,565.0	9.94	145.59	6,687.2	3,176.1	662.2	-2,872.8	7.64	1.29	47.40	
7,654.0	14.86	164.57	6,774.1	3,158.7	669.5	-2,854.1	7.11	5.53	21.33	
7,743.0	19.79	169.32	6,859.1	3,132.9	675.4	-2,827.7	5.76	5.54	5.34	
7,832.0	22.51	173.71	6,942.1	3,101.2	680.0	-2,795.9	3.53	3.06	4.93	
7,921.0	31.66	179.69	7,021.2	3,060.8	682.0	-2,756.5	10.71	10.28	6.72	
8,010.0	44.14	177.75	7,091.3	3,006.2	683.4	-2,703.7	14.08	14.02	-2.18	
8,100.0	55.31	176.87	7,149.4	2,937.8	686.6	-2,636.9	12.43	12.41	-0.98	
8,189.0	59.00	177.05	7,197.7	2,863.1	690.6	-2,564.0	4.15	4.15	0.20	
8,278.0	64.72	177.93	7,239.6	2,784.7	694.0	-2,487.7	6.49	6.43	0.99	
8,367.0	68.32	172.83	7,275.1	2,703.4	700.6	-2,407.7	6.63	4.04	-5.73	

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8,456.0	78.88	175.64	7,300.2	2,618.6	709.1	-2,323.8	12.24	11.87	3.16
8,545.0	84.06	176.87	7,313.4	2,530.8	714.9	-2,237.8	5.98	5.82	1.38
8,546.2	84.15	176.90	7,313.5	2,529.6	714.9	-2,236.6	8.32	7.91	2.59
TPZ - 300'FSL, 61'FWL, Sec.8									
8,547.3	84.24	176.93	7,313.6	2,528.5	715.0	-2,235.6	8.32	7.91	2.59
TPZ 300'FSL & 80'FWL, Sec.8									
8,634.0	91.10	179.16	7,317.2	2,442.0	718.0	-2,151.6	8.32	7.91	2.57
8,723.0	90.75	177.23	7,315.7	2,353.1	720.8	-2,065.3	2.20	-0.39	-2.17
8,812.0	90.31	178.63	7,314.9	2,264.1	724.0	-1,978.8	1.65	-0.49	1.57
8,901.0	89.16	179.69	7,315.3	2,175.1	725.3	-1,892.9	1.76	-1.29	1.19
8,990.0	89.34	179.16	7,316.5	2,086.2	726.2	-1,807.1	0.63	0.20	-0.60
9,079.0	89.60	178.10	7,317.3	1,997.2	728.3	-1,720.9	1.23	0.29	-1.19
9,169.0	90.31	176.70	7,317.4	1,907.3	732.4	-1,633.4	1.74	0.79	-1.56
9,258.0	90.22	177.23	7,317.0	1,818.4	737.1	-1,546.6	0.60	-0.10	0.60
9,347.0	90.31	181.97	7,316.5	1,729.4	737.7	-1,460.9	5.33	0.10	5.33
9,436.0	88.99	181.97	7,317.1	1,640.5	734.7	-1,376.2	1.48	-1.48	0.00
9,525.0	88.46	182.15	7,319.1	1,551.6	731.5	-1,291.5	0.63	-0.60	0.20
9,614.0	88.29	182.15	7,321.6	1,462.7	728.1	-1,207.0	0.19	-0.19	0.00
9,703.0	88.90	180.74	7,323.8	1,373.7	725.9	-1,122.0	1.73	0.69	-1.58
9,793.0	89.69	180.74	7,324.9	1,283.7	724.7	-1,035.8	0.88	0.88	0.00
9,882.0	90.84	178.81	7,324.5	1,194.7	725.1	-950.2	2.52	1.29	-2.17
9,971.0	91.63	178.63	7,322.5	1,105.8	727.1	-864.1	0.91	0.89	-0.20
10,060.0	89.52	180.04	7,321.7	1,016.8	728.1	-778.2	2.85	-2.37	1.58
10,149.0	89.43	179.69	7,322.5	927.8	728.3	-692.6	0.41	-0.10	-0.39
10,238.0	89.34	178.10	7,323.4	838.8	730.0	-606.5	1.79	-0.10	-1.79
10,327.0	89.08	179.86	7,324.7	749.9	731.6	-520.5	2.00	-0.29	1.98
10,416.0	88.99	179.51	7,326.2	660.9	732.1	-434.8	0.41	-0.10	-0.39
10,505.0	88.20	179.16	7,328.3	571.9	733.1	-349.0	0.97	-0.89	-0.39
10,595.0	86.88	178.28	7,332.2	482.0	735.1	-262.0	1.76	-1.47	-0.98
10,618.8	87.19	178.94	7,333.4	458.2	735.7	-238.9	3.04	1.28	2.77
Kugel 1M -458 TGT									
10,684.0	88.02	180.74	7,336.2	393.1	735.9	-176.3	3.04	1.28	2.76
10,773.0	88.90	180.04	7,338.5	304.2	735.3	-90.9	1.26	0.99	-0.79
10,862.0	88.29	179.69	7,340.7	215.2	735.5	-5.3	0.79	-0.69	-0.39
10,951.0	90.13	180.04	7,342.0	126.2	735.7	80.4	2.10	2.07	0.39
11,040.0	90.22	178.81	7,341.7	37.2	736.6	166.2	1.39	0.10	-1.38
11,129.0	89.78	178.98	7,341.7	-51.8	738.3	252.2	0.53	-0.49	0.19
11,218.0	89.87	180.21	7,342.0	-140.8	738.9	338.0	1.39	0.10	1.38
11,308.0	90.13	178.98	7,342.0	-230.8	739.6	424.7	1.40	0.29	-1.37
11,397.0	90.13	180.39	7,341.8	-319.8	740.1	510.4	1.58	0.00	1.58
11,486.0	89.78	180.74	7,341.8	-408.8	739.2	595.8	0.56	-0.39	0.39
11,575.0	90.66	181.27	7,341.5	-497.7	737.6	680.9	1.15	0.99	0.60
11,664.0	89.78	180.21	7,341.1	-586.7	736.5	766.2	1.55	-0.99	-1.19
11,753.0	89.52	179.86	7,341.7	-675.7	736.4	851.8	0.49	-0.29	-0.39

Company:	Crestone Peak Resources	Local Co-ordinate Reference:	Well Kugel 1M-18H-H267
Project:	DJ BASIN	TVD Reference:	WELL @ 4976.0ft (Ensign 153 RKB - 23')
Site:	Kugel Pad Sec.18-T2N-R67W	MD Reference:	WELL @ 4976.0ft (Ensign 153 RKB - 23')
Well:	Kugel 1M-18H-H267	North Reference:	True
Wellbore:	Kugel 1M-18H-H267 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,842.0	89.34	179.34	7,342.6	-764.7	737.0	937.5	0.62	-0.20	-0.58
11,931.0	89.60	179.34	7,343.4	-853.7	738.1	1,023.4	0.29	0.29	0.00
12,021.0	89.43	177.93	7,344.2	-943.7	740.2	1,110.5	1.58	-0.19	-1.57
12,110.0	89.78	179.51	7,344.8	-1,032.7	742.2	1,196.6	1.82	0.39	1.78
12,199.0	90.04	180.74	7,344.9	-1,121.7	742.0	1,282.1	1.41	0.29	1.38
12,288.0	91.63	181.09	7,343.6	-1,210.6	740.6	1,367.3	1.83	1.79	0.39
12,349.4	90.42	179.76	7,342.5	-1,272.1	740.1	1,426.2	2.93	-1.98	-2.17
Kugel 1M 1272 TGT									
12,377.0	89.87	179.16	7,342.4	-1,299.6	740.4	1,452.8	2.93	-1.98	-2.17
12,466.0	90.22	179.69	7,342.4	-1,388.6	741.3	1,538.6	0.71	0.39	0.60
12,555.0	89.96	179.16	7,342.2	-1,477.6	742.2	1,624.5	0.66	-0.29	-0.60
12,644.0	90.13	180.04	7,342.2	-1,566.6	742.8	1,710.2	1.01	0.19	0.99
12,733.0	90.75	179.69	7,341.5	-1,655.6	743.0	1,795.9	0.80	0.70	-0.39
12,822.0	90.84	178.63	7,340.2	-1,744.6	744.3	1,881.8	1.20	0.10	-1.19
12,911.0	90.92	179.86	7,338.9	-1,833.6	745.5	1,967.7	1.38	0.09	1.38
13,001.0	91.28	179.51	7,337.2	-1,923.5	746.0	2,054.4	0.56	0.40	-0.39
13,090.0	89.87	180.39	7,336.3	-2,012.5	746.1	2,140.0	1.87	-1.58	0.99
13,179.0	90.13	180.92	7,336.3	-2,101.5	745.0	2,225.3	0.66	0.29	0.60
13,268.0	89.96	180.39	7,336.2	-2,190.5	744.0	2,310.6	0.63	-0.19	-0.60
13,357.0	89.34	179.69	7,336.7	-2,279.5	744.0	2,396.1	1.05	-0.70	-0.79
13,446.0	89.16	179.86	7,337.9	-2,368.5	744.3	2,481.8	0.28	-0.20	0.19
13,536.0	89.25	179.16	7,339.1	-2,458.5	745.1	2,568.6	0.78	0.10	-0.78
13,600.0	89.34	177.93	7,339.9	-2,522.5	746.7	2,630.5	1.93	0.14	-1.92
Last Survey - 7339.94' TVD									
13,665.0	89.34	177.93	7,340.7	-2,587.4	749.0	2,693.6	0.00	0.00	0.00
PTB - 465'FSL, 60'FWL, Sec.17 - BHL 460'FSL & 50'FWL, Sec.17									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8,546.2	7,313.5	2,529.6	714.9	TPZ - 300'FSL, 61'FWL, Sec.8
13,600.0	7,339.9	-2,522.5	746.7	Last Survey - 7339.94' TVD
13,665.0	7,340.7	-2,587.4	749.0	PTB - 465'FSL, 60'FWL, Sec.17

Checked By: _____	Approved By: _____	Date: _____
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