

CRESTONE PEAK RESOURCES

ARAPAHOE COUNTY

SEC 30-T4S-R64W

WATKINS 4-64 30-29 1AH

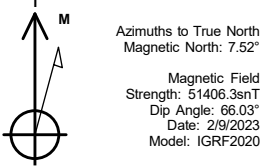
OWB

Plan: PROPOSAL 1

Standard Planning Report

10 February, 2023

Project: ARAPAHOE COUNTY
Site: SEC 30-T4S-R64W
Well: WATKINS 4-64 30-29 1AH
Wellbore: OWB
Design: PROPOSAL 1



WELL DETAILS: WATKINS 4-64 30-29 1AH

5766.00							Slot
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude		
0.00	0.00	1671477.33	3252836.45	39.673572°N	104.601773°W		

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	
3	1169.21	21.38	343.45	1144.56	189.05	-56.17	2.00	343.45	-10.92	
4	7524.93	21.38	343.45	7062.73	2410.51	-716.15	0.00	0.00	-139.27	
5	8488.52	90.00	91.14	7659.00	2621.63	-142.42	10.00	106.53	467.74	LP-WATKINS 4-64 1AH
6	13146.11	90.00	91.14	7659.00	2529.28	4514.26	0.00	0.00	4976.82	MID PNT-WATKINS 4-64 1AH
7	13179.50	90.00	91.80	7659.00	2528.43	4547.64	2.00	90.00	5009.09	PBHL-WATKINS 4-64 1AH
8	18558.76	90.00	91.80	7659.00	2359.10	9924.23	0.00	0.00	10200.77	

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	Start Build 2.00
1169.21	21.38	343.45	1144.56	189.05	-56.17	-10.92	197.22	Start 6355.73 hold at 1169.21 MD
7524.93	21.38	343.45	7062.73	2410.51	-716.15	-139.27	2514.65	Start DLS 10.00 TFO 106.53
8488.52	90.00	91.14	7659.00	2621.63	-142.42	467.74	3180.67	Start 4657.59 hold at 8488.52 MD
13146.11	90.00	91.14	7659.00	2529.28	4514.26	4976.82	7838.26	Start DLS 2.00 TFO 90.00
13179.50	90.00	91.80	7659.00	2528.43	4547.64	5009.09	7871.65	Start 5379.28 hold at 13179.50 MD
18558.76	90.00	91.80	7659.00	2359.10	9924.23	10200.77	13250.91	TD at 18558.76

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
LP-WATKINS 4-64 1AH	7659.00	2621.63	-142.42	1674097.39	3252668.11	39.680769°N	104.602279°W	Point
- plan hits target center								
MID PNT-WATKINS 4-64 1AH	7659.00	2529.28	4514.26	1674051.09	3257325.41	39.680514°N	104.585735°W	Point
- plan hits target center								
PBHL-WATKINS 4-64 1AH	7659.00	2359.10	9924.23	1673934.40	3262736.72	39.680043°N	104.566514°W	Point
- plan hits target center								

PROJECT DETAILS: ARAPAHOE COUNTY

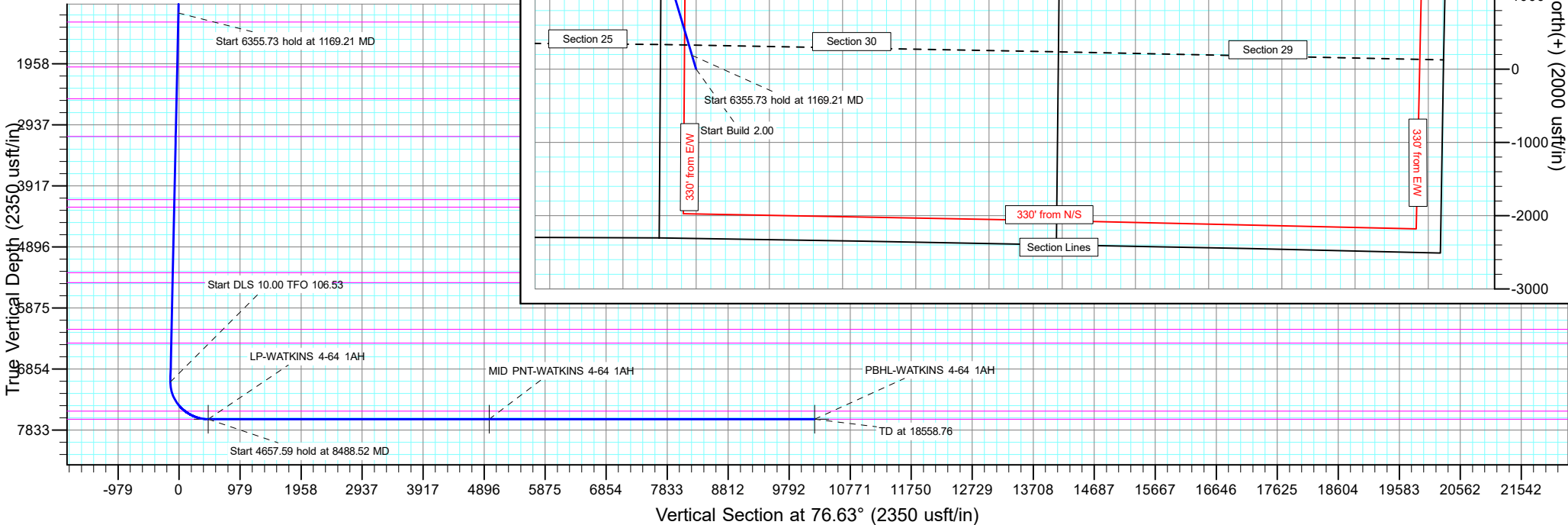
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Central Zone

System Datum: Mean Sea Level

SHL:
2312' FSL, 490' FWL
Sec 30-T4S-R64W

LP:
350' FNL, 330' FWL
Sec 30-T4S-R64W

BHL:
400' FNL, 330' FEL
Sec 29-T4S-R64W



Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well WATKINS 4-64 30-29 1AH
Company:	CRESTONE PEAK RESOURCES	TVD Reference:	KB 25' @ 5791.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5791.00usft
Site:	SEC 30-T4S-R64W	North Reference:	True
Well:	WATKINS 4-64 30-29 1AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Project	ARAPAHOE COUNTY		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		Using geodetic scale factor

Site		SEC 30-T4S-R64W			
Site Position:		Northing:	1,669,168.52 usft	Latitude:	39.667247°N
From:	Lat/Long	Easting:	3,252,354.22 usft	Longitude:	104.603567°W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.57 °

Well	WATKINS 4-64 30-29 1AH					
Well Position	+N/-S	2,303.98 usft	Northing:	1,671,477.33 usft	Latitude:	39.673572°N
	+E/-W	505.00 usft	Easting:	3,252,836.45 usft	Longitude:	104.601773°W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	5,766.00 usft

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	2/9/2023	7.52	66.03	51,406.32577941

Design	PROPOSAL 1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	76.63

Plan Survey Tool Program	Date	2/10/2023		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	18,558.76	PROPOSAL 1 (OWB)	MWD OWSG
				OWSG MWD - Standard

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,169.21	21.38	343.45	1,144.56	189.05	-56.17	2.00	2.00	0.00	343.45	
7,524.93	21.38	343.45	7,062.73	2,410.51	-716.15	0.00	0.00	0.00	0.00	
8,488.52	90.00	91.14	7,659.00	2,621.63	-142.42	10.00	7.12	11.18	106.53	LP-WATKINS 4-64 1A
13,146.11	90.00	91.14	7,659.00	2,529.28	4,514.26	0.00	0.00	0.00	0.00	MID PNT-WATKINS 4
13,179.50	90.00	91.80	7,659.00	2,528.43	4,547.64	2.00	0.00	2.00	90.00	PBHL-WATKINS 4-64
18,558.76	90.00	91.80	7,659.00	2,359.10	9,924.23	0.00	0.00	0.00	0.00	PBHL-WATKINS 4-64

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well WATKINS 4-64 30-29 1AH
Company:	CRESTONE PEAK RESOURCES	TVD Reference:	KB 25' @ 5791.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5791.00usft
Site:	SEC 30-T4S-R64W	North Reference:	True
Well:	WATKINS 4-64 30-29 1AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24.00	0.00	0.00	24.00	0.00	0.00	0.00	0.00	0.00	0.00
Denver									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
200.00	2.00	343.45	199.98	1.67	-0.50	-0.10	2.00	2.00	0.00
300.00	4.00	343.45	299.84	6.69	-1.99	-0.39	2.00	2.00	0.00
400.00	6.00	343.45	399.45	15.04	-4.47	-0.87	2.00	2.00	0.00
500.00	8.00	343.45	498.70	26.73	-7.94	-1.54	2.00	2.00	0.00
600.00	10.00	343.45	597.47	41.72	-12.39	-2.41	2.00	2.00	0.00
693.23	11.86	343.45	689.00	58.67	-17.43	-3.39	2.00	2.00	0.00
Arapahoe									
700.00	12.00	343.45	695.62	60.01	-17.83	-3.47	2.00	2.00	0.00
800.00	14.00	343.45	793.06	81.57	-24.23	-4.71	2.00	2.00	0.00
900.00	16.00	343.45	889.64	106.38	-31.61	-6.15	2.00	2.00	0.00
1,000.00	18.00	343.45	985.27	134.41	-39.93	-7.77	2.00	2.00	0.00
1,100.00	20.00	343.45	1,079.82	165.61	-49.20	-9.57	2.00	2.00	0.00
1,169.21	21.38	343.45	1,144.56	189.05	-56.17	-10.92	2.00	2.00	0.00
Start 6355.73 hold at 1169.21 MD									
1,200.00	21.38	343.45	1,173.23	199.82	-59.36	-11.54	0.00	0.00	0.00
1,300.00	21.38	343.45	1,266.35	234.77	-69.75	-13.56	0.00	0.00	0.00
1,324.33	21.38	343.45	1,289.00	243.27	-72.28	-14.05	0.00	0.00	0.00
Laramie-Fox Hills Formation									
1,400.00	21.38	343.45	1,359.46	269.72	-80.13	-15.58	0.00	0.00	0.00
1,500.00	21.38	343.45	1,452.58	304.67	-90.52	-17.60	0.00	0.00	0.00
1,600.00	21.38	343.45	1,545.69	339.63	-100.90	-19.62	0.00	0.00	0.00
1,700.00	21.38	343.45	1,638.81	374.58	-111.29	-21.64	0.00	0.00	0.00
1,800.00	21.38	343.45	1,731.92	409.53	-121.67	-23.66	0.00	0.00	0.00
1,900.00	21.38	343.45	1,825.04	444.48	-132.05	-25.68	0.00	0.00	0.00
2,000.00	21.38	343.45	1,918.15	479.43	-142.44	-27.70	0.00	0.00	0.00
2,097.56	21.38	343.45	2,009.00	513.53	-152.57	-29.67	0.00	0.00	0.00
Pierre Formation									
2,100.00	21.38	343.45	2,011.27	514.39	-152.82	-29.72	0.00	0.00	0.00
2,200.00	21.38	343.45	2,104.39	549.34	-163.21	-31.74	0.00	0.00	0.00
2,300.00	21.38	343.45	2,197.50	584.29	-173.59	-33.76	0.00	0.00	0.00
2,400.00	21.38	343.45	2,290.62	619.24	-183.97	-35.78	0.00	0.00	0.00
2,500.00	21.38	343.45	2,383.73	654.19	-194.36	-37.80	0.00	0.00	0.00
2,600.00	21.38	343.45	2,476.85	689.15	-204.74	-39.81	0.00	0.00	0.00
2,645.27	21.38	343.45	2,519.00	704.97	-209.44	-40.73	0.00	0.00	0.00
Upper Pierre aquifer									
2,700.00	21.38	343.45	2,569.96	724.10	-215.13	-41.83	0.00	0.00	0.00
2,800.00	21.38	343.45	2,663.08	759.05	-225.51	-43.85	0.00	0.00	0.00
2,900.00	21.38	343.45	2,756.20	794.00	-235.89	-45.87	0.00	0.00	0.00
3,000.00	21.38	343.45	2,849.31	828.95	-246.28	-47.89	0.00	0.00	0.00
3,100.00	21.38	343.45	2,942.43	863.91	-256.66	-49.91	0.00	0.00	0.00
3,200.00	21.38	343.45	3,035.54	898.86	-267.05	-51.93	0.00	0.00	0.00
3,295.00	21.38	343.45	3,124.00	932.06	-276.91	-53.85	0.00	0.00	0.00
Base of Upper Pierre aquifer									
3,300.00	21.38	343.45	3,128.66	933.81	-277.43	-53.95	0.00	0.00	0.00
3,400.00	21.38	343.45	3,221.77	968.76	-287.81	-55.97	0.00	0.00	0.00
3,500.00	21.38	343.45	3,314.89	1,003.71	-298.20	-57.99	0.00	0.00	0.00
3,600.00	21.38	343.45	3,408.01	1,038.67	-308.58	-60.01	0.00	0.00	0.00
3,700.00	21.38	343.45	3,501.12	1,073.62	-318.97	-62.03	0.00	0.00	0.00

Planning Report

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Company:	CRESTONE PEAK RESOURCES	TVD Reference:	KB 25' @ 5791.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5791.00usft
Site:	SEC 30-T4S-R64W	North Reference:	True
Well:	WATKINS 4-64 30-29 1AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
3,800.00	21.38	343.45	3,594.24	1,108.57	-329.35	-64.05	0.00	0.00	0.00	
3,900.00	21.38	343.45	3,687.35	1,143.52	-339.74	-66.07	0.00	0.00	0.00	
4,000.00	21.38	343.45	3,780.47	1,178.48	-350.12	-68.09	0.00	0.00	0.00	
4,100.00	21.38	343.45	3,873.58	1,213.43	-360.50	-70.10	0.00	0.00	0.00	
4,200.00	21.38	343.45	3,966.70	1,248.38	-370.89	-72.12	0.00	0.00	0.00	
4,300.00	21.38	343.45	4,059.81	1,283.33	-381.27	-74.14	0.00	0.00	0.00	
4,385.04	21.38	343.45	4,139.00	1,313.05	-390.10	-75.86	0.00	0.00	0.00	
Larimer ("Parkman") sandstone										
4,400.00	21.38	343.45	4,152.93	1,318.28	-391.66	-76.16	0.00	0.00	0.00	
4,500.00	21.38	343.45	4,246.05	1,353.24	-402.04	-78.18	0.00	0.00	0.00	
4,513.91	21.38	343.45	4,259.00	1,358.10	-403.48	-78.46	0.00	0.00	0.00	
Pierre Formation										
4,600.00	21.38	343.45	4,339.16	1,388.19	-412.42	-80.20	0.00	0.00	0.00	
4,700.00	21.38	343.45	4,432.28	1,423.14	-422.81	-82.22	0.00	0.00	0.00	
4,800.00	21.38	343.45	4,525.39	1,458.09	-433.19	-84.24	0.00	0.00	0.00	
4,900.00	21.38	343.45	4,618.51	1,493.04	-443.58	-86.26	0.00	0.00	0.00	
5,000.00	21.38	343.45	4,711.62	1,528.00	-453.96	-88.28	0.00	0.00	0.00	
5,100.00	21.38	343.45	4,804.74	1,562.95	-464.34	-90.30	0.00	0.00	0.00	
5,200.00	21.38	343.45	4,897.86	1,597.90	-474.73	-92.32	0.00	0.00	0.00	
5,300.00	21.38	343.45	4,990.97	1,632.85	-485.11	-94.34	0.00	0.00	0.00	
5,400.00	21.38	343.45	5,084.09	1,667.80	-495.50	-96.36	0.00	0.00	0.00	
5,500.00	21.38	343.45	5,177.20	1,702.76	-505.88	-98.38	0.00	0.00	0.00	
5,600.00	21.38	343.45	5,270.32	1,737.71	-516.26	-100.39	0.00	0.00	0.00	
5,641.54	21.38	343.45	5,309.00	1,752.23	-520.58	-101.23	0.00	0.00	0.00	
Terry ("Sussex") sandstone										
5,700.00	21.38	343.45	5,363.43	1,772.66	-526.65	-102.41	0.00	0.00	0.00	
5,800.00	21.38	343.45	5,456.55	1,807.61	-537.03	-104.43	0.00	0.00	0.00	
5,813.37	21.38	343.45	5,469.00	1,812.29	-538.42	-104.70	0.00	0.00	0.00	
Pierre Formation										
5,900.00	21.38	343.45	5,549.67	1,842.56	-547.42	-106.45	0.00	0.00	0.00	
6,000.00	21.38	343.45	5,642.78	1,877.52	-557.80	-108.47	0.00	0.00	0.00	
6,100.00	21.38	343.45	5,735.90	1,912.47	-568.18	-110.49	0.00	0.00	0.00	
6,200.00	21.38	343.45	5,829.01	1,947.42	-578.57	-112.51	0.00	0.00	0.00	
6,300.00	21.38	343.45	5,922.13	1,982.37	-588.95	-114.53	0.00	0.00	0.00	
6,400.00	21.38	343.45	6,015.24	2,017.32	-599.34	-116.55	0.00	0.00	0.00	
6,500.00	21.38	343.45	6,108.36	2,052.28	-609.72	-118.57	0.00	0.00	0.00	
6,600.00	21.38	343.45	6,201.47	2,087.23	-620.11	-120.59	0.00	0.00	0.00	
6,618.82	21.38	343.45	6,219.00	2,093.81	-622.06	-120.97	0.00	0.00	0.00	
Hygiene ("Shannon") sandstone										
6,700.00	21.38	343.45	6,294.59	2,122.18	-630.49	-122.61	0.00	0.00	0.00	
6,800.00	21.38	343.45	6,387.71	2,157.13	-640.87	-124.63	0.00	0.00	0.00	
6,855.09	21.38	343.45	6,439.00	2,176.39	-646.59	-125.74	0.00	0.00	0.00	
Pierre Formation										
6,900.00	21.38	343.45	6,480.82	2,192.08	-651.26	-126.65	0.00	0.00	0.00	
7,000.00	21.38	343.45	6,573.94	2,227.04	-661.64	-128.66	0.00	0.00	0.00	
7,100.00	21.38	343.45	6,667.05	2,261.99	-672.03	-130.68	0.00	0.00	0.00	
7,200.00	21.38	343.45	6,760.17	2,296.94	-682.41	-132.70	0.00	0.00	0.00	
7,300.00	21.38	343.45	6,853.28	2,331.89	-692.79	-134.72	0.00	0.00	0.00	
7,400.00	21.38	343.45	6,946.40	2,366.85	-703.18	-136.74	0.00	0.00	0.00	
7,500.00	21.38	343.45	7,039.52	2,401.80	-713.56	-138.76	0.00	0.00	0.00	
7,524.93	21.38	343.45	7,062.73	2,410.51	-716.15	-139.27	0.00	0.00	0.00	
Start DLS 10.00 TFO 106.53										
7,550.00	20.80	350.23	7,086.12	2,419.28	-718.21	-139.24	10.00	-2.32	27.05	

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well WATKINS 4-64 30-29 1AH
Company:	CRESTONE PEAK RESOURCES	TVD Reference:	KB 25' @ 5791.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5791.00usft
Site:	SEC 30-T4S-R64W	North Reference:	True
Well:	WATKINS 4-64 30-29 1AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,600.00	20.49	4.42	7,132.94	2,436.77	-719.04	-136.00	10.00	-0.63	28.37
7,650.00	21.33	18.26	7,179.68	2,454.14	-715.52	-128.56	10.00	1.67	27.69
7,700.00	23.18	30.55	7,225.98	2,471.26	-707.66	-116.95	10.00	3.72	24.57
7,750.00	25.85	40.77	7,271.48	2,488.00	-695.53	-101.28	10.00	5.33	20.45
7,800.00	29.09	49.03	7,315.86	2,504.23	-679.22	-81.66	10.00	6.49	16.52
7,850.00	32.75	55.69	7,358.76	2,519.84	-658.86	-58.24	10.00	7.31	13.30
7,900.00	36.69	61.09	7,399.85	2,534.69	-634.60	-31.20	10.00	7.89	10.82
7,950.00	40.84	65.57	7,438.84	2,548.68	-606.62	-0.75	10.00	8.29	8.94
8,000.00	45.13	69.33	7,475.41	2,561.71	-575.14	32.89	10.00	8.58	7.54
8,050.00	49.53	72.57	7,509.30	2,573.66	-540.39	69.46	10.00	8.79	6.48
8,081.25	52.32	74.39	7,529.00	2,580.55	-517.13	93.68	10.00	8.93	5.80
Sharon Springs Member									
8,100.00	54.00	75.41	7,540.24	2,584.46	-502.65	108.68	10.00	9.00	5.46
8,150.00	58.54	77.94	7,568.00	2,594.02	-462.19	150.25	10.00	9.07	5.06
8,200.00	63.12	80.24	7,592.37	2,602.26	-419.34	193.85	10.00	9.16	4.59
8,250.00	67.74	82.35	7,613.15	2,609.12	-374.40	239.15	10.00	9.23	4.23
8,300.00	72.38	84.33	7,630.20	2,614.56	-327.73	285.81	10.00	9.28	3.96
8,350.00	77.04	86.21	7,643.39	2,618.53	-279.68	333.48	10.00	9.32	3.76
8,400.00	81.71	88.02	7,652.61	2,620.99	-230.62	381.78	10.00	9.35	3.62
8,450.00	86.39	89.79	7,657.79	2,621.94	-180.91	430.36	10.00	9.36	3.54
8,488.45	89.99	91.13	7,659.00	2,621.63	-142.49	467.67	10.00	9.37	3.50
Niobrara Formation									
8,488.52	90.00	91.14	7,659.00	2,621.63	-142.42	467.74	10.00	9.37	3.50
Start 4657.59 hold at 8488.52 MD									
8,500.00	90.00	91.14	7,659.00	2,621.40	-130.94	478.85	0.00	0.00	0.00
8,600.00	90.00	91.14	7,659.00	2,619.42	-30.96	575.66	0.00	0.00	0.00
8,700.00	90.00	91.14	7,659.00	2,617.44	69.02	672.48	0.00	0.00	0.00
8,800.00	90.00	91.14	7,659.00	2,615.46	169.00	769.29	0.00	0.00	0.00
8,900.00	90.00	91.14	7,659.00	2,613.47	268.98	866.10	0.00	0.00	0.00
9,000.00	90.00	91.14	7,659.00	2,611.49	368.96	962.91	0.00	0.00	0.00
9,100.00	90.00	91.14	7,659.00	2,609.51	468.94	1,059.72	0.00	0.00	0.00
9,200.00	90.00	91.14	7,659.00	2,607.52	568.92	1,156.53	0.00	0.00	0.00
9,300.00	90.00	91.14	7,659.00	2,605.54	668.90	1,253.34	0.00	0.00	0.00
9,400.00	90.00	91.14	7,659.00	2,603.56	768.88	1,350.16	0.00	0.00	0.00
9,500.00	90.00	91.14	7,659.00	2,601.58	868.86	1,446.97	0.00	0.00	0.00
9,600.00	90.00	91.14	7,659.00	2,599.59	968.84	1,543.78	0.00	0.00	0.00
9,700.00	90.00	91.14	7,659.00	2,597.61	1,068.82	1,640.59	0.00	0.00	0.00
9,800.00	90.00	91.14	7,659.00	2,595.63	1,168.80	1,737.40	0.00	0.00	0.00
9,900.00	90.00	91.14	7,659.00	2,593.65	1,268.78	1,834.21	0.00	0.00	0.00
10,000.00	90.00	91.14	7,659.00	2,591.66	1,368.76	1,931.02	0.00	0.00	0.00
10,100.00	90.00	91.14	7,659.00	2,589.68	1,468.74	2,027.84	0.00	0.00	0.00
10,200.00	90.00	91.14	7,659.00	2,587.70	1,568.73	2,124.65	0.00	0.00	0.00
10,300.00	90.00	91.14	7,659.00	2,585.72	1,668.71	2,221.46	0.00	0.00	0.00
10,400.00	90.00	91.14	7,659.00	2,583.73	1,768.69	2,318.27	0.00	0.00	0.00
10,500.00	90.00	91.14	7,659.00	2,581.75	1,868.67	2,415.08	0.00	0.00	0.00
10,600.00	90.00	91.14	7,659.00	2,579.77	1,968.65	2,511.89	0.00	0.00	0.00
10,700.00	90.00	91.14	7,659.00	2,577.78	2,068.63	2,608.70	0.00	0.00	0.00
10,800.00	90.00	91.14	7,659.00	2,575.80	2,168.61	2,705.51	0.00	0.00	0.00
10,900.00	90.00	91.14	7,659.00	2,573.82	2,268.59	2,802.33	0.00	0.00	0.00
11,000.00	90.00	91.14	7,659.00	2,571.84	2,368.57	2,899.14	0.00	0.00	0.00
11,100.00	90.00	91.14	7,659.00	2,569.85	2,468.55	2,995.95	0.00	0.00	0.00
11,200.00	90.00	91.14	7,659.00	2,567.87	2,568.53	3,092.76	0.00	0.00	0.00
11,300.00	90.00	91.14	7,659.00	2,565.89	2,668.51	3,189.57	0.00	0.00	0.00

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well WATKINS 4-64 30-29 1AH
Company:	CRESTONE PEAK RESOURCES	TVD Reference:	KB 25' @ 5791.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5791.00usft
Site:	SEC 30-T4S-R64W	North Reference:	True
Well:	WATKINS 4-64 30-29 1AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
11,400.00	90.00	91.14	7,659.00	2,563.91	2,768.49	3,286.38	0.00	0.00	0.00	
11,500.00	90.00	91.14	7,659.00	2,561.92	2,868.47	3,383.19	0.00	0.00	0.00	
11,600.00	90.00	91.14	7,659.00	2,559.94	2,968.45	3,480.01	0.00	0.00	0.00	
11,700.00	90.00	91.14	7,659.00	2,557.96	3,068.43	3,576.82	0.00	0.00	0.00	
11,800.00	90.00	91.14	7,659.00	2,555.97	3,168.41	3,673.63	0.00	0.00	0.00	
11,900.00	90.00	91.14	7,659.00	2,553.99	3,268.39	3,770.44	0.00	0.00	0.00	
12,000.00	90.00	91.14	7,659.00	2,552.01	3,368.37	3,867.25	0.00	0.00	0.00	
12,100.00	90.00	91.14	7,659.00	2,550.03	3,468.35	3,964.06	0.00	0.00	0.00	
12,200.00	90.00	91.14	7,659.00	2,548.04	3,568.33	4,060.87	0.00	0.00	0.00	
12,300.00	90.00	91.14	7,659.00	2,546.06	3,668.31	4,157.69	0.00	0.00	0.00	
12,400.00	90.00	91.14	7,659.00	2,544.08	3,768.29	4,254.50	0.00	0.00	0.00	
12,500.00	90.00	91.14	7,659.00	2,542.10	3,868.27	4,351.31	0.00	0.00	0.00	
12,600.00	90.00	91.14	7,659.00	2,540.11	3,968.25	4,448.12	0.00	0.00	0.00	
12,700.00	90.00	91.14	7,659.00	2,538.13	4,068.23	4,544.93	0.00	0.00	0.00	
12,800.00	90.00	91.14	7,659.00	2,536.15	4,168.21	4,641.74	0.00	0.00	0.00	
12,900.00	90.00	91.14	7,659.00	2,534.16	4,268.19	4,738.55	0.00	0.00	0.00	
13,000.00	90.00	91.14	7,659.00	2,532.18	4,368.17	4,835.36	0.00	0.00	0.00	
13,100.00	90.00	91.14	7,659.00	2,530.20	4,468.16	4,932.18	0.00	0.00	0.00	
13,146.11	90.00	91.14	7,659.00	2,529.28	4,514.26	4,976.82	0.00	0.00	0.00	
Start DLS 2.00 TFO 90.00										
13,179.50	90.00	91.80	7,659.00	2,528.43	4,547.64	5,009.09	2.00	0.00	2.00	
Start 5379.26 hold at 13179.50 MD										
13,200.00	90.00	91.80	7,659.00	2,527.78	4,568.12	5,028.88	0.00	0.00	0.00	
13,300.00	90.00	91.80	7,659.00	2,524.64	4,668.08	5,125.39	0.00	0.00	0.00	
13,400.00	90.00	91.80	7,659.00	2,521.49	4,768.03	5,221.90	0.00	0.00	0.00	
13,500.00	90.00	91.80	7,659.00	2,518.34	4,867.98	5,318.42	0.00	0.00	0.00	
13,600.00	90.00	91.80	7,659.00	2,515.19	4,967.93	5,414.93	0.00	0.00	0.00	
13,700.00	90.00	91.80	7,659.00	2,512.04	5,067.88	5,511.44	0.00	0.00	0.00	
13,800.00	90.00	91.80	7,659.00	2,508.90	5,167.83	5,607.95	0.00	0.00	0.00	
13,900.00	90.00	91.80	7,659.00	2,505.75	5,267.78	5,704.47	0.00	0.00	0.00	
14,000.00	90.00	91.80	7,659.00	2,502.60	5,367.73	5,800.98	0.00	0.00	0.00	
14,100.00	90.00	91.80	7,659.00	2,499.45	5,467.68	5,897.49	0.00	0.00	0.00	
14,200.00	90.00	91.80	7,659.00	2,496.30	5,567.63	5,994.01	0.00	0.00	0.00	
14,300.00	90.00	91.80	7,659.00	2,493.16	5,667.58	6,090.52	0.00	0.00	0.00	
14,400.00	90.00	91.80	7,659.00	2,490.01	5,767.53	6,187.03	0.00	0.00	0.00	
14,500.00	90.00	91.80	7,659.00	2,486.86	5,867.48	6,283.54	0.00	0.00	0.00	
14,600.00	90.00	91.80	7,659.00	2,483.71	5,967.43	6,380.06	0.00	0.00	0.00	
14,700.00	90.00	91.80	7,659.00	2,480.57	6,067.38	6,476.57	0.00	0.00	0.00	
14,800.00	90.00	91.80	7,659.00	2,477.42	6,167.33	6,573.08	0.00	0.00	0.00	
14,900.00	90.00	91.80	7,659.00	2,474.27	6,267.28	6,669.60	0.00	0.00	0.00	
15,000.00	90.00	91.80	7,659.00	2,471.12	6,367.23	6,766.11	0.00	0.00	0.00	
15,100.00	90.00	91.80	7,659.00	2,467.97	6,467.18	6,862.62	0.00	0.00	0.00	
15,200.00	90.00	91.80	7,659.00	2,464.83	6,567.13	6,959.13	0.00	0.00	0.00	
15,300.00	90.00	91.80	7,659.00	2,461.68	6,667.08	7,055.65	0.00	0.00	0.00	
15,400.00	90.00	91.80	7,659.00	2,458.53	6,767.03	7,152.16	0.00	0.00	0.00	
15,500.00	90.00	91.80	7,659.00	2,455.38	6,866.99	7,248.67	0.00	0.00	0.00	
15,600.00	90.00	91.80	7,659.00	2,452.24	6,966.94	7,345.19	0.00	0.00	0.00	
15,700.00	90.00	91.80	7,659.00	2,449.09	7,066.89	7,441.70	0.00	0.00	0.00	
15,800.00	90.00	91.80	7,659.00	2,445.94	7,166.84	7,538.21	0.00	0.00	0.00	
15,900.00	90.00	91.80	7,659.00	2,442.79	7,266.79	7,634.72	0.00	0.00	0.00	
16,000.00	90.00	91.80	7,659.00	2,439.64	7,366.74	7,731.24	0.00	0.00	0.00	
16,100.00	90.00	91.80	7,659.00	2,436.50	7,466.69	7,827.75	0.00	0.00	0.00	
16,200.00	90.00	91.80	7,659.00	2,433.35	7,566.64	7,924.26	0.00	0.00	0.00	
16,300.00	90.00	91.80	7,659.00	2,430.20	7,666.59	8,020.78	0.00	0.00	0.00	

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well WATKINS 4-64 30-29 1AH
Company:	CRESTONE PEAK RESOURCES	TVD Reference:	KB 25' @ 5791.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5791.00usft
Site:	SEC 30-T4S-R64W	North Reference:	True
Well:	WATKINS 4-64 30-29 1AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
16,400.00	90.00	91.80	7,659.00	2,427.05	7,766.54	8,117.29	0.00	0.00	0.00	
16,500.00	90.00	91.80	7,659.00	2,423.91	7,866.49	8,213.80	0.00	0.00	0.00	
16,600.00	90.00	91.80	7,659.00	2,420.76	7,966.44	8,310.31	0.00	0.00	0.00	
16,700.00	90.00	91.80	7,659.00	2,417.61	8,066.39	8,406.83	0.00	0.00	0.00	
16,800.00	90.00	91.80	7,659.00	2,414.46	8,166.34	8,503.34	0.00	0.00	0.00	
16,900.00	90.00	91.80	7,659.00	2,411.31	8,266.29	8,599.85	0.00	0.00	0.00	
17,000.00	90.00	91.80	7,659.00	2,408.17	8,366.24	8,696.37	0.00	0.00	0.00	
17,100.00	90.00	91.80	7,659.00	2,405.02	8,466.19	8,792.88	0.00	0.00	0.00	
17,200.00	90.00	91.80	7,659.00	2,401.87	8,566.14	8,889.39	0.00	0.00	0.00	
17,300.00	90.00	91.80	7,659.00	2,398.72	8,666.09	8,985.90	0.00	0.00	0.00	
17,400.00	90.00	91.80	7,659.00	2,395.58	8,766.04	9,082.42	0.00	0.00	0.00	
17,500.00	90.00	91.80	7,659.00	2,392.43	8,865.99	9,178.93	0.00	0.00	0.00	
17,600.00	90.00	91.80	7,659.00	2,389.28	8,965.94	9,275.44	0.00	0.00	0.00	
17,700.00	90.00	91.80	7,659.00	2,386.13	9,065.89	9,371.95	0.00	0.00	0.00	
17,800.00	90.00	91.80	7,659.00	2,382.98	9,165.85	9,468.47	0.00	0.00	0.00	
17,900.00	90.00	91.80	7,659.00	2,379.84	9,265.80	9,564.98	0.00	0.00	0.00	
18,000.00	90.00	91.80	7,659.00	2,376.69	9,365.75	9,661.49	0.00	0.00	0.00	
18,100.00	90.00	91.80	7,659.00	2,373.54	9,465.70	9,758.01	0.00	0.00	0.00	
18,200.00	90.00	91.80	7,659.00	2,370.39	9,565.65	9,854.52	0.00	0.00	0.00	
18,300.00	90.00	91.80	7,659.00	2,367.24	9,665.60	9,951.03	0.00	0.00	0.00	
18,400.00	90.00	91.80	7,659.00	2,364.10	9,765.55	10,047.54	0.00	0.00	0.00	
18,500.00	90.00	91.80	7,659.00	2,360.95	9,865.50	10,144.06	0.00	0.00	0.00	
18,558.76	90.00	91.80	7,659.00	2,359.10	9,924.23	10,200.77	0.00	0.00	0.00	
TD at 18558.76										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
PBHL-WATKINS 4-64 1/ - plan hits target center - Point	0.00	0.00	7,659.00	2,359.10	9,924.23	1,673,934.40	3,262,736.73	39.680043°N	104.566514°W	
MID PNT-WATKINS 4-6 - plan hits target center - Point	0.00	0.00	7,659.00	2,529.28	4,514.26	1,674,051.09	3,257,325.41	39.680514°N	104.585735°W	
LP-WATKINS 4-64 1AH - plan hits target center - Point	0.00	0.00	7,659.00	2,621.63	-142.42	1,674,097.39	3,252,668.12	39.680769°N	104.602279°W	

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well WATKINS 4-64 30-29 1AH
Company:	CRESTONE PEAK RESOURCES	TVD Reference:	KB 25' @ 5791.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5791.00usft
Site:	SEC 30-T4S-R64W	North Reference:	True
Well:	WATKINS 4-64 30-29 1AH	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
24.00	24.00	Denver				
693.23	689.00	Arapahoe				
1,324.33	1,289.00	Laramie-Fox Hills Formation				
2,097.56	2,009.00	Pierre Formation				
2,645.27	2,519.00	Upper Pierre aquifer				
3,295.00	3,124.00	Base of Upper Pierre aquifer				
4,385.04	4,139.00	Larimer ("Parkman") sandstone				
4,513.91	4,259.00	Pierre Formation				
5,641.54	5,309.00	Terry ("Sussex") sandstone				
5,813.37	5,469.00	Pierre Formation				
6,618.82	6,219.00	Hygiene ("Shannon") sandstone				
6,855.09	6,439.00	Pierre Formation				
8,081.25	7,529.00	Sharon Springs Member				
8,488.45	7,659.00	Niobrara Formation				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
100.00	100.00	0.00	0.00	Start Build 2.00	
1,169.21	1,144.56	189.05	-56.17	Start 6355.73 hold at 1169.21 MD	
7,524.93	7,062.73	2,410.51	-716.15	Start DLS 10.00 TFO 106.53	
8,488.52	7,659.00	2,621.63	-142.42	Start 4657.59 hold at 8488.52 MD	
13,146.11	7,659.00	2,529.28	4,514.26	Start DLS 2.00 TFO 90.00	
13,179.50	7,659.00	2,528.43	4,547.64	Start 5379.26 hold at 13179.50 MD	
18,558.76	7,659.00	2,359.10	9,924.23	TD at 18558.76	