



**Departure**  
Energy Services (US) LP

Departure Energy Services (US) LP

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## **Laramie Energy II, LLC**

**Garfield County, CO**

**Sec 18-T7S-R94W**

**Savage 18-07B**

**S-Well**

**Job Number: 310021**

## **Final Survey Report**

**December 23, 2010**



Laramie Energy II, LLC

Site: Sec 18-T7S-R94W (Savage 17-05 Pad)  
Well: Savage 18-07B  
Wellbore: 310021 DD  
Design: Plan #2

Reference Details - WELL CENTRE

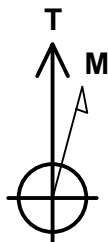
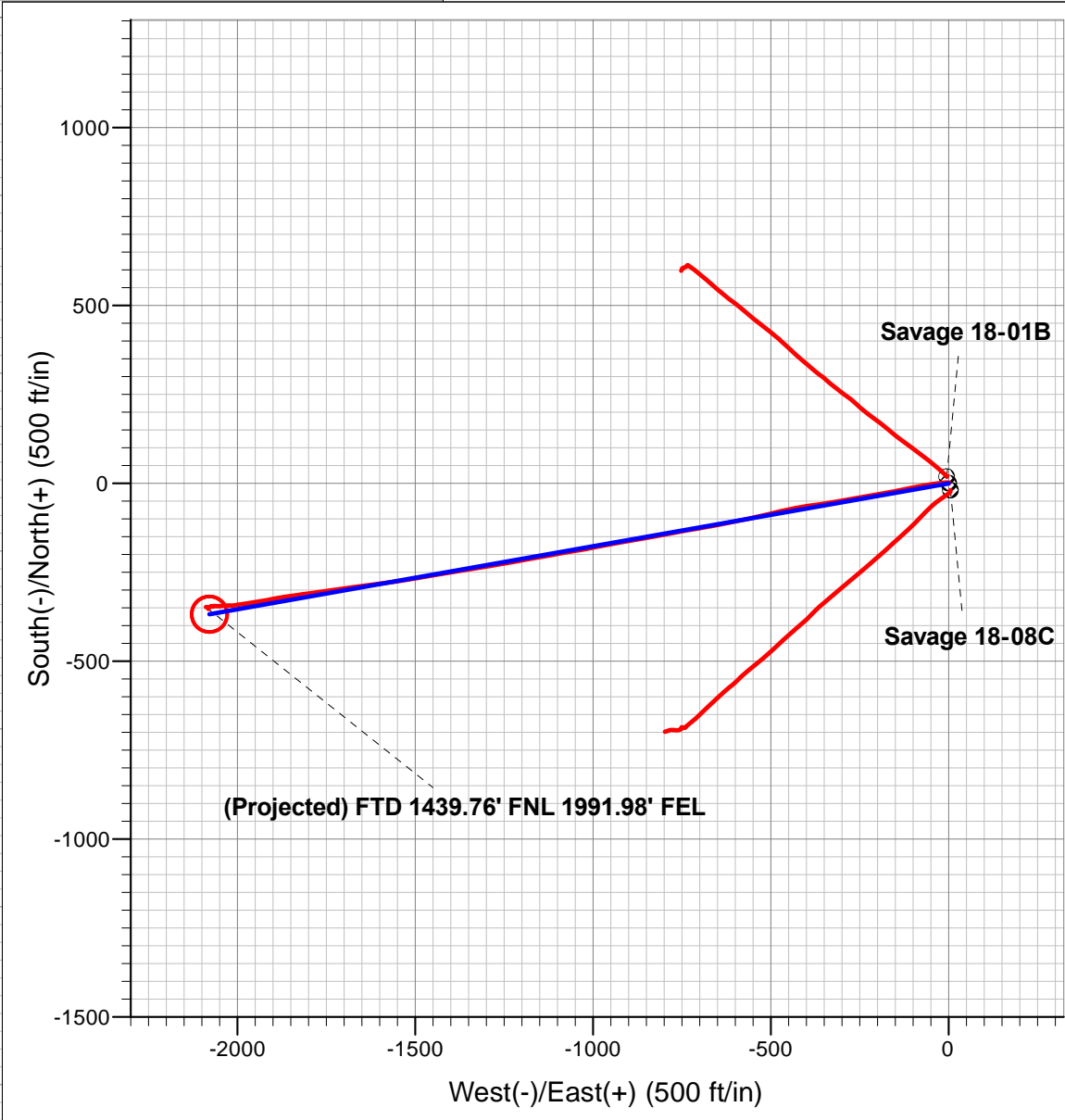
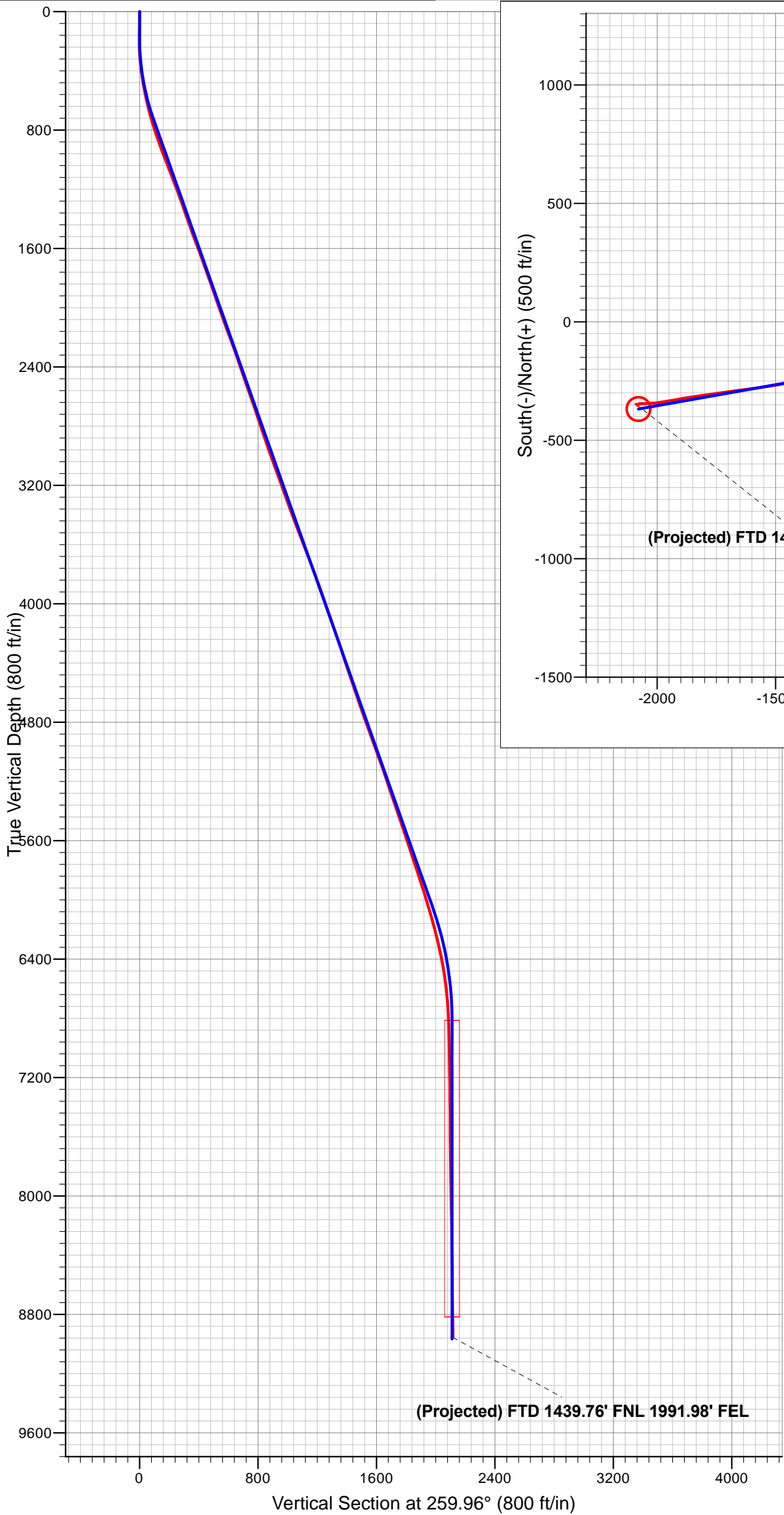
Geodetic System: Universal Transverse Mercator  
Ellipsoid: GRS 1980  
Zone: Zone 13N (108 W to 102 W)  
Northing: 14336938.76  
Easting: 816218.68  
Latitude: 39° 26' 31.3188 N  
Longitude: 107° 55' 8.9976 W  
Grid Convergence: 1.86° East  
Ground Elevation: 7202.00  
KB Elevation: Est. KB @ 7232.00ft



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Azimuths to True North  
Magnetic North: 10.42°  
  
Magnetic Field  
Strength: 52305.8snT  
Dip Angle: 65.73°  
Date: 8/12/2010  
Model: IGRF2010

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
180.00	180.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP - Build at 3.50°/ 100'
726.56	737.27	19.50	259.96	-16.37	-92.50	93.94	93.94	End of Build - Hold at 19.5° Inc.
6049.81	6384.57	19.50	259.96	-345.04	-1949.14	1979.45	1979.45	Drop at 2.50°/ 100'
6815.00	7164.74	0.00	0.00	-367.97	-2078.64	2110.96	2110.96	End of Drop - Hold Vert.
8967.00	9316.74	0.00	0.00	-367.97	-2078.64	2110.96	2110.96	PBHL - 1460' FNL & 1981' FEL



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## Survey Report



<b>Company:</b>	Laramie Energy II, LLC	<b>Local Co-ordinate Reference:</b>	Well Savage 18-07B
<b>Project:</b>	Garfield County, CO	<b>TVD Reference:</b>	Est. KB @ 7232.00ft
<b>Site:</b>	Sec 18-T7S-R94W (Savage 17-05 Pad)	<b>MD Reference:</b>	Est. KB @ 7232.00ft
<b>Well:</b>	Savage 18-07B	<b>North Reference:</b>	True
<b>Wellbore:</b>	310021 DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.1 Single User Db

<b>Project</b>	Garfield County, CO		
<b>Map System:</b>	Universal Transverse Mercator	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 Colorado - HARN		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

<b>Site</b>	Sec 18-T7S-R94W (Savage 17-05 Pad)		
<b>Site Position:</b>		<b>Northing:</b>	14,336,938.76 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	816,218.67 ft
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.20 in
		<b>Latitude:</b>	39° 26' 31.3188 N
		<b>Longitude:</b>	107° 55' 8.9976 W
		<b>Grid Convergence:</b>	-1.86 °

<b>Well</b>	Savage 18-07B		
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	39° 26' 31.3188 N
		<b>Longitude:</b>	107° 55' 8.9976 W
		<b>Ground Level:</b>	7,202.00 ft

<b>Wellbore</b>	310021 DD				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	8/12/2010	10.42	65.73	52,306

<b>Design</b>	Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	259.96	

<b>Survey Program</b>	<b>Date</b>	12/23/2010			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
95.00	9,300.00	Survey (310021 DD)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
95.00	0.90	66.20	95.00	0.30	0.68	-0.72	0.95	0.95	0.00	
126.00	1.30	52.10	125.99	0.62	1.18	-1.27	1.55	1.29	-45.48	
156.00	1.40	45.10	155.98	1.08	1.71	-1.87	0.64	0.33	-23.33	
248.00	2.00	281.10	247.96	2.19	0.93	-1.30	3.28	0.65	-134.78	
340.00	5.70	271.90	339.74	2.65	-5.21	4.67	4.06	4.02	-10.00	
431.00	8.00	265.40	430.08	2.29	-16.04	15.40	2.66	2.53	-7.14	
522.00	11.00	260.50	519.83	0.35	-30.92	30.39	3.41	3.30	-5.38	
613.00	12.80	260.00	608.87	-2.84	-49.41	49.15	1.98	1.98	-0.55	
705.00	15.30	259.90	698.11	-6.74	-71.40	71.48	2.72	2.72	-0.11	



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<b>Site:</b>	Sec 18-T7S-R94W (Savage 17-05 Pad)	<b>MD Reference:</b>	Est. KB @ 7232.00ft
<b>Well:</b>	Savage 18-07B	<b>North Reference:</b>	True
<b>Wellbore:</b>	310021 DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.1 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
796.00	17.60	260.30	785.38	-11.16	-96.79	97.25	2.53	2.53	0.44
887.00	19.30	257.60	871.70	-16.71	-125.04	126.04	2.09	1.87	-2.97
965.00	21.40	259.20	944.83	-22.14	-151.61	153.15	2.78	2.69	2.05
1,046.00	21.20	259.50	1,020.29	-27.58	-180.53	182.57	0.28	-0.25	0.37
1,109.00	20.70	260.10	1,079.13	-31.57	-202.69	205.09	0.86	-0.79	0.95
1,205.00	20.70	260.60	1,168.93	-37.26	-236.15	239.03	0.18	0.00	0.52
1,300.00	20.00	259.60	1,258.00	-42.93	-268.69	272.06	0.82	-0.74	-1.05
1,396.00	19.60	260.20	1,348.33	-48.64	-300.71	304.58	0.47	-0.42	0.63
1,491.00	19.00	258.70	1,437.99	-54.38	-331.57	335.98	0.82	-0.63	-1.58
1,586.00	20.70	263.30	1,527.35	-59.37	-363.42	368.20	2.43	1.79	4.84
1,682.00	20.10	261.10	1,617.33	-63.90	-396.57	401.63	1.01	-0.63	-2.29
1,777.00	19.40	259.50	1,706.74	-69.30	-428.21	433.73	0.93	-0.74	-1.68
1,872.00	20.10	258.00	1,796.15	-75.57	-459.69	465.82	0.91	0.74	-1.58
1,968.00	19.20	256.70	1,886.56	-82.63	-491.19	498.07	1.04	-0.94	-1.35
2,063.00	19.60	256.50	1,976.16	-89.95	-521.88	529.57	0.43	0.42	-0.21
2,158.00	19.40	256.00	2,065.72	-97.48	-552.69	561.22	0.27	-0.21	-0.53
2,254.00	19.70	259.20	2,156.18	-104.37	-584.05	593.30	1.16	0.31	3.33
2,349.00	20.20	259.30	2,245.48	-110.42	-615.90	625.71	0.53	0.53	0.11
2,444.00	19.20	259.00	2,334.92	-116.44	-647.35	657.73	1.06	-1.05	-0.32
2,539.00	19.50	259.20	2,424.55	-122.40	-678.26	689.21	0.32	0.32	0.21
2,635.00	18.90	261.00	2,515.22	-127.83	-709.35	720.77	0.88	-0.63	1.88
2,730.00	19.20	259.90	2,605.01	-132.98	-739.93	751.78	0.49	0.32	-1.16
2,825.00	18.50	258.40	2,694.92	-138.75	-770.07	782.47	0.90	-0.74	-1.58
2,921.00	18.40	260.40	2,785.98	-144.34	-799.93	812.84	0.67	-0.10	2.08
3,016.00	18.90	258.80	2,876.00	-149.83	-829.81	843.22	0.75	0.53	-1.68
3,111.00	19.30	260.30	2,965.77	-155.46	-860.38	874.30	0.67	0.42	1.58
3,207.00	20.10	260.40	3,056.15	-160.88	-892.28	906.66	0.83	0.83	0.10
3,302.00	20.40	260.20	3,145.27	-166.42	-924.69	939.54	0.32	0.32	-0.21
3,398.00	20.00	259.10	3,235.37	-172.38	-957.30	972.69	0.57	-0.42	-1.15
3,493.00	19.20	257.70	3,324.87	-178.78	-988.51	1,004.54	0.98	-0.84	-1.47
3,589.00	20.60	261.00	3,415.13	-184.78	-1,020.62	1,037.21	1.87	1.46	3.44
3,684.00	20.80	260.80	3,504.00	-190.09	-1,053.78	1,070.78	0.22	0.21	-0.21
3,779.00	21.20	259.10	3,592.69	-196.04	-1,087.30	1,104.82	0.77	0.42	-1.79
3,874.00	21.10	259.90	3,681.29	-202.28	-1,121.00	1,139.10	0.32	-0.11	0.84
3,969.00	20.70	260.00	3,770.04	-208.20	-1,154.37	1,172.99	0.42	-0.42	0.11
4,065.00	19.60	259.60	3,860.16	-214.05	-1,186.92	1,206.06	1.15	-1.15	-0.42
4,160.00	19.40	259.60	3,949.72	-219.78	-1,218.11	1,237.77	0.21	-0.21	0.00
4,255.00	19.30	260.60	4,039.35	-225.19	-1,249.11	1,269.24	0.36	-0.11	1.05
4,350.00	19.00	260.90	4,129.09	-230.20	-1,279.87	1,300.40	0.33	-0.32	0.32
4,445.00	18.50	258.90	4,219.05	-235.55	-1,309.93	1,330.94	0.86	-0.53	-2.11
4,541.00	18.80	261.80	4,310.01	-240.69	-1,340.19	1,361.63	1.02	0.31	3.02
4,636.00	18.40	261.00	4,400.05	-245.21	-1,370.15	1,391.92	0.50	-0.42	-0.84
4,731.00	18.50	261.00	4,490.17	-249.92	-1,399.84	1,421.98	0.11	0.11	0.00
4,827.00	19.00	259.80	4,581.07	-255.07	-1,430.27	1,452.83	0.66	0.52	-1.25



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## Survey Report



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<b>Project:</b>	Garfield County, CO	<b>TVD Reference:</b>	Est. KB @ 7232.00ft
<b>Site:</b>	Sec 18-T7S-R94W (Savage 17-05 Pad)	<b>MD Reference:</b>	Est. KB @ 7232.00ft
<b>Well:</b>	Savage 18-07B	<b>North Reference:</b>	True
<b>Wellbore:</b>	310021 DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.1 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,922.00	18.70	259.70	4,670.98	-260.53	-1,460.47	1,483.53	0.32	-0.32	-0.11
5,017.00	19.60	260.30	4,760.72	-265.94	-1,491.16	1,514.69	0.97	0.95	0.63
5,113.00	20.40	261.20	4,850.93	-271.21	-1,523.57	1,547.52	0.89	0.83	0.94
5,207.00	19.60	260.50	4,939.26	-276.32	-1,555.31	1,579.66	0.89	-0.85	-0.74
5,303.00	19.90	263.20	5,029.62	-280.91	-1,587.41	1,612.08	1.00	0.31	2.81
5,398.00	19.50	263.30	5,119.05	-284.67	-1,619.22	1,644.05	0.42	-0.42	0.11
5,493.00	18.50	262.40	5,208.88	-288.52	-1,649.90	1,674.94	1.10	-1.05	-0.95
5,589.00	18.70	262.50	5,299.86	-292.54	-1,680.26	1,705.53	0.21	0.21	0.10
5,684.00	19.20	261.00	5,389.72	-296.97	-1,710.79	1,736.36	0.73	0.53	-1.58
5,779.00	18.50	261.30	5,479.62	-301.70	-1,741.12	1,767.05	0.74	-0.74	0.32
5,874.00	18.50	263.50	5,569.71	-305.68	-1,770.99	1,797.16	0.73	0.00	2.32
5,972.00	17.80	261.10	5,662.84	-309.76	-1,801.24	1,827.66	1.04	-0.71	-2.45
6,067.00	18.90	262.10	5,753.00	-314.12	-1,830.82	1,857.55	1.20	1.16	1.05
6,162.00	18.30	261.50	5,843.04	-318.44	-1,860.81	1,887.83	0.66	-0.63	-0.63
6,258.00	17.30	261.00	5,934.45	-322.90	-1,889.82	1,917.17	1.05	-1.04	-0.52
6,353.00	16.00	257.00	6,025.46	-328.06	-1,916.53	1,944.37	1.82	-1.37	-4.21
6,449.00	15.90	262.10	6,117.77	-332.84	-1,942.45	1,970.73	1.46	-0.10	5.31
6,544.00	15.10	261.30	6,209.32	-336.50	-1,967.57	1,996.10	0.87	-0.84	-0.84
6,639.00	12.90	259.60	6,301.49	-340.29	-1,990.23	2,019.08	2.36	-2.32	-1.79
6,734.00	11.60	264.50	6,394.33	-343.12	-2,010.17	2,039.21	1.75	-1.37	5.16
6,830.00	9.00	271.60	6,488.78	-343.83	-2,027.29	2,056.19	3.01	-2.71	7.40
6,925.00	7.40	262.20	6,582.81	-344.46	-2,040.78	2,069.58	2.19	-1.68	-9.89
7,020.00	4.60	265.80	6,677.28	-345.57	-2,050.64	2,079.48	2.97	-2.95	3.79
7,114.00	2.90	279.70	6,771.07	-345.44	-2,056.75	2,085.47	2.04	-1.81	14.79
7,209.00	1.10	283.80	6,866.01	-344.82	-2,060.00	2,088.57	1.90	-1.89	4.32
7,304.00	1.70	262.20	6,960.98	-344.79	-2,062.28	2,090.81	0.83	0.63	-22.74
7,399.00	1.20	278.10	7,055.95	-344.84	-2,064.66	2,093.17	0.67	-0.53	16.74
7,495.00	1.20	275.60	7,151.93	-344.60	-2,066.66	2,095.09	0.05	0.00	-2.60
7,590.00	0.20	156.00	7,246.92	-344.66	-2,067.58	2,096.01	1.38	-1.05	-125.89
7,685.00	0.70	218.00	7,341.92	-345.27	-2,067.87	2,096.40	0.66	0.53	65.26
7,781.00	1.40	235.80	7,437.91	-346.39	-2,069.20	2,097.90	0.80	0.73	18.54
7,876.00	0.40	338.40	7,532.90	-346.73	-2,070.29	2,099.03	1.62	-1.05	108.00
7,972.00	0.60	348.10	7,628.89	-345.93	-2,070.51	2,099.11	0.23	0.21	10.10
8,065.00	0.50	309.40	7,721.89	-345.19	-2,070.93	2,099.39	0.40	-0.11	-41.61
8,161.00	0.90	270.30	7,817.88	-344.92	-2,072.00	2,100.41	0.63	0.42	-40.73
8,256.00	1.30	245.00	7,912.86	-345.38	-2,073.73	2,102.18	0.65	0.42	-26.63
8,351.00	1.50	250.60	8,007.84	-346.24	-2,075.88	2,104.45	0.25	0.21	5.89
8,447.00	1.00	238.80	8,103.81	-347.10	-2,077.78	2,106.47	0.58	-0.52	-12.29
8,542.00	1.80	205.10	8,198.79	-348.88	-2,079.12	2,108.10	1.17	0.84	-35.47
8,638.00	1.40	197.80	8,294.75	-351.36	-2,080.12	2,109.52	0.47	-0.42	-7.60
8,733.00	1.10	217.90	8,389.73	-353.18	-2,081.03	2,110.74	0.55	-0.32	21.16
8,828.00	1.20	344.20	8,484.72	-352.95	-2,081.86	2,111.51	2.16	0.11	132.95
8,923.00	1.10	344.70	8,579.70	-351.11	-2,082.38	2,111.70	0.11	-0.11	0.53



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<b>Wellbore:</b>	310021 DD	<b>Survey Calculation Method:</b>	Minimum Curvature
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Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
9,019.00	1.00	317.00	8,675.68	-349.61	-2,083.19	2,112.24	0.53	-0.10	-28.85	
9,114.00	1.40	292.10	8,770.66	-348.56	-2,084.83	2,113.67	0.68	0.42	-26.21	
9,209.00	1.20	285.90	8,865.64	-347.85	-2,086.86	2,115.55	0.26	-0.21	-6.53	
9,250.00	1.40	277.20	8,906.63	-347.67	-2,087.77	2,116.41	0.68	0.49	-21.22	
9,300.00	1.40	277.20	8,956.61	-347.52	-2,088.98	2,117.58	0.00	0.00	0.00	
(Projected) FTD 1439.76' FNL 1991.98' FEL										

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
5,666.31	5,373.00	Williams Fork		0.00		
7,308.02	6,965.00	ETOG		0.00		
8,240.13	7,897.00	Cameo		0.00		
9,160.35	8,817.00	Rollins		0.00		

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
9,300.00	8,956.61	-347.52	-2,088.98	(Projected) FTD 1439.76' FNL 1991.98' FEL	

Checked By: _____	Approved By: _____	Date: _____
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