



Job Number: 14-0076
Company: Mack Energy
Lease/Well: Cascade Fee # 1
Location: Carlsbad
Rig Name: Silver Oak 6
State/County: New Mexico/ Eddy
Country: USA
API Number: 30-015-42320

Elevation GL: 3160.00 ft **RKB:** 17.50 ft
Projection System: US State Plane 1983
Projection Group: New Mexico Eastern Zone
Projection Datum: GRS80
Mag. Declination: 7.49° (C:\HawkEye\IGRF2005.MIF)
Grid Convergence: 0.08270 E
Date: Friday, August 22, 2014

Calculated by HawkEye Software
 Minimum Curvature Method
 Vertical Section Plane 0.00°

Northing (US ft): 485295.82 Easting (US ft): 589094.54
 Latitude: 32°20'2.5987" N Longitude: -104°10'43.3534" W

Well Location: 2637.03 FSL, 2397.65 FWL, Section 3, T23S, R27E, New Mexico Principal Meridian, Eddy County, NM
 Direction Reference: Grid North

Measured Depth (Ft)	INC Deg	AZM Deg	TVD (Ft)	NS (Ft)	EW (Ft)	VS (Ft)	DLS */100 Ft	LR/EW From-Plan (Ft)	UD/NS From-Plan (Ft)	Comment	CL (Ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-		0.00
211.00	0.80	0.00	210.99	1.47	0.00	1.47	0.38	-	-		211.00
332.00	0.50	0.00	331.99	2.85	0.00	2.85	0.25	-	-	Tie In From Rig Surveys	121.00
441.00	0.70	60.90	440.98	3.65	0.58	3.65	0.58	-	-		109.00
617.00	1.40	107.30	616.95	3.53	3.57	3.53	0.60	-	-		176.00
706.00	2.80	70.80	705.89	3.92	6.67	3.92	2.10	-	-		89.00
888.00	2.80	295.80	887.80	7.32	6.86	7.32	2.84	-	-		182.00
1077.00	2.80	176.20	1076.69	4.72	3.01	4.72	2.56	-	-		189.00
1263.00	3.50	316.90	1262.57	4.33	-0.57	4.33	3.19	-	-		186.00
1451.00	0.70	233.90	1450.44	7.85	-5.42	7.85	1.85	-	-		188.00
1638.00	0.70	63.80	1637.44	7.68	-5.32	7.68	0.75	-	-		187.00
1719.00	0.70	48.30	1718.43	8.23	-4.51	8.23	0.23	-	-	Final 12.25" Hole	81.00
1914.00	0.00	277.50	1913.43	9.02	-3.62	9.02	0.36	-	-		195.00
2102.00	0.70	248.00	2101.42	8.59	-4.69	8.59	0.37	-	-		188.00
2288.00	0.00	207.20	2287.42	8.16	-5.74	8.16	0.38	-	-		186.00
2477.00	0.70	200.20	2476.41	7.08	-6.14	7.08	0.37	-	-		189.00
2664.00	0.70	218.40	2663.40	5.11	-7.24	5.11	0.12	-	-		187.00
2853.00	0.70	243.80	2852.39	3.70	-9.00	3.70	0.16	-	-		189.00
3041.00	1.40	249.60	3040.35	2.39	-12.18	2.39	0.38	-	-		188.00
3231.00	1.40	252.20	3230.30	0.87	-16.57	0.87	0.03	-	-		190.00
3420.00	1.40	245.20	3419.24	-0.81	-20.86	-0.81	0.09	-	-		189.00
3610.00	0.70	248.00	3609.21	-2.21	-24.04	-2.21	0.37	-	-		90.00
3800.00	1.40	262.00	3799.18	-2.97	-27.42	-2.97	0.39	-	-		190.00
3987.00	1.40	264.80	3986.12	-3.50	-31.95	-3.50	0.04	-	-		187.00
4176.00	0.70	263.40	4175.09	-3.84	-35.40	-3.84	0.37	-	-		189.00
4365.00	1.40	273.30	4364.05	-3.84	-38.85	-3.84	0.38	-	-		189.00
4554.00	1.40	277.50	4553.00	-3.40	-43.45	-3.40	0.05	-	-		189.00
4742.00	1.40	270.50	4740.94	-3.08	-48.02	-3.08	0.09	-	-		188.00
4931.00	0.70	284.50	4929.91	-2.77	-51.45	-2.77	0.39	-	-		189.00
5120.00	1.40	270.50	5118.88	-2.47	-54.87	-2.47	0.39	-	-		189.00
5306.00	1.40	253.60	5304.82	-3.09	-59.33	-3.09	0.22	-	-		186.00
5495.00	2.10	240.90	5493.73	-5.42	-64.57	-5.42	0.42	-	-		189.00
5683.00	1.40	245.20	5681.64	-8.06	-69.66	-8.06	0.38	-	-		188.00
5871.00	3.50	235.50	5869.46	-12.28	-76.48	-12.28	1.13	-	-		188.00
6060.00	0.70	58.10	6058.36	-14.93	-80.25	-14.93	2.22	-	-		189.00
6248.00	1.40	11.70	6246.33	-12.08	-78.81	-12.08	0.56	-	-		188.00
6437.00	0.70	353.40	6435.30	-8.67	-78.48	-8.67	0.41	-	-		189.00
6626.00	0.70	322.50	6624.29	-6.61	-79.31	-6.61	0.20	-	-		189.00
6814.00	0.70	84.80	6812.28	-5.59	-78.87	-5.59	0.65	-	-		188.00
7002.00	1.40	76.40	7000.25	-4.95	-75.49	-4.95	0.38	-	-		188.00
7192.00	2.10	69.40	7190.16	-3.18	-69.98	-3.18	0.38	-	-		190.00
7380.00	0.70	52.50	7378.10	-1.27	-65.84	-1.27	0.77	-	-		188.00
7568.00	0.70	53.90	7566.09	0.11	-64.00	0.11	0.01	-	-		188.00

provide signature page for survey

Measured Depth (Ft)	INC Deg	AZM Deg	TVD (Ft)	NS (Ft)	EW (Ft)	VS (Ft)	DLS "/100 Ft	LR/EW From-Plan (Ft)	UD/NS From-Plan (Ft)	Comment	CL (Ft)
7757.00	0.70	180.50	7755.08	-0.37	-63.08	-0.37	0.66	-	-		189.00
7945.00	2.10	143.90	7943.02	-4.30	-61.06	-4.30	0.85	-	-		188.00
8137.00	0.70	136.90	8134.96	-8.00	-58.18	-8.00	0.73	-	-		192.00
8325.00	0.00	214.20	8322.95	-8.84	-57.40	-8.84	0.37	-	-		188.00
8510.00	1.40	87.70	8507.94	-8.75	-55.14	-8.75	0.76	-	-		185.00
8700.00	1.40	83.40	8697.88	-8.39	-50.52	-8.39	0.06	-	-		190.00
8889.00	1.40	65.20	8886.82	-7.15	-46.13	-7.15	0.23	-	-		189.00
9078.00	0.70	142.50	9075.80	-7.10	-43.33	-7.10	0.75	-	-		189.00
9267.00	0.70	314.10	9264.79	-7.21	-43.46	-7.21	0.74	-	-		189.00
9456.00	1.40	326.70	9453.76	-4.48	-45.55	-4.48	0.39	-	-		189.00
9571.00	2.10	322.50	9568.71	-1.63	-47.61	-1.63	0.62	-	-		115.00
9620.00	2.10	322.50	9617.67	-0.21	-48.70	-0.21	0.00	-	-	SLPTB	49.00