



Scientific Drilling

30-039-29530

Gyroscopic Survey Report
for
Black Hills

Well Location	Jicarilla 29-02-30 #34
Well Name	Jicarilla 29-02-30#34
Rig Number	
Survey Date	8/7/2014
Latitude	36.6940000N
Longitude	107.0778160W
North Reference	True North
Grid Correction	None
Depth Reference	Ground Level (0.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 344.81Azim (deg)
Definitive Survey	None
Operator(s)	M.Heuton

Well Notes

RCVD AUG 21 '14

OIL CONS. DIV.

DIST. 3



Well Name: Jicarilla 29-02-30#34
Survey: Jicarilla 29-02-30#34
Survey Date: 8/7/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid
25.00	0.07	275.10	25.00	0.01	0.00	-0.02	0.28
50.00	0.09	285.62	50.00	0.02	0.01	-0.05	0.11
75.00	0.13	298.54	75.00	0.05	0.03	-0.09	0.18
100.00	0.17	325.10	100.00	0.11	0.07	-0.14	0.31
125.00	0.23	309.16	125.00	0.18	0.13	-0.20	0.32
150.00	0.29	313.02	150.00	0.27	0.21	-0.28	0.26
175.00	0.38	310.83	175.00	0.40	0.30	-0.39	0.37
200.00	0.45	308.31	200.00	0.55	0.42	-0.53	0.29
225.00	0.43	302.66	225.00	0.69	0.53	-0.69	0.19
250.00	0.48	302.19	250.00	0.84	0.64	-0.86	0.20
275.00	0.49	304.61	275.00	1.00	0.76	-1.04	0.09
300.00	0.54	306.51	299.99	1.18	0.89	-1.22	0.18
325.00	0.50	301.21	324.99	1.35	1.01	-1.41	0.25
350.00	0.59	304.28	349.99	1.52	1.14	-1.61	0.38
375.00	0.69	316.67	374.99	1.75	1.32	-1.82	0.68
400.00	0.65	308.34	399.99	2.00	1.52	-2.03	0.42
425.00	0.64	312.67	424.99	2.23	1.70	-2.24	0.20
450.00	0.64	311.76	449.99	2.47	1.89	-2.45	0.05
475.00	0.66	317.38	474.98	2.71	2.09	-2.65	0.26
500.00	0.67	316.57	499.98	2.97	2.30	-2.85	0.05
525.00	0.67	317.06	524.98	3.23	2.51	-3.05	0.02
550.00	0.66	316.73	549.98	3.48	2.73	-3.25	0.04
575.00	0.69	318.11	574.98	3.74	2.94	-3.45	0.15
600.00	0.75	324.59	599.98	4.03	3.19	-3.64	0.39
625.00	0.78	326.84	624.97	4.34	3.46	-3.83	0.17
650.00	0.77	324.88	649.97	4.66	3.74	-4.02	0.11
675.00	0.78	326.74	674.97	4.98	4.02	-4.21	0.12
700.00	0.81	330.45	699.97	5.32	4.32	-4.39	0.24
725.00	0.80	332.03	724.96	5.66	4.62	-4.56	0.10
750.00	0.84	334.58	749.96	6.01	4.94	-4.72	0.21
775.00	0.88	335.60	774.96	6.38	5.28	-4.87	0.20
800.00	0.91	334.84	799.96	6.76	5.64	-5.04	0.13
825.00	0.92	337.13	824.95	7.16	6.00	-5.20	0.15
850.00	0.97	338.66	849.95	7.57	6.39	-5.36	0.24
875.00	1.02	337.50	874.95	8.00	6.79	-5.52	0.20
900.00	1.02	339.67	899.94	8.44	7.20	-5.68	0.16
925.00	1.09	340.02	924.94	8.90	7.63	-5.84	0.28



Well Name: Jicarilla 29-02-30#34

Survey: Jicarilla 29-02-30#34

Survey Date: 8/7/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft
950.00	1.14	337.00	949.93	9.38	8.09	-6.02	0.31
975.00	1.11	340.42	974.93	9.87	8.55	-6.20	0.31
1000.00	1.16	339.16	999.92	10.36	9.01	-6.37	0.25
1025.00	1.15	340.41	1024.92	10.87	9.48	-6.54	0.12
1050.00	1.18	345.45	1049.91	11.37	9.97	-6.69	0.43
1075.00	1.21	350.70	1074.91	11.90	10.48	-6.80	0.45
1100.00	1.13	354.64	1099.90	12.40	10.99	-6.86	0.45
1125.00	1.22	2.42	1124.90	12.90	11.50	-6.88	0.73
1150.00	1.25	6.90	1149.89	13.40	12.03	-6.83	0.41
1175.00	1.35	6.43	1174.88	13.93	12.60	-6.77	0.39
1200.00	1.29	5.29	1199.88	14.47	13.17	-6.71	0.27
1225.00	1.26	1.59	1224.87	15.00	13.73	-6.67	0.35
1250.00	1.39	358.54	1249.86	15.56	14.31	-6.67	0.58
1275.00	1.42	353.85	1274.86	16.16	14.92	-6.71	0.48
1300.00	1.50	351.18	1299.85	16.79	15.55	-6.80	0.41
1325.00	1.63	353.56	1324.84	17.46	16.23	-6.89	0.58
1350.00	1.69	348.64	1349.83	18.18	16.94	-7.00	0.62
1375.00	1.72	348.70	1374.82	18.93	17.67	-7.15	0.12
1400.00	1.74	345.84	1399.81	19.68	18.41	-7.31	0.35
1425.00	1.82	347.69	1424.79	20.45	19.16	-7.49	0.41
1450.00	1.95	344.36	1449.78	21.28	19.96	-7.69	0.68
1475.00	1.88	344.95	1474.77	22.11	20.76	-7.91	0.29
1500.00	1.85	346.65	1499.75	22.92	21.55	-8.11	0.25
1525.00	1.79	350.85	1524.74	23.71	22.33	-8.27	0.58
1550.00	1.87	351.57	1549.73	24.51	23.12	-8.39	0.33
1575.00	1.91	353.35	1574.72	25.33	23.94	-8.50	0.28
1600.00	1.90	352.76	1599.70	26.15	24.76	-8.60	0.08
1625.00	1.85	353.55	1624.69	26.96	25.57	-8.69	0.24
1650.00	1.79	353.78	1649.68	27.74	26.36	-8.78	0.22
1675.00	1.70	353.31	1674.66	28.49	27.12	-8.87	0.37
1700.00	1.64	356.11	1699.65	29.21	27.84	-8.93	0.40
1725.00	1.52	359.98	1724.64	29.88	28.53	-8.96	0.67
1750.00	1.45	4.03	1749.64	30.50	29.18	-8.94	0.49
1775.00	1.26	9.30	1774.63	31.05	29.77	-8.87	0.91
1800.00	1.06	15.34	1799.62	31.50	30.26	-8.76	0.94
1825.00	1.05	19.62	1824.62	31.89	30.70	-8.63	0.32
1850.00	1.07	25.20	1849.61	32.26	31.13	-8.45	0.42



Well Name: Jicarilla 29-02-30#34

Survey: Jicarilla 29-02-30#34

Survey Date: 8/7/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft
1875.00	0.96	12.21	1874.61	32.62	31.55	-8.31	1.02
1900.00	0.66	16.38	1899.61	32.93	31.89	-8.22	1.23
1925.00	0.56	19.68	1924.61	33.15	32.14	-8.14	0.41
1950.00	0.57	18.51	1949.61	33.36	32.38	-8.06	0.05
1975.00	0.58	17.19	1974.60	33.57	32.62	-7.98	0.08
2000.00	0.65	13.34	1999.60	33.80	32.88	-7.91	0.32
2025.00	0.69	4.28	2024.60	34.07	33.16	-7.87	0.45
2050.00	0.71	352.51	2049.60	34.36	33.47	-7.87	0.58
2075.00	0.56	338.81	2074.60	34.64	33.73	-7.94	0.85
2100.00	0.57	345.83	2099.60	34.88	33.97	-8.01	0.28
2125.00	0.60	6.05	2124.60	35.13	34.22	-8.03	0.83
2150.00	0.99	347.77	2149.59	35.47	34.56	-8.06	1.84
2175.00	0.99	5.09	2174.59	35.88	34.99	-8.09	1.19
2200.00	1.12	1.50	2199.59	36.32	35.45	-8.06	0.59
2225.00	1.54	359.28	2224.58	36.88	36.02	-8.06	1.68
2250.00	1.53	352.31	2249.57	37.53	36.69	-8.11	0.75
2275.00	1.48	352.12	2274.56	38.18	37.34	-8.20	0.18
2300.00	1.54	354.10	2299.55	38.84	38.00	-8.28	0.30
2325.00	1.47	353.93	2324.54	39.49	38.65	-8.35	0.27
2350.00	1.53	354.39	2349.53	40.13	39.30	-8.41	0.22
2375.00	1.57	353.05	2374.53	40.80	39.97	-8.49	0.22
2400.00	1.62	353.45	2399.52	41.49	40.66	-8.57	0.22
2425.00	1.60	355.28	2424.51	42.18	41.36	-8.64	0.23
2450.00	1.68	353.45	2449.50	42.88	42.07	-8.71	0.40
2475.00	1.69	350.66	2474.49	43.61	42.80	-8.81	0.33
2500.00	1.72	341.64	2499.47	44.35	43.52	-8.99	1.08
2525.00	1.76	336.03	2524.46	45.11	44.23	-9.26	0.70
2550.00	1.68	333.01	2549.45	45.85	44.90	-9.58	0.48
2575.00	1.68	328.76	2574.44	46.56	45.54	-9.94	0.50
2600.00	1.71	325.78	2599.43	47.26	46.17	-10.34	0.38
2625.00	1.81	325.67	2624.42	47.99	46.80	-10.77	0.37
2650.00	1.80	327.04	2649.41	48.73	47.46	-11.21	0.17
2675.00	1.79	329.02	2674.39	49.48	48.12	-11.62	0.26
2700.00	1.75	327.93	2699.38	50.22	48.78	-12.03	0.21
2725.00	1.72	328.89	2724.37	50.95	49.42	-12.42	0.15
2750.00	1.60	332.55	2749.36	51.65	50.05	-12.78	0.63
2775.00	1.48	331.46	2774.35	52.31	50.65	-13.09	0.50
2800.00	1.50	335.51	2799.34	52.95	51.23	-13.38	0.43



Well Name: Jicarilla 29-02-30#34

Survey: Jicarilla 29-02-30#34

Survey Date: 8/7/2014

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft
2825.00	1.51	338.19	2824.33	53.60	51.83	-13.64	0.28
2850.00	1.40	338.33	2849.33	54.23	52.42	-13.88	0.43
2875.00	1.46	339.17	2874.32	54.85	53.01	-14.10	0.26
2900.00	1.46	341.93	2899.31	55.49	53.61	-14.32	0.28
2925.00	1.39	345.29	2924.30	56.11	54.20	-14.49	0.44
2950.00	1.45	341.62	2949.29	56.72	54.80	-14.67	0.43
2975.00	1.44	336.98	2974.29	57.35	55.38	-14.89	0.47
3000.00	1.34	343.00	2999.28	57.96	55.95	-15.10	0.73
3025.00	1.30	338.15	3024.27	58.53	56.49	-15.29	0.47
3050.00	1.29	336.17	3049.27	59.09	57.01	-15.51	0.18
3075.00	1.13	337.92	3074.26	59.61	57.50	-15.72	0.65
3100.00	1.04	327.91	3099.26	60.07	57.92	-15.93	0.84
3125.00	1.15	330.79	3124.25	60.53	58.33	-16.17	0.50
3150.00	1.22	6.60	3149.25	61.02	58.81	-16.26	2.92
3175.00	1.62	353.37	3174.24	61.61	59.43	-16.27	2.06
3200.00	1.81	348.87	3199.23	62.36	60.17	-16.39	0.96
3225.00	1.81	347.72	3224.21	63.15	60.94	-16.55	0.15