



Scientific Drilling

Gyroscopic Survey Report
for
Black Hills

30-039-29429

Well Location	Jicarilla 29-03-14#32
Well Name	Jicarilla 29-03-14 #32
Rig Number	Blue Jet wireline
Survey Date	8/7/2014
Latitude	36.7221388N
Longitude	107.1242500W
North Reference	True North
Grid Correction	None
Depth Reference	RKB (6.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 334.99Azim (deg)
Definitive Survey	None
Operator(s)	M.Heuton

Well Notes

ROVD AUG 21 '14

OIL CONS. DIV.

DIST. 3



Well Name: Jicarilla 29-03-14 #32
Survey: Jicarilla 29-03-14 #32 Computed Surveys
Survey Date: 8/7/2014

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS
ft	deg	deg	ft	ft	ft	ft	7100ft
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid
25.00	0.81	20.08	25.00	0.12	0.17	0.06	3.25
50.00	0.80	20.72	50.00	0.37	0.50	0.18	0.06
75.00	0.71	24.55	74.99	0.59	0.80	0.31	0.42
100.00	0.69	26.00	99.99	0.79	1.08	0.44	0.09
125.00	0.76	27.47	124.99	0.99	1.36	0.58	0.29
150.00	0.86	24.66	149.99	1.21	1.68	0.74	0.42
175.00	0.94	19.82	174.99	1.48	2.04	0.89	0.44
200.00	0.91	19.71	199.98	1.76	2.42	1.02	0.11
225.00	0.87	15.68	224.98	2.05	2.79	1.14	0.30
250.00	0.93	17.29	249.98	2.34	3.17	1.25	0.25
275.00	0.94	18.30	274.97	2.64	3.55	1.38	0.08
300.00	1.07	14.32	299.97	2.97	3.97	1.50	0.60
325.00	0.93	11.61	324.96	3.31	4.40	1.60	0.58
350.00	0.90	12.42	349.96	3.63	4.79	1.68	0.16
375.00	0.87	16.69	374.96	3.93	5.16	1.78	0.29
400.00	0.80	20.04	399.96	4.19	5.51	1.89	0.32
425.00	0.90	21.88	424.95	4.45	5.86	2.02	0.38
450.00	0.83	17.86	449.95	4.72	6.21	2.15	0.35
475.00	0.78	13.77	474.95	4.98	6.55	2.25	0.31
500.00	0.72	11.86	499.95	5.24	6.87	2.32	0.25
525.00	0.71	17.13	524.94	5.48	7.17	2.40	0.27
550.00	0.71	17.42	549.94	5.71	7.47	2.49	0.01
575.00	0.76	16.83	574.94	5.95	7.78	2.59	0.21
600.00	0.73	7.94	599.94	6.21	8.09	2.66	0.49
625.00	0.76	0.04	624.94	6.49	8.41	2.68	0.44
650.00	0.70	348.10	649.93	6.79	8.73	2.65	0.66
675.00	0.64	344.62	674.93	7.08	9.01	2.58	0.27
700.00	0.63	354.75	699.93	7.35	9.29	2.53	0.45
725.00	0.65	1.48	724.93	7.60	9.57	2.52	0.30
750.00	0.79	348.86	749.93	7.90	9.87	2.49	0.84
775.00	0.74	341.71	774.92	8.22	10.20	2.41	0.42
800.00	0.81	340.29	799.92	8.56	10.51	2.30	0.28
825.00	0.71	350.72	824.92	8.88	10.83	2.21	0.68
850.00	0.56	353.19	849.92	9.14	11.10	2.17	0.59
875.00	0.57	0.98	874.92	9.37	11.35	2.16	0.31
900.00	0.62	11.63	899.92	9.59	11.61	2.19	0.48
925.00	0.62	1.02	924.91	9.82	11.87	2.22	0.46



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MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS
ft	deg	deg	ft	ft	ft	ft	7100ft
950.00	0.50	7.85	949.91	10.04	12.12	2.24	0.54
975.00	0.52	6.04	974.91	10.23	12.34	2.26	0.11
1000.00	0.49	15.42	999.91	10.41	12.56	2.31	0.36
1025.00	0.51	18.87	1024.91	10.57	12.77	2.37	0.14
1050.00	0.53	10.73	1049.91	10.74	12.98	2.43	0.31
1075.00	0.61	17.57	1074.91	10.93	13.22	2.49	0.40
1100.00	0.66	9.76	1099.91	11.15	13.49	2.55	0.42
1125.00	0.47	9.50	1124.91	11.35	13.74	2.59	0.76
1150.00	0.50	3.62	1149.90	11.53	13.95	2.62	0.23
1175.00	0.74	351.95	1174.90	11.78	14.22	2.60	1.08
1200.00	0.67	357.86	1199.90	12.07	14.52	2.57	0.40
1225.00	0.70	359.35	1224.90	12.35	14.82	2.57	0.12
1250.00	0.87	4.44	1249.90	12.65	15.16	2.58	0.74
1275.00	1.08	346.34	1274.89	13.05	15.58	2.54	1.48
1300.00	1.41	337.84	1299.89	13.58	16.09	2.37	1.53
1325.00	1.83	333.14	1324.88	14.29	16.74	2.07	1.76
1350.00	2.15	334.36	1349.86	15.16	17.52	1.69	1.28
1375.00	2.05	337.77	1374.85	16.08	18.35	1.32	0.65
1400.00	1.87	340.18	1399.83	16.93	19.15	1.01	0.80
1425.00	1.87	341.81	1424.82	17.74	19.92	0.74	0.21
1450.00	1.91	348.06	1449.80	18.55	20.71	0.53	0.84
1475.00	1.81	346.68	1474.79	19.34	21.50	0.35	0.44
1500.00	1.80	346.59	1499.78	20.11	22.27	0.17	0.02
1525.00	1.67	344.69	1524.77	20.85	23.00	-0.02	0.58
1550.00	1.49	339.43	1549.76	21.54	23.66	-0.23	0.93
1575.00	1.44	340.06	1574.75	22.17	24.26	-0.45	0.21
1600.00	1.28	339.33	1599.74	22.76	24.81	-0.65	0.64
1625.00	1.12	346.04	1624.74	23.28	25.31	-0.81	0.83
1650.00	1.11	351.10	1649.73	23.75	25.79	-0.91	0.40
1675.00	1.00	0.85	1674.73	24.18	26.25	-0.94	0.85
1700.00	0.92	350.05	1699.72	24.57	26.66	-0.97	0.78
1725.00	0.82	351.46	1724.72	24.94	27.04	-1.03	0.43
1750.00	0.78	341.50	1749.72	25.28	27.37	-1.11	0.57
1775.00	0.60	344.96	1774.72	25.58	27.66	-1.20	0.76
1800.00	0.45	342.08	1799.72	25.80	27.88	-1.27	0.59
1825.00	0.30	358.26	1824.72	25.96	28.04	-1.30	0.75
1850.00	0.32	359.17	1849.72	26.08	28.17	-1.30	0.08



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ft	deg	deg	ft	ft	ft	ft	1100ft
1875.00	0.47	10.84	1874.71	26.23	28.34	-1.28	0.68
1900.00	0.42	13.85	1899.71	26.38	28.53	-1.24	0.20
1925.00	0.34	9.55	1924.71	26.52	28.70	-1.21	0.34
1950.00	0.31	42.02	1949.71	26.60	28.82	-1.15	0.74
1975.00	0.22	53.68	1974.71	26.64	28.90	-1.07	0.42
2000.00	0.23	59.75	1999.71	26.65	28.95	-0.98	0.10
2025.00	0.25	76.54	2024.71	26.65	28.99	-0.89	0.30
2050.00	0.28	82.24	2049.71	26.62	29.01	-0.77	0.17
2075.00	0.37	85.13	2074.71	26.57	29.03	-0.63	0.36
2100.00	0.16	79.29	2099.71	26.53	29.04	-0.51	0.84
2125.00	0.17	334.52	2124.71	26.56	29.08	-0.49	1.06
2150.00	0.28	295.85	2149.71	26.65	29.14	-0.57	0.73
2175.00	0.32	261.92	2174.71	26.72	29.16	-0.69	0.73
2200.00	0.30	241.77	2199.71	26.73	29.12	-0.82	0.45
2225.00	0.27	221.42	2224.71	26.71	29.04	-0.92	0.42
2250.00	0.26	220.64	2249.71	26.66	28.96	-0.99	0.02
2275.00	0.37	245.25	2274.71	26.64	28.88	-1.10	0.67
2300.00	0.55	244.50	2299.71	26.64	28.79	-1.28	0.72
2325.00	0.75	227.19	2324.71	26.58	28.63	-1.51	1.13
2350.00	0.87	233.77	2349.70	26.50	28.41	-1.78	0.59
2375.00	0.89	237.59	2374.70	26.44	28.19	-2.10	0.24
2400.00	0.90	230.17	2399.70	26.36	27.96	-2.41	0.46
2425.00	0.90	233.17	2424.70	26.27	27.72	-2.72	0.19
2450.00	0.81	234.18	2449.69	26.20	27.50	-3.02	0.34
2475.00	0.86	246.91	2474.69	26.17	27.32	-3.34	0.76
2500.00	0.90	246.03	2499.69	26.18	27.17	-3.69	0.17
2525.00	1.01	251.25	2524.68	26.21	27.02	-4.08	0.57
2550.00	0.95	228.73	2549.68	26.17	26.81	-4.44	1.55
2575.00	0.85	234.97	2574.68	26.08	26.57	-4.75	0.54
2600.00	0.90	231.78	2599.67	26.01	26.34	-5.06	0.27
2625.00	0.79	240.41	2624.67	25.95	26.13	-5.36	0.68
2650.00	0.48	232.75	2649.67	25.91	25.98	-5.59	1.27
2675.00	0.59	252.86	2674.67	25.91	25.88	-5.80	0.87
2700.00	0.57	230.58	2699.67	25.89	25.77	-6.02	0.90
2725.00	0.67	230.20	2724.67	25.83	25.59	-6.23	0.40
2750.00	0.57	211.86	2749.66	25.72	25.39	-6.41	0.88
2775.00	0.44	234.67	2774.66	25.63	25.23	-6.55	0.96
2800.00	0.62	243.96	2799.66	25.61	25.12	-6.75	0.78



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MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS 7100ft
2825.00	0.54	252.08	2824.66	25.63	25.02	-6.98	0.46
2850.00	0.57	250.41	2849.66	25.65	24.94	-7.21	0.13
2875.00	0.53	250.08	2874.66	25.67	24.86	-7.44	0.13
2900.00	0.48	234.02	2899.66	25.67	24.76	-7.63	0.60
2925.00	0.54	242.25	2924.66	25.64	24.64	-7.82	0.38
2950.00	0.61	255.02	2949.66	25.66	24.55	-8.06	0.59
2975.00	0.56	251.88	2974.65	25.69	24.48	-8.30	0.26
3000.00	0.41	241.47	2999.65	25.70	24.40	-8.50	0.70
3025.00	0.47	229.51	3024.65	25.67	24.29	-8.65	0.43
3050.00	0.34	265.91	3049.65	25.67	24.22	-8.80	1.11
3075.00	0.52	316.60	3074.65	25.80	24.30	-8.96	1.60
3100.00	0.45	301.55	3099.65	25.99	24.43	-9.12	0.57
3125.00	0.34	263.57	3124.65	26.10	24.47	-9.27	1.11
3150.00	0.36	272.13	3149.65	26.16	24.47	-9.43	0.23
3175.00	0.52	253.21	3174.65	26.21	24.44	-9.61	0.84
3200.00	0.27	261.82	3199.65	26.24	24.40	-9.78	1.01
3225.00	0.38	212.18	3224.65	26.22	24.32	-9.88	1.17
3250.00	0.52	212.66	3249.65	26.11	24.15	-9.99	0.55
3275.00	0.49	192.78	3274.65	25.97	23.95	-10.07	0.70
3300.00	0.62	201.85	3299.65	25.79	23.72	-10.15	0.61
3325.00	0.54	179.30	3324.64	25.59	23.48	-10.19	0.95
3350.00	0.56	191.82	3349.64	25.38	23.24	-10.22	0.49
3375.00	0.63	167.91	3374.64	25.15	22.99	-10.21	1.02
3400.00	0.70	136.33	3399.64	24.87	22.74	-10.08	1.48
3425.00	0.72	147.36	3424.64	24.57	22.50	-9.89	0.55
3450.00	0.60	156.82	3449.64	24.29	22.25	-9.75	0.63
3475.00	0.58	134.91	3474.64	24.04	22.04	-9.61	0.90
3500.00	0.82	168.23	3499.63	23.74	21.77	-9.49	1.85
3525.00	0.69	160.95	3524.63	23.42	21.46	-9.40	0.65
3550.00	0.69	160.98	3549.63	23.12	21.17	-9.30	0.01
3575.00	0.60	135.71	3574.63	22.85	20.94	-9.16	1.18
3600.00	0.58	197.91	3599.63	22.63	20.72	-9.11	2.44
3625.00	0.52	264.67	3624.63	22.58	20.59	-9.26	2.43
3650.00	0.45	295.04	3649.62	22.69	20.62	-9.46	1.05
3675.00	0.38	253.97	3674.62	22.78	20.64	-9.63	1.20