

Murchison Oil and Gas

Ramsey
Ogden 5B
Ogden 5B
Ogden 5B Leg 3 ST7

Design: Ogden 5^A Leg 3 ST7

MOJO Standard Survey

17 May, 2012

This survey is correct to the best of my knowledge and is supported by actual field data.

Notarized this date 17 of MAY, 2012.

Cynthia L. Cottrell

Notary Signature

County of Collin

State of Texas



MOJO
DIRECTIONAL CORPORATION

Company:	Murchison Oil and Gas	Local Co-ordinate Reference:	Well Ogden 5B
Project:	Ramsey	TVD Reference:	Well @ 3390.0usft (HWD 4)
Site:	Ogden 5B	MD Reference:	Well @ 3390.0usft (HWD 4)
Well:	Ogden 5B	North Reference:	Grid
Wellbore:	Ogden 5B Leg 3 ST7	Survey Calculation Method:	Minimum Curvature
Design:	Ogden 5B Leg 3 ST7	Database:	EDM 5000.1 Single User Db

Project Ramsey, Pinnate Appraisal Well

Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Eastern Zone

System Datum: Mean Sea Level

Site Ogden 5B

Site Position:		Northing:	419,069.17 usft	Latitude:	32° 9' 7.484 N
From: Lat/Long		Easting:	563,741.80 usft	Longitude:	104° 15' 39.380 W
Position Uncertainty:	1.0 usft	Slot Radius:	15 "	Grid Convergence:	0.04 °

Well Ogden 5B, Multi-Lateral Horizontal Intersection

Well Position	+N/-S	0.0 usft	Northing:	419,069.17 usft	Latitude:	32° 9' 7.484 N
	+E/-W	0.0 usft	Easting:	563,741.80 usft	Longitude:	104° 15' 39.380 W
Position Uncertainty		1.0 usft	Wellhead Elevation:	usft	Ground Level:	3,378.0 usft

Wellbore Ogden 5B Leg 3 ST7

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	18/11/2011	7.83	60.01	48,493

Design Ogden 5B Leg 3 ST7

Audit Notes:

Version: 1.0 **Phase:** ACTUAL **Tie On Depth:** 2,891.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	10.87

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Local Co-ordinate Reference:**TVD Reference:****MD Reference:****North Reference:****Survey Calculation Method:****Database:**

Well Ogden 5B

Well @ 3390.0usft (HWD 4)

Well @ 3390.0usft (HWD 4)

Gnd

Minimum Curvature

EDM 5000 1 Single User Db

Survey Program Date 17/05/2012

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
360.0	2,255.0	Ogden 5B Main bore (Ogden 5B)		
2,278.0	2,569.0	Ogden 5B Leg 2 (Ogden 5B)		
2,590.0	2,891.0	Ogden 5B Leg 3 (Ogden 5B)		
3,021.0	5,800.0	Ogden 5B Leg 3 ST7 (Ogden 5B Leg 3 ST)		

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	Closure Azimuth (°)	Closure Distance (usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.00	419,069.17	563,741.80	0.00	0.00
334.0	0.46	313.30	334.0	0.9	-1.0	0.14	419,070.10	563,740.81	313.30	1.35
9 5/8"										
360.0	0.50	313.30	360.0	1.1	-1.1	0.14	419,070.25	563,740.65	313.30	1.57
420.0	0.40	334.80	420.0	1.4	-1.4	0.32	419,070.62	563,740.37	315.47	2.03
574.0	0.60	339.80	574.0	2.7	-1.9	0.13	419,071.86	563,739.87	324.33	3.31
674.0	0.20	24.10	674.0	3.3	-2.0	0.48	419,072.51	563,739.76	328.59	3.91
774.0	1.00	319.60	774.0	4.2	-2.5	0.93	419,073.34	563,739.26	328.68	4.87
874.0	1.50	315.70	874.0	5.8	-4.0	0.51	419,074.94	563,737.78	325.16	7.02
974.0	1.50	314.90	973.9	7.6	-5.9	0.02	419,076.80	563,735.94	322.48	9.61
1,074.0	2.70	338.70	1,073.9	10.7	-7.6	1.46	419,079.92	563,734.16	324.59	13.18
1,174.0	2.70	341.50	1,173.7	15.2	-9.2	0.13	419,084.34	563,732.56	328.66	17.76
1,274.0	2.40	357.20	1,273.6	19.5	-10.1	0.76	419,088.67	563,731.71	332.64	21.95
1,349.0	2.40	3.30	1,348.6	22.6	-10.1	0.34	419,091.81	563,731.72	336.00	24.78
1,388.0	2.50	4.20	1,387.5	24.3	-10.0	0.27	419,093.47	563,731.83	337.70	26.26
1,433.0	2.60	11.90	1,432.5	26.3	-9.7	0.79	419,095.45	563,732.11	339.77	28.00
1,478.0	3.80	20.90	1,477.4	28.7	-8.9	2.88	419,097.84	563,732.85	342.67	30.03
1,523.0	5.80	27.20	1,522.3	32.1	-7.4	4.59	419,101.25	563,734.43	347.06	32.92
1,568.0	6.60	29.50	1,567.0	36.4	-5.1	1.86	419,105.53	563,736.74	352.08	36.71
1,613.0	7.10	26.70	1,611.7	41.1	-2.5	1.34	419,110.26	563,739.26	356.47	41.17

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Local Co-ordinate Reference: Well Ogden 5B
 TVD Reference: Well @ 3390.0usft (HWD 4)
 MD Reference: Well @ 3390.0usft (HWD 4)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.1 Single User Db

Survey	MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	Closure Azimuth (°)	Closure Distance (usft)
	1,658.0	8.20	22.30	1,656.3	46.5	-0.1	2.77	419,115.72	563,741.73	359.92	46.54
	1,703.0	9.50	18.90	1,700.7	53.0	2.4	3.11	419,122.20	563,744.15	2.54	53.08
	1,748.0	11.90	17.80	1,745.0	61.0	5.0	5.35	419,130.13	563,746.77	4.67	61.16
	1,799.0	16.60	14.00	1,794.4	73.0	8.3	9.39	419,142.21	563,750.14	6.52	73.52
	1,843.0	24.20	11.60	1,835.6	88.0	11.7	17.37	419,157.17	563,753.48	7.56	88.77
	1,879.0	30.00	10.50	1,867.6	104.1	14.8	16.17	419,173.26	563,756.61	8.10	105.14
	1,924.0	35.50	9.00	1,905.5	128.1	18.9	12.35	419,197.24	563,760.71	8.40	129.46
	1,969.0	40.90	7.50	1,940.8	155.6	22.9	12.18	419,224.78	563,764.67	8.36	157.28
	2,014.0	48.20	9.30	1,972.9	186.8	27.5	16.46	419,255.98	563,769.31	8.38	188.82
	2,059.0	55.10	12.20	2,000.8	221.4	34.1	16.14	419,290.61	563,775.93	8.76	224.06
	2,075.0	56.99	11.57	2,009.7	234.4	36.9	12.23	419,303.60	563,778.67	8.94	237.31
7"											
	2,098.0	59.70	10.70	2,021.8	253.6	40.6	12.23	419,322.81	563,782.44	9.10	256.87
	2,143.0	62.50	10.60	2,043.5	292.3	47.9	6.23	419,361.52	563,789.72	9.31	296.25
	2,188.0	72.00	3.30	2,060.9	333.5	52.8	25.86	419,402.64	563,794.64	9.01	337.63
	2,233.0	79.70	1.80	2,071.9	377.0	54.8	17.41	419,446.20	563,796.57	8.27	380.99
	2,255.0	82.00	1.10	2,075.4	398.7	55.3	10.92	419,467.91	563,797.12	7.90	402.56
	2,278.0	81.90	5.90	2,078.6	421.5	56.7	20.67	419,490.64	563,798.51	7.66	425.26
	2,302.0	86.80	12.50	2,081.0	445.0	60.5	34.14	419,514.19	563,802.33	7.75	449.12
	2,324.0	88.80	13.80	2,081.8	466.4	65.5	10.84	419,535.60	563,807.33	8.00	471.01
	2,354.0	90.20	15.00	2,082.1	495.5	73.0	6.15	419,564.65	563,814.79	8.38	500.83
	2,369.0	92.60	16.40	2,081.7	509.9	77.1	18.52	419,579.09	563,818.85	8.59	515.70
	2,392.0	95.40	16.70	2,080.1	531.9	83.6	12.24	419,601.08	563,825.39	8.93	538.43
	2,414.0	96.20	18.60	2,077.9	552.8	90.2	9.33	419,621.93	563,832.02	9.27	560.08
	2,430.0	96.30	19.50	2,076.2	567.8	95.4	5.63	419,636.97	563,837.21	9.54	575.76
	2,459.0	96.80	20.10	2,072.9	594.9	105.2	2.68	419,664.07	563,846.97	10.03	604.13
	2,479.0	95.30	18.40	2,070.8	613.7	111.7	11.30	419,682.85	563,853.53	10.32	623.77

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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	Closure Azimuth (°)	Closure Distance (usft)
2,504.0	92.70	15 10	2,069.0	637.6	118.9	16 78	419,706.73	563,860.71	10.57	648.55
2,531.0	90.80	11 70	2,068.2	663.8	125.2	14 42	419,732.97	563,866.97	10 68	675.50
2,569.0	91.60	10.00	2,067.4	701.1	132.3	4.94	419,770.28	563,874.12	10 69	713.49
2,590.0	90 70	9.50	2,067.0	721.8	135.9	4.90	419,790.98	563,877.67	10 66	734.48
2,633.0	87 80	5.90	2,067.5	764.4	141.6	10 75	419,833.57	563,883.43	10.50	777.41
2,676.0	90.20	5.70	2,068.3	807.2	146.0	5 60	419,876.34	563,887.78	10 25	820.27
2,719.0	90.70	7.50	2,067.9	849.9	150.9	4 34	419,919.06	563,892.72	10.07	863.18
2,762.0	90.00	10.70	2,067.7	892.3	157.7	7.62	419,961.51	563,899.52	10.02	906.17
2,805.0	90.60	10.90	2,067.5	934.6	165.8	1.47	420,003.75	563,907.58	10 06	949.16
2,848.0	90 60	11.80	2,067.0	976.7	174.2	2 09	420,045.90	563,916.04	10.11	992.15
2,891.0	89.30	13.40	2,067.0	1,018.7	183.6	4 79	420,087.86	563,925.42	10 22	1,035.11
3,021.0	89 60	18 80	2,068.3	1,143.5	219.7	4.16	420,212.71	563,961.45	10.87	1,164.45
3,064.0	90.60	19.50	2,068.2	1,184.2	233.8	2.84	420,253.33	563,975.56	11.17	1,207.01
3,107.0	90 90	22 00	2,067.7	1,224.4	249.0	5.86	420,293.54	563,990.79	11 50	1,249.43
3,150.0	90 40	23 10	2,067.2	1,264.1	265.5	2.81	420,333.25	564,007.28	11 86	1,291.65
3,191.4	90.00	26.00	2,067.0	1,301.7	282.7	7.07	420,370.90	564,024.48	12.25	1,332.07
3,279.0	91 10	26 70	2,066.2	1,380.2	321.6	1 49	420,449.39	564,063.36	13 11	1,417.18
3,365.0	88 70	27.20	2,066.3	1,456.9	360.5	2.85	420,526.05	564,102.33	13.90	1,500.82
3,494.0	89.80	30 10	2,068.0	1,570.1	422.4	2 40	420,639.23	564,164.17	15 06	1,625.88
3,581.0	90.60	30.10	2,067.7	1,645.3	466.0	0 92	420,714.50	564,207.80	15 81	1,710.04
3,666.0	88.30	27.20	2,068.5	1,719.9	506.7	4.35	420,789.07	564,248.54	16.42	1,793.00
3,752.0	88.70	27.20	2,070.8	1,796.4	546.0	0 47	420,865.54	564,287.84	16.91	1,877.52
3,838.0	89.20	27.50	2,072.4	1,872.7	585.5	0.68	420,941.91	564,327.35	17.36	1,962.15
3,925.0	89 20	27.50	2,073.6	1,949.9	625.7	0.00	421,019.07	564,367.51	17.79	2,047.84
4,011.0	90 70	23.50	2,073.6	2,027.5	662.7	4 97	421,096.68	564,404.53	18.10	2,133.07
4,097.0	91.10	24 00	2,072.3	2,106.2	697.4	0 74	421,175.38	564,439.16	18.32	2,218.66
4,183.0	91.20	24.50	2,070.6	2,184.6	732.7	0 59	421,253.78	564,474.48	18.54	2,304.20

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Well Ogden 5B
 Well @ 3390.0usft (HWD 4)
 Well @ 3390.0usft (HWD 4)
 Grid
 Minimum Curvature
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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	Closure Azimuth (°)	Closure Distance (usft)
4,269.0	92.20	24.80	2,068.0	2,262.7	768.5	1.21	421,331.91	564,510.33	18.76	2,389.69
4,355.0	90.90	23.70	2,065.7	2,341.1	803.8	1.98	421,410.29	564,545.63	18.95	2,475.27
4,484.0	88.60	24.40	2,066.3	2,458.9	856.4	1.86	421,528.08	564,598.20	19.20	2,603.78
4,656.0	90.10	23.70	2,068.2	2,616.0	926.5	0.96	421,685.13	564,668.29	19.50	2,775.18
4,828.0	89.10	24.40	2,069.4	2,773.0	996.6	0.71	421,842.19	564,738.38	19.77	2,946.66
5,000.0	89.90	22.10	2,070.9	2,931.0	1,064.5	1.42	422,000.21	564,806.27	19.96	3,118.35
5,172.0	89.80	20.60	2,071.4	3,091.2	1,127.1	0.87	422,160.40	564,868.89	20.03	3,290.29
5,344.0	89.40	23.50	2,072.6	3,250.6	1,191.7	1.70	422,319.80	564,933.45	20.13	3,462.17
5,518.0	90.60	26.10	2,072.6	3,408.6	1,264.6	1.65	422,477.73	565,006.43	20.36	3,635.60
5,698.0	90.50	25.60	2,070.8	3,570.5	1,343.1	0.28	422,639.71	565,084.91	20.61	3,814.80
5,763.0	90.50	24.80	2,070.3	3,629.4	1,370.8	1.23	422,698.53	565,112.58	20.69	3,879.60
5,800.0	90.50	24.80	2,069.9	3,662.9	1,386.3	0.00	422,732.11	565,128.10	20.73	3,916.50

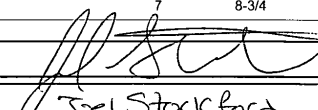
Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
334.0	334.0	9 5/8"	12-1/4	12-1/4
2,075.0	2,009.7	7"	7	8-3/4

Checked By:


 Steve Morris

Approved By:


 Joel Stockford

Date:

17/05/2012