

Murchison Oil and Gas

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

Design: Ogden 5^AB 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
Project: Ramsey
Site: Ogden 5B
Well: Ogden 5B
Wellbore: Ogden 5B Leg 3 ST7
Design: Ogden 5B Leg 3 ST7

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

Project	Ramsey, Pinnate Appraisal Well		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Ogden 5B		
Site Position:		Northing:	419,069.17 usft
From:	Lat/Long	Easting:	563,741.80 usft
Position Uncertainty:	1.0 usft	Slot Radius:	15 "
		Latitude:	32° 9' 7.484 N
		Longitude:	104° 15' 39.380 W
		Grid Convergence:	0.04 °

Well	Ogden 5B, Multi-Lateral Horizontal Intersection		
Well Position	+N/-S	0.0 usft	Northing: 419,069.17 usft
	+E/-W	0.0 usft	Easting: 563,741.80 usft
Position Uncertainty	1.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 9' 7.484 N
		Longitude:	104° 15' 39.380 W
		Ground Level:	3,378.0 usft

Wellbore	Ogden 5B Leg 3 ST7		
Magnetics	Model Name	Sample Date	Declination
	IGRF200510	18/11/2011	(°)
			7.83
			Dip Angle
			(°)
			60.01
			Field Strength
			(nT)
			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)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
		Direction	(°)
			10.87

Company: Murchison Oil and Gas
Project: Ramsey
Site: Ogden 5B
Well: Ogden 5B
Wellbore: Ogden 5B Leg 3 ST7
Design: Ogden 5B Leg 3 ST7

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 Program		Date	17/05/2012
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
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	

Company: Murchison Oil and Gas
Project: Ramsey
Site: Ogden 5B
Well: Ogden 5B
Wellbore: Ogden 5B Leg 3 ST7
Design: Ogden 5B Leg 3 ST7

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

Company: Murchison Oil and Gas
Project: Ramsey
Site: Ogden 5B
Well: Ogden 5B
Wellbore: Ogden 5B Leg 3 ST7
Design: Ogden 5B Leg 3 ST7

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)
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

Company: Murchison Oil and Gas
 Project: Ramsey
 Site: Ogden 5B
 Well: Ogden 5B
 Wellbore: Ogden 5B Leg 3 ST7
 Design: Ogden 5B Leg 3 ST7

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)
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

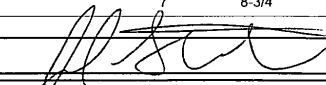
Casing Points

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