

Murchison Oil and Gas

Ramsey
Ogden 5B
Ogden 5B
Ogden 5B Leg 3 ST5

Design: Ogden 5^H Leg 3 ST5

MOJO Standard Survey

17 May, 2012

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

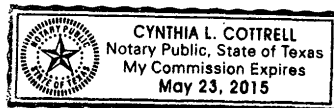
Notarized this date 17 of May, 2012.

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 ST5	Survey Calculation Method:	Minimum Curvature
Design:	Ogden 5B Leg 3 ST5	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		Latitude: 32° 9' 7.484 N
			Longitude: 104° 15' 39.380 W
		Wellhead Elevation:	usft
			Ground Level: 3,378.0 usft

Wellbore:	Ogden 5B Leg 3 ST5				
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 ST5				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	3,020.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	10.64	

Company: Murchison Oil and Gas
Project: Ramsey
Site: Ogden 5B
Well: Ogden 5B
Wellbore: Ogden 5B Leg 3 ST5
Design: Ogden 5B Leg 3 ST5

Local Co-ordinate Reference: Well Ogden 5B
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Survey Program	Date 10/05/2012				
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	3,020.0	Ogden 5B Leg 3 (Ogden 5B)			
3,107.0	5,982.0	Ogden 5B Leg 3 ST5 (Ogden 5B Leg 3 ST)			

Survey	MD (usft)	Incl (°)	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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 Wellbore: Ogden 5B Leg 3 ST5
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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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Design:	Ogden 5B Leg 3 ST5	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	
2,934.0	90.40	13.00	2,067.2	1,060.6	193.4	2.72	420,129.73	563,935.24	10.34	1,078.05	
2,977.0	89.80	11.20	2,067.1	1,102.6	202.5	4.41	420,171.77	563,944.25	10.40	1,121.03	
3,020.0	90.50	11.00	2,067.0	1,144.8	210.7	1.69	420,213.97	563,952.53	10.43	1,164.03	
3,107.0	89.70	15.80	2,066.8	1,229.4	230.9	5.59	420,298.57	563,972.68	10.64	1,250.89	
3,150.0	90.90	15.80	2,066.6	1,270.8	242.6	2.79	420,339.95	563,984.39	10.81	1,293.72	
3,193.0	90.70	15.10	2,066.0	1,312.2	254.0	1.69	420,381.39	563,995.85	10.96	1,336.58	
3,236.0	90.20	17.50	2,065.7	1,353.5	266.1	5.70	420,422.65	564,007.91	11.12	1,379.40	
3,279.0	90.50	19.80	2,065.4	1,394.2	279.9	5.39	420,463.39	564,021.66	11.35	1,422.03	
3,322.0	90.20	20.10	2,065.1	1,434.6	294.5	0.99	420,503.81	564,036.33	11.60	1,464.56	
3,365.0	90.50	19.60	2,064.9	1,475.1	309.1	1.36	420,544.26	564,050.93	11.84	1,507.13	
3,408.0	89.40	22.30	2,064.9	1,515.2	324.5	6.78	420,584.41	564,066.31	12.09	1,549.60	
3,451.0	90.90	23.50	2,064.8	1,554.8	341.2	4.47	420,624.02	564,083.04	12.38	1,591.85	
3,494.0	91.20	23.00	2,064.0	1,594.3	358.2	1.36	420,663.52	564,100.01	12.66	1,634.09	
3,537.0	90.60	21.10	2,063.3	1,634.2	374.4	4.63	420,703.37	564,116.15	12.90	1,676.52	
3,580.0	91.20	23.40	2,062.6	1,674.0	390.6	5.53	420,743.16	564,132.43	13.14	1,718.96	
3,623.0	91.40	26.30	2,061.7	1,713.0	408.7	6.76	420,782.16	564,150.49	13.42	1,761.07	

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Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Northings (usft)	Easting (usft)	Closure Azimuth (°)	Closure Distance (usft)	
3,666.0	91.90	25.50	2,060.4	1,751.7	427.5	2.19	420,820.83	564,169.27	13.71	1,803.06	
3,709.0	92.40	24.40	2,058.8	1,790.6	445.6	2.81	420,859.79	564,187.39	13.97	1,845.22	
3,752.0	92.00	23.20	2,057.2	1,829.9	462.9	2.94	420,899.10	564,204.73	14.20	1,887.58	
3,795.0	90.00	22.10	2,056.4	1,869.6	479.5	5.31	420,938.77	564,221.29	14.38	1,930.11	
3,838.0	90.40	21.60	2,056.3	1,909.5	495.5	1.49	420,978.68	564,237.29	14.55	1,972.75	
3,924.0	90.60	21.40	2,055.5	1,989.5	527.0	0.33	421,058.70	564,268.81	14.84	2,058.14	
3,967.0	90.30	21.50	2,055.2	2,029.5	542.7	0.74	421,098.72	564,284.53	14.97	2,100.86	
4,010.0	90.60	20.90	2,054.8	2,069.6	558.3	1.56	421,138.81	564,300.08	15.10	2,143.61	
4,053.0	90.80	20.90	2,054.3	2,109.8	573.6	0.47	421,178.97	564,315.42	15.21	2,186.39	
4,096.0	90.40	20.50	2,053.9	2,150.0	588.8	1.32	421,219.20	564,330.62	15.32	2,229.20	
4,139.0	91.20	20.20	2,053.3	2,190.3	603.8	1.99	421,259.51	564,345.57	15.41	2,272.03	
4,182.0	91.20	21.40	2,052.4	2,230.5	619.0	2.79	421,299.70	564,360.84	15.51	2,314.83	
4,225.0	89.90	19.50	2,052.0	2,270.8	634.1	5.35	421,339.98	564,375.86	15.60	2,357.67	
4,268.0	90.90	21.00	2,051.7	2,311.1	648.9	4.19	421,380.32	564,390.74	15.68	2,400.53	
4,311.0	90.60	21.20	2,051.1	2,351.3	664.4	0.84	421,420.43	564,406.22	15.78	2,443.34	
4,354.0	90.30	21.70	2,050.8	2,391.3	680.1	1.36	421,460.45	564,421.94	15.88	2,486.13	
4,397.0	87.60	22.60	2,051.5	2,431.1	696.4	6.62	421,500.27	564,438.15	15.98	2,528.86	
4,440.0	88.00	22.00	2,053.2	2,470.9	712.7	1.68	421,540.02	564,454.46	16.09	2,571.57	
4,483.0	88.40	22.10	2,054.5	2,510.7	728.8	0.96	421,579.86	564,470.59	16.19	2,614.32	
4,526.0	89.00	22.30	2,055.5	2,550.5	745.0	1.47	421,619.66	564,486.83	16.28	2,657.08	
4,569.0	89.20	22.10	2,056.2	2,590.3	761.3	0.66	421,659.47	564,503.08	16.38	2,699.85	
4,613.0	89.50	22.00	2,056.7	2,631.1	777.8	0.72	421,700.25	564,519.60	16.47	2,743.64	
4,656.0	89.30	21.60	2,057.1	2,671.0	793.8	1.04	421,740.17	564,535.56	16.55	2,786.45	
4,699.0	91.00	22.30	2,057.0	2,710.9	809.8	4.28	421,780.05	564,551.64	16.63	2,829.26	
4,742.0	91.30	22.60	2,056.2	2,750.6	826.3	0.99	421,819.78	564,568.05	16.72	2,872.03	
4,785.0	90.80	23.10	2,055.4	2,790.2	843.0	1.64	421,859.40	564,584.75	16.81	2,914.78	
4,828.0	91.00	23.80	2,054.7	2,829.7	860.1	1.69	421,898.85	564,601.86	16.91	2,957.49	

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4,871.0	91.30	22.40	2,053.8	2,869.2	876.9	3.33	421,938.39	564,618.73	16.99	3,000.24	
4,914.0	89.40	22.70	2,053.6	2,908.9	893.4	4.47	421,978.10	564,635.21	17.07	3,043.03	
4,957.0	87.40	22.40	2,054.8	2,948.6	909.9	4.70	422,017.79	564,651.70	17.15	3,085.82	
5,000.0	87.50	21.70	2,056.7	2,988.4	926.0	1.64	422,057.61	564,667.82	17.22	3,128.62	
5,086.0	87.80	21.80	2,060.2	3,068.2	957.9	0.37	422,137.42	564,699.66	17.34	3,214.29	
5,129.0	87.80	21.80	2,061.9	3,108.1	973.8	0.00	422,177.32	564,715.62	17.40	3,257.13	
5,172.0	87.90	21.50	2,063.5	3,148.1	989.7	0.73	422,217.25	564,731.47	17.45	3,299.98	
5,215.0	88.10	22.80	2,065.0	3,187.9	1,005.9	3.06	422,257.06	564,747.68	17.51	3,342.81	
5,258.0	88.70	23.70	2,066.2	3,227.4	1,022.8	2.51	422,296.55	564,764.64	17.58	3,385.58	
5,300.0	89.10	24.70	2,067.0	3,265.7	1,040.1	2.56	422,334.85	564,781.86	17.67	3,427.30	
5,343.0	88.90	24.70	2,067.7	3,304.7	1,058.0	0.47	422,373.91	564,799.82	17.75	3,469.97	
5,387.0	90.90	23.30	2,067.8	3,344.9	1,075.9	5.55	422,414.10	564,817.72	17.83	3,513.71	
5,429.0	90.80	21.70	2,067.2	3,383.7	1,092.0	3.82	422,452.90	564,833.79	17.89	3,555.57	
5,472.0	90.90	21.40	2,066.6	3,423.7	1,107.8	0.74	422,492.89	564,849.58	17.93	3,598.48	
5,517.0	91.30	20.30	2,065.7	3,465.8	1,123.8	2.60	422,534.93	564,865.59	17.97	3,643.41	
5,562.0	92.00	19.70	2,064.4	3,508.0	1,139.2	2.05	422,577.20	564,880.98	17.99	3,688.36	
5,607.0	92.20	18.80	2,062.7	3,550.5	1,154.0	2.05	422,619.66	564,895.80	18.01	3,733.32	
5,652.0	92.70	17.20	2,060.8	3,593.2	1,167.9	3.72	422,662.41	564,909.70	18.01	3,778.28	
5,697.0	92.50	14.20	2,058.8	3,636.5	1,180.1	6.67	422,705.69	564,921.86	17.98	3,823.19	
5,742.0	92.70	3.00	2,056.7	3,680.9	1,186.8	24.87	422,750.06	564,928.57	17.87	3,867.48	
5,787.0	91.60	11.00	2,055.0	3,725.5	1,192.3	17.93	422,794.66	564,934.05	17.75	3,911.61	
5,832.0	91.90	11.20	2,053.7	3,769.6	1,200.9	0.80	422,838.80	564,942.71	17.67	3,956.29	
5,877.0	90.50	10.40	2,052.7	3,813.8	1,209.3	3.58	422,882.99	564,951.14	17.59	4,000.96	
5,922.0	90.60	10.20	2,052.3	3,858.1	1,217.4	0.50	422,927.26	564,959.18	17.51	4,045.60	
5,965.0	90.60	10.20	2,051.8	3,900.4	1,225.0	0.00	422,969.58	564,966.80	17.44	4,088.25	
5,982.0	90.60	10.20	2,051.7	3,917.1	1,228.0	0.00	422,986.31	564,969.81	17.41	4,105.12	

Company: Murchison Oil and Gas
Project: Ramsey
Site: Ogden 5B
Well: Ogden 5B
Wellbore: Ogden 5B Leg 3 ST5
Design: Ogden 5B Leg 3 ST5

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

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