

Nemo Fund I, LLC

Lea County, New Mexico (NAD 27)

Williams State

12-004 H

Wellbore #1

Survey: Scientific Gyro

Standard Survey Report

28 September, 2015



MS Energy Services

Survey Report

Company:	Nemo Fund I, LLC	Local Co-ordinate Reference:	Well 12-004 H
Project:	Lea County, New Mexico (NAD 27)	TVD Reference:	WELL @ 4006.00usft (Silver Oak 1)
Site:	Williams State	MD Reference:	WELL @ 4006.00usft (Silver Oak 1)
Well:	12-004 H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Project	Lea County, New Mexico (NAD 27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Well	12-004 H			
Well Position	+N/-S	0.00 usft	Northing:	899,808.70 usft
	+E/-W	0.00 usft	Easting:	844,810.60 usft
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft
			Latitude:	33° 28' 6.262 N
			Longitude:	103° 12' 9.583 W
			Ground Level:	3,988.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2015	09/04/15	7.02	61.35	48,965

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	180.00	

Survey Program	Date 09/28/15				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
80.00	4,885.00	Scientific Gyro (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80.00	0.22	64.14	80.00	0.07	0.14	-0.07	0.28	0.28	0.00
170.00	0.29	99.04	170.00	0.11	0.52	-0.11	0.19	0.08	38.78
258.00	0.40	93.72	258.00	0.05	1.05	-0.05	0.13	0.13	-6.05
346.00	0.39	93.07	346.00	0.02	1.65	-0.02	0.01	-0.01	-0.74
435.00	0.51	90.78	434.99	-0.01	2.35	0.01	0.14	0.13	-2.57
529.00	0.71	94.29	528.99	-0.06	3.35	0.06	0.22	0.21	3.73
624.00	0.71	109.98	623.98	-0.30	4.49	0.30	0.20	0.00	16.52
719.00	0.66	81.09	718.97	-0.42	5.58	0.42	0.36	-0.05	-30.41
813.00	0.57	51.06	812.97	-0.04	6.48	0.04	0.35	-0.10	-31.95
908.00	0.54	138.74	907.97	-0.08	7.14	0.08	0.81	-0.03	92.29
1,003.00	0.47	81.88	1,002.96	-0.36	7.82	0.36	0.51	-0.07	-59.85
1,098.00	0.39	112.90	1,097.96	-0.43	8.51	0.43	0.26	-0.08	32.65
1,193.00	0.31	61.45	1,192.96	-0.43	9.03	0.43	0.33	-0.08	-54.16
1,288.00	0.29	116.52	1,287.96	-0.42	9.47	0.42	0.29	-0.02	57.97

MS Energy Services
Survey Report



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Site:	Williams State	MD Reference:	WELL @ 4006.00usft (Silver Oak 1)
Well:	12-004 H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,383.00	0.13	118.90	1,382.96	-0.58	9.78	0.58	0.17	-0.17	2.51
1,477.00	0.07	86.20	1,476.96	-0.63	9.93	0.63	0.09	-0.06	-34.79
1,572.00	0.16	38.72	1,571.96	-0.52	10.07	0.52	0.13	0.09	-49.98
1,667.00	0.14	44.81	1,666.96	-0.33	10.24	0.33	0.03	-0.02	6.41
1,761.00	0.10	141.28	1,760.96	-0.31	10.37	0.31	0.19	-0.04	102.63
1,855.00	0.09	349.54	1,854.96	-0.31	10.41	0.31	0.20	-0.01	-161.43
1,949.00	0.06	251.06	1,948.96	-0.25	10.35	0.25	0.12	-0.03	-104.77
2,044.00	0.08	204.08	2,043.96	-0.33	10.27	0.33	0.06	0.02	-49.45
2,138.00	0.10	150.57	2,137.96	-0.46	10.29	0.46	0.09	0.02	-56.93
2,233.00	0.28	233.38	2,232.95	-0.67	10.14	0.67	0.30	0.19	87.17
2,327.00	0.28	180.19	2,326.95	-1.04	9.96	1.04	0.27	0.00	-56.59
2,422.00	0.24	177.09	2,421.95	-1.47	9.97	1.47	0.04	-0.04	-3.26
2,517.00	0.28	152.68	2,516.95	-1.87	10.08	1.87	0.12	0.04	-25.69
2,612.00	0.39	164.87	2,611.95	-2.39	10.27	2.39	0.14	0.12	12.83
2,706.00	0.25	190.85	2,705.95	-2.90	10.32	2.90	0.21	-0.15	27.64
2,801.00	0.30	176.87	2,800.95	-3.35	10.29	3.35	0.09	0.05	-14.72
2,895.00	0.51	199.71	2,894.95	-3.99	10.17	3.99	0.28	0.22	24.30
2,990.00	0.48	173.34	2,989.94	-4.78	10.07	4.78	0.24	-0.03	-27.76
3,085.00	0.60	186.12	3,084.94	-5.67	10.06	5.67	0.18	0.13	13.45
3,180.00	0.74	184.38	3,179.93	-6.78	9.96	6.78	0.15	0.15	-1.83
3,274.00	0.92	238.28	3,273.92	-7.78	9.27	7.78	0.82	0.19	57.34
3,369.00	0.99	180.08	3,368.91	-9.00	8.62	9.00	0.98	0.07	-61.26
3,463.00	0.84	179.13	3,462.90	-10.50	8.63	10.50	0.16	-0.16	-1.01
3,558.00	0.76	180.55	3,557.89	-11.83	8.64	11.83	0.09	-0.08	1.49
3,653.00	0.79	172.68	3,652.88	-13.11	8.72	13.11	0.12	0.03	-8.28
3,748.00	0.69	164.91	3,747.87	-14.31	8.95	14.31	0.15	-0.11	-8.18
3,842.00	0.63	157.19	3,841.87	-15.34	9.30	15.34	0.11	-0.06	-8.21
3,937.00	0.54	157.55	3,936.86	-16.23	9.67	16.23	0.09	-0.09	0.38
4,030.00	0.46	146.39	4,029.86	-16.95	10.04	16.95	0.14	-0.09	-12.00
4,126.00	0.46	134.94	4,125.86	-17.54	10.53	17.54	0.10	0.00	-11.93
4,220.00	0.52	138.66	4,219.85	-18.13	11.08	18.13	0.07	0.06	3.96
4,315.00	0.58	141.38	4,314.85	-18.83	11.66	18.83	0.07	0.06	2.86
4,410.00	0.57	133.26	4,409.84	-19.53	12.31	19.53	0.09	-0.01	-8.55
4,504.00	0.66	132.33	4,503.84	-20.21	13.05	20.21	0.10	0.10	-0.99
4,599.00	0.79	136.44	4,598.83	-21.05	13.90	21.05	0.15	0.14	4.33
4,694.00	0.83	130.96	4,693.82	-21.98	14.87	21.98	0.09	0.04	-5.77
4,789.00	0.73	133.01	4,788.81	-22.84	15.84	22.84	0.11	-0.11	2.16
4,885.00	0.51	144.12	4,884.81	-23.61	16.53	23.61	0.26	-0.23	11.57

Final Scientific Gyro - 4885.00' MD

MS Energy Services
Survey Report



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Site:	Williams State	MD Reference:	WELL @ 4006.00usft (Silver Oak 1)
Well:	12-004 H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,885.00	4,884.81	-23.61	16.53	Final Scientific Gyro - 4885.00' MD

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Nemo Fund I, LLC

Lea County, New Mexico (NAD 27)

Williams State

12-004 H

Wellbore #2

Survey: MS MWD

Standard Survey Report

28 September, 2015

MS Energy Services

Survey Report



Company:	Nemo Fund I, LLC	Local Co-ordinate Reference:	Well 12-004 H
Project:	Lea County, New Mexico (NAD 27)	TVD Reference:	WELL @ 4006.00usft (Silver Oak 1)
Site:	Williams State	MD Reference:	WELL @ 4006.00usft (Silver Oak 1)
Well:	12-004 H	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Project	Lea County, New Mexico (NAD 27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Well	12-004 H			
Well Position	+N/-S	0.00 usft	Northing:	899,808.70 usft
	+E/-W	0.00 usft	Easting:	844,810.60 usft
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft
			Ground Level:	3,988.00 usft

Wellbore	Wellbore #2				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2015	09/04/15	7.02	61.35	48,965

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	4,220.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	180.00	

Survey Program	Date 09/28/15				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
80.00	4,220.00	Scientific Gyro (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro	
4,314.00	9,490.00	MS MWD (Wellbore #2)	MWD	OWSG MWD - Standard	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,220.00	0.52	138.66	4,219.85	-18.13	11.08	18.13	0.00	0.00	0.00	
Tie-in to Scientific Gyro - 4220.00' MD										
4,314.00	0.60	141.40	4,313.85	-18.83	11.67	18.83	0.09	0.09	2.91	
4,351.00	4.40	198.30	4,350.81	-20.33	11.34	20.33	11.09	10.27	153.78	
4,459.00	9.60	199.30	4,457.97	-32.77	7.06	32.77	4.82	4.81	0.93	
4,490.00	9.40	199.00	4,488.54	-37.61	5.38	37.61	0.66	-0.65	-0.97	
4,522.00	11.40	198.60	4,520.01	-43.07	3.52	43.07	6.25	6.25	-1.25	
4,554.00	15.60	198.40	4,551.12	-50.16	1.16	50.16	13.13	13.13	-0.63	
4,584.00	17.80	198.60	4,579.86	-58.33	-1.58	58.33	7.34	7.33	0.67	
4,616.00	20.30	195.80	4,610.10	-68.31	-4.65	68.31	8.32	7.81	-8.75	
4,647.00	24.70	191.10	4,638.74	-79.85	-7.37	79.85	15.32	14.19	-15.16	
4,679.00	28.70	187.40	4,667.32	-94.03	-9.64	94.03	13.53	12.50	-11.56	
4,710.00	32.10	186.00	4,694.06	-109.61	-11.46	109.61	11.20	10.97	-4.52	
4,742.00	35.80	184.70	4,720.60	-127.40	-13.12	127.40	11.78	11.56	-4.06	
4,774.00	39.10	182.30	4,746.00	-146.82	-14.29	146.82	11.27	10.31	-7.50	

MS Energy Services
Survey Report



Company:	Nemo Fund I, LLC	Local Co-ordinate Reference:	Well 12-004 H
Project:	Lea County, New Mexico (NAD 27)	TVD Reference:	WELL @ 4006.00usft (Silver Oak 1)
Site:	Williams State	MD Reference:	WELL @ 4006.00usft (Silver Oak 1)
Well:	12-004 H	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,806.00	42.50	180.20	4,770.22	-167.72	-14.73	167.72	11.46	10.63	-6.56
4,837.00	46.50	179.50	4,792.33	-189.44	-14.67	189.44	13.00	12.90	-2.26
4,868.00	51.20	178.30	4,812.72	-212.77	-14.22	212.77	15.44	15.16	-3.87
4,898.00	54.70	176.60	4,830.79	-236.69	-13.14	236.69	12.51	11.67	-5.67
4,930.00	58.20	176.40	4,848.48	-263.30	-11.51	263.30	10.95	10.94	-0.63
4,962.00	62.80	178.00	4,864.23	-291.11	-10.16	291.11	15.02	14.38	5.00
4,993.00	68.00	180.20	4,877.13	-319.28	-9.73	319.28	17.97	16.77	7.10
5,025.00	70.70	179.60	4,888.42	-349.22	-9.68	349.22	8.62	8.44	-1.88
5,056.00	72.70	179.60	4,898.15	-378.65	-9.47	378.65	6.45	6.45	0.00
5,088.00	76.30	179.70	4,906.70	-409.48	-9.28	409.48	11.25	11.25	0.31
5,120.00	78.60	180.20	4,913.65	-440.72	-9.26	440.72	7.35	7.19	1.56
5,151.00	79.40	179.90	4,919.57	-471.15	-9.28	471.15	2.75	2.58	-0.97
5,183.00	80.00	180.20	4,925.29	-502.63	-9.31	502.63	2.09	1.88	0.94
5,214.00	80.10	180.10	4,930.65	-533.17	-9.39	533.17	0.45	0.32	-0.32
5,246.00	80.60	179.90	4,936.01	-564.71	-9.39	564.71	1.68	1.56	-0.63
5,278.00	81.10	180.40	4,941.10	-596.30	-9.47	596.30	2.20	1.56	1.56
5,310.00	81.80	180.20	4,945.86	-627.95	-9.64	627.95	2.27	2.19	-0.63
5,341.00	83.70	180.40	4,949.77	-658.70	-9.80	658.70	6.16	6.13	0.65
5,373.00	86.00	180.80	4,952.64	-690.57	-10.14	690.57	7.29	7.19	1.25
5,404.00	87.30	181.10	4,954.45	-721.51	-10.65	721.51	4.30	4.19	0.97
5,436.00	88.00	181.20	4,955.76	-753.47	-11.29	753.47	2.21	2.19	0.31
5,468.00	89.60	181.60	4,956.43	-785.46	-12.07	785.46	5.15	5.00	1.25
5,500.00	90.40	181.60	4,956.43	-817.44	-12.97	817.44	2.50	2.50	0.00
5,531.00	90.90	181.30	4,956.08	-848.43	-13.75	848.43	1.88	1.61	-0.97
5,563.00	91.30	181.70	4,955.47	-880.41	-14.59	880.41	1.77	1.25	1.25
5,595.00	89.60	177.60	4,954.74	-973.39	-14.02	973.39	4.77	-1.83	-4.41
5,751.00	89.10	177.20	4,955.81	-1,068.28	-9.71	1,068.28	0.67	-0.53	-0.42
5,845.00	87.40	177.10	4,958.68	-1,162.12	-5.04	1,162.12	1.81	-1.81	-0.11
5,940.00	88.60	180.30	4,962.00	-1,257.02	-2.89	1,257.02	3.60	1.26	3.37
6,035.00	90.40	181.10	4,962.83	-1,352.01	-4.05	1,352.01	2.07	1.89	0.84
6,129.00	89.60	180.00	4,962.83	-1,446.00	-4.95	1,446.00	1.45	-0.85	-1.17
6,224.00	89.00	179.20	4,963.99	-1,540.99	-4.29	1,540.99	1.05	-0.63	-0.84
6,318.00	87.80	180.10	4,966.62	-1,634.95	-3.71	1,634.95	1.60	-1.28	0.96
6,412.00	89.30	180.30	4,968.99	-1,728.92	-4.04	1,728.92	1.61	1.60	0.21
6,505.00	90.40	180.70	4,969.24	-1,821.91	-4.85	1,821.91	1.26	1.18	0.43
6,599.00	89.00	180.30	4,969.73	-1,915.90	-5.67	1,915.90	1.55	-1.49	-0.43
6,693.00	89.80	180.80	4,970.71	-2,009.89	-6.57	2,009.89	1.00	0.85	0.53
6,786.00	88.80	180.00	4,971.85	-2,102.88	-7.22	2,102.88	1.38	-1.08	-0.86
6,879.00	90.20	180.30	4,972.66	-2,195.87	-7.47	2,195.87	1.54	1.51	0.32
6,973.00	89.10	179.30	4,973.24	-2,289.87	-7.14	2,289.87	1.58	-1.17	-1.06
7,067.00	90.00	179.60	4,973.97	-2,383.86	-6.24	2,383.86	1.01	0.96	0.32
7,161.00	91.40	180.50	4,972.83	-2,477.85	-6.32	2,477.85	1.77	1.49	0.96
7,254.00	90.50	178.80	4,971.28	-2,570.83	-5.75	2,570.83	2.07	-0.97	-1.83

MS Energy Services

Survey Report

Company:	Nemo Fund I, LLC	Local Co-ordinate Reference:	Well 12-004 H
Project:	Lea County, New Mexico (NAD 27)	TVD Reference:	WELL @ 4006.00usft (Silver Oak 1)
Site:	Williams State	MD Reference:	WELL @ 4006.00usft (Silver Oak 1)
Well:	12-004 H	North Reference:	Grid
Wellbore:	Wellbore #2	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,347.00	89.50	179.70	4,971.28	-2,663.82	-4.53	2,663.82	1.45	-1.08	0.97
7,441.00	89.20	179.60	4,972.35	-2,757.81	-3.96	2,757.81	0.34	-0.32	-0.11
7,536.00	90.00	179.50	4,973.01	-2,852.81	-3.21	2,852.81	0.85	0.84	-0.11
7,629.00	89.90	178.90	4,973.09	-2,945.80	-1.91	2,945.80	0.65	-0.11	-0.65
7,722.00	88.60	178.80	4,974.31	-3,038.77	-0.05	3,038.77	1.40	-1.40	-0.11
7,816.00	88.90	179.10	4,976.36	-3,132.73	1.67	3,132.73	0.45	0.32	0.32
7,910.00	90.30	179.00	4,977.02	-3,226.71	3.23	3,226.71	1.49	1.49	-0.11
8,003.00	89.00	179.30	4,977.59	-3,319.70	4.61	3,319.70	1.43	-1.40	0.32
8,096.00	89.50	179.50	4,978.80	-3,412.69	5.59	3,412.69	0.58	0.54	0.22
8,190.00	90.50	179.50	4,978.80	-3,506.68	6.41	3,506.68	1.06	1.06	0.00
8,284.00	87.70	178.90	4,980.28	-3,600.65	7.72	3,600.65	3.05	-2.98	-0.64
8,378.00	88.80	179.20	4,983.15	-3,694.59	9.28	3,694.59	1.21	1.17	0.32
8,471.00	90.50	179.10	4,983.72	-3,787.58	10.66	3,787.58	1.83	1.83	-0.11
8,565.00	89.30	180.20	4,983.88	-3,881.57	11.23	3,881.57	1.73	-1.28	1.17
8,658.00	88.70	181.80	4,985.51	-3,974.54	9.61	3,974.54	1.84	-0.65	1.72
8,752.00	88.40	181.70	4,987.88	-4,068.47	6.74	4,068.47	0.34	-0.32	-0.11
8,845.00	87.90	179.60	4,990.89	-4,161.41	5.68	4,161.41	2.32	-0.54	-2.26
8,939.00	88.30	178.80	4,994.00	-4,255.35	7.00	4,255.35	0.95	0.43	-0.85
9,034.00	89.40	178.70	4,995.91	-4,350.30	9.07	4,350.30	1.16	1.16	-0.11
9,128.00	90.50	178.30	4,995.99	-4,444.27	11.53	4,444.27	1.25	1.17	-0.43
9,222.00	90.80	178.80	4,994.93	-4,538.23	13.91	4,538.23	0.62	0.32	0.53
9,316.00	89.90	179.30	4,994.35	-4,632.22	15.46	4,632.22	1.10	-0.96	0.53
9,409.00	90.00	179.20	4,994.43	-4,725.21	16.68	4,725.21	0.15	0.11	-0.11
9,440.00	90.50	179.60	4,994.30	-4,756.21	17.01	4,756.21	2.07	1.61	1.29
9,490.00	90.50	179.60	4,993.86	-4,806.20	17.36	4,806.20	0.00	0.00	0.00

Projection to TD - 9490.00' MD

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
4,220.00	4,219.85	-18.13	11.08	Tie-in to Scientific Gyro - 4220.00' MD
9,490.00	4,993.86	-4,806.20	17.36	Projection to TD - 9490.00' MD

