

Aim Directional Services

Survey Report

HOBBS OCD

MAY 08 2018

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Company:	Marshall & Winston, Inc.	Local Co-ordinate Reference:	Well 36 #3H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	Well @ 3674.00usft (Precision 590)
Site:	Loco Dinero 36 #3H	MD Reference:	Well @ 3674.00usft (Precision 590)
Well:	36 #3H	North Reference:	Grid
Wellbore:	Drilling	Survey Calculation Method:	Minimum Curvature
Design:	Surveys 30-025-44211	Database:	EDM 5000.14 Single User Db

Project	Lea County, NM (NAD83 NME)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Loco Dinero 36 #3H		
Site Position:		Northing:	525,500.20 usft
From:	Map	Easting:	792,677.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 26' 31.308 N
		Longitude:	103° 31' 6.988 W
		Grid Convergence:	0.44 °

Well	36 #3H		
Well Position	+N/-S	0.00 usft	Northing: 525,500.20 usft
	+E/-W	0.00 usft	Easting: 792,677.20 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 26' 31.308 N
		Longitude:	103° 31' 6.988 W
		Ground Level:	3,649.00 usft

Wellbore	Drilling				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	2/22/2018	6.77	60.29	48,232.02058254

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	179.63	

Survey Program	Date	3/15/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	4,700.00	Phoenix Gyro Svy (Drilling)	GYRO-NS-CT	OWSG XYZ Accel with XY Static and Continuous	
4,756.00	14,210.00	Aim MWD Svys (Drilling)	MWD+HDGM	OWSG MWD + HDGM	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,700.00	4.90	61.41	4,696.42	-16.40	83.09	16.94	0.00	0.00	0.00	
Tie on Phoenix Gyro										
4,756.00	5.23	38.32	4,752.20	-13.25	86.77	13.81	3.66	0.59	-41.23	
First Aim Svy										
4,848.00	5.14	38.50	4,843.83	-6.74	91.94	7.33	0.10	-0.10	0.20	
4,941.00	5.14	33.66	4,936.45	-0.01	96.84	0.63	0.47	0.00	-5.20	
5,034.00	4.70	34.72	5,029.11	6.59	101.32	-5.94	0.48	-0.47	1.14	
5,127.00	4.53	24.26	5,121.81	13.07	105.00	-12.39	0.92	-0.18	-11.25	
5,221.00	4.62	13.89	5,215.51	20.13	107.43	-19.44	0.88	0.10	-11.03	

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Well:	36 #3H	North Reference:	Grid
Wellbore:	Drilling	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,252.00	4.62	9.93	5,246.41	22.57	107.95	-21.87	1.03	0.00	-12.77
5,313.00	4.92	7.30	5,307.20	27.59	108.71	-26.88	0.61	0.49	-4.31
5,407.00	4.18	1.14	5,400.91	35.01	109.29	-34.30	0.94	-0.79	-6.55
5,498.00	4.40	358.68	5,491.65	41.82	109.27	-41.11	0.32	0.24	-2.70
5,561.00	4.26	357.54	5,554.47	46.57	109.11	-45.86	0.26	-0.22	-1.81
5,642.00	4.84	0.70	5,635.22	52.99	109.03	-52.29	0.78	0.72	3.90
5,672.00	4.92	358.16	5,665.11	55.54	109.00	-54.84	0.77	0.27	-8.47
5,765.00	4.31	337.94	5,757.81	62.77	107.56	-62.07	1.86	-0.66	-21.74
5,859.00	4.62	317.11	5,851.53	68.82	103.66	-68.14	1.75	0.33	-22.16
5,951.00	4.53	298.74	5,943.24	73.28	97.95	-72.64	1.59	-0.10	-19.97
6,043.00	4.31	282.04	6,034.97	75.75	91.38	-75.15	1.41	-0.24	-18.15
6,134.00	4.44	267.45	6,125.71	76.30	84.52	-75.75	1.23	0.14	-16.03
6,226.00	3.91	259.63	6,217.47	75.58	77.88	-75.07	0.84	-0.58	-8.50
6,319.00	3.47	254.80	6,310.28	74.27	72.04	-73.80	0.58	-0.47	-5.19
6,411.00	3.56	260.25	6,402.10	73.06	66.54	-72.63	0.38	0.10	5.92
6,504.00	3.30	265.52	6,494.94	72.36	61.03	-71.96	0.44	-0.28	5.67
6,597.00	3.47	267.63	6,587.77	72.03	55.55	-71.67	0.23	0.18	2.27
6,690.00	3.03	271.67	6,680.62	71.99	50.28	-71.66	0.53	-0.47	4.34
6,783.00	3.30	271.23	6,773.48	72.12	45.14	-71.82	0.29	0.29	-0.47
6,875.00	2.77	269.74	6,865.35	72.16	40.27	-71.90	0.58	-0.58	-1.62
6,968.00	2.81	267.37	6,958.24	72.05	35.75	-71.82	0.13	0.04	-2.55
7,060.00	2.68	269.83	7,050.14	71.94	31.34	-71.74	0.19	-0.14	2.67
7,153.00	2.73	277.91	7,143.03	72.24	26.98	-72.06	0.41	0.05	8.69
7,245.00	3.47	256.91	7,234.90	71.91	22.09	-71.76	1.46	0.80	-22.83
7,337.00	3.47	254.45	7,326.73	70.53	16.70	-70.42	0.16	0.00	-2.67
7,429.00	3.74	270.97	7,418.55	69.84	11.02	-69.76	1.16	0.29	17.96
7,522.00	3.34	266.13	7,511.38	69.70	5.28	-69.67	0.54	-0.43	-5.20
7,614.00	3.30	268.51	7,603.22	69.46	-0.04	-69.45	0.16	-0.04	2.59
7,707.00	3.12	265.87	7,696.08	69.20	-5.24	-69.24	0.25	-0.19	-2.84
7,798.00	3.16	272.02	7,786.94	69.11	-10.22	-69.18	0.37	0.04	6.76
7,891.00	3.12	266.93	7,879.80	69.07	-15.30	-69.17	0.30	-0.04	-5.47
7,982.00	2.68	269.12	7,970.68	68.90	-19.90	-69.03	0.50	-0.48	2.41
8,074.00	2.95	271.32	8,062.57	68.92	-24.42	-69.08	0.32	0.29	2.39
8,167.00	2.99	265.43	8,155.45	68.79	-29.23	-68.97	0.33	0.04	-6.33
8,259.00	2.81	268.95	8,247.33	68.55	-33.88	-68.77	0.28	-0.20	3.83
8,352.00	2.73	266.05	8,340.22	68.36	-38.37	-68.61	0.17	-0.09	-3.12
8,444.00	2.51	268.33	8,432.12	68.15	-42.57	-68.42	0.26	-0.24	2.48
8,536.00	2.77	261.92	8,524.03	67.78	-46.78	-68.08	0.43	0.28	-6.97
8,628.00	2.37	268.24	8,615.93	67.41	-50.88	-67.73	0.53	-0.43	6.87
8,738.00	2.42	264.99	8,725.84	67.14	-55.47	-67.49	0.13	0.05	-2.95
8,830.00	2.51	263.41	8,817.75	66.73	-59.41	-67.12	0.12	0.10	-1.72
8,861.00	2.81	245.04	8,848.72	66.34	-60.77	-66.73	2.90	0.97	-59.26
8,891.00	4.66	217.97	8,878.66	65.06	-62.19	-65.46	8.36	6.17	-90.23

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8,922.00	7.96	205.14	8,909.47	62.13	-63.87	-62.54	11.51	10.65	-41.39
8,953.00	11.21	201.71	8,940.03	57.38	-65.90	-57.81	10.64	10.48	-11.06
8,983.00	14.11	197.05	8,969.30	51.18	-68.05	-51.62	10.24	9.67	-15.53
9,014.00	16.57	191.08	8,999.19	43.22	-70.01	-43.68	9.42	7.94	-19.26
9,059.00	19.12	182.55	9,042.03	29.56	-71.57	-30.02	8.10	5.67	-18.96
9,107.00	21.27	179.74	9,087.08	13.00	-71.88	-13.46	4.91	4.48	-5.85
9,152.00	25.19	181.94	9,128.42	-4.74	-72.17	4.28	8.92	8.71	4.89
9,200.00	28.18	186.42	9,171.31	-26.22	-73.78	25.74	7.50	6.23	9.33
9,246.00	31.96	188.18	9,211.11	-49.07	-76.73	48.58	8.44	8.22	3.83
9,293.00	35.56	188.88	9,250.18	-74.90	-80.61	74.38	7.70	7.66	1.49
9,339.00	37.67	187.12	9,287.10	-102.06	-84.42	101.52	5.12	4.59	-3.83
9,385.00	40.75	186.77	9,322.74	-130.93	-87.93	130.36	6.71	6.70	-0.76
9,432.00	44.88	185.80	9,357.21	-162.67	-91.42	162.08	8.90	8.79	-2.06
9,478.00	49.89	184.40	9,388.35	-196.38	-94.41	195.76	11.12	10.89	-3.04
9,506.67	53.45	184.68	9,406.13	-218.79	-96.19	218.17	12.44	12.41	0.98
FTP-Loco Dinero 36 #3H									
9,524.00	55.60	184.84	9,416.18	-232.86	-97.36	232.22	12.44	12.41	0.91
9,570.00	59.87	185.01	9,440.73	-271.60	-100.70	270.95	9.29	9.28	0.37
9,615.00	64.44	183.96	9,461.75	-311.26	-103.81	310.58	10.36	10.16	-2.33
9,663.00	70.07	182.64	9,480.30	-355.43	-106.34	354.74	12.00	11.73	-2.75
9,709.00	76.26	181.50	9,493.62	-399.41	-107.92	398.71	13.66	13.46	-2.48
9,755.00	79.52	181.50	9,503.26	-444.37	-109.10	443.65	7.09	7.09	0.00
9,801.00	83.69	181.94	9,509.98	-489.84	-110.47	489.12	9.11	9.07	0.96
9,845.00	87.34	181.14	9,513.42	-533.69	-111.65	532.95	8.49	8.30	-1.82
9,891.00	88.57	181.32	9,515.06	-579.64	-112.63	578.91	2.70	2.67	0.39
9,937.00	88.79	181.41	9,516.12	-625.62	-113.73	624.87	0.52	0.48	0.20
10,029.00	90.24	181.76	9,516.90	-717.58	-116.27	716.81	1.62	1.58	0.38
10,122.00	89.89	179.83	9,516.79	-810.56	-117.56	809.79	2.11	-0.38	-2.08
10,214.00	90.15	178.68	9,516.76	-902.56	-116.37	901.79	1.28	0.28	-1.25
10,306.00	88.84	178.51	9,517.57	-994.52	-114.11	993.76	1.44	-1.42	-0.18
10,399.00	88.84	180.53	9,519.45	-1,087.49	-113.33	1,086.74	2.17	0.00	2.17
10,490.00	88.79	180.88	9,521.34	-1,178.47	-114.45	1,177.70	0.39	-0.05	0.38
10,582.00	89.05	180.53	9,523.07	-1,270.44	-115.58	1,269.67	0.47	0.28	-0.38
10,674.00	88.92	180.00	9,524.70	-1,362.43	-116.01	1,361.65	0.59	-0.14	-0.58
10,766.00	88.53	179.83	9,526.75	-1,454.41	-115.87	1,453.63	0.46	-0.42	-0.18
10,857.00	87.82	179.30	9,529.65	-1,545.36	-115.18	1,544.58	0.97	-0.78	-0.58
10,950.00	88.35	179.21	9,532.75	-1,638.30	-113.97	1,637.53	0.58	0.57	-0.10
11,044.00	89.41	179.04	9,534.59	-1,732.27	-112.54	1,731.50	1.14	1.13	-0.18
11,137.00	89.89	178.95	9,535.16	-1,825.25	-110.91	1,824.50	0.53	0.52	-0.10
11,238.00	91.08	178.86	9,534.30	-1,926.23	-108.98	1,925.48	1.18	1.18	-0.09
11,331.00	92.66	179.47	9,531.27	-2,019.16	-107.62	2,018.43	1.82	1.70	0.66
11,424.00	92.70	180.09	9,526.92	-2,112.06	-107.27	2,111.32	0.67	0.04	0.67
11,518.00	91.08	180.09	9,523.82	-2,206.01	-107.41	2,205.27	1.72	-1.72	0.00
11,609.00	91.47	180.27	9,521.80	-2,296.98	-107.70	2,296.24	0.47	0.43	0.20

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Wellbore:	Drilling	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,702.00	90.15	180.00	9,520.48	-2,389.97	-107.92	2,389.22	1.45	-1.42	-0.29
11,794.00	90.02	179.91	9,520.34	-2,481.97	-107.85	2,481.22	0.17	-0.14	-0.10
11,886.00	90.20	180.09	9,520.17	-2,573.97	-107.85	2,573.22	0.28	0.20	0.20
11,979.00	89.01	179.83	9,520.81	-2,666.97	-107.78	2,666.21	1.31	-1.28	-0.28
12,071.00	89.58	180.09	9,521.94	-2,758.96	-107.72	2,758.21	0.68	0.62	0.28
12,164.00	90.99	180.18	9,521.48	-2,851.96	-107.94	2,851.20	1.52	1.52	0.10
12,256.00	89.98	179.83	9,520.70	-2,943.95	-107.94	2,943.19	1.16	-1.10	-0.38
12,348.00	89.36	179.74	9,521.23	-3,035.95	-107.60	3,035.19	0.68	-0.67	-0.10
12,442.00	88.70	179.12	9,522.82	-3,129.93	-106.66	3,129.17	0.96	-0.70	-0.66
12,534.00	88.97	178.86	9,524.69	-3,221.90	-105.04	3,221.15	0.41	0.29	-0.28
12,626.00	89.01	178.77	9,526.31	-3,313.86	-103.14	3,313.13	0.11	0.04	-0.10
12,718.00	89.19	178.68	9,527.76	-3,405.83	-101.09	3,405.10	0.22	0.20	-0.10
12,811.00	89.93	178.86	9,528.47	-3,498.80	-99.10	3,498.09	0.82	0.80	0.19
12,903.00	89.58	178.77	9,528.87	-3,590.78	-97.19	3,590.08	0.39	-0.38	-0.10
12,996.00	90.20	178.86	9,529.04	-3,683.76	-95.27	3,683.07	0.67	0.67	0.10
13,088.00	88.84	178.68	9,529.82	-3,775.73	-93.30	3,775.05	1.49	-1.48	-0.20
13,180.00	89.19	179.04	9,531.40	-3,867.70	-91.47	3,867.03	0.55	0.38	0.39
13,273.00	89.93	179.47	9,532.11	-3,960.69	-90.26	3,960.03	0.92	0.80	0.46
13,365.00	91.16	179.39	9,531.24	-4,052.68	-89.34	4,052.02	1.34	1.34	-0.09
13,457.00	91.12	180.09	9,529.41	-4,144.66	-88.92	4,144.00	0.76	-0.04	0.76
13,549.00	89.23	180.79	9,529.12	-4,236.65	-89.63	4,235.99	2.19	-2.05	0.76
13,641.00	89.41	181.23	9,530.22	-4,328.63	-91.25	4,327.95	0.52	0.20	0.48
13,734.00	90.33	181.94	9,530.43	-4,421.59	-93.82	4,420.90	1.25	0.99	0.76
13,827.00	89.98	180.71	9,530.18	-4,514.57	-95.98	4,513.85	1.38	-0.38	-1.32
13,919.00	89.58	179.83	9,530.53	-4,606.56	-96.41	4,605.85	1.05	-0.43	-0.96
14,011.00	90.11	179.74	9,530.78	-4,698.56	-96.06	4,697.84	0.58	0.58	-0.10
14,090.17	90.75	179.51	9,530.18	-4,777.73	-95.55	4,777.01	0.86	0.81	-0.29
LTP-Loco Dinero 36 #3H									
14,104.00	90.86	179.47	9,529.99	-4,791.56	-95.42	4,790.84	0.86	0.81	-0.29
14,143.00	91.30	179.56	9,529.26	-4,830.55	-95.09	4,829.83	1.15	1.13	0.23
Last Aim Svy									
14,209.86	91.30	179.56	9,527.74	-4,897.39	-94.58	4,896.68	0.00	0.00	0.00
BHL-Loco Dinero 36 #3H									
14,210.00	91.30	179.56	9,527.74	-4,897.53	-94.58	4,896.82	0.00	0.00	0.00
Projection to BHL									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,700.00	4,696.42	-16.40	83.09	Tie on Phoenix Gyro
4,756.00	4,752.20	-13.25	86.77	First Aim Svy
14,143.00	9,529.26	-4,830.55	-95.09	Last Aim Svy
14,210.00	9,527.74	-4,897.53	-94.58	Projection to BHL

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Wellbore:	Drilling	Survey Calculation Method:	Minimum Curvature
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Checked By: _____	Approved By: _____	Date: _____
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Marshall & Winston, Inc.

Lea County, NM (NAD83 NME)

Loco Dinero 36 #3H

36 #3H

Drilling

Survey: Aim MWD Svys

Survey Report - Geographic

15 March, 2018

Aim Directional Services

Survey Report - Geographic

Company:	Marshall & Winston, Inc.	Local Co-ordinate Reference:	Well 36 #3H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	Well @ 3674.00usft (Precision 590)
Site:	Loco Dinero 36 #3H	MD Reference:	Well @ 3674.00usft (Precision 590)
Well:	36 #3H	North Reference:	Grid
Wellbore:	Drilling	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 Single User Db

Project	Lea County, NM (NAD83 NME)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Loco Dinero 36 #3H		
Site Position:		Northing:	525,500.20 usft
From:	Map	Easting:	792,677.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 26' 31.308 N
		Longitude:	103° 31' 6.988 W
		Grid Convergence:	0.44 °

Well	36 #3H		
Well Position	+N/-S	0.00 usft	Northing: 525,500.20 usft
	+E/-W	0.00 usft	Easting: 792,677.20 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 26' 31.308 N
		Longitude:	103° 31' 6.988 W
		Ground Level:	3,649.00 usft

Wellbore	Drilling		
Magnetics	Model Name	Sample Date	Declination (°)
	MVHD	2/22/2018	6.77
			Dip Angle (°)
			60.29
			Field Strength (nT)
			48,232.02058254

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)
	0.00	0.00	0.00
			Direction (°)
			179.63

Survey Program	Date 3/15/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.00	4,700.00	Phoenix Gyro Svy (Drilling)	GYRO-NS-CT
4,756.00	14,210.00	Aim MWD Svys (Drilling)	MWD+HDGM
			Description
			OWSG XYZ Accel with XY Static and Continuous
			OWSG MWD + HDGM

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,700.00	4.90	61.41	4,696.42	-16.40	83.09	525,483.80	792,760.29	32° 26' 31.139 N	103° 31' 6.020 W	
Tie on Phoenix Gyro										
4,756.00	5.23	38.32	4,752.20	-13.25	86.77	525,486.95	792,763.97	32° 26' 31.170 N	103° 31' 5.976 W	
First Aim Svy										
4,848.00	5.14	38.50	4,843.83	-6.74	91.94	525,493.46	792,769.14	32° 26' 31.234 N	103° 31' 5.915 W	
4,941.00	5.14	33.66	4,936.45	-0.01	96.84	525,500.19	792,774.04	32° 26' 31.300 N	103° 31' 5.858 W	
5,034.00	4.70	34.72	5,029.11	6.59	101.32	525,506.79	792,778.52	32° 26' 31.365 N	103° 31' 5.805 W	
5,127.00	4.53	24.26	5,121.81	13.07	105.00	525,513.27	792,782.20	32° 26' 31.429 N	103° 31' 5.761 W	
5,221.00	4.62	13.89	5,215.51	20.13	107.43	525,520.33	792,784.63	32° 26' 31.499 N	103° 31' 5.732 W	
5,252.00	4.62	9.93	5,246.41	22.57	107.95	525,522.77	792,785.15	32° 26' 31.523 N	103° 31' 5.726 W	
5,313.00	4.92	7.30	5,307.20	27.59	108.71	525,527.79	792,785.90	32° 26' 31.573 N	103° 31' 5.717 W	

Aim Directional Services

Survey Report - Geographic

Company:	Marshall & Winston, Inc.	Local Co-ordinate Reference:	Well 36 #3H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	Well @ 3674.00usft (Precision 590)
Site:	Loco Dinero 36 #3H	MD Reference:	Well @ 3674.00usft (Precision 590)
Well:	36 #3H	North Reference:	Grid
Wellbore:	Drilling	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,407.00	4.18	1.14	5,400.91	35.01	109.29	525,535.21	792,786.48	32° 26' 31.646 N	103° 31' 5.709 W
5,498.00	4.40	358.68	5,491.65	41.82	109.27	525,542.02	792,786.47	32° 26' 31.713 N	103° 31' 5.709 W
5,561.00	4.26	357.54	5,554.47	46.57	109.11	525,546.77	792,786.31	32° 26' 31.760 N	103° 31' 5.710 W
5,642.00	4.84	0.70	5,635.22	52.99	109.03	525,553.19	792,786.23	32° 26' 31.824 N	103° 31' 5.711 W
5,672.00	4.92	358.16	5,665.11	55.54	109.00	525,555.74	792,786.20	32° 26' 31.849 N	103° 31' 5.711 W
5,765.00	4.31	337.94	5,757.81	62.77	107.56	525,562.97	792,784.76	32° 26' 31.921 N	103° 31' 5.727 W
5,859.00	4.62	317.11	5,851.53	68.82	103.66	525,569.02	792,780.86	32° 26' 31.981 N	103° 31' 5.772 W
5,951.00	4.53	298.74	5,943.24	73.28	97.95	525,573.48	792,775.15	32° 26' 32.026 N	103° 31' 5.838 W
6,043.00	4.31	282.04	6,034.97	75.75	91.38	525,575.95	792,768.58	32° 26' 32.050 N	103° 31' 5.915 W
6,134.00	4.44	267.45	6,125.71	76.30	84.52	525,576.50	792,761.72	32° 26' 32.056 N	103° 31' 5.995 W
6,226.00	3.91	259.63	6,217.47	75.58	77.88	525,575.78	792,755.07	32° 26' 32.050 N	103° 31' 6.072 W
6,319.00	3.47	254.80	6,310.28	74.27	72.04	525,574.47	792,749.24	32° 26' 32.037 N	103° 31' 6.140 W
6,411.00	3.56	260.25	6,402.10	73.06	66.54	525,573.26	792,743.74	32° 26' 32.026 N	103° 31' 6.205 W
6,504.00	3.30	265.52	6,494.94	72.36	61.03	525,572.56	792,738.22	32° 26' 32.019 N	103° 31' 6.269 W
6,597.00	3.47	267.63	6,587.77	72.03	55.55	525,572.24	792,732.74	32° 26' 32.016 N	103° 31' 6.333 W
6,690.00	3.03	271.67	6,680.62	71.99	50.28	525,572.19	792,727.47	32° 26' 32.016 N	103° 31' 6.395 W
6,783.00	3.30	271.23	6,773.48	72.12	45.14	525,572.32	792,722.34	32° 26' 32.018 N	103° 31' 6.454 W
6,875.00	2.77	269.74	6,865.35	72.16	40.27	525,572.37	792,717.47	32° 26' 32.019 N	103° 31' 6.511 W
6,968.00	2.81	267.37	6,958.24	72.05	35.75	525,572.25	792,712.95	32° 26' 32.018 N	103° 31' 6.564 W
7,060.00	2.68	269.83	7,050.14	71.94	31.34	525,572.14	792,708.54	32° 26' 32.017 N	103° 31' 6.615 W
7,153.00	2.73	277.91	7,143.03	72.24	26.98	525,572.44	792,704.17	32° 26' 32.021 N	103° 31' 6.666 W
7,245.00	3.47	256.91	7,234.90	71.91	22.09	525,572.11	792,699.29	32° 26' 32.018 N	103° 31' 6.723 W
7,337.00	3.47	254.45	7,326.73	70.53	16.70	525,570.73	792,693.90	32° 26' 32.005 N	103° 31' 6.787 W
7,429.00	3.74	270.97	7,418.55	69.84	11.02	525,570.04	792,688.22	32° 26' 31.998 N	103° 31' 6.853 W
7,522.00	3.34	266.13	7,511.38	69.70	5.28	525,569.91	792,682.48	32° 26' 31.997 N	103° 31' 6.920 W
7,614.00	3.30	268.51	7,603.22	69.46	-0.04	525,569.66	792,677.16	32° 26' 31.995 N	103° 31' 6.982 W
7,707.00	3.12	265.87	7,696.08	69.20	-5.24	525,569.41	792,671.96	32° 26' 31.993 N	103° 31' 7.043 W
7,798.00	3.16	272.02	7,786.94	69.11	-10.22	525,569.32	792,666.98	32° 26' 31.993 N	103° 31' 7.101 W
7,891.00	3.12	266.93	7,879.80	69.07	-15.30	525,569.27	792,661.89	32° 26' 31.992 N	103° 31' 7.160 W
7,982.00	2.68	269.12	7,970.68	68.90	-19.90	525,569.10	792,657.29	32° 26' 31.991 N	103° 31' 7.214 W
8,074.00	2.95	271.32	8,062.57	68.92	-24.42	525,569.13	792,652.78	32° 26' 31.992 N	103° 31' 7.266 W
8,167.00	2.99	265.43	8,155.45	68.79	-29.23	525,568.99	792,647.97	32° 26' 31.991 N	103° 31' 7.323 W
8,259.00	2.81	268.95	8,247.33	68.55	-33.88	525,568.76	792,643.32	32° 26' 31.989 N	103° 31' 7.377 W
8,352.00	2.73	266.05	8,340.22	68.36	-38.37	525,568.56	792,638.83	32° 26' 31.987 N	103° 31' 7.429 W
8,444.00	2.51	268.33	8,432.12	68.15	-42.57	525,568.35	792,634.63	32° 26' 31.985 N	103° 31' 7.478 W
8,536.00	2.77	261.92	8,524.03	67.78	-46.78	525,567.98	792,630.42	32° 26' 31.982 N	103° 31' 7.527 W
8,628.00	2.37	268.24	8,615.93	67.41	-50.88	525,567.61	792,626.31	32° 26' 31.979 N	103° 31' 7.575 W
8,738.00	2.42	264.99	8,725.84	67.14	-55.47	525,567.34	792,621.73	32° 26' 31.976 N	103° 31' 7.629 W
8,830.00	2.51	263.41	8,817.75	66.73	-59.41	525,566.94	792,617.79	32° 26' 31.973 N	103° 31' 7.675 W
8,861.00	2.81	245.04	8,848.72	66.34	-60.77	525,566.54	792,616.43	32° 26' 31.969 N	103° 31' 7.691 W
8,891.00	4.66	217.97	8,878.66	65.06	-62.19	525,565.27	792,615.01	32° 26' 31.956 N	103° 31' 7.707 W
8,922.00	7.96	205.14	8,909.47	62.13	-63.87	525,562.33	792,613.32	32° 26' 31.927 N	103° 31' 7.727 W
8,953.00	11.21	201.71	8,940.03	57.38	-65.90	525,557.59	792,611.30	32° 26' 31.881 N	103° 31' 7.752 W
8,983.00	14.11	197.05	8,969.30	51.18	-68.05	525,551.38	792,609.15	32° 26' 31.819 N	103° 31' 7.777 W
9,014.00	16.57	191.08	8,999.19	43.22	-70.01	525,543.43	792,607.19	32° 26' 31.741 N	103° 31' 7.801 W
9,059.00	19.12	182.55	9,042.03	29.56	-71.57	525,529.76	792,605.63	32° 26' 31.606 N	103° 31' 7.820 W
9,107.00	21.27	179.74	9,087.08	13.00	-71.88	525,513.20	792,605.32	32° 26' 31.442 N	103° 31' 7.825 W
9,152.00	25.19	181.94	9,128.42	-4.74	-72.17	525,495.46	792,605.03	32° 26' 31.266 N	103° 31' 7.830 W
9,200.00	28.18	186.42	9,171.31	-26.22	-73.78	525,473.98	792,603.41	32° 26' 31.054 N	103° 31' 7.851 W
9,246.00	31.96	188.18	9,211.11	-49.07	-76.73	525,451.13	792,600.47	32° 26' 30.828 N	103° 31' 7.887 W
9,293.00	35.56	188.88	9,250.18	-74.90	-80.61	525,425.30	792,596.59	32° 26' 30.573 N	103° 31' 7.935 W
9,339.00	37.67	187.12	9,287.10	-102.06	-84.42	525,398.14	792,592.78	32° 26' 30.304 N	103° 31' 7.982 W
9,385.00	40.75	186.77	9,322.74	-130.93	-87.93	525,369.27	792,589.27	32° 26' 30.019 N	103° 31' 8.025 W
9,432.00	44.88	185.80	9,357.21	-162.67	-91.42	525,337.53	792,585.78	32° 26' 29.705 N	103° 31' 8.069 W
9,478.00	49.89	184.40	9,388.35	-196.38	-94.41	525,303.82	792,582.79	32° 26' 29.372 N	103° 31' 8.107 W

Aim Directional Services

Survey Report - Geographic

Company:	Marshall & Winston, Inc.	Local Co-ordinate Reference:	Well 36 #3H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	Well @ 3674.00usft (Precision 590)
Site:	Loco Dinero 36 #3H	MD Reference:	Well @ 3674.00usft (Precision 590)
Well:	36 #3H	North Reference:	Grid
Wellbore:	Drilling	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,506.67	53.45	184.68	9,406.13	-218.79	-96.19	525,281.41	792,581.01	32° 26' 29.150 N	103° 31' 8.130 W	
FTP-Loce Dinero 36 #3H										
9,524.00	55.60	184.84	9,416.18	-232.86	-97.36	525,267.34	792,579.84	32° 26' 29.011 N	103° 31' 8.144 W	
9,570.00	59.87	185.01	9,440.73	-271.60	-100.70	525,228.60	792,576.50	32° 26' 28.628 N	103° 31' 8.187 W	
9,615.00	64.44	183.96	9,461.75	-311.26	-103.81	525,188.94	792,573.39	32° 26' 28.236 N	103° 31' 8.227 W	
9,663.00	70.07	182.64	9,480.30	-355.43	-106.34	525,144.77	792,570.86	32° 26' 27.799 N	103° 31' 8.260 W	
9,709.00	76.26	181.50	9,493.62	-399.41	-107.92	525,100.79	792,569.27	32° 26' 27.364 N	103° 31' 8.283 W	
9,755.00	79.52	181.50	9,503.26	-444.37	-109.10	525,055.83	792,568.10	32° 26' 26.919 N	103° 31' 8.300 W	
9,801.00	83.69	181.94	9,509.98	-489.84	-110.47	525,010.36	792,566.73	32° 26' 26.469 N	103° 31' 8.320 W	
9,845.00	87.34	181.14	9,513.42	-533.69	-111.65	524,966.52	792,565.55	32° 26' 26.036 N	103° 31' 8.338 W	
9,891.00	88.57	181.32	9,515.06	-579.64	-112.63	524,920.56	792,564.57	32° 26' 25.581 N	103° 31' 8.353 W	
9,937.00	88.79	181.41	9,516.12	-625.62	-113.73	524,874.58	792,563.47	32° 26' 25.126 N	103° 31' 8.370 W	
10,029.00	90.24	181.76	9,516.90	-717.58	-116.27	524,782.62	792,560.92	32° 26' 24.216 N	103° 31' 8.408 W	
10,122.00	89.89	179.83	9,516.79	-810.56	-117.56	524,689.64	792,559.63	32° 26' 23.296 N	103° 31' 8.432 W	
10,214.00	90.15	178.68	9,516.76	-902.56	-116.37	524,597.65	792,560.83	32° 26' 22.386 N	103° 31' 8.426 W	
10,306.00	88.84	178.51	9,517.57	-994.52	-114.11	524,505.68	792,563.09	32° 26' 21.476 N	103° 31' 8.408 W	
10,399.00	88.84	180.53	9,519.45	-1,087.49	-113.33	524,412.71	792,563.87	32° 26' 20.556 N	103° 31' 8.407 W	
10,490.00	88.79	180.88	9,521.34	-1,178.47	-114.45	524,321.73	792,562.75	32° 26' 19.656 N	103° 31' 8.428 W	
10,582.00	89.05	180.53	9,523.07	-1,270.44	-115.58	524,229.76	792,561.61	32° 26' 18.746 N	103° 31' 8.449 W	
10,674.00	88.92	180.00	9,524.70	-1,362.43	-116.01	524,137.77	792,561.19	32° 26' 17.836 N	103° 31' 8.463 W	
10,766.00	88.53	179.83	9,526.75	-1,454.41	-115.87	524,045.80	792,561.33	32° 26' 16.926 N	103° 31' 8.469 W	
10,857.00	87.82	179.30	9,529.65	-1,545.36	-115.18	523,954.85	792,562.02	32° 26' 16.026 N	103° 31' 8.469 W	
10,950.00	88.35	179.21	9,532.75	-1,638.30	-113.97	523,861.91	792,563.22	32° 26' 15.106 N	103° 31' 8.463 W	
11,044.00	89.41	179.04	9,534.59	-1,732.27	-112.54	523,767.94	792,564.66	32° 26' 14.176 N	103° 31' 8.455 W	
11,137.00	89.89	178.95	9,535.16	-1,825.25	-110.91	523,674.95	792,566.29	32° 26' 13.256 N	103° 31' 8.444 W	
11,238.00	91.08	178.86	9,534.30	-1,926.23	-108.98	523,573.98	792,568.22	32° 26' 12.257 N	103° 31' 8.431 W	
11,331.00	92.66	179.47	9,531.27	-2,019.16	-107.62	523,481.04	792,569.58	32° 26' 11.337 N	103° 31' 8.423 W	
11,424.00	92.70	180.09	9,526.92	-2,112.06	-107.27	523,388.14	792,569.93	32° 26' 10.418 N	103° 31' 8.427 W	
11,518.00	91.08	180.09	9,523.82	-2,206.01	-107.41	523,294.20	792,569.78	32° 26' 9.488 N	103° 31' 8.437 W	
11,609.00	91.47	180.27	9,521.80	-2,296.98	-107.70	523,203.22	792,569.50	32° 26' 8.588 N	103° 31' 8.449 W	
11,702.00	90.15	180.00	9,520.48	-2,389.97	-107.92	523,110.23	792,569.28	32° 26' 7.668 N	103° 31' 8.460 W	
11,794.00	90.02	179.91	9,520.34	-2,481.97	-107.85	523,018.23	792,569.35	32° 26' 6.758 N	103° 31' 8.467 W	
11,886.00	90.20	180.09	9,520.17	-2,573.97	-107.85	522,926.23	792,569.35	32° 26' 5.847 N	103° 31' 8.475 W	
11,979.00	89.01	179.83	9,520.81	-2,666.97	-107.78	522,833.24	792,569.42	32° 26' 4.927 N	103° 31' 8.483 W	
12,071.00	89.58	180.09	9,521.94	-2,758.96	-107.72	522,741.24	792,569.48	32° 26' 4.017 N	103° 31' 8.490 W	
12,164.00	90.99	180.18	9,521.48	-2,851.96	-107.94	522,648.25	792,569.26	32° 26' 3.097 N	103° 31' 8.501 W	
12,256.00	89.98	179.83	9,520.70	-2,943.95	-107.94	522,556.25	792,569.25	32° 26' 2.186 N	103° 31' 8.509 W	
12,348.00	89.36	179.74	9,521.23	-3,035.95	-107.60	522,464.25	792,569.60	32° 26' 1.276 N	103° 31' 8.513 W	
12,442.00	88.70	179.12	9,522.82	-3,129.93	-106.66	522,370.27	792,570.53	32° 26' 0.346 N	103° 31' 8.511 W	
12,534.00	88.97	178.86	9,524.69	-3,221.90	-105.04	522,278.31	792,572.16	32° 25' 59.436 N	103° 31' 8.500 W	
12,626.00	89.01	178.77	9,526.31	-3,313.86	-103.14	522,186.34	792,574.06	32° 25' 58.526 N	103° 31' 8.486 W	
12,718.00	89.19	178.68	9,527.76	-3,405.83	-101.09	522,094.37	792,576.10	32° 25' 57.616 N	103° 31' 8.470 W	
12,811.00	89.93	178.86	9,528.47	-3,498.80	-99.10	522,001.40	792,578.10	32° 25' 56.696 N	103° 31' 8.455 W	
12,903.00	89.58	178.77	9,528.87	-3,590.78	-97.19	521,909.42	792,580.00	32° 25' 55.785 N	103° 31' 8.441 W	
12,996.00	90.20	178.86	9,529.04	-3,683.76	-95.27	521,816.44	792,581.93	32° 25' 54.865 N	103° 31' 8.427 W	
13,088.00	88.84	178.68	9,529.82	-3,775.73	-93.30	521,724.47	792,583.90	32° 25' 53.955 N	103° 31' 8.412 W	
13,180.00	89.19	179.04	9,531.40	-3,867.70	-91.47	521,632.50	792,585.73	32° 25' 53.045 N	103° 31' 8.399 W	
13,273.00	89.93	179.47	9,532.11	-3,960.69	-90.26	521,539.51	792,586.94	32° 25' 52.125 N	103° 31' 8.393 W	
13,365.00	91.16	179.39	9,531.24	-4,052.68	-89.34	521,447.52	792,587.86	32° 25' 51.214 N	103° 31' 8.391 W	
13,457.00	91.12	180.09	9,529.41	-4,144.66	-88.92	521,355.54	792,588.27	32° 25' 50.304 N	103° 31' 8.394 W	
13,549.00	89.23	180.79	9,529.12	-4,236.65	-89.63	521,263.55	792,587.57	32° 25' 49.394 N	103° 31' 8.410 W	
13,641.00	89.41	181.23	9,530.22	-4,328.63	-91.25	521,171.57	792,585.95	32° 25' 48.484 N	103° 31' 8.437 W	
13,734.00	90.33	181.94	9,530.43	-4,421.59	-93.82	521,078.61	792,583.37	32° 25' 47.564 N	103° 31' 8.476 W	
13,827.00	89.98	180.71	9,530.18	-4,514.57	-95.98	520,985.63	792,581.22	32° 25' 46.645 N	103° 31' 8.509 W	
13,919.00	89.58	179.83	9,530.53	-4,606.56	-96.41	520,893.64	792,580.79	32° 25' 45.734 N	103° 31' 8.522 W	

Aim Directional Services

Survey Report - Geographic

Company:	Marshall & Winston, Inc.	Local Co-ordinate Reference:	Well 36 #3H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	Well @ 3674.00usft (Precision 590)
Site:	Loco Dinero 36 #3H	MD Reference:	Well @ 3674.00usft (Precision 590)
Well:	36 #3H	North Reference:	Grid
Wellbore:	Drilling	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,011.00	90.11	179.74	9,530.78	-4,698.56	-96.06	520,801.64	792,581.13	32° 25' 44.824 N	103° 31' 8.527 W
14,090.17	90.75	179.51	9,530.18	-4,777.73	-95.55	520,722.47	792,581.65	32° 25' 44.041 N	103° 31' 8.528 W
LTP-Loco Dinero 36 #3H									
14,104.00	90.86	179.47	9,529.99	-4,791.56	-95.42	520,708.64	792,581.78	32° 25' 43.904 N	103° 31' 8.527 W
14,143.00	91.30	179.56	9,529.26	-4,830.55	-95.09	520,669.65	792,582.11	32° 25' 43.518 N	103° 31' 8.527 W
Last Aim Svy									
14,209.86	91.30	179.56	9,527.74	-4,897.39	-94.58	520,602.81	792,582.62	32° 25' 42.857 N	103° 31' 8.527 W
BHL-Loco Dinero 36 #3H									
14,210.00	91.30	179.56	9,527.74	-4,897.53	-94.58	520,602.67	792,582.62	32° 25' 42.855 N	103° 31' 8.527 W
Projection to BHL									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,700.00	4,696.42	-16.40	83.09	Tie on Phoenix Gyro
4,756.00	4,752.20	-13.25	86.77	First Aim Svy
14,143.00	9,529.26	-4,830.55	-95.09	Last Aim Svy
14,210.00	9,527.74	-4,897.53	-94.58	Projection to BHL

Checked By: _____ Approved By: _____ Date: _____

Marshall & Winston, Inc.

Loco Dinero 36 #3H
Lea County, New Mexico
Job No: WT-18-009
Rig: Precision 590



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation
1	14143.00	91.30	179.56	9529.26	-4830.55	-95.09	0.00	0.00	4829.84		Last Aim Svy
2	14210.00	91.30	179.56	9527.74	-4897.53	-94.58	0.00	0.00	4896.82		Projection to BHL

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
FTP-Loco Dinero 36 #3H	9486.27	-155.80	-118.90	525344.40	792558.30	32° 26' 29.775 N	103° 31' 8.389 W
LTP-Loco Dinero 36 #3H	9548.39	-4777.80	-83.40	520722.40	792593.80	32° 25' 44.039 N	103° 31' 8.386 W
BHL-Loco Dinero 36 #3H	9550.00	-4897.80	-82.40	520602.40	792594.80	32° 25' 42.852 N	103° 31' 8.385 W

PROJECT DETAILS: Lea County, NM (NAD83 NME)

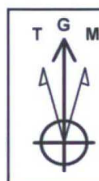
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone

System Datum: Mean Sea Level

SITE DETAILS: Loco Dinero 36 #3H

Site Centre Northing: 525500.20
Easting: 792677.20

Positional Uncertainty: 0.00
Convergence: 0.44
Local North: Grid



Azimuths to Grid North
True North: -0.44°
Magnetic North: 6.33°

Magnetic Field
Strength: 48232.0snT
Dip Angle: 60.29°
Date: 2/22/2018
Model: MVHD

