

30-015-34879

MARSHALL & WINSTON

Dublin Ranch
Eddy County, NM
Dublin Federal 23 #1
VH - Job #32K0612776

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NMOCD ARTESIA

Survey: Gyro

SDI Standard Survey Report

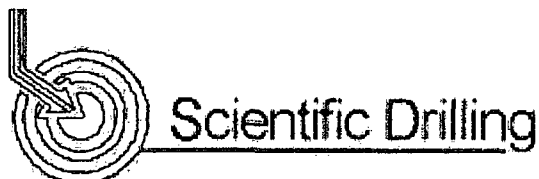
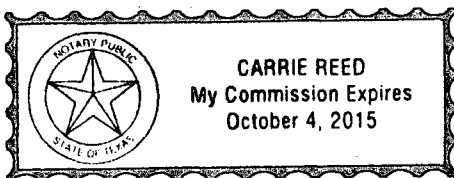
This survey is correct to the best of my knowledge and is supported by actual field data.

Hubert

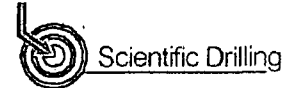
Notarized this date 19th of July, 2012.

Carrie Reed

Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	MARSHALL & WINSTON	Local Co-ordinate Reference:	Well Dublin Federal 23 #1
Project:	Dublin Ranch	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Well:	Dublin Federal 23 #1	North Reference:	Grid
Wellbore:	VH - Job #32K0612776	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0612776	Database:	EDM-Regulatory

Project		Dublin Ranch	
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		

Site		Eddy County, NM			
Site Position:		Northing:	499,160.47 usft	Latitude:	32° 22' 19.200 N
From:	Lat/Long	Easting:	585,931.84 usft	Longitude:	104° 3' 18.000 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.15 °

Well	Dublin Federal 23 #1, Vertical					
Well Position	+N/-S	0.00 usft	Northing:	499,160.47 usft	Latitude:	32° 22' 19.200 N
	+E/-W	0.00 usft	Easting:	585,931.84 usft	Longitude:	104° 3' 18.000 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	0.00 usft

Wellbore		VH - Job #32K0612776			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	06/23/12	7.70	60.22	48,575

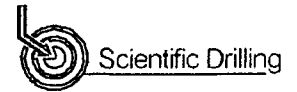
Design	VH - Job #32K0612776			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	354.13

Survey Program		Date 07/31/12		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	7,924.20	Gyro (VH - Job #32K0612776)	KSRG	Keeper Gyro

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.76	335.47	100.00	0.60	-0.28	335.47	0.66	
200.00	1.51	338.13	199.98	2.43	-1.04	336.80	2.64	
300.00	2.04	325.98	299.93	5.13	-2.53	333.75	5.72	
400.00	2.97	301.28	399.83	7.95	-5.74	324.17	9.80	
500.00	2.93	296.49	499.70	10.43	-10.24	315.54	14.62	
600.00	2.86	291.82	599.58	12.50	-14.84	310.10	19.41	
700.00	2.64	290.80	699.46	14.25	-19.31	306.41	24.00	
800.00	2.60	287.90	799.36	15.76	-23.62	303.71	28.40	
900.00	2.45	288.79	899.26	17.15	-27.81	301.66	32.67	
1,000.00	2.38	288.12	999.17	18.48	-31.80	300.16	36.78	
1,100.00	2.34	289.46	1,099.08	19.81	-35.70	299.02	40.83	

Scientific Drilling International, Inc.

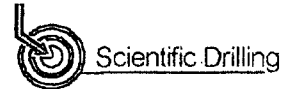
SDI Standard Survey Report



Company:	MARSHALL & WINSTON	Local Co-ordinate Reference:	Well Dublin Federal 23 #1
Project:	Dublin Ranch	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Well:	Dublin Federal 23 #1	North Reference:	Grid
Wellbore:	VH - Job #32K0612776	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0612776	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,200.00	2.19	290.83	1,199.01	21.17	-39.41	298.24	44.73
1,300.00	2.12	290.73	1,298.94	22.50	-42.93	297.66	48.47
1,400.00	1.92	288.87	1,398.87	23.70	-46.24	297.13	51.96
1,500.00	1.86	285.31	1,498.82	24.67	-49.39	296.54	55.21
1,600.00	1.72	284.51	1,598.77	25.47	-52.41	295.92	58.27
1,700.00	1.60	283.98	1,698.73	26.18	-55.22	295.37	61.11
1,800.00	1.04	285.58	1,798.70	26.77	-57.45	294.98	63.38
1,900.00	0.25	298.10	1,898.69	27.11	-58.51	294.86	64.49
2,000.00	0.31	113.04	1,998.69	27.11	-58.46	294.88	64.44
2,100.00	0.31	132.66	2,098.69	26.82	-58.01	294.81	63.91
2,200.00	0.63	113.73	2,198.69	26.42	-57.31	294.75	63.10
2,300.00	1.33	103.27	2,298.67	25.93	-55.67	294.97	61.42
2,400.00	1.81	102.87	2,398.64	25.31	-53.00	295.52	58.74
2,500.00	1.75	100.56	2,498.59	24.68	-49.96	296.29	55.73
2,600.00	1.71	99.11	2,598.54	24.16	-46.99	297.21	52.84
2,700.00	1.71	97.98	2,698.50	23.72	-44.04	298.31	50.02
2,800.00	1.52	96.16	2,798.46	23.37	-41.24	299.54	47.40
2,900.00	1.43	95.76	2,898.42	23.10	-38.68	300.85	45.06
3,000.00	1.48	95.10	2,998.39	22.86	-36.16	302.31	42.78
3,100.00	1.37	92.81	3,098.36	22.69	-33.67	303.97	40.60
3,200.00	1.32	90.20	3,198.33	22.63	-31.33	305.84	38.64
3,300.00	1.25	88.61	3,298.31	22.65	-29.09	307.91	36.86
3,400.00	1.24	89.00	3,398.29	22.69	-26.91	310.14	35.20
3,500.00	1.25	89.11	3,498.26	22.73	-24.74	312.57	33.60
3,600.00	1.01	87.49	3,598.24	22.78	-22.77	315.02	32.21
3,700.00	0.85	85.62	3,698.23	22.88	-21.15	317.25	31.16
3,800.00	0.80	87.86	3,798.22	22.96	-19.71	319.35	30.26
3,900.00	0.88	89.96	3,898.21	22.99	-18.25	321.56	29.35
4,000.00	0.83	87.75	3,998.20	23.02	-16.76	323.95	28.47
4,100.00	0.82	84.42	4,098.19	23.12	-15.32	326.46	27.73
4,200.00	0.76	84.62	4,198.18	23.25	-13.95	329.04	27.11
4,300.00	0.69	79.74	4,298.17	23.42	-12.70	331.54	26.64
4,400.00	0.65	76.90	4,398.16	23.65	-11.55	333.97	26.32
4,500.00	0.63	79.58	4,498.16	23.88	-10.46	336.35	26.07
4,600.00	0.65	79.63	4,598.15	24.08	-9.36	338.76	25.84
4,700.00	0.63	82.73	4,698.14	24.25	-8.26	341.20	25.62
4,800.00	0.65	80.18	4,798.14	24.42	-7.15	343.68	25.45
4,900.00	0.53	63.10	4,898.13	24.73	-6.18	345.97	25.49
5,000.00	0.65	69.68	4,998.13	25.13	-5.24	348.23	25.67
5,100.00	0.53	63.50	5,098.12	25.54	-4.29	350.46	25.89
5,200.00	0.48	69.84	5,198.12	25.89	-3.48	352.34	26.12
5,300.00	0.43	61.70	5,298.11	26.21	-2.76	353.99	26.35
5,400.00	0.42	59.20	5,398.11	26.57	-2.11	355.45	26.66
5,500.00	0.38	45.07	5,498.11	27.00	-1.56	356.68	27.04

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	MARSHALL & WINSTON	Local Co-ordinate Reference:	Well Dublin Federal 23 #1
Project:	Dublin Ranch	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Well:	Dublin Federal 23 #1	North Reference:	Grid
Wellbore:	VH - Job #32K0612776	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0612776	Database:	EDM-Regulatory

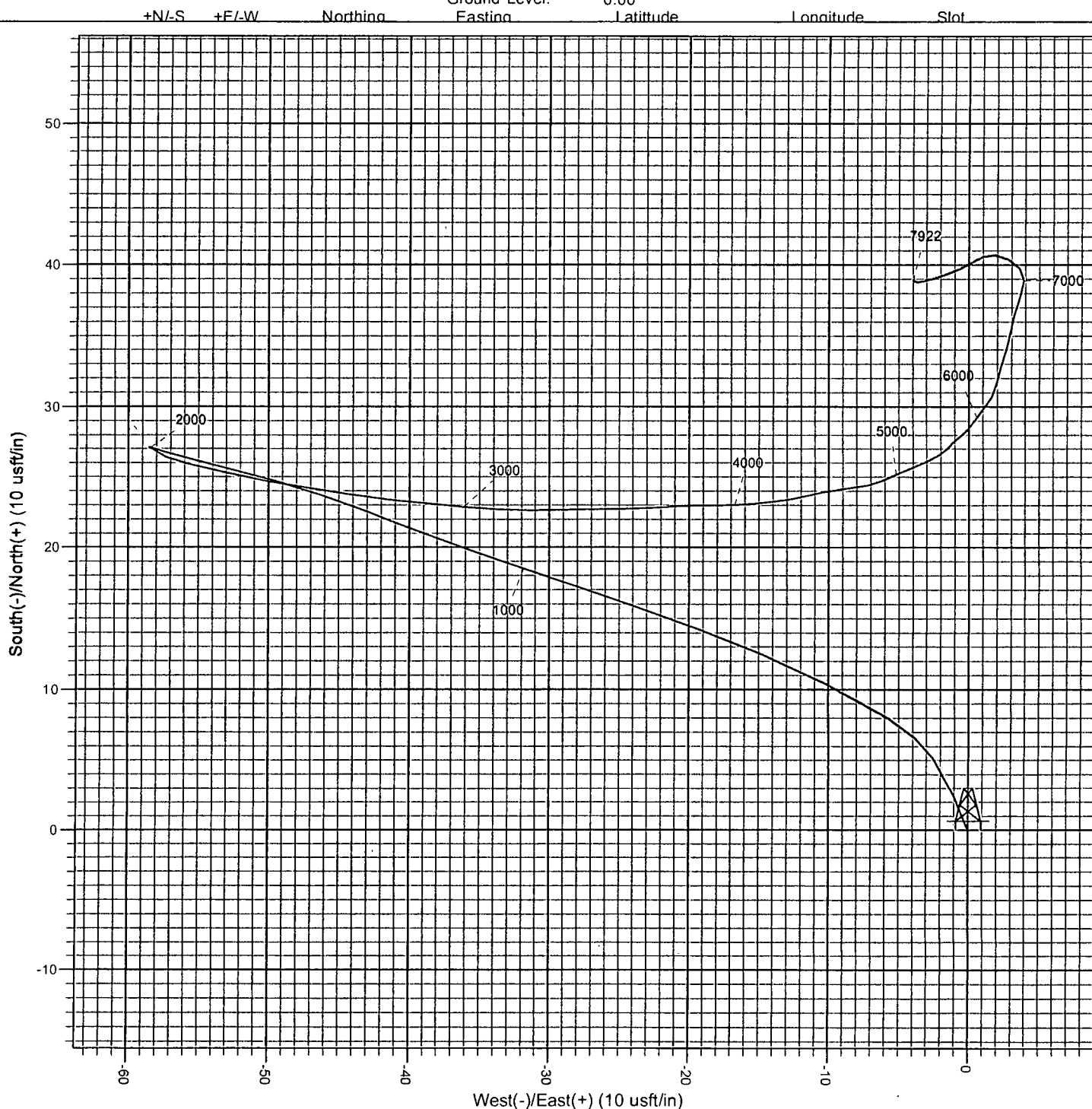
Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
5,600.00	0.33	43.47	5,598.11	27.44	-1.13	357.64	27.46
5,700.00	0.47	55.01	5,698.10	27.88	-0.60	358.77	27.89
5,800.00	0.33	36.14	5,798.10	28.35	-0.09	359.82	28.35
5,900.00	0.27	44.92	5,898.10	28.75	0.25	0.49	28.75
6,000.00	0.36	33.58	5,998.10	29.18	0.59	1.15	29.19
6,100.00	0.30	34.58	6,098.10	29.66	0.91	1.75	29.67
6,200.00	0.35	39.63	6,198.10	30.11	1.25	2.38	30.13
6,300.00	0.41	28.11	6,298.09	30.66	1.61	3.01	30.70
6,400.00	0.69	14.76	6,398.09	31.56	1.94	3.51	31.62
6,500.00	0.71	16.78	6,498.08	32.73	2.27	3.97	32.81
6,600.00	0.73	17.95	6,598.07	33.93	2.64	4.46	34.03
6,700.00	0.71	7.67	6,698.07	35.15	2.92	4.75	35.27
6,800.00	0.77	15.34	6,798.06	36.41	3.18	5.00	36.55
6,900.00	0.81	21.14	6,898.05	37.72	3.62	5.48	37.89
7,000.00	0.58	2.34	6,998.04	38.89	3.89	5.72	39.08
7,100.00	0.55	315.49	7,098.04	39.73	3.58	5.14	39.89
7,200.00	0.60	301.27	7,198.03	40.35	2.79	3.96	40.44
7,300.00	0.54	278.53	7,298.03	40.69	1.88	2.64	40.73
7,400.00	0.50	245.38	7,398.02	40.58	1.02	1.43	40.59
7,500.00	0.55	239.59	7,498.02	40.15	0.21	0.29	40.15
7,600.00	0.59	243.91	7,598.01	39.68	-0.67	359.03	39.69
7,700.00	0.58	253.56	7,698.01	39.31	-1.62	357.64	39.35
7,800.00	0.55	249.91	7,798.00	39.01	-2.56	356.25	39.09
7,900.00	0.73	264.43	7,898.00	38.78	-3.64	354.64	38.95
7,924.20	1.11	298.26	7,922.19	38.87	-4.00	354.13	39.08



Scientific Drilling

Project: Dublin Ranch
Eddy County, NM
Well: Dublin Federal 23 #1
Wellbore: VH - Job #32K0612776
Design: VH - Job #32K0612776

WELL DETAILS: Dublin Federal 23 #1
WELL @ 0.00usft (Original Well Elev)
Ground Level: 0.00



PROJECT DETAILS: Dublin Ranch	SITE DETAILS: Eddy County, NM
Geodetic System: US State Plane 1927 (Exact solution)	Site Centre Latitude: 32° 22' 19.200 N
Datum: NAD 1927 (NADCON CONUS)	Longitude: 104° 3' 18.000 W
Ellipsoid: Clarke 1866	Positional Uncertainty: 0.00
Zone: New Mexico East 3001	Convergence: 0.15
System Datum: Mean Sea Level	Local North: Grid



Marshall & Winston, Inc

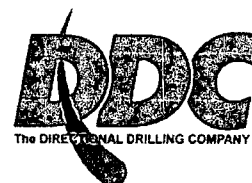
Eddy County, NM
Sec 23, T22S R28E
Dublin Fed 23-1H

Wellbore #1

Survey: MWD

DDC Survey Report

09 July, 2012



Company:	Marshall & Winston, Inc	Local Co-ordinate Reference:	Well Dublin Fed 23-1H
Project:	Eddy County, NM	TVD Reference:	GL + 3161' - RKB 20' Est. @ 3181.0usft (TBD)
Site:	Sec 23, T22S R28E	MD Reference:	GL + 3161' - RKB 20' Est. @ 3181.0usft (TBD)
Well:	Dublin Fed 23-1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project:	Eddy County, NM		
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		

Site	Sec 23, T22S R28E				
Site Position:		Northing:	499,412.30 usft	Latitude:	32° 22' 21.698 N
From:	Map	Easting:	585,699.90 usft	Longitude:	104° 3' 20.697 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.15 °

Well	Dublin Fed 23-1H					
Well Position	+N/-S	0.0 usft	Northing:	499,412.30 usft	Latitude:	32° 22' 21.698 N
	+E/-W	0.0 usft	Easting:	585,699.90 usft	Longitude:	104° 3' 20.697 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,161.0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/19/2012	7.70	60.22	48,553

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	1.23	

Survey Program		Date 7/9/2012		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	7,924.2	Gyro (Wellbore #1)	Good_gyro	Good Gyro
8,007.0	12,107.0	MWD (Wellbore #1)	MWD default	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)
TIE IN @ 7924' MD / 7922' TVD									
7,924.2	1.11	298.26	7,922.2	38.9	-4.0	38.8	0.00	0.00	0.00
8,007.0	10.40	354.80	8,004.5	46.7	-5.4	46.6	11.87	11.22	68.29
8,039.0	13.80	352.70	8,035.8	53.4	-6.1	53.2	10.71	10.63	-6.56
8,071.0	16.40	353.90	8,066.7	61.7	-7.1	61.5	8.18	8.13	3.75
8,103.0	18.10	356.60	8,097.2	71.1	-7.9	70.9	5.87	5.31	8.44
8,134.0	20.70	359.70	8,126.5	81.4	-8.2	81.2	9.02	8.39	10.00
8,166.0	24.70	0.40	8,156.0	93.7	-8.2	93.6	12.53	12.50	2.19
8,197.0	29.10	358.80	8,183.6	107.8	-8.3	107.6	14.38	14.19	-5.16
8,229.0	32.20	359.20	8,211.2	124.1	-8.6	123.9	9.71	9.69	1.25

Company:	Marshall & Winston, Inc	Local Co-ordinate Reference:	Well Dublin Fed 23-1H
Project:	Eddy County, NM	TVD Reference:	GL + 3161' - RKB 20' Est. @ 3181.0usft (TBD)
Site:	Sec 23, T22S R28E	MD Reference:	GL + 3161' - RKB 20' Est. @ 3181.0usft (TBD)
Well:	Dublin Fed 23-1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User 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)
8,261.0	35.70	358.60	8,237.7	141.9	-8.9	141.7	10.99	10.94	-1.88
8,292.0	39.00	358.30	8,262.3	160.7	-9.4	160.5	10.66	10.65	-0.97
8,324.0	41.20	358.40	8,286.8	181.3	-10.0	181.1	6.88	6.88	0.31
8,356.0	44.90	357.80	8,310.2	203.2	-10.7	202.9	11.63	11.56	-1.88
8,387.0	49.70	358.20	8,331.2	225.9	-11.5	225.6	15.51	15.48	1.29
8,419.0	55.30	359.80	8,350.7	251.3	-12.0	251.0	17.94	17.50	5.00
8,451.0	60.90	1.40	8,367.6	278.5	-11.7	278.1	18.01	17.50	5.00
8,483.0	65.30	2.30	8,382.1	307.0	-10.7	306.7	13.98	13.75	2.81
8,515.0	68.80	3.30	8,394.5	336.4	-9.3	336.1	11.31	10.94	3.13
8,546.0	72.20	4.40	8,404.9	365.5	-7.3	365.3	11.47	10.97	3.55
8,578.0	75.90	3.80	8,413.7	396.2	-5.1	396.0	11.70	11.56	-1.88
8,593.0	77.40	3.60	8,417.1	410.8	-4.2	410.6	10.08	10.00	-1.33
8,625.0	79.80	2.60	8,423.5	442.1	-2.5	442.0	8.10	7.50	-3.13
8,657.0	83.10	3.00	8,428.2	473.7	-1.0	473.6	10.39	10.31	1.25
8,689.0	85.80	3.30	8,431.3	505.5	0.8	505.4	8.49	8.44	0.94
8,720.0	88.20	2.40	8,432.9	536.4	2.3	536.4	8.27	7.74	-2.90
8,752.0	90.30	1.80	8,433.4	568.4	3.5	568.4	6.83	6.56	-1.88
8,784.0	91.40	2.60	8,432.9	600.4	4.7	600.3	4.25	3.44	2.50
8,816.0	89.80	2.50	8,432.6	632.3	6.2	632.3	5.01	-5.00	-0.31
8,848.0	88.60	0.70	8,433.0	664.3	7.0	664.3	6.76	-3.75	-5.63
8,879.0	88.60	359.60	8,433.8	695.3	7.1	695.3	3.55	0.00	-3.55
8,911.0	89.30	1.00	8,434.3	727.3	7.3	727.3	4.89	2.19	4.38
8,943.0	90.70	2.50	8,434.3	759.3	8.3	759.3	6.41	4.38	4.69
8,975.0	90.60	2.70	8,434.0	791.3	9.7	791.3	0.70	-0.31	0.63
9,006.0	89.90	1.40	8,433.8	822.2	10.8	822.3	4.76	-2.26	-4.19
9,038.0	89.50	0.20	8,434.0	854.2	11.3	854.3	3.95	-1.25	-3.75
9,069.0	89.60	0.50	8,434.3	885.2	11.5	885.3	1.02	0.32	0.97
9,101.0	90.20	0.50	8,434.3	917.2	11.8	917.3	1.88	1.88	0.00
9,133.0	89.90	1.20	8,434.3	949.2	12.2	949.3	2.38	-0.94	2.19
9,165.0	89.80	0.90	8,434.4	981.2	12.8	981.3	0.99	-0.31	-0.94
9,197.0	89.90	359.10	8,434.5	1,013.2	12.8	1,013.3	5.63	0.31	-5.63
9,228.0	89.90	359.90	8,434.5	1,044.2	12.5	1,044.2	2.58	0.00	2.58
9,260.0	90.60	359.20	8,434.4	1,076.2	12.3	1,076.2	3.09	2.19	-2.19
9,292.0	89.60	358.20	8,434.3	1,108.2	11.6	1,108.2	4.42	-3.13	-3.13
9,324.0	89.70	0.20	8,434.5	1,140.2	11.1	1,140.2	6.26	0.31	6.25
9,355.0	89.10	0.70	8,434.8	1,171.2	11.4	1,171.2	2.52	-1.94	1.61
9,387.0	88.80	0.30	8,435.4	1,203.2	11.6	1,203.2	1.56	-0.94	-1.25
9,419.0	88.50	358.30	8,436.2	1,235.2	11.2	1,235.1	6.32	-0.94	-6.25
9,450.0	89.60	359.40	8,436.7	1,266.2	10.6	1,266.1	5.02	3.55	3.55
9,482.0	89.80	0.20	8,436.9	1,298.2	10.5	1,298.1	2.58	0.63	2.50
9,513.0	89.70	1.90	8,437.0	1,329.2	11.1	1,329.1	5.49	-0.32	5.48
9,545.0	89.20	3.10	8,437.3	1,361.1	12.5	1,361.1	4.06	-1.56	3.75
9,576.0	89.60	2.20	8,437.6	1,392.1	13.9	1,392.1	3.18	1.29	-2.90

Company:	Marshall & Winston, Inc	Local Co-ordinate Reference:	Well Dublin Fed 23-1H
Project:	Eddy County, NM	TVD Reference:	GL + 3161' - RKB 20' Est. @ 3181.0usft (TBD)
Site:	Sec 23, T22S R28E	MD Reference:	GL + 3161' - RKB 20' Est. @ 3181.0usft (TBD)
Well:	Dublin Fed 23-1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User 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)	
9,608.0	89.60	3.00	8,437.8	1,424.1	15.4	1,424.1	2.50	0.00	2.50	
9,640.0	90.10	1.70	8,437.9	1,456.0	16.7	1,456.1	4.35	1.56	-4.06	
9,672.0	90.60	3.40	8,437.7	1,488.0	18.1	1,488.0	5.54	1.56	5.31	
9,704.0	89.30	4.70	8,437.8	1,519.9	20.4	1,520.0	5.75	-4.06	4.06	
9,736.0	89.10	4.70	8,438.2	1,551.8	23.0	1,551.9	0.63	-0.63	0.00	
9,767.0	89.30	3.70	8,438.6	1,582.7	25.3	1,582.9	3.29	0.65	-3.23	
9,799.0	89.80	2.30	8,438.9	1,614.7	26.9	1,614.9	4.65	1.56	-4.38	
9,831.0	89.40	1.90	8,439.1	1,646.7	28.1	1,646.9	1.77	-1.25	-1.25	
9,863.0	89.10	1.90	8,439.5	1,678.6	29.2	1,678.9	0.94	-0.94	0.00	
9,895.0	88.90	1.70	8,440.1	1,710.6	30.2	1,710.9	0.88	-0.63	-0.63	
9,927.0	89.40	1.80	8,440.6	1,742.6	31.1	1,742.9	1.59	1.56	0.31	
9,959.0	90.10	1.10	8,440.7	1,774.6	32.0	1,774.9	3.09	2.19	-2.19	
9,991.0	90.20	1.20	8,440.6	1,806.6	32.6	1,806.9	0.44	0.31	0.31	
10,023.0	90.90	2.10	8,440.3	1,838.6	33.5	1,838.9	3.56	2.19	2.81	
10,054.0	91.50	3.00	8,439.7	1,869.5	34.9	1,869.8	3.49	1.94	2.90	
10,086.0	91.00	2.50	8,439.0	1,901.5	36.4	1,901.8	2.21	-1.56	-1.56	
10,118.0	90.80	3.80	8,438.5	1,933.4	38.2	1,933.8	4.11	-0.63	4.06	
10,150.0	90.90	3.90	8,438.0	1,965.3	40.3	1,965.8	0.44	0.31	0.31	
10,182.0	89.90	2.60	8,437.8	1,997.3	42.1	1,997.7	5.13	-3.13	-4.06	
10,214.0	89.40	2.10	8,438.0	2,029.3	43.5	2,029.7	2.21	-1.56	-1.56	
10,246.0	89.00	359.70	8,438.4	2,061.3	44.0	2,061.7	7.60	-1.25	-7.50	
10,277.0	88.50	0.30	8,439.1	2,092.3	44.0	2,092.7	2.52	-1.61	1.94	
10,309.0	88.80	0.20	8,439.8	2,124.2	44.1	2,124.7	0.99	0.94	-0.31	
10,341.0	89.10	0.10	8,440.4	2,156.2	44.2	2,156.7	0.99	0.94	-0.31	
10,373.0	89.00	0.40	8,441.0	2,188.2	44.3	2,188.7	0.99	-0.31	0.94	
10,404.0	89.60	359.50	8,441.3	2,219.2	44.3	2,219.7	3.49	1.94	-2.90	
10,436.0	89.60	359.70	8,441.6	2,251.2	44.1	2,251.7	0.62	0.00	0.63	
10,468.0	89.20	359.80	8,441.9	2,283.2	43.9	2,283.6	1.29	-1.25	0.31	
10,499.0	89.50	0.50	8,442.2	2,314.2	44.0	2,314.6	2.46	0.97	2.26	
10,531.0	89.50	0.60	8,442.5	2,346.2	44.3	2,346.6	0.31	0.00	0.31	
10,563.0	89.70	0.80	8,442.8	2,378.2	44.7	2,378.6	0.88	0.63	0.63	
10,595.0	89.80	1.70	8,442.9	2,410.2	45.4	2,410.6	2.83	0.31	2.81	
10,626.0	89.40	3.10	8,443.1	2,441.2	46.7	2,441.6	4.70	-1.29	4.52	
10,658.0	89.80	2.80	8,443.3	2,473.1	48.4	2,473.6	1.56	1.25	-0.94	
10,689.0	90.00	1.90	8,443.4	2,504.1	49.6	2,504.6	2.97	0.65	-2.90	
10,721.0	90.10	1.80	8,443.4	2,536.1	50.7	2,536.6	0.44	0.31	-0.31	
10,753.0	89.70	1.00	8,443.4	2,568.1	51.4	2,568.6	2.80	-1.25	-2.50	
10,785.0	90.10	1.60	8,443.5	2,600.1	52.2	2,600.6	2.25	1.25	1.88	
10,816.0	90.60	2.50	8,443.3	2,631.1	53.3	2,631.6	3.32	1.61	2.90	
10,848.0	90.00	1.60	8,443.1	2,663.0	54.4	2,663.6	3.38	-1.88	-2.81	
10,880.0	89.70	0.30	8,443.2	2,695.0	55.0	2,695.6	4.17	-0.94	-4.06	
10,912.0	89.60	1.40	8,443.4	2,727.0	55.4	2,727.6	3.45	-0.31	3.44	
10,944.0	90.20	0.50	8,443.4	2,759.0	56.0	2,759.6	3.38	1.88	-2.81	

Company:	Marshall & Winston, Inc	Local Co-ordinate Reference:	Well Dublin Fed 23-1H
Project:	Eddy County, NM	TVD Reference:	GL + 3161' - RKB 20' Est. @ 3181.0usft (TBD)
Site:	Sec 23, T22S R28E	MD Reference:	GL + 3161' - RKB 20' Est. @ 3181.0usft (TBD)
Well:	Dublin Fed 23-1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User 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)
10,976.0	90.20	1.30	8,443.3	2,791.0	56.5	2,791.6	2.50	0.00	2.50
11,008.0	89.20	1.40	8,443.5	2,823.0	57.2	2,823.6	3.14	-3.13	0.31
11,039.0	88.90	1.60	8,444.0	2,854.0	58.0	2,854.6	1.16	-0.97	0.65
11,071.0	89.00	2.70	8,444.6	2,886.0	59.2	2,886.6	3.45	0.31	3.44
11,103.0	89.40	3.20	8,445.0	2,917.9	60.9	2,918.5	2.00	1.25	1.56
11,135.0	89.90	1.80	8,445.2	2,949.9	62.3	2,950.5	4.65	1.56	-4.38
11,166.0	89.90	0.50	8,445.3	2,980.9	62.9	2,981.5	4.19	0.00	-4.19
11,198.0	89.60	1.00	8,445.4	3,012.9	63.3	3,013.5	1.82	-0.94	1.56
11,230.0	90.40	0.40	8,445.4	3,044.9	63.7	3,045.5	3.12	2.50	-1.88
11,261.0	90.60	0.20	8,445.2	3,075.9	63.9	3,076.5	0.91	0.65	-0.65
11,293.0	89.40	0.70	8,445.2	3,107.9	64.1	3,108.5	4.06	-3.75	1.56
11,325.0	90.10	1.80	8,445.3	3,139.9	64.8	3,140.5	4.07	2.19	3.44
11,357.0	91.40	3.40	8,444.9	3,171.8	66.3	3,172.5	6.44	4.06	5.00
11,388.0	90.60	3.80	8,444.3	3,202.8	68.2	3,203.5	2.89	-2.58	1.29
11,420.0	90.20	2.50	8,444.1	3,234.7	70.0	3,235.5	4.25	-1.25	-4.06
11,452.0	89.70	2.40	8,444.2	3,266.7	71.3	3,267.5	1.59	-1.56	-0.31
11,483.0	90.20	1.60	8,444.2	3,297.7	72.4	3,298.5	3.04	1.61	-2.58
11,515.0	90.20	1.80	8,444.1	3,329.6	73.4	3,330.4	0.62	0.00	0.63
11,547.0	88.90	2.10	8,444.3	3,361.6	74.5	3,362.4	4.17	-4.06	0.94
11,579.0	89.00	2.00	8,444.9	3,393.6	75.6	3,394.4	0.44	0.31	-0.31
11,610.0	89.60	1.90	8,445.3	3,424.6	76.7	3,425.4	1.96	1.94	-0.32
11,642.0	90.10	0.50	8,445.4	3,456.6	77.3	3,457.4	4.65	1.56	-4.38
11,674.0	89.00	359.40	8,445.6	3,488.6	77.3	3,489.4	4.86	-3.44	-3.44
11,706.0	89.10	359.80	8,446.1	3,520.6	77.1	3,521.4	1.29	0.31	1.25
11,737.0	89.10	0.10	8,446.6	3,551.6	77.1	3,552.4	0.97	0.00	0.97
11,769.0	89.20	0.60	8,447.1	3,583.6	77.2	3,584.4	1.59	0.31	1.56
11,801.0	89.90	1.10	8,447.4	3,615.5	77.7	3,616.4	2.69	2.19	1.56
11,832.0	91.30	1.80	8,447.0	3,646.5	78.5	3,647.4	5.05	4.52	2.26
11,864.0	92.00	1.90	8,446.1	3,678.5	79.5	3,679.4	2.21	2.19	0.31
11,895.0	92.30	1.80	8,445.0	3,709.5	80.5	3,710.3	1.02	0.97	-0.32
11,927.0	90.80	1.90	8,444.1	3,741.4	81.6	3,742.3	4.70	-4.69	0.31
11,959.0	90.60	2.60	8,443.7	3,773.4	82.8	3,774.3	2.27	-0.63	2.19
11,991.0	89.40	2.20	8,443.7	3,805.4	84.2	3,806.3	3.95	-3.75	-1.25
12,022.0	88.70	2.30	8,444.2	3,836.4	85.4	3,837.3	2.28	-2.26	0.32
TD @ 12107' MD / 8446' TVD									
12,107.0	88.70	2.30	8,446.1	3,921.3	88.8	3,922.3	0.00	0.00	0.00

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,924.2	7,922.2	38.9	-4.0	TIE IN @ 7924' MD / 7922' TVD
12,107.0	8,446.1	3,921.3	88.8	TD @ 12107' MD / 8446' TVD

Company:	Marshall & Winston, Inc	Local Co-ordinate Reference:	Well Dublin Fed 23-1H
Project:	Eddy County, NM	TVD Reference:	GL + 3161' - RKB 20' Est. @ 3181.0usft (TBD)
Site:	Sec 23, T22S R28E	MD Reference:	GL + 3161' - RKB 20' Est. @ 3181.0usft (TBD)
Well:	Dublin Fed 23-1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Checked By: _____	Approved By: _____	Date: _____
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