

30-015-31477

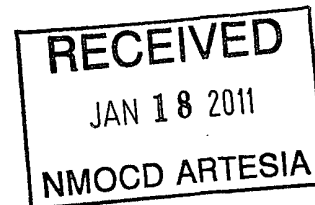
CIMAREX ENERGY

Palmillo
Eddy County, NM
Palmillo State Com #4
VH - Job #32K1010738

Survey: Actual

SDI Standard Survey Report

30 October, 2010



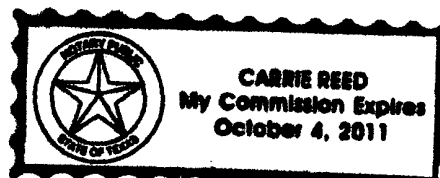
This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notorized this date 2nd of November, 2010.

[Signature]

Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.
SDI Standard Survey Report

Company:	CIMAREX ENERGY	Local Co-ordinate Reference:	Well Palmillo State Com #4
Project:	Palmillo	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Palmillo State Com #4	North Reference:	Grid
Wellbore:	VH - Job #32K1010738	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K1010738	Database:	EDM-Regulatory

Project	Palmillo		
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:	619,175.55 usft	Latitude:	32° 42' 7.200 N
From:	Lat/Long	Easting:	570,852.85 usft	Longitude:	104° 6' 10.800 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.12 °

Well	Palmillo State Com #4, Directional (Baker Hughes)					
Well Position	+N/-S	0.0 usft	Northing:	619,175.55 usft	Latitude:	32° 42' 7.200 N
	+E/-W	0.0 usft	Easting:	570,852.85 usft	Longitude:	104° 6' 10.800 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	0.0 usft

Wellbore	VH - Job #32K1010738				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2010	10/1/2010	8.02	60.56	48,976

Design					VH - Job #32K1010738							
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			190.98	

Survey Program	Date 10/30/2010				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	7,444.0	Actual (VH - Job #32K1010738)	Keeper	Keeper Gyro	

Survey								
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0	
100.0	0.33	304.77	100.0	0.2	-0.2	304.77	0.3	
200.0	0.32	299.26	200.0	0.5	-0.7	302.97	0.9	
300.0	0.30	300.50	300.0	0.7	-1.2	301.77	1.4	
400.0	0.31	308.43	400.0	1.0	-1.6	302.53	1.9	
500.0	0.26	2.42	500.0	1.4	-1.8	308.07	2.3	
600.0	0.33	34.48	600.0	1.9	-1.7	318.89	2.5	
700.0	0.35	31.11	700.0	2.4	-1.3	330.89	2.7	
800.0	0.34	40.23	800.0	2.9	-1.0	341.16	3.0	
900.0	0.35	46.37	900.0	3.3	-0.6	350.25	3.4	
1,000.0	0.36	63.78	1,000.0	3.7	-0.1	358.95	3.7	
1,100.0	0.35	71.17	1,100.0	3.9	0.5	7.35	3.9	

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Well:	Palmillo State Com #4	North Reference:	Grid
Wellbore:	VH - Job #32K1010738	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K1010738	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,200.0	0.31	76.23	1,200.0	4.1	1.1	14.54	4.2
1,300.0	0.35	80.86	1,300.0	4.2	1.6	21.18	4.5
1,400.0	0.36	86.76	1,400.0	4.2	2.2	27.75	4.8
1,500.0	0.39	85.31	1,500.0	4.3	2.9	33.93	5.2
1,600.0	0.40	83.60	1,600.0	4.4	3.6	39.34	5.6
1,700.0	0.39	83.65	1,700.0	4.4	4.3	43.83	6.1
1,800.0	0.53	88.62	1,800.0	4.5	5.1	48.44	6.8
1,900.0	0.54	86.28	1,900.0	4.5	6.0	52.93	7.5
2,000.0	0.52	77.12	2,000.0	4.7	6.9	55.99	8.3
2,100.0	0.46	73.74	2,100.0	4.9	7.7	57.79	9.1
2,200.0	0.42	70.88	2,200.0	5.1	8.5	58.91	9.9
2,300.0	0.29	91.88	2,300.0	5.2	9.1	60.08	10.5
2,400.0	0.18	114.04	2,400.0	5.1	9.5	61.46	10.8
2,500.0	0.22	107.12	2,499.9	5.0	9.8	62.83	11.0
2,600.0	0.19	106.12	2,599.9	4.9	10.1	64.09	11.3
2,700.0	0.18	148.08	2,699.9	4.7	10.4	65.43	11.4
2,800.0	0.15	221.58	2,799.9	4.5	10.4	66.49	11.3
2,900.0	0.47	312.47	2,899.9	4.7	10.0	64.83	11.0
3,000.0	0.58	313.31	2,999.9	5.3	9.3	60.28	10.7
3,100.0	0.56	317.46	3,099.9	6.0	8.6	55.03	10.5
3,200.0	0.32	329.00	3,199.9	6.6	8.1	50.86	10.5
3,300.0	0.28	329.56	3,299.9	7.1	7.9	48.05	10.6
3,400.0	0.26	313.50	3,399.9	7.4	7.6	45.54	10.6
3,500.0	0.36	288.71	3,499.9	7.7	7.1	42.77	10.5
3,600.0	0.38	293.82	3,599.9	7.9	6.5	39.41	10.3
3,700.0	0.43	287.39	3,699.9	8.2	5.9	35.61	10.1
3,800.0	0.50	270.76	3,799.9	8.3	5.1	31.39	9.7
3,900.0	0.49	270.97	3,899.9	8.3	4.2	26.80	9.3
4,000.0	0.49	278.67	3,999.9	8.4	3.3	21.77	9.0
4,100.0	0.52	269.01	4,099.9	8.4	2.5	16.32	8.8
4,200.0	0.32	259.77	4,199.9	8.4	1.7	11.74	8.6
4,300.0	0.32	184.39	4,299.9	8.0	1.4	10.18	8.2
4,400.0	0.60	133.44	4,399.9	7.4	1.8	13.68	7.6
4,500.0	0.71	133.43	4,499.9	6.6	2.6	21.68	7.1
4,600.0	0.57	245.48	4,599.9	6.0	2.6	23.71	6.5
4,700.0	0.99	267.55	4,699.9	5.7	1.3	12.89	5.9
4,800.0	1.18	262.25	4,799.9	5.6	-0.6	354.18	5.6
4,900.0	1.23	257.42	4,899.8	5.2	-2.6	333.12	5.8
5,000.0	1.30	253.76	4,999.8	4.6	-4.8	314.25	6.7
5,100.0	1.31	253.89	5,099.8	4.0	-7.0	299.98	8.0
5,200.0	1.37	257.04	5,199.8	3.4	-9.2	290.40	9.8
5,300.0	1.38	254.51	5,299.7	2.8	-11.5	283.81	11.9
5,400.0	1.03	227.98	5,399.7	1.9	-13.4	278.15	13.5
5,500.0	1.05	224.00	5,499.7	0.7	-14.7	272.56	14.7

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Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Palmillo State Com #4	North Reference:	Grid
Wellbore:	VH - Job #32K1010738	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K1010738	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
5,600.0	1.06	233.67	5,599.7	-0.6	-16.1	268.03	16.1
5,700.0	1.09	251.35	5,699.7	-1.4	-17.7	265.47	17.8
5,800.0	1.23	267.15	5,799.6	-1.8	-19.7	264.89	19.8
5,900.0	1.31	272.47	5,899.6	-1.8	-21.9	265.39	22.0
6,000.0	1.13	270.31	5,999.6	-1.7	-24.0	265.93	24.1
6,100.0	1.05	263.92	6,099.6	-1.8	-25.9	266.02	26.0
6,200.0	0.80	248.83	6,199.6	-2.2	-27.5	265.52	27.6
6,300.0	0.77	236.50	6,299.6	-2.8	-28.7	264.48	28.8
6,400.0	0.94	227.00	6,399.5	-3.7	-29.9	262.93	30.1
6,500.0	1.00	196.79	6,499.5	-5.1	-30.7	260.57	31.1
6,600.0	0.76	173.60	6,599.5	-6.6	-30.9	257.95	31.6
6,700.0	0.70	177.80	6,699.5	-7.9	-30.8	255.67	31.8
6,800.0	0.45	212.89	6,799.5	-8.8	-31.0	254.13	32.2
6,900.0	0.47	210.32	6,899.5	-9.5	-31.4	253.19	32.8
7,000.0	0.50	173.56	6,999.5	-10.3	-31.6	251.96	33.2
7,100.0	0.60	166.41	7,099.5	-11.2	-31.4	250.33	33.3
7,200.0	0.56	137.46	7,199.5	-12.1	-30.9	248.66	33.2
7,300.0	0.55	126.94	7,299.5	-12.7	-30.2	247.15	32.8
7,400.0	0.74	103.93	7,399.5	-13.2	-29.2	245.71	32.0
7,444.0	1.19	86.84	7,443.5	-13.2	-28.5	245.09	31.4

Checked By: _____	Approved By: _____	Date: _____
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Project: Palmillo
Eddy County, NM
Well: Palmillo State Com #4
Wellbore: VH - Job #32K1010738
Design: VH - Job #32K1010738

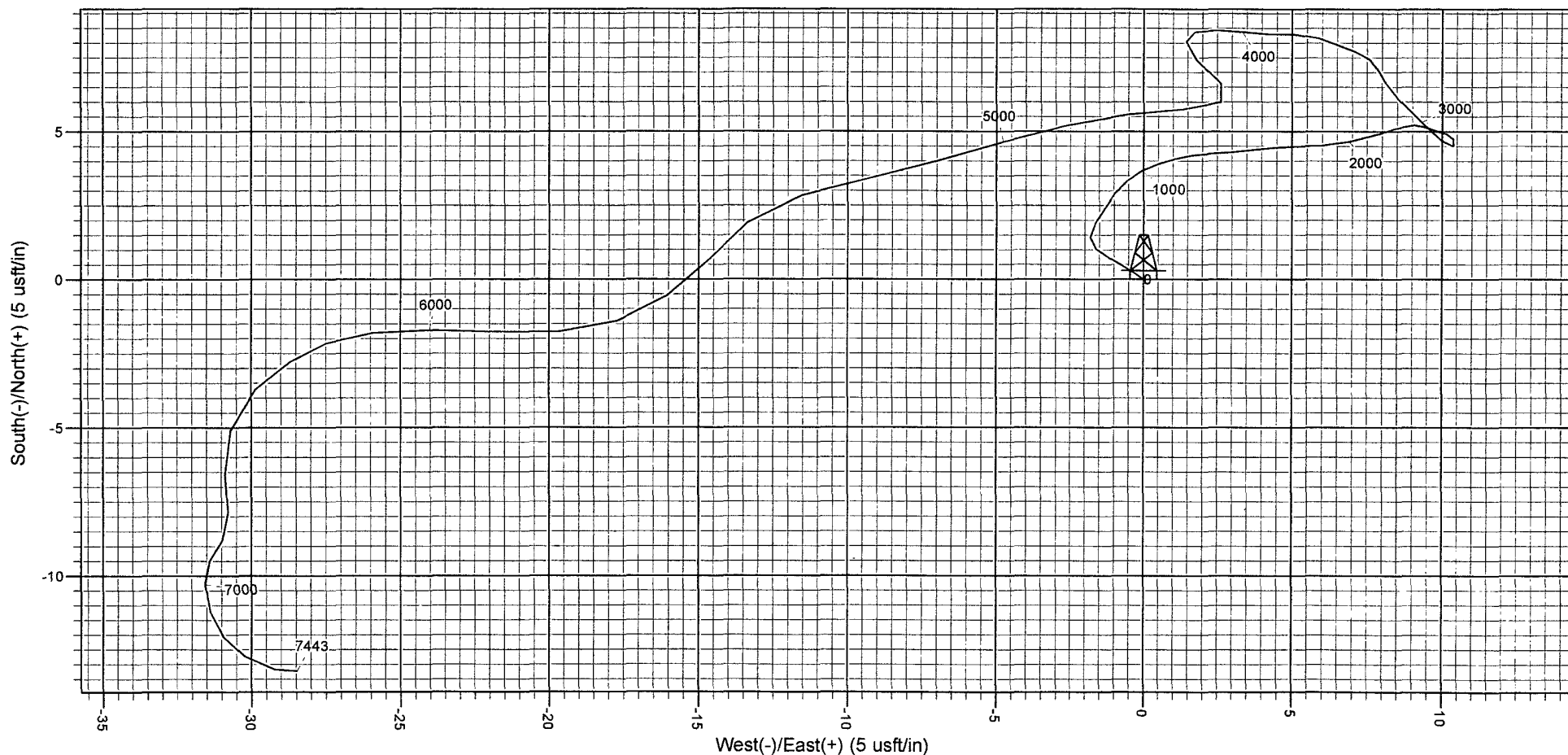


Azimuths to Grid North
True North: -0.12°
Magnetic North: 7.89°

Magnetic Field
Strength: 48976.0snT
Dip Angle: 60.56°
Date: 10/1/2010
Model: BGGM2010

WELL DETAILS: Palmillo State Com #4
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	619175.55	570852.85	$32^\circ 42' 7.200\text{ N}$	$104^\circ 6' 10.800\text{ W}$	



PROJECT DETAILS: Palmillo
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Eddy County, NM
Site Centre Latitude: $32^\circ 42' 7.200\text{ N}$
Longitude: $104^\circ 6' 10.800\text{ W}$
Positional Uncertainty: 0.0
Convergence: 0.12
Local North: Grid