

3D-015-37416

COG OPERATING

Red Bluff

Eddy County, NM

Myox 21 State #9H

VH - Job #32K0411366

Survey: Actual

SDI Standard Survey Report

13 May, 2011

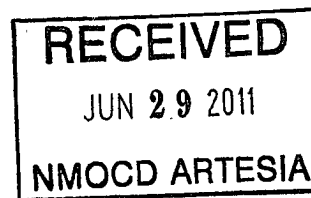
This survey is correct to the best of my knowledge and is supported by actual field data.

Richard

Notarized this date 17th of May, 2011.

Carrie Reed

Notary Signature
County of Midland
State of Texas



Scientific Drilling
Directional Drilling Operations

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Myox 21 State #9H
Project:	Red Bluff	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Myox 21 State #9H	North Reference:	Grid
Wellbore:	VH - Job #32K0411366	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0411366	Database:	EDM-Regulatory

Project	Red Bluff		
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:	403,456 01 usft	Latitude:	32° 6' 32 400 N
From:	Lat/Long	Easting:	572,556 11 usft	Longitude:	104° 5' 56 400 W
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0 12 °

Well	Myox 21 State #9H, Directional (Pathfinder)					
Well Position	+N/-S	0 0 usft	Northing:	403,456 01 usft	Latitude:	32° 6' 32 400 N
	+E/-W	0 0 usft	Easting:	572,556 11 usft	Longitude:	104° 5' 56 400 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	0 0 usft

Wellbore	VH - Job #32K0411366				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/24/2011	7 84	59 99	48,527

Design	VH - Job #32K0411366			
Audit Notes:				
Version:	1 0	Phase:	ACTUAL	Tie On Depth: 0 0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0 0	0 0	0 0	169 05

Survey Program		Date 5/13/2011		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100 0	9,535 0	Actual (VH - Job #32K0411366)	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	0 0
100 0	1 59	68 66	100 0	0 5	1 3	68 66	1 4	
200 0	1 77	72 31	199 9	1 5	4 1	69 96	4 3	
300 0	1 66	71 65	299 9	2 4	6 9	70 79	7 3	
400 0	1 41	84 08	399 9	3 0	9 5	72 55	10 0	
500 0	0 80	71 92	499 8	3 3	11 4	73 70	11 9	
600 0	0 68	55 80	599 8	3 9	12 5	72 81	13 1	
700 0	0 62	56 77	699 8	4 5	13 5	71 50	14 2	
800 0	0 96	357 33	799 8	5 6	13 9	67 90	15 0	
900 0	1 03	353 05	899 8	7 4	13 8	61 80	15 6	
1,000 0	0 80	2 80	999 8	9 0	13 7	56 76	16 4	
1,100 0	0 22	320 80	1,099 8	9 8	13 6	54 18	16 8	

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Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Myox 21 State #9H	North Reference:	Grid
Wellbore:	VH - Job #32K0411366	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0411366	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 32	243 53	1,199 8	9 8	13 2	53 35	16 5
1,300 0	0 26	220 77	1,299 8	9 5	12 8	53 35	16 0
1,400 0	0 29	213 01	1,399 8	9 2	12 5	53 86	15 5
1,500 0	0 11	154 11	1,499 8	8 9	12 4	54 55	15 3
1,600 0	0 20	125 92	1,599 8	8 7	12 6	55 53	15 3
1,700 0	0 88	105 58	1,699 8	8 4	13 5	58 25	15 9
1,800 0	1 76	98 13	1,799 8	7 9	15 8	63 28	17 6
1,900 0	1 85	95 00	1,899 7	7 6	18 9	68 15	20 4
2,000 0	1 79	91 63	1,999 7	7 4	22 1	71 48	23 3
2,100 0	1 83	89 58	2,099 6	7 4	25 2	73 73	26 3
2,200 0	2 29	85 21	2,199 5	7 5	28 8	75 34	29 8
2,300 0	2 01	85 26	2,299 5	7 8	32 5	76 44	33 5
2,400 0	1 86	92 30	2,399 4	7 9	35 9	77 55	36 8
2,500 0	1 61	89 42	2,499 4	7 9	38 9	78 56	39 7
2,600 0	1 44	91 07	2,599 3	7 9	41 6	79 29	42 3
2,700 0	1 37	82 29	2,699 3	8 0	44 0	79 70	44 8
2,800 0	1 33	91 82	2,799 3	8 1	46 4	80 06	47 1
2,900 0	1 11	89 97	2,899 2	8 1	48 5	80 53	49 2
3,000 0	0 72	95 04	2,999 2	8 0	50 1	80 89	50 7
3,100 0	0 77	92 08	3,099 2	8 0	51 4	81 20	52 0
3,200 0	0 63	97 12	3,199 2	7 9	52 6	81 50	53 2
3,300 0	0 41	125 96	3,299 2	7 6	53 5	81 92	54 0
3,400 0	0 48	169 22	3,399 2	7 0	53 8	82 63	54 3
3,500 0	0 34	175 39	3,499 2	6 3	53 9	83 38	54 3
3,600 0	0 45	203 31	3,599 2	5 6	53 8	84 06	54 1
3,700 0	0 50	215 67	3,699 2	4 9	53 4	84 77	53 6
3,800 0	0 51	223 31	3,799 2	4 2	52 8	85 45	53 0
3,900 0	0 44	233 78	3,899 2	3 7	52 2	85 99	52 3
4,000 0	0 54	229 62	3,999 2	3 1	51 5	86 53	51 6
4,100 0	0 54	233 32	4,099 2	2 5	50 8	87 14	50 9
4,200 0	0 54	237 20	4,199 2	2 0	50 0	87 71	50 1
4,300 0	0 36	250 20	4,299 2	1 6	49 3	88 10	49 4
4,400 0	0 44	250 32	4,399 2	1 4	48 7	88 35	48 7
4,500 0	0 48	239 11	4,499 2	1 1	48 0	88 73	48 0
4,600 0	0 43	230 24	4,599 2	0 6	47 3	89 27	47 3
4,700 0	0 86	203 24	4,699 2	-0 3	46 7	90 40	46 7
4,800 0	0 75	209 96	4,799 2	-1 6	46 1	91 96	46 1
4,900 0	0 89	214 14	4,899 1	-2 8	45 3	93 52	45 4
5,000 0	0 94	212 96	4,999 1	-4 1	44 5	95 30	44 7
5,100 0	0 70	221 13	5,099 1	-5 3	43 6	96 89	43 9
5,200 0	0 85	215 10	5,199 1	-6 3	42 8	98 43	43 3
5,300 0	1 00	204 31	5,299 1	-7 7	42 0	100 44	42 7
5,400 0	0 99	201 27	5,399 1	-9 3	41 3	102 73	42 4
5,500 0	0 93	192 89	5,499 1	-10 9	40 8	104 99	42 3

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Wellbore:	VH - Job #32K0411366	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0411366	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	0.99	189.19	5,599.1	-12.6	40.5	107.25	42.4
5,700.0	1.43	189.98	5,699.0	-14.7	40.2	110.06	42.8
5,800.0	1.44	190.59	5,799.0	-17.1	39.7	113.33	43.2
5,900.0	1.64	192.06	5,899.0	-19.8	39.2	116.76	43.9
6,000.0	1.69	194.03	5,998.9	-22.6	38.5	120.39	44.7
6,100.0	1.57	195.37	6,098.9	-25.3	37.8	123.83	45.5
6,200.0	2.21	155.83	6,198.8	-28.4	38.2	126.63	47.6
6,300.0	2.52	144.70	6,298.8	-32.0	40.3	128.43	51.4
6,400.0	2.21	139.75	6,398.7	-35.2	42.8	129.46	55.4
6,500.0	1.66	145.94	6,498.6	-37.9	44.9	130.20	58.7
6,600.0	0.79	221.96	6,598.6	-39.6	45.2	131.23	60.1
6,700.0	2.55	184.49	6,698.5	-42.4	44.6	133.53	61.5
6,800.0	2.18	175.84	6,798.5	-46.5	44.5	136.21	64.4
6,900.0	1.73	178.95	6,898.4	-49.9	44.7	138.13	67.0
7,000.0	1.42	196.62	6,998.4	-52.6	44.4	139.83	68.8
7,100.0	1.15	197.79	7,098.3	-54.7	43.7	141.37	70.0
7,200.0	0.60	211.60	7,198.3	-56.1	43.1	142.45	70.8
7,300.0	0.55	251.42	7,298.3	-56.7	42.4	143.21	70.8
7,400.0	0.47	245.03	7,398.3	-57.0	41.6	143.91	70.6
7,500.0	1.18	173.32	7,498.3	-58.2	41.3	144.64	71.4
7,600.0	1.79	161.47	7,598.3	-60.7	41.9	145.37	73.8
7,700.0	2.20	187.43	7,698.2	-64.1	42.2	146.65	76.8
7,800.0	2.81	205.12	7,798.1	-68.2	40.9	149.06	79.6
7,900.0	1.89	205.25	7,898.0	-72.0	39.2	151.44	81.9
8,000.0	1.52	211.63	7,998.0	-74.6	37.8	153.14	83.6
8,100.0	1.15	222.45	8,098.0	-76.5	36.4	154.54	84.7
8,200.0	0.87	222.18	8,197.9	-77.8	35.2	155.64	85.4
8,300.0	0.99	215.16	8,297.9	-79.0	34.2	156.60	86.1
8,400.0	1.23	186.44	8,397.9	-80.8	33.6	157.43	87.5
8,500.0	1.06	202.89	8,497.9	-82.7	33.1	158.19	89.1
8,600.0	1.27	205.51	8,597.9	-84.6	32.3	159.12	90.5
8,700.0	1.43	205.59	8,697.9	-86.7	31.2	160.18	92.2
8,800.0	1.37	219.09	8,797.8	-88.7	30.0	161.35	93.7
8,900.0	1.34	218.79	8,897.8	-90.6	28.5	162.55	95.0
9,000.0	1.29	215.56	8,997.8	-92.4	27.1	163.67	96.3
9,100.0	1.30	217.11	9,097.7	-94.2	25.7	164.72	97.7
9,200.0	1.01	212.19	9,197.7	-95.9	24.6	165.62	99.0
9,300.0	0.79	221.26	9,297.7	-97.1	23.7	166.31	100.0
9,400.0	1.28	283.94	9,397.7	-97.4	22.1	167.20	99.9
9,500.0	1.51	246.58	9,497.7	-97.6	19.8	168.52	99.6
9,535.0	1.60	241.08	9,532.7	-98.1	19.0	169.05	99.9



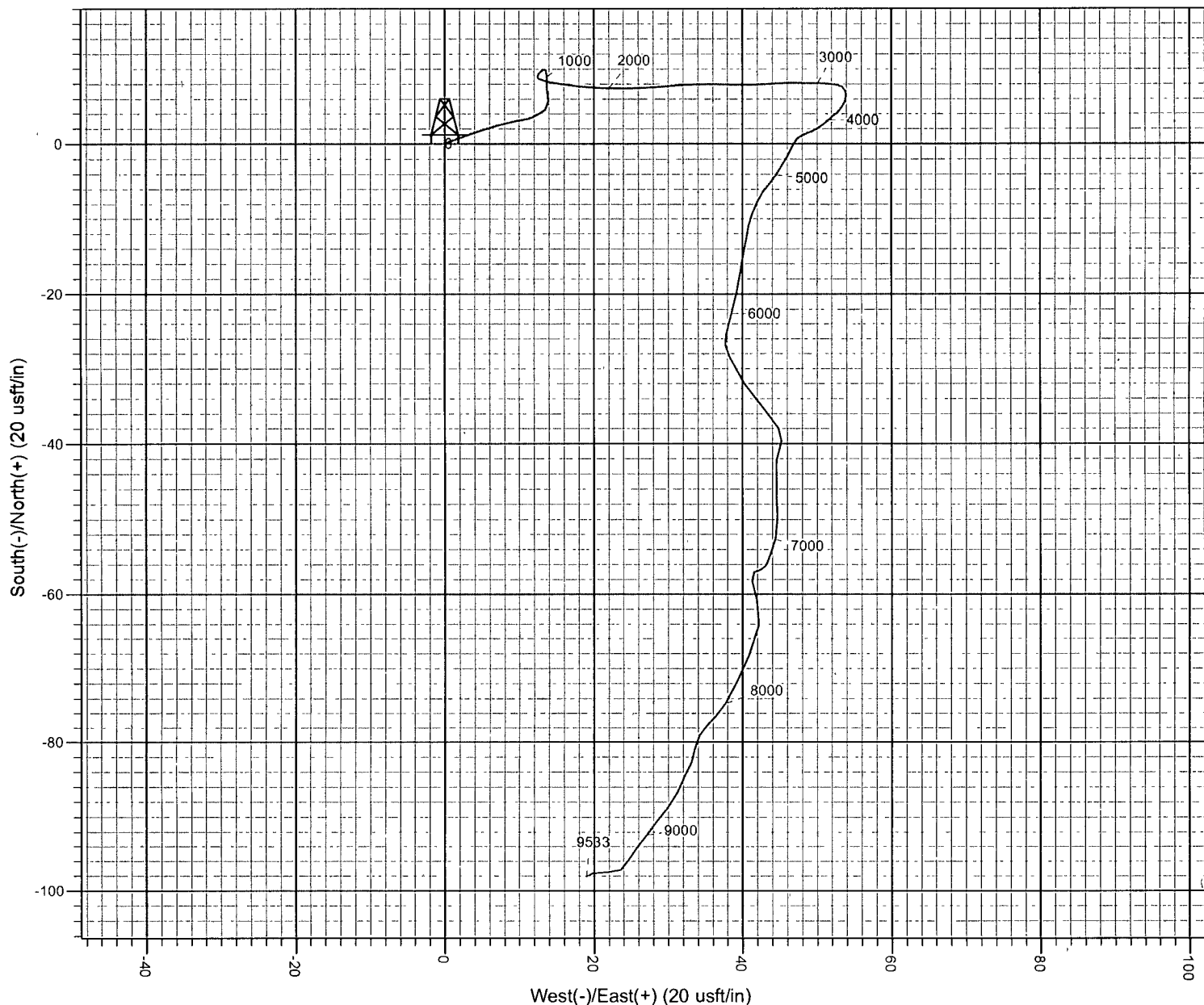
Project: Red Bluff
 Eddy County, NM
 Well: Myox 21 State #9H
 Wellbore: VH - Job #32K0411366
 Design: VH - Job #32K0411366



Azimuths to Grid North
 True North -0 12°
 Magnetic North 7 71°
 Magnetic Field
 Strength 48527.1snT
 Dip Angle 59 99°
 Date 4/24/2011
 Model IGRF2010

WELL DETAILS: Myox 21 State #9H
 WELL @ 0.0usft (Original Well Elev)
 Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	403456.01	572556.11	32° 6' 32.400 N	104° 5' 56.400 W	



PROJECT DETAILS: Red Bluff
 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° 6' 32.400 N
 Longitude: 104° 5' 56.400 W
 Positional Uncertainty: 0.0
 Convergence: 0.12
 Local North: Grid