

COG OPERATING

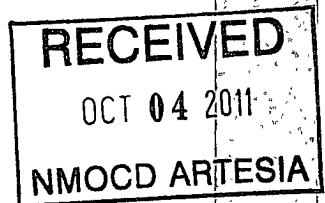
WC Bone Spring
Eddy County, NM
Eggs State #1
VH - Job #32K0211165

30-015-37260

Survey: Actual

SDI Standard Survey Report

24 February, 2011



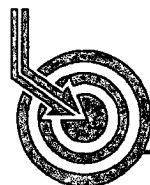
This survey is correct to the best of my knowledge and is supported by actual field data.

Richard

Notarized this date 21st of March, 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 Eggs State #1
Project:	WC Bone Spring	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Eggs State #1	North Reference:	Grid
Wellbore:	VH - Job #32K0211165	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0211165	Database:	EDM-Regulatory

Project	WC Bone Spring		
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:	391,811 97 usft	Latitude: 32° 4' 37.166 N
From: Lat/Long	Easting:	572,493 48 usft	Longitude: 104° 5' 57 422 W
Position Uncertainty: 0 0 usft	Slot Radius:	13-3/16"	Grid Convergence: 0 12 °

Well	Eggs State #1, Directional (DDC)		
Well Position	+N/-S	0 0 usft	Northing: 418,654 55 usft
	+E/-W	0 0 usft	Easting: 634,223.80 usft
Position Uncertainty	0 0 usft	Wellhead Elevation:	usft
		Ground Level:	0 0 usft

Wellbore	VH - Job #32K0211165				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2010	2/22/2011	7.82	60 07	48,623

Design	VH - Job #32K0211165			
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	271 94

Survey Program	Date:	2/24/2011		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	7,430 0	Actual (VH - Job #32K0211165)	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 11	173 51	100.0	-0.1	0 0	173 51	0 1
200.0	0 20	61 49	200.0	-0.1	0 2	121 54	0.2
300.0	0 31	46 17	300 0	0 2	0 5	72.69	0.5
400.0	0 33	292 92	400.0	0 5	0 5	44 43	0 6
500 0	0 32	264 54	500 0	0 5	-0.1	350.71	0.6
600 0	0 27	263 43	600.0	0 5	-0.6	309 43	0.8
700.0	0 39	269 35	700 0	0 5	-1 2	291 53	1.3
800 0	0 55	303 19	800 0	0 7	-1.9	290 65	2.0
900 0	0 54	310 93	900 0	1 3	-2 7	295 81	3 0
1,000 0	0 45	308.07	1,000 0	1 8	-3 3	298 91	3.8
1,100 0	0 22	344 57	1,100 0	2.3	-3 7	301.55	4 3

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Well:	Eggs State #1	North Reference:	Grid
Wellbore:	VH-- Job #32K0211165	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0211165	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 54	72 87	1,200 0	2 6	-3 3	308 18	4 2	
1,300 0	0 75	81 09	1,300 0	2 8	-2 2	322 14	3 6	
1,400 0	0 85	89 00	1,400 0	3 0	-0 8	344 53	3 1	
1,500 0	0 82	89 83	1,500 0	3 0	0 6	12 18	3 0	
1,600 0	0 79	93 94	1,599 9	2 9	2 0	34 98	3 6	
1,700 0	0 63	97 43	1,699 9	2 8	3 3	49 46	4 3	
1,800 0	0 50	105 11	1,799 9	2 6	4 2	58 33	5 0	
1,900 0	0 70	222 39	1,899 9	2 1	4 3	64 24	4 7	
2,000 0	1 76	244 54	1,999 9	0 9	2 5	69 02	2 6	
2,100 0	2 47	249 76	2,099 8	-0 5	-1 0	244 04	1 1	
2,200 0	2 97	250 39	2,199 7	-2 1	-5 4	249 00	5 8	
2,300 0	3 20	262 68	2,299 6	-3 3	-10 6	252 72	11 1	
2,400 0	2 33	266 78	2,399 5	-3 8	-15 4	256 25	15 9	
2,500 0	1 43	265 42	2,499 4	-4 0	-18 7	257 96	19 1	
2,600 0	1 63	261 01	2,599 4	-4 3	-21 3	258 58	21 8	
2,700 0	1 85	267 20	2,699 3	-4 6	-24 4	259 28	24 8	
2,800 0	1 45	286 68	2,799 3	-4 3	-27 2	260 96	27 5	
2,900 0	0 74	333 52	2,899 3	-3 4	-28 7	263 27	28 9	
3,000 0	0 86	46 23	2,999 3	-2 3	-28 4	265 40	28 5	
3,100 0	1 28	79 90	3,099 2	-1 6	-26 8	266 64	26 8	
3,200 0	1 62	102 67	3,199 2	-1 7	-24 3	266 03	24 4	
3,300 0	1 62	111 25	3,299 2	-2 5	-21 6	263 38	21 8	
3,400 0	1 65	106 61	3,399 1	-3 4	-18 9	259 71	19 2	
3,500 0	1 28	106 89	3,499 1	-4 2	-16 5	255 79	17 0	
3,600 0	1 22	99 81	3,599 1	-4 7	-14 4	251 95	15 1	
3,700 0	1 20	101 18	3,699 0	-5 1	-12 3	247 60	13 3	
3,800 0	1 20	100 29	3,799 0	-5 5	-10 2	241 93	11 6	
3,900 0	1 09	100 56	3,899 0	-5 8	-8 3	234 85	10 1	
4,000 0	0 99	103 37	3,999 0	-6 2	-6 5	226 32	9 0	
4,100 0	0 86	100 03	4,099 0	-6 5	-4 9	216 93	8 2	
4,200 0	0 82	104 18	4,199 0	-6 8	-3 5	206 93	7 7	
4,300 0	0 71	112 11	4,299 0	-7 2	-2 2	196 91	7 6	
4,400 0	0 66	122 78	4,399 0	-7 8	-1 1	188 34	7 9	
4,500 0	0 46	132 36	4,498 9	-8 4	-0 4	182 46	8 4	
4,600 0	0 41	126 54	4,598 9	-8 8	0 2	178 54	8 8	
4,700 0	0 39	129 00	4,698 9	-9 3	0 8	175 21	9 3	
4,800 0	0 33	131 95	4,798 9	-9 7	1 3	172 60	9 8	
4,900 0	0 32	129 87	4,898 9	-10 0	1 7	170 48	10 2	
5,000 0	0 32	128 85	4,998 9	-10 4	2 1	168 50	10 6	
5,100 0	0 31	116 13	5,098 9	-10 7	2 6	166 46	11 0	
5,200 0	0 17	159 36	5,198 9	-11 0	2 9	165 31	11 3	
5,300 0	0 31	225 02	5,298 9	-11 3	2 7	166 39	11 6	
5,400 0	0 26	235 77	5,398 9	-11 6	2 4	168 53	11 8	
5,500 0	0 53	236 99	5,498 9	-12 0	1 8	171 56	12 1	

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Wellbore:	VH - Job #32K0211165	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0211165	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	0.57	235.69	5,598.9	-12.5	1.0	175.52	12.6
5,700.0	0.66	234.71	5,698.9	-13.1	0.1	179.57	13.1
5,800.0	1.08	243.94	5,798.9	-13.9	-1.2	185.02	13.9
5,900.0	1.10	239.62	5,898.9	-14.8	-2.9	191.08	15.1
6,000.0	0.76	248.50	5,998.9	-15.5	-4.3	195.63	16.1
6,100.0	0.73	244.49	6,098.9	-16.0	-5.5	199.04	16.9
6,200.0	0.74	242.16	6,198.9	-16.6	-6.7	201.91	17.9
6,300.0	0.69	236.92	6,298.9	-17.2	-7.8	204.23	18.9
6,400.0	0.75	227.36	6,398.8	-18.0	-8.7	205.90	20.0
6,500.0	0.76	219.05	6,498.8	-19.0	-9.6	206.95	21.3
6,600.0	0.74	207.31	6,598.8	-20.0	-10.4	207.31	22.6
6,700.0	0.84	207.61	6,698.8	-21.3	-11.0	207.32	23.9
6,800.0	0.80	204.98	6,798.8	-22.6	-11.6	207.26	25.4
6,900.0	0.79	202.95	6,898.8	-23.8	-12.2	207.09	26.8
7,000.0	0.93	203.80	6,998.8	-25.2	-12.8	206.90	28.3
7,100.0	1.20	198.44	7,098.8	-26.9	-13.4	206.52	30.1
7,200.0	1.26	200.25	7,198.7	-29.0	-14.2	206.05	32.2
7,300.0	1.67	217.08	7,298.7	-31.2	-15.4	206.32	34.8
7,400.0	1.32	219.05	7,398.7	-33.2	-17.0	207.13	37.3
7,430.0	0.77	191.55	7,428.7	-33.7	-17.3	207.16	37.8



Project: WC Bone Spring
 Eddy County, NM
 Well: Eggs State #1
 Wellbore: VH - Job #32K0211165
 Design: VH - Job #32K0211165

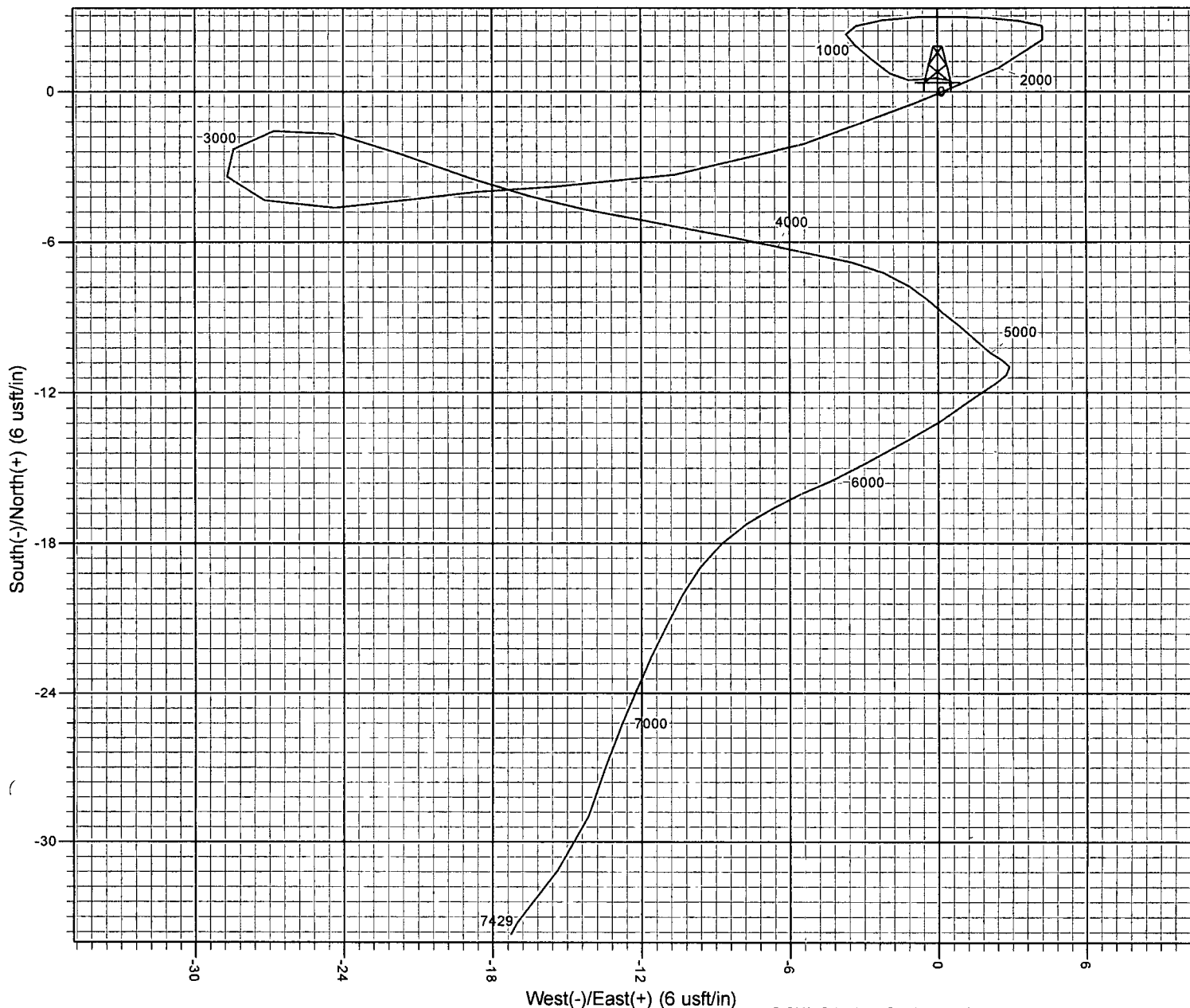


Azimuths to Grid North
 True North -0 23°
 Magnetic North. 7 59°

Magnetic Field
 Strength: 48622.9snT
 Dip Angle: 60.07°
 Date: 2/22/2011
 Model: BGGM2010

WELL DETAILS: Eggs State #1
 WELL @ 0.0usft (Original Well Elev)
 Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	418654.55	634223.80	32° 9' 0.918 N	103° 53' 58.700 W	



PROJECT DETAILS: WC Bone Spring

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° 4' 37.166 N
 Longitude: 104° 5' 57.422 W
 Positional Uncertainty: 0.0
 Convergence: 0.12
 Local North: Grid