

30-015-37423

COG OPERATING

WC Bone Spring

Eddy County, NM

SRO State Unit Com #102¹⁵H

VH - Job #32K0411317



Survey: Actual

SDI Standard Survey Report

12 April, 2011

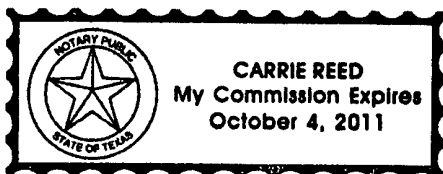
This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notarized this date 10th of May, 2011.

[Signature]

Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well SRO State Unit Com #102H
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:	SRO State Unit Com #102H	North Reference:	Grid
Wellbore:	VH - Job #32K0411317	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0411317	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
From:	Lat/Long	Easting:	572,493 48 usft
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"
		Latitude:	32° 4' 37 166 N
		Longitude:	104° 5' 57 422 W
		Grid Convergence:	0.12 °

Well	SRO State Unit Com #102H, Directional (Pathfinder)		
Well Position	+N/-S	0 0 usft	Northing: 381,254 88 usft
	+E/-W	0 0 usft	Easting: 567,027 29 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 2' 52 800 N
		Longitude:	104° 7' 1 200 W
		Ground Level:	0 0 usft

Wellbore	VH - Job #32K0411317				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/6/2011	7 85	59 93	48,493

Design	VH - Job #32K0411317			
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	179 27

Survey Program	Date 4/12/2011				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100 0	6,136 0	Actual (VH - Job #32K0411317)	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 38	222 11	100 0	-0 2	-0 2	222 11	0 3
200 0	0 76	187 79	200 0	-1 1	-0 5	204 95	1 3
300 0	0 43	193 66	300 0	-2 2	-0 7	198 19	2 3
400 0	0 32	178 66	400 0	-2 8	-0 8	195 78	2 9
500 0	0 88	85 57	500 0	-3 0	0 0	180 44	3 0
600 0	1 05	74 55	600 0	-2 7	1 6	149 24	3 2
700 0	1 20	108 09	699 9	-2 8	3 5	128 75	4 5
800 0	1 20	130 22	799 9	-3 8	5 3	125 74	6 5
900 0	1 36	135 65	899 9	-5 3	6 9	127 61	8 7
1,000 0	1 51	122 82	999 9	-6 9	8 9	127 90	11 2
1,100 0	2 02	107 67	1,099.8	-8 2	11 7	124 97	14 2

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Design:	VH - Job #32K0411317	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	3 11	94 96	1,199 7	-8 9	16 0	119 09	18 3
1,300 0	3 20	93 87	1,299 6	-9 3	21 5	113 47	23 5
1,400 0	3 05	99 50	1,399.4	-10 0	26 9	110 32	28 7
1,500 0	2 70	99 10	1,499 3	-10 8	31 9	108 69	33 7
1,600 0	2 35	99 65	1,599 2	-11 5	36 2	107 61	38 0
1,700 0	2.71	99 54	1,699 1	-12 2	40 6	106 78	42.4
1,800 0	3 42	96 78	1,799.0	-13 0	45 9	105.80	47 7
1,900 0	3 34	97.40	1,898 8	-13 7	51 7	104 84	53 5
2,000 0	3 65	96 05	1,998 6	-14 4	57 8	104 01	59 5
2,100 0	3.81	95 20	2,098.4	-15.1	64 3	103 18	66 0
2,200 0	3 67	96 43	2,198 2	-15 7	70 7	102 52	72.5
2,300 0	2.67	103 79	2,298 0	-16 6	76 2	102 31	78 0
2,400.0	2 08	113 19	2,397 9	-17 9	80 1	102 59	82 1
2,500 0	1 87	113 15	2,497 9	-19 3	83 3	103 02	85.5
2,600 0	1 47	109 69	2,597 8	-20 3	86 0	103 30	88 4
2,700 0	1 18	113 70	2,697 8	-21 2	88 1	103 51	90 6
2,800 0	1 06	111 76	2,797 8	-21 9	89 9	103 70	92 6
2,900 0	0 67	114 59	2,897 8	-22 5	91 3	103 85	94 1
3,000 0	0 82	118 75	2,997 8	-23 1	92 5	104 02	95 3
3,100 0	0.62	118 42	3,097 8	-23 7	93 6	104 21	96 5
3,200 0	0 68	122 58	3,197 8	-24 3	94 6	104 40	97 6
3,300.0	0 52	106 68	3,297.7	-24 7	95.5	104 52	98 7
3,400 0	0 37	137 22	3,397.7	-25 1	96 2	104 63	99 4
3,500 0	0 28	106 59	3,497 7	-25 4	96 6	104.73	99 9
3,600 0	0 26	143 47	3,597 7	-25 7	97 0	104 82	100 3
3,700 0	0 32	119 89	3,697 7	-26.0	97.4	104 94	100 8
3,800 0	0 28	64 73	3,797 7	-26 0	97.8	104 89	101 2
3,900 0	0 24	150 23	3,897.7	-26 1	98.1	104 89	101 6
4,000.0	0 20	147 45	3,997 7	-26 4	98 3	105 04	101 8
4,100 0	0 04	222 91	4,097.7	-26 6	98.4	105 12	101.9
4,200 0	0 17	189 13	4,197 7	-26.8	98 4	105 22	101 9
4,300 0	0 16	195 97	4,297 7	-27 0	98 3	105 38	102 0
4,400 0	0 26	233 18	4,397.7	-27 3	98 1	105 56	101 8
4,500 0	0 24	188 26	4,497 7	-27 7	97 9	105 78	101 7
4,600 0	0 20	212 18	4,597 7	-28 0	97 8	105 99	101 7
4,700 0	0 45	214 28	4,697 7	-28 5	97 4	106 30	101 5
4,800 0	0 49	200 98	4,797 7	-29 2	97 1	106.75	101 4
4,900 0	0 52	202 81	4,897 7	-30 0	96 7	107 24	101 3
5,000 0	0.53	204 78	4,997 7	-30 9	96 4	107 76	101 2
5,100 0	0 48	206 68	5,097 7	-31 7	96 0	108 25	101 1
5,200.0	0 62	187 25	5,197 7	-32 6	95 7	108 79	101 1
5,300 0	0 60	190 29	5,297.7	-33 6	95 6	109 38	101 3
5,400 0	0 70	196 00	5,397 7	-34 7	95.3	110 02	101 4
5,500 0	0 69	189 48	5,497.7	-35 9	95 0	110 70	101 6

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5,600 0	0 65	199 44	5,597 7	-37 0	94 7	111 35	101 7
5,700 0	0 87	199 12	5,697 7	-38 3	94 3	112 10	101 8
5,800 0	0 91	198 67	5,797 7	-39 8	93 8	112 97	101 9
5,900 0	0 85	193 93	5,897 7	-41 2	93 4	113 82	102 1
6,000 0	0 88	200 98	5,997 6	-42 7	92 9	114 66	102 2
6,100 0	0 86	195 22	6,097 6	-44 1	92 4	115 51	102 4
6,136 0	0 90	211 89	6,133 6	-44 6	92 2	115 81	102 4



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Well: SRO State Unit Com #102H
Wellbore: VH - Job #32K0411317
Design: VH - Job #32K0411317

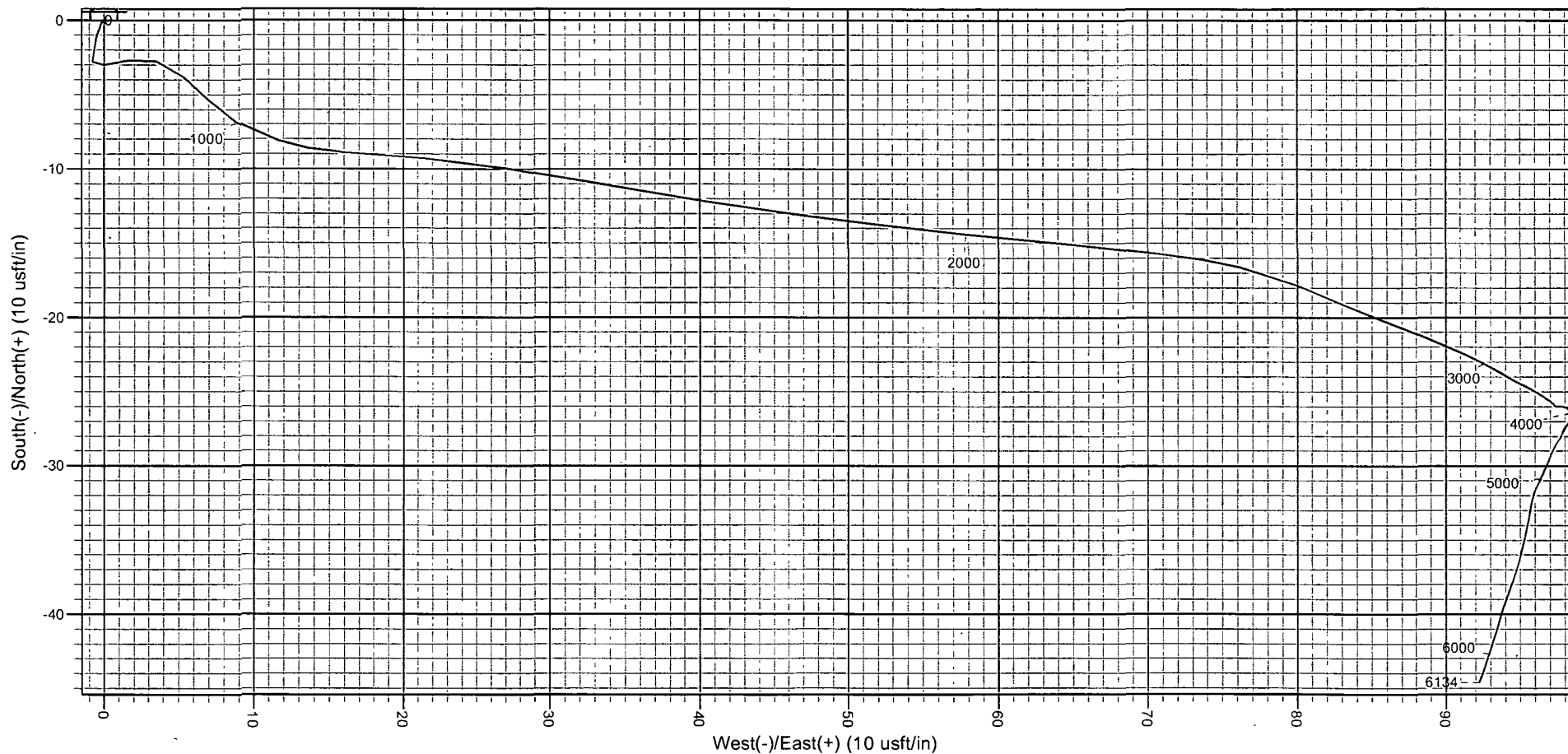


Azimuths to Grid North
True North -0 12°
Magnetic North 7 73°

Magnetic Field
Strength 48493 0snT
Dip Angle 59 93°
Date 4/6/2011
Model IGRF2010

WELL DETAILS SRO State Unit Com #102H
WELL @ 0.0usft (Original Well Elev)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0 0	0.0	381254.88	567027 29	32° 2' 52.800 N	104° 7' 1.200 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