

COG OPERATING

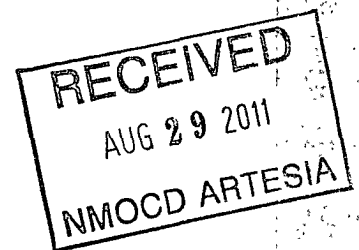
30-015-38980

Rock Spur
Eddy County, NM
Hambone Fee Com #1H
VH - Job #32K0511439

Survey: Actual

SDI Standard Survey Report

28 May, 2011



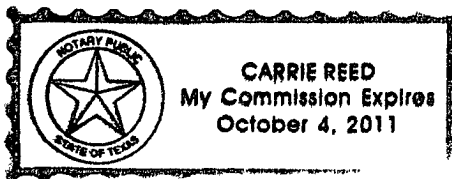
This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notarized this date 17th of June, 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 Hambone Fee Com #1H
Project:	Rock Spur	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Hambone Fee Com #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0511439	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0511439	Database:	EDM-Regulatory

Project:	Rock Spur	System Datum:	Mean Sea Level
Map System:	US State Plane 1927 (Exact solution)		
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Eddy County, NM				
Site Position:		Northing:	389,220 91 usft	Latitude:	32° 4' 10 848 N
From:	Lat/Long	Easting:	599,085 75 usft	Longitude:	104° 0' 48 438 W
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0 17 °

Well:	Hambone Fee Com #1H, Directional (Pathfinder)					
Well Position	+N/-S	0 0 usft	Northing:	390,254.95 usft	Latitude:	32° 3' 57.787 N
	+E/-W	0 0 usft	Easting:	908,885.33 usft	Longitude:	103° 0' 48.348 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	0 0 usft

Wellbore	VH - Job #32K0511439				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/11/2011	7 33	60 14	48,617

Design:	VH - Job #32K0511439				
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	89 83	

Survey Program		Date	5/28/2011		
From	To	Survey (Wellbore)		Tool Name	Description
(usft)	(usft)				
100 0	6,592 0	Actual (VH - Job #32K0511439)		Keeper	Keeper Gyro

Measured Depth	Inclination	Azimuth	True Vertical	North/South	East/West	Closure Azimuth	Closure Distance
(usft)	(°)	(°)	Depth	(usft)	(usft)	(°)	(usft)
0 0	0 00	0 00	0 0	0 0	0 0	0 00	0 0
100 0	0 89	345 37	100 0	0 8	-0 2	345 37	0 8
200 0	0 82	356 76	200 0	2 2	-0 4	348 96	2 3
300 0	1 15	0 75	300 0	3 9	-0 5	353 33	4 0
400 0	1 24	357 47	399 9	6 0	-0 5	355 30	6 0
500 0	0 94	354 32	499 9	7 9	-0 6	355 50	7 9
600 0	0 72	348 52	599 9	9 3	-0 8	354 93	9 4
700 0	0 67	340 36	699 9	10 5	-1 2	353 75	10 6
800 0	0 69	339 81	799 9	11 6	-1 6	352 38	11 7
900 0	0 36	359 17	899 9	12 5	-1 8	351 96	12 6
1,000 0	0 21	126 81	999 9	12 7	-1 6	352 71	12 8
1,100 0	0 46	198 30	1,099 9	12 2	-1 6	352 52	12 3

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Hambone Fee Com #1H
Project:	Rock Spur	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Hambone Fee Com #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0511439	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0511439	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	1 05	213.82	1,199 9	11 1	-2.2	348 57	11 3
1,300 0	1 33	206 48	1,299 9	9 3	-3 3	340 60	9 8
1,400 0	1 38	202 12	1,399 8	7 1	-4 2	329 25	8 3
1,500 0	1 30	213 10	1,499 8	5 1	-5 3	313 61	7 3
1,600 0	1 11	234 25	1,599 8	3 5	-6 7	297 82	7 6
1,700 0	1 24	244 64	1,699 8	2 5	-8 5	286 52	8 8
1,800 0	0 81	245 37	1,799 8	1 8	-10 1	279 87	10 3
1,900 0	0 59	234 59	1,899 7	1 2	-11 2	275 96	11 2
2,000 0	0 40	271 47	1,999 7	0 9	-11 9	274 20	12 0
2,100 0	2 10	92 97	2,099 7	0 8	-10 5	274 32	10 5
2,200 0	3 04	85 34	2,199 6	0 9	-6 0	278 65	6 0
2,300 0	3 03	86 81	2,299 5	1 3	-0 7	331 27	1 5
2,400 0	3 18	89 10	2,399 3	1 5	4 7	72 76	4 9
2,500 0	3 22	92 98	2,499 2	1 4	10 3	82 47	10 4
2,600 0	2 70	95 74	2,599 0	1 0	15 4	86 37	15 5
2,700 0	1 67	109 26	2,699 0	0 3	19 2	89 21	19 2
2,800 0	1 44	108 19	2,798 9	-0 6	21 7	91 61	21 7
2,900 0	1 17	107 83	2,898 9	-1 3	23 9	93 15	23 9
3,000 0	0 98	101 30	2,998 9	-1 8	25 7	93 99	25 8
3,100 0	1 01	110 20	3,098 9	-2 3	27 4	94 73	27 5
3,200 0	0 73	103 32	3,198 9	-2 7	28 8	95 39	28 9
3,300 0	0 64	92 28	3,298 9	-2 9	30 0	95 50	30 1
3,400 0	0 42	86 88	3,398 9	-2 9	30 9	95 34	31 1
3,500 0	0 35	65 86	3,498 9	-2 7	31 6	94 97	31 7
3,600 0	0 15	310 13	3,598 9	-2 5	31 7	94 57	31 8
3,700 0	0 28	296 62	3,698 9	-2 3	31 4	94 26	31 5
3,800 0	0 25	333 09	3,798 8	-2 0	31 1	93 75	31 2
3,900 0	0 37	336 73	3,898 8	-1 5	30 9	92 87	30 9
4,000 0	0 70	347 84	3,998 8	-0 7	30 6	91 22	30 6
4,100 0	0 61	343 63	4,098 8	0 5	30 3	89 14	30 4
4,200 0	0 72	344 47	4,198 8	1 6	30 0	87 00	30 1
4,300 0	0 79	352 35	4,298 8	2 9	29 8	84 51	29 9
4,400 0	0 42	338 39	4,398 8	3 9	29 5	82 51	29 8
4,500 0	0 38	317 91	4,498 8	4 5	29 2	81 29	29 5
4,600 0	0 54	301 35	4,598 8	5 0	28 6	80 14	29 0
4,700 0	0 62	304 72	4,698 8	5 5	27 7	78 74	28 3
4,800 0	0 38	319 35	4,798 8	6 1	27 1	77 34	27 7
4,900 0	0 28	283 23	4,898 8	6 4	26 6	76 51	27 4
5,000 0	0 36	245 10	4,998 8	6 3	26 1	76 40	26 8
5,100 0	0 28	243 60	5,098 8	6 1	25 6	76 66	26 3
5,200 0	0 44	281 67	5,198 8	6 0	25 0	76 42	25 7
5,300 0	0 35	258 69	5,298 8	6 1	24 3	76 01	25 0
5,400 0	0 47	266 86	5,398 8	6 0	23 6	75 80	24 3
5,500 0	0 33	244 18	5,498 8	5 8	22 9	75 75	23 7

Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Hambone Fee Com #1H
Project:	Rock Spur	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Hambone Fee Com #1H	North Reference:	Grid
Wellbore:	VH - Job #32K0511439	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0511439	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 46	216 56	5,598 8	5 4	22 4	76 52	23 1	
5,700 0	0 75	229 60	5,698 8	4 6	21 7	77 96	22 2	
5,800 0	0 57	232 19	5,798 8	3 9	20 8	79 38	21 2	
5,900 0	0 85	216 39	5,898 8	3 0	20 0	81 46	20 2	
6,000 0	0 93	228 64	5,998 8	1 9	18 9	84 37	19 0	
6,100 0	0 99	226 05	6,098 7	0 7	17 7	87 65	17 7	
6,200 0	1 03	221 09	6,198 7	-0 5	16 5	91 91	16 5	
6,300 0	1 15	212 71	6,298 7	-2 1	15 3	97 69	15 5	
6,400 0	0 93	220 37	6,398 7	-3 5	14 3	103 91	14 7	
6,500 0	1 18	225 36	6,498 7	-4 9	13 0	110 54	13 9	
6,592 0	1 45	260 31	6,590 6	-5 7	11 2	117 15	12 6	



Scientific Drilling
Directional Drilling Operations

Project: Rock Spur
Eddy County, NM
Well: Hambone Fee Com #1H
Wellbore: VH - Job #32K0511439
Design: VH - Job #32K0511439



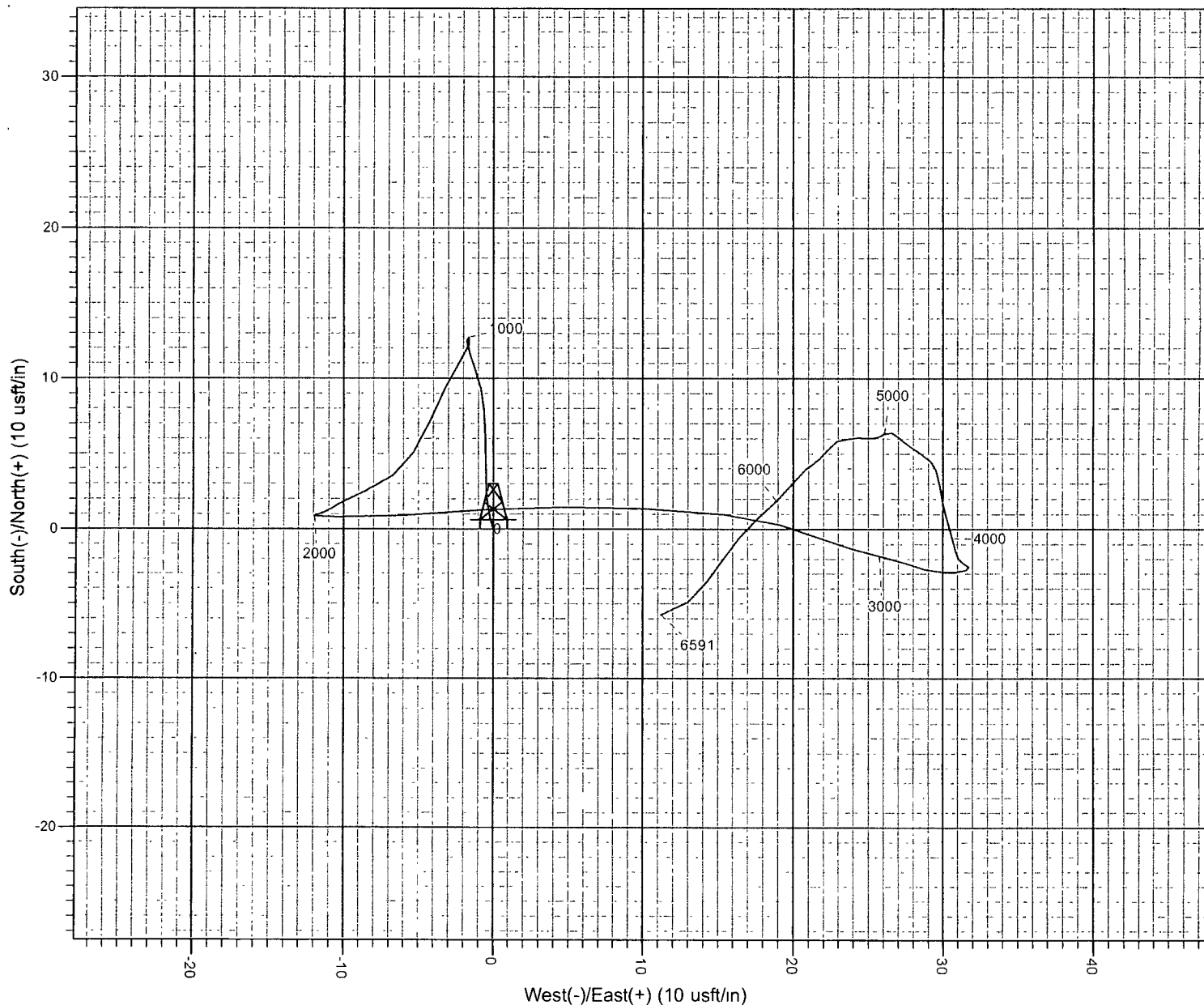
Azimuths to Grid North
True North -0 70°
Magnetic North 6 63°

Magnetic Field
Strength 48617 3snT
Dip Angle 60 14°
Date 5/11/2011
Model IGRF2010

WELL DETAILS: Hambone Fee Com #1H
WELL @ 0.0usft (Original Well Elev)

Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0 0	390254.95	908885.33	32° 3' 57.787 N	103° 0' 48.348 W	



PROJECT DETAILS: Rock Spur
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' 10.848 N
Longitude: 104° 0' 48.438 W
Positional Uncertainty: 0.0
Convergence: 0.17
Local North: Grid