

30-015-38063

COG OPERATING

Watkins

Eddy County, NM

Corsair State #3H

VH - Job #32K0311279

RECEIVED

MAY 23 2011

NMOCD ARTESIA

Survey: Actual

SDI Standard Survey Report

18 April, 2011

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

Hubert

Notarized this date 19th of April, 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 Corsair State #3H
Project:	Watkins	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Corsair State #3H	North Reference:	Grid
Wellbore:	VH - Job #32K0311279	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0311279	Database:	EDM-Regulatory

Project	Watkins		
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:	622,376 46 usft	Latitude:	32° 42' 36 000 N
From:	Lat/Long	Easting:	654,817 23 usft	Longitude:	103° 49' 48 000 W
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0 27 °

Well	Corsair State #3H, Directional (Pathfinder)					
Well Position	+N/-S	0 0 usft	Northing:	615,381 68 usft	Latitude:	32° 41' 26 822 N
	+E/-W	0 0 usft	Easting:	654,016 67 usft	Longitude:	103° 49' 57 756 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	0 0 usft

Wellbore	VH - Job #32K0311279				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/26/2011	7 77	60 58	48,917

Design		VH - Job #32K0311279		
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	267 43

Survey Program		Date	4/18/2011		
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
100 0	8,400 0	Actual (VH - Job #32K0311279)	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 35	115 52	100 0	-0 1	0 3	115 52	0 3
200 0	0 40	103 95	200 0	-0 3	0 9	111 32	1 0
300 0	0 34	114 13	300 0	-0 6	1 5	110 23	1 6
400 0	0 44	112 74	400 0	-0 8	2 1	111 16	2 3
500 0	0 33	137 12	500 0	-1 2	2 7	113 84	2 9
600 0	0 17	171 22	600 0	-1 5	2 9	118 02	3 3
700 0	0 33	201 85	700 0	-2 0	2 8	124 82	3 4
800 0	0 39	210 40	800 0	-2 5	2 5	134 83	3 6
900 0	0 34	207 52	900 0	-3 1	2 2	144 14	3 8
1,000 0	0 41	182 48	1,000 0	-3 7	2 1	150 75	4 2
1,100 0	0 42	174 68	1,100 0	-4 4	2 1	154 71	4 9

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Corsair State #3H
Project:	Watkins	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Corsair State #3H	North Reference:	Grid
Wellbore:	VH - Job #32K0311279	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0311279	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 23	171 68	1,200 0	-5 0	2 1	156 65	5 4	
1,300 0	0 17	106 79	1,300 0	-5 2	2 3	156 03	5 7	
1,400 0	0 14	102 79	1,400 0	-5 3	2 6	153 99	5 9	
1,500 0	0 26	97 12	1,500 0	-5 3	2 9	151 30	6 1	
1,600 0	0 52	119 31	1,600 0	-5 6	3 5	147 63	6 6	
1,700 0	0 59	108 47	1,700 0	-6 0	4 4	143 47	7 4	
1,800 0	0 65	103 40	1,800 0	-6 3	5 5	138 91	8 3	
1,900 0	0 70	92 40	1,900 0	-6 4	6 6	134 12	9 2	
2,000 0	1 28	82 58	1,999 9	-6 3	8 4	127 09	10 5	
2,100 0	1 46	85 24	2,099 9	-6 1	10 7	119 47	12 3	
2,200 0	1 60	83 51	2,199 9	-5 8	13 4	113 43	14 6	
2,300 0	1 88	82 65	2,299 8	-5 4	16 4	108 33	17 3	
2,400 0	1 75	84 13	2,399 8	-5 1	19 5	104 53	20 2	
2,500 0	1 27	81 48	2,499 7	-4 7	22 2	102 09	22 7	
2,600 0	1 11	80 94	2,599 7	-4 4	24 2	100 36	24 6	
2,700 0	1 14	77 48	2,699 7	-4 1	26 1	98 83	26 5	
2,800 0	1 13	77 97	2,799 7	-3 6	28 1	97 39	28 3	
2,900 0	1 09	77 51	2,899 7	-3 2	30 0	96 15	30 1	
3,000 0	1 18	74 48	2,999 6	-2 7	31 9	94 92	32 0	
3,100 0	1 22	77 08	3,099 6	-2 2	33 9	93 77	34 0	
3,200 0	1 19	77 24	3,199 6	-1 8	36 0	92 81	36 0	
3,300 0	0 81	74 33	3,299 6	-1 3	37 7	92 05	37 7	
3,400 0	0 69	76 41	3,399 6	-1 0	38 9	91 49	38 9	
3,500 0	0 42	81 01	3,499 6	-0 8	39 9	91 17	39 9	
3,600 0	0 46	86 71	3,599 6	-0 7	40 6	91 03	40 6	
3,700 0	0 45	68 34	3,699 6	-0 6	41 4	90 78	41 4	
3,800 0	0 41	72 31	3,799 6	-0 3	42 1	90 42	42 1	
3,900 0	0 49	67 97	3,899 6	0 0	42 8	90 06	42 8	
4,000 0	0 41	60 05	3,999 6	0 3	43 6	89 61	43 6	
4,100 0	0 45	53 54	4,099 6	0 7	44 2	89 08	44 2	
4,200 0	0 38	44 76	4,199 6	1 2	44 7	88 49	44 7	
4,300 0	0 33	65 88	4,299 6	1 5	45 2	88 06	45 3	
4,400 0	0 41	66 00	4,399 6	1 8	45 8	87 76	45 8	
4,500 0	0 49	52 38	4,499 5	2 2	46 5	87 29	46 5	
4,600 0	0 44	39 65	4,599 5	2 8	47 1	86 65	47 1	
4,700 0	0 38	26 62	4,699 5	3 3	47 5	85 96	47 6	
4,800 0	0 46	29 83	4,799 5	4 0	47 8	85 23	48 0	
4,900 0	0 51	337 76	4,899 5	4 8	47 8	84 33	48 1	
5,000 0	0 37	2 12	4,999 5	5 5	47 7	83 43	48 0	
5,100 0	0 63	356 85	5,099 5	6 4	47 7	82 40	48 1	
5,200 0	0 63	357 43	5,199 5	7 5	47 6	81 10	48 2	
5,300 0	0 88	2 63	5,299 5	8 8	47 6	79 56	48 4	
5,400 0	0 93	2 52	5,399 5	10 4	47 7	77 75	48 8	
5,500 0	0 95	350 55	5,499 5	12 0	47 6	75 87	49 1	

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	COG OPERATING	Local Co-ordinate Reference:	Well Corsair State #3H
Project:	Watkins	TVD Reference:	WELL @ 0 0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0 0usft (Original Well Elev)
Well:	Corsair State #3H	North Reference:	Grid
Wellbore:	VH - Job #32K0311279	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0311279	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 04	355 05	5,599 5	13 7	47 4	73 87	49 3
5,700 0	1 12	345 14	5,699 5	15 6	47 0	71 71	49 5
5,800 0	1 25	343 43	5,799 4	17 5	46 5	69 33	49 7
5,900 0	1 26	350 42	5,899 4	19 7	46 0	66 84	50 0
6,000 0	1 04	349 70	5,999 4	21 6	45 6	64 63	50 5
6,100 0	0 94	1 34	6,099 4	23 4	45 5	62 82	51 1
6,200 0	0 93	358 36	6,199 4	25 0	45 5	61 22	51 9
6,300 0	0 91	1 65	6,299 3	26 6	45 5	59 69	52 7
6,400 0	0 94	3 18	6,399 3	28 2	45 6	58 24	53 6
6,500 0	1 14	16 07	6,499 3	30 0	45 9	56 84	54 8
6,600 0	1 17	12 22	6,599 3	31 9	46 4	55 45	56 3
6,700 0	1 15	12 17	6,699 3	33 9	46 8	54 07	57 8
6,800 0	0 97	9 60	6,799 3	35 7	47 2	52 85	59 2
6,900 0	0 81	7 20	6,899 2	37 3	47 4	51 82	60 3
7,000 0	0 78	358 08	6,999 2	38 6	47 5	50 84	61 2
7,100 0	0 73	6 75	7,099 2	40 0	47 5	49 93	62 1
7,200 0	0 17	16 69	7,199 2	40 7	47 6	49 46	62 7
7,300 0	0 39	331 38	7,299 2	41 2	47 5	49 08	62 9
7,400 0	0 50	29 28	7,399 2	41 9	47 6	48 64	63 4
7,500 0	0 09	39 87	7,499 2	42 3	47 8	48 50	63 8
7,600 0	0 38	200 65	7,599 2	42 0	47 7	48 63	63 6
7,700 0	0 53	192 87	7,699 2	41 3	47 5	49 02	63 0
7,800 0	0 69	199 17	7,799 2	40 3	47 2	49 55	62 1
7,900 0	1 31	201 50	7,899 2	38 6	46 6	50 35	60 5
8,000 0	1 33	200 14	7,999 2	36 5	45 8	51 46	58 5
8,100 0	1 22	197 46	8,099 1	34 4	45 1	52 67	56 7
8,200 0	1 19	201 25	8,199 1	32 4	44 4	53 87	54 9
8,300 0	1 26	221 74	8,299 1	30 6	43 3	54 73	53 0
8,400 0	1 38	230 57	8,399 1	29 0	41 6	55 11	50 7



Scientific Drilling
Directional Drilling Operations

Project: Watkins
Eddy County, NM
Well: Corsair State #3H
Wellbore: VH - Job #32K0311279
Design: VH - Job #32K0311279

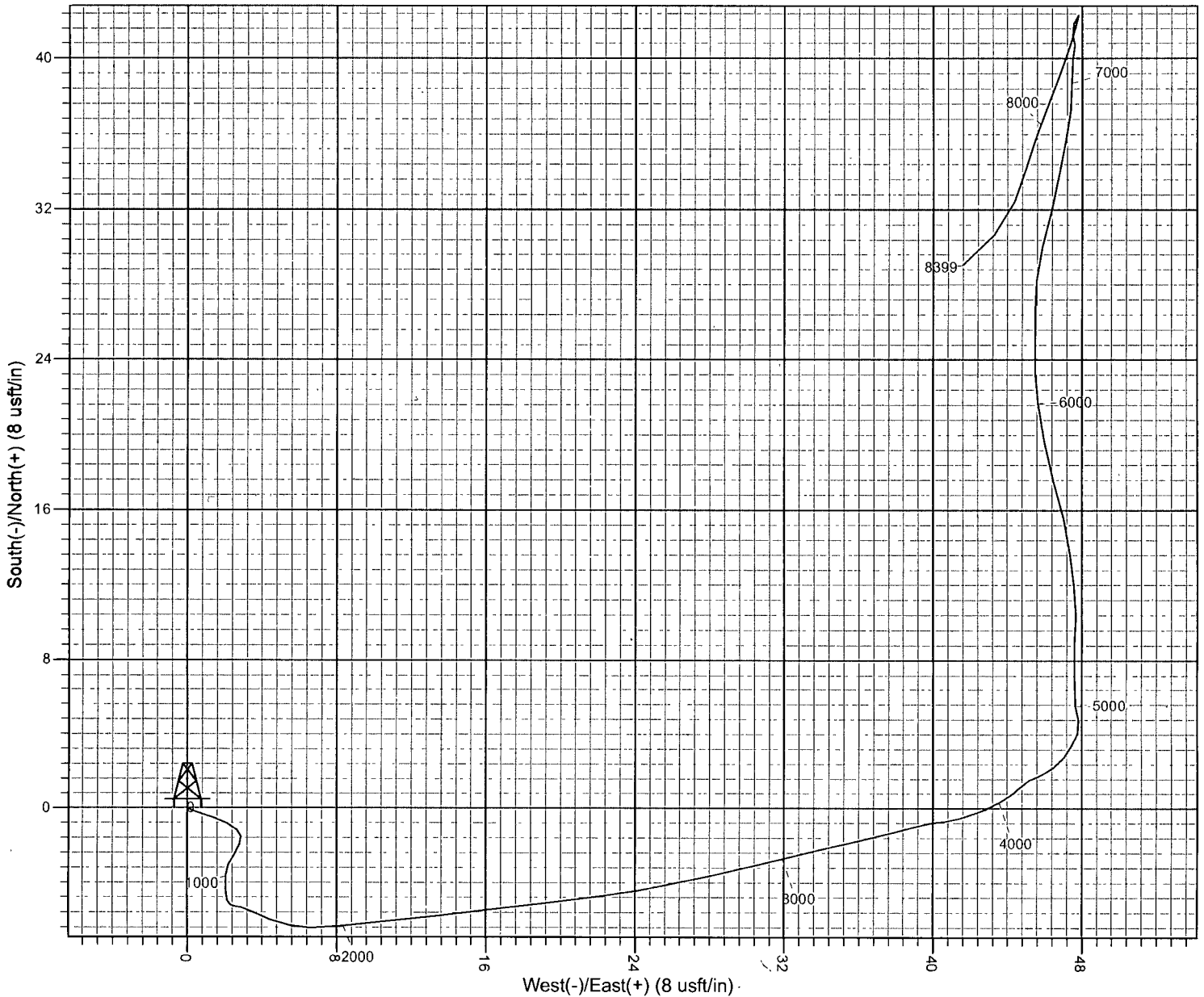


Azimuths to Grid North
True North -0 27°
Magnetic North 7 50°

Magnetic Field
Strength 48917 2snT
Dip Angle 60 58°
Date 3/26/2011
Model IGRF2010

WELL DETAILS: Corsair State #3H
WELL @ 0 0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0 0	0.0	615381.68	654016.67	32° 41' 26 822 N	103° 49' 57.756 W	



PROJECT DETAILS: Watkins
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° 42' 36.000 N
Longitude: 103° 49' 48.000 W
Positional Uncertainty: 0 0
Convergence 0 27
Local North: Grid