Results of Directional Survey

API number:	30-025-40969			
OGRID:		Operator:	COG OPERATING LLC	
		Property:	OSPREY 20 STATE COM	# 3H

surface	ULSTR:	K	20	T	21S	R	34E
				2590	FSL	1680	FWL

BH Loc	ULSTR:	K	29	T	21S	R	34E
16573	MD	10938.6	TVD	1862	FSL	1970	FWL
				3418	FNL		

Top Perf/OH	ULSTR:	K	20	T	21S	R	34E
11114	MD	11892.8	TVD	2033	FSL	1742	FWL

Bot Perf/OH	ULSTR:	K	29	T	21S	R	34E
16269	MD	10940.1	TVD	2116	FSL	1956	FWL
				3114	FNL		

	MD	N/S	E/W	VD
	11082	-526.20	62.30	10883.9
TOP PERFS/OH	**11114**	-556.90	61.80	11892.80
	11114	-556.90	61.80	11892.80
	16182	-5617.10	273.30	10939.30
BOT PERFS/OH	**16269**	-5704.01	275.96	10940.12
	16277	-5712.00	276.20	10940.20

NEXT TO LAST	16467	-5901.80	284.60	10939.70
LAST READING	16573	-6007.70	289.50	10938.60
TD	**16573**	-6007.70	289.50	10938.60

Surface Location	2590	FS	1680	FW
Projected BHL	3418	FN	1970	FW
Location of				
Top Perfs/OH	2033	FS	1742	FW
Bottom Perfs/OH	3114	FN	1956	FW

SUMMARY of Subsurface Locations

Surface Location	K-20-21S-34E	2590	FS	1680	FW	Vert. Depth
Top Perfs/OH	K-20-21S-34E	2033	FS	1742	FW	11892.80
Bottom Perfs/OH	K-29-21S-34E	3114	FN	1956	FW	10940.12
Projected TD	K-29-21S-34E	3418	FN	1970	FW	10938.60

VES
VAUGHN ENERGY SERVICES
A GYRO TECHNOLOGIES INC. COMPANY

PO Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

July 29, 2013

COG Operating LLC (Concho)
One Concho Center
600 W. Illinois Avenue
Midland, TX 79701

Attn: Kanicia Castillo

Re: **Osprey 20 State Com No 003H**

Please find enclosed a copy of the survey from 0' to 12,175' ran on the above referenced well.

If I can be of any further service, please do not hesitate to call me at 800-606-4976.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
§
COUNTY OF NUECES §

This instrument was acknowledged before me on the 29th day of July, A.D., 2013, by Keith Havelka.

Laura Ballew
Notary Public, State of Texas

LAURA BALLEW
Notary Public, State of Texas
My Commission Expires
January 28, 2014

Company: COG Operating-Concho
Lease/Well: Osprey 20 State Com/No 003H
Location: Sec 20 T21S R34E
Rig Name: Precision 105
State/County: New Mexico/Lea
Latitude: 32.46, Longitude: -103.49
GRID North is 0.45 Degrees East of True North
VS-Azi: 177.24 Degrees

Depth Reference : RKB 26 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: osprey 20 state com #3h-de_01.ut
Minimum Curvature Method
Report Date/Time: 7/29/2013 / 09:33

Vaughn Energy Services
West Texas
Surveyor: Chris Bankson
432-563-5444
Osprey 20 State Com No 003H / API 30-025-40969

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.81	128.58	100.00	-0.44	0.55	0.47	0.71	128.58	0.81
200.00	0.92	132.96	199.99	-1.43	1.69	1.51	2.22	130.16	0.13
300.00	0.94	137.14	299.97	-2.58	2.84	2.71	3.83	132.24	0.07
400.00	0.84	151.71	399.96	-3.83	3.75	4.00	5.35	135.62	0.25
500.00	0.77	169.46	499.95	-5.13	4.22	5.33	6.64	140.59	0.26
600.00	1.00	170.84	599.94	-6.65	4.48	6.85	8.01	146.04	0.23
700.00	0.79	176.03	699.93	-8.19	4.66	8.41	9.43	150.35	0.22
800.00	0.69	171.72	799.92	-9.48	4.80	9.70	10.62	153.15	0.11
900.00	0.73	166.63	899.91	-10.70	5.03	10.92	11.82	154.80	0.07
1000.00	0.83	169.42	999.90	-12.02	5.31	12.27	13.14	156.17	0.10
1100.00	0.79	166.64	1099.89	-13.40	5.60	13.65	14.52	157.31	0.06
1200.00	1.09	166.18	1199.88	-14.99	5.99	15.26	16.14	158.22	0.31
1300.00	1.05	169.78	1299.86	-16.82	6.38	17.10	17.98	159.23	0.08
1400.00	1.25	176.20	1399.84	-18.80	6.61	19.10	19.93	160.62	0.24
1500.00	1.28	191.88	1499.82	-20.98	6.45	21.27	21.95	162.90	0.35
1600.00	1.39	197.95	1599.79	-23.23	5.85	23.48	23.95	165.86	0.18
1700.00	0.87	196.26	1699.77	-25.11	5.26	25.33	25.66	168.16	0.51
1800.00	0.56	180.12	1799.76	-26.33	5.05	26.55	26.81	169.14	0.37

VES Survey Date: 07/23/2013

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.26	175.18	1899.76	-27.05	5.07	27.27	27.52	169.39	0.30
2000.00	0.38	144.51	1999.76	-27.55	5.28	27.78	28.05	169.15	0.21
2100.00	0.34	129.05	2099.76	-28.01	5.71	28.26	28.59	168.49	0.11
2200.00	0.45	101.82	2199.75	-28.28	6.33	28.55	28.98	167.39	0.22
2300.00	0.40	91.82	2299.75	-28.37	7.07	28.68	29.24	166.02	0.09
2400.00	0.36	90.18	2399.75	-28.39	7.73	28.73	29.42	164.76	0.04
2500.00	0.10	84.55	2499.75	-28.38	8.14	28.74	29.52	164.00	0.26
2600.00	0.17	80.53	2599.75	-28.35	8.37	28.72	29.56	163.54	0.07
2700.00	0.27	82.65	2699.75	-28.29	8.75	28.68	29.61	162.82	0.10
2800.00	0.41	91.59	2799.74	-28.27	9.34	28.69	29.78	161.72	0.16
2900.00	0.65	80.70	2899.74	-28.19	10.26	28.65	30.00	160.00	0.26
3000.00	0.91	72.10	2999.73	-27.86	11.57	28.38	30.16	157.44	0.28
3100.00	1.08	61.27	3099.72	-27.16	13.15	27.76	30.18	154.16	0.25
3200.00	1.37	59.71	3199.69	-26.10	15.01	26.80	30.11	150.09	0.30
3300.00	1.36	55.74	3299.66	-24.83	17.03	25.62	30.11	145.56	0.10
3400.00	1.36	55.31	3399.64	-23.49	18.99	24.37	30.20	141.05	0.01
3500.00	0.73	59.32	3499.62	-22.48	20.51	23.45	30.44	137.63	0.64
3600.00	0.74	62.76	3599.61	-21.86	21.64	22.88	30.76	135.30	0.05
3700.00	0.55	66.17	3699.60	-21.37	22.66	22.44	31.14	133.33	0.20
3800.00	0.56	73.81	3799.60	-21.04	23.57	22.15	31.59	131.75	0.08
3900.00	0.38	84.30	3899.60	-20.87	24.37	22.02	32.08	130.57	0.20
4000.00	0.20	73.28	3999.59	-20.79	24.86	21.96	32.41	129.90	0.19
4100.00	0.05	70.14	4099.59	-20.72	25.07	21.90	32.53	129.57	0.14
4200.00	0.08	67.20	4199.59	-20.68	25.18	21.87	32.58	129.40	0.02
4300.00	0.18	67.32	4299.59	-20.59	25.38	21.79	32.68	129.06	0.10
4400.00	0.39	64.77	4399.59	-20.39	25.83	21.61	32.91	128.28	0.21
4500.00	0.34	54.32	4499.59	-20.07	26.38	21.32	33.15	127.26	0.09
4600.00	0.80	68.04	4599.59	-19.64	27.26	20.93	33.60	125.77	0.48
4700.00	0.89	79.28	4699.57	-19.24	28.67	20.59	34.53	123.85	0.19
4800.00	0.33	119.99	4799.57	-19.24	29.69	20.64	35.38	122.94	0.68
4900.00	0.58	130.23	4899.57	-19.71	30.33	21.15	36.17	123.02	0.26
5000.00	0.15	133.80	4999.56	-20.13	30.81	21.59	36.80	123.15	0.43
5100.00	0.02	134.89	5099.56	-20.23	30.92	21.70	36.95	123.20	0.13
5200.00	0.27	140.86	5199.56	-20.43	31.09	21.90	37.20	123.32	0.25
5300.00	0.12	145.03	5299.56	-20.70	31.29	22.18	37.52	123.48	0.16
5400.00	0.17	155.45	5399.56	-20.92	31.41	22.40	37.74	123.66	0.06
5500.00	0.27	176.97	5499.56	-21.29	31.49	22.78	38.01	124.06	0.13
5600.00	0.34	205.93	5599.56	-21.79	31.37	23.28	38.20	124.78	0.17
5700.00	0.33	216.31	5699.56	-22.29	31.07	23.76	38.24	125.65	0.06

VES Survey Date: 07/23/2013

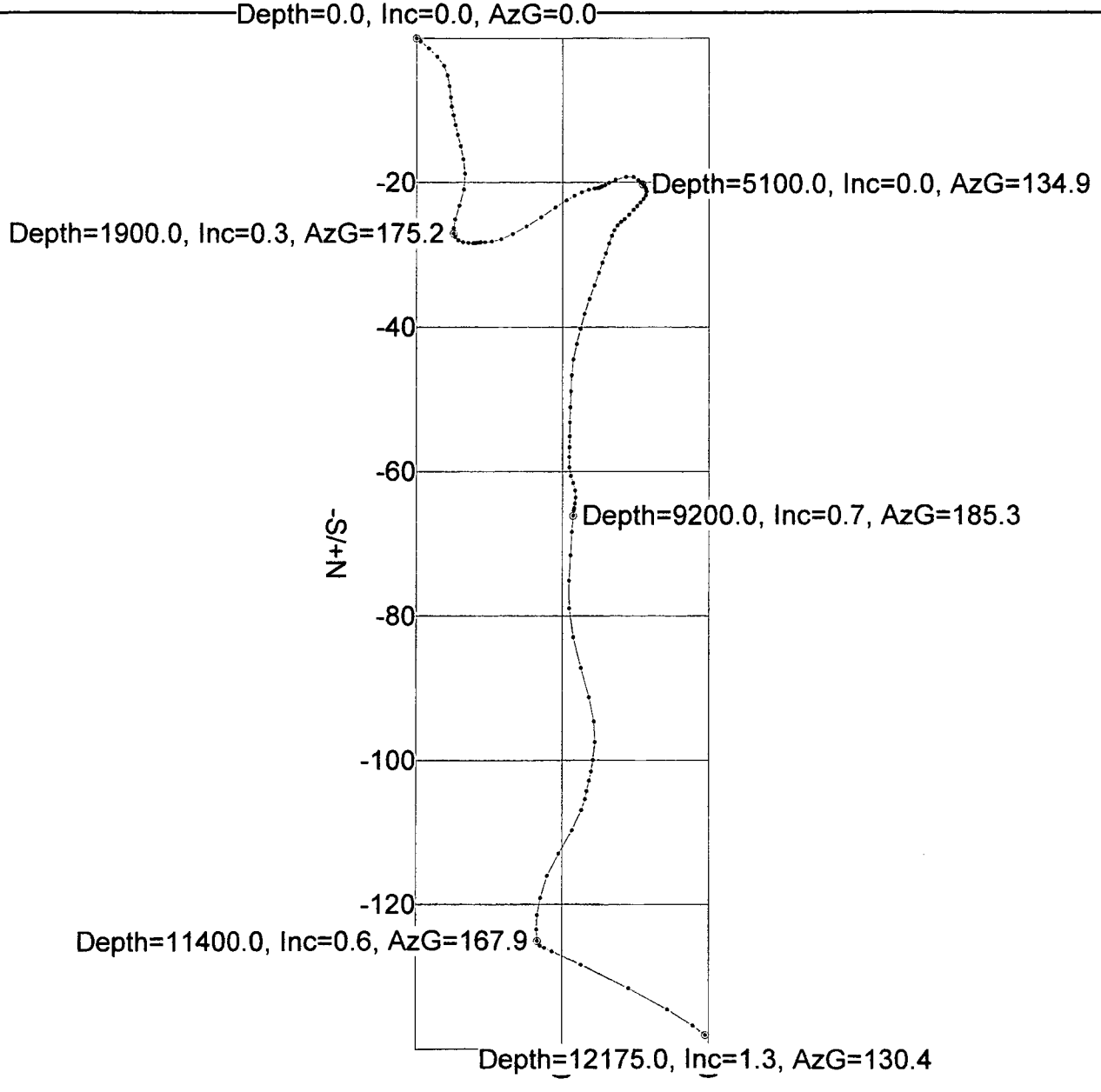
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.39	223.89	5799.56	-22.76	30.67	24.21	38.19	126.59	0.08
5900.00	0.41	222.90	5899.55	-23.27	30.18	24.70	38.11	127.64	0.02
6000.00	0.42	222.83	5999.55	-23.81	29.68	25.21	38.05	128.73	0.01
6100.00	0.58	221.27	6099.55	-24.46	29.10	25.83	38.01	130.05	0.15
6200.00	0.42	230.69	6199.54	-25.07	28.48	26.41	37.95	131.36	0.17
6300.00	0.30	226.99	6299.54	-25.48	28.01	26.80	37.87	132.30	0.12
6400.00	0.46	222.34	6399.54	-25.96	27.55	27.25	37.85	133.30	0.16
6500.00	0.49	201.22	6499.54	-26.65	27.12	27.92	38.02	134.49	0.18
6600.00	0.47	207.12	6599.53	-27.41	26.78	28.67	38.32	135.66	0.05
6700.00	0.81	196.89	6699.53	-28.46	26.39	29.69	38.81	137.16	0.36
6800.00	0.85	198.88	6799.52	-29.83	25.94	31.05	39.54	138.99	0.05
6900.00	0.72	201.33	6899.51	-31.12	25.48	32.31	40.22	140.70	0.14
7000.00	0.96	198.99	6999.50	-32.50	24.97	33.66	40.99	142.46	0.25
7100.00	1.14	198.38	7099.48	-34.24	24.38	35.38	42.04	144.54	0.18
7200.00	1.16	201.59	7199.46	-36.13	23.70	37.23	43.21	146.73	0.07
7300.00	1.29	195.60	7299.44	-38.15	23.02	39.22	44.56	148.89	0.19
7400.00	1.20	193.34	7399.41	-40.26	22.48	41.30	46.11	150.82	0.11
7500.00	1.24	194.22	7499.39	-42.33	21.97	43.34	47.69	152.57	0.04
7600.00	1.27	189.68	7599.36	-44.47	21.52	45.46	49.40	154.18	0.10
7700.00	1.25	182.82	7699.34	-46.66	21.28	47.63	51.28	155.48	0.15
7800.00	1.27	183.02	7799.32	-48.86	21.17	49.82	53.25	156.58	0.02
7900.00	1.26	181.49	7899.29	-51.07	21.08	52.02	55.25	157.57	0.04
8000.00	1.16	181.06	7999.27	-53.18	21.03	54.13	57.19	158.42	0.10
8100.00	1.02	180.50	8099.25	-55.08	21.01	56.03	58.95	159.13	0.15
8200.00	0.72	181.69	8199.24	-56.60	20.98	57.54	60.36	159.66	0.30
8300.00	0.84	182.21	8299.23	-57.96	20.93	58.90	61.62	160.14	0.13
8400.00	0.81	176.96	8399.22	-59.40	20.94	60.34	62.98	160.58	0.08
8500.00	0.59	162.05	8499.21	-60.59	21.14	61.53	64.17	160.77	0.28
8600.00	0.62	159.39	8599.21	-61.58	21.48	62.54	65.22	160.77	0.04
8700.00	0.63	170.65	8699.20	-62.63	21.76	63.60	66.30	160.84	0.12
8800.00	0.51	185.66	8799.20	-63.61	21.81	64.59	67.25	161.08	0.19
8900.00	0.43	186.25	8899.19	-64.43	21.72	65.40	67.99	161.37	0.08
9000.00	0.33	193.61	8999.19	-65.08	21.62	66.04	68.57	161.62	0.11
9100.00	0.06	189.89	9099.19	-65.41	21.54	66.37	68.87	161.77	0.26
9200.00	0.71	185.27	9199.19	-66.08	21.47	67.04	69.48	162.00	0.65
9300.00	1.90	183.67	9299.16	-68.35	21.31	69.30	71.59	162.68	1.19
9400.00	1.85	183.09	9399.11	-71.61	21.12	72.55	74.66	163.57	0.05
9500.00	2.14	184.04	9499.05	-75.09	20.90	76.01	77.95	164.45	0.29
9600.00	2.25	174.85	9598.97	-78.92	20.94	79.83	81.65	165.14	0.37

VES Survey Date: 07/23/2013

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
9700.00	2.37	168.53	9698.89	-82.90	21.53	83.84	85.65	165.44	0.28
9800.00	2.67	164.24	9798.79	-87.17	22.57	88.16	90.05	165.48	0.36
9900.00	2.17	165.77	9898.70	-91.25	23.67	92.28	94.27	165.46	0.51
10000.00	1.75	172.04	9998.65	-94.59	24.35	95.66	97.68	165.56	0.47
10100.00	1.60	182.42	10098.60	-97.49	24.50	98.56	100.53	165.89	0.34
10200.00	1.27	190.89	10198.57	-99.97	24.23	101.02	102.87	166.37	0.39
10300.00	0.58	186.43	10298.56	-101.56	23.97	102.60	104.35	166.72	0.69
10400.00	0.93	194.39	10398.55	-102.85	23.71	103.87	105.54	167.02	0.36
10500.00	0.81	190.74	10498.54	-104.32	23.38	105.32	106.91	167.37	0.13
10600.00	0.47	191.01	10598.53	-105.41	23.17	106.40	107.93	167.60	0.34
10700.00	1.36	201.33	10698.52	-106.91	22.66	107.88	109.29	168.03	0.90
10800.00	2.20	206.65	10798.47	-109.73	21.37	110.63	111.79	168.98	0.85
10900.00	2.08	213.28	10898.40	-112.96	19.52	113.76	114.63	170.20	0.27
11000.00	1.89	200.84	10998.34	-116.01	17.94	116.74	117.39	171.21	0.47
11100.00	1.79	192.06	11098.29	-119.07	17.02	119.76	120.29	171.86	0.30
11200.00	1.01	188.29	11198.26	-121.47	16.57	122.13	122.60	172.23	0.78
11300.00	1.25	179.44	11298.24	-123.44	16.45	124.08	124.53	172.41	0.29
11400.00	0.63	167.89	11398.23	-125.06	16.58	125.72	126.16	172.45	0.64
11500.00	0.37	117.79	11498.22	-125.75	16.98	126.42	126.89	172.31	0.49
11600.00	0.36	114.72	11598.22	-126.03	17.55	126.73	127.25	172.07	0.02
11700.00	0.95	114.27	11698.21	-126.50	18.59	127.25	127.86	171.64	0.59
11800.00	4.14	114.70	11798.10	-128.35	22.62	129.29	130.33	170.00	3.19
11900.00	4.17	118.74	11897.84	-131.61	29.09	132.86	134.78	167.54	0.29
12000.00	2.81	120.27	11997.65	-134.59	34.39	136.09	138.91	165.67	1.36
12100.00	1.92	125.58	12097.57	-136.80	37.87	138.46	141.94	164.53	0.91
12175.00	1.35	130.39	12172.54	-138.10	39.56	139.84	143.65	164.02	0.78

VES Survey Date: 07/23/2013

Vaughn Energy Services
West Texas
Surveyor: Chris Bankson
432-563-5444
Osprey 20 State Com No 003H / API 30-025-40969



VES Survey Date: 07/23/2013

CONCHO

COG Operating, LLC

Lea County, NM
Sec 20, T21S, R34E
Osprey 20 State Com #3H

Wellbore #1

Survey: MWD

DDC Survey Report

15 August, 2013

DDC
The DIRECTIONAL DRILLING COMPANY

The DIRECTIONAL DRILLING COMPANY

Survey Certification Sheet

COG Operating, LLC	WT-13557	8/16/13
Company	Job Number	Date

Sec20, T21S, R34E	Osprey 20 State Com #3H	Lea, NM
Lease	Well Name	County & State

API: 30-025-40969

Surveyed from a depth of: 10300 feet to 16573 feet MD

Type of Survey: MWD

Directional Supervisor/Surveyor: Jay Schriewer

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The Directional Drilling Company, ou=GM of Guidance Services, email=larryw@directionaldrillers.com, c=US
Date: 2013.08.22 10:24:12 -05'00'

Larry Wright
MWD General Manager

• 11390 FM 830 • Willis, Texas 77318 •
• PH 936-856-4332 • FAX 936-856-8678 •

Company:	COG Operating, LLC	**Local Co-ordinate Reference:**	Well Osprey 20 State Com #3H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3741.0usft (Precision #105)
Site:	Sec 20, T21S, R34E	**MD Reference:**	WELL @ 3741.0usft (Precision #105)
Well:	Osprey 20 State Com #3H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

Project Lea County, NM

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 Sec 20, T21S, R34E

Site Position:		**Northing:**	533,555.40 usft	**Latitude:**	32° 27' 50.624 N
From:	Map	**Easting:**	758,676.40 usft	**Longitude:**	103° 29' 40.705 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.45 °

Well Osprey 20 State Com #3H

Well Position	**+N/-S**	0.0 usft	**Northing:**	533,555.40 usft	**Latitude:**	32° 27' 50.623 N
	+E/-W	0.0 usft	**Easting:**	758,676.40 usft	**Longitude:**	103° 29' 40.705 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,714.9 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/10/2013	7.31	60.37	48,560

Design Wellbore #1

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	177.24

Survey Program **Date** 8/15/2013

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	10,300.0	Gyro (Wellbore #1)	Good_gyro	Good Gyro
10,387.0	16,573.0	MWD (Wellbore #1)		

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Tie In @ 10300' MD / 10299' TVD									
10,300.0	0.58	186.43	10,298.6	-101.5	23.9	102.6	0.00	0.00	0.00
10,387.0	5.80	141.70	10,385.4	-105.4	26.6	106.6	6.21	6.00	-51.41
10,419.0	10.60	142.40	10,417.1	-109.0	29.4	110.3	15.00	15.00	2.19
10,450.0	15.00	147.60	10,447.3	-114.7	33.3	116.2	14.66	14.19	16.77
10,482.0	17.70	153.10	10,478.0	-122.5	37.7	124.2	9.72	8.44	17.19
10,514.0	19.60	161.30	10,508.3	-131.9	41.7	133.8	10.11	5.94	25.63
10,545.0	21.60	166.70	10,537.3	-142.4	44.6	144.4	8.89	6.45	17.42
10,577.0	24.50	169.90	10,566.8	-154.7	47.2	156.8	9.87	9.06	10.00
10,608.0	28.00	173.30	10,594.6	-168.3	49.1	170.4	12.28	11.29	10.97

Company:	COG Operating, LLC	**Local Co-ordinate Reference:**	Well Osprey 20 State Com #3H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3741.0usft (Precision #105)
Site:	Sec 20, T21S, R34E	**MD Reference:**	WELL @ 3741.0usft (Precision #105)
Well:	Osprey 20 State Com #3H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,640.0	31.00	175.50	10,622.4	-183.9	50.7	186.2	9.97	9.38	6.88
10,672.0	32.70	176.00	10,649.6	-200.8	51.9	203.0	5.38	5.31	1.56
10,703.0	35.20	175.70	10,675.3	-218.0	53.2	220.3	8.08	8.06	-0.97
10,735.0	38.20	175.40	10,701.0	-237.1	54.6	239.5	9.39	9.38	-0.94
10,767.0	44.20	176.00	10,725.0	-258.1	56.2	260.5	18.79	18.75	1.88
10,798.0	49.00	179.70	10,746.3	-280.6	57.0	283.0	17.74	15.48	11.94
10,830.0	51.40	181.40	10,766.8	-305.2	56.8	307.6	8.54	7.50	5.31
10,862.0	52.10	181.00	10,786.6	-330.3	56.3	332.6	2.40	2.19	-1.25
10,893.0	55.30	180.20	10,805.0	-355.3	56.0	357.6	10.53	10.32	-2.58
10,925.0	59.80	177.50	10,822.1	-382.3	56.6	384.6	15.76	14.06	-8.44
10,957.0	63.70	176.50	10,837.3	-410.4	58.0	412.7	12.49	12.19	-3.13
10,988.0	66.00	176.60	10,850.5	-438.4	59.7	440.8	7.43	7.42	0.32
11,019.0	67.60	177.20	10,862.7	-466.9	61.3	469.3	5.46	5.16	1.94
11,050.0	70.40	178.90	10,873.8	-495.8	62.3	498.2	10.38	9.03	5.48
11,082.0	72.80	181.10	10,883.9	-526.2	62.3	528.5	9.94	7.50	6.88
11,114.0	74.90	180.60	10,892.8	-556.9	61.8	559.2	6.73	6.56	-1.56
11,145.0	77.70	179.80	10,900.1	-587.0	61.7	589.3	9.37	9.03	-2.58
11,177.0	80.40	179.60	10,906.2	-618.4	61.9	620.7	8.46	8.44	-0.63
11,208.0	80.70	180.20	10,911.3	-649.0	61.9	651.2	2.14	0.97	1.94
11,277.0	85.10	179.20	10,919.8	-717.5	62.3	719.6	6.54	6.38	-1.45
11,308.0	85.10	178.30	10,922.5	-748.3	62.9	750.5	2.89	0.00	-2.90
11,403.0	89.10	178.70	10,927.3	-843.2	65.4	845.3	4.23	4.21	0.42
11,498.0	90.00	177.20	10,928.0	-938.1	68.8	940.3	1.84	0.95	-1.58
11,593.0	90.30	176.80	10,927.8	-1,033.0	73.8	1,035.3	0.53	0.32	-0.42
11,688.0	90.60	176.10	10,927.0	-1,127.8	79.7	1,130.3	0.80	0.32	-0.74
11,783.0	89.90	176.90	10,926.6	-1,222.6	85.5	1,225.3	1.12	-0.74	0.84
11,878.0	90.30	176.40	10,926.4	-1,317.4	91.0	1,320.3	0.67	0.42	-0.53
11,973.0	90.40	178.50	10,925.9	-1,412.3	95.3	1,415.3	2.21	0.11	2.21
12,068.0	90.90	178.80	10,924.8	-1,507.3	97.5	1,510.2	0.61	0.53	0.32
12,164.0	89.40	178.30	10,924.5	-1,603.3	99.9	1,606.2	1.65	-1.56	-0.52
12,259.0	89.50	178.00	10,925.5	-1,698.2	103.0	1,701.2	0.33	0.11	-0.32
12,353.0	90.50	177.50	10,925.5	-1,792.1	106.7	1,795.2	1.19	1.06	-0.53
12,448.0	88.50	178.30	10,926.3	-1,887.1	110.2	1,890.2	2.27	-2.11	0.84
12,543.0	88.80	178.00	10,928.5	-1,982.0	113.2	1,985.1	0.45	0.32	-0.32
12,638.0	89.10	177.50	10,930.3	-2,076.9	117.0	2,080.1	0.61	0.32	-0.53
12,733.0	89.40	176.80	10,931.5	-2,171.8	121.7	2,175.1	0.80	0.32	-0.74
12,828.0	89.10	177.00	10,932.7	-2,266.6	126.8	2,270.1	0.38	-0.32	0.21
12,923.0	89.60	176.70	10,933.8	-2,361.5	132.0	2,365.1	0.61	0.53	-0.32
13,018.0	89.90	177.90	10,934.2	-2,456.4	136.5	2,460.1	1.30	0.32	1.26
13,113.0	90.50	178.00	10,933.9	-2,551.3	139.9	2,555.1	0.64	0.63	0.11
13,208.0	91.10	177.20	10,932.6	-2,646.2	143.9	2,650.1	1.05	0.63	-0.84
13,303.0	90.30	177.60	10,931.4	-2,741.1	148.2	2,745.1	0.94	-0.84	0.42
13,399.0	90.00	177.20	10,931.2	-2,837.0	152.6	2,841.1	0.52	-0.31	-0.42

Company:	COG Operating, LLC	**Local Co-ordinate Reference:**	Well Osprey 20 State Com #3H
Project:	Lea County, NM	**TVD Reference:**	WELL @ 3741.0usft (Precision #105)
Site:	Sec 20, T21S, R34E	**MD Reference:**	WELL @ 3741.0usft (Precision #105)
Well:	Osprey 20 State Com #3H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,494.0	89.40	176.70	10,931.7	-2,931.9	157.6	2,936.1	0.82	-0.63	-0.53
13,589.0	89.80	176.80	10,932.3	-3,026.7	163.0	3,031.1	0.43	0.42	0.11
13,684.0	89.50	176.10	10,932.9	-3,121.5	168.9	3,126.0	0.80	-0.32	-0.74
13,778.0	90.20	177.90	10,933.2	-3,215.4	173.8	3,220.0	2.05	0.74	1.91
13,874.0	90.70	177.50	10,932.4	-3,311.3	177.6	3,316.0	0.67	0.52	-0.42
13,969.0	90.90	177.70	10,931.1	-3,406.2	181.6	3,411.0	0.30	0.21	0.21
14,064.0	90.30	178.00	10,930.1	-3,501.1	185.2	3,506.0	0.71	-0.63	0.32
14,159.0	90.10	176.90	10,929.7	-3,596.1	189.4	3,601.0	1.18	-0.21	-1.16
14,254.0	89.00	177.40	10,930.5	-3,690.9	194.1	3,696.0	1.27	-1.16	0.53
14,349.0	89.20	177.50	10,932.0	-3,785.8	198.4	3,791.0	0.24	0.21	0.11
14,444.0	90.00	177.20	10,932.7	-3,880.7	202.8	3,886.0	0.90	0.84	-0.32
14,566.0	90.20	178.00	10,932.4	-4,002.6	207.9	4,008.0	0.68	0.16	0.66
14,661.0	89.40	177.40	10,932.8	-4,097.5	211.7	4,103.0	1.05	-0.84	-0.63
14,755.0	88.90	177.30	10,934.2	-4,191.4	216.0	4,197.0	0.54	-0.53	-0.11
14,850.0	88.50	177.20	10,936.3	-4,286.3	220.6	4,291.9	0.43	-0.42	-0.11
14,945.0	89.90	178.00	10,937.6	-4,381.2	224.6	4,386.9	1.70	1.47	0.84
15,040.0	89.90	178.30	10,937.8	-4,476.1	227.6	4,481.9	0.32	0.00	0.32
15,135.0	89.40	178.00	10,938.4	-4,571.1	230.7	4,576.9	0.61	-0.53	-0.32
15,230.0	89.30	178.30	10,939.5	-4,666.0	233.8	4,671.9	0.33	-0.11	0.32
15,325.0	89.90	177.60	10,940.1	-4,761.0	237.2	4,766.9	0.97	0.63	-0.74
15,420.0	90.70	177.60	10,939.6	-4,855.9	241.1	4,861.9	0.84	0.84	0.00
15,516.0	90.70	177.30	10,938.5	-4,951.8	245.4	4,957.9	0.31	0.00	-0.31
15,611.0	90.60	177.30	10,937.4	-5,046.7	249.9	5,052.8	0.11	-0.11	0.00
15,706.0	90.40	176.80	10,936.6	-5,141.5	254.8	5,147.8	0.57	-0.21	-0.53
15,801.0	90.70	176.90	10,935.6	-5,236.4	260.0	5,242.8	0.33	0.32	0.11
15,896.0	90.70	177.70	10,934.5	-5,331.3	264.5	5,337.8	0.84	0.00	0.84
15,991.0	88.80	178.30	10,934.9	-5,426.2	267.8	5,432.8	2.10	-2.00	0.63
16,087.0	88.50	178.20	10,937.2	-5,522.1	270.7	5,528.8	0.33	-0.31	-0.10
16,182.0	88.90	178.70	10,939.3	-5,617.1	273.3	5,623.7	0.67	0.42	0.53
16,277.0	90.00	177.80	10,940.2	-5,712.0	276.2	5,718.7	1.50	1.16	-0.95
16,372.0	90.00	177.40	10,940.2	-5,807.0	280.2	5,813.7	0.42	0.00	-0.42
16,467.0	90.60	177.30	10,939.7	-5,901.8	284.6	5,908.7	0.64	0.63	-0.11
TD @ 16573' MD / 10938.6' TVD									
16,573.0	90.60	177.30	10,938.6	-6,007.7	289.5	6,014.7	0.00	0.00	0.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,300.0	10,298.6	-101.5	23.9	Tie In @ 10300' MD / 10299' TVD
16,573.0	10,938.6	-6,007.7	289.5	TD @ 16573' MD / 10938.6' TVD

Checked By: _____ Approved By: _____ Date: _____