Results of Directional Survey

API number:	30-025-40684			
OGRID:		Operator:	COG PRODUCTION, LLC	
		Property:	PINTAIL 3 FEDERAL	# 1H

surface	ULSTR:	O	03	T	26S	R	32E
				260	FSL	2290	FEL

BH Loc	ULSTR:	B	03	T	26S	R	32E
14007	MD	9520.3	TVD	266	FNL	2308	FEL
				5014	FSL		

Top Perf/OH	ULSTR:	O	03	T	26S	R	32E
9817	MD	9522.0	TVD	829	FSL	2231	FEL

Bot Perf/OH	ULSTR:	B	03	T	26S	R	32E
13872	MD	9519.7	TVD	401	FNL	2298	FEL
				4879	FSL		

	MD	N/S	E/W	VD
	9786	539.90	57.40	9512.2
TOP PERFS/OH	**9817**	569.20	59.00	9522.00
	9817	569.20	59.00	9522.00
	13786	4533.30	-3.10	9520.50
BOT PERFS/OH	**13872**	4619.12	-8.17	9519.69
	13881	4628.10	-8.70	9519.60

NEXT TO LAST	13962	4708.90	-14.40	9519.80
LAST READING	14007	4753.80	-17.90	9520.30
TD	**14007**	4753.80	-17.90	9520.30

Surface Location	260	FS	2290	FE
Projected BHL	5014	FS	2308	FE
Location of				
Top Perfs/OH	829	FS	2231	FE
Bottom Perfs/OH	4879	FS	2298	FE

SUMMARY of Subsurface Locations

Surface Location	O-03-26S-32E	260	FS	2290	FE	Vert. Depth
Top Perfs/OH	O-03-26S-32E	829	FS	2231	FE	9522.00
Bottom Perfs/OH	B-03-26S-32E	4879	FS	2298	FE	9519.69
Projected TD	B-03-26S-32E	5014	FS	2308	FE	9520.30

APR 10 2013

PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

COG OPERATING, LLC
RECEIVED
OCT 15 2012
ARTESIA WEST

October 4, 2012

COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

RE: Pin Tail 3 Federal #1H
260' FSL & 2290' FEL
Sec. 3, T26S, R32E
Lea County, New Mexico

Dear Sir,

The attached is the Deviation Survey for the above captioned well.

HOBBS OCD
JAN 29 2013
RECEIVED

Very truly yours,

Eddie LaRue
Operations Manager

SUR: O-03-26s-32e, 260/S & 2290/E
BHL: B-03-26s-32e, 5014/S & 2308/E
API # 30-025-40684

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 4th day of October, 2012.

Notary Public

OFFICIAL SEAL
REGINIA L. GARNER
NOTARY PUBLIC - STATE OF NEW MEXICO
My commission expires Aug. 30, 2016

Pason DataHub Deviation Survey
Well Dossier 1346685981 - PINTAIL 3 FEDERAL 1H

# Date	Depth	Deviation	Direction	TVD	Horiz
9/4/2012	268	0.70	0.00	0.00	0.00
9/4/2012	408	2.20	0.00	0.00	0.00
9/4/2012	502	5.00	0.00	0.00	0.00
9/4/2012	606	6.20	0.00	0.00	0.00
9/4/2012	637	6.20	0.00	0.00	0.00
9/5/2012	971	0.50	29.10	0.00	0.00
9/7/2012	1455	1.20	0.00	0.00	0.00
9/8/2012	1955	1.50	205.80	0.00	0.00
9/8/2012	2050	1.70	206.10	0.00	0.00
9/8/2012	2242	1.00	179.10	0.00	0.00
9/8/2012	2527	1.40	0.00	0.00	0.00
9/8/2012	2622	1.90	0.00	0.00	0.00
9/8/2012	2717	0.90	282.00	2715.05	17.91
9/8/2012	2812	1.10	300.20	2810.04	18.52
9/8/2012	2907	0.90	284.60	2905.00	18.52
9/8/2012	3002	1.00	280.50	3000.00	19.00
9/8/2012	3097	0.60	280.60	3095.00	19.98
9/9/2012	3193	0.70	40.90	3191.00	0.00
9/9/2012	3287	1.00	55.20	3284.00	0.00
9/9/2012	3382	1.60	55.00	3379.00	0.00
9/9/2012	4145	1.00	115.10	4142.00	19.00
9/9/2012	4241	1.20	114.80	4238.00	18.00
9/12/2012	4813	0.90	0.00	0.00	0.00
9/13/2012	5319	0.10	0.00	0.00	0.00
9/13/2012	5808	0.20	0.00	0.00	0.00
9/13/2012	6307	0.20	0.00	0.00	0.00
9/13/2012	6779	0.50	0.00	0.00	0.00
9/14/2012	7279	0.90	0.00	0.00	0.00
9/14/2012	7796	1.10	0.00	0.00	0.00
9/15/2012	8272	1.20	0.00	0.00	0.00
9/15/2012	8722	1.60	0.00	0.00	0.00
9/15/2012	8983	1.90	0.00	0.00	0.00
9/25/2012	9436	62.30	4.10	9347.51	231.84
9/25/2012	9500	63.90	4.40	9375.87	209.05
9/26/2012	9532	63.40	4.20	9390.00	1.66
9/26/2012	9595	60.70	3.40	9419.00	4.76
9/26/2012	9722	61.00	2.50	9484.00	7.42
9/26/2012	9786	68.90	3.00	9512.00	13.47
9/26/2012	9847	98.60	4.20	9529.00	14.53
9/26/2012	9944	91.50	4.90	9537.00	10.99
9/27/2012	10644	90.60	358.60	9521.04	0.00
9/27/2012	10739	90.80	358.30	0.00	0.00

9/27/2012	10832	90.40	357.40	0.00	0.00
9/28/2012	11309	91.50	358.10	9513.17	0.00
9/28/2012	11404	90.60	358.80	9511.91	0.00
9/28/2012	11499	89.20	357.70	9511.60	2247.65
9/28/2012	11599	89.50	356.90	9512.73	2347.55
9/28/2012	11690	89.90	356.30	9513.00	0.76
9/28/2012	12022	89.00	0.70	9514.00	1.16
9/28/2012	12071	88.20	0.40	9517.00	1.11
9/28/2012	12357	89.80	0.00	9518.09	0.00
9/28/2012	12453	88.40	0.00	9519.60	0.00
9/29/2012	12642	90.20	359.80	0.00	0.00
9/29/2012	12832	89.50	358.40	0.00	0.00
9/29/2012	13023	88.20	357.90	0.00	0.00
9/30/2012	13214	92.00	359.50	0.00	0.00
9/30/2012	13499	90.60	357.60	0.00	0.00
9/30/2012	13595	90.20	357.60	9520.74	0.00
9/30/2012	13690	89.60	357.00	9520.90	0.00
9/30/2012	13881	90.20	356.30	9519.57	0.00

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

September 25, 2012

SUR: O-03-26s-32e, 260/S & 2290/E
BHL: B-03-26s-32e, 5014/S & 2308/E
API # 30-025-40684

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

Attn: Kanicia Castillo

Re: **Pintail 3 Federal No. 001H**

Please find enclosed a copy of the survey from 0' to 9,700' 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

Company: COG Operating LLC (Concho)
Lease/Well: Pintail 3 Federal No. / 001H
Location: SEC3 T26S R32E
Rig Name: Silver Oak 12
State/County: New Mexico / Lea
Latitude: 32.07, Longitude: -103.66
GRID North is 0.36 Degrees East of True North
VS-Azi: 359.82 Degrees

Depth Reference : RKB = 18'

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: gyro survey_mrg9700.ut
Minimum Curvature Method
Report Date/Time: 9/25/2012 / 15:38

Vaughn Energy Services
Gardendale, Texas
432- 563-5444
Suveyor: Colby Ware / Danny Spring
Pintail 3 Federal No. 001H / API 30-025-40684

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W 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	****
100.00	0.56	56.81	100.00	0.27	0.41	0.48	56.81	0.56
200.00	0.77	54.67	199.99	0.92	1.36	1.64	55.93	0.22
300.00	1.60	43.45	299.97	2.33	2.87	3.70	51.01	0.86
400.00	2.43	32.22	399.91	5.13	4.96	7.14	44.04	0.91
500.00	4.18	23.62	499.74	10.27	7.55	12.75	36.35	1.82
600.00	5.94	16.01	599.35	18.58	10.44	21.31	29.34	1.87
700.00	4.19	7.61	698.95	27.17	12.35	29.85	24.44	1.89
800.00	2.43	354.21	798.78	32.90	12.62	35.24	20.99	1.91
900.00	1.41	10.47	898.73	36.22	12.63	38.36	19.23	1.15
1000.00	0.39	26.72	998.71	37.72	13.01	39.90	19.02	1.04
1100.00	0.49	45.00	1098.71	38.33	13.46	40.62	19.35	0.18
1200.00	0.60	63.28	1198.71	38.87	14.24	41.40	20.11	0.20
1300.00	0.94	68.37	1298.70	39.41	15.47	42.34	21.43	0.34
1400.00	1.27	73.45	1398.68	40.03	17.29	43.60	23.37	0.35
1500.00	1.18	121.09	1498.66	39.81	19.24	44.22	25.79	0.99
1600.00	1.08	158.73	1598.64	38.41	20.46	43.52	28.05	0.73
1700.00	1.13	191.99	1698.62	36.56	20.60	41.97	29.40	0.63
1800.00	1.18	195.26	1798.60	34.60	20.12	40.02	30.18	0.08

VES Survey Date: 09/21/2012

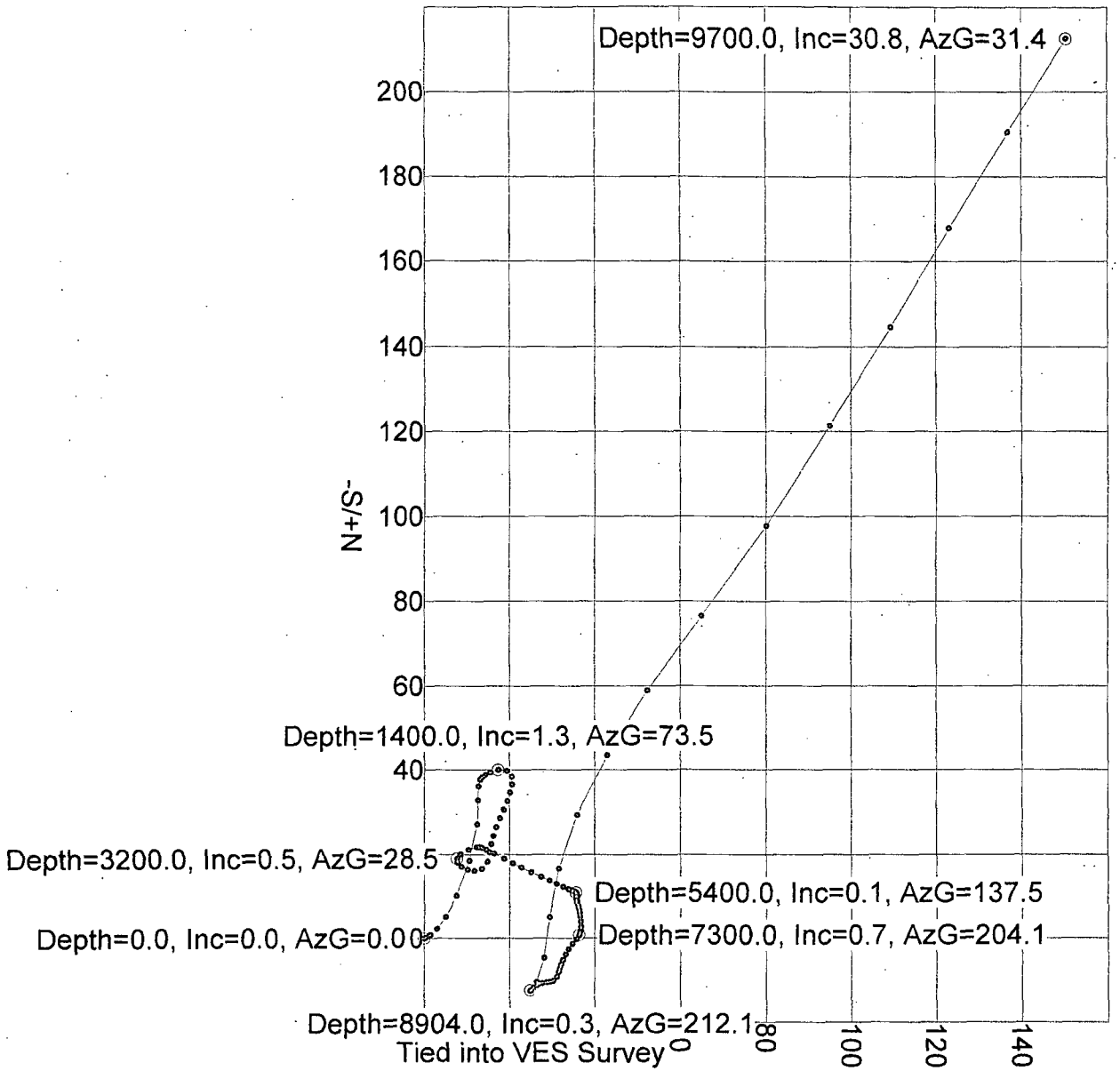
Depth FT	Angle Deg	Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	DogLeg Severity Deg/100
1900.00	1.22	200.76	1898.58	32.60	19.47	37.97	30.85	0.12
2000.00	1.28	206.26	1998.56	30.60	18.60	35.81	31.29	0.13
2100.00	1.29	202.95	2098.53	28.56	17.66	33.58	31.73	0.07
2200.00	1.30	199.64	2198.50	26.45	16.84	31.36	32.48	0.08
2300.00	1.18	195.73	2298.48	24.39	16.18	29.27	33.56	0.14
2400.00	1.05	191.82	2398.46	22.50	15.71	27.44	34.93	0.15
2500.00	1.23	190.71	2498.44	20.54	15.32	25.63	36.72	0.19
2600.00	1.42	199.59	2598.42	18.32	14.71	23.50	38.76	0.28
2700.00	1.19	241.02	2698.39	16.65	13.39	21.37	38.80	0.95
2800.00	0.95	272.44	2798.37	16.19	11.65	19.95	35.75	0.62
2900.00	0.93	287.00	2898.36	16.46	10.05	19.28	31.40	0.24
3000.00	0.92	301.55	2998.35	17.12	8.59	19.15	26.66	0.23
3100.00	0.72	335.00	3098.34	18.10	7.65	19.65	22.90	0.51
3200.00	0.52	28.46	3198.33	19.06	7.60	20.52	21.73	0.58
3300.00	1.01	47.53	3298.32	20.06	8.47	21.77	22.88	0.55
3400.00	1.51	66.60	3398.30	21.18	10.33	23.56	26.00	0.65
3500.00	0.79	84.07	3498.28	21.77	12.23	24.97	29.32	0.79
3600.00	0.07	101.53	3598.28	21.83	12.98	25.40	30.72	0.72
3700.00	0.19	102.26	3698.28	21.79	13.20	25.47	31.20	0.12
3800.00	0.30	113.00	3798.28	21.65	13.60	25.56	32.13	0.12
3900.00	0.91	115.29	3898.27	21.21	14.56	25.72	34.47	0.61
4000.00	1.52	119.57	3998.25	20.21	16.43	26.05	39.11	0.62
4100.00	1.38	117.89	4098.21	18.99	18.65	26.62	44.48	0.15
4200.00	1.22	116.20	4198.19	17.96	20.67	27.38	49.02	0.16
4300.00	1.41	116.02	4298.16	16.95	22.74	28.36	53.30	0.19
4400.00	1.59	115.85	4398.13	15.80	25.09	29.65	57.80	0.17
4500.00	1.35	114.73	4498.09	14.71	27.41	31.10	61.78	0.24
4600.00	1.13	113.61	4598.07	13.82	29.38	32.47	64.81	0.22
4700.00	1.03	115.47	4698.05	13.04	31.10	33.72	67.25	0.11
4800.00	0.93	114.32	4798.04	12.32	32.65	34.89	69.33	0.10
4900.00	0.66	112.79	4898.03	11.76	33.91	35.89	70.87	0.27
5000.00	0.38	108.25	4998.02	11.43	34.76	36.59	71.79	0.28
5100.00	0.22	113.38	5098.02	11.25	35.26	37.01	72.30	0.16
5200.00	0.05	113.50	5198.02	11.16	35.47	37.19	72.54	0.18
5300.00	0.07	112.98	5298.02	11.12	35.57	37.26	72.64	0.03
5400.00	0.10	137.47	5398.02	11.03	35.68	37.35	72.82	0.04
5500.00	0.13	156.17	5498.02	10.86	35.78	37.40	73.11	0.05
5600.00	0.09	174.88	5598.02	10.68	35.84	37.40	73.40	0.06
5700.00	0.11	182.72	5698.02	10.52	35.84	37.35	73.65	0.02

VES Survey Date: 09/21/2012

Depth FT	Angle Deg	Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	0.13	180.56	5798.02	10.32	35.83	37.29	73.94	0.02
5900.00	0.10	178.14	5898.02	10.12	35.84	37.24	74.23	0.03
6000.00	0.03	175.72	5998.02	10.00	35.84	37.21	74.40	0.07
6100.00	0.11	173.69	6098.02	9.88	35.85	37.19	74.59	0.08
6200.00	0.18	179.66	6198.02	9.63	35.87	37.14	74.97	0.07
6300.00	0.21	181.75	6298.02	9.29	35.86	37.04	75.47	0.04
6400.00	0.24	171.85	6398.02	8.90	35.88	36.97	76.07	0.05
6500.00	0.33	169.06	6498.02	8.41	35.97	36.94	76.84	0.10
6600.00	0.41	166.27	6598.02	7.77	36.11	36.94	77.85	0.08
6700.00	0.44	168.98	6698.01	7.05	36.27	36.95	79.00	0.03
6800.00	0.48	171.69	6798.01	6.26	36.40	36.94	80.25	0.05
6900.00	0.63	172.21	6898.01	5.30	36.54	36.92	81.75	0.15
7000.00	0.78	172.74	6998.00	4.08	36.70	36.92	83.66	0.15
7100.00	0.65	180.45	7097.99	2.84	36.78	36.89	85.59	0.16
7200.00	0.51	188.16	7197.99	1.83	36.71	36.76	87.15	0.15
7300.00	0.65	204.14	7297.98	0.86	36.42	36.43	88.64	0.21
7400.00	0.79	220.12	7397.97	-0.18	35.74	35.74	90.29	0.24
7500.00	0.85	216.97	7497.96	-1.30	34.85	34.88	92.13	0.07
7600.00	0.94	213.82	7597.95	-2.57	33.95	34.05	94.33	0.11
7700.00	0.85	208.95	7697.94	-3.90	33.13	33.36	96.72	0.13
7800.00	0.75	204.08	7797.93	-5.14	32.51	32.91	98.99	0.12
7900.00	0.58	199.51	7897.92	-6.22	32.07	32.67	100.97	0.17
8000.00	0.44	194.94	7997.92	-7.07	31.80	32.58	102.53	0.15
8100.00	0.64	191.87	8097.91	-7.99	31.59	32.58	104.19	0.20
8200.00	0.84	208.81	8197.90	-9.17	31.12	32.45	106.42	0.29
8300.00	0.62	238.90	8297.90	-10.09	30.31	31.95	108.42	0.43
8400.00	0.39	267.99	8397.89	-10.38	29.51	31.28	109.38	0.33
8500.00	0.53	264.38	8497.89	-10.44	28.71	30.55	109.98	0.14
8600.00	0.66	249.77	8597.88	-10.69	27.70	29.69	111.09	0.20
8700.00	0.67	246.67	8697.88	-11.12	26.62	28.85	112.67	0.04
8800.00	0.68	235.56	8797.87	-11.69	25.59	28.13	114.55	0.13
8900.00	0.36	212.84	8897.87	-12.29	24.93	27.79	116.25	0.38
Tied into VES Survey								
8904.00	0.31	212.12	8901.87	-12.31	24.91	27.79	116.30	1.43
8950.00	0.16	221.29	8947.87	-12.47	24.80	27.76	116.69	0.33
9000.00	0.94	70.16	8997.86	-12.38	25.14	28.03	116.22	2.16
9050.00	4.68	25.20	9047.80	-10.40	26.39	28.37	111.50	8.14
9100.00	9.10	12.28	9097.43	-4.69	28.10	28.49	99.47	9.31

Depth FT	Angle Deg	Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Distance FT	Direction Deg	Severity Deg/100
9150.00	13.72	4.60	9146.43	5.09	29.42	29.86	80.19	9.71
9200.00	13.60	16.38	9195.03	16.64	31.55	35.67	62.19	5.56
9250.00	17.63	20.35	9243.17	29.38	35.85	46.35	50.66	8.33
9300.00	19.43	32.66	9290.60	43.49	42.97	61.14	44.66	8.58
9350.00	22.78	30.03	9337.24	58.88	52.31	78.75	41.62	6.97
9400.00	28.97	39.98	9382.22	76.56	64.95	100.40	40.31	15.08
9450.00	34.16	31.71	9424.83	97.80	80.13	126.43	39.33	13.50
9500.00	33.58	32.82	9466.35	121.37	95.00	154.13	38.05	1.69
9550.00	32.92	30.71	9508.16	144.67	109.44	181.40	37.11	2.68
9600.00	32.32	30.72	9550.28	167.84	123.20	208.21	36.28	1.20
9650.00	31.62	31.69	9592.69	190.49	136.92	234.59	35.71	1.73
9700.00	30.79	31.43	9635.46	212.56	150.48	260.43	35.30	1.69

Vaughn Energy Services
Gardendale, Texas
432- 563-5444
Suveyor: Colby Ware / Danny Spring
Pintail 3 Federal No. 001H / API 30-025-40684



VES Survey Date: 09/21/2012

CRESCENT DIRECTIONAL DRILLING

COG Operating LLC

Lea County, NM (NAD 83)
Pintail 3 Federal 1H
#1H

ST1

SUR: O-03-26s-32e, 260/S & 2290/E
BHL: B-03-26s-32e, 5014/S & 2308/E
API # 30-025-40684

Design: ST1

Standard Survey Report

01 October, 2012

CONCHO

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM (NAD 83)	TVD Reference:	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal 1H	MD Reference:	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

Project Lea County, NM (NAD 83)

Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Pintail 3 Federal 1H

Site Position:		Northing:	388,231.32 usft	Latitude:	32° 3' 58.257 N
From:	Map	Easting:	708,221.28 usft	Longitude:	103° 47' 40.538 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.29 °

Well #1H

Well Position	+N/-S	0.0 usft	Northing:	388,231.32 usft	Latitude:	32° 3' 58.257 N
	+E/-W	0.0 usft	Easting:	708,221.28 usft	Longitude:	103° 47' 40.538 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,283.0 usft

Wellbore ST1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	9/21/2012	7.51	60.00	48,413

Design ST1

Audit Notes:

Version:	1.0	Phase:	ACTUAL	Tie On Depth:	8,904.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	359.83

Survey Program Date 10/1/2012

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	8,904.0	VES - Gyro (OH)	CB-GYRO-MS	Camera based gyro multishot
8,926.0	13,962.0	MWD2 - ST1 (ST1)	MWD	MWD - Standard
14,007.0	14,007.0	PTB (ST1)	MWD	MWD - Standard

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.56	56.81	100.0	0.3	0.4	0.3	0.56	0.56	0.00
200.0	0.77	54.67	200.0	0.9	1.4	0.9	0.21	0.21	-2.14
300.0	1.60	43.45	300.0	2.3	2.9	2.3	0.86	0.83	-11.22
400.0	2.43	32.22	399.9	5.1	5.0	5.1	0.92	0.83	-11.23
500.0	4.18	23.62	499.7	10.3	7.6	10.2	1.81	1.75	-8.60
600.0	5.94	16.01	599.3	18.6	10.4	18.5	1.88	1.76	-7.61
700.0	4.19	7.61	699.0	27.2	12.4	27.1	1.90	-1.75	-8.40
800.0	2.43	354.21	798.8	32.9	12.6	32.9	1.91	-1.76	-13.40

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM (NAD 83)	TVD Reference:	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal 1H	MD Reference:	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

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)
900.0	1.41	10.47	898.7	36.2	12.6	36.2	1.15	-1.02	16.26
1,000.0	0.39	26.72	998.7	37.7	13.0	37.7	1.04	-1.02	16.25
1,100.0	0.49	45.00	1,098.7	38.3	13.5	38.3	0.17	0.10	18.28
1,200.0	0.60	63.28	1,198.7	38.9	14.2	38.8	0.20	0.11	18.28
1,300.0	0.94	68.37	1,298.7	39.4	15.5	39.4	0.35	0.34	5.09
1,400.0	1.27	73.45	1,398.7	40.0	17.3	40.0	0.34	0.33	5.08
1,500.0	1.18	121.09	1,498.7	39.8	19.2	39.8	0.99	-0.09	47.64
1,600.0	1.08	158.73	1,598.6	38.4	20.5	38.4	0.74	-0.10	37.64
1,700.0	1.13	191.99	1,698.6	36.6	20.6	36.5	0.63	0.05	33.26
1,800.0	1.18	195.26	1,798.6	34.6	20.1	34.6	0.08	0.05	3.27
1,900.0	1.22	200.76	1,898.6	32.6	19.5	32.6	0.12	0.04	5.50
2,000.0	1.28	206.26	1,998.6	30.6	18.6	30.6	0.13	0.06	5.50
2,100.0	1.29	202.95	2,098.5	28.6	17.7	28.5	0.07	0.01	-3.31
2,200.0	1.30	199.64	2,198.5	26.5	16.8	26.4	0.08	0.01	-3.31
2,300.0	1.18	195.73	2,298.5	24.4	16.2	24.4	0.15	-0.12	-3.91
2,400.0	1.05	191.82	2,398.5	22.5	15.7	22.5	0.15	-0.13	-3.91
2,500.0	1.23	190.71	2,498.4	20.6	15.3	20.5	0.18	0.18	-1.11
2,600.0	1.42	199.59	2,598.4	18.4	14.7	18.3	0.28	0.19	8.88
2,700.0	1.19	241.02	2,698.4	16.7	13.4	16.7	0.95	-0.23	41.43
2,800.0	0.95	272.44	2,798.4	16.2	11.7	16.2	0.62	-0.24	31.42
2,900.0	0.93	287.00	2,898.4	16.5	10.1	16.5	0.24	-0.02	14.56
3,000.0	0.92	301.55	2,998.3	17.2	8.6	17.1	0.23	-0.01	14.55
3,100.0	0.72	335.00	3,098.3	18.1	7.6	18.1	0.51	-0.20	33.45
3,200.0	0.52	28.46	3,198.3	19.1	7.6	19.1	0.59	-0.20	53.46
3,300.0	1.01	47.53	3,298.3	20.1	8.5	20.1	0.55	0.49	19.07
3,400.0	1.51	66.60	3,398.3	21.2	10.3	21.2	0.65	0.50	19.07
3,500.0	0.79	84.07	3,498.3	21.8	12.2	21.8	0.79	-0.72	17.47
3,600.0	0.07	101.53	3,598.3	21.9	13.0	21.8	0.72	-0.72	17.46
3,700.0	0.19	102.26	3,698.3	21.8	13.2	21.8	0.12	0.12	0.73
3,800.0	0.30	113.00	3,798.3	21.7	13.6	21.7	0.12	0.11	10.74
3,900.0	0.91	115.29	3,898.3	21.3	14.5	21.2	0.61	0.61	2.29
4,000.0	1.52	119.57	3,998.2	20.3	16.4	20.2	0.62	0.61	4.28
4,100.0	1.38	117.89	4,098.2	19.0	18.6	19.0	0.15	-0.14	-1.68
4,200.0	1.22	116.20	4,198.2	18.0	20.7	17.9	0.16	-0.16	-1.69
4,300.0	1.41	116.02	4,298.2	17.0	22.7	16.9	0.19	0.19	-0.18
4,400.0	1.59	115.85	4,398.1	15.9	25.1	15.8	0.18	0.18	-0.17
4,500.0	1.35	114.73	4,498.1	14.8	27.4	14.7	0.24	-0.24	-1.12
4,600.0	1.13	113.61	4,598.1	13.9	29.4	13.8	0.22	-0.22	-1.12
4,700.0	1.03	115.47	4,698.0	13.1	31.1	13.0	0.11	-0.10	1.86
4,800.0	0.93	114.32	4,798.0	12.4	32.6	12.3	0.10	-0.10	-1.15
4,900.0	0.66	112.79	4,898.0	11.8	33.9	11.7	0.27	-0.27	-1.53
5,000.0	0.38	108.25	4,998.0	11.5	34.7	11.4	0.28	-0.28	-4.54
5,100.0	0.22	113.38	5,098.0	11.3	35.2	11.2	0.16	-0.16	5.13

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM (NAD 83)	TVD Reference:	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal 1H	MD Reference:	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

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)
5,200.0	0.05	113.50	5,198.0	11.2	35.4	11.1	0.17	-0.17	0.12
5,300.0	0.07	112.98	5,298.0	11.2	35.5	11.1	0.02	0.02	-0.52
5,400.0	0.10	137.47	5,398.0	11.1	35.7	11.0	0.05	0.03	24.49
5,500.0	0.13	156.17	5,498.0	10.9	35.8	10.8	0.05	0.03	18.70
5,600.0	0.09	174.88	5,598.0	10.7	35.8	10.6	0.05	-0.04	18.71
5,700.0	0.11	182.72	5,698.0	10.6	35.8	10.4	0.02	0.02	7.84
5,800.0	0.13	180.56	5,798.0	10.3	35.8	10.2	0.02	0.02	-2.16
5,900.0	0.10	178.14	5,898.0	10.1	35.8	10.0	0.03	-0.03	-2.42
6,000.0	0.03	175.72	5,998.0	10.0	35.8	9.9	0.07	-0.07	-2.42
6,100.0	0.11	173.69	6,098.0	9.9	35.8	9.8	0.08	0.08	-2.03
6,200.0	0.18	179.66	6,198.0	9.7	35.8	9.5	0.07	0.07	5.97
6,300.0	0.21	181.75	6,298.0	9.3	35.8	9.2	0.03	0.03	2.09
6,400.0	0.24	171.85	6,398.0	8.9	35.9	8.8	0.05	0.03	-9.90
6,500.0	0.33	169.06	6,498.0	8.4	35.9	8.3	0.09	0.09	-2.79
6,600.0	0.41	166.27	6,598.0	7.8	36.1	7.7	0.08	0.08	-2.79
6,700.0	0.44	168.98	6,698.0	7.1	36.2	7.0	0.04	0.03	2.71
6,800.0	0.48	171.69	6,798.0	6.3	36.4	6.2	0.05	0.04	2.71
6,900.0	0.63	172.21	6,898.0	5.3	36.5	5.2	0.15	0.15	0.52
7,000.0	0.78	172.74	6,998.0	4.1	36.7	4.0	0.15	0.15	0.53
7,100.0	0.65	180.45	7,098.0	2.9	36.8	2.8	0.16	-0.13	7.71
7,200.0	0.51	188.16	7,198.0	1.9	36.7	1.8	0.16	-0.14	7.71
7,300.0	0.65	204.14	7,298.0	0.9	36.4	0.8	0.21	0.14	15.98
7,400.0	0.79	220.12	7,398.0	-0.1	35.7	-0.2	0.24	0.14	15.98
7,500.0	0.85	216.97	7,497.9	-1.3	34.8	-1.4	0.08	0.06	-3.15
7,600.0	0.94	213.82	7,597.9	-2.5	33.9	-2.6	0.10	0.09	-3.15
7,700.0	0.85	208.95	7,697.9	-3.9	33.1	-4.0	0.12	-0.09	-4.87
7,800.0	0.75	204.08	7,797.9	-5.1	32.5	-5.2	0.12	-0.10	-4.87
7,900.0	0.58	199.51	7,897.9	-6.2	32.0	-6.3	0.18	-0.17	-4.57
8,000.0	0.44	194.94	7,997.9	-7.0	31.8	-7.1	0.15	-0.14	-4.57
8,100.0	0.64	191.87	8,097.9	-8.0	31.6	-8.0	0.20	0.20	-3.07
8,200.0	0.84	208.81	8,197.9	-9.1	31.1	-9.2	0.29	0.20	16.94
8,300.0	0.62	238.90	8,297.9	-10.1	30.3	-10.2	0.43	-0.22	30.09
8,400.0	0.39	267.99	8,397.9	-10.4	29.5	-10.4	0.34	-0.23	29.09
8,500.0	0.53	264.38	8,497.9	-10.4	28.7	-10.5	0.14	0.14	-3.61
8,600.0	0.66	249.77	8,597.9	-10.7	27.7	-10.7	0.20	0.13	-14.61
8,700.0	0.67	246.67	8,697.9	-11.1	26.6	-11.2	0.04	0.01	-3.10
8,800.0	0.68	235.56	8,797.9	-11.7	25.6	-11.7	0.13	0.01	-11.11
8,900.0	0.36	212.84	8,897.8	-12.3	24.9	-12.3	0.37	-0.32	-22.72
8,904.0	0.31	212.12	8,901.9	-12.3	24.9	-12.3	1.25	-1.24	-17.92
Tie into OH/KOP @ 8904 MD									
8,926.0	1.00	300.40	8,923.9	-12.2	24.7	-12.3	4.72	3.14	401.27
8,958.0	5.10	359.00	8,955.8	-10.7	24.4	-10.7	14.56	12.81	183.13
8,990.0	12.10	9.30	8,987.4	-5.9	25.0	-6.0	22.31	21.88	32.19
9,023.0	16.40	1.10	9,019.4	2.1	25.6	2.1	14.36	13.03	-24.85

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM (NAD 83)	TVD Reference:	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal 1H	MD Reference:	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

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)
9,055.0	14.90	358.80	9,050.2	10.8	25.6	10.7	5.07	-4.69	-7.19
9,087.0	17.10	357.40	9,081.0	19.6	25.3	19.5	6.98	6.88	-4.38
9,118.0	21.70	359.70	9,110.2	29.9	25.1	29.8	15.04	14.84	7.42
9,150.0	26.00	3.00	9,139.5	42.8	25.4	42.7	14.06	13.44	10.31
9,182.0	29.80	2.50	9,167.8	57.8	26.1	57.7	11.90	11.88	-1.56
9,207.5	32.43	3.23	9,189.6	70.9	26.8	70.8	10.42	10.31	2.86
Cross into 330' Lease - 9207.5' MD, 9189.6' TVD, 32.43° INC, 3.23° AZI, 70.8' VS									
9,214.0	33.10	3.40	9,195.1	74.4	27.0	74.4	10.42	10.32	2.61
9,246.0	36.00	7.10	9,221.4	92.5	28.7	92.4	11.18	9.06	11.56
9,277.0	39.80	8.10	9,245.9	111.4	31.2	111.3	12.42	12.26	3.23
9,309.0	43.60	5.80	9,269.8	132.5	33.8	132.4	12.80	11.88	-7.19
9,341.0	47.10	2.10	9,292.2	155.2	35.3	155.1	13.68	10.94	-11.56
9,373.0	51.70	3.00	9,313.1	179.5	36.4	179.3	14.53	14.38	2.81
9,405.0	56.70	3.90	9,331.8	205.4	38.0	205.2	15.79	15.63	2.81
9,436.0	62.30	4.10	9,347.5	232.0	39.8	231.9	18.07	18.06	0.65
9,468.0	64.30	3.90	9,361.9	260.5	41.8	260.4	6.27	6.25	-0.63
9,500.0	63.90	4.40	9,375.9	289.2	43.9	289.1	1.88	-1.25	1.56
9,532.0	63.40	4.20	9,390.1	317.8	46.0	317.7	1.66	-1.56	-0.63
9,563.0	62.20	3.70	9,404.2	345.3	47.9	345.2	4.13	-3.87	-1.61
9,595.0	60.70	3.40	9,419.5	373.4	49.7	373.2	4.76	-4.69	-0.94
9,627.0	59.00	2.80	9,435.6	401.0	51.2	400.8	5.55	-5.31	-1.88
9,659.0	57.50	2.10	9,452.4	428.2	52.3	428.0	5.04	-4.69	-2.19
9,691.0	58.70	2.50	9,469.4	455.3	53.4	455.2	3.90	3.75	1.25
9,722.0	61.00	2.50	9,484.9	482.1	54.6	481.9	7.42	7.42	0.00
9,754.0	64.60	2.70	9,499.5	510.5	55.9	510.4	11.26	11.25	0.63
9,786.0	68.90	3.00	9,512.2	539.9	57.4	539.7	13.47	13.44	0.94
9,817.0	74.00	3.50	9,522.0	569.2	59.0	569.1	16.52	16.45	1.61
9,849.0	78.60	4.20	9,529.6	600.2	61.1	600.1	14.53	14.38	2.19
9,881.0	83.30	5.80	9,534.6	631.7	63.9	631.5	15.49	14.69	5.00
9,912.0	88.10	5.80	9,537.0	662.5	67.0	662.3	15.48	15.48	0.00
9,930.0	90.01	5.29	9,537.3	680.4	68.7	680.2	10.99	10.62	-2.81
EOC - 9930.0' MD, 9537.3' TVD, 90.01° INC, 5.29° AZI, 680.2' VS									
9,944.0	91.50	4.90	9,537.1	694.3	70.0	694.1	10.99	10.63	-2.81
9,976.0	94.60	3.00	9,535.4	726.2	72.2	726.0	11.36	9.69	-5.94
10,072.0	93.80	1.40	9,528.3	821.9	75.9	821.6	1.86	-0.83	-1.67
10,167.0	91.20	1.60	9,524.2	916.7	78.3	916.5	2.74	-2.74	0.21
10,262.0	89.90	0.60	9,523.3	1,011.7	80.2	1,011.5	1.73	-1.37	-1.05
10,358.0	90.20	0.00	9,523.2	1,107.7	80.7	1,107.4	0.70	0.31	-0.63
10,453.0	90.20	359.80	9,522.9	1,202.7	80.5	1,202.4	0.21	0.00	-0.21
10,548.0	90.70	358.80	9,522.1	1,297.7	79.3	1,297.4	1.18	0.53	-1.05
10,644.0	90.60	358.60	9,521.0	1,393.7	77.2	1,393.4	0.23	-0.10	-0.21
10,739.0	90.80	358.30	9,519.9	1,488.6	74.6	1,488.4	0.38	0.21	-0.32
10,832.0	90.40	357.40	9,518.9	1,581.5	71.1	1,581.3	1.06	-0.43	-0.97

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM (NAD 83)	TVD Reference:	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal 1H	MD Reference:	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

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)
10,928.0	90.80	356.70	9,517.9	1,677.4	66.2	1,677.2	0.84	0.42	-0.73
11,023.0	91.00	357.00	9,516.4	1,772.2	60.9	1,772.1	0.38	0.21	0.32
11,118.0	90.00	357.40	9,515.6	1,867.1	56.3	1,867.0	1.13	-1.05	0.42
11,214.0	90.70	357.20	9,515.0	1,963.0	51.8	1,962.9	0.76	0.73	-0.21
11,309.0	91.50	358.10	9,513.2	2,057.9	47.9	2,057.8	1.27	0.84	0.95
11,404.0	90.60	358.80	9,511.4	2,152.9	45.3	2,152.7	1.20	-0.95	0.74
11,499.0	89.20	357.70	9,511.6	2,247.8	42.4	2,247.7	1.87	-1.47	-1.16
11,595.0	89.50	356.90	9,512.7	2,343.7	37.9	2,343.6	0.89	0.31	-0.83
11,690.0	89.90	356.30	9,513.2	2,438.5	32.3	2,438.4	0.76	0.42	-0.63
11,786.0	89.50	358.10	9,513.7	2,534.4	27.6	2,534.3	1.92	-0.42	1.88
11,881.0	90.00	0.20	9,514.1	2,629.4	26.2	2,629.3	2.27	0.53	2.21
11,977.0	89.00	0.70	9,514.9	2,725.4	26.9	2,725.3	1.16	-1.04	0.52
12,071.0	88.00	0.40	9,517.4	2,819.4	27.8	2,819.3	1.11	-1.06	-0.32
12,167.0	88.60	0.20	9,520.2	2,915.3	28.3	2,915.2	0.66	0.63	-0.21
12,262.0	92.10	1.10	9,519.7	3,010.3	29.4	3,010.2	3.80	3.68	0.95
12,357.0	89.80	0.00	9,518.1	3,105.3	30.3	3,105.2	2.68	-2.42	-1.16
12,453.0	88.40	0.00	9,519.6	3,201.2	30.3	3,201.1	1.46	-1.46	0.00
12,547.0	88.40	359.80	9,522.2	3,295.2	30.1	3,295.1	0.21	0.00	-0.21
12,642.0	90.20	359.80	9,523.4	3,390.2	29.8	3,390.1	1.89	1.89	0.00
12,737.0	90.20	0.00	9,523.0	3,485.2	29.6	3,485.1	0.21	0.00	0.21
12,832.0	89.50	358.40	9,523.3	3,580.2	28.3	3,580.1	1.84	-0.74	-1.68
12,928.0	89.60	358.30	9,524.1	3,676.1	25.6	3,676.1	0.15	0.10	-0.10
13,023.0	88.20	357.90	9,525.9	3,771.1	22.4	3,771.0	1.53	-1.47	-0.42
13,118.0	87.30	358.80	9,529.6	3,866.0	19.7	3,865.9	1.34	-0.95	0.95
13,214.0	92.00	359.50	9,530.2	3,961.9	18.2	3,961.8	4.95	4.90	0.73
13,308.0	91.90	359.10	9,527.0	4,055.9	17.1	4,055.8	0.44	-0.11	-0.43
13,404.0	92.10	357.70	9,523.6	4,151.8	14.4	4,151.7	1.47	0.21	-1.46
13,499.0	90.60	357.60	9,521.4	4,246.6	10.5	4,246.6	1.58	-1.58	-0.11
13,595.0	90.20	357.60	9,520.7	4,342.6	6.5	4,342.5	0.42	-0.42	0.00
13,690.0	89.60	357.00	9,520.9	4,437.5	2.0	4,437.4	0.89	-0.63	-0.63
13,786.0	90.90	356.90	9,520.5	4,533.3	-3.1	4,533.3	1.36	1.35	-0.10
13,881.0	90.20	356.30	9,519.6	4,628.1	-8.7	4,628.1	0.97	-0.74	-0.63
13,962.0	89.40	355.60	9,519.9	4,708.9	-14.4	4,709.0	1.31	-0.99	-0.86
14,007.0	89.40	355.60	9,520.3	4,753.8	-17.9	4,753.8	0.00	0.00	0.00

BHL - 14007.0' MD, 9520.3' TVD, 89.40° INC, 355.60° AZI, 4753.8' N, -17.9' E, 4753.8' VS

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM (NAD 83)	**TVD Reference:**	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Site:	Pintail 3 Federal 1H	**MD Reference:**	well @ 3301.0usft (Silver Oak #12 - 18' KB)
Well:	#1H	**North Reference:**	Grid
Wellbore:	ST1	**Survey Calculation Method:**	Minimum Curvature
Design:	ST1	**Database:**	Houston R5000 Database

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,904.0	8,901.9	-12.3	24.9	Tie into OH/KOP @ 8904 MD
9,207.5	9,189.6	70.9	26.8	Cross into 330' Lease - 9207.5' MD, 9189.6' TVD, 32.43° INC, 3.23° AZI, 70.8' \
9,930.0	9,537.3	680.4	68.7	EOC - 9930.0' MD, 9537.3' TVD, 90.01° INC, 5.29° AZI, 680.2' VS
14,007.0	9,520.3	4,753.8	-17.9	BHL - 14007.0' MD, 9520.3' TVD, 89.40° INC, 355.60° AZI, 4753.8' N, -17.9' E,

Checked By: _____ Approved By: _____ Date: _____

COG Operating LLC
Project: Lea County, NM (NAD 83)
Site: Pintail 3 Federal 1H
Well: #1H
Wellbore: ST1
Plan: ST1 Plan #1 (#1H/ST1)

CONCHO

Azimuths to Grid North
True North: -0.29°
Magnetic North: 7.23°

Magnetic Field
Strength: 48413.1snT
Dip Angle: 60.00°
Date: 9/21/2012
Model: IGRF200510

WELL DETAILS: #1H

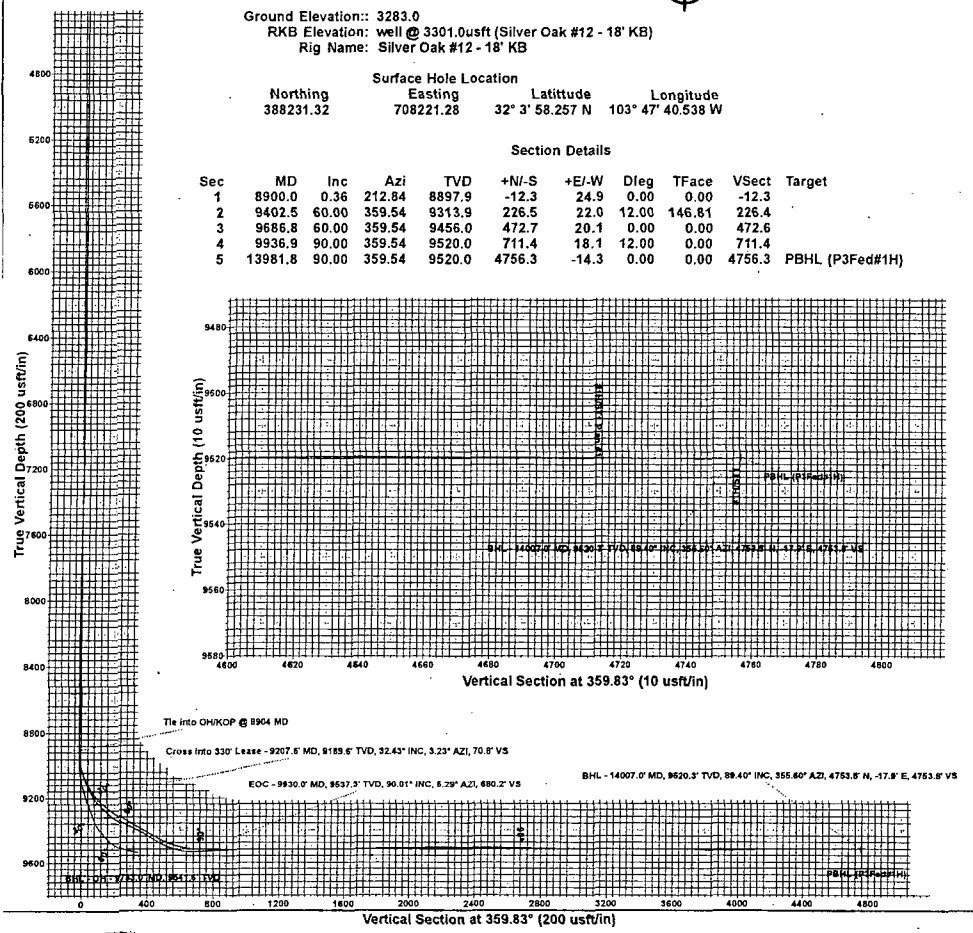
Ground Elevation:: 3283.0
RKB Elevation: well @ 3301.0usft (Silver Oak #12 - 18' KB)
Rig Name: Silver Oak #12 - 18' KB

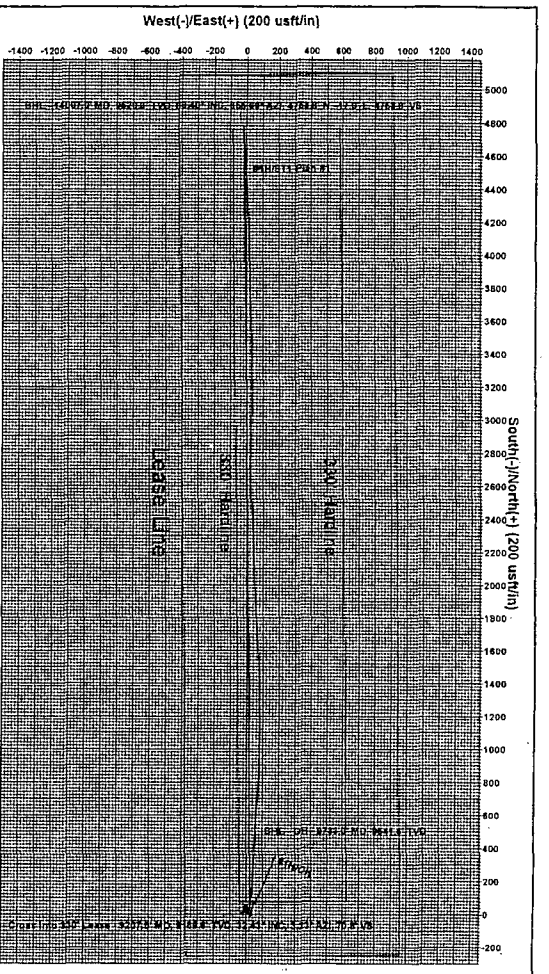
Surface Hole Location

Northing	Easting	Latitude	Longitude
388231.32	708221.28	32° 3' 58.257 N	103° 47' 40.538 W

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	8900.0	0.36	212.84	8897.9	-12.3	24.9	0.00	0.00	-12.3	
2	9402.5	60.00	359.54	9313.9	226.5	22.0	12.00	146.81	226.4	
3	9686.8	60.00	359.54	9456.0	472.7	20.1	0.00	0.00	472.6	
4	9936.9	90.00	359.54	9520.0	711.4	18.1	12.00	0.00	711.4	
5	13981.8	90.00	359.54	9520.0	4756.3	-14.3	0.00	0.00	4756.3	PBHL (P3Fed#1H)





PROJECT DETAILS: Lea County, NM (NAD 83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid

Crescent Directional Drilling
7715 West Industrial Ave. Midland, Tx.79706
Phone: 432-618-1135

Plan: ST1 Plan #1 (#1H/ST1)
Created By: Matt Higgins Date: 10:24, October 01 2012