

District I

1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

District II

811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

District III

1000 Rio Brazos Rd., Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

District IV

1220 S. St Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3470 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

NM OIL CONSERVATION
ARTESIA DISTRICT

Form C-101
August 1, 2011

Permit 137741

NM OIL CONSERVATION
ARTESIA DISTRICT

JAN 08 2015

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address COG OPERATING LLC One Concho Center Midland, TX 79701		2. OGRID Number 229137
		3. API Number 30-015-42891
4. Property Code 38873	5. Property Name FALABELLA 31 FEE	6. Well No. 005H

7. Surface Location

UL - Lot M	Section 31	Township 18S	Range 26E	Lot Idn 4	Feet From 150	N/S Line S	Feet From 929	EW Line W	County EDDY
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8. Proposed Bottom Hole Location

UL - Lot D	Section 31	Township 18S	Range 26E	Lot Idn 1	Feet From 330	N/S Line N	Feet From 807	EW Line W	County Eddy
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9. Pool Information

PENASCO DRAW/SA-YESO (ASSOC)	50270
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Additional Well Information

11. Work Type New Well	12. Well Type OIL	13. Cable/Rotary	14. Lease Type Private	15. Ground Level Elevation 3432
16. Multiple N	17. Proposed Depth 7387	18. Formation Yeso Formation	19. Contractor	20. Spud Date 7/18/2015
Depth to Ground water 110		Distance from nearest fresh water well > 1000		Distance to nearest surface water > 1000

☒ We will be using a closed-loop system in lieu of lined pits

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surf	11	8.625	32	1200	700	0
Prod	7.875	5.5	17	7306	800	0

Casing/Cement Program: Additional Comments

COG proposes to drill an 11" hole to 1200' w/fresh water, run 8-5/8" 32# J-55 and cement to surface. Drill a 7-7/8" hole to 2156' MD and kick off and drill curve to 2664' TVD 3332' MD. Drill a 7-7/8" lateral to new BHL @ 2526' TVD 7306' MD. Run a 5 1/2" 17# L-80 casing to TD cement to surface with 800 sacks.

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Double Ram	2000	2000	

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief.
I further certify I have complied with 19.15.14.9 (A) NMAC ☒ and/or 19.15.14.9 (B) NMAC ☒, if applicable.

Signature: *Kelly Holly*
Printed Name: **Kelly Holly**
Title: **Permitting Tech**
Email Address: **michaholly@gmail.com**
Date: **1-6-15**

312-0447

OIL CONSERVATION DIVISION

Approved By: *[Signature]*
Title: **Dist. II Supervisor**
Approved Date: **1-8-2015** Expiration Date: **1-8-2017**
Conditions of Approval Attached

JAN 07 2015

Form C-102

Revised August 1, 2011

Submit one copy to appropriate
District Office

☐ AMENDED REPORT

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1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-42891	Pool Code 50270	Pool Name Penasco Draw; SA-Yeso (Assoc)
Property Code 38873	Property Name FALABELLA 31 FEE	Well Number 5H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3432'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
4	31	18-S	26-E		150	SOUTH	929	WEST	EDDY

Bottom Hole Location If Different From Surface

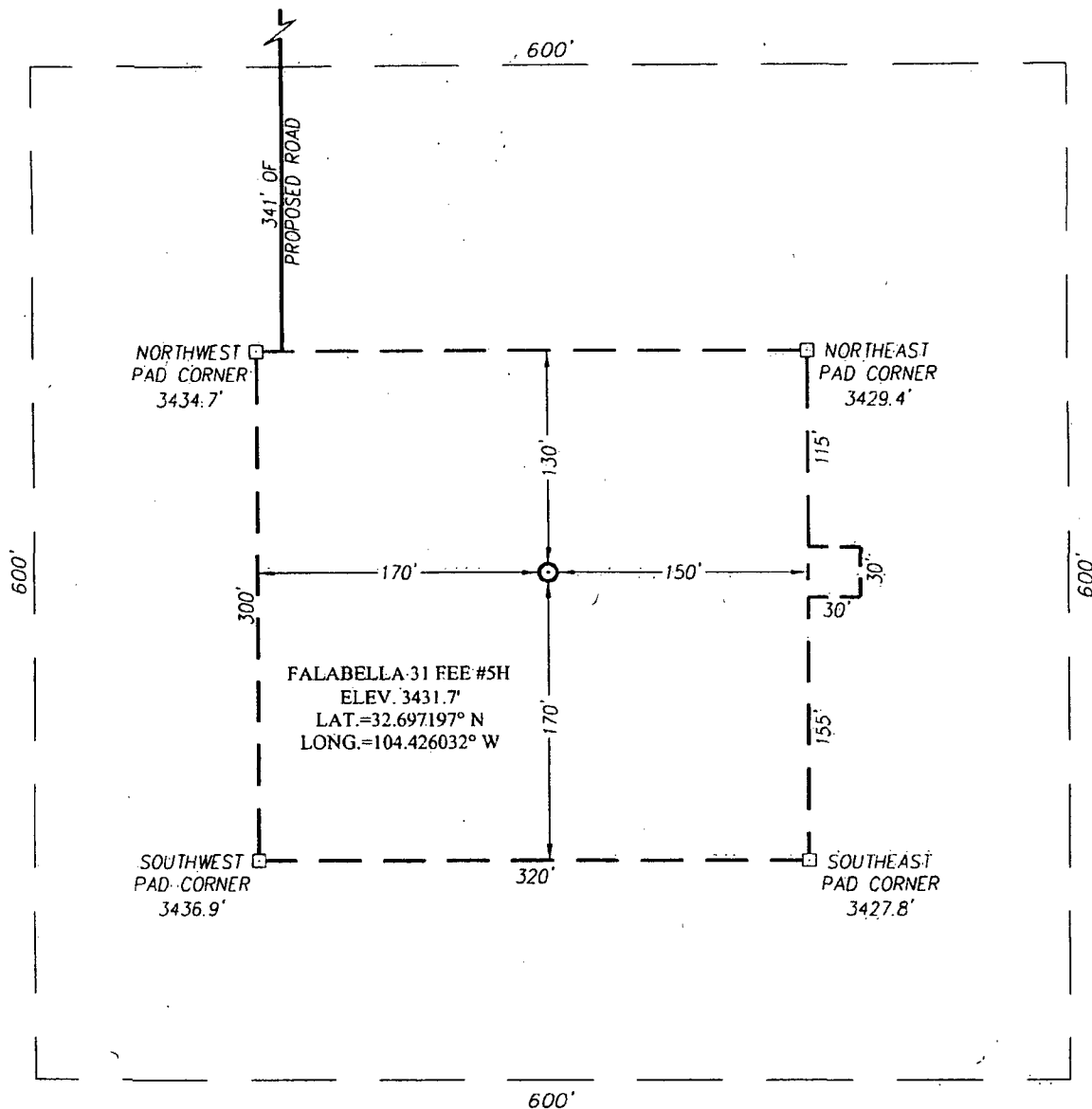
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
1	31	18-S	26-E		330	NORTH	807	WEST	EDDY

Dedicated Acres 141.38	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

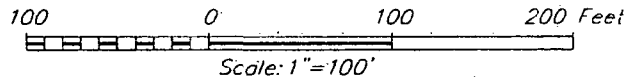
PRODUCING AREA PROJECT AREA GRID: AZ = 358'43"15" HORIZ. DIST. = 4843.3'	GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=617363.6 N X=471483.6 E LAT.=32.697197° N LONG.=104.426032° W BOTTOM HOLE LOCATION Y=622204.3 N X=471375.5 E	OPERATOR CERTIFICATION I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature 1-6-14 Date Kelly J. Holly Printed Name kholly@concho.com E-mail Address
	CORNER COORDINATES TABLE A - Y=622530.7 N, X=470569.0 E B - Y=622535.7 N, X=471703.5 E C - Y=617216.7 N, X=470554.5 E D - Y=617212.7 N, X=471734.5 E Estimated Completed Interval: U19 FSL 807 FWL	SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. NOVEMBER 29, 2012 Date of Survey Signature & Seal of Professional Surveyor: Gary G. Eidson Certificate Number AF JWSC W.O.: 12.11.1719

SECTION 31, TOWNSHIP 18 SOUTH, RANGE 26 EAST, N.M.P.M.
EDDY COUNTY **NEW MEXICO**



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF HWY. #285 AND CO. RD. #38 (KINCAID RANCH) GO WEST ON CO. RD. #38 APPROX. 2.75 MILES. TURN LEFT AND GO SOUTH APPROX. 0.9 MILES. TURN LEFT AND GO EAST APPROX. 1.0 MILE TO THE ROAD SURVEY. FOLLOW ROAD SURVEY 340 FEET SOUTH TO THIS LOCATION.



COG OPERATING, LLC

FALABELLA 31 FEE #5H WELL
LOCATED 150 FEET FROM THE SOUTH LINE
AND 929 FEET FROM THE WEST LINE OF SECTION 31,
TOWNSHIP 18 SOUTH, RANGE 26 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO

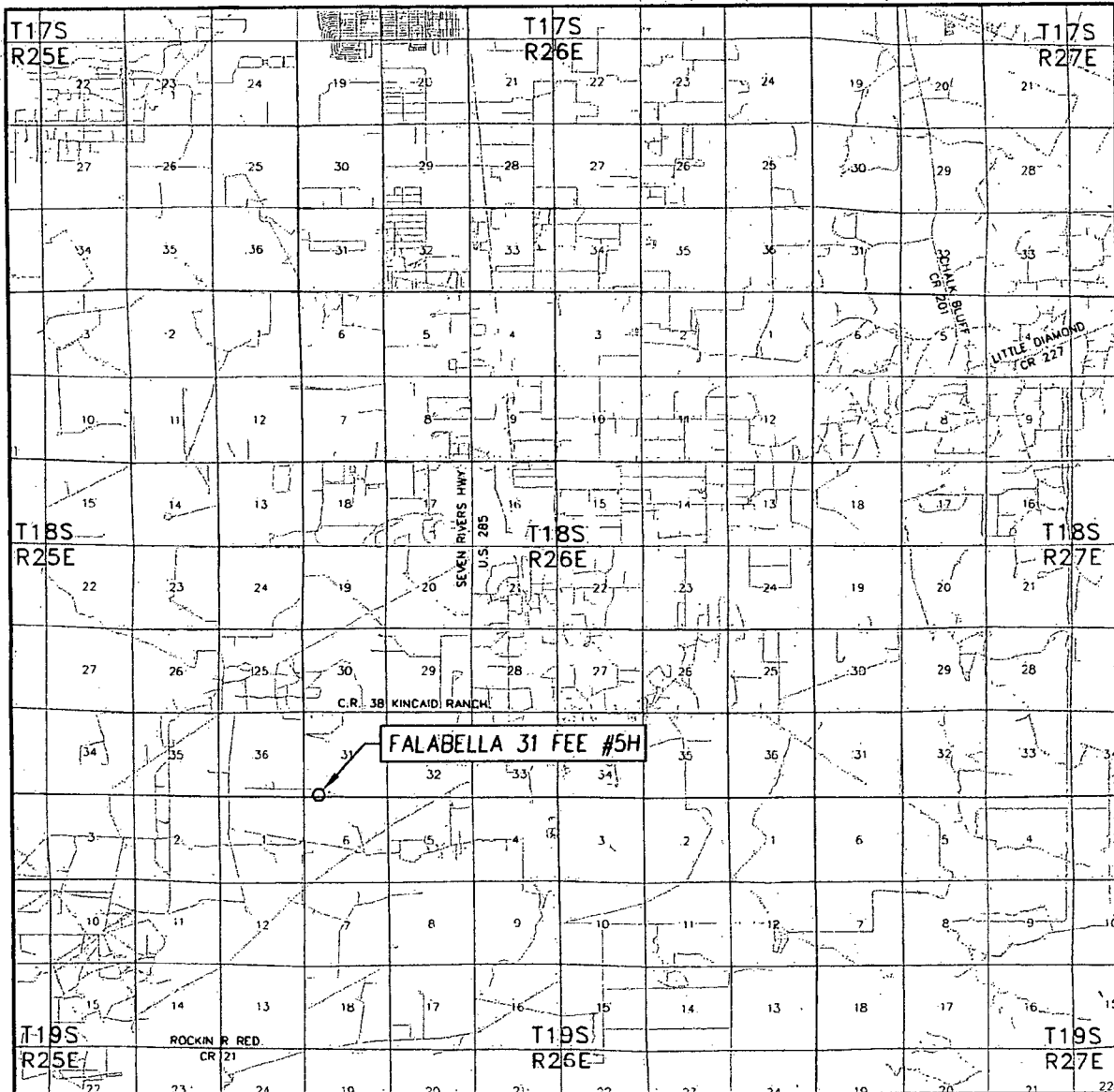


PROVIDING SURVEYING SERVICES
 SINCE 1946
JOHN WEST SURVEYING COMPANY
 412 N. DAL PASO
 HOBBS, N.M. 88240
 (575) 393-3117 www.jwsc.biz

Survey Date: 11/29/12	CAD Date: 12/5/12	Drawn By: AF
W.O. No.: 12111719	Rev.:	Rel. W.O.:

Sheet 1 of 1

VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 31 TWP. 18-S RGE. 26-E

SURVEY N.M.P.M.

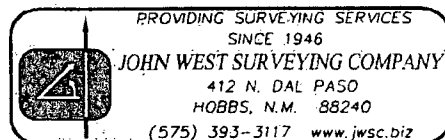
COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 150' FSL & 929' FWL

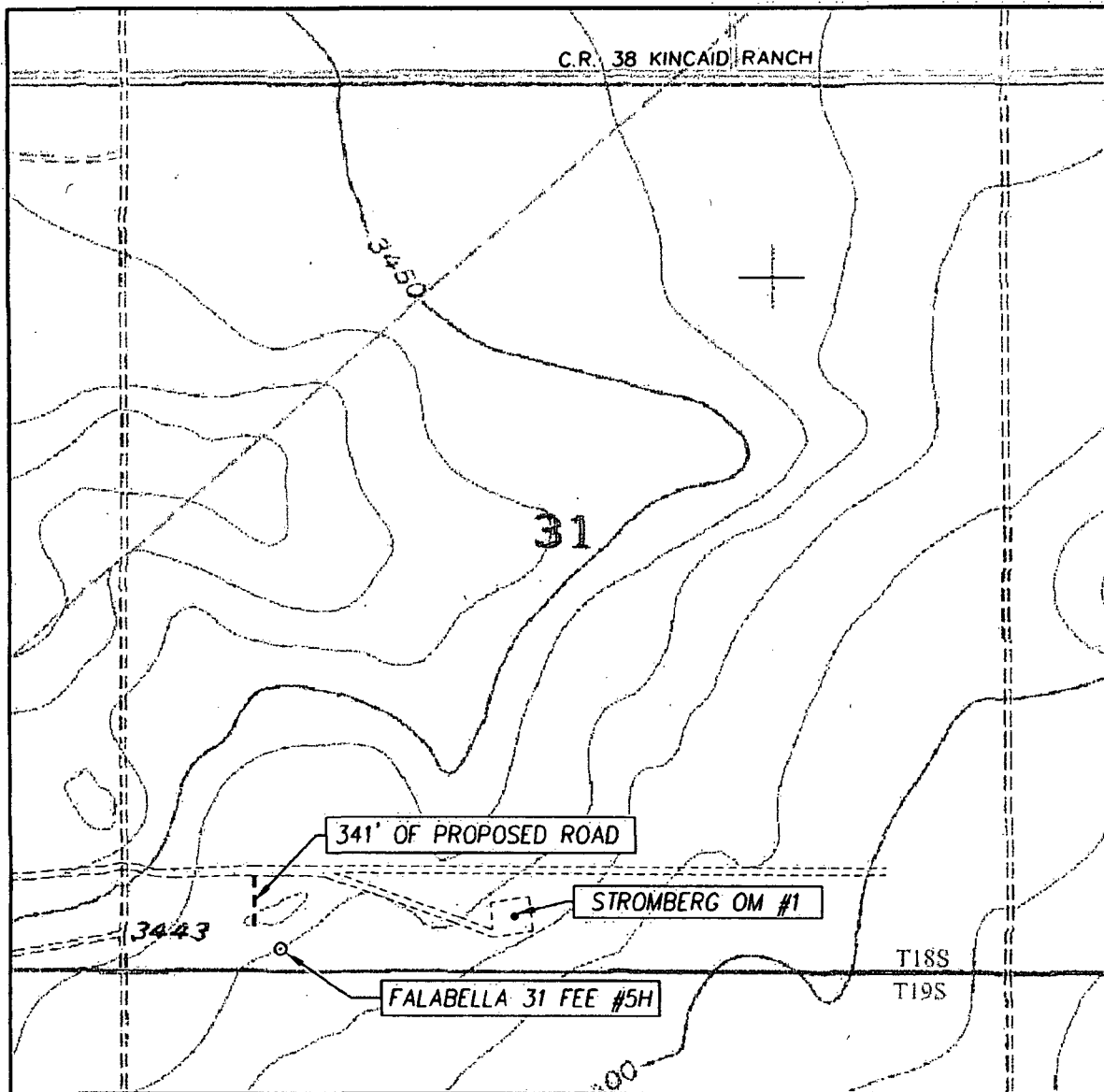
ELEVATION 3432'

OPERATOR COG OPERATING, LLC

LEASE FALABELLA 31 FEE



LOCATION VERIFICATION MAP



SCALE: 1" = 1000'

CONTOUR INTERVAL:
DAYTON, N.M. - 10'

SEC. 31 TWP. 18-S RGE. 26-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

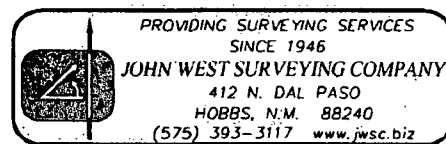
DESCRIPTION 150' FSL & 929' FWL

ELEVATION 3432'

OPERATOR COG OPERATING, LLC

LEASE FALABELLA 31 FEE

U.S.G.S. TOPOGRAPHIC MAP
DAYTON, N.M.





COG Operating LLC

Eddy County, NM (NAD27 NME)

Falabella 31 Fee

#5H

WB1

Plan: Plan #1 12-19-14

Surface: 150' FSL, 929' FWL, Sec 31, T18S, R26E, Lot #4

PP: 619' FSL, 807' FWL, Sec 31, T18S, R26E, Lot #4

BHL: 330' FNL, 807' FWL, Sec 31, T18S, R26E, Lot #1

Standard Planning Report

19 December, 2014





Phoenix Technology Services
Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #5H
Company:	COG Operating LLC	TVD Reference:	KB @ 3450.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27/NME)	MD Reference:	KB @ 3450.00usft (Silver Oak 3)
Site:	Falabella 31 Fee	North Reference:	Grid
Well:	#5H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 12-19-14		

Project	Eddy County, NM (NAD27/NME)		
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	Falabella 31 Fee		
Site Position:		Northing:	617,359.30 usft
From:	Map	Easting:	472,777.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 41' 49.87612 N
		Longitude:	104° 25' 18.57515 W
		Grid Convergence:	-0.05 °

Well	#5H		
Well Position	+N-S	4.30 usft	Northing:
	+E-W	-1,293.60 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 41' 49.90774 N
		Longitude:	104° 25' 33.71355 W
		Ground Level:	3,432.00 usft

Wellbore	WB1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010_14	12/19/2014	7.58
			Dip Angle
			(°)
			60.39
			Field Strength
			(nT)
			48,456

Design	Plan #1 12-19-14		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/S	+E/W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			358.72

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/S	+E/W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,155.71	0.00	0.00	2,155.71	0.00	0.00	0.00	0.00	0.00	0.00	
2,992.07	92.00	350.00	2,676.26	530.86	-93.60	11.00	11.00	0.00	350.00	
3,332.16	92.00	0.21	2,664.38	869.05	-122.57	3.00	0.00	3.00	89.85	
7,306.25	92.00	0.21	2,526.00	4,840.70	-108.10	0.00	0.00	0.00	0.00	PBHL-Falabella 31 #5



Phoenix Technology Services
Planning Report



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Company:	COG Operating LLC	TVD Reference:	KB @ 3450.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3450.00usft (Silver Oak 3)
Site:	Falabella 31 Fee	North Reference:	Grid
Well:	#5H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 12-19-14		

Planned 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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,155.71	0.00	0.00	2,155.71	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 11°/100' Build									
2,200.00	4.87	350.00	2,199.95	1.85	-0.33	1.86	11.00	11.00	0.00
2,300.00	15.87	350.00	2,298.16	19.56	-3.45	19.63	11.00	11.00	0.00
2,400.00	26.87	350.00	2,391.14	55.39	-9.77	55.59	11.00	11.00	0.00
2,500.00	37.87	350.00	2,475.47	108.04	-19.05	108.43	11.00	11.00	0.00
2,600.00	48.87	350.00	2,548.05	175.56	-30.96	176.21	11.00	11.00	0.00
2,700.00	59.87	350.00	2,606.21	255.49	-45.05	256.43	11.00	11.00	0.00
2,800.00	70.87	350.00	2,647.82	344.87	-60.81	346.14	11.00	11.00	0.00
2,900.00	81.87	350.00	2,671.35	440.43	-77.66	442.06	11.00	11.00	0.00
2,929.18	85.08	350.00	2,674.66	468.98	-82.69	470.71	11.00	11.00	0.00
PP, Falabella 31, #5H									
2,992.07	92.00	350.00	2,676.26	530.86	-93.60	532.81	11.00	11.00	0.00
LP, Hold 92° Inc, 358.72° Azm									
3,000.00	92.00	350.24	2,675.99	538.66	-94.96	540.65	3.00	0.01	3.00
3,100.00	92.01	353.24	2,672.49	637.55	-109.32	639.84	3.00	0.00	3.00
3,200.00	92.00	356.24	2,668.99	737.06	-118.48	739.52	3.00	0.00	3.00
3,300.00	92.00	359.24	2,665.50	836.91	-122.42	839.44	3.00	-0.01	3.00
3,332.16	92.00	0.21	2,664.38	869.05	-122.57	871.57	3.00	-0.01	3.00
3,400.00	92.00	0.21	2,662.01	936.85	-122.32	939.35	0.00	0.00	0.00
3,500.00	92.00	0.21	2,658.53	1,036.79	-121.96	1,039.25	0.00	0.00	0.00
3,600.00	92.00	0.21	2,655.05	1,136.73	-121.60	1,139.16	0.00	0.00	0.00
3,700.00	92.00	0.21	2,651.57	1,236.66	-121.23	1,239.06	0.00	0.00	0.00
3,800.00	92.00	0.21	2,648.09	1,336.60	-120.87	1,338.97	0.00	0.00	0.00
3,900.00	92.00	0.21	2,644.60	1,436.54	-120.50	1,438.87	0.00	0.00	0.00
4,000.00	92.00	0.21	2,641.12	1,536.48	-120.14	1,538.78	0.00	0.00	0.00
4,100.00	92.00	0.21	2,637.64	1,636.42	-119.78	1,638.69	0.00	0.00	0.00
4,200.00	92.00	0.21	2,634.16	1,736.36	-119.41	1,738.59	0.00	0.00	0.00
4,300.00	92.00	0.21	2,630.68	1,836.30	-119.05	1,838.50	0.00	0.00	0.00
4,400.00	92.00	0.21	2,627.19	1,936.24	-118.68	1,938.40	0.00	0.00	0.00
4,500.00	92.00	0.21	2,623.71	2,036.17	-118.32	2,038.31	0.00	0.00	0.00
4,600.00	92.00	0.21	2,620.23	2,136.11	-117.95	2,138.21	0.00	0.00	0.00
4,700.00	92.00	0.21	2,616.75	2,236.05	-117.59	2,238.12	0.00	0.00	0.00
4,800.00	92.00	0.21	2,613.27	2,335.99	-117.23	2,338.03	0.00	0.00	0.00
4,900.00	92.00	0.21	2,609.78	2,435.93	-116.86	2,437.93	0.00	0.00	0.00
5,000.00	92.00	0.21	2,606.30	2,535.87	-116.50	2,537.84	0.00	0.00	0.00
5,100.00	92.00	0.21	2,602.82	2,635.81	-116.13	2,637.74	0.00	0.00	0.00
5,200.00	92.00	0.21	2,599.34	2,735.75	-115.77	2,737.65	0.00	0.00	0.00
5,300.00	92.00	0.21	2,595.86	2,835.68	-115.41	2,837.55	0.00	0.00	0.00
5,400.00	92.00	0.21	2,592.38	2,935.62	-115.04	2,937.46	0.00	0.00	0.00
5,500.00	92.00	0.21	2,588.89	3,035.56	-114.68	3,037.37	0.00	0.00	0.00
5,600.00	92.00	0.21	2,585.41	3,135.50	-114.31	3,137.27	0.00	0.00	0.00
5,700.00	92.00	0.21	2,581.93	3,235.44	-113.95	3,237.18	0.00	0.00	0.00
5,800.00	92.00	0.21	2,578.45	3,335.38	-113.59	3,337.08	0.00	0.00	0.00
5,900.00	92.00	0.21	2,574.97	3,435.32	-113.22	3,436.99	0.00	0.00	0.00
6,000.00	92.00	0.21	2,571.48	3,535.25	-112.86	3,536.89	0.00	0.00	0.00
6,084.97	92.00	0.21	2,568.52	3,620.17	-112.55	3,621.78	0.00	0.00	0.00
TL, 2695' TVD, @ 0 VZ, 92° Inc									
6,100.00	92.00	0.21	2,568.00	3,635.19	-112.49	3,636.80	0.00	0.00	0.00
6,200.00	92.00	0.21	2,564.52	3,735.13	-112.13	3,736.70	0.00	0.00	0.00
6,300.00	92.00	0.21	2,561.04	3,835.07	-111.76	3,836.61	0.00	0.00	0.00
6,400.00	92.00	0.21	2,557.56	3,935.01	-111.40	3,936.52	0.00	0.00	0.00
6,500.00	92.00	0.21	2,554.07	4,034.95	-111.04	4,036.42	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #5H
Company:	COG Operating LLC	TVD Reference:	KB @ 3450.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27-NME)	MD Reference:	KB @ 3450.00usft (Silver Oak 3)
Site:	Falabella 31 Fee	North Reference:	Grid
Well:	#5H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 12-19-14		

Planned 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)
6,600.00	92.00	0.21	2,550.59	4,134.89	-110.67	4,136.33	0.00	0.00	0.00
6,700.00	92.00	0.21	2,547.11	4,234.83	-110.31	4,236.23	0.00	0.00	0.00
6,800.00	92.00	0.21	2,543.63	4,334.76	-109.94	4,336.14	0.00	0.00	0.00
6,900.00	92.00	0.21	2,540.15	4,434.70	-109.58	4,436.04	0.00	0.00	0.00
7,000.00	92.00	0.21	2,536.66	4,534.64	-109.22	4,535.95	0.00	0.00	0.00
7,100.00	92.00	0.21	2,533.18	4,634.58	-108.85	4,635.86	0.00	0.00	0.00
7,200.00	92.00	0.21	2,529.70	4,734.52	-108.49	4,735.76	0.00	0.00	0.00
7,297.55	92.00	0.21	2,526.30	4,832.01	-108.13	4,833.22	0.00	0.00	0.00
TD at 7297.55 MD									
7,300.00	92.00	0.21	2,526.22	4,834.46	-108.12	4,835.67	0.00	0.00	0.00
7,306.25	92.00	0.21	2,526.00	4,840.70	-108.10	4,841.91	0.00	0.00	0.00
PBHL-Falabella 31 #5H									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL-Falabella 31 #5H	0.00	360.00	2,526.00	4,840.70	-108.10	622,204.30	471,375.50	32° 42' 37.80847° N	104° 25' 35.02830° W
- plan hits target center									
- Point									
PP-Falabella 31 #5H	0.00	360.00	2,674.66	469.00	-82.70	617,832.60	471,400.90	32° 41' 54.54807° N	104° 25' 34.68613° W
- plan hits target center									
- Point									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,084.97	2,568.52	TL, 2695' TVD @ 0 VZ, 92° Inc		-2.00	358.72

Plan Annotations

Measured	Vertical	Local Coordinates		Comment
Depth (usft)	Depth (usft)	+N/-S (usft)	+E/-W (usft)	
2,155.71	2,155.71	0.00	0.00	KOP, Begin 11°/100' Build
2,992.07	2,676.26	530.86	-93.60	LP, Hold 92° Inc, 358.72° Azm
7,297.55	2,526.30	4,832.01	-108.13	TD at 7297.55' MD



Project: Eddy County, NM (NAD27 NME)
Site: Falabella 31 Fee
Well: #5H
Wellbore: WB1
Design: Plan #1 12-19-14
Rig: Silver Oak 3



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TECHNOLOGY SERVICES



Azimuths to Grid North
True North: 0.05°
Magnetic North: 7.63°
Magnetic Field
Strength: 48455.6nT
Dip Angle: 60.39°
Date: 12/19/2014
Model: IGRF2010_14

WELL DETAILS

+N-S	+E-W	Northing	Ground Level	Easting	Latitude	Longitude
0.00	0.00	617363.60	3432.00	471483.60	32° 41' 49.90774 N	104° 25' 33.71355 W

SECTION DETAILS

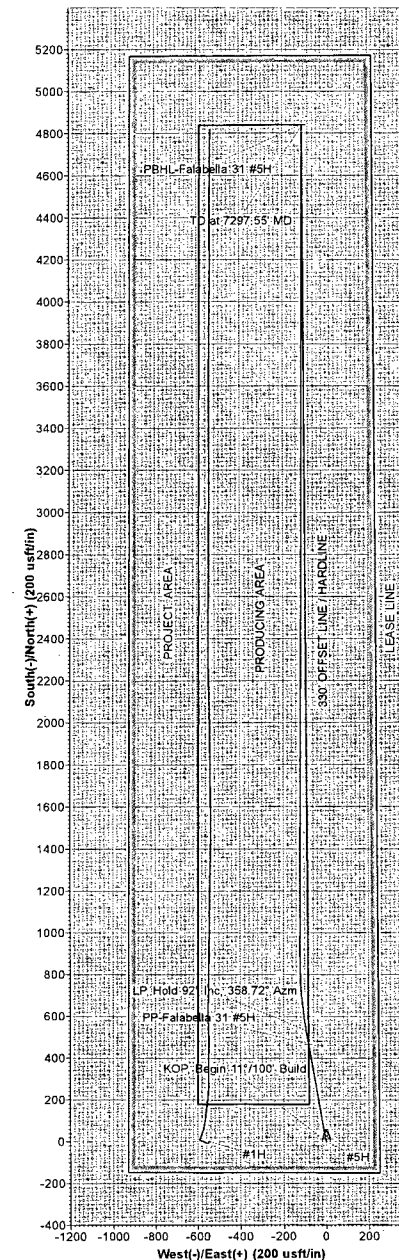
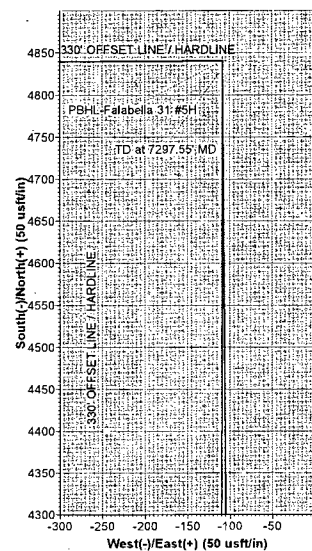
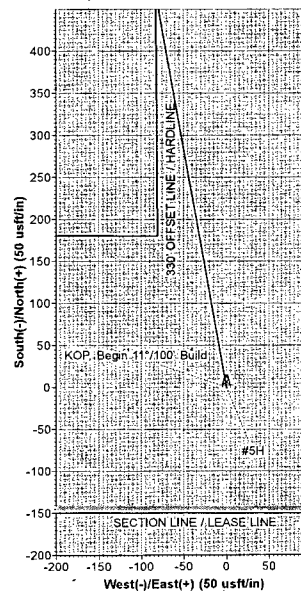
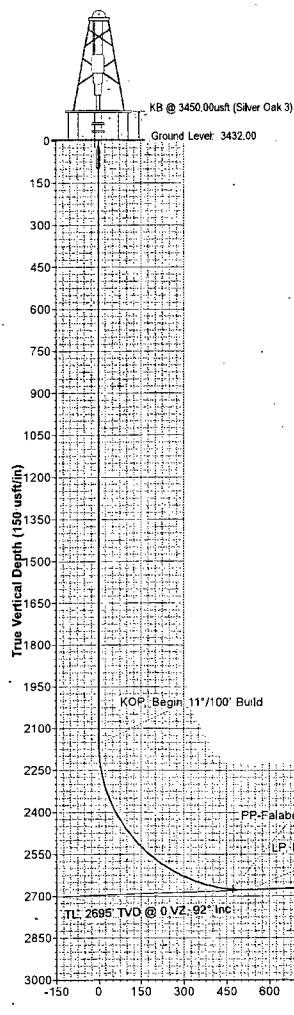
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	V Sect - Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2155.71	0.00	0.00	2155.71	0.00	0.00	0.00	0.00	0.00	KOP, Begin 11°/100' Build
3	2892.07	92.00	350.00	2676.26	530.86	-93.60	11.00	350.00	532.82	LP, Hold 92° Inc. 358.72° Azm
4	3332.16	92.00	0.21	2664.38	669.05	-122.57	3.00	66.85	871.57	
5	7306.25	92.00	0.21	2526.00	4840.70	-108.10	0.00	0.00	4841.91	PBHL-Falabella 31 #5H

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude	Shape
PBHL-Falabella 31 #5H	2526.00	4840.70	-108.10	622204.30	471375.50	32° 42' 37.80847 N	104° 25' 35.02830 W	Point
PP-Falabella 31 #5H	2674.66	469.00	-32.70	617832.60	471400.90	32° 41' 54.54807 N	104° 25' 34.68612 W	Point

LEGEND

— #1H, WB1/Job #1310862, Surveys (JW 4) V0
— Plan #1 12-19-14





COG Operating LLC

Eddy County, NM (NAD27 NME)

Falabella 31 Fee

#5H

WB1

Plan #1 12-19-14

Anticollision Report

19 December, 2014



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #5H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3450.00usft (Silver Oak 3)
Reference Site:	Falabella 31 Fee	MD Reference:	KB @ 3450.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#5H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 12-19-14	Offset TVD Reference:	Offset Datum

Reference	Plan #1 12-19-14		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Circular Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 12/19/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	7,306.25	Plan #1 12-19-14 (WB1)	PHX+MWD+IGRF	PHX+MWD+IGRF v3: standard declination

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Falabella 31 Fee						
#1H - WB1/Job #1310862 - Surveys (JW 4)	3,901.87	3,989.43	433.79	375.85	7.486	CC
#1H - WB1/Job #1310862 - Surveys (JW 4)	7,271.14	7,363.35	442.97	256.31	2.373	ES
#1H - WB1/Job #1310862 - Surveys (JW 4)	7,306.25	7,366.00	443.82	256.37	2.368	SF

Offset Design Falabella 31 Fee - #1H - WB1/Job #1310862 - Surveys (JW 4)											Offset Site Error: 0.00 usft		
Survey Program: 100-VES-ISCWSA-GYRO-3 2230-MWD											Offset Well Error: 0.00 usft		
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	3.06	3.06	0.00	0.00	-89.81	1.80	-548.80	548.80				
100.00	100.00	104.65	104.65	0.15	0.09	-89.85	1.40	-548.62	548.63	548.39	0.24	2,296.463	
150.98	150.98	153.98	153.98	0.33	0.18	-89.89	1.06	-548.55	548.55	548.04	0.51	1,069.693	
200.00	200.00	201.44	201.44	0.51	0.27	-89.92	0.78	-548.62	548.62	547.85	0.78	707.432	
300.00	300.00	300.00	299.99	0.86	0.45	-90.00	-0.01	-549.06	549.07	547.75	1.32	417.071	
400.00	400.00	400.00	399.99	1.22	0.64	-90.10	-0.97	-549.63	549.64	547.78	1.86	295.252	
500.00	500.00	497.88	497.85	1.58	0.82	-90.20	-1.94	-550.35	550.37	547.97	2.40	229.061	
600.00	600.00	598.72	598.69	1.94	1.01	-90.34	-3.27	-551.21	551.24	548.29	2.95	186.847	
700.00	700.00	698.30	698.26	2.30	1.20	-90.49	-4.75	-552.02	552.06	548.58	3.50	157.922	
800.00	800.00	795.97	795.91	2.66	1.38	-90.59	-5.71	-553.05	553.13	549.09	4.03	137.109	
900.00	900.00	894.86	894.79	3.01	1.56	-90.63	-6.05	-554.42	554.51	549.94	4.57	121.307	
1,000.00	1,000.00	890.95	890.86	3.37	1.73	-90.62	-6.05	-556.16	556.33	551.23	5.10	109.063	
1,100.00	1,100.00	1,091.87	1,091.77	3.73	1.91	-90.58	-5.68	-558.33	558.47	552.83	5.64	99.052	
1,200.00	1,200.00	1,190.81	1,190.68	4.09	2.08	-90.51	-4.96	-560.40	560.55	554.38	6.17	90.841	
1,300.00	1,300.00	1,289.83	1,289.67	4.45	2.26	-90.41	-4.06	-562.67	562.84	556.14	6.70	83.945	
1,400.00	1,400.00	1,391.55	1,391.35	4.81	2.44	-90.31	-3.03	-564.95	565.08	557.84	7.24	78.007	
1,500.00	1,500.00	1,486.84	1,486.60	5.17	2.61	-90.15	-1.53	-567.27	567.51	559.73	7.77	73.025	
1,600.00	1,600.00	1,583.41	1,583.11	5.52	2.78	-89.99	0.13	-570.37	570.72	562.41	8.30	68.731	
1,700.00	1,700.00	1,680.76	1,680.38	5.88	2.96	-89.83	1.67	-573.99	574.43	565.60	8.84	64.985	
1,800.00	1,800.00	1,783.98	1,783.52	6.24	3.15	-89.69	3.13	-577.85	578.19	568.80	9.39	61.594	
1,900.00	1,900.00	1,882.73	1,882.20	6.60	3.33	-89.57	4.37	-581.19	581.58	571.65	9.93	58.585	
2,000.00	2,000.00	1,984.39	1,983.79	6.96	3.52	-89.46	5.52	-584.73	585.07	574.60	10.47	55.862	
2,100.00	2,100.00	2,083.16	2,082.51	7.32	3.70	-89.38	6.41	-588.01	588.41	577.39	11.02	53.418	
2,155.71	2,155.71	2,141.90	2,141.21	7.52	3.80	-89.31	7.06	-589.94	590.25	578.93	11.31	52.166	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate/Reference:	Well #5H
Project:	Eddy County - NM (NAD27 NME)	TVD Reference:	KB @ 3450.00usft (Silver Oak 3)
Reference Site:	Falabella 31 Fee	MD Reference:	KB @ 3450.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#5H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #112-19-14	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 100-VES-ISCWSA-GYRO-3-2230-MWD												Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,200.00	2,199.95	2,187.79	2,187.08	7.68	3.84	-79.36	7.56	-591.24	591.15	579.63	11.52	51.328	
2,250.00	2,249.49	2,248.73	2,248.00	7.86	3.88	-80.09	8.26	-592.61	591.15	579.40	11.74	50.343	
2,300.00	2,298.16	2,347.57	2,346.07	8.04	3.91	-81.71	18.02	-588.36	586.63	574.68	11.96	49.069	
2,350.00	2,345.53	2,420.03	2,415.44	8.23	3.97	-82.87	37.65	-581.70	579.36	567.16	12.20	47.506	
2,400.00	2,391.14	2,478.65	2,468.91	8.43	4.06	-84.01	60.61	-574.89	570.07	557.58	12.49	45.639	
2,450.00	2,434.59	2,520.78	2,505.57	8.66	4.17	-85.19	80.77	-570.07	560.16	547.32	12.84	43.642	
2,500.00	2,475.47	2,560.73	2,538.89	8.93	4.32	-86.44	102.47	-566.31	550.61	537.36	13.25	41.543	
2,550.00	2,513.41	2,606.93	2,575.36	9.26	4.56	-87.78	130.59	-562.76	541.36	527.54	13.82	39.165	
2,600.00	2,548.05	2,661.99	2,615.72	9.65	4.95	-89.28	167.81	-558.87	531.92	517.32	14.60	36.442	
2,650.00	2,579.08	2,715.86	2,651.84	10.11	5.42	-90.92	207.53	-554.64	521.61	506.08	15.53	33.591	
2,700.00	2,606.21	2,760.00	2,678.88	10.64	5.87	-92.59	242.27	-551.64	511.53	495.02	16.51	30.980	
2,750.00	2,629.20	2,797.78	2,700.10	11.25	6.30	-94.20	273.49	-550.00	502.52	484.96	17.55	28.627	
2,800.00	2,647.82	2,838.49	2,721.13	11.94	6.80	-95.91	308.32	-549.34	494.91	476.17	18.74	26.411	
2,850.00	2,661.92	2,889.89	2,745.29	12.69	7.48	-98.00	353.69	-549.22	486.28	468.11	20.17	24.210	
2,900.00	2,671.35	2,950.45	2,769.91	13.50	8.34	-100.55	409.00	-548.79	481.75	459.92	21.84	22.063	
2,950.00	2,676.03	3,009.52	2,786.76	14.35	9.25	-102.88	465.54	-548.42	475.11	451.51	23.60	20.133	
2,992.07	2,676.26	3,052.71	2,793.55	15.10	9.95	-104.40	508.17	-549.01	470.07	445.02	25.05	18.765	
3,000.00	2,675.99	3,061.68	2,794.43	15.24	10.10	-104.57	517.10	-549.22	469.19	443.85	25.34	18.514	
3,100.00	2,672.49	3,190.63	2,796.14	17.09	12.23	-105.67	645.96	-550.62	457.58	428.25	29.32	15.605	
3,200.00	2,668.99	3,292.46	2,791.94	18.97	13.91	-105.78	747.69	-549.19	447.22	414.34	32.89	13.599	
3,300.00	2,665.50	3,391.17	2,787.79	20.86	15.48	-105.70	846.30	-548.46	442.52	406.19	36.33	12.179	
3,332.16	2,664.38	3,426.09	2,786.50	21.46	16.02	-105.68	881.20	-547.93	441.89	404.42	37.48	11.791	
3,400.00	2,662.01	3,493.88	2,784.16	22.74	17.09	-105.72	948.93	-546.52	440.78	400.95	39.83	11.068	
3,500.00	2,658.53	3,590.82	2,781.20	24.66	18.64	-105.82	1,045.82	-544.97	439.70	396.41	43.29	10.156	
3,600.00	2,655.05	3,692.95	2,778.33	26.61	20.32	-105.94	1,147.90	-543.59	438.94	392.01	46.93	9.353	
3,700.00	2,651.57	3,796.59	2,773.87	28.59	22.05	-105.89	1,251.42	-541.59	437.21	386.57	50.64	8.633	
3,800.00	2,648.09	3,896.77	2,770.11	30.59	23.72	-105.94	1,351.49	-539.05	435.05	380.74	54.31	8.010	
3,900.00	2,644.60	3,987.77	2,766.72	32.60	25.28	-105.95	1,442.41	-537.58	433.80	375.91	57.88	7.495	
3,901.87	2,644.54	3,989.43	2,766.66	32.64	25.31	-105.95	1,444.08	-537.58	433.79	375.85	57.95	7.486 CC	
4,000.00	2,641.12	4,083.22	2,763.49	34.63	26.91	-105.94	1,537.81	-537.85	434.43	372.90	61.53	7.060	
4,100.00	2,637.64	4,178.70	2,760.59	36.67	28.54	-105.94	1,633.25	-538.85	435.92	370.71	65.21	6.685	
4,200.00	2,634.16	4,285.76	2,756.51	38.72	30.39	-105.84	1,740.22	-540.16	437.36	368.25	69.11	6.328	
4,300.00	2,630.68	4,383.28	2,751.57	40.78	32.09	-105.60	1,837.60	-540.92	438.04	365.18	72.86	6.012	
4,400.00	2,627.19	4,481.48	2,746.87	42.84	33.79	-105.39	1,935.68	-542.14	439.23	362.60	76.63	5.732	
4,500.00	2,623.71	4,579.46	2,742.56	44.91	35.49	-105.21	2,033.56	-543.70	440.89	360.49	80.40	5.484	
4,600.00	2,620.23	4,679.01	2,738.62	46.99	37.18	-105.08	2,133.01	-545.44	442.80	358.62	84.17	5.261	
4,700.00	2,616.75	4,778.31	2,735.08	49.07	38.86	-105.00	2,232.23	-547.17	444.81	356.88	87.93	5.058	
4,800.00	2,613.27	4,881.24	2,732.33	51.16	40.62	-105.03	2,335.12	-548.84	446.95	355.17	91.77	4.870	
4,900.00	2,609.78	4,987.43	2,728.62	53.24	42.45	-105.02	2,441.24	-548.79	447.23	351.54	95.69	4.674	
5,000.00	2,606.30	5,090.80	2,725.05	55.34	44.24	-105.02	2,544.54	-548.44	447.27	347.69	99.57	4.492	
5,100.00	2,602.82	5,191.18	2,721.34	57.43	45.97	-105.03	2,644.85	-547.01	446.18	342.78	103.40	4.315	
5,200.00	2,599.34	5,288.39	2,718.17	59.53	47.68	-105.07	2,742.00	-546.20	445.79	338.58	107.21	4.158	
5,257.82	2,597.33	5,345.58	2,716.47	60.74	48.69	-105.11	2,799.16	-545.88	445.76	336.33	109.43	4.073	
5,300.00	2,595.86	5,387.67	2,715.26	61.63	49.43	-105.15	2,841.24	-545.66	445.76	334.71	111.05	4.014	
5,400.00	2,592.38	5,488.37	2,712.62	63.73	51.15	-105.26	2,941.90	-545.02	445.72	330.85	114.87	3.880	
5,500.00	2,588.89	5,587.93	2,710.56	65.83	52.84	-105.45	3,041.43	-544.16	445.61	326.94	118.67	3.755	
5,516.07	2,588.33	5,603.83	2,710.27	66.17	53.11	-105.49	3,057.33	-544.02	445.61	326.32	119.28	3.736	
5,600.00	2,585.41	5,686.55	2,707.70	67.94	54.53	-105.53	3,140.01	-543.75	445.72	323.25	122.47	3.639	
5,700.00	2,581.93	5,787.19	2,703.31	70.04	56.24	-105.40	3,240.56	-543.84	445.92	319.64	126.28	3.531	
5,800.00	2,578.45	5,885.81	2,699.01	72.15	57.94	-105.28	3,339.08	-544.03	446.23	316.14	130.08	3.430	
5,900.00	2,574.97	5,986.52	2,694.61	74.26	59.67	-105.14	3,439.69	-544.27	446.58	312.65	133.92	3.335	
6,000.00	2,571.48	6,086.25	2,690.15	76.37	61.37	-105.00	3,539.32	-544.46	446.85	309.11	137.74	3.244	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Phoenix Technology Services
Anticollision Report



Company:	GOG Operating LLC	Local Co-ordinate Reference:	Well #5H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3450.00usft (Silver Oak 3)
Reference Site:	Falabella 31 Fee	MD Reference:	KB @ 3450.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#5H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1, 12-19-14	Offset TVD Reference:	Offset Datum

Offset Design Falabella 31 Fee - #1H - WB1/Job #1310862 - Surveys (JW4)												Offset Site Error:	0.00 usft
Survey Program: 100-VES-HSCWSA-GYRO-3-2230-MWD												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning					
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre	Between	Between	Minimum	Separation		
Depth	Depth	Depth	Depth	Depth	Depth	Toolface	+N-S	+E-W	Centres	Ellipses	Separation		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
6,100.00	2,568.00	6,187.14	2,685.87	78.48	63.13	-104.89	3,640.12	-544.80	447.33	305.72	141.61	3.159	
6,200.00	2,564.52	6,292.03	2,682.39	80.59	64.94	-104.93	3,744.94	-543.64	446.64	301.12	145.53	3.069	
6,300.00	2,561.04	6,390.16	2,679.81	82.71	66.64	-105.07	3,843.03	-542.28	445.88	296.53	149.35	2.986	
6,400.00	2,557.56	6,489.61	2,677.83	84.82	68.38	-105.28	3,942.45	-541.14	445.52	292.33	153.19	2.908	
6,500.00	2,554.07	6,590.52	2,676.08	86.93	70.10	-105.53	4,043.34	-539.74	445.00	287.96	157.03	2.834	
6,598.26	2,550.65	6,686.12	2,674.57	89.01	71.74	-105.79	4,138.92	-538.45	444.57	283.82	160.75	2.766	
6,600.00	2,550.59	6,687.78	2,674.54	89.05	71.76	-105.80	4,140.58	-538.43	444.57	283.76	160.81	2.765	
6,700.00	2,547.11	6,782.97	2,672.71	91.17	73.41	-105.98	4,235.75	-538.21	445.12	280.55	164.57	2.705	
6,800.00	2,543.63	6,882.68	2,669.93	93.28	75.12	-106.02	4,335.42	-539.00	446.42	278.02	168.40	2.651	
6,900.00	2,540.15	6,991.40	2,666.41	95.40	76.98	-106.04	4,444.07	-538.92	446.78	274.40	172.38	2.592	
7,000.00	2,536.66	7,092.11	2,661.46	97.52	78.71	-105.89	4,544.66	-537.97	445.83	269.60	176.23	2.530	
7,100.00	2,533.18	7,193.31	2,656.97	99.64	80.45	-105.80	4,645.75	-536.73	444.74	264.65	180.09	2.470	
7,200.00	2,529.70	7,292.21	2,652.86	101.75	82.17	-105.74	4,744.56	-535.45	443.66	259.74	183.92	2.412	
7,271.14	2,527.22	7,363.35	2,650.00	103.26	83.40	-105.72	4,815.63	-534.58	442.97	256.31	186.66	2.373 ES	
7,306.25	2,526.00	7,366.00	2,649.90	104.01	83.44	-105.72	4,818.28	-534.55	443.82	256.37	187.45	2.368 SF	



Phoenix Technology Services
Anticollision Report

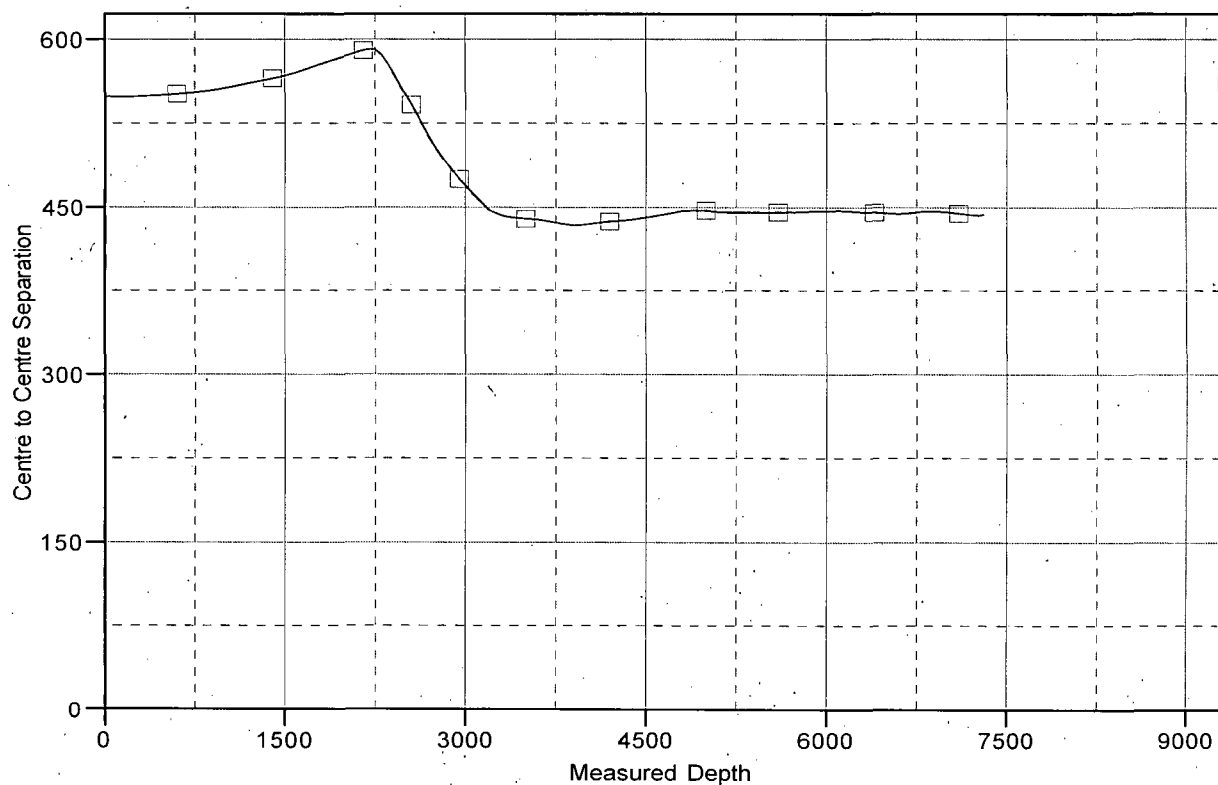


Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well #5H
Project:	Eddy County - NM (NAD27 NME)	TVD Reference:	KB @ 3450.00usft (Silver Oak 3)
Reference Site:	Falabella 31 Fee	MD Reference:	KB @ 3450.00usft (Silver Oak 3)
Site Error:	0:00 usft	North Reference:	Grid
Reference Well:	#5H	Survey Calculation Method:	Minimum Curvature
Well Error:	0:00 usft	Output errors are at	2:00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1, 12-19-14	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3450.00usft (Silver Oak 3)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #5H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.05°

Ladder Plot



LEGEND

—■— #1H, WB1/Job #1310862, Surveys (JW4) V0



Phoenix Technology Services
Anticollision Report

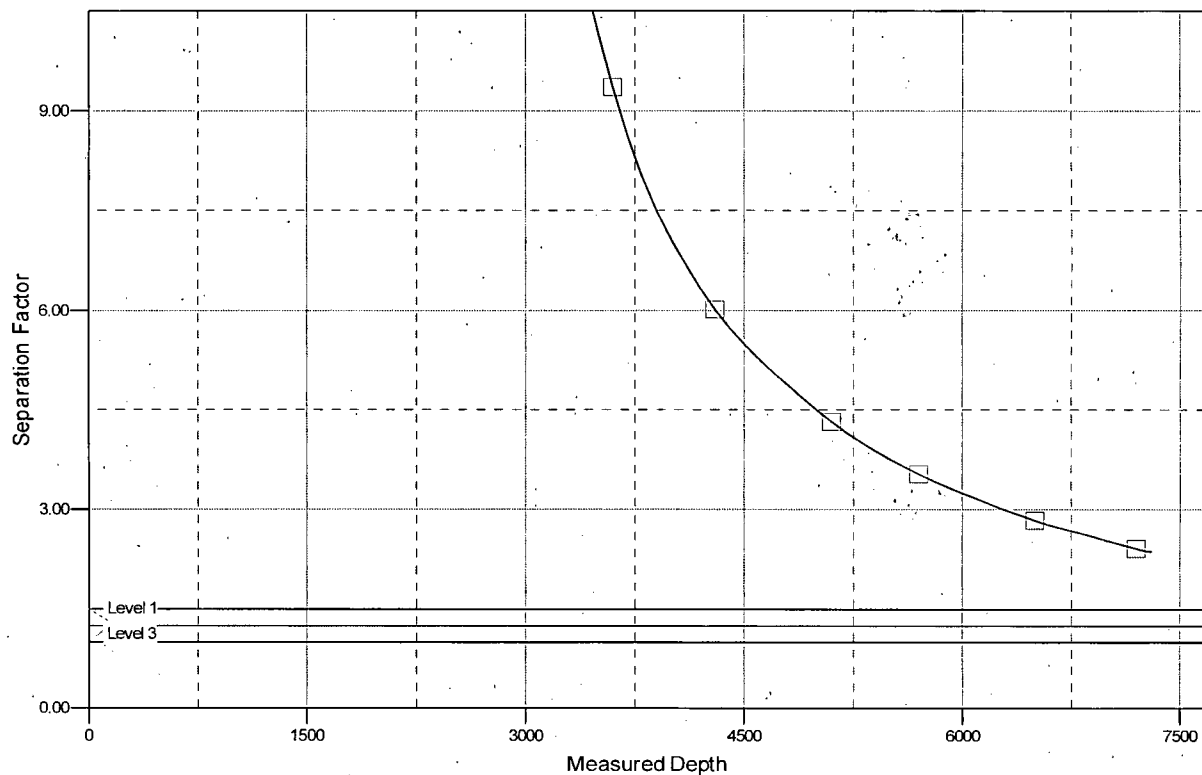


Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #5H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3450.00usft (Silver Oak 3)
Reference Site:	Falabella 31 Fee	MD Reference:	KB @ 3450.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#5H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1-12-19-14	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3450.00usft (Silver Oak 3).
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #5H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.05°

Separation Factor Plot



LEGEND

■ #1H, WB1/Job #1310862, Surveys (JW4) V0