

District I1625 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

Form C-101
August 1, 2011

Permit 194484

NM OIL CONSERVATION
ARTESIA DISTRICT

OCT 27 2014

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

RECEIVED

1. Operator Name and Address COG OPERATING LLC One Concho Center Midland, TX 79701		2. OGRID Number 229137
4. Property Code 39004		5. Property Name BRADLEY 8 FEE
		3. API Number 30-015-42757
		6. Well No. 026H

7. Surface Location

UL - Lot C	Section 17	Township 19S	Range 26E	Lot Idn	Feet From 165	N/S Line N	Feet From 2310	E/W Line W	County EDDY
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8. Proposed Bottom Hole Location

UL - Lot C	Section 8	Township 19S	Range 26E	Lot Idn C	Feet From 330	N/S Line N	Feet From 2301	E/W Line W	County Eddy
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9. Pool Information

WILDCAT G-01 S192617K:GLOR-YESO	97788
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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 3377
16. Multiple N	17. Proposed Depth 9065	18. Formation Yeso Formation	19. Contractor	20. Spud Date 11/5/2014
Depth to Ground water 110		Distance from nearest fresh water well > 1000		Distance to nearest surface water > 1000

X 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	12.25	9.625	40	1200	700	0
Int1	8.75	7	29	3600	0	
Prod	7.875	5.5	17	9065	800	

Casing/Cement Program: Additional Comments

COG proposes to drill an 12 1/2" hole to 1200' w/fresh water, run 9-5/8" 40# J-55 and cement to surface. Drill a 8-3/4" hole to 3500' MD and reduce hole size to 7-7/8". Drill pilot hole to 4700'. Evaluate with logs and cores. Plug back pilot hole with cement. Kick off, drill 8-3/4" curve to 4130' TVD, 4432' MD. Drill 7 7/8" lateral to new BHL @ 4090' TVD 9065' MD. Run tapered string 7" 29# L80 and 5 1/2" 17# L80 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:

Printed Name: Kelly J Holly

Title: Permitting Tech

Email Address: kholly@concho.com

Date: 10-27-14

Phone: 432

685-4384

OIL CONSERVATION DIVISION

Approved By:

Title:

Approved Date:

Conditions of Approval Attached

Expiration Date:

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

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Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
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

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

DAMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015- 42757	Pool Code 97788	Pool Name Wildcat G-01 S192617K; Glor-Yeso
Property Code 39004	Property Name BRADLEY 8 FEE	Well Number 26H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3377'

Surface Location

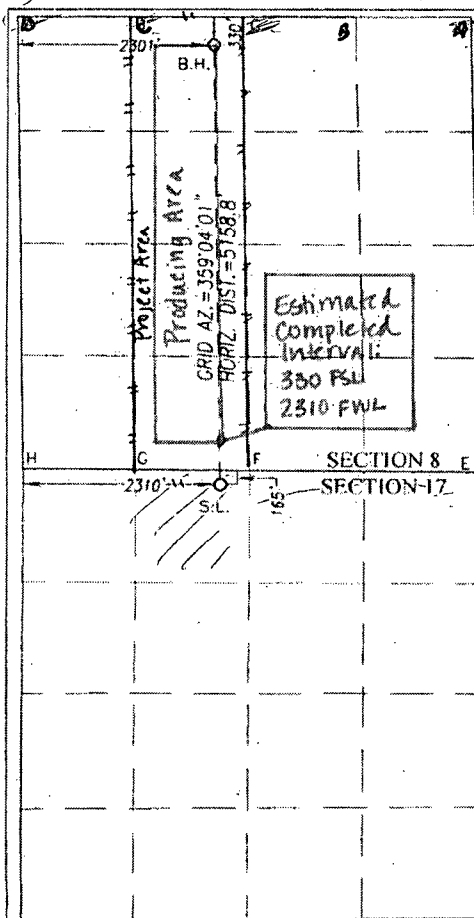
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	17	19-S	26-E		165	NORTH	2310	WEST	EDDY

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
C	8	19-S	26-E		330	NORTH	2301	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

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



BOTTOM HOLE LOCATION

Y= 611643.4 N
X= 478044.9 E

CORNER COORDINATES TABLE

A - Y= 611972.4 N, X= 475739.2 E
B - Y= 611972.9 N, X= 477054.2 E
C - Y= 611973.5 N, X= 478369.2 E
D - Y= 611974.5 N, X= 480999.1 E
E - Y= 606633.7 N, X= 481111.2 E
F - Y= 606649.7 N, X= 478466.0 E
G - Y= 606657.7 N, X= 477143.4 E
H - Y= 606665.7 N, X= 475820.8 E

GEODETIC COORDINATES
NAD 27 NME

SURFACE LOCATION
Y= 606486.7 N
X= 478128.9 E

LAT.=32.667312° N
LONG.=103.404406° W

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 under heretofore entered by the division.

[Signature]
Signature
10-22-14
Date

Kelly J. Holly

Printed Name

kholly@concho.com

E-mail Address

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.

SEPTEMBER 09, 2014

Date of Survey
Signature & Seal of Professional Surveyor:

[Signature]
RONALD J. EIDSON
Professional Surveyor
Certificate Number: 8290
Date: 09/24/2014
LSI: JWSC W.O.: 14.1.0950



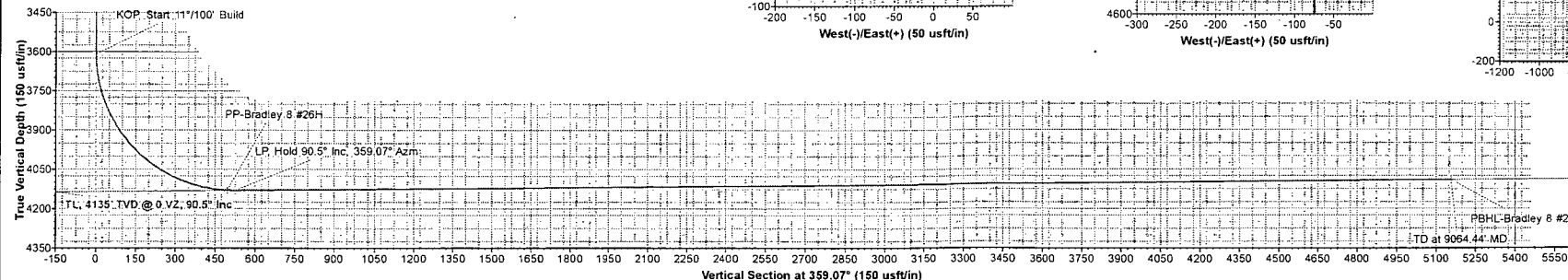
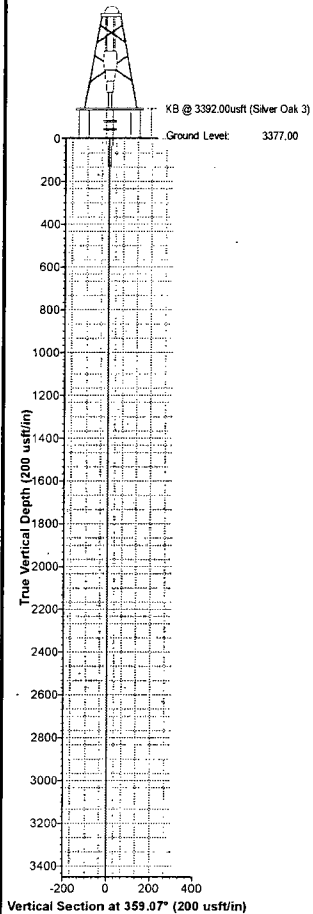
Project: Eddy County, NM (NAD27 NME)
Site: Bradley 8 Fee
Well: #26H
Wellbore: WB1
Design: Plan #1 10-20-14
Rig: Silver Oak 3



PHOENIX
TECHNOLOGY SERVICES



Azimuths to Grid North
True North: 0.04°
Magnetic North: 7.63°
Magnetic Field
Strength: 48456.9nT
Dip Angle: 60.37°
Date: 10/20/2014
Model: IGRF2010_14



WELL DETAILS						
		Ground Level	3377.00			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	606486.70	478128.90	32° 40' 2.32456 N	104° 24' 15.86164 W	

SECTION DETAILS										
Sec	MD	Inc	As	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3609.57	0.00	0.00	3609.57	0.00	0.00	0.00	0.00	0.00	KOP Start 11°/100' Build
3	4432.30	90.50	359.07	4130.42	525.35	-8.56	11.00	359.07	525.42	LP Hold 90.5° Inc. 359.07° Azm
4	9064.44	90.50	359.07	4090.00	5156.70	-84.00	0.00	0.00	5157.38	PBHL-Bradley 8 #26H

DESIGN TARGET DETAILS										
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape		
PBHL-Bradley 8 #26H	4090.00	5156.70	-84.00	611643.40	478044.90	32° 40' 53.35294 N	104° 24' 16.88488 W	Point		
	plan hits target center									
PP-Bradley 8 #26H	4129.80	495.00	-8.06	606981.70	478120.84	32° 40' 7.22286 N	104° 24' 15.95985 W	Point		
	plan hits target center									

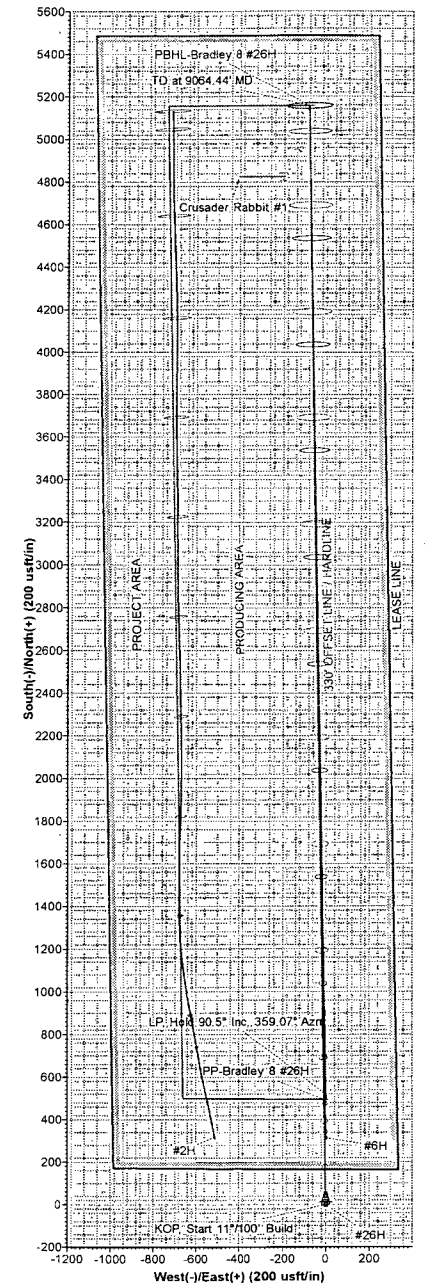
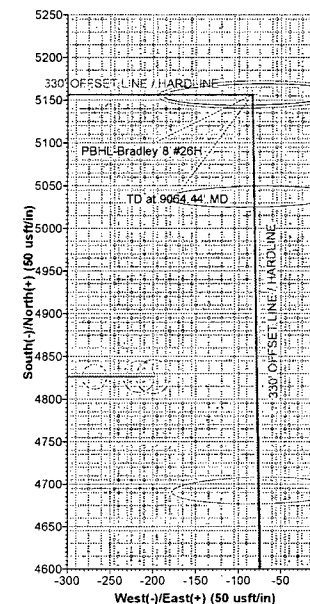
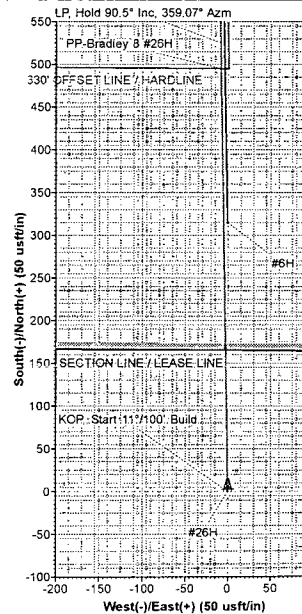
PROJECT DETAILS: Eddy County, NM (NAD27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Bradley 8 Fee
Site Centre Northing: 606797.50
Easting: 478847.80
Positional Uncertainty: 0.00
Convergence: -0.04
Local North: Grid

LEGEND
— #2H, WB1/Job #1310409, Surveys (JV #4) V0
— Crusader Rabbit #1, WB1, Surveys V0
— #6H, WB1, Plan #1 10-20-14 V0
— Plan #1 10-20-14

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001
Local Origin: Well #26H, Grid North
Latitude: 32° 40' 2.32456 N
Longitude: 104° 24' 15.86164 W
Grid East: 478128.90
Grid North: 606486.70
Scale Factor: 1.000
Geomagnetic Model: IGRF2010_14
Sample Date: 20-Oct-14
Magnetic Declination: 7.59°
Dip Angle from Horizontal: 60.37°
Magnetic Field Strength: 48457
To convert a Magnetic Direction to a Grid Direction, Add 7.63°
To convert a Magnetic Direction to a True Direction, Add 7.59° East
To convert a True Direction to a Grid Direction, Add 0.04°

FORMATION TOP DETAILS				
TVDPath	MDPath	Formation	DipAngle	DipDir
4130.44	4429.45	TL, 4135' TVD @ 0 VZ, 90.5° Inc	-0.50	359.07





COG Operating LLC

Eddy County, NM (NAD27 NME)

Bradley 8 Fee

#26H

WB1

Plan: Plan #1 10-20-14

Surface: 165' FNL, 2310' FWL, Sec 17, T19S, R26E, Unit C

PP: 330' FSL, 2310' FWL, Sec 8, T19S, R26E, Unit N

BHL: 330' FNL, 2301' FWL, Sec 8, T19S, R26E, Unit C

Standard Planning Report

20 October, 2014





Phoenix Technology Services
Planning Report



Database: Compass 5000 GCR DB
Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Site: Bradley 8 Fee
Well: #26H
Wellbore: WB1
Design: Plan #1 10-20-14

Local Co-ordinate Reference: Well #26H
TVD Reference: KB @ 3392.00usft (Silver Oak 3)
MD Reference: KB @ 3392.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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: Bradley 8 Fee
Site Position: Northing: 606,797.50 usft Latitude: 32° 40' 5.40482 N
From: Map Easting: 478,847.80 usft Longitude: 104° 24' 7.45386 W
Position Uncertainty: 0.00 usft Slot Radius: 13-3/16 " Grid Convergence: -0.04 °

Well: #26H
Well Position: +N/-S -310.80 usft Northing: 606,486.70 usft Latitude: 32° 40' 2.32456 N
+E/-W -718.90 usft Easting: 478,128.90 usft Longitude: 104° 24' 15.86164 W
Position Uncertainty: 0.00 usft Wellhead Elevation: 0.00 usft Ground Level: 3,377.00 usft

Wellbore: WB1
Magnetics: Model Name Sample Date Declination Dip Angle Field Strength
(°) (°) (nT)
IGRF2010_14 10/20/2014 7.59 60.37 48,457

Design: Plan #1 10-20-14
Audit Notes:
Version: Phase: PLAN Tie On Depth: 0.00
Vertical Section: Depth From (TVD) +N/-S +E/-W Direction
(usft) (usft) (usft) (°)
0.00 0.00 0.00 359.07

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,609.57	0.00	0.00	3,609.57	0.00	0.00	0.00	0.00	0.00	0.00	
4,432.30	90.50	359.07	4,130.42	525.35	-8.56	11.00	11.00	0.00	359.07	
9,064.44	90.50	359.07	4,090.00	5,156.70	-84.00	0.00	0.00	0.00	0.00	PBHL-Bradley 8 #26H



Phoenix Technology Services
Planning Report



Database:	Compass 5000 GCR DB	Local Co-ordinate Reference:	Well #26H
Company:	COG Operating LLC	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site:	Bradley 8 Fee	North Reference:	Grid
Well:	#26H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 10-20-14		

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
3,609.57	0.00	0.00	3,609.57	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Start 11°/100' Build									
3,700.00	9.95	359.07	3,699.55	7.83	-0.13	7.83	11.00	11.00	0.00
3,800.00	20.95	359.07	3,795.79	34.42	-0.56	34.42	11.00	11.00	0.00
3,900.00	31.95	359.07	3,885.18	78.88	-1.28	78.89	11.00	11.00	0.00
4,000.00	42.95	359.07	3,964.45	139.58	-2.27	139.60	11.00	11.00	0.00
4,100.00	53.95	359.07	4,030.68	214.29	-3.49	214.32	11.00	11.00	0.00
4,200.00	64.95	359.07	4,081.44	300.27	-4.89	300.31	11.00	11.00	0.00
4,300.00	75.95	359.07	4,114.85	394.34	-6.42	394.39	11.00	11.00	0.00
4,400.00	86.95	359.07	4,129.70	493.06	-8.03	493.13	11.00	11.00	0.00
4,401.94	87.16	359.07	4,129.80	495.00	-8.06	495.07	11.00	11.00	0.00
PP-Bradley 8 #26H									
4,429.45	90.19	359.07	4,130.44	522.49	-8.51	522.56	11.00	11.00	0.00
TL, 4135° TVD @ 0 VZ, 90.5° Inc									
4,432.30	90.50	359.07	4,130.42	525.35	-8.56	525.42	11.00	11.00	0.00
LP, Hold 90.5° Inc, 359.07° Azm									
4,500.00	90.50	359.07	4,129.83	593.04	-9.66	593.11	0.00	0.00	0.00
4,600.00	90.50	359.07	4,128.96	693.02	-11.29	693.11	0.00	0.00	0.00
4,700.00	90.50	359.07	4,128.09	793.00	-12.92	793.11	0.00	0.00	0.00
4,800.00	90.50	359.07	4,127.21	892.98	-14.55	893.10	0.00	0.00	0.00
4,900.00	90.50	359.07	4,126.34	992.97	-16.17	993.10	0.00	0.00	0.00
5,000.00	90.50	359.07	4,125.47	1,092.95	-17.80	1,093.10	0.00	0.00	0.00
5,100.00	90.50	359.07	4,124.60	1,192.93	-19.43	1,193.09	0.00	0.00	0.00
5,200.00	90.50	359.07	4,123.72	1,292.92	-21.06	1,293.09	0.00	0.00	0.00
5,300.00	90.50	359.07	4,122.85	1,392.90	-22.69	1,393.08	0.00	0.00	0.00
5,400.00	90.50	359.07	4,121.98	1,492.88	-24.32	1,493.08	0.00	0.00	0.00
5,500.00	90.50	359.07	4,121.11	1,592.87	-25.95	1,593.08	0.00	0.00	0.00
5,600.00	90.50	359.07	4,120.23	1,692.85	-27.58	1,693.07	0.00	0.00	0.00
5,700.00	90.50	359.07	4,119.36	1,792.83	-29.20	1,793.07	0.00	0.00	0.00
5,800.00	90.50	359.07	4,118.49	1,892.81	-30.83	1,893.07	0.00	0.00	0.00
5,900.00	90.50	359.07	4,117.61	1,992.80	-32.46	1,993.06	0.00	0.00	0.00
6,000.00	90.50	359.07	4,116.74	2,092.78	-34.09	2,093.06	0.00	0.00	0.00
6,100.00	90.50	359.07	4,115.87	2,192.76	-35.72	2,193.05	0.00	0.00	0.00
6,200.00	90.50	359.07	4,115.00	2,292.75	-37.35	2,293.05	0.00	0.00	0.00
6,300.00	90.50	359.07	4,114.12	2,392.73	-38.98	2,393.05	0.00	0.00	0.00
6,400.00	90.50	359.07	4,113.25	2,492.71	-40.60	2,493.04	0.00	0.00	0.00
6,500.00	90.50	359.07	4,112.38	2,592.69	-42.23	2,593.04	0.00	0.00	0.00
6,600.00	90.50	359.07	4,111.51	2,692.68	-43.86	2,693.03	0.00	0.00	0.00
6,700.00	90.50	359.07	4,110.63	2,792.66	-45.49	2,793.03	0.00	0.00	0.00
6,800.00	90.50	359.07	4,109.76	2,892.64	-47.12	2,893.03	0.00	0.00	0.00
6,900.00	90.50	359.07	4,108.89	2,992.63	-48.75	2,993.02	0.00	0.00	0.00
7,000.00	90.50	359.07	4,108.02	3,092.61	-50.38	3,093.02	0.00	0.00	0.00
7,100.00	90.50	359.07	4,107.14	3,192.59	-52.01	3,193.02	0.00	0.00	0.00
7,200.00	90.50	359.07	4,106.27	3,292.58	-53.63	3,293.01	0.00	0.00	0.00
7,300.00	90.50	359.07	4,105.40	3,392.56	-55.26	3,393.01	0.00	0.00	0.00
7,400.00	90.50	359.07	4,104.52	3,492.54	-56.89	3,493.00	0.00	0.00	0.00
7,500.00	90.50	359.07	4,103.65	3,592.52	-58.52	3,593.00	0.00	0.00	0.00
7,600.00	90.50	359.07	4,102.78	3,692.51	-60.15	3,693.00	0.00	0.00	0.00
7,700.00	90.50	359.07	4,101.91	3,792.49	-61.78	3,792.99	0.00	0.00	0.00
7,800.00	90.50	359.07	4,101.03	3,892.47	-63.41	3,892.99	0.00	0.00	0.00
7,900.00	90.50	359.07	4,100.16	3,992.46	-65.04	3,992.99	0.00	0.00	0.00
8,000.00	90.50	359.07	4,099.29	4,092.44	-66.66	4,092.98	0.00	0.00	0.00
8,100.00	90.50	359.07	4,098.42	4,192.42	-68.29	4,192.98	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



Database:	Compass 5000 GCR DB	Local Co-ordinate Reference:	Well #26H
Company:	C&G Operating LLC	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site:	Bradley 8 Fee	North Reference:	Grid
Well:	#26H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 10-20-14		

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)
8,200.00	90.50	359.07	4,097.54	4,292.40	-69.92	4,292.97	0.00	0.00	0.00
8,300.00	90.50	359.07	4,096.67	4,392.39	-71.55	4,392.97	0.00	0.00	0.00
8,400.00	90.50	359.07	4,095.80	4,492.37	-73.18	4,492.97	0.00	0.00	0.00
8,500.00	90.50	359.07	4,094.93	4,592.35	-74.81	4,592.96	0.00	0.00	0.00
8,600.00	90.50	359.07	4,094.05	4,692.34	-76.44	4,692.96	0.00	0.00	0.00
8,700.00	90.50	359.07	4,093.18	4,792.32	-78.06	4,792.95	0.00	0.00	0.00
8,800.00	90.50	359.07	4,092.31	4,892.30	-79.69	4,892.95	0.00	0.00	0.00
8,900.00	90.50	359.07	4,091.44	4,992.28	-81.32	4,992.95	0.00	0.00	0.00
9,000.00	90.50	359.07	4,090.56	5,092.27	-82.95	5,092.94	0.00	0.00	0.00
9,064.44	90.50	359.07	4,090.00	5,156.70	-84.00	5,157.38	0.00	0.00	0.00
TD at 9064.44' MD - PBHL-Bradley 8 #26H									

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-Bradley 8 #26H	0.00	360.00	4,090.00	5,156.70	-84.00	611,643.40	478,044.90	32° 40' 53.35295 N	104° 24' 16.88488 W
- plan hits target center									
- Point									
PP-Bradley 8 #26H	0.00	360.00	4,129.80	495.00	-8.06	606,981.70	478,120.84	32° 40' 7.22286 N	104° 24' 15.95985 W
- plan hits target center									
- Point									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,429.45	4,130.44	TL, 4135' TVD @ 0 VZ, 90.5° Inc		-0.50	359.07

Plan Annotations

Measured	Vertical	Local Coordinates		Comment
Depth (usft)	Depth (usft)	+N/-S (usft)	+E/-W (usft)	
3,609.57	3,609.57	0.00	0.00	KOP, Start 11°/100' Build
4,432.30	4,130.42	525.35	-8.56	LP, Hold 90.5° Inc, 359.07° Azm
9,064.44	4,090.00	5,156.70	-84.00	TD at 9064.44' MD



COG Operating LLC

Eddy County, NM (NAD27 NME)

Bradley 8 Fee

#26H

WB1

Plan #1 10-20-14

Anticollision Report

20 October, 2014



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #26H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#26H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR DB
Reference Design:	Plan #1 10-20-14	Offset TVD Reference:	Offset Datum

Reference	Plan #1 10-20-14		
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 10/20/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
0.00	9,064.44	Plan #1 10-20-14 (WB1)	PHX+MWD+IGRF
			Description
			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
Offset Well - Wellbore - Design					Warning
Bradley 8 Fee					
#2H - WB1/Job #1310409 - Surveys (JW #4)	2,017.68	2,012.70	597.17	586.58	56.368 CC
#2H - WB1/Job #1310409 - Surveys (JW #4)	2,500.00	2,489.00	598.83	585.79	45.900 ES
#2H - WB1/Job #1310409 - Surveys (JW #4)	9,064.44	7,632.82	1,246.23	1,051.35	6.395 SF
#6H - WB1 - Plan #1 10-20-14	2,558.14	2,558.14	315.00	297.08	17.575 CC
#6H - WB1 - Plan #1 10-20-14	2,600.00	2,592.32	315.25	297.05	17.326 ES
#6H - WB1 - Plan #1 10-20-14	9,064.44	7,710.55	1,027.16	812.22	4.779 SF
Crusader Rabbit					
Crusader Rabbit #1 - WB1 - Surveys	8,738.23	4,093.29	263.02	150.35	2.334 CC, ES, SF

Offset Design	Bradley 8 Fee - #2H - WB1/Job #1310409 - Surveys (JW #4)										Offset Site Error:	0.00 usft
Survey Program:	100-VES-ISCWSA-GYRO-3: 2489-MWD										Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis			Distance			Minimum Separation	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		
0.00	0.00	0.00	0.00	0.00	0.00	-58.09	318.10	-510.90	601.86			
100.00	100.00	96.13	96.13	0.15	0.08	-58.10	317.99	-510.86	601.75	601.52	0.23	2,612.557
200.00	200.00	197.28	197.28	0.51	0.26	-58.11	317.77	-510.66	601.46	600.69	0.77	777.735
300.00	300.00	297.92	297.92	0.87	0.45	-58.11	317.56	-510.28	601.03	599.71	1.32	455.286
400.00	400.00	396.65	396.65	1.23	0.63	-58.10	317.40	-509.93	600.65	598.78	1.86	322.499
500.00	500.00	496.27	496.27	1.59	0.82	-58.10	317.32	-509.70	600.41	598.00	2.41	249.422
600.00	600.00	595.46	595.46	1.94	1.01	-58.09	317.25	-509.58	600.26	597.31	2.95	203.341
700.00	700.00	696.78	696.78	2.30	1.20	-58.10	317.10	-509.46	600.08	596.58	3.50	171.447
800.00	800.00	797.18	797.17	2.66	1.38	-58.12	316.74	-509.29	599.75	595.71	4.04	148.283
900.00	900.00	897.74	897.74	3.02	1.57	-58.15	316.26	-509.10	599.34	594.75	4.59	130.597
1,000.00	1,000.00	997.44	997.44	3.38	1.75	-58.18	315.74	-508.92	598.91	593.78	5.13	116.690
1,100.00	1,100.00	1,097.65	1,097.64	3.74	1.94	-58.22	315.18	-508.76	598.49	592.81	5.68	105.431
1,200.00	1,200.00	1,197.00	1,196.99	4.10	2.12	-58.25	314.70	-508.61	598.10	591.88	6.22	96.158
1,300.00	1,300.00	1,296.28	1,296.27	4.45	2.31	-58.27	314.39	-508.48	597.83	591.06	6.76	88.382
1,374.30	1,374.30	1,369.31	1,369.30	4.72	2.43	-58.28	314.28	-508.45	597.74	590.59	7.15	83.556
1,400.00	1,400.00	1,394.56	1,394.55	4.81	2.48	-58.28	314.27	-508.47	597.75	590.47	7.29	82.013
1,500.00	1,500.00	1,494.17	1,494.15	5.17	2.63	-58.29	314.25	-508.62	597.87	590.07	7.80	76.618
1,600.00	1,600.00	1,594.75	1,594.74	5.53	2.80	-58.33	313.98	-508.90	597.97	589.63	8.33	71.771
1,700.00	1,700.00	1,697.96	1,697.95	5.89	2.99	-58.39	313.29	-509.07	597.75	588.87	8.88	67.338

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 #26H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#26H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR DB
Reference Design:	Plan #1 10-20-14	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error: 0.00 usft	
Bradley 8 Fee - #2H - WB1/Job #1310409 - Surveys (JW #4)													Offset Well Error: 0.00 usft	
Survey Program: 100-VES-ISCWSA-GYRO-3:2489-MWD														
Reference		Offset		Semi-Major Axis		Distance								
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	+N/-S (usft)	+E/-W (usft)	(usft)	(usft)	(usft)			
1,800.00	1,800.00	1,795.78	1,795.77	6.25	3.17	-58.44	312.70	-509.06	597.43	588.02	9.42	63.446		
1,900.00	1,900.00	1,896.12	1,896.10	6.60	3.36	-58.48	312.30	-509.14	597.29	587.33	9.96	59.969		
2,000.00	2,000.00	1,995.21	1,995.20	6.96	3.54	-58.53	311.77	-509.33	597.17	586.67	10.50	56.876		
2,017.68	2,017.68	2,012.70	2,012.68	7.03	3.57	-58.54	311.68	-509.38	597.17	586.58	10.59	56.368 CC		
2,100.00	2,100.00	2,094.06	2,094.04	7.32	3.71	-58.57	311.40	-509.62	597.24	586.20	11.03	54.132		
2,200.00	2,200.00	2,193.30	2,193.28	7.68	3.87	-58.59	311.37	-509.91	597.46	585.91	11.55	51.706		
2,300.00	2,300.00	2,291.72	2,291.70	8.04	4.03	-58.59	311.60	-510.25	597.88	585.81	12.07	49.543		
2,400.00	2,400.00	2,392.17	2,392.14	8.40	4.19	-58.58	311.94	-510.66	598.41	585.82	12.58	47.552		
2,500.00	2,500.00	2,489.00	2,488.98	8.76	4.29	-58.57	312.26	-510.94	598.83	585.79	13.05	45.900 ES		
2,600.00	2,600.00	2,564.68	2,564.61	9.11	4.30	-58.41	314.51	-511.34	601.09	587.68	13.41	44.809		
2,700.00	2,700.00	2,615.00	2,614.34	9.47	4.33	-57.87	321.86	-512.42	610.47	596.67	13.80	44.228		
2,800.00	2,800.00	2,661.83	2,659.43	9.83	4.38	-56.98	334.27	-514.27	628.16	613.95	14.21	44.211		
2,900.00	2,900.00	2,708.00	2,702.74	10.19	4.42	-55.92	349.95	-517.33	653.50	638.88	14.61	44.722		
3,000.00	3,000.00	2,762.04	2,751.77	10.55	4.49	-54.53	372.09	-522.26	685.84	670.80	15.04	45.614		
3,100.00	3,100.00	2,810.36	2,793.84	10.91	4.56	-53.12	395.37	-526.95	724.35	708.88	15.47	46.832		
3,200.00	3,200.00	2,853.47	2,829.63	11.26	4.71	-51.74	419.01	-531.22	768.94	752.96	15.98	48.127		
3,300.00	3,300.00	2,895.00	2,862.64	11.62	4.93	-50.38	443.73	-536.06	819.26	802.71	16.56	49.481		
3,400.00	3,400.00	2,927.00	2,887.09	11.98	5.14	-49.37	463.85	-540.60	874.86	857.73	17.13	51.086		
3,500.00	3,500.00	2,958.00	2,909.82	12.34	5.38	-48.39	484.37	-545.45	935.18	917.46	17.72	52.778		
3,609.57	3,609.57	2,989.00	2,931.49	12.73	5.65	-47.41	505.96	-550.47	1,006.01	987.63	18.38	54.734		
3,650.00	3,649.96	3,004.76	2,942.10	12.88	5.80	-43.31	517.32	-553.06	1,032.41	1,013.73	18.68	55.279		
3,700.00	3,699.55	3,020.00	2,952.09	13.06	5.95	-40.08	528.55	-555.56	1,063.44	1,044.44	19.00	55.959		
3,750.00	3,748.31	3,035.58	2,962.02	13.24	6.11	-37.36	540.28	-558.15	1,092.49	1,073.14	19.35	56.465		
3,800.00	3,795.79	3,051.00	2,971.55	13.41	6.27	-35.11	552.10	-560.80	1,119.38	1,099.69	19.69	56.861		
3,850.00	3,841.55	3,068.90	2,982.27	13.59	6.48	-33.23	566.09	-563.94	1,143.92	1,123.84	20.07	56.985		
3,900.00	3,885.18	3,082.00	2,989.88	13.79	6.63	-31.71	576.50	-566.26	1,165.95	1,145.53	20.42	57.088		
3,950.00	3,926.28	3,114.00	3,007.66	14.01	7.03	-30.44	602.52	-571.76	1,185.25	1,164.22	21.04	56.340		
4,000.00	3,964.45	3,128.93	3,015.55	14.26	7.22	-29.48	614.97	-574.20	1,201.68	1,180.20	21.48	55.949		
4,050.00	3,999.36	3,145.00	3,023.74	14.54	7.43	-28.73	628.56	-576.70	1,215.24	1,193.27	21.97	55.318		
4,100.00	4,030.68	3,176.00	3,038.53	14.86	7.86	-28.22	655.39	-581.41	1,225.98	1,203.26	22.72	53.969		
4,150.00	4,058.12	3,176.00	3,038.53	15.23	7.86	-27.82	655.39	-581.41	1,233.72	1,210.64	23.08	53.446		
4,200.00	4,081.44	3,207.00	3,051.95	15.64	8.31	-27.72	682.92	-586.19	1,238.51	1,214.56	23.95	51.715		
4,250.00	4,100.41	3,219.22	3,056.87	16.11	8.49	-27.71	693.94	-588.13	1,240.39	1,215.79	24.60	50.423		
4,300.00	4,114.85	3,238.00	3,063.99	16.62	8.78	-27.92	711.04	-591.22	1,239.40	1,214.01	25.40	48.799		
4,350.00	4,124.65	3,250.99	3,068.58	17.18	8.98	-28.25	722.99	-593.43	1,235.55	1,209.39	26.16	47.226		
4,400.00	4,129.70	3,269.00	3,074.43	17.78	9.27	-28.82	739.72	-596.56	1,228.93	1,201.89	27.05	45.439		
4,432.30	4,130.42	3,269.00	3,074.43	18.19	9.27	-29.12	739.72	-596.56	1,223.23	1,195.78	27.45	44.560		
4,500.00	4,129.83	3,300.00	3,083.16	19.09	9.77	-29.55	768.93	-602.16	1,211.23	1,182.37	28.86	41.970		
4,600.00	4,128.96	3,332.00	3,090.38	20.53	10.31	-29.95	799.53	-608.14	1,198.27	1,167.43	30.84	38.848		
4,700.00	4,128.09	3,363.00	3,095.66	22.09	10.85	-30.31	829.49	-614.04	1,190.92	1,157.98	32.94	36.155		
4,783.30	4,127.36	3,394.00	3,099.11	23.46	11.40	-30.63	859.72	-619.95	1,189.18	1,154.32	34.86	34.114		
4,800.00	4,127.21	3,394.00	3,099.11	23.74	11.40	-30.63	859.72	-619.95	1,189.26	1,154.13	35.13	33.848		
4,900.00	4,126.34	3,437.11	3,100.93	25.46	12.16	-30.98	902.05	-627.89	1,193.19	1,155.57	37.62	31.717		
5,000.00	4,125.47	3,538.80	3,102.66	27.25	13.93	-31.69	1,002.24	-645.22	1,199.09	1,157.92	41.17	29.124		
5,100.00	4,124.60	3,631.40	3,102.42	29.08	15.55	-32.19	1,093.84	-658.71	1,205.46	1,160.83	44.63	27.012		
5,200.00	4,123.72	3,756.14	3,100.19	30.95	17.73	-32.66	1,217.70	-673.24	1,211.78	1,163.09	48.69	24.890		
5,300.00	4,122.85	3,879.02	3,097.74	32.86	19.83	-32.83	1,340.35	-680.22	1,214.80	1,162.12	52.69	23.056		
5,400.00	4,121.98	4,022.86	3,094.94	34.79	22.21	-32.74	1,484.13	-681.47	1,215.11	1,158.11	57.00	21.317		
5,500.00	4,121.11	4,135.05	3,093.68	36.75	24.01	-32.64	1,596.31	-680.91	1,214.23	1,153.47	60.75	19.986		
5,600.00	4,120.23	4,248.14	3,093.09	38.72	25.82	-32.45	1,709.35	-677.62	1,211.45	1,146.91	64.54	18.771		
5,700.00	4,119.36	4,356.91	3,093.08	40.72	27.52	-32.26	1,818.06	-674.20	1,208.17	1,139.93	68.24	17.705		
5,800.00	4,118.49	4,431.10	3,093.00	42.72	28.72	-32.16	1,892.23	-672.56	1,205.49	1,134.04	71.45	16.873		

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 #26H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#26H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR DB
Reference Design:	Plan #1 10-20-14	Offset TVD Reference:	Offset Datum

Offset Design Bradley 8 Fee - #2H - WB1/Job #1310409 - Surveys (JW #4)														Offset Site Error: 0.00 usft	
Survey Program: 100-VES-ISCWSA-GYRO-3, 2489-MWD														Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
5,900.00	4,117.61	4,538.83	3,092.21	44.74	30.50	-32.06	1,999.96	-671.59	1,204.07	1,128.82	75.24	16.002			
6,000.00	4,116.74	4,618.47	3,091.87	46.78	31.83	-32.00	2,079.59	-671.18	1,202.58	1,123.97	78.60	15.299			
6,100.00	4,115.87	4,731.00	3,091.21	48.82	33.72	-31.97	2,192.12	-672.18	1,202.00	1,119.46	82.53	14.564			
6,183.91	4,115.14	4,796.29	3,091.05	50.54	34.83	-31.97	2,257.41	-672.84	1,201.29	1,115.93	85.37	14.072			
6,200.00	4,115.00	4,808.51	3,090.92	50.87	35.04	-31.97	2,269.61	-673.05	1,201.32	1,115.41	85.90	13.985			
6,300.00	4,114.12	4,908.33	3,089.63	52.92	36.74	-31.97	2,369.40	-675.11	1,201.90	1,112.24	89.66	13.405			
6,400.00	4,113.25	5,016.00	3,089.09	54.99	38.55	-32.00	2,477.06	-677.28	1,201.79	1,108.25	93.54	12.848			
6,423.70	4,113.04	5,038.63	3,089.05	55.48	38.94	-32.01	2,499.69	-677.73	1,201.70	1,107.27	94.42	12.727			
6,500.00	4,112.38	5,110.00	3,088.43	57.06	40.17	-32.03	2,571.03	-679.41	1,201.97	1,104.73	97.23	12.362			
6,600.00	4,111.51	5,180.23	3,087.03	59.13	41.41	-32.06	2,641.21	-681.71	1,203.67	1,103.13	100.54	11.972			
6,700.00	4,110.63	5,277.47	3,084.14	61.21	43.11	-32.10	2,738.32	-685.59	1,206.70	1,102.38	104.33	11.567			
6,800.00	4,109.76	5,392.93	3,080.78	63.30	45.13	-32.09	2,853.69	-688.74	1,209.02	1,100.59	108.43	11.151			
6,900.00	4,108.89	5,498.44	3,077.70	65.38	46.97	-32.00	2,959.15	-689.70	1,210.37	1,098.02	112.35	10.773			
7,000.00	4,108.02	5,600.32	3,075.00	67.48	48.70	-31.93	3,060.99	-690.70	1,211.54	1,095.36	116.18	10.428			
7,100.00	4,107.14	5,720.17	3,072.79	69.57	50.76	-31.86	3,180.81	-691.61	1,211.94	1,091.62	120.33	10.072			
7,193.36	4,106.33	5,805.91	3,072.15	71.53	52.24	-31.81	3,266.56	-691.66	1,211.12	1,087.35	123.77	9.786			
7,200.00	4,106.27	5,810.51	3,072.07	71.67	52.32	-31.81	3,271.15	-691.68	1,211.13	1,087.14	123.98	9.768			
7,300.00	4,105.40	5,889.01	3,069.74	73.77	53.67	-31.74	3,349.61	-692.39	1,212.45	1,085.01	127.44	9.514			
7,400.00	4,104.52	5,985.32	3,066.63	75.87	55.31	-31.69	3,445.86	-694.00	1,214.47	1,083.29	131.18	9.258			
7,500.00	4,103.65	6,088.54	3,063.35	77.97	57.09	-31.66	3,548.99	-696.55	1,216.90	1,081.84	135.06	9.010			
7,600.00	4,102.78	6,199.44	3,060.49	80.08	59.01	-31.61	3,659.84	-698.08	1,218.20	1,079.10	139.09	8.758			
7,700.00	4,101.91	6,305.55	3,057.23	82.19	60.84	-31.47	3,765.90	-697.82	1,219.10	1,076.06	143.03	8.523			
7,800.00	4,101.03	6,416.96	3,054.68	84.30	62.75	-31.34	3,877.29	-697.36	1,219.24	1,072.19	147.05	8.291			
7,833.68	4,100.74	6,446.43	3,054.10	85.01	63.25	-31.30	3,906.74	-697.19	1,219.17	1,070.91	148.27	8.223			
7,900.00	4,100.16	6,502.99	3,052.53	86.41	64.23	-31.22	3,963.28	-696.78	1,219.44	1,068.80	150.64	8.095			
8,000.00	4,099.29	6,605.54	3,049.44	88.53	65.98	-31.09	4,065.78	-696.37	1,220.22	1,065.72	154.50	7.898			
8,100.00	4,098.42	6,701.00	3,046.86	90.64	67.61	-31.00	4,161.21	-696.78	1,221.17	1,062.91	158.25	7.717			
8,200.00	4,097.54	6,794.00	3,044.51	92.76	69.21	-30.95	4,254.17	-697.92	1,222.38	1,060.42	161.97	7.547			
8,300.00	4,096.67	6,876.29	3,042.15	94.88	70.63	-30.93	4,336.40	-699.80	1,224.47	1,058.96	165.51	7.398			
8,400.00	4,095.80	6,963.60	3,038.72	96.99	72.16	-30.93	4,423.60	-702.81	1,228.02	1,058.87	169.15	7.260			
8,500.00	4,094.93	7,083.03	3,034.23	99.11	74.24	-30.95	4,542.85	-707.36	1,231.69	1,058.33	173.36	7.105			
8,600.00	4,094.05	7,182.00	3,031.46	101.23	75.97	-30.96	4,641.74	-710.36	1,234.07	1,056.87	177.20	6.964			
8,700.00	4,093.18	7,278.23	3,028.25	103.36	77.63	-30.94	4,737.88	-712.94	1,236.72	1,055.74	180.99	6.833			
8,800.00	4,092.31	7,389.08	3,024.02	105.48	79.56	-30.84	4,848.64	-714.03	1,238.90	1,053.87	185.04	6.695			
8,900.00	4,091.44	7,480.18	3,020.15	107.60	81.14	-30.73	4,939.66	-714.57	1,241.27	1,052.53	188.74	6.577			
9,000.00	4,090.56	7,574.10	3,016.17	109.73	82.76	-30.64	5,033.49	-715.69	1,243.95	1,051.46	192.49	6.463			
9,064.44	4,090.00	7,632.82	3,013.33	111.10	83.78	-30.59	5,092.13	-716.80	1,246.23	1,051.35	194.88	6.395 SF			



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #26H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#26H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR DB
Reference Design:	Plan #1 10-20-14	Offset TVD Reference:	Offset Datum

Offset Design Bradley 8 Fee - #6H - WB1 - Plan #1 10-20-14													Offset Site Error:	0.00 usft
Survey Program: 0-PHX+MWD+IGRF													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/S (usft)	+E/W (usft)						
0.00	0.00	0.00	0.00	0.00	0.00	-0.09	315.00	-0.50	315.00					
100.00	100.00	100.00	100.00	0.15	0.15	-0.09	315.00	-0.50	315.00	314.70	0.30	1,052.372		
200.00	200.00	200.00	200.00	0.51	0.51	-0.09	315.00	-0.50	315.00	313.98	1.02	309.958		
300.00	300.00	300.00	300.00	0.87	0.86	-0.09	315.00	-0.50	315.00	313.27	1.73	181.744		
400.00	400.00	400.00	400.00	1.23	1.22	-0.09	315.00	-0.50	315.00	312.55	2.45	128.564		
500.00	500.00	500.00	500.00	1.59	1.58	-0.09	315.00	-0.50	315.00	311.83	3.17	99.460		
600.00	600.00	600.00	600.00	1.94	1.94	-0.09	315.00	-0.50	315.00	311.12	3.88	81.101		
700.00	700.00	700.00	700.00	2.30	2.30	-0.09	315.00	-0.50	315.00	310.40	4.60	68.464		
800.00	800.00	800.00	800.00	2.66	2.66	-0.09	315.00	-0.50	315.00	309.68	5.32	59.234		
900.00	900.00	900.00	900.00	3.02	3.01	-0.09	315.00	-0.50	315.00	308.97	6.03	52.197		
1,000.00	1,000.00	1,000.00	1,000.00	3.38	3.37	-0.09	315.00	-0.50	315.00	308.25	6.75	46.654		
1,100.00	1,100.00	1,100.00	1,100.00	3.74	3.73	-0.09	315.00	-0.50	315.00	307.53	7.47	42.176		
1,200.00	1,200.00	1,200.00	1,200.00	4.10	4.09	-0.09	315.00	-0.50	315.00	306.81	8.19	38.482		
1,300.00	1,300.00	1,300.00	1,300.00	4.45	4.45	-0.09	315.00	-0.50	315.00	306.10	8.90	35.383		
1,400.00	1,400.00	1,400.00	1,400.00	4.81	4.81	-0.09	315.00	-0.50	315.00	305.38	9.62	32.746		
1,500.00	1,500.00	1,500.00	1,500.00	5.17	5.17	-0.09	315.00	-0.50	315.00	304.66	10.34	30.474		
1,600.00	1,600.00	1,600.00	1,600.00	5.53	5.52	-0.09	315.00	-0.50	315.00	303.95	11.05	28.498		
1,700.00	1,700.00	1,700.00	1,700.00	5.89	5.88	-0.09	315.00	-0.50	315.00	303.23	11.77	26.762		
1,800.00	1,800.00	1,800.00	1,800.00	6.25	6.24	-0.09	315.00	-0.50	315.00	302.51	12.49	25.226		
1,900.00	1,900.00	1,900.00	1,900.00	6.60	6.60	-0.09	315.00	-0.50	315.00	301.80	13.20	23.856		
2,000.00	2,000.00	2,000.00	2,000.00	6.96	6.96	-0.09	315.00	-0.50	315.00	301.08	13.92	22.627		
2,100.00	2,100.00	2,100.00	2,100.00	7.32	7.32	-0.09	315.00	-0.50	315.00	300.36	14.64	21.519		
2,200.00	2,200.00	2,200.00	2,200.00	7.68	7.67	-0.09	315.00	-0.50	315.00	299.65	15.36	20.514		
2,300.00	2,300.00	2,300.00	2,300.00	8.04	8.03	-0.09	315.00	-0.50	315.00	298.93	16.07	19.599		
2,400.00	2,400.00	2,400.00	2,400.00	8.40	8.39	-0.09	315.00	-0.50	315.00	298.21	16.79	18.762		
2,500.00	2,500.00	2,500.00	2,500.00	8.76	8.75	-0.09	315.00	-0.50	315.00	297.49	17.51	17.994		
2,558.14	2,558.14	2,558.14	2,558.14	8.96	8.96	-0.09	315.00	-0.50	315.00	297.08	17.92	17.575 CC		
2,600.00	2,600.00	2,592.32	2,592.32	9.11	9.08	-0.09	315.15	-0.50	315.25	297.05	18.20	17.326 ES		
2,700.00	2,700.00	2,650.00	2,649.79	9.47	9.29	-0.10	319.75	-0.58	323.67	304.90	18.76	17.251		
2,800.00	2,800.00	2,713.90	2,712.42	9.83	9.52	-0.14	332.21	-0.80	343.56	324.21	19.35	17.751		
2,900.00	2,900.00	2,770.28	2,766.05	10.19	9.73	-0.18	349.50	-1.09	374.29	354.38	19.91	18.795		
3,000.00	3,000.00	2,822.35	2,813.66	10.55	9.93	-0.23	370.53	-1.46	414.75	394.28	20.47	20.258		
3,100.00	3,100.00	2,869.68	2,854.92	10.91	10.13	-0.27	393.68	-1.86	463.74	442.70	21.04	22.042		
3,200.00	3,200.00	2,900.00	2,880.18	11.26	10.27	-0.30	410.45	-2.15	520.34	498.80	21.54	24.158		
3,300.00	3,300.00	2,950.00	2,919.57	11.62	10.54	-0.35	441.21	-2.68	582.58	560.41	22.17	26.281		
3,400.00	3,400.00	2,983.85	2,944.48	11.98	10.76	-0.38	464.12	-3.07	650.32	627.58	22.74	28.599		
3,500.00	3,500.00	3,000.00	2,955.83	12.34	10.86	-0.39	475.60	-3.27	722.73	699.53	23.20	31.153		
3,609.57	3,609.57	3,050.00	2,988.62	12.73	11.23	-0.44	513.31	-3.92	805.66	781.70	23.96	33.627		
3,650.00	3,649.96	3,050.00	2,988.62	12.88	11.23	0.45	513.31	-3.92	836.22	812.12	24.10	34.693		
3,700.00	3,699.55	3,066.20	2,998.45	13.06	11.36	0.40	526.18	-4.14	871.92	847.49	24.42	35.703		
3,750.00	3,748.31	3,080.01	3,006.52	13.24	11.48	0.36	537.40	-4.34	905.09	880.38	24.72	36.617		
3,800.00	3,795.79	3,100.00	3,017.65	13.41	11.65	0.33	553.99	-4.62	935.66	910.60	25.06	37.334		
3,850.00	3,841.55	3,100.00	3,017.65	13.59	11.65	0.31	553.99	-4.62	963.49	938.25	25.24	38.168		
3,900.00	3,885.18	3,124.13	3,030.24	13.79	11.88	0.29	574.58	-4.98	988.26	962.59	25.68	38.489		
3,950.00	3,926.28	3,150.00	3,042.65	14.01	12.13	0.27	597.27	-5.37	1,010.37	984.22	26.15	38.643		
4,000.00	3,964.45	3,150.00	3,042.65	14.26	12.13	0.26	597.27	-5.37	1,029.18	1,002.78	26.39	38.995		
4,050.00	3,999.36	3,171.01	3,051.89	14.54	12.36	0.25	616.13	-5.69	1,044.98	1,018.08	26.90	38.843		
4,100.00	4,030.68	3,200.00	3,063.38	14.86	12.68	0.24	642.74	-6.15	1,057.94	1,030.40	27.54	38.414		
4,150.00	4,058.12	3,200.00	3,063.38	15.23	12.68	0.23	642.74	-6.15	1,067.25	1,039.35	27.91	38.242		
4,200.00	4,081.44	3,219.39	3,070.24	15.64	12.92	0.23	660.87	-6.46	1,073.58	1,045.02	28.56	37.593		
4,250.00	4,100.41	3,250.00	3,079.66	16.11	13.28	0.23	689.99	-6.97	1,076.99	1,047.59	29.39	36.641		
4,300.00	4,114.85	3,250.00	3,079.66	16.62	13.28	0.23	689.99	-6.97	1,076.58	1,046.67	29.91	35.997		

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 #26H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#26H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR DB
Reference Design:	Plan #1 10-20-14	Offset TVD Reference:	Offset Datum

Offset Design											Offset Site Error:		0.00 usft
Bradley 8 Fee - #6H - WB1 - Plan #1 10-20-14											Offset Well Error:		0.00 usft
Survey Program: 0-PHX+MWD+IGRF													
Reference		Offset		Semi Major Axis			Distance		Minimum		Separation		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Factor	
4,350.00	4,124.65	3,268.25	3,084.46	17.18	13.52	0.23	707.59	-7.27	1,073.22	1,042.52	30.71	34.951	
4,400.00	4,129.70	3,300.00	3,091.34	17.78	13.94	0.23	738.58	-7.81	1,066.99	1,035.27	31.72	33.636	
4,432.30	4,130.42	3,300.00	3,091.34	18.19	13.94	0.23	738.58	-7.81	1,060.74	1,028.61	32.13	33.017	
4,500.00	4,129.83	3,316.91	3,094.22	19.09	14.18	0.23	755.23	-8.09	1,048.23	1,014.97	33.26	31.512	
4,600.00	4,128.96	3,350.00	3,098.30	20.53	14.64	0.23	788.06	-8.66	1,035.03	999.86	35.17	29.426	
4,700.00	4,128.09	3,383.44	3,100.30	22.09	15.14	0.23	821.43	-9.23	1,028.19	990.96	37.23	27.619	
4,776.21	4,127.42	3,422.33	3,100.30	23.35	15.73	0.23	860.31	-9.90	1,027.17	988.09	39.08	26.283	
4,800.00	4,127.21	3,446.11	3,100.09	23.74	16.11	0.23	884.09	-10.31	1,027.17	987.32	39.85	25.776	
4,900.00	4,126.34	3,546.11	3,099.22	25.46	17.74	0.22	984.07	-12.04	1,027.17	983.96	43.20	23.775	
5,000.00	4,125.47	3,646.11	3,098.35	27.25	19.47	0.22	1,084.06	-13.76	1,027.17	980.45	46.72	21.986	
5,100.00	4,124.60	3,746.11	3,097.47	29.08	21.28	0.21	1,184.04	-15.49	1,027.17	976.81	50.36	20.397	
5,200.00	4,123.72	3,846.11	3,096.60	30.95	23.14	0.21	1,284.02	-17.21	1,027.17	973.07	54.10	18.988	
5,300.00	4,122.85	3,946.11	3,095.73	32.86	25.05	0.20	1,384.00	-18.94	1,027.17	969.26	57.91	17.737	
5,400.00	4,121.98	4,046.11	3,094.86	34.79	27.00	0.20	1,483.98	-20.66	1,027.17	965.38	61.79	16.624	
5,500.00	4,121.11	4,146.11	3,093.98	36.75	28.97	0.19	1,583.96	-22.38	1,027.17	961.45	65.72	15.630	
5,600.00	4,120.23	4,246.11	3,093.11	38.72	30.97	0.19	1,683.94	-24.11	1,027.17	957.47	69.69	14.739	
5,700.00	4,119.36	4,346.11	3,092.24	40.72	32.98	0.18	1,783.92	-25.83	1,027.17	953.47	73.70	13.937	
5,800.00	4,118.49	4,446.11	3,091.37	42.72	35.01	0.17	1,883.91	-27.56	1,027.17	949.43	77.74	13.213	
5,900.00	4,117.61	4,546.11	3,090.49	44.74	37.06	0.17	1,983.89	-29.28	1,027.17	945.36	81.80	12.557	
6,000.00	4,116.74	4,646.11	3,089.62	46.78	39.11	0.16	2,083.87	-31.01	1,027.17	941.28	85.89	11.959	
6,100.00	4,115.87	4,746.11	3,088.75	48.82	41.17	0.16	2,183.85	-32.73	1,027.16	937.17	89.99	11.414	
6,200.00	4,115.00	4,846.11	3,087.87	50.87	43.25	0.15	2,283.83	-34.45	1,027.16	933.05	94.11	10.914	
6,300.00	4,114.12	4,946.11	3,087.00	52.92	45.32	0.15	2,383.81	-36.18	1,027.16	928.92	98.25	10.455	
6,400.00	4,113.25	5,046.11	3,086.13	54.99	47.41	0.14	2,483.79	-37.90	1,027.16	924.77	102.40	10.031	
6,500.00	4,112.38	5,146.11	3,085.26	57.06	49.50	0.14	2,583.77	-39.63	1,027.16	920.61	106.55	9.640	
6,600.00	4,111.51	5,246.11	3,084.38	59.13	51.59	0.13	2,683.76	-41.35	1,027.16	916.44	110.72	9.277	
6,700.00	4,110.63	5,346.11	3,083.51	61.21	53.69	0.13	2,783.74	-43.08	1,027.16	912.26	114.90	8.940	
6,800.00	4,109.76	5,446.11	3,082.64	63.30	55.79	0.12	2,883.72	-44.80	1,027.16	908.08	119.09	8.625	
6,900.00	4,108.89	5,546.11	3,081.77	65.38	57.89	0.12	2,983.70	-46.52	1,027.16	903.89	123.28	8.332	
7,000.00	4,108.02	5,646.11	3,080.89	67.48	60.00	0.11	3,083.68	-48.25	1,027.16	899.69	127.48	8.058	
7,100.00	4,107.14	5,746.11	3,080.02	69.57	62.11	0.11	3,183.66	-49.97	1,027.16	895.48	131.68	7.800	
7,200.00	4,106.27	5,846.11	3,079.15	71.67	64.22	0.10	3,283.64	-51.70	1,027.16	891.27	135.89	7.559	
7,300.00	4,105.40	5,946.11	3,078.28	73.77	66.34	0.09	3,383.62	-53.42	1,027.16	887.06	140.10	7.331	
7,400.00	4,104.52	6,046.11	3,077.40	75.87	68.45	0.09	3,483.61	-55.15	1,027.16	882.84	144.32	7.117	
7,500.00	4,103.65	6,146.11	3,076.53	77.97	70.57	0.08	3,583.59	-56.87	1,027.16	878.62	148.55	6.915	
7,600.00	4,102.78	6,246.11	3,075.66	80.08	72.69	0.08	3,683.57	-58.59	1,027.16	874.39	152.77	6.723	
7,700.00	4,101.91	6,346.11	3,074.79	82.19	74.81	0.07	3,783.55	-60.32	1,027.16	870.16	157.00	6.542	
7,800.00	4,101.03	6,446.11	3,073.91	84.30	76.93	0.07	3,883.53	-62.04	1,027.16	865.93	161.23	6.371	
7,900.00	4,100.16	6,546.11	3,073.04	86.41	79.06	0.06	3,983.51	-63.77	1,027.16	861.69	165.47	6.208	
8,000.00	4,099.29	6,646.11	3,072.17	88.53	81.18	0.06	4,083.49	-65.49	1,027.16	857.45	169.71	6.053	
8,100.00	4,098.42	6,746.11	3,071.29	90.64	83.31	0.05	4,183.48	-67.22	1,027.16	853.21	173.95	5.905	
8,200.00	4,097.54	6,846.11	3,070.42	92.76	85.43	0.05	4,283.46	-68.94	1,027.16	848.97	178.19	5.764	
8,300.00	4,096.67	6,946.11	3,069.55	94.88	87.56	0.04	4,383.44	-70.66	1,027.16	844.72	182.44	5.630	
8,400.00	4,095.80	7,046.11	3,068.68	96.99	89.69	0.04	4,483.42	-72.39	1,027.16	840.48	186.68	5.502	
8,500.00	4,094.93	7,146.11	3,067.80	99.11	91.82	0.03	4,583.40	-74.11	1,027.16	836.23	190.93	5.380	
8,600.00	4,094.05	7,246.11	3,066.93	101.23	93.95	0.03	4,683.38	-75.84	1,027.16	831.98	195.18	5.263	
8,700.00	4,093.18	7,346.11	3,066.06	103.36	96.08	0.02	4,783.36	-77.56	1,027.16	827.73	199.44	5.150	
8,800.00	4,092.31	7,446.11	3,065.19	105.48	98.21	0.01	4,883.34	-79.29	1,027.16	823.47	203.69	5.043	
8,900.00	4,091.44	7,546.11	3,064.31	107.60	100.34	0.01	4,983.33	-81.01	1,027.16	819.22	207.94	4.940	
9,000.00	4,090.56	7,646.11	3,063.44	109.73	102.47	0.00	5,083.31	-82.73	1,027.16	814.96	212.20	4.841	
9,064.44	4,090.00	7,710.55	3,062.88	111.10	103.85	0.00	5,147.74	-83.85	1,027.16	812.22	214.94	4.779 SF	

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 #26H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#26H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR DB
Reference Design:	Plan #1 10-20-14	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Crusader Rabbit - Crusader Rabbit #1 - WB1 - Surveys												Offset Well Error:	0.00 usft
Survey Program: 370-MWD													
Reference		Offset		Semi Major Axis		Distance		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-4.80	4,826.30	-404.90	4,843.26				
100.00	100.00	96.38	96.38	0.15	0.11	-4.79	4,826.30	-404.74	4,843.24	4,842.98	0.26	N/A	
200.00	200.00	197.83	197.83	0.51	0.22	-4.79	4,826.30	-404.21	4,843.20	4,842.46	0.73	6,595.693	
300.00	300.00	299.28	299.27	0.87	0.34	-4.78	4,826.30	-403.32	4,843.12	4,841.92	1.21	4,011.661	
400.00	400.00	400.28	400.26	1.23	0.49	-4.76	4,826.30	-402.08	4,843.02	4,841.31	1.71	2,825.715	
500.00	500.00	500.27	500.25	1.59	0.71	-4.75	4,826.30	-400.77	4,842.91	4,840.62	2.30	2,107.322	
600.00	600.00	600.26	600.23	1.94	0.94	-4.73	4,826.30	-399.46	4,842.81	4,839.92	2.88	1,679.630	
700.00	700.00	700.25	700.21	2.30	1.16	-4.72	4,826.30	-398.16	4,842.70	4,839.23	3.47	1,396.508	
800.00	800.00	800.24	800.20	2.66	1.39	-4.70	4,826.30	-396.85	4,842.59	4,838.54	4.05	1,195.057	
900.00	900.00	900.58	900.52	3.02	1.62	-4.68	4,826.30	-395.49	4,842.48	4,837.84	4.64	1,044.126	
1,000.00	1,000.00	1,000.92	1,000.85	3.38	1.84	-4.67	4,826.30	-394.04	4,842.36	4,837.14	5.22	927.039	
1,100.00	1,100.00	1,101.25	1,101.17	3.74	2.07	-4.65	4,826.30	-392.51	4,842.24	4,836.43	5.81	833.559	
1,200.00	1,200.00	1,201.58	1,201.49	4.10	2.30	-4.63	4,826.30	-390.89	4,842.11	4,835.71	6.39	757.201	
1,300.00	1,300.00	1,301.89	1,301.78	4.45	2.53	-4.61	4,826.30	-389.18	4,841.97	4,834.99	6.98	693.710	
1,400.00	1,400.00	1,401.31	1,401.19	4.81	2.72	-4.59	4,826.30	-387.52	4,841.84	4,834.30	7.54	642.454	
1,500.00	1,500.00	1,500.73	1,500.60	5.17	2.92	-4.57	4,826.30	-386.01	4,841.72	4,833.62	8.09	598.245	
1,600.00	1,600.00	1,600.18	1,600.04	5.53	3.12	-4.56	4,826.30	-384.64	4,841.61	4,832.96	8.65	559.719	
1,700.00	1,700.00	1,700.17	1,700.02	5.89	3.32	-4.54	4,826.30	-383.33	4,841.50	4,832.29	9.21	525.600	
1,800.00	1,800.00	1,800.16	1,800.00	6.25	3.53	-4.53	4,826.30	-382.02	4,841.40	4,831.63	9.77	495.399	
1,900.00	1,900.00	1,900.15	1,899.98	6.60	3.73	-4.51	4,826.30	-380.71	4,841.29	4,830.96	10.33	468.479	
2,000.00	2,000.00	2,000.43	2,000.26	6.96	3.95	-4.49	4,826.30	-379.36	4,841.19	4,830.27	10.92	443.511	
2,100.00	2,100.00	2,100.75	2,100.57	7.32	4.18	-4.48	4,826.30	-377.93	4,841.08	4,829.58	11.50	420.969	
2,200.00	2,200.00	2,201.07	2,200.87	7.68	4.40	-4.46	4,826.30	-376.41	4,840.96	4,828.88	12.08	400.606	
2,300.00	2,300.00	2,301.38	2,301.17	8.04	4.63	-4.44	4,826.30	-374.80	4,840.84	4,828.17	12.67	382.121	
2,400.00	2,400.00	2,401.69	2,401.47	8.40	4.86	-4.42	4,826.30	-373.10	4,840.70	4,827.45	13.25	365.265	
2,500.00	2,500.00	2,502.07	2,501.83	8.76	5.08	-4.40	4,826.30	-371.31	4,840.57	4,826.73	13.84	349.799	
2,600.00	2,600.00	2,602.45	2,602.19	9.11	5.31	-4.38	4,826.30	-369.41	4,840.42	4,826.00	14.42	335.583	
2,700.00	2,700.00	2,702.82	2,702.54	9.47	5.54	-4.35	4,826.30	-367.41	4,840.27	4,825.26	15.01	322.476	
2,800.00	2,800.00	2,803.19	2,802.89	9.83	5.76	-4.33	4,826.30	-365.29	4,840.11	4,824.52	15.60	310.354	
2,900.00	2,900.00	2,903.92	2,903.59	10.19	5.99	-4.30	4,826.30	-363.02	4,839.94	4,823.76	16.18	299.076	
3,000.00	3,000.00	3,004.73	3,004.37	10.55	6.22	-4.27	4,826.30	-360.52	4,839.76	4,822.98	16.77	288.580	
3,100.00	3,100.00	3,103.27	3,102.88	10.91	6.43	-4.24	4,826.30	-358.13	4,839.58	4,822.24	17.33	279.228	
3,200.00	3,200.00	3,201.62	3,201.22	11.26	6.63	-4.22	4,826.30	-356.19	4,839.43	4,821.54	17.89	270.499	
3,300.00	3,300.00	3,300.06	3,299.64	11.62	6.83	-4.20	4,826.30	-354.70	4,839.32	4,820.87	18.45	262.299	
3,400.00	3,400.00	3,400.05	3,399.63	11.98	7.03	-4.19	4,826.30	-353.39	4,839.22	4,820.21	19.01	254.540	
3,500.00	3,500.00	3,500.04	3,499.61	12.34	7.23	-4.17	4,826.30	-352.08	4,839.13	4,819.55	19.57	247.227	
3,609.57	3,609.57	3,609.62	3,609.18	12.73	7.46	-4.16	4,826.30	-350.65	4,839.02	4,818.83	20.19	239.677	
3,650.00	3,649.96	3,650.45	3,650.00	12.88	7.55	-3.23	4,826.30	-350.08	4,837.42	4,816.99	20.43	236.816	
3,700.00	3,699.55	3,700.57	3,700.11	13.06	7.66	-3.26	4,826.30	-349.32	4,831.11	4,810.39	20.72	233.158	
3,750.00	3,748.31	3,749.85	3,749.39	13.24	7.77	-3.33	4,826.30	-348.50	4,820.08	4,799.07	21.01	229.413	
3,800.00	3,795.79	3,797.83	3,797.36	13.41	7.88	-3.44	4,826.30	-347.63	4,804.44	4,783.14	21.29	225.633	
3,850.00	3,841.55	3,844.08	3,843.60	13.59	7.98	-3.59	4,826.30	-346.72	4,784.32	4,762.74	21.58	221.716	
3,900.00	3,885.18	3,888.16	3,887.67	13.79	8.08	-3.79	4,826.30	-345.79	4,759.91	4,738.03	21.88	217.580	
3,950.00	3,926.28	3,929.06	3,928.56	14.01	8.17	-4.07	4,826.30	-344.91	4,731.44	4,709.26	22.18	213.319	
4,000.00	3,964.45	3,967.02	3,966.51	14.26	8.25	-4.43	4,826.30	-344.11	4,699.17	4,676.67	22.50	208.810	
4,050.00	3,999.36	4,001.72	4,001.21	14.54	8.32	-4.91	4,826.30	-343.41	4,663.41	4,640.55	22.86	204.028	
4,100.00	4,030.68	4,032.86	4,032.34	14.86	8.38	-5.56	4,826.30	-342.79	4,624.48	4,601.23	23.24	198.970	
4,150.00	4,058.12	4,060.14	4,059.62	15.23	8.44	-6.48	4,826.30	-342.26	4,582.73	4,559.07	23.67	193.648	
4,200.00	4,081.44	4,083.32	4,082.79	15.64	8.49	-7.83	4,826.30	-341.82	4,538.56	4,514.43	24.13	188.099	
4,250.00	4,100.41	4,102.17	4,101.64	16.11	8.52	-9.97	4,826.30	-341.46	4,492.37	4,467.74	24.63	182.373	
4,300.00	4,114.85	4,116.53	4,115.99	16.62	8.55	-13.77	4,826.30	-341.20	4,444.59	4,419.41	25.18	176.538	
4,350.00	4,124.65	4,126.26	4,125.72	17.18	8.57	-22.09	4,826.30	-341.02	4,395.65	4,369.89	25.76	170.668	

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 #26H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#26H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR DB
Reference Design:	Plan #1 10-20-14	Offset TVD Reference:	Offset Datum

Offset Design Crusader Rabbit - Crusader Rabbit #1 - WB1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 370-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toothface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N-S (usft)	+E-W (usft)						
4,400.00	4,129.70	4,131.27	4,130.73	17.78	8.58	-49.37	4,826.30	-340.93	4,346.01	4,319.64	26.36	164.843		
4,432.30	4,130.42	4,131.98	4,131.44	18.19	8.59	-99.44	4,826.30	-340.92	4,313.78	4,287.01	26.77	161.134		
4,500.00	4,129.83	4,131.37	4,130.83	19.09	8.58	-99.31	4,826.30	-340.93	4,246.21	4,218.54	27.67	153.460		
4,600.00	4,128.96	4,130.47	4,129.93	20.53	8.58	-99.12	4,826.30	-340.95	4,146.41	4,117.30	29.11	142.425		
4,700.00	4,128.09	4,129.57	4,129.04	22.09	8.58	-98.92	4,826.30	-340.96	4,046.62	4,015.95	30.67	131.941		
4,800.00	4,127.21	4,128.68	4,128.14	23.74	8.58	-98.73	4,826.30	-340.98	3,946.84	3,914.52	32.32	122.124		
4,900.00	4,126.34	4,127.78	4,127.24	25.46	8.58	-98.54	4,826.30	-340.99	3,847.07	3,813.03	34.04	113.015		
5,000.00	4,125.47	4,126.88	4,126.35	27.25	8.58	-98.35	4,826.30	-341.01	3,747.32	3,711.50	35.82	104.609		
5,100.00	4,124.60	4,125.98	4,125.45	29.08	8.57	-98.16	4,826.30	-341.03	3,647.58	3,609.92	37.65	96.875		
5,200.00	4,123.72	4,125.09	4,124.55	30.95	8.57	-97.96	4,826.30	-341.04	3,547.85	3,508.32	39.52	89.767		
5,300.00	4,122.85	4,124.19	4,123.65	32.86	8.57	-97.77	4,826.30	-341.06	3,448.13	3,406.71	41.43	83.235		
5,400.00	4,121.98	4,123.29	4,122.75	34.79	8.57	-97.58	4,826.30	-341.08	3,348.44	3,305.08	43.36	77.228		
5,500.00	4,121.11	4,122.39	4,121.86	36.75	8.57	-97.38	4,826.30	-341.09	3,248.76	3,203.45	45.31	71.697		
5,600.00	4,120.23	4,121.49	4,120.96	38.72	8.56	-97.19	4,826.30	-341.11	3,149.10	3,101.82	47.29	66.595		
5,700.00	4,119.36	4,120.60	4,120.06	40.72	8.56	-97.00	4,826.30	-341.13	3,049.47	3,000.19	49.28	61.882		
5,800.00	4,118.49	4,119.70	4,119.16	42.72	8.56	-96.80	4,826.30	-341.14	2,949.86	2,898.57	51.28	57.519		
5,900.00	4,117.61	4,118.80	4,118.27	44.74	8.56	-96.61	4,826.30	-341.16	2,850.27	2,796.97	53.30	53.472		
6,000.00	4,116.74	4,117.90	4,117.37	46.78	8.56	-96.42	4,826.30	-341.17	2,750.72	2,695.39	55.33	49.712		
6,100.00	4,115.87	4,117.00	4,116.47	48.82	8.56	-96.22	4,826.30	-341.19	2,651.20	2,593.83	57.37	46.210		
6,200.00	4,115.00	4,116.11	4,115.57	50.87	8.55	-96.03	4,826.30	-341.21	2,551.72	2,492.30	59.42	42.943		
6,300.00	4,114.12	4,115.21	4,114.67	52.92	8.55	-95.83	4,826.30	-341.22	2,452.28	2,390.80	61.48	39.890		
6,400.00	4,113.25	4,114.31	4,113.78	54.99	8.55	-95.64	4,826.30	-341.24	2,352.88	2,289.34	63.54	37.031		
6,500.00	4,112.38	4,113.41	4,112.88	57.06	8.55	-95.44	4,826.30	-341.26	2,253.54	2,187.93	65.61	34.350		
6,600.00	4,111.51	4,112.51	4,111.98	59.13	8.55	-95.25	4,826.30	-341.27	2,154.26	2,086.58	67.68	31.831		
6,700.00	4,110.63	4,111.61	4,111.08	61.21	8.54	-95.06	4,826.30	-341.29	2,055.05	1,985.29	69.76	29.461		
6,800.00	4,109.76	4,110.72	4,110.18	63.30	8.54	-94.86	4,826.30	-341.31	1,955.92	1,884.08	71.84	27.227		
6,900.00	4,108.89	4,109.82	4,109.28	65.38	8.54	-94.67	4,826.30	-341.32	1,856.88	1,782.95	73.92	25.119		
7,000.00	4,108.02	4,108.92	4,108.39	67.48	8.54	-94.47	4,826.30	-341.34	1,757.95	1,681.93	76.01	23.127		
7,100.00	4,107.14	4,108.02	4,107.49	69.57	8.54	-94.28	4,826.30	-341.36	1,659.14	1,581.04	78.11	21.242		
7,200.00	4,106.27	4,107.12	4,106.59	71.67	8.53	-94.08	4,826.30	-341.37	1,560.49	1,480.29	80.20	19.457		
7,300.00	4,105.40	4,106.22	4,105.69	73.77	8.53	-93.89	4,826.30	-341.39	1,462.02	1,379.72	82.30	17.765		
7,400.00	4,104.52	4,105.32	4,104.79	75.87	8.53	-93.69	4,826.30	-341.41	1,363.78	1,279.38	84.40	16.158		
7,500.00	4,103.65	4,104.43	4,103.89	77.97	8.53	-93.49	4,826.30	-341.42	1,265.81	1,179.30	86.50	14.633		
7,600.00	4,102.78	4,103.53	4,103.00	80.08	8.53	-93.30	4,826.30	-341.44	1,168.18	1,079.57	88.61	13.184		
7,700.00	4,101.91	4,102.63	4,102.10	82.19	8.53	-93.10	4,826.30	-341.46	1,070.99	980.27	90.72	11.806		
7,800.00	4,101.03	4,101.73	4,101.20	84.30	8.52	-92.91	4,826.30	-341.47	974.36	881.54	92.82	10.497		
7,900.00	4,100.16	4,100.83	4,100.30	86.41	8.52	-92.71	4,826.30	-341.49	878.49	783.56	94.93	9.254		
8,000.00	4,099.29	4,099.93	4,099.40	88.53	8.52	-92.52	4,826.30	-341.51	783.66	686.61	97.05	8.075		
8,100.00	4,098.42	4,099.03	4,098.50	90.64	8.52	-92.32	4,826.30	-341.52	690.28	591.12	99.16	6.961		
8,200.00	4,097.54	4,098.13	4,097.60	92.76	8.52	-92.13	4,826.30	-341.54	599.04	497.76	101.27	5.915		
8,300.00	4,096.67	4,097.23	4,096.70	94.88	8.51	-91.93	4,826.30	-341.56	511.09	407.70	103.39	4.943		
8,400.00	4,095.80	4,096.33	4,095.80	96.99	8.51	-91.73	4,826.30	-341.57	428.45	322.94	105.51	4.061		
8,500.00	4,094.93	4,095.44	4,094.91	99.11	8.51	-91.54	4,826.30	-341.59	354.86	247.24	107.62	3.297		
8,600.00	4,094.05	4,094.54	4,094.01	101.23	8.51	-91.34	4,826.30	-341.61	297.13	187.39	109.74	2.707		
8,700.00	4,093.18	4,093.64	4,093.11	103.36	8.51	-91.15	4,826.30	-341.62	265.79	153.92	111.86	2.376		
8,738.23	4,092.85	4,093.29	4,092.76	104.17	8.51	-91.07	4,826.30	-341.63	263.02	150.35	112.67	2.334 CC, ES, SF		
8,800.00	4,092.31	4,092.74	4,092.21	105.48	8.51	-90.95	4,826.30	-341.64	270.18	156.19	113.98	2.370		
8,900.00	4,091.44	4,091.84	4,091.31	107.60	8.50	-90.75	4,826.30	-341.66	308.79	192.68	116.11	2.660		
9,000.00	4,090.56	4,090.94	4,090.41	109.73	8.50	-90.56	4,826.30	-341.67	371.08	252.85	118.23	3.139		
9,064.44	4,090.00	4,090.36	4,089.83	111.10	8.50	-90.43	4,826.30	-341.68	419.03	299.44	119.60	3.504		

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 #26H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#26H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR DB
Reference Design:	Plan #1 10-20-14	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3392.00usft (Silver Oak 3)

Offset Depths are relative to Offset Datum

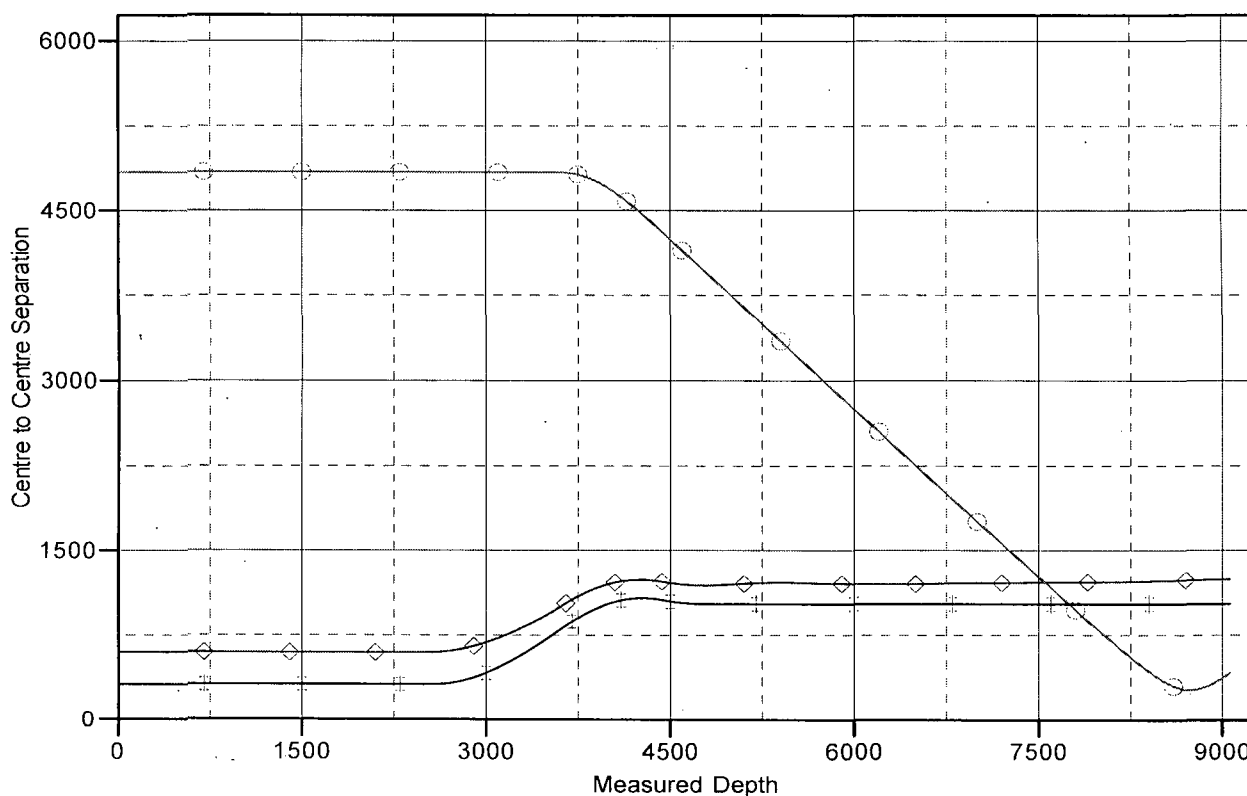
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #26H

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30

Grid Convergence at Surface is: -0.04°

Ladder Plot



LEGEND

◆ #2H, WB1/Job #1310409, Surveys (JW#4) V0 ○ Crusader Rabbit #1, WB1, Surveys V0 ■ #6H, WB1, Plan #1 10-20-14 V0



Phoenix Technology Services
Anticollision Report



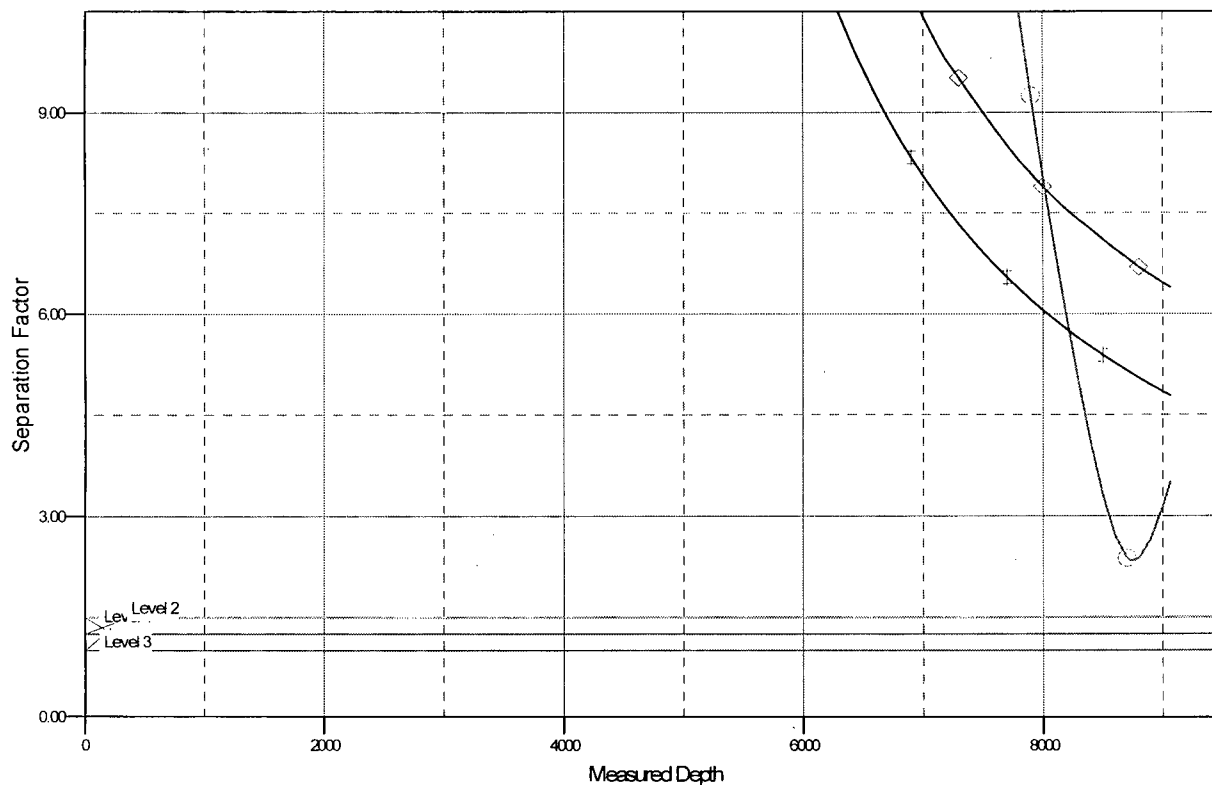
Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Bradley 8 Fee
Site Error: 0.00 usft
Reference Well: #26H
Well Error: 0.00 usft
Reference Wellbore: WB1
Reference Design: Plan #1 10-20-14

Local Co-ordinate Reference: Well #26H
TVD Reference: KB @ 3392.00usft (Silver Oak 3)
MD Reference: KB @ 3392.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3392.00usft (Silver Oak 3)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #26H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.04°

Separation Factor Plot



LEGEND

◆ #2H, WB1/Job #1310409, Surveys (JW #4) V0 ◆ Crusader Rabbit #1, WB1, Surveys V0 ◆ #6H, WB1, Plan #1 10-20-14 V0