

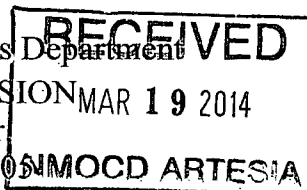
DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

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

DISTRICT III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 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
AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-42204	Pool Code 3250	Pool Name Atoka; Glorieta Yeso
Property Code 38909	Property Name SHERMAN 4 FEE	Well Number 2H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3349'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	4	19-S	26-E		150	SOUTH	1645	WEST	EDDY

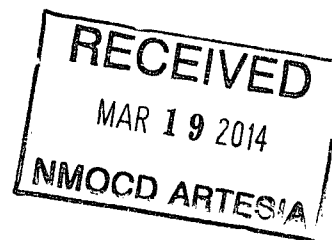
Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
3	4	19-S	26-E		330	NORTH	1650	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
159.06			

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

CORNER COORDINATES TABLE A - Y=617241.2 N, X=482293.4 E B - Y=617249.4 N, X=483613.2 E C - Y=611991.5 N, X=483626.0 E D - Y=611983.0 N, X=482312.6 E GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=612135.1 N X=482642.9 E BOTTOM HOLE LOCATION Y=616913.3 N X=482624.7 E Estimated Completed Interval: 330 FSL + 1646 FWL	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. Date: 3-18-14 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. JANUARY 13, 2014 Date of Survey Signature & Seal of Professional Surveyor: Certificate Number: 12641 Signature: Gary G. Eidson Ronald J. Eidson 3239 JWSC W.O.: 14.11.0024
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COG Operating LLC

Eddy County, NM (NAD 27 NME)

Sherman 4 Fee

#2H

WB1

Plan: Plan #1 03-17-14

Surface: 150' FSL, 1645' FWL, Sec 4, T18S, R26E, Unit N

PP: 330' FSL, 1646' FWL, Sec 4, T18S, R26E, Unit N

BHL: 330' FNL, 1650' FWL, Sec 4, T19S, R26E, Lot #3

Standard Planning Report

17 March, 2014





Phoenix Technology Services
Planning Report



Database:	GCR-DB	Local Co-ordinate Reference:	Well #2H
Company:	COG Operating LLC	TVD Reference:	GL @ 3349.00usft
Project:	Eddy County NM (NAD 27 NME)	MD Reference:	GL @ 3349.00usft
Site:	Sherman 4 Fee	North Reference:	Grid
Well:	#2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1_03-17-14		

Project	Eddy County NM (NAD 27 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	Sherman 4 Fee		
Site Position:		Northing:	612,151.80 usft
From:	Map	Easting:	485,212.40 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.68290
		Longitude:	104° 22' 53.02452 W
		Grid Convergence:	-0.03 °

Well	#2H		
Well Position	+N/-S	-16.70 usft	Northing:
	+E/-W	-2,569.50 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	Ground Level:

Wellbore	WB1		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010_14	03/17/14	7.66
			Dip Angle
			60.40
			Field Strength
			48,527

Design	Plan #1_03-17-14		
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
			(°)
			359.78

Plan Sections										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Dogleg Rate	Build Rate	Turn Rate	TFO	Target
(usft)	(°)	(°)	(usft)	(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	
2,560.49	0.00	0.00	2,560.49	0.00	0.00	0.00	0.00	0.00	0.00	
3,382.31	90.40	359.78	3,081.35	524.50	-2.00	11.00	11.00	0.00	359.78	
7,636.14	90.40	359.78	3,051.65	4,778.20	-18.20	0.00	0.00	0.00	0.00	PBHL-Sherman 4 Fee



Phoenix Technology Services

Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #2H
Company:	COG Operating LLC	TVD Reference:	GL @ 3349.00usft
Project:	Eddy County, NM (NAD 27/NME)	MD Reference:	GL @ 3349.00usft
Site:	Sherman 4 Fee	North Reference:	Grid
Well:	#2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 03-17-14		

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
2,560.49	0.00	0.00	2,560.49	0.00	0.00	0.00	0.00	0.00	0.00
KOP: 11°/100' Build									
2,600.00	4.35	359.78	2,599.96	1.50	-0.01	1.50	11.00	11.00	0.00
2,700.00	15.35	359.78	2,698.34	18.57	-0.07	18.57	11.00	11.00	0.00
2,800.00	26.35	359.78	2,791.65	54.10	-0.21	54.10	11.00	11.00	0.00
2,900.00	37.35	359.78	2,876.46	106.79	-0.41	106.79	11.00	11.00	0.00
3,000.00	48.35	359.78	2,949.67	174.68	-0.67	174.69	11.00	11.00	0.00
3,011.44	49.60	359.78	2,957.18	183.32	-0.70	183.32	11.00	11.00	0.00
PP: Sherman 4 Fee #2H									
3,100.00	59.35	359.78	3,008.58	255.30	-0.97	255.31	11.00	11.00	0.00
3,200.00	70.35	359.78	3,051.02	345.68	-1.32	345.68	11.00	11.00	0.00
3,300.00	81.35	359.78	3,075.43	442.50	-1.69	442.50	11.00	11.00	0.00
3,379.26	90.06	359.78	3,081.36	521.46	-1.99	521.46	11.00	11.00	0.00
TL: 3085' TVD @ 0.4° VZ, 90.4° Inc									
3,382.31	90.40	359.78	3,081.35	524.51	-2.00	524.51	10.99	10.99	0.00
LP: Hold 90.4° Inc, 359.78° Azm									
3,400.00	90.40	359.78	3,081.22	542.20	-2.07	542.20	0.00	0.00	0.00
3,500.00	90.40	359.78	3,080.53	642.19	-2.45	642.20	0.00	0.00	0.00
3,600.00	90.40	359.78	3,079.83	742.19	-2.83	742.19	0.00	0.00	0.00
3,700.00	90.40	359.78	3,079.13	842.19	-3.21	842.19	0.00	0.00	0.00
3,800.00	90.40	359.78	3,078.43	942.18	-3.59	942.19	0.00	0.00	0.00
3,900.00	90.40	359.78	3,077.73	1,042.18	-3.97	1,042.19	0.00	0.00	0.00
4,000.00	90.40	359.78	3,077.03	1,142.18	-4.35	1,142.18	0.00	0.00	0.00
4,100.00	90.40	359.78	3,076.34	1,242.17	-4.73	1,242.18	0.00	0.00	0.00
4,200.00	90.40	359.78	3,075.64	1,342.17	-5.11	1,342.18	0.00	0.00	0.00
4,300.00	90.40	359.78	3,074.94	1,442.17	-5.49	1,442.18	0.00	0.00	0.00
4,400.00	90.40	359.78	3,074.24	1,542.16	-5.87	1,542.18	0.00	0.00	0.00
4,500.00	90.40	359.78	3,073.54	1,642.16	-6.25	1,642.17	0.00	0.00	0.00
4,600.00	90.40	359.78	3,072.85	1,742.16	-6.64	1,742.17	0.00	0.00	0.00
4,700.00	90.40	359.78	3,072.15	1,842.15	-7.02	1,842.17	0.00	0.00	0.00
4,800.00	90.40	359.78	3,071.45	1,942.15	-7.40	1,942.17	0.00	0.00	0.00
4,900.00	90.40	359.78	3,070.75	2,042.15	-7.78	2,042.16	0.00	0.00	0.00
5,000.00	90.40	359.78	3,070.05	2,142.14	-8.16	2,142.16	0.00	0.00	0.00
5,100.00	90.40	359.78	3,069.36	2,242.14	-8.54	2,242.16	0.00	0.00	0.00
5,200.00	90.40	359.78	3,068.66	2,342.14	-8.92	2,342.16	0.00	0.00	0.00
5,300.00	90.40	359.78	3,067.96	2,442.14	-9.30	2,442.15	0.00	0.00	0.00
5,400.00	90.40	359.78	3,067.26	2,542.13	-9.68	2,542.15	0.00	0.00	0.00
5,500.00	90.40	359.78	3,066.56	2,642.13	-10.06	2,642.15	0.00	0.00	0.00
5,600.00	90.40	359.78	3,065.86	2,742.13	-10.44	2,742.15	0.00	0.00	0.00
5,700.00	90.40	359.78	3,065.17	2,842.12	-10.83	2,842.14	0.00	0.00	0.00
5,800.00	90.40	359.78	3,064.47	2,942.12	-11.21	2,942.14	0.00	0.00	0.00
5,900.00	90.40	359.78	3,063.77	3,042.12	-11.59	3,042.14	0.00	0.00	0.00
6,000.00	90.40	359.78	3,063.07	3,142.11	-11.97	3,142.14	0.00	0.00	0.00
6,100.00	90.40	359.78	3,062.37	3,242.11	-12.35	3,242.13	0.00	0.00	0.00
6,200.00	90.40	359.78	3,061.68	3,342.11	-12.73	3,342.13	0.00	0.00	0.00
6,300.00	90.40	359.78	3,060.98	3,442.10	-13.11	3,442.13	0.00	0.00	0.00
6,400.00	90.40	359.78	3,060.28	3,542.10	-13.49	3,542.13	0.00	0.00	0.00
6,500.00	90.40	359.78	3,059.58	3,642.10	-13.87	3,642.12	0.00	0.00	0.00
6,600.00	90.40	359.78	3,058.88	3,742.09	-14.25	3,742.12	0.00	0.00	0.00
6,700.00	90.40	359.78	3,058.19	3,842.09	-14.63	3,842.12	0.00	0.00	0.00
6,800.00	90.40	359.78	3,057.49	3,942.09	-15.02	3,942.12	0.00	0.00	0.00
6,900.00	90.40	359.78	3,056.79	4,042.08	-15.40	4,042.11	0.00	0.00	0.00
7,000.00	90.40	359.78	3,056.09	4,142.08	-15.78	4,142.11	0.00	0.00	0.00



Phoenix Technology Services

Planning Report



Database:	GCR DB	Local Co-ordinate/Reference:	Well #2H
Company:	COG Operating LLC	TVD Reference:	GL @ 3349.00usft
Project:	Eddy County, NM (NAD 27 NME)	MD Reference:	GL @ 3349.00usft
Site:	Sherman 4 Fee	North Reference:	Grid
Well:	#2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1, 03-17-14		

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)
7,100.00	90.40	359.78	3,055.39	4,242.08	-16.16	4,242.11	0.00	0.00	0.00
7,200.00	90.40	359.78	3,054.69	4,342.08	-16.54	4,342.11	0.00	0.00	0.00
7,300.00	90.40	359.78	3,054.00	4,442.07	-16.92	4,442.10	0.00	0.00	0.00
7,400.00	90.40	359.78	3,053.30	4,542.07	-17.30	4,542.10	0.00	0.00	0.00
7,500.00	90.40	359.78	3,052.60	4,642.07	-17.68	4,642.10	0.00	0.00	0.00
7,600.00	90.40	359.78	3,051.90	4,742.06	-18.06	4,742.10	0.00	0.00	0.00
7,636.14	90.40	359.78	3,051.65	4,778.20	-18.20	4,778.23	0.00	0.00	0.00
TD at 7636.14 - PBHL-Sherman 4 Fee #2H									

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									
PP-Sherman 4 Fee #2H	0.00	0.00	2,961.76	180.00	-0.69	612,315.10	482,642.22	32.68334	104° 23' 23.09837 W
- plan misses target center by 5.65usft at 3011.44usft MD (2957.18 TVD, 183.32 N, -0.70 E)									
- Point									
PBHL-Sherman 4 Fee #	0.00	0.00	3,051.65	4,778.20	-18.20	616,913.30	482,624.70	32.69598	104° 23' 23.33194 W
- plan hits target center									
- Point									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,379.26	3,081.36	TL, 3085' TVD @ 0 VZ, 90.4° Inc		-0.40	359.78

Plan Annotations

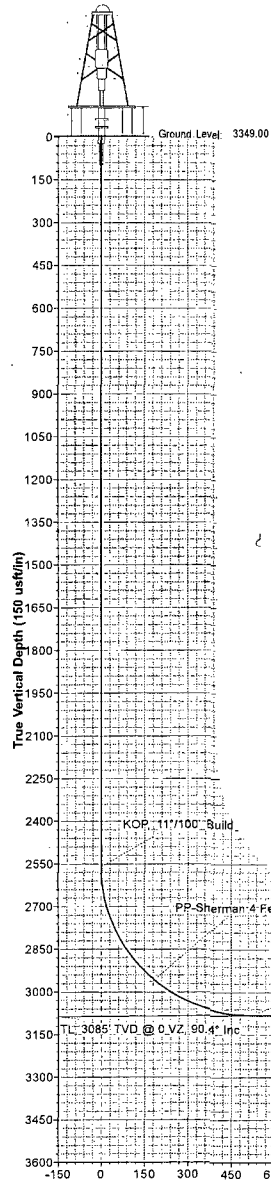
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
2,560.49	2,560.49	0.00	0.00	KOP, 11°/100' Build
3,382.31	3,081.35	524.51	-2.00	LP, Hold 90.4° Inc, 359.78° Azm
7,636.14	3,051.65	4,778.20	-18.20	TD at 7636.14



Project: Eddy County, NM (NAD 27 NME)
Site: Sherman 4 Fee
Well: #2H
Wellbore: WB1
Design: Plan #1 03-17-14



Azimuths to Grid North
True North: 0.03°
Magnetic North: 7.69°
Magnetic Field
Strength: 48527.2nT
Dip Angle: 60.40°
Date: 03/17/2014
Model: IGRF2010_14



WELL DETAILS									
+N/S	+E/W	Northing	Ground Level	3349.00	Latitude	Longitude			
0.00	0.00	612135.10	Easting	482642.90	32.68285	104° 23' 23.08923 W			

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dleg	TFace	VSeet
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2560.49	0.00	0.00	2560.49	0.00	0.00	0.00	0.00	0.00
3	3382.31	90.40	359.78	3081.35	524.50	-2.00	11.00	359.78	524.51
4	7636.14	90.40	359.78	3051.65	4778.20	-18.20	0.00	0.00	4778.23
PBHL-Sherman 4 Fee #2H									
KOP, 11'100' Build									
LP, Hold 90.4° Inc, 359.78° Azm									
TD at 7636.14									

DESIGN TARGET DETAILS									
Name	TVD	+N/S	+E/W	Northing	Easting	Latitude	Longitude	Shape	
PP-Sherman 4 Fee #2H	2961.76	180.00	-0.69	612315.10	482642.21	32.68334	104° 23' 23.09837 W	Point	
- plan misses target center by 5.64usft at 3011.73usft MD (2957.37 TVD, 183.54 N, -0.70 E)									
PBHL-Sherman 4 Fee #2H	3051.65	4778.20	-18.20	616913.30	482624.70	32.69598	104° 23' 23.33194 W	Point	
- plan hits target center									

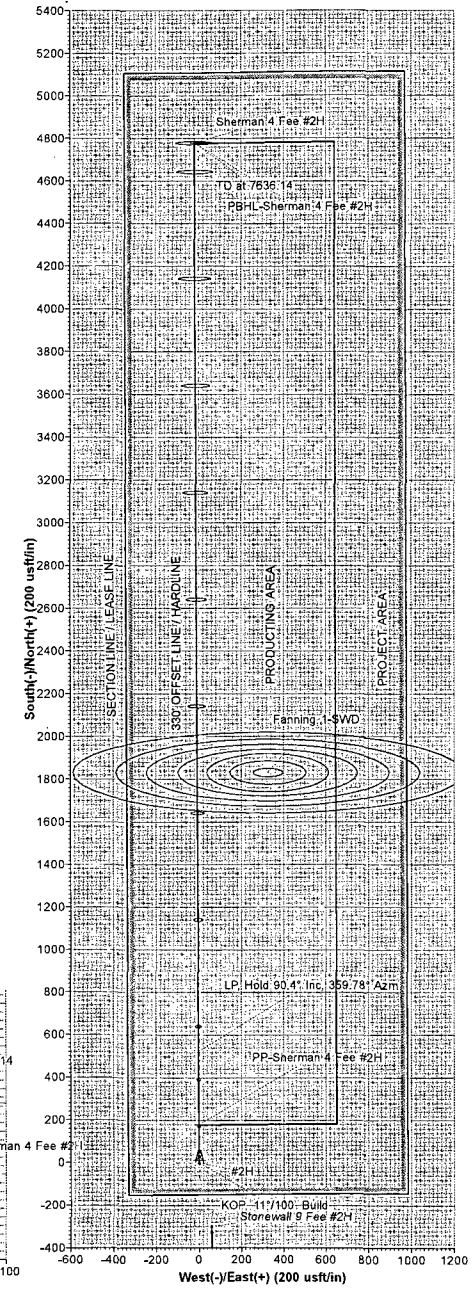
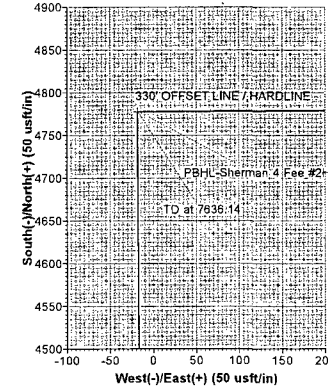
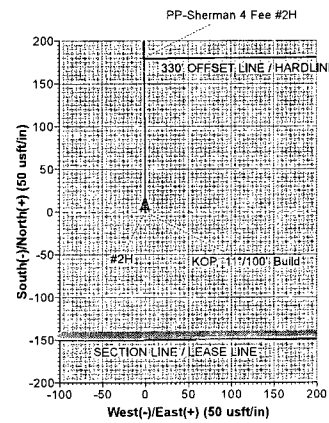
PROJECT DETAILS: Eddy County, NM (NAD 27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Sherman 4 Fee
Site Centre Northing: 612151.80
Easting: 485212.40
Positional Uncertainty: 0.00
Convergence: -0.03
Local North: Grid

LEGEND:
— 1-SWD, WB1, Inc Surveys V0
— #2H, OH, Plan #1 01-07-13 V0
— Plan #1 03-17-14

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 #2H, Grid North
Latitude: 32.68285
Longitude: 104° 23' 23.08923 W
Grid East: 482642.90
Grid North: 612135.10
Scale Factor: 1.000
Geomagnetic Model: IGRF2010_14
Sample Date: 17-Mar-14
Magnetic Declination: 7.66°
Dip Angle from Horizontal: 60.40°
Magnetic Field Strength: 48527
To convert a Magnetic Direction to a Grid Direction, Add 7.69°
To convert a Magnetic Direction to a True Direction, Add 0.03°

FORMATION TOP DETAILS
TVDPath MDPPath Formation
3081.38 3379.26 TL 3085 TVD @ 0 VZ 90.4° Inc -0.40 359.78



Created By: Julio Pina Date: 15:10, March 17 2014



COG Operating LLC

Eddy County, NM (NAD 27 NME)

Sherman 4 Fee

#2H

WB1

Plan #1 03-17-14

Anticollision Report

17 March, 2014





Phoenix Technology Services
Anticollision Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	GL @ 3349.00usft
Reference Site:	Sherman 4 Fee	MD Reference:	GL @ 3349.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	GCR DB
Reference Design:	Plan #1 03-17-14	Offset TVD Reference:	Offset Datum

Reference	Plan #1 03-17-14		
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 10,000.00 usft	Error Surface:	Circular Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	03/17/14		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	7,636.14	Plan #1 03-17-14 (WB1)	MWD	MWD - Standard	

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						
Fanning						
1-SWD - WB1 - Inc Surveys	4,687.84	3,082.85	333.07	99.33	1.425	Level 3, CC, ES
1-SWD - WB1 - Inc Surveys	4,700.00	3,082.78	333.29	99.34	1.425	Level 3, SF
Stonewall 19 Fee						
#2H - OH - Plan #1 01-07-13	2,506.17	2,517.17	305.37	294.32	27.635	CC, ES
#2H - OH - Plan #1 01-07-13	2,560.49	2,550.00	306.63	295.39	27.281	SF

Offset Design												Offset Site Error:	0.00 usft
Fanning - 1-SWD - WB1 - Inc Surveys												Offset Well Error:	0.00 usft
Survey Program: 300-INC													
Reference		Offset		Semi Major Axis			Distance						
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	Warning
0.00	0.00	17.08	17.08	0.00	0.33	10.09	1,831.83	326.10	1,860.64	1,860.32	0.33	5,696.441	
100.00	100.00	112.03	112.03	0.11	2.14	10.10	1,831.59	326.10	1,860.40	1,858.14	2.25	825.665	
140.00	140.00	150.00	150.00	0.20	2.87	10.10	1,831.57	326.10	1,860.38	1,857.31	3.07	606.239	
200.00	200.00	206.96	206.96	0.34	3.95	10.10	1,831.62	326.10	1,860.43	1,856.13	4.29	433.452	
300.00	300.00	300.00	300.00	0.56	5.73	10.09	1,831.90	326.10	1,860.73	1,854.43	6.29	295.605	
392.60	392.60	402.26	402.25	0.77	11.60	10.10	1,831.46	326.10	1,860.27	1,847.90	12.37	150.423	
400.00	400.00	408.63	408.63	0.79	11.96	10.10	1,831.47	326.10	1,860.27	1,847.52	12.75	145.913	
500.00	500.00	500.00	499.96	1.01	17.20	10.09	1,831.90	326.10	1,860.73	1,842.51	18.21	102.161	
600.00	600.00	609.58	609.53	1.24	25.56	10.09	1,832.03	326.10	1,860.83	1,834.03	26.80	69.447	
700.00	700.00	712.93	712.87	1.46	33.44	10.09	1,831.97	326.10	1,860.77	1,825.86	34.90	53.315	
792.88	792.88	803.00	802.88	1.67	40.72	10.09	1,831.78	326.10	1,860.58	1,818.19	42.39	43.888	
800.00	800.00	809.21	809.10	1.69	41.25	10.09	1,831.78	326.10	1,860.58	1,817.65	42.93	43.339	
900.00	900.00	858.00	857.85	1.91	45.33	10.09	1,831.90	326.10	1,861.43	1,814.18	47.25	39.399	
1,000.00	1,000.00	1,010.17	1,010.00	2.14	60.23	10.09	1,831.90	326.10	1,860.70	1,798.34	62.36	29.837	
1,065.89	1,065.89	1,076.08	1,075.89	2.28	66.68	10.09	1,831.90	326.10	1,860.70	1,791.74	68.96	26.983	
1,100.00	1,100.00	1,108.00	1,107.74	2.36	69.80	10.09	1,831.90	326.10	1,860.70	1,788.54	72.16	25.786	
1,200.00	1,200.00	1,202.89	1,202.61	2.58	77.18	10.09	1,832.40	326.10	1,861.21	1,781.44	79.77	23.333	
1,300.00	1,300.00	1,308.03	1,307.74	2.81	85.36	10.09	1,832.68	326.10	1,861.46	1,773.29	88.17	21.111	
1,400.00	1,400.00	1,413.19	1,412.88	3.03	93.55	10.09	1,832.66	326.10	1,861.45	1,764.87	96.58	19.273	
1,500.00	1,500.00	1,518.37	1,518.05	3.26	101.73	10.09	1,832.35	326.10	1,861.15	1,756.16	104.99	17.727	
1,588.81	1,588.81	1,611.80	1,611.46	3.46	109.00	10.09	1,831.82	326.10	1,860.66	1,748.20	112.46	16.545	

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 #2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	GL @ 3349.00usft
Reference Site:	Sherman 4 Fee	MD Reference:	GL @ 3349.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	GCR DB
Reference Design:	Plan #1, 03-17-14	Offset TVD Reference:	Offset Datum

Offset Design Fanning - 1-SWD - WB1 - Inc Surveys														Offset Site Error:	0.00 usft
Survey Program: 300-INC														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 Depth (usft)	Offset Depth (usft)		N/S (usft)	E/W (usft)	Between Centres (usft)	Between Ellipses (usft)					
1,600.00	1,600.00	1,600.00	1,599.59	3.48	108.08	10.09	1,831.90	326.10	1,860.73	1,749.16	111.57	16.678			
1,700.00	1,700.00	1,710.41	1,710.00	3.71	114.50	10.09	1,831.90	326.10	1,860.70	1,742.49	118.21	15.740			
1,763.59	1,763.59	1,774.01	1,773.59	3.85	118.20	10.09	1,831.90	326.10	1,860.70	1,738.64	122.05	15.245			
1,800.00	1,800.00	1,802.00	1,801.56	3.93	119.83	10.09	1,831.90	326.10	1,860.72	1,736.95	123.76	15.034			
1,900.00	1,900.00	1,910.44	1,910.00	4.16	126.19	10.09	1,831.90	326.10	1,860.70	1,730.35	130.35	14.275			
2,000.00	2,000.00	2,010.45	2,010.00	4.38	132.05	10.09	1,831.90	326.10	1,860.70	1,724.26	136.44	13.638			
2,100.00	2,100.00	2,110.45	2,110.00	4.61	137.92	10.09	1,831.90	326.10	1,860.70	1,718.17	142.53	13.055			
2,162.34	2,162.34	2,172.79	2,172.34	4.75	141.57	10.09	1,831.90	326.10	1,860.70	1,714.38	146.32	12.717			
2,200.00	2,200.00	2,199.00	2,198.50	4.83	143.11	10.09	1,831.90	326.10	1,860.73	1,712.79	147.94	12.577			
2,300.00	2,300.00	2,310.51	2,310.00	5.06	149.62	10.09	1,831.90	326.10	1,860.70	1,706.02	154.68	12.029			
2,400.00	2,400.00	2,410.51	2,410.00	5.28	155.46	10.09	1,831.90	326.10	1,860.70	1,699.95	160.74	11.575			
2,500.00	2,500.00	2,510.54	2,510.00	5.51	161.32	10.09	1,831.90	326.10	1,860.70	1,693.87	166.83	11.153			
2,560.49	2,560.49	2,571.03	2,570.49	5.64	164.86	10.09	1,831.90	326.10	1,860.70	1,690.19	170.51	10.913			
2,600.00	2,599.96	2,610.50	2,609.96	5.73	167.18	10.35	1,831.90	326.10	1,859.22	1,686.32	172.91	10.753			
2,650.00	2,649.56	2,660.10	2,659.56	5.85	170.08	10.51	1,831.90	326.10	1,853.15	1,677.22	175.94	10.533			
2,700.00	2,698.34	2,708.89	2,708.34	5.98	172.94	10.79	1,831.90	326.10	1,842.43	1,663.51	178.92	10.298			
2,750.00	2,745.85	2,756.40	2,755.85	6.11	175.72	11.22	1,831.90	326.10	1,827.16	1,645.33	181.83	10.049			
2,800.00	2,791.65	2,802.20	2,801.65	6.24	178.41	11.82	1,831.90	326.10	1,807.49	1,622.85	184.64	9.789			
2,850.00	2,835.32	2,832.00	2,831.40	6.38	180.15	12.55	1,831.90	326.10	1,783.67	1,597.13	186.53	9.562			
2,900.00	2,876.46	2,894.90	2,894.30	6.59	185.06	13.71	1,831.55	326.10	1,755.42	1,563.76	191.65	9.159			
2,950.00	2,914.70	2,931.05	2,930.44	6.85	187.89	15.08	1,831.41	326.10	1,723.67	1,528.94	194.73	8.851			
3,000.00	2,949.67	2,964.15	2,963.54	7.17	190.47	16.88	1,831.31	326.10	1,688.55	1,490.92	197.64	8.544			
3,050.00	2,981.06	2,993.91	2,993.30	7.55	192.80	19.29	1,831.26	326.10	1,650.38	1,450.04	200.35	8.238			
3,100.00	3,008.58	3,020.06	3,019.44	8.00	194.84	22.55	1,831.23	326.10	1,609.51	1,406.68	202.84	7.935			
3,150.00	3,031.97	3,042.33	3,041.72	8.52	196.58	27.10	1,831.23	326.10	1,566.32	1,361.23	205.09	7.637			
3,200.00	3,051.02	3,060.52	3,059.91	9.09	198.00	33.66	1,831.24	326.10	1,521.21	1,314.12	207.09	7.346			
3,250.00	3,065.55	3,074.45	3,073.84	9.73	199.09	43.34	1,831.25	326.10	1,474.60	1,265.79	208.81	7.062			
3,300.00	3,075.43	3,083.97	3,083.35	10.40	199.83	57.67	1,831.26	326.10	1,426.93	1,216.70	210.23	6.787			
3,350.00	3,080.57	3,088.97	3,088.35	11.11	200.22	77.18	1,831.27	326.10	1,378.64	1,167.31	211.33	6.524			
3,382.31	3,081.35	3,089.76	3,089.15	11.59	200.28	91.19	1,831.27	326.10	1,347.33	1,135.46	211.87	6.359			
3,400.00	3,081.22	3,089.67	3,089.06	11.85	200.27	91.17	1,831.27	326.10	1,330.20	1,118.07	212.13	6.271			
3,500.00	3,080.53	3,089.16	3,088.55	13.39	200.23	91.09	1,831.27	326.10	1,233.64	1,020.01	213.63	5.775			
3,600.00	3,079.83	3,088.65	3,088.04	15.00	200.19	91.00	1,831.27	326.10	1,137.67	922.48	215.20	5.287			
3,700.00	3,079.13	3,088.13	3,087.52	16.66	200.15	90.91	1,831.27	326.10	1,042.47	825.66	216.81	4.808			
3,800.00	3,078.43	3,087.61	3,087.00	18.34	200.11	90.82	1,831.27	326.10	948.25	729.79	218.46	4.341			
3,900.00	3,077.73	3,087.09	3,086.48	20.06	200.07	90.73	1,831.27	326.10	855.34	635.21	220.13	3.886			
4,000.00	3,077.03	3,086.56	3,085.95	21.79	200.03	90.64	1,831.27	326.10	764.23	542.41	221.82	3.445			
4,100.00	3,076.34	3,086.03	3,085.42	23.54	199.99	90.55	1,831.27	326.10	675.64	452.10	223.53	3.023			
4,200.00	3,075.64	3,085.50	3,084.89	25.30	199.95	90.46	1,831.27	326.10	590.69	365.44	225.25	2.622			
4,300.00	3,074.94	3,084.96	3,084.35	27.07	199.91	90.36	1,831.27	326.10	511.23	284.25	226.98	2.252			
4,400.00	3,074.24	3,084.42	3,083.81	28.85	199.86	90.27	1,831.27	326.10	440.21	211.50	228.72	1.925			
4,500.00	3,073.54	3,083.88	3,083.27	30.64	199.82	90.18	1,831.26	326.10	382.39	151.93	230.46	1.659			
4,600.00	3,072.85	3,083.33	3,082.72	32.43	199.78	90.08	1,831.26	326.10	344.46	112.25	232.21	1.483 Level 3			
4,687.84	3,072.23	3,082.85	3,082.24	34.00	199.74	90.00	1,831.26	326.10	333.07	99.33	233.75	1.425 Level 3, CC, ES			
4,700.00	3,072.15	3,082.78	3,082.17	34.22	199.74	89.99	1,831.26	326.10	333.29	99.34	233.96	1.425 Level 3, SF			
4,800.00	3,071.45	3,082.23	3,081.62	36.02	199.69	89.89	1,831.26	326.10	351.45	115.74	235.71	1.491 Level 3			
4,900.00	3,070.75	3,081.67	3,081.06	37.82	199.65	89.80	1,831.26	326.10	394.90	157.43	237.47	1.663			
5,000.00	3,070.05	3,081.11	3,080.50	39.63	199.61	89.70	1,831.26	326.10	456.48	217.25	239.23	1.908			
5,100.00	3,069.36	3,080.55	3,079.93	41.44	199.56	89.60	1,831.26	326.10	529.91	288.91	241.00	2.199			
5,200.00	3,068.66	3,079.98	3,079.37	43.25	199.52	89.51	1,831.26	326.10	610.93	368.17	242.76	2.517			
5,300.00	3,067.96	3,079.41	3,078.79	45.06	199.47	89.41	1,831.26	326.10	696.90	452.37	244.53	2.850			
5,400.00	3,067.26	3,078.83	3,078.22	46.87	199.43	89.31	1,831.26	326.10	786.19	539.89	246.30	3.192			

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 #2H
Project:	Eddy County, NM (NAD:27,NME)	TVD Reference:	GL @ 3349.00usft
Reference Site:	Sherman 4 Fee	MD Reference:	GL @ 3349.00usft
Site Error:	0.00'usft	North Reference:	Grid
Reference Well:	#2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00'usft	Output errors are at	2.00'sigma
Reference Wellbore:	WB1	Database:	GCR:DB
Reference Design:	Plan #1, 03-17-14	Offset TVD Reference:	Offset Datum

Offset Design: Fanning - 1°SWD - WB1 - Inc Surveys											Offset Site Error: 0.00 usft		
Survey Program: 300-INC											Offset Well Error: 0.00 usft		
Reference		Offset		Semi Major Axis		Highside Footface (ft)	Offset Wellbore Centres		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)			
5,500.00	3,066.56	3,078.25	3,077.64	48.69	199.38	89.21	1,831.26	326.10	877.79	629.72	248.07	3.538	
5,600.00	3,065.86	3,077.67	3,077.06	50.50	199.34	89.11	1,831.26	326.10	971.05	721.21	249.84	3.887	
5,700.00	3,065.17	3,077.08	3,076.47	52.32	199.29	89.01	1,831.26	326.10	1,065.54	813.93	251.61	4.235	
5,800.00	3,064.47	3,076.49	3,075.88	54.14	199.24	88.91	1,831.25	326.10	1,160.95	907.56	253.39	4.582	
5,900.00	3,063.77	3,075.90	3,075.28	55.96	199.20	88.80	1,831.25	326.10	1,257.07	1,001.91	255.16	4.927	
6,000.00	3,063.07	3,075.30	3,074.68	57.78	199.15	88.70	1,831.25	326.10	1,353.75	1,096.82	256.93	5.269	
6,100.00	3,062.37	3,074.70	3,074.08	59.60	199.10	88.60	1,831.25	326.10	1,450.89	1,192.18	258.71	5.608	
6,200.00	3,061.68	3,074.09	3,073.48	61.43	199.06	88.49	1,831.25	326.10	1,548.38	1,287.90	260.48	5.944	
6,300.00	3,060.98	3,073.48	3,072.86	63.25	199.01	88.39	1,831.25	326.10	1,646.18	1,383.92	262.26	6.277	
6,400.00	3,060.28	3,072.86	3,072.25	65.07	198.96	88.28	1,831.25	326.10	1,744.23	1,480.20	264.03	6.606	
6,500.00	3,059.58	3,072.24	3,071.63	66.90	198.91	88.18	1,831.25	326.10	1,842.49	1,576.68	265.81	6.932	
6,600.00	3,058.88	3,071.62	3,071.01	68.72	198.86	88.07	1,831.25	326.10	1,940.92	1,673.34	267.58	7.253	
6,700.00	3,058.19	3,070.99	3,070.38	70.55	198.82	87.96	1,831.25	326.10	2,039.51	1,770.15	269.36	7.572	
6,800.00	3,057.49	3,070.36	3,069.75	72.37	198.77	87.85	1,831.25	326.10	2,138.23	1,867.09	271.14	7.886	
6,900.00	3,056.79	3,069.72	3,069.11	74.20	198.72	87.74	1,831.25	326.10	2,237.06	1,964.14	272.91	8.197	
7,000.00	3,056.09	3,069.08	3,068.47	76.02	198.67	87.63	1,831.25	326.10	2,335.99	2,061.30	274.69	8.504	
7,100.00	3,055.39	3,068.44	3,067.82	77.85	198.62	87.52	1,831.25	326.10	2,435.01	2,158.54	276.47	8.808	
7,200.00	3,054.69	3,067.79	3,067.18	79.68	198.56	87.41	1,831.24	326.10	2,534.10	2,255.86	278.24	9.108	
7,300.00	3,054.00	3,067.13	3,066.52	81.51	198.51	87.30	1,831.24	326.10	2,633.27	2,353.25	280.02	9.404	
7,400.00	3,053.30	3,066.48	3,065.86	83.33	198.46	87.19	1,831.24	326.10	2,732.49	2,450.70	281.80	9.697	
7,500.00	3,052.60	3,065.81	3,065.20	85.16	198.41	87.07	1,831.24	326.10	2,831.77	2,548.20	283.57	9.986	
7,600.00	3,051.90	3,065.14	3,064.53	86.99	198.36	86.96	1,831.24	326.10	2,931.10	2,645.75	285.35	10.272	
7,636.14	3,051.65	3,064.90	3,064.29	87.65	198.34	86.92	1,831.24	326.10	2,967.00	2,681.01	285.99	10.375	

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 #2H
Project:	Eddy County, NM (NAD:27-NME)	TVD Reference:	GL @ 3349.00usft
Reference Site:	Sherman 4 Fee	MD Reference:	GL @ 3349.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	GCR.DB
Reference Design:	Plan #1, 03-17-14	Offset TVD Reference:	Offset Datum

Offset Design											Offset Site Error: 0.00 usft			
Stonewall 9 Fee - #2H - OH - Plan #1, 01-07-13											Offset Well Error: 0.00 usft			
Survey Program: 10-MWD														
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		
0.00	0.00	11.00	11.00	0.00	0.01	168.84	-299.60	59.10	305.37	305.36	0.01	N/A		
100.00	100.00	111.00	111.00	0.11	0.12	168.84	-299.60	59.10	305.37	305.14	0.23	1,306.373		
200.00	200.00	211.00	211.00	0.34	0.35	168.84	-299.60	59.10	305.37	304.69	0.68	446.917		
300.00	300.00	311.00	311.00	0.56	0.57	168.84	-299.60	59.10	305.37	304.24	1.13	269.569		
400.00	400.00	411.00	411.00	0.79	0.80	168.84	-299.60	59.10	305.37	303.79	1.58	192.987		
500.00	500.00	511.00	511.00	1.01	1.02	168.84	-299.60	59.10	305.37	303.34	2.03	150.291		
600.00	600.00	611.00	611.00	1.24	1.25	168.84	-299.60	59.10	305.37	302.89	2.48	123.064		
700.00	700.00	711.00	711.00	1.46	1.47	168.84	-299.60	59.10	305.37	302.44	2.93	104.189		
800.00	800.00	811.00	811.00	1.69	1.69	168.84	-299.60	59.10	305.37	301.99	3.38	90.334		
900.00	900.00	911.00	911.00	1.91	1.92	168.84	-299.60	59.10	305.37	301.54	3.83	79.732		
1,000.00	1,000.00	1,011.00	1,011.00	2.14	2.14	168.84	-299.60	59.10	305.37	301.09	4.28	71.357		
1,100.00	1,100.00	1,111.00	1,111.00	2.36	2.37	168.84	-299.60	59.10	305.37	300.64	4.73	64.574		
1,200.00	1,200.00	1,211.00	1,211.00	2.58	2.59	168.84	-299.60	59.10	305.37	300.19	5.18	58.968		
1,300.00	1,300.00	1,311.00	1,311.00	2.81	2.82	168.84	-299.60	59.10	305.37	299.75	5.63	54.258		
1,400.00	1,400.00	1,411.00	1,411.00	3.03	3.04	168.84	-299.60	59.10	305.37	299.30	6.08	50.245		
1,500.00	1,500.00	1,511.00	1,511.00	3.26	3.27	168.84	-299.60	59.10	305.37	298.85	6.53	46.785		
1,600.00	1,600.00	1,611.00	1,611.00	3.48	3.49	168.84	-299.60	59.10	305.37	298.40	6.98	43.770		
1,700.00	1,700.00	1,711.00	1,711.00	3.71	3.72	168.84	-299.60	59.10	305.37	297.95	7.43	41.121		
1,800.00	1,800.00	1,811.00	1,811.00	3.93	3.94	168.84	-299.60	59.10	305.37	297.50	7.88	38.774		
1,900.00	1,900.00	1,911.00	1,911.00	4.16	4.17	168.84	-299.60	59.10	305.37	297.05	8.33	36.680		
2,000.00	2,000.00	2,011.00	2,011.00	4.38	4.39	168.84	-299.60	59.10	305.37	296.60	8.77	34.801		
2,100.00	2,100.00	2,111.00	2,111.00	4.61	4.62	168.84	-299.60	59.10	305.37	296.15	9.22	33.105		
2,200.00	2,200.00	2,211.00	2,211.00	4.83	4.84	168.84	-299.60	59.10	305.37	295.70	9.67	31.567		
2,300.00	2,300.00	2,311.00	2,311.00	5.06	5.07	168.84	-299.60	59.10	305.37	295.25	10.12	30.165		
2,400.00	2,400.00	2,411.00	2,411.00	5.28	5.29	168.84	-299.60	59.10	305.37	294.80	10.57	28.882		
2,500.00	2,500.00	2,511.00	2,511.00	5.51	5.52	168.84	-299.60	59.10	305.37	294.35	11.02	27.704		
2,506.17	2,506.17	2,517.17	2,517.17	5.52	5.53	168.84	-299.60	59.10	305.37	294.32	11.05	27.635 CC, ES		
2,560.49	2,560.49	2,550.00	2,549.99	5.64	5.60	168.86	-300.11	59.11	306.63	295.39	11.24	27.281 SF		
2,600.00	2,599.96	2,579.95	2,579.86	5.73	5.65	169.08	-302.29	59.16	311.05	299.67	11.38	27.327		
2,650.00	2,649.56	2,610.17	2,609.82	5.85	5.71	169.07	-306.22	59.24	323.45	311.89	11.56	27.983		
2,700.00	2,698.34	2,638.31	2,637.46	5.98	5.76	169.01	-311.45	59.35	342.94	331.20	11.74	29.211		
2,750.00	2,745.85	2,663.68	2,662.11	6.11	5.81	168.83	-317.43	59.47	368.91	356.99	11.92	30.947		
2,800.00	2,791.65	2,685.84	2,683.39	6.24	5.86	168.46	-323.63	59.60	400.60	388.50	12.10	33.114		
2,850.00	2,835.32	2,700.00	2,696.84	6.38	5.89	167.63	-328.06	59.70	437.22	424.95	12.27	35.637		
2,900.00	2,876.46	2,719.90	2,715.52	6.59	5.93	166.66	-334.91	59.84	477.79	465.27	12.52	38.162		
2,950.00	2,914.70	2,731.92	2,726.67	6.85	5.96	164.78	-339.38	59.93	521.63	508.82	12.81	40.734		
3,000.00	2,949.67	2,750.00	2,743.25	7.17	6.00	162.30	-346.60	60.09	568.07	554.90	13.16	43.153		
3,050.00	2,981.06	2,750.00	2,743.25	7.55	6.00	155.63	-346.60	60.09	615.97	602.42	13.55	45.466		
3,100.00	3,008.58	2,750.00	2,743.25	8.00	6.00	139.70	-346.60	60.09	665.11	651.11	14.00	47.513		
3,150.00	3,031.97	2,750.00	2,743.25	8.52	6.00	93.33	-346.60	60.09	714.84	700.32	14.51	49.250		
3,200.00	3,051.02	2,750.00	2,743.25	9.09	6.00	41.14	-346.60	60.09	764.62	749.52	15.09	50.665		
3,250.00	3,065.55	2,750.00	2,743.25	9.73	6.00	22.46	-346.60	60.09	814.02	798.30	15.72	51.775		
3,300.00	3,075.43	2,750.00	2,743.25	10.40	6.00	14.92	-346.60	60.09	862.71	846.31	16.40	52.608		
3,350.00	3,080.57	2,750.00	2,743.25	11.11	6.00	11.02	-346.60	60.09	910.37	893.26	17.11	53.205		
3,382.31	3,081.35	2,750.00	2,743.25	11.59	6.00	9.39	-346.60	60.09	940.50	922.92	17.58	53.483		
3,400.00	3,081.22	2,731.65	2,726.43	11.85	5.96	8.96	-339.28	59.93	956.37	938.57	17.81	53.702		
3,500.00	3,080.53	2,718.73	2,714.43	13.39	5.93	8.67	-334.48	59.83	1,048.80	1,029.47	19.32	54.278		
3,600.00	3,079.83	2,700.00	2,696.84	15.00	5.89	8.28	-328.06	59.70	1,142.18	1,121.29	20.89	54.677		
3,700.00	3,079.13	2,700.00	2,696.84	16.66	5.89	8.28	-328.06	59.70	1,236.17	1,213.62	22.54	54.833		
3,800.00	3,078.43	2,700.00	2,696.84	18.34	5.89	8.28	-328.06	59.70	1,331.03	1,306.80	24.23	54.927		
3,900.00	3,077.73	2,679.48	2,677.32	20.06	5.85	7.89	-321.76	59.56	1,426.05	1,400.15	25.90	55.050		
4,000.00	3,077.03	2,671.95	2,670.09	21.79	5.83	7.75	-319.64	59.52	1,521.73	1,494.10	27.62	55.090		

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 #2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	GL @ 3349.00usft
Reference Site:	Sherman 4 Fee	MD Reference:	GL @ 3349.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	GCR DB
Reference Design:	Plan #1-03-17-14	Offset-TVD Reference:	Offset Datum

Offset Design: Stonewall 9 Fee - #2H - OH - Plan #1-01-07-13														Offset Site Error:	0.00 usft
Survey Program: 0-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)					
4,100.00	3,076.34	2,650.00	2,648.86	23.54	5.78	7.38	-314.05	59.40	1,618.09	1,588.76	29.33	55.177			
4,200.00	3,075.64	2,650.00	2,648.86	25.30	5.78	7.38	-314.05	59.40	1,714.32	1,683.23	31.09	55.147			
4,300.00	3,074.94	2,650.00	2,648.86	27.07	5.78	7.38	-314.05	59.40	1,810.95	1,778.10	32.86	55.116			
4,400.00	3,074.24	2,650.00	2,648.86	28.85	5.78	7.38	-314.05	59.40	1,907.94	1,873.30	34.64	55.086			
4,500.00	3,073.54	2,650.00	2,648.86	30.64	5.78	7.38	-314.05	59.40	2,005.22	1,968.80	36.42	55.057			
4,600.00	3,072.85	2,650.00	2,648.86	32.43	5.78	7.38	-314.05	59.40	2,102.75	2,064.54	38.21	55.029			
4,700.00	3,072.15	2,650.00	2,648.86	34.22	5.78	7.38	-314.05	59.40	2,200.51	2,160.50	40.01	55.004			
4,800.00	3,071.45	2,650.00	2,648.86	36.02	5.78	7.38	-314.05	59.40	2,298.46	2,256.65	41.81	54.980			
4,900.00	3,070.75	2,626.67	2,626.07	37.82	5.74	7.02	-309.11	59.30	2,395.94	2,352.38	43.56	55.000			
5,000.00	3,070.05	2,623.27	2,622.72	39.63	5.73	6.97	-308.47	59.29	2,494.02	2,448.66	45.36	54.982			
5,100.00	3,069.36	2,600.00	2,599.76	41.44	5.69	6.64	-304.71	59.21	2,592.68	2,545.56	47.12	55.019			
5,200.00	3,068.66	2,600.00	2,599.76	43.25	5.69	6.64	-304.71	59.21	2,690.86	2,641.93	48.93	54.991			
5,300.00	3,067.96	2,600.00	2,599.76	45.06	5.69	6.64	-304.71	59.21	2,789.17	2,738.42	50.74	54.964			
5,400.00	3,067.26	2,600.00	2,599.76	46.87	5.69	6.64	-304.71	59.21	2,887.59	2,835.03	52.56	54.940			
5,500.00	3,066.56	2,600.00	2,599.76	48.69	5.69	6.64	-304.71	59.21	2,986.12	2,931.75	54.37	54.918			
5,600.00	3,065.86	2,600.00	2,599.76	50.50	5.69	6.64	-304.71	59.21	3,084.75	3,028.56	56.19	54.898			
5,700.00	3,065.17	2,600.00	2,599.76	52.32	5.69	6.64	-304.71	59.21	3,183.46	3,125.45	58.01	54.880			
5,800.00	3,064.47	2,600.00	2,599.76	54.14	5.69	6.64	-304.71	59.21	3,282.25	3,222.42	59.83	54.862			
5,900.00	3,063.77	2,600.00	2,599.76	55.96	5.69	6.64	-304.71	59.21	3,381.10	3,319.46	61.65	54.846			
6,000.00	3,063.07	2,600.00	2,599.76	57.78	5.69	6.64	-304.71	59.21	3,480.03	3,416.56	63.47	54.832			
6,100.00	3,062.37	2,600.00	2,599.76	59.60	5.69	6.64	-304.71	59.21	3,579.01	3,513.72	65.29	54.818			
6,200.00	3,061.68	2,600.00	2,599.76	61.43	5.69	6.64	-304.71	59.21	3,678.05	3,610.94	67.11	54.805			
6,300.00	3,060.98	2,600.00	2,599.76	63.25	5.69	6.64	-304.71	59.21	3,777.14	3,708.21	68.93	54.793			
6,400.00	3,060.28	2,600.00	2,599.76	65.07	5.69	6.64	-304.71	59.21	3,876.28	3,805.52	70.76	54.782			
6,500.00	3,059.58	2,600.00	2,599.76	66.90	5.69	6.64	-304.71	59.21	3,975.46	3,902.88	72.58	54.772			
6,600.00	3,058.88	2,600.00	2,599.76	68.72	5.69	6.64	-304.71	59.21	4,074.68	4,000.27	74.41	54.762			
6,700.00	3,058.19	2,600.00	2,599.76	70.55	5.69	6.64	-304.71	59.21	4,173.94	4,097.70	76.23	54.753			
6,800.00	3,057.49	2,600.00	2,599.76	72.37	5.69	6.64	-304.71	59.21	4,273.23	4,195.17	78.06	54.745			
6,900.00	3,056.79	2,600.00	2,599.76	74.20	5.69	6.64	-304.71	59.21	4,372.55	4,292.67	79.88	54.737			
7,000.00	3,056.09	2,600.00	2,599.76	76.02	5.69	6.64	-304.71	59.21	4,471.91	4,390.20	81.71	54.729			
7,100.00	3,055.39	2,600.00	2,599.76	77.85	5.69	6.64	-304.71	59.21	4,571.29	4,487.75	83.54	54.722			
7,200.00	3,054.69	2,600.00	2,599.76	79.68	5.69	6.64	-304.71	59.21	4,670.70	4,585.33	85.36	54.715			
7,300.00	3,054.00	2,600.00	2,599.76	81.51	5.69	6.64	-304.71	59.21	4,770.13	4,682.94	87.19	54.709			
7,400.00	3,053.30	2,600.00	2,599.76	83.33	5.69	6.64	-304.71	59.21	4,869.59	4,780.57	89.02	54.703			
7,500.00	3,052.60	2,600.00	2,599.76	85.16	5.69	6.64	-304.71	59.21	4,969.07	4,878.22	90.85	54.697			
7,600.00	3,051.90	2,577.02	2,576.94	86.99	5.64	6.35	-302.00	59.15	5,068.01	4,975.37	92.63	54.710			
7,636.14	3,051.65	2,576.68	2,576.60	87.65	5.64	6.35	-301.97	59.15	5,103.95	5,010.66	93.29	54.708			

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



Phoenix Technology Services
Anticollision Report

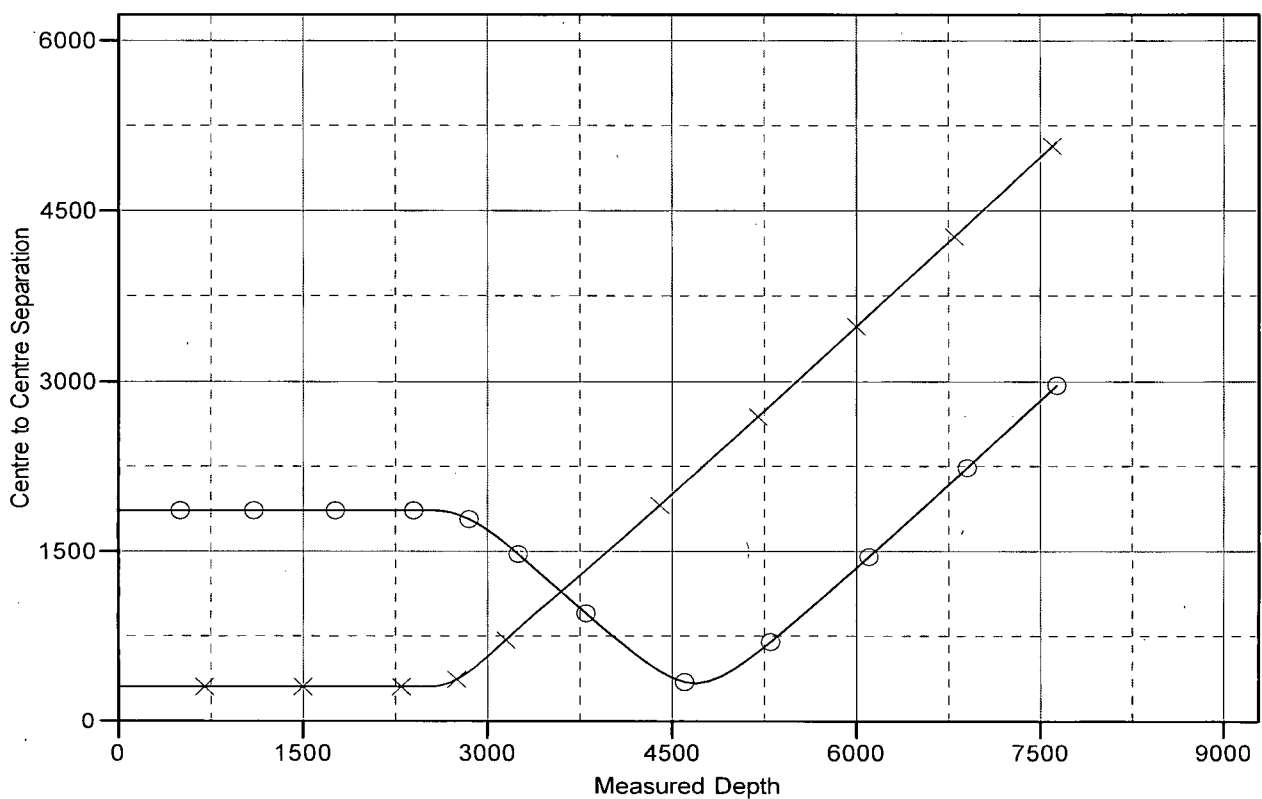


Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	GL @ 3349.00usft.
Reference Site:	Sherman 4 Fee	MD Reference:	GL @ 3349.00usft.
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	GCR DB
Reference Design:	Plan #1, 03-17-14	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL @ 3349.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #2H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.03°

Ladder Plot



LEGEND

○ 1-SWD, WB1, Inc Surveys V0 ✕ #2H, OH, Plan #1 01-07-13 V0



Phoenix Technology Services
Anticollision Report

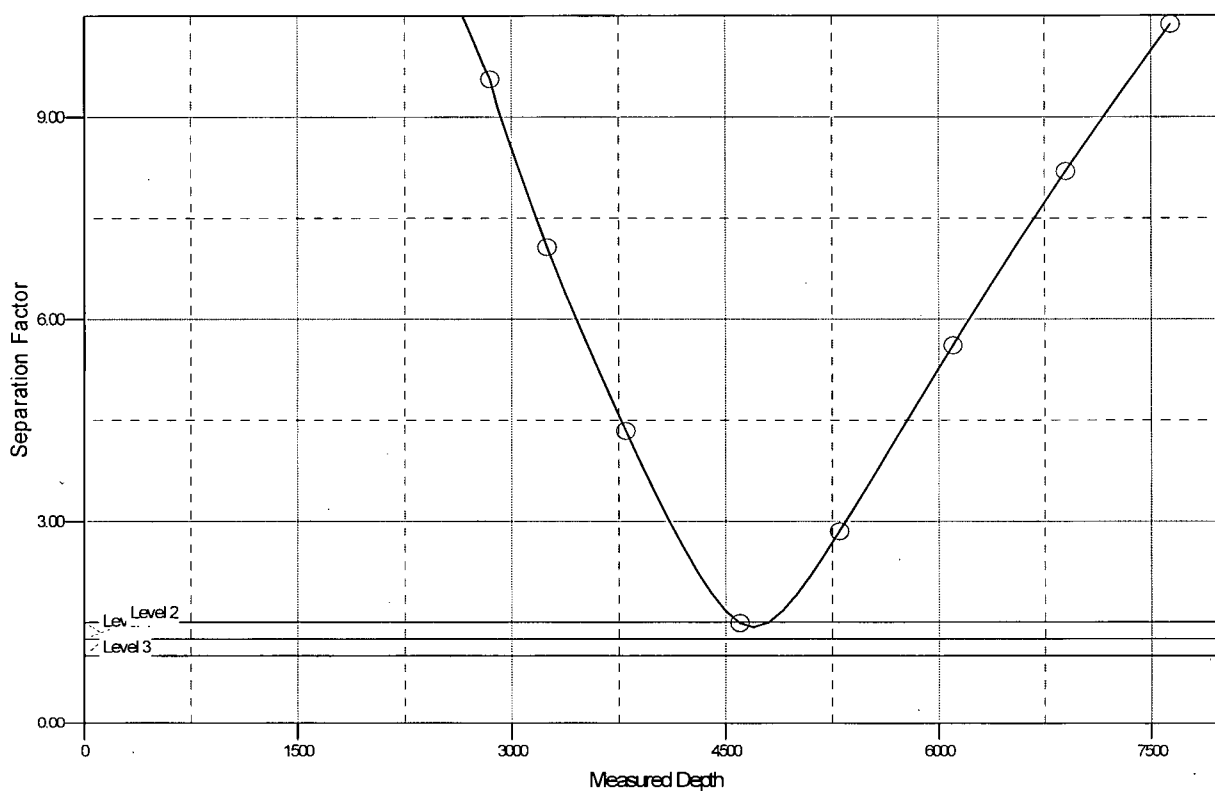


Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well #2H
Project:	Eddy County, NM (NAD:27, NME)	TVD Reference:	GL @ 3349.00usft
Reference Site:	Sherman 4 Fee	MD Reference:	GL @ 3349.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	GCR DB
Reference Design:	Plan #1 03-17-14	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL @ 3349.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #2H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.03°

Separation Factor Plot



LEGEND

○ 1-SWD, WB1, Inc Surveys V0 ✕ #2H, OH, Plan #1 01-07-13 V0