

NM OIL CONSERVATION

ARTESIA DISTRICT

Form C-102

Revised August 1, 2011

Submit one copy to appropriate

District Office

DEC 18 2014

RECEIVED

AMENDED REPORT

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (505) 393-6161 Fax: (505) 393-0720
DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (505) 748-1283 Fax: (505) 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

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015- 42877	Pool Code 50270	Pool Name Penasco Draw; SA-Yeso (Assoc)
Property Code 38979	Property Name PINTO 36 STATE COM	Well Number 9H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3455'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	31	18-S	26-E		436	SOUTH	194	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
M	36	18-S	25-E		330	SOUTH	330	WEST	EDDY

Dedicated Acres 160	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

SCALE: 1"=2000'

Estimated 428 FSL
Completed 330 FEL
Interval:

A - Y=617333.4 N, X=465187.4 E
B - Y=618644.1 N, X=465212.0 E
C - Y=618545.2 N, X=470558.1 E
D - Y=618543.6 N, X=471726.7 E
E - Y=617212.7 N, X=471734.5 E
F - Y=617216.7 N, X=470554.4 E

Y=617652.0 N
X=470749.6 E

LAT.=32.697987° N
LONG.=104.428418° 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 order heretofore entered by the division.

 **11-4-14**
Signature Date

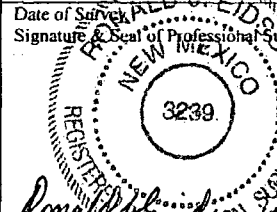
Kelly J. Holly
Printed Name

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 3, 2014
Date of Survey

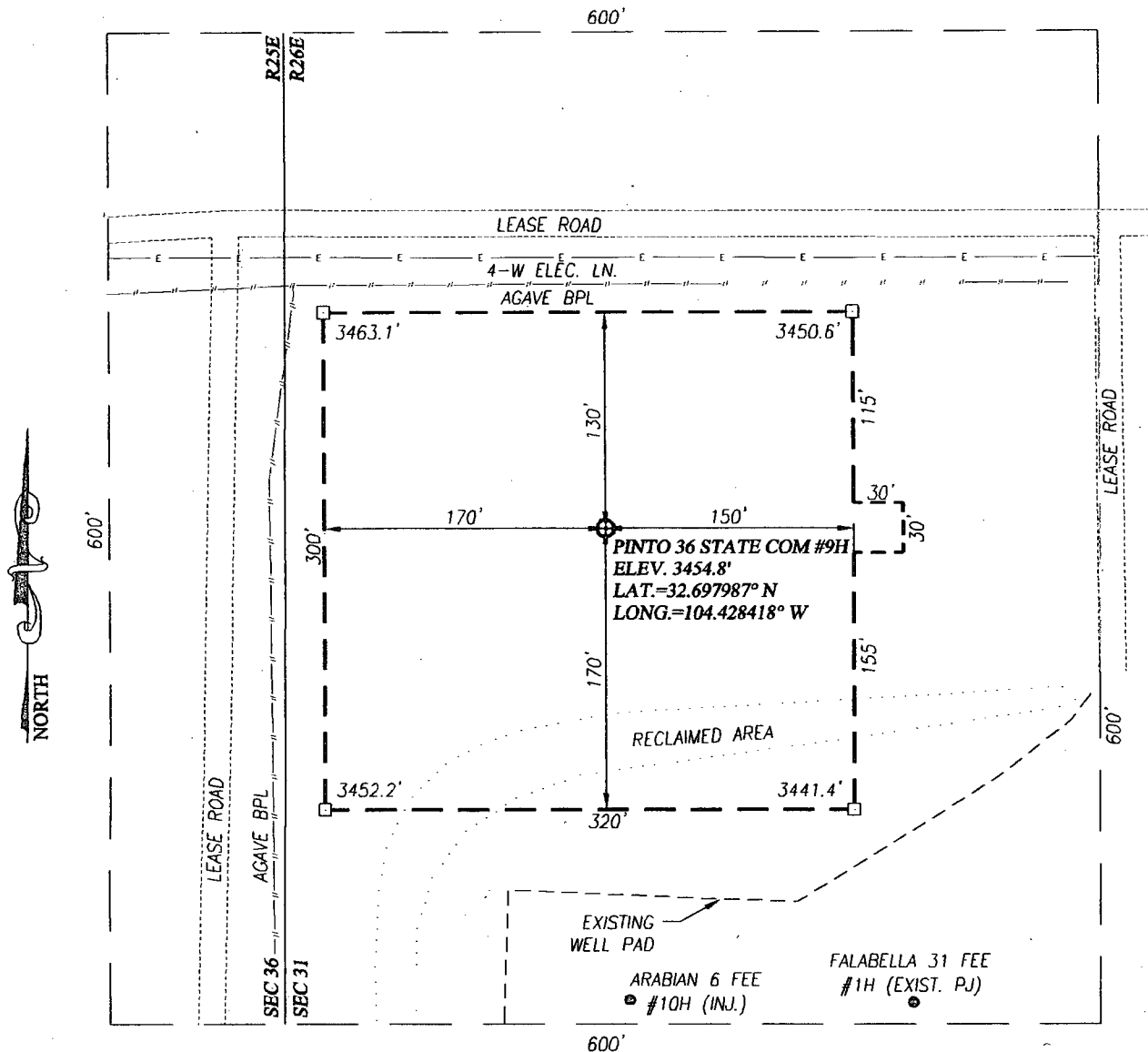
 **3239**
Signature & Seal of Professional Surveyor

NEW MEXICO
REGISTERED SURVEYOR

3239
Certificate Number

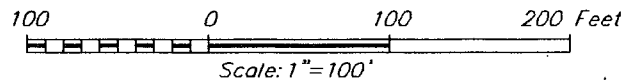
Gary G. Eidson 12641
Ronald J. Eidson 3239

ACK REV.: 10/1/14 JWSC W.O.: 14.11.0927



DIRECTIONS TO PINTO 36 STATE COM #9H:

FROM THE INTERSECTION OF U.S. HWY. 285 AND CO. RD. 38 (KINCAID RANCH), GO WEST APPROX. 2.8 MILES ON CO. RD. 38. TURN LEFT AND GO SOUTH APPROX. 0.9 MILES. TURN LEFT AND GO EAST APPROX. 0.9 MILES. THE LOCATION STAKE IS 180 FEET SOUTH OF THE ROAD.



COG OPERATING, LLC

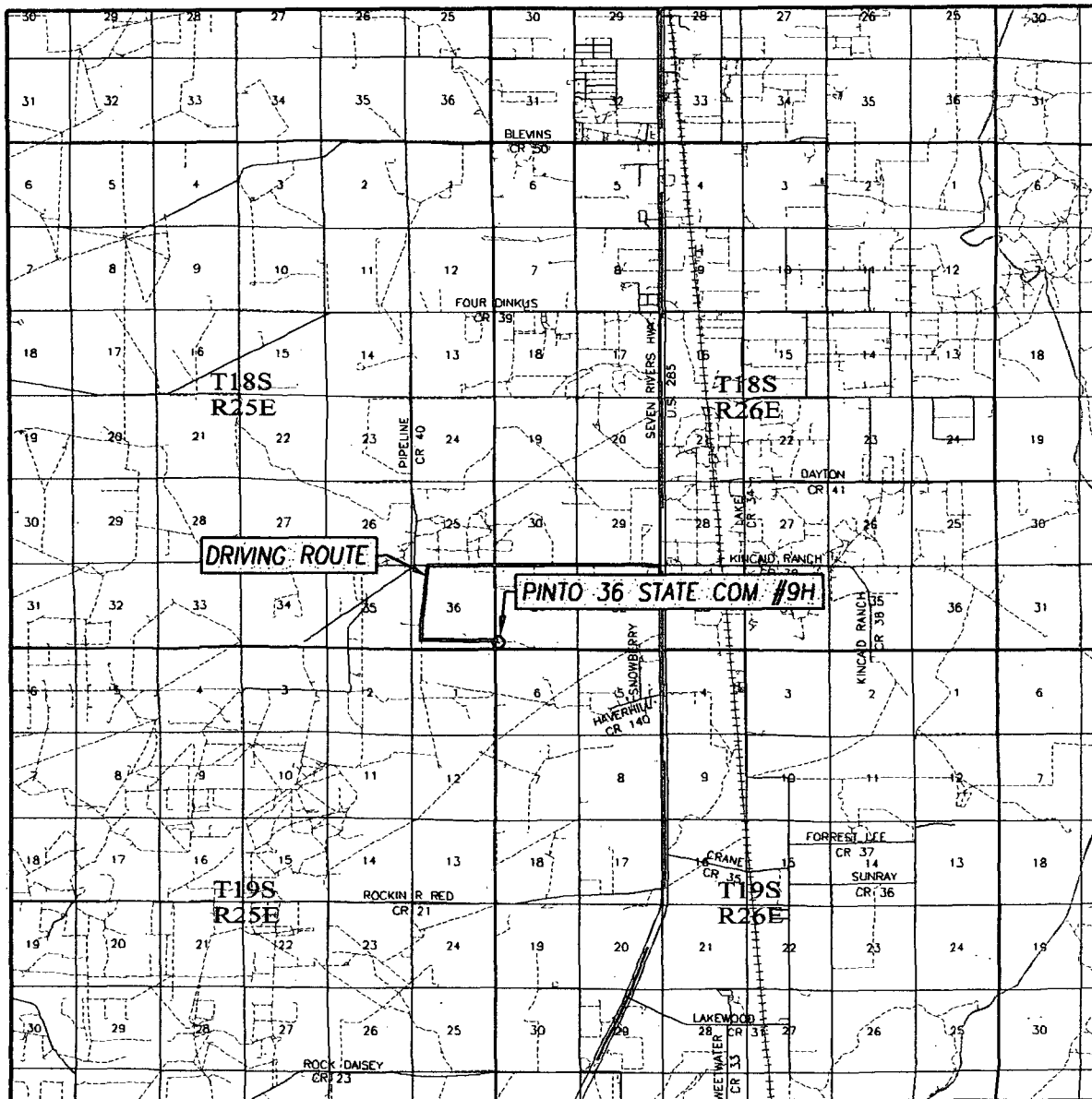
**PINTO 36 STATE COM #9H WELL
LOCATED 436 FEET FROM THE SOUTH LINE
AND 194 FEET FROM THE WEST LINE OF SECTION 31,
TOWNSHIP 18 SOUTH, RANGE 26 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO**



PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 9/3/14	CAD Date: 9/23/14	Drawn By: ACK
W.O. No.: 14110927	Rev: 10/1/14	Rel. W.O.:
		Sheet 1 of 1

VICINITY MAP



SCALE: 1" = 2 MILES

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

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 436' FSL & 194' FWL

ELEVATION 3455'

OPERATOR COG OPERATING, LLC

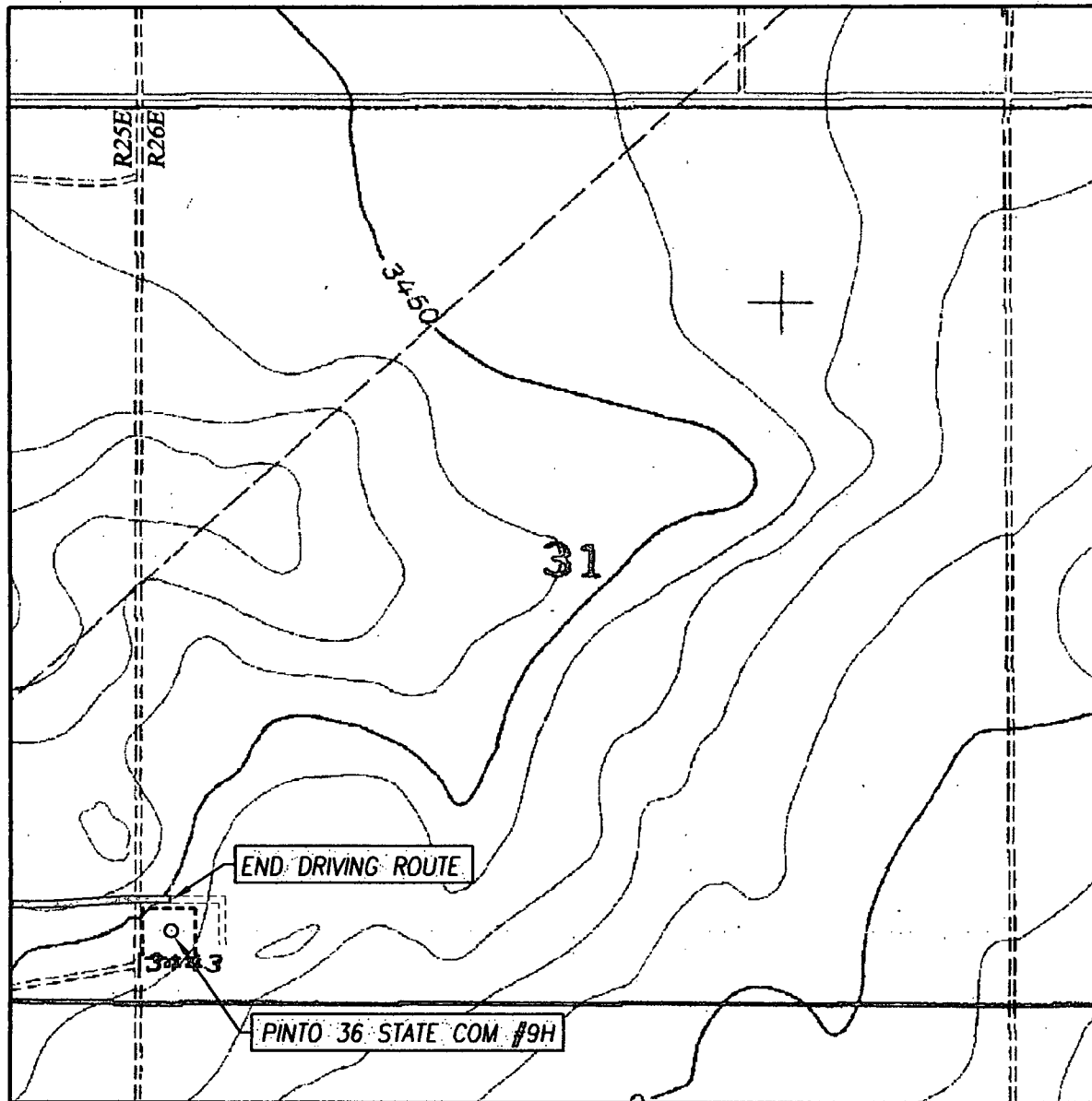
LEASE PINTO 36 STATE COM

PROVIDING SURVEYING SERVICES
SINCE 1946

JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

LOCATION VERIFICATION MAP



SCALE: 1" = 1000'

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

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

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 436' FSL & 194' FWL

ELEVATION 3455'

OPERATOR COG OPERATING, LLC

LEASE PINTO 36 STATE COM

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

DIRECTIONS TO PINTO 36 STATE COM #9H:

FROM THE INTERSECTION OF U.S. HWY. 285 AND CO. RD. 38 (KINCAID RANCH), GO WEST APPROX. 2.8 MILES ON CO. RD. 38. TURN LEFT AND GO SOUTH APPROX. 0.9 MILES. TURN LEFT AND GO EAST APPROX. 0.9 MILES. THE LOCATION STAKE IS 180 FEET SOUTH OF THE ROAD.



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COG Operating LLC

Eddy County, NM (NAD27 NME)

Pinto 36 State Com

#9H

WB1

Plan: Plan #1 10-28-14

Surface: 436' FSL, 194' FWL, Sec 31, T18S, R26E, Unit M

PP: 428' FSL, 330' FEL, Sec 36, T18S, R25E, Unit P

BHL: 330' FSL, 330' FWL, Sec 36, T18S, R25E, Unit M

Standard Planning Report

28 October, 2014





Phoenix Technology Services
Planning Report



Database:	Compass 5000 GCR epdm	Local Co-ordinate Reference:	Well #9H
Company:	COG Operating LLC	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27/NME)	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site:	Pinto 36 State Com	North Reference:	Grid
Well:	#9H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 10-28-14		

Project:	Eddy County, NM (NAD27/NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:	Pinto 36 State Com		
Site Position:		Northing:	617,373.90 usft
From:	Map	Easting:	470,225.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 41' 49.99854 N
		Longitude:	104° 25' 48.44242 W
		Grid Convergence:	-0.05 °

Well:	#9H		
Well Position	+N/-S	278.10 usft	Northing:
	+E/-W	524.60 usft	Easting:
Position Uncertainty	0.00 usft		Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	WB1		
Magnetics:	Model Name	Sample Date	Declination
			(°)
	IGRF2010_14	10/28/2014	7.60
			Dip Angle
			(°)
			Field Strength
			(nT)
			60.40
			48,470

Design:	Plan #1 10-28-14		
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
			(°)
			270.04

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	
2,257.74	0.00	0.00	2,257.74	0.00	0.00	0.00	0.00	0.00	0.00	
3,092.29	91.80	270.04	2,778.36	0.42	-537.23	11.00	11.00	0.00	270.04	
7,783.57	91.80	270.04	2,631.00	4.10	-5,226.20	0.00	0.00	0.00	0.00	PBHL-Pinto 36 State i



Phoenix Technology Services
Planning Report



Database:	Compass 5000 GCR epdm	Local Co-ordinate Reference:	Well #9H
Company:	COG Operating LLC	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site:	Pinto 36 State Com	North Reference:	Grid
Well:	#9H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 10-28-14		

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	
2,257.74	0.00	0.00	2,257.74	0.00	0.00	0.00	0.00	0.00	0.00	
KOP: Start 11°/100' Build										
2,300.00	4.65	270.04	2,299.95	0.00	-1.71	1.71	11.00	11.00	0.00	
2,400.00	15.65	270.04	2,398.24	0.02	-19.31	19.31	11.00	11.00	0.00	
2,500.00	26.65	270.04	2,491.36	0.04	-55.33	55.33	11.00	11.00	0.00	
2,600.00	37.65	270.04	2,575.90	0.09	-108.46	108.46	11.00	11.00	0.00	
2,700.00	48.65	270.04	2,648.74	0.14	-176.74	176.74	11.00	11.00	0.00	
2,800.00	59.65	270.04	2,707.22	0.20	-257.67	257.67	11.00	11.00	0.00	
2,900.00	70.65	270.04	2,749.19	0.27	-348.27	348.27	11.00	11.00	0.00	
3,000.00	81.65	270.04	2,773.09	0.35	-445.21	445.21	11.00	11.00	0.00	
3,076.48	90.06	270.04	2,778.61	0.41	-521.43	521.43	11.00	11.00	0.00	
TL: 2795' TVD @ 0.0V, 91.8° Inc										
3,079.05	90.34	270.04	2,778.60	0.41	-524.00	524.00	11.00	11.00	0.00	
PP: Pinto 36 State #9H										
3,092.29	91.80	270.04	2,778.36	0.42	-537.23	537.23	11.00	11.00	0.00	
LP: Hold 91.8° Inc, 270.04° Azm										
3,100.00	91.80	270.04	2,778.11	0.43	-544.94	544.94	0.00	0.00	0.00	
3,200.00	91.80	270.04	2,774.97	0.51	-644.89	644.89	0.00	0.00	0.00	
3,300.00	91.80	270.04	2,771.83	0.58	-744.84	744.84	0.00	0.00	0.00	
3,400.00	91.80	270.04	2,768.69	0.66	-844.79	844.79	0.00	0.00	0.00	
3,500.00	91.80	270.04	2,765.55	0.74	-944.74	944.74	0.00	0.00	0.00	
3,600.00	91.80	270.04	2,762.41	0.82	-1,044.69	1,044.69	0.00	0.00	0.00	
3,700.00	91.80	270.04	2,759.27	0.90	-1,144.64	1,144.64	0.00	0.00	0.00	
3,800.00	91.80	270.04	2,756.13	0.98	-1,244.59	1,244.59	0.00	0.00	0.00	
3,900.00	91.80	270.04	2,752.99	1.05	-1,344.54	1,344.54	0.00	0.00	0.00	
4,000.00	91.80	270.04	2,749.84	1.13	-1,444.49	1,444.50	0.00	0.00	0.00	
4,100.00	91.80	270.04	2,746.70	1.21	-1,544.45	1,544.45	0.00	0.00	0.00	
4,200.00	91.80	270.04	2,743.56	1.29	-1,644.40	1,644.40	0.00	0.00	0.00	
4,300.00	91.80	270.04	2,740.42	1.37	-1,744.35	1,744.35	0.00	0.00	0.00	
4,400.00	91.80	270.04	2,737.28	1.45	-1,844.30	1,844.30	0.00	0.00	0.00	
4,500.00	91.80	270.04	2,734.14	1.53	-1,944.25	1,944.25	0.00	0.00	0.00	
4,600.00	91.80	270.04	2,731.00	1.60	-2,044.20	2,044.20	0.00	0.00	0.00	
4,700.00	91.80	270.04	2,727.86	1.68	-2,144.15	2,144.15	0.00	0.00	0.00	
4,800.00	91.80	270.04	2,724.72	1.76	-2,244.10	2,244.10	0.00	0.00	0.00	
4,900.00	91.80	270.04	2,721.58	1.84	-2,344.05	2,344.05	0.00	0.00	0.00	
5,000.00	91.80	270.04	2,718.43	1.92	-2,444.00	2,444.00	0.00	0.00	0.00	
5,100.00	91.80	270.04	2,715.29	2.00	-2,543.95	2,543.95	0.00	0.00	0.00	
5,200.00	91.80	270.04	2,712.15	2.07	-2,643.90	2,643.90	0.00	0.00	0.00	
5,300.00	91.80	270.04	2,709.01	2.15	-2,743.85	2,743.85	0.00	0.00	0.00	
5,400.00	91.80	270.04	2,705.87	2.23	-2,843.80	2,843.80	0.00	0.00	0.00	
5,500.00	91.80	270.04	2,702.73	2.31	-2,943.75	2,943.76	0.00	0.00	0.00	
5,600.00	91.80	270.04	2,699.59	2.39	-3,043.70	3,043.71	0.00	0.00	0.00	
5,700.00	91.80	270.04	2,696.45	2.47	-3,143.66	3,143.66	0.00	0.00	0.00	
5,800.00	91.80	270.04	2,693.31	2.54	-3,243.61	3,243.61	0.00	0.00	0.00	
5,900.00	91.80	270.04	2,690.16	2.62	-3,343.56	3,343.56	0.00	0.00	0.00	
6,000.00	91.80	270.04	2,687.02	2.70	-3,443.51	3,443.51	0.00	0.00	0.00	
6,100.00	91.80	270.04	2,683.88	2.78	-3,543.46	3,543.46	0.00	0.00	0.00	
6,200.00	91.80	270.04	2,680.74	2.86	-3,643.41	3,643.41	0.00	0.00	0.00	
6,300.00	91.80	270.04	2,677.60	2.94	-3,743.36	3,743.36	0.00	0.00	0.00	
6,400.00	91.80	270.04	2,674.46	3.02	-3,843.31	3,843.31	0.00	0.00	0.00	
6,500.00	91.80	270.04	2,671.32	3.09	-3,943.26	3,943.26	0.00	0.00	0.00	
6,600.00	91.80	270.04	2,668.18	3.17	-4,043.21	4,043.21	0.00	0.00	0.00	
6,700.00	91.80	270.04	2,665.04	3.25	-4,143.16	4,143.16	0.00	0.00	0.00	



Phoenix Technology Services
Planning Report



Database:	Compass 5000 GCR:epdm	Local Co-ordinate Reference:	Well #9H
Company:	COG Operating LLC	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site:	Pinto 36 State Com	North Reference:	Grid:
Well:	#9H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1, 10-28-14		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,800.00	91.80	270.04	2,661.89	3.33	-4,243.11	4,243.11	0.00	0.00	0.00
6,900.00	91.80	270.04	2,658.75	3.41	-4,343.06	4,343.06	0.00	0.00	0.00
7,000.00	91.80	270.04	2,655.61	3.49	-4,443.01	4,443.01	0.00	0.00	0.00
7,100.00	91.80	270.04	2,652.47	3.56	-4,542.96	4,542.97	0.00	0.00	0.00
7,200.00	91.80	270.04	2,649.33	3.64	-4,642.91	4,642.92	0.00	0.00	0.00
7,300.00	91.80	270.04	2,646.19	3.72	-4,742.87	4,742.87	0.00	0.00	0.00
7,400.00	91.80	270.04	2,643.05	3.80	-4,842.82	4,842.82	0.00	0.00	0.00
7,500.00	91.80	270.04	2,639.91	3.88	-4,942.77	4,942.77	0.00	0.00	0.00
7,600.00	91.80	270.04	2,636.77	3.96	-5,042.72	5,042.72	0.00	0.00	0.00
7,700.00	91.80	270.04	2,633.63	4.03	-5,142.67	5,142.67	0.00	0.00	0.00
7,783.57	91.80	270.04	2,631.00	4.10	-5,226.20	5,226.20	0.00	0.00	0.00
TD at 7783.57' MD - PBHL Pinto 36 State #9H									

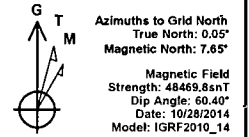
Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL-Pinto 36 State #9I	0.00	360.00	2,631.00	4.10	-5,226.20	617,656.10	465,523.40	32° 41' 52.74527 N	104° 26' 43.46638 W
- plan hits target center									
- Point									
PP-Pinto 36 State #9H	0.00	0.00	2,778.60	0.41	-524.00	617,652.41	470,225.60	32° 41' 52.75458 N	104° 25' 48.43838 W
- plan hits target center									
- Point									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction	
3,076.48	2,778.61	TL, 2795' TVD @ 0 VZ, 91.8° Inc		-1.80	270.04	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,257.74	2,257.74	0.00	0.00	KOP, Start 11°/100' Build
3,092.29	2,778.36	0.42	-537.23	LP, Hold 91.8° Inc, 270.04° Azm
7,783.57	2,631.00	4.10	-5,226.20	TD at 7783.57' MD



Project: Eddy County, NM (NAD27 NME)
Site: Pinto 36 State Com
Well: #9H
Wellbore: WB1
Design: Plan #1 10-28-14
Rig: Silver Oak 3



WELL DETAILS

+N-S	+E-W	Northing	Ground Level	Easting	3455.00	Latitude	Longitude
0.00	0.00	617652.00	470749.60	32° 41' 52.75520 N	104° 25' 42.30621 W		

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSet	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	2257.74	0.00	0.00	2257.74	0.00	0.00	0.00	0.00	0.00		KOP: Start 11°/100' Build
3	3092.28	91.80	270.04	2778.36	0.42	-537.23	11.00	270.04	537.23		LP: Hold 91.8° Inc: 270.04° Azm
4	7783.57	91.80	270.04	2631.00	4.10	-5226.20	0.00	0.00	5226.20	PBHL-Pinto 36 State #9H	TD at 7783.57 MD

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude	Shape
PBHL-Pinto 36 State #9H	2631.00	4.10	-5226.20	617656.10	465523.40	32° 41' 52.74527 N	104° 26' 43.46638 W	Point
PP-Pinto 36 State #9H	2778.80	0.41	-524.00	617652.41	470225.60	32° 41' 52.75458 N	104° 25' 48.43838 W	Point

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	TL, 2795° TVD @ 0 VZ, 91.8° Inc	DipAngle	DipDir
2778.51	3076.48	TL, 2795° TVD @ 0 VZ, 91.8° Inc		-1.89	270.04

LEGEND

- #10H, WB1/Job #1410329, Surveys (Silver Oak 3) V0
- #1H, WB1/Job #1310195, Surveys (JW 4) V0
- #1H, WB1/Job #1310862, Surveys (JW 4) V0
- #6H, WB1, Plan #1 09-05-13 V0
- #7H, WB1, Plan #1 09-05-13 V0
- #8H, WB1, Plan #1 09-05-13 V0
- Plan #1 10-28-14

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 #9H, Grd North

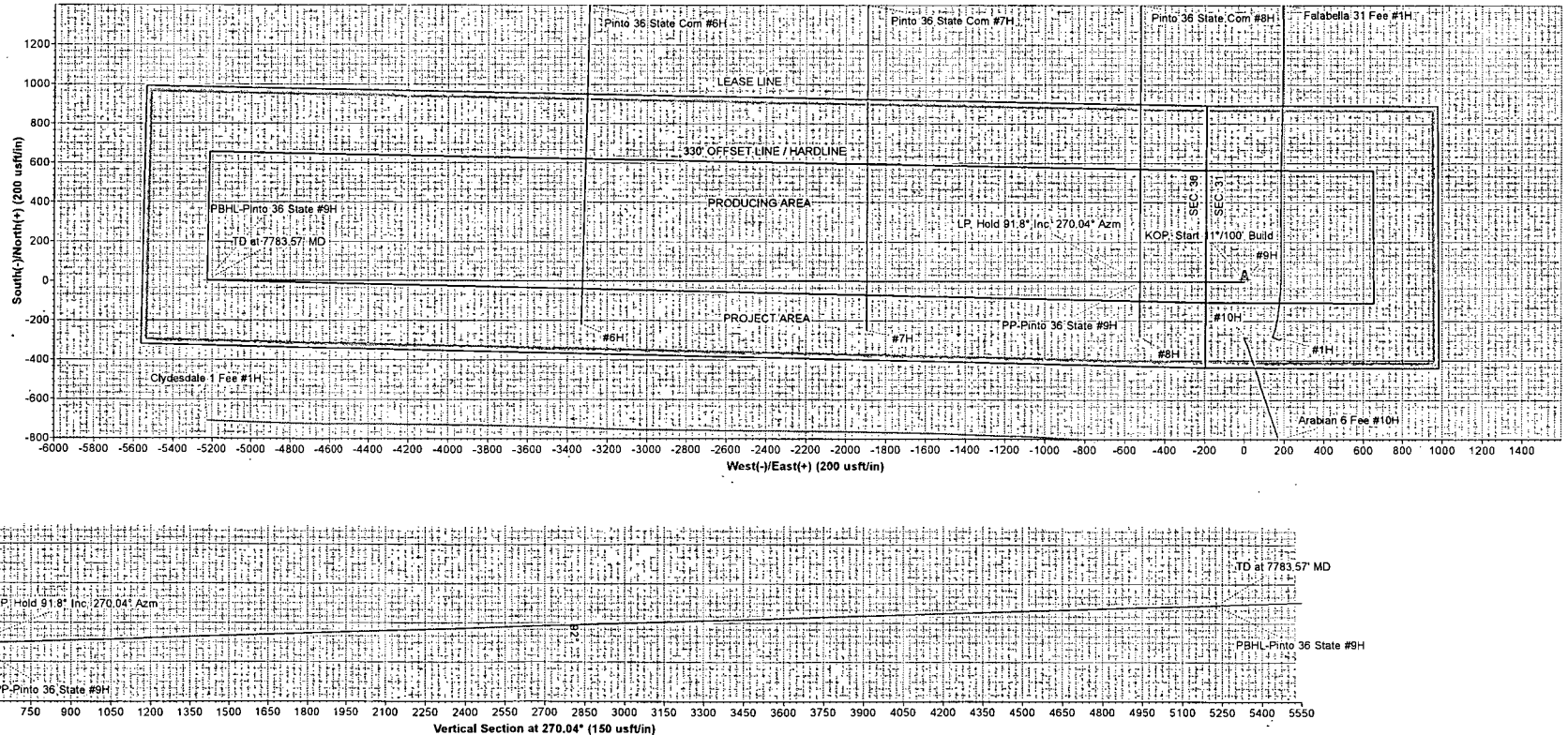
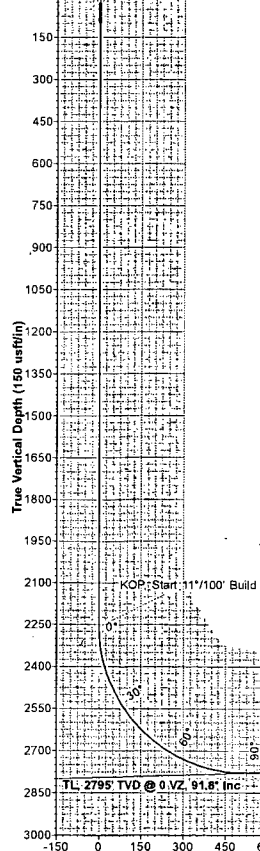
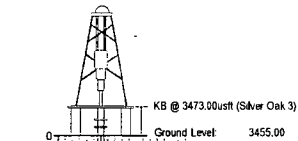
Latitude: 32° 41' 52.75520 N
Longitude: 104° 25' 42.30621 W

Grid East: 470749.60
Grid North: 617652.00
Scale Factor: 1.000

Geomagnetic Model: IGRF2010_14
Sample Date: 28-Oct-14

Magnetic Declination: 7.60°
Dip Angle from Horizontal: 60.40°
Magnetic Field Strength: 48470

To convert a Magnetic Direction to a Grid Direction, Add 7.65°
To convert a Magnetic Direction to a True Direction, Add 7.60° East
To convert a True Direction to a Grid Direction, Add 0.05°





COG Operating LLC

Eddy County, NM (NAD27 NME)

Pinto 36 State Com

#9H

WB1

Plan #1 10-28-14

Anticollision Report

28 October, 2014



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services
Anticollision Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well #9H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Gnd
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #1 10-28-14	Offset TVD Reference:	Offset Datum

Reference	Plan #1 10-28-14		
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 10/28/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	7,783.57	Plan #1 10-28-14 (WB1)	PHX+MWD+IGRF	PHX+MWD+IGRF v3: standard declination

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Arabian 6 Fee						
#10H - WB1/Job #1410329 - Surveys (Silver Oak 3)	2,295.83	2,286.69	280.60	268.56	23.296	CC
#10H - WB1/Job #1410329 - Surveys (Silver Oak 3)	2,300.00	2,289.94	280.61	268.55	23.268	ES
#10H - WB1/Job #1410329 - Surveys (Silver Oak 3)	2,350.00	2,325.08	281.90	269.66	23.033	SF
Clydesdale 1 Fee						
#1H - WB1/Job #1310195 - Surveys (JW 4)	7,779.34	7,424.00	714.12	384.60	2.167	CC
#1H - WB1/Job #1310195 - Surveys (JW 4)	7,783.57	7,424.00	714.13	384.45	2.166	ES, SF
Falabella 31 Fee						
#1H - WB1/Job #1310862 - Surveys (JW 4)	2,496.24	2,611.79	294.97	281.60	22.063	CC
#1H - WB1/Job #1310862 - Surveys (JW 4)	2,500.00	2,615.46	294.99	281.58	21.999	ES
#1H - WB1/Job #1310862 - Surveys (JW 4)	2,550.00	2,656.89	299.53	285.56	21.446	SF
Pinto 36 State Com						
#6H - WB1 - Plan #1 09-05-13	5,883.37	2,710.92	119.11	13.42	0.899	Level 1, CC, ES, SF
#7H - WB1 - Plan #1 09-05-13	4,451.86	2,764.01	95.57	17.40	1.223	Level 2, CC, ES, SF
#8H - WB1 - Plan #1 09-05-13	3,079.10	2,830.82	45.13	17.39	1.627	CC, ES, SF

Offset Design Arabian 6 Fee - #10H - WB1/Job #1410329 - Surveys (Silver Oak 3)											
Survey Program: 100-VES:ISCWSA:GYRO-3:2251-MWD											
Reference Offset Semi Major Axis											
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)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)
0.00	0.00	0.00	0.00	0.00	0.00	176.94	-286.00	15.30	286.55		
100.00	100.00	91.00	91.00	0.15	0.07	176.96	-286.01	15.21	286.41	286.19	0.22 1,331.776
200.00	200.00	190.63	190.63	0.51	0.25	177.01	-286.08	14.94	286.47	285.72	0.75 380.683
300.00	300.00	292.14	292.14	0.86	0.43	177.11	-286.00	14.45	286.37	285.07	1.30 220.513
400.00	400.00	391.74	391.73	1.22	0.62	177.21	-285.67	13.91	286.01	284.17	1.84 155.362
500.00	500.00	491.23	491.23	1.58	0.80	177.29	-285.52	13.50	285.84	283.46	2.39 119.830
600.00	600.00	591.36	591.35	1.94	0.99	177.41	-285.46	12.94	285.75	282.82	2.93 97.460
700.00	700.00	692.09	692.08	2.30	1.18	177.54	-285.24	12.26	285.51	282.03	3.48 82.072
800.00	800.00	792.13	792.12	2.66	1.37	177.64	-284.87	11.75	285.11	281.09	4.02 70.871
900.00	900.00	891.53	891.52	3.01	1.55	177.74	-284.60	11.23	284.82	280.25	4.57 62.365
984.62	984.62	975.63	975.62	3.32	1.71	177.85	-284.54	10.67	284.74	279.71	5.03 56.635
1,000.00	1,000.00	990.92	990.91	3.37	1.74	177.88	-284.55	10.56	284.74	279.63	5.11 55.707

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



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #9H
Project:	Eddy County - NM (NAD27/NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #1 10-28-14	Offset TVD Reference:	Offset Datum

Offset Design Arabian 6 Fee #10H WB1/Job #1410329 - Surveys (Silver Oak 3)													Offset Site Error:	0.00 usft
Survey Program: 100-VES/ISCVSA-GYRO 3-2251-MWD													Offset Well Error:	0.00 usft
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)	Minimum Separation (usft)	Separation Factor		
1,100.00	1,100.00	1,091.12	1,091.10	3.73	1.93	178.07	-284.60	9.59	284.76	279.10	5.66	50.335		
1,196.80	1,196.80	1,187.82	1,187.80	4.08	2.11	178.30	-284.61	8.44	284.74	278.55	6.19	46.033		
1,200.00	1,200.00	1,191.02	1,191.00	4.09	2.11	178.31	-284.61	8.40	284.74	278.53	6.20	45.903		
1,300.00	1,300.00	1,290.81	1,290.77	4.45	2.30	178.56	-284.68	7.15	284.77	278.03	6.75	42.200		
1,400.00	1,400.00	1,391.62	1,391.58	4.81	2.49	178.86	-284.67	5.66	284.73	277.43	7.30	39.026		
1,500.00	1,500.00	1,492.23	1,492.17	5.17	2.68	179.16	-284.38	4.16	284.42	276.57	7.84	36.262		
1,600.00	1,600.00	1,592.21	1,592.14	5.52	2.87	179.45	-283.99	2.75	284.00	275.61	8.39	33.851		
1,700.00	1,700.00	1,692.18	1,692.10	5.88	3.05	179.69	-283.60	1.56	283.61	274.67	8.94	31.738		
1,800.00	1,800.00	1,792.28	1,792.20	6.24	3.24	179.92	-283.20	0.37	283.20	273.72	9.48	29.867		
1,900.00	1,900.00	1,892.14	1,892.05	6.60	3.43	-179.84	-282.80	-0.78	282.80	272.77	10.03	28.201		
2,000.00	2,000.00	1,992.25	1,992.15	6.96	3.62	-179.61	-282.41	-1.92	282.42	271.84	10.57	26.707		
2,100.00	2,100.00	2,093.15	2,093.04	7.32	3.80	-179.38	-281.84	-3.04	281.86	270.74	11.12	25.344		
2,200.00	2,200.00	2,193.10	2,192.98	7.67	3.97	-179.22	-281.08	-3.82	281.11	269.46	11.65	24.133		
2,257.74	2,257.74	2,250.29	2,250.18	7.88	4.03	-179.11	-280.72	-4.35	280.76	268.85	11.91	23.577		
2,295.83	2,295.80	2,286.69	2,286.57	8.02	4.03	-89.37	-280.58	-4.69	280.60	268.56	12.04	23.296 CC		
2,300.00	2,299.95	2,289.94	2,289.82	8.03	4.03	-89.42	-280.59	-4.71	280.61	268.55	12.06	23.268 ES		
2,350.00	2,349.52	2,325.08	2,324.95	8.20	4.03	-90.22	-281.44	-4.49	281.90	269.66	12.24	23.033 SF		
2,400.00	2,398.24	2,353.65	2,353.38	8.38	4.04	-91.15	-283.99	-3.54	286.69	274.27	12.42	23.077		
2,450.00	2,445.66	2,377.00	2,376.42	8.57	4.05	-91.84	-287.46	-2.08	295.58	282.95	12.62	23.414		
2,500.00	2,491.36	2,408.00	2,406.60	8.79	4.07	-93.20	-293.88	0.83	308.68	295.82	12.86	23.994		
2,550.00	2,534.90	2,430.12	2,427.80	9.06	4.09	-93.54	-299.58	3.47	326.12	312.97	13.15	24.797		
2,600.00	2,575.90	2,451.50	2,448.03	9.40	4.12	-93.46	-305.88	6.34	347.73	334.22	13.51	25.733		
2,650.00	2,613.96	2,471.00	2,466.23	9.84	4.14	-92.70	-312.30	9.15	373.29	359.31	13.98	26.707		
2,700.00	2,648.74	2,484.59	2,478.75	10.41	4.16	-90.63	-317.18	11.20	402.41	387.84	14.57	27.618		
2,750.00	2,679.93	2,502.00	2,494.54	11.14	4.18	-88.54	-323.99	13.91	434.70	419.37	15.32	28.366		
2,800.00	2,707.22	2,502.00	2,494.54	12.04	4.18	-83.24	-323.99	13.91	469.41	453.19	16.22	28.935		
2,850.00	2,730.38	2,514.23	2,505.48	13.11	4.21	-79.29	-329.11	15.87	506.06	488.75	17.32	29.222		
2,900.00	2,749.19	2,519.46	2,510.12	14.35	4.22	-73.84	-331.36	16.72	544.18	525.62	18.56	29.315		
2,950.00	2,763.47	2,522.16	2,512.51	15.73	4.22	-67.77	-332.54	17.16	583.25	563.30	19.95	29.238		
3,000.00	2,773.09	2,522.43	2,512.74	17.22	4.22	-61.38	-332.66	17.20	622.82	601.37	21.45	29.039		
3,050.00	2,777.97	2,520.32	2,510.88	18.81	4.22	-55.00	-331.74	16.86	662.47	639.45	23.03	28.766		
3,092.29	2,778.36	2,516.75	2,507.71	20.20	4.21	-49.81	-330.19	16.28	695.80	671.39	24.41	28.504		
3,100.00	2,778.11	2,515.95	2,507.00	20.46	4.21	-49.71	-329.84	16.15	701.86	677.19	24.67	28.455		
3,200.00	2,774.97	2,502.00	2,494.54	23.86	4.18	-47.97	-323.99	13.91	782.94	754.90	28.05	27.914		
3,300.00	2,771.83	2,502.00	2,494.54	27.39	4.18	-47.97	-323.99	13.91	867.78	836.21	31.57	27.486		
3,400.00	2,768.69	2,487.93	2,481.79	30.99	4.16	-46.27	-318.44	11.71	955.33	920.18	35.15	27.180		
3,500.00	2,765.55	2,479.59	2,474.16	34.64	4.15	-45.28	-315.34	10.44	1,045.00	1,006.21	38.79	26.943		
3,600.00	2,762.41	2,471.00	2,466.23	38.32	4.14	-44.29	-312.30	9.15	1,136.26	1,093.80	42.46	26.761		
3,700.00	2,759.27	2,471.00	2,466.23	42.04	4.14	-44.29	-312.30	9.15	1,228.82	1,182.65	46.17	26.613		
3,800.00	2,756.13	2,456.01	2,452.26	45.77	4.12	-42.61	-307.31	6.97	1,322.27	1,272.38	49.89	26.503		
3,900.00	2,752.99	2,440.00	2,437.19	49.52	4.10	-40.90	-302.40	4.76	1,416.63	1,363.00	53.62	26.418		
4,000.00	2,749.84	2,440.00	2,437.19	53.28	4.10	-40.90	-302.40	4.76	1,511.52	1,454.13	57.39	26.340		
4,100.00	2,746.70	2,440.00	2,437.19	57.06	4.10	-40.90	-302.40	4.76	1,607.02	1,545.87	61.16	26.276		
4,200.00	2,743.56	2,440.00	2,437.19	60.84	4.10	-40.90	-302.40	4.76	1,703.05	1,638.11	64.94	26.225		
4,300.00	2,740.42	2,424.51	2,422.45	64.62	4.09	-39.33	-298.06	2.77	1,799.31	1,730.60	68.71	26.186		
4,400.00	2,737.28	2,419.36	2,417.53	68.42	4.08	-38.83	-296.71	2.14	1,896.00	1,823.49	72.50	26.151		
4,500.00	2,734.14	2,408.00	2,406.60	72.22	4.07	-37.75	-293.88	0.83	1,993.00	1,916.71	76.29	26.124		
4,600.00	2,731.00	2,408.00	2,406.60	76.02	4.07	-37.75	-293.88	0.83	2,090.20	2,010.11	80.09	26.098		
4,700.00	2,727.86	2,408.00	2,406.60	79.82	4.07	-37.75	-293.88	0.83	2,187.65	2,103.75	83.90	26.075		
4,800.00	2,724.72	2,408.00	2,406.60	83.63	4.07	-37.75	-293.88	0.83	2,285.31	2,197.61	87.71	26.057		
4,900.00	2,721.58	2,408.00	2,406.60	87.44	4.07	-37.75	-293.88	0.83	2,383.18	2,291.66	91.52	26.041		
5,000.00	2,718.43	2,408.00	2,406.60	91.26	4.07	-37.75	-293.88	0.83	2,481.21	2,385.88	95.33	26.027		

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 #9H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Gnd
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #1 10-28-14	Offset TVD Reference:	Offset Datum

Offset Design Arabian 6 Fee #10H - WB1/Job #1410329 - Surveys (Silver Oak 3)													Offset Site Error: 0.00 usft	
Survey Program: 100-VES/SCVSA-GYRO-3 2251-MWD													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)				Between Centres (usft)	Between Ellipses (usft)				
5,100.00	2,715.29	2,393.95	2,392.99	95.07	4.06	-36.49	-290.72	-0.63	2,579.21	2,480.08	99.14	26.017		
5,200.00	2,712.15	2,391.31	2,390.42	98.89	4.06	-36.26	-290.17	-0.87	2,677.46	2,574.51	102.95	26.007		
5,300.00	2,709.01	2,377.00	2,376.42	102.71	4.05	-35.06	-287.46	-2.08	2,775.95	2,669.19	106.76	26.002		
5,400.00	2,705.87	2,377.00	2,376.42	106.53	4.05	-35.06	-287.46	-2.08	2,874.37	2,763.78	110.58	25.993		
5,500.00	2,702.73	2,377.00	2,376.42	110.35	4.05	-35.06	-287.46	-2.08	2,972.89	2,858.49	114.40	25.986		
5,600.00	2,699.59	2,377.00	2,376.42	114.17	4.05	-35.06	-287.46	-2.08	3,071.51	2,953.28	118.22	25.980		
5,700.00	2,696.45	2,377.00	2,376.42	118.00	4.05	-35.06	-287.46	-2.08	3,170.21	3,048.17	122.05	25.975		
5,800.00	2,693.31	2,377.00	2,376.42	121.82	4.05	-35.06	-287.46	-2.08	3,269.00	3,143.13	125.87	25.971		
5,900.00	2,690.16	2,377.00	2,376.42	125.65	4.05	-35.06	-287.46	-2.08	3,367.86	3,238.16	129.70	25.967		
6,000.00	2,687.02	2,377.00	2,376.42	129.47	4.05	-35.06	-287.46	-2.08	3,466.78	3,333.25	133.52	25.964		
6,100.00	2,683.88	2,377.00	2,376.42	133.30	4.05	-35.06	-287.46	-2.08	3,565.76	3,428.41	137.35	25.961		
6,200.00	2,680.74	2,377.00	2,376.42	137.13	4.05	-35.06	-287.46	-2.08	3,664.80	3,523.62	141.18	25.959		
6,300.00	2,677.60	2,377.00	2,376.42	140.95	4.05	-35.06	-287.46	-2.08	3,763.89	3,618.88	145.01	25.957		
6,400.00	2,674.46	2,377.00	2,376.42	144.78	4.05	-35.06	-287.46	-2.08	3,863.02	3,714.19	148.83	25.955		
6,500.00	2,671.32	2,377.00	2,376.42	148.61	4.05	-35.06	-287.46	-2.08	3,962.20	3,809.54	152.66	25.954		
6,600.00	2,668.18	2,377.00	2,376.42	152.44	4.05	-35.06	-287.46	-2.08	4,061.42	3,904.93	156.49	25.953		
6,700.00	2,665.04	2,363.21	2,362.84	156.27	4.05	-33.99	-285.26	-3.02	4,160.52	4,000.20	160.32	25.952		
6,800.00	2,661.89	2,361.87	2,361.52	160.10	4.05	-33.89	-285.07	-3.10	4,259.78	4,095.64	164.15	25.951		
6,900.00	2,658.75	2,360.59	2,360.25	163.93	4.04	-33.79	-284.89	-3.18	4,359.08	4,191.10	167.98	25.950		
7,000.00	2,655.61	2,359.35	2,359.02	167.76	4.04	-33.70	-284.72	-3.25	4,458.40	4,286.59	171.81	25.950		
7,100.00	2,652.47	2,345.00	2,344.79	171.60	4.04	-32.68	-283.01	-3.92	4,557.88	4,382.25	175.63	25.951		
7,200.00	2,649.33	2,345.00	2,344.79	175.43	4.04	-32.68	-283.01	-3.92	4,657.23	4,477.77	179.47	25.951		
7,300.00	2,646.19	2,345.00	2,344.79	179.26	4.04	-32.68	-283.01	-3.92	4,756.61	4,573.31	183.30	25.950		
7,400.00	2,643.05	2,345.00	2,344.79	183.09	4.04	-32.68	-283.01	-3.92	4,856.01	4,668.88	187.13	25.950		
7,500.00	2,639.91	2,345.00	2,344.79	186.92	4.04	-32.68	-283.01	-3.92	4,955.44	4,764.48	190.96	25.950		
7,600.00	2,636.77	2,345.00	2,344.79	190.76	4.04	-32.68	-283.01	-3.92	5,054.89	4,860.10	194.79	25.950		
7,700.00	2,633.63	2,345.00	2,344.79	194.59	4.04	-32.68	-283.01	-3.92	5,154.36	4,955.74	198.63	25.950		
7,783.57	2,631.00	2,345.00	2,344.79	197.79	4.04	-32.68	-283.01	-3.92	5,237.51	5,035.68	201.83	25.950		



Phoenix Technology Services
Anticollision Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well #9H
Project:	Eddy County, NM (NAD27/NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com.	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #110-28-14	Offset TVD Reference:	Offset Datum

Offset Design: Clydesdale, 11 Fee - #1H - WB1/Job #1310195 - Surveys (JW,4)												Offset Site Error:	0.00 usft
Survey Program: 100-MWD:2241-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	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-156.80	-811.90	-347.90	883.68				
100.00	100.00	71.29	71.29	0.15	0.07	-156.79	-811.88	-348.21	883.41	883.19	0.22	4,041.799	
200.00	200.00	171.20	171.20	0.51	0.25	-156.72	-811.83	-349.28	883.78	883.03	0.75	1,177.350	
300.00	300.00	270.24	270.23	0.86	0.45	-156.67	-811.83	-350.11	884.12	882.80	1.31	672.675	
400.00	400.00	372.35	372.34	1.22	0.67	-156.60	-811.77	-351.21	884.49	882.60	1.89	468.088	
500.00	500.00	473.79	473.76	1.58	0.89	-156.51	-811.25	-352.61	884.56	882.10	2.47	358.405	
600.00	600.00	574.30	574.26	1.94	1.10	-156.42	-810.70	-353.86	884.56	881.52	3.04	291.172	
700.00	700.00	676.16	676.12	2.30	1.31	-156.36	-810.25	-354.58	884.45	880.84	3.61	245.141	
800.00	800.00	775.91	775.87	2.66	1.52	-156.31	-809.68	-355.25	884.19	880.01	4.17	211.829	
900.00	900.00	875.57	875.52	3.01	1.73	-156.26	-809.21	-355.88	884.01	879.26	4.74	186.477	
1,000.00	1,000.00	975.29	975.23	3.37	1.94	-156.20	-808.67	-356.71	883.85	878.54	5.31	166.488	
1,100.00	1,100.00	1,074.65	1,074.59	3.73	2.14	-156.14	-808.21	-357.48	883.74	877.87	5.87	150.452	
1,183.36	1,183.36	1,157.42	1,157.36	4.03	2.32	-156.10	-807.93	-358.05	883.71	877.37	6.35	139.258	
1,200.00	1,200.00	1,173.94	1,173.88	4.09	2.35	-156.09	-807.86	-358.21	883.71	877.27	6.44	137.217	
1,300.00	1,300.00	1,274.87	1,274.80	4.45	2.56	-156.01	-807.38	-359.24	883.70	876.69	7.01	126.050	
1,400.00	1,400.00	1,375.90	1,375.83	4.81	2.77	-155.95	-806.84	-360.08	883.54	875.96	7.58	116.549	
1,500.00	1,500.00	1,476.82	1,476.74	5.17	2.99	-155.87	-806.10	-361.09	883.28	875.13	8.15	108.329	
1,600.00	1,600.00	1,574.48	1,574.38	5.52	3.20	-155.75	-805.17	-362.64	883.07	874.34	8.72	101.245	
1,611.34	1,611.34	1,585.44	1,585.34	5.56	3.22	-155.74	-805.07	-362.86	883.06	874.28	8.79	100.504	
1,700.00	1,700.00	1,673.25	1,673.13	5.88	3.41	-155.60	-804.23	-364.85	883.12	873.83	9.29	95.012	
1,800.00	1,800.00	1,771.42	1,771.26	6.24	3.63	-155.42	-803.25	-367.45	883.31	873.44	9.87	89.528	
1,900.00	1,900.00	1,869.64	1,869.44	6.60	3.84	-155.23	-802.42	-370.24	883.73	873.29	10.44	84.664	
2,000.00	2,000.00	1,967.19	1,966.93	6.96	4.05	-155.03	-801.70	-373.30	884.37	873.36	11.01	80.316	
2,100.00	2,100.00	2,066.11	2,065.79	7.32	4.27	-154.81	-801.05	-376.77	885.27	873.68	11.59	76.385	
2,200.00	2,200.00	2,165.81	2,165.42	7.67	4.47	-154.59	-800.42	-380.32	886.22	874.07	12.15	72.962	
2,257.74	2,257.74	2,223.50	2,223.08	7.88	4.53	-154.47	-800.15	-382.19	886.78	874.36	12.41	71.431	
2,300.00	2,299.95	2,262.47	2,262.03	8.03	4.55	-64.55	-799.96	-383.55	886.50	873.92	12.58	70.446	
2,350.00	2,349.52	2,303.00	2,302.49	8.20	4.56	-64.90	-799.82	-385.78	884.74	871.97	12.77	69.300	
2,400.00	2,398.24	2,334.00	2,333.35	8.38	4.57	-65.44	-799.73	-388.69	881.79	868.83	12.95	68.074	
2,450.00	2,445.66	2,370.77	2,369.78	8.57	4.59	-66.25	-799.48	-393.73	877.68	864.52	13.16	66.678	
2,500.00	2,491.36	2,407.39	2,405.75	8.79	4.62	-67.28	-798.95	-400.49	872.40	858.99	13.41	65.061	
2,550.00	2,534.90	2,440.50	2,437.97	9.06	4.65	-68.47	-798.36	-408.09	866.17	852.46	13.71	63.183	
2,600.00	2,575.90	2,470.95	2,467.27	9.40	4.69	-69.79	-797.87	-416.40	859.29	845.20	14.09	60.988	
2,650.00	2,613.96	2,499.54	2,494.40	9.84	4.74	-71.23	-797.52	-425.38	852.01	837.43	14.58	58.433	
2,700.00	2,648.74	2,522.00	2,515.39	10.41	4.79	-72.62	-797.36	-433.37	844.63	829.42	15.20	55.563	
2,750.00	2,679.93	2,542.36	2,534.02	11.14	4.85	-73.98	-797.47	-441.56	837.60	821.61	15.99	52.386	
2,800.00	2,707.22	2,554.00	2,544.44	12.04	4.88	-75.04	-797.69	-446.75	831.32	814.40	16.92	49.129	
2,850.00	2,730.38	2,585.00	2,571.10	13.11	5.01	-76.75	-798.59	-462.52	825.63	807.51	18.12	45.565	
2,900.00	2,749.19	2,603.46	2,586.11	14.35	5.11	-77.96	-799.29	-473.24	820.79	801.34	19.46	42.181	
2,950.00	2,763.47	2,629.42	2,606.07	15.73	5.28	-79.40	-800.46	-489.79	816.86	795.85	21.01	38.884	
3,000.00	2,773.09	2,666.36	2,632.61	17.22	5.59	-81.26	-801.97	-515.42	813.49	790.67	22.81	35.660	
3,050.00	2,777.97	2,705.85	2,659.16	18.81	6.00	-83.25	-803.23	-544.61	810.48	785.68	24.81	32.672	
3,092.29	2,778.36	2,738.32	2,679.39	20.20	6.40	-84.89	-804.03	-570.00	808.42	781.82	26.60	30.393	
3,100.00	2,778.11	2,745.62	2,683.71	20.46	6.50	-85.21	-804.18	-575.87	808.10	781.15	26.96	29.978	
3,200.00	2,774.97	2,851.65	2,738.58	23.86	8.25	-89.31	-803.80	-666.47	804.66	772.54	32.12	25.055	
3,300.00	2,771.83	2,957.96	2,777.59	27.39	10.47	-92.31	-800.77	-765.13	802.24	764.38	37.86	21.189	
3,400.00	2,768.69	3,069.36	2,798.85	30.99	13.16	-94.09	-796.52	-874.31	799.71	755.56	44.14	18.116	
3,500.00	2,765.55	3,173.24	2,807.53	34.64	15.81	-94.97	-791.59	-977.66	795.93	745.48	50.44	15.779	
3,600.00	2,762.41	3,271.05	2,807.82	38.32	18.36	-95.24	-787.65	-1,075.37	792.29	735.62	56.68	13.979	
3,700.00	2,759.27	3,366.02	2,803.90	42.04	20.86	-95.19	-784.48	-1,170.20	788.96	726.07	62.90	12.544	
3,800.00	2,756.13	3,465.25	2,798.28	45.77	23.50	-95.03	-782.26	-1,269.25	786.59	717.32	69.27	11.356	
3,900.00	2,752.99	3,574.53	2,792.84	49.52	26.43	-94.90	-778.26	-1,378.31	782.82	706.87	75.95	10.307	

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



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #9H
Project:	Eddy County - NM (NAD27 NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0'00" usft	North Reference:	Grid
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0'00" usft	Output errors are at	±2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #1-10-28-14	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Clydesdale 1 Fee #1H - WB1/Job #1310195 - Surveys (JW.4)												Offset Well Error:	0.00 usft
Survey Program: 100-MWD/2241-MWD													
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
4,000.00	2,749.84	3,671.59	2,789.92	53.28	29.05	-94.94	-774.46	-1,475.25	779.01	696.68	82.33	9.462	
4,100.00	2,746.70	3,764.07	2,786.61	57.06	31.55	-94.93	-771.43	-1,567.63	775.79	687.18	88.61	8.755	
4,200.00	2,743.56	3,859.52	2,782.33	60.84	34.14	-94.84	-769.36	-1,662.96	773.58	678.61	94.98	8.145	
4,300.00	2,740.42	3,961.78	2,777.53	64.62	36.92	-94.74	-767.22	-1,765.08	771.45	669.91	101.54	7.597	
4,400.00	2,737.28	4,057.99	2,774.61	68.42	39.54	-94.77	-764.95	-1,861.23	769.21	661.26	107.96	7.125	
4,500.00	2,734.14	4,154.76	2,771.66	72.22	42.18	-94.78	-763.33	-1,957.93	767.61	653.22	114.39	6.710	
4,600.00	2,731.00	4,251.53	2,767.54	76.02	44.82	-94.70	-762.13	-2,054.60	766.36	645.53	120.83	6.342	
4,700.00	2,727.86	4,347.71	2,762.74	79.82	47.44	-94.57	-761.45	-2,150.66	765.59	638.33	127.26	6.016	
4,800.00	2,724.72	4,450.63	2,758.35	83.63	50.25	-94.49	-760.81	-2,253.49	764.95	631.07	133.88	5.714	
4,900.00	2,721.58	4,551.09	2,755.37	87.44	53.00	-94.51	-759.78	-2,353.89	764.00	623.56	140.44	5.440	
5,000.00	2,718.43	4,649.61	2,751.18	91.26	55.70	-94.43	-758.91	-2,452.32	763.14	616.18	146.95	5.193	
5,100.00	2,715.29	4,748.90	2,747.08	95.07	58.41	-94.36	-758.21	-2,551.52	762.44	608.96	153.49	4.968	
5,200.00	2,712.15	4,851.33	2,743.37	98.89	61.22	-94.33	-757.27	-2,653.88	761.56	601.45	160.11	4.756	
5,300.00	2,709.01	4,950.40	2,740.54	102.71	63.94	-94.36	-756.24	-2,752.90	760.62	593.98	166.65	4.564	
5,400.00	2,705.87	5,047.62	2,737.89	106.53	66.60	-94.39	-755.38	-2,850.08	759.86	586.73	173.13	4.389	
5,500.00	2,702.73	5,146.06	2,734.86	110.35	69.30	-94.40	-755.12	-2,948.47	759.68	580.02	179.65	4.229	
5,600.00	2,699.59	5,262.82	2,730.67	114.17	72.51	-94.36	-753.69	-3,065.15	758.53	571.85	186.68	4.063	
5,700.00	2,696.45	5,363.52	2,725.96	118.00	75.27	-94.26	-750.66	-3,165.69	755.49	562.22	193.27	3.909	
5,800.00	2,693.31	5,469.88	2,720.12	121.82	78.19	-94.09	-747.87	-3,271.85	752.81	552.79	200.01	3.764	
5,900.00	2,690.16	5,571.14	2,714.31	125.65	80.97	-93.91	-744.26	-3,372.89	749.14	542.52	206.62	3.626	
6,000.00	2,687.02	5,671.40	2,708.79	129.47	83.73	-93.74	-740.69	-3,472.92	745.50	532.31	213.20	3.497	
6,100.00	2,683.88	5,767.00	2,704.21	133.30	86.35	-93.64	-737.51	-3,568.36	742.16	522.51	219.65	3.379	
6,200.00	2,680.74	5,863.15	2,698.66	137.13	88.99	-93.45	-734.92	-3,664.31	739.38	513.26	226.12	3.270	
6,300.00	2,677.60	5,963.82	2,693.72	140.95	91.76	-93.33	-732.28	-3,764.82	736.73	504.02	232.71	3.166	
6,400.00	2,674.46	6,057.94	2,690.37	144.78	94.35	-93.31	-730.14	-3,858.87	734.51	495.39	239.13	3.072	
6,500.00	2,671.32	6,157.06	2,686.69	148.61	97.07	-93.27	-728.25	-3,957.89	732.66	486.97	245.68	2.982	
6,600.00	2,668.18	6,252.27	2,682.82	152.44	99.69	-93.21	-726.96	-4,053.02	731.32	479.20	252.13	2.901	
6,700.00	2,665.04	6,353.78	2,678.43	156.27	102.48	-93.12	-725.66	-4,154.43	730.06	471.32	258.75	2.822	
6,800.00	2,661.89	6,448.56	2,674.04	160.10	105.08	-93.01	-724.64	-4,249.10	728.99	463.81	265.18	2.749	
6,830.39	2,660.94	6,475.35	2,672.72	161.27	105.81	-92.97	-724.56	-4,275.85	728.89	461.82	267.08	2.729	
6,900.00	2,658.75	6,543.36	2,669.27	163.93	107.68	-92.87	-724.80	-4,343.78	729.12	457.51	271.61	2.684	
7,000.00	2,655.61	6,651.18	2,665.07	167.76	110.64	-92.81	-723.99	-4,451.51	728.38	449.98	278.40	2.616	
7,100.00	2,652.47	6,745.71	2,661.44	171.60	113.24	-92.76	-723.35	-4,545.97	727.76	442.93	284.83	2.555	
7,116.81	2,651.94	6,761.28	2,660.79	172.24	113.66	-92.75	-723.33	-4,561.53	727.75	441.84	285.90	2.545	
7,200.00	2,649.33	6,847.36	2,656.98	175.43	116.03	-92.66	-723.37	-4,647.52	727.80	436.35	291.45	2.497	
7,300.00	2,646.19	6,967.18	2,651.53	179.26	119.32	-92.53	-721.42	-4,767.19	726.23	427.65	298.58	2.432	
7,400.00	2,643.05	7,066.06	2,648.10	183.09	122.04	-92.52	-718.09	-4,865.96	722.93	417.80	305.13	2.369	
7,500.00	2,639.91	7,163.24	2,644.41	186.92	124.72	-92.48	-715.35	-4,963.02	720.15	408.51	311.64	2.311	
7,600.00	2,636.77	7,263.15	2,640.16	190.76	127.47	-92.40	-712.73	-5,062.82	717.57	399.35	318.22	2.255	
7,700.00	2,633.63	7,357.29	2,635.81	194.59	130.06	-92.29	-710.65	-5,156.83	715.38	390.74	324.65	2.204	
7,779.34	2,631.13	7,424.00	2,632.67	197.63	131.89	-92.21	-709.49	-5,223.46	714.12	384.60	329.52	2.167 CC	
7,783.57	2,631.00	7,424.00	2,632.67	197.79	131.89	-92.21	-709.49	-5,223.46	714.13	384.45	329.68	2.166 ES, SF	



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #9H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00' usft	North Reference:	Grid
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00' usft	Output errors are at:	2.00' sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #1 10-28-14	Offset TVD Reference:	Offset Datum

Offset Design										Offset Site Error: 0.00 usft	
Survey Program: 100-VES-ISCWSA-GYRO-312230-MWD										Offset Well Error: 0.00 usft	
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 Factor
0.00	0.00	0.00	0.00	0.00	0.00	147.13	-286.60	185.20	341.82		
100.00	100.00	77.89	77.89	0.15	0.07	147.14	-286.82	185.30	341.48	341.27	0.21 1,608.904
200.00	200.00	178.56	178.56	0.51	0.23	147.18	-287.49	185.43	342.11	341.37	0.73 466.365
300.00	300.00	278.31	278.30	0.86	0.41	147.29	-288.20	185.07	342.51	341.23	1.28 268.428
400.00	400.00	378.38	378.36	1.22	0.60	147.46	-289.18	184.49	343.02	341.20	1.82 188.356
500.00	500.00	478.52	478.50	1.58	0.79	147.64	-290.13	183.83	343.47	341.10	2.37 145.136
600.00	600.00	577.30	577.27	1.94	0.97	147.87	-291.35	182.96	344.04	341.13	2.91 118.227
700.00	700.00	677.30	677.26	2.30	1.16	148.12	-292.85	182.16	344.89	341.44	3.46 99.787
800.00	800.00	780.30	780.24	2.66	1.35	148.36	-294.01	181.14	345.34	341.33	4.01 86.220
900.00	900.00	881.95	881.89	3.01	1.53	148.59	-294.42	179.77	344.97	340.42	4.55 75.855
1,000.00	1,000.00	984.45	984.37	3.37	1.72	148.85	-294.46	177.98	344.10	339.01	5.09 67.611
1,100.00	1,100.00	1,085.07	1,084.96	3.73	1.89	149.13	-294.11	175.81	342.89	337.07	5.63 60.912
1,200.00	1,200.00	1,186.81	1,186.68	4.09	2.07	149.37	-293.40	173.69	341.02	334.86	6.16 55.328
1,300.00	1,300.00	1,286.45	1,286.28	4.45	2.25	149.63	-292.48	171.41	339.07	332.37	6.70 50.616
1,400.00	1,400.00	1,387.65	1,387.46	4.81	2.43	149.88	-291.48	169.13	337.08	329.84	7.24 46.577
1,500.00	1,500.00	1,490.18	1,489.94	5.17	2.61	150.11	-289.87	166.64	334.50	326.73	7.78 43.010
1,600.00	1,600.00	1,590.79	1,590.48	5.52	2.79	150.45	-288.15	163.37	331.41	323.09	8.32 39.847
1,700.00	1,700.00	1,691.10	1,690.71	5.88	2.98	150.88	-286.57	159.60	328.19	319.33	8.86 37.049
1,800.00	1,800.00	1,789.19	1,788.73	6.24	3.16	151.33	-285.21	155.98	325.19	315.79	9.40 34.607
1,900.00	1,900.00	1,889.78	1,889.25	6.60	3.34	151.75	-283.94	152.55	322.46	312.52	9.94 32.440
2,000.00	2,000.00	1,987.82	1,987.22	6.96	3.52	152.20	-282.85	149.16	319.85	309.37	10.48 30.520
2,100.00	2,100.00	2,088.81	2,088.15	7.32	3.71	152.66	-281.93	145.79	317.50	306.47	11.03 28.796
2,200.00	2,200.00	2,187.49	2,186.78	7.67	3.84	153.05	-280.85	142.77	315.13	303.61	11.52 27.364
2,257.74	2,257.74	2,244.75	2,244.02	7.88	3.88	153.22	-280.21	141.43	313.94	302.18	11.76 26.886
2,300.00	2,299.95	2,301.18	2,300.33	8.03	3.89	-117.72	-277.41	142.62	313.38	301.46	11.93 26.278
2,350.00	2,349.52	2,395.47	2,392.26	8.20	3.94	-122.83	-258.44	149.74	309.28	297.12	12.16 25.429
2,400.00	2,398.24	2,478.01	2,468.34	8.38	4.06	-130.72	-228.08	159.04	303.23	290.78	12.45 24.353
2,450.00	2,445.66	2,555.77	2,534.84	8.57	4.30	-140.43	-188.76	167.27	297.50	284.63	12.87 23.114
2,496.24	2,487.99	2,611.79	2,579.05	8.78	4.59	-148.40	-154.68	171.59	294.97	281.60	13.37 22.063 CC
2,500.00	2,491.36	2,615.46	2,581.83	8.79	4.62	-148.95	-152.28	171.85	294.99	281.58	13.41 21.999 ES
2,550.00	2,534.90	2,656.89	2,612.13	9.06	4.91	-155.11	-124.20	174.75	299.53	285.56	13.97 21.448 SF
2,600.00	2,575.90	2,688.07	2,633.59	9.40	5.16	-159.84	-101.71	177.15	313.01	298.44	14.56 21.494
2,650.00	2,613.96	2,716.31	2,652.13	9.84	5.42	-163.62	-80.52	179.39	335.32	320.06	15.26 21.968
2,700.00	2,648.74	2,742.39	2,668.39	10.41	5.68	-167.29	-60.22	181.28	365.23	349.13	16.10 22.689
2,750.00	2,679.93	2,765.84	2,682.28	11.14	5.93	-170.69	-41.39	182.68	401.26	384.19	17.08 23.500
2,800.00	2,707.22	2,786.34	2,693.86	12.04	6.16	-173.92	-24.50	183.61	442.02	423.82	18.20 24.281
2,850.00	2,730.38	2,803.57	2,703.20	13.11	6.37	-177.14	-10.02	184.16	486.29	466.81	19.48 24.964
2,900.00	2,749.19	2,817.74	2,710.63	14.35	6.54	179.21	2.04	184.45	533.05	512.16	20.88 25.523
2,950.00	2,763.47	2,826.91	2,715.33	15.73	6.65	174.86	9.91	184.57	581.49	559.12	22.38 25.985
3,000.00	2,773.09	2,832.23	2,718.01	17.22	6.72	165.54	14.50	184.62	630.96	607.02	23.94 26.351
3,050.00	2,777.97	2,834.74	2,719.27	18.81	6.75	73.94	16.68	184.64	680.89	655.33	25.56 26.636
3,092.29	2,778.36	2,834.62	2,719.21	20.20	6.75	15.13	16.57	184.63	723.11	696.16	26.95 26.832
3,100.00	2,778.11	2,834.40	2,719.10	20.46	6.75	14.94	16.38	184.63	730.79	703.59	27.20 26.864
3,200.00	2,774.97	2,831.41	2,717.60	23.86	6.71	12.39	13.79	184.61	830.45	799.87	30.57 27.162
3,300.00	2,771.83	2,828.12	2,715.94	27.39	6.67	9.68	10.95	184.58	930.17	896.11	34.06 27.313
3,400.00	2,768.69	2,824.47	2,714.09	30.99	6.62	6.78	7.81	184.54	1,029.94	992.33	37.61 27.386
3,500.00	2,765.55	2,816.79	2,710.14	34.64	6.53	1.11	1.22	184.44	1,129.73	1,088.57	41.16 27.445
3,600.00	2,762.41	2,790.75	2,696.28	38.32	6.21	-13.72	-20.82	183.77	1,229.52	1,184.98	44.54 27.607
3,700.00	2,759.27	2,754.34	2,675.55	42.04	5.81	-25.63	-50.69	182.03	1,329.20	1,281.36	47.84 27.782
3,800.00	2,756.13	2,726.68	2,658.69	45.77	5.52	-30.65	-72.54	180.17	1,428.76	1,377.47	51.29 27.855
3,900.00	2,752.99	2,712.63	2,649.76	49.52	5.39	-32.41	-83.33	179.11	1,528.25	1,473.34	54.91 27.832
4,000.00	2,749.84	2,697.40	2,639.82	53.28	5.24	-33.89	-94.80	177.90	1,627.72	1,569.20	58.53 27.811

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 #9H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #1 10-28-14	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 100-VES-ISCWSA-GYRO-3-2230-MWD												Offset Well Error:	0.00 usft
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)	Minimum Separation (usft)	Separation Factor	
4,100.00	2,746.70	2,689.09	2,634.28	57.06	5.17	-34.54	-100.96	177.24	1,727.18	1,664.95	62.23	27.755	
4,200.00	2,743.56	2,681.12	2,628.90	60.84	5.11	-35.09	-106.81	176.60	1,826.66	1,760.72	65.94	27.701	
4,300.00	2,740.42	2,673.28	2,623.54	64.62	5.04	-35.56	-112.50	175.99	1,926.15	1,856.49	69.66	27.649	
4,400.00	2,737.28	2,666.00	2,618.51	68.42	4.98	-35.95	-117.73	175.43	2,025.65	1,952.26	73.40	27.599	
4,500.00	2,734.14	2,659.49	2,613.96	72.22	4.93	-36.25	-122.36	174.94	2,125.17	2,048.02	77.14	27.548	
4,600.00	2,731.00	2,653.51	2,609.74	76.02	4.88	-36.49	-126.57	174.50	2,224.70	2,143.80	80.90	27.499	
4,700.00	2,727.86	2,647.71	2,605.59	79.82	4.84	-36.70	-130.60	174.08	2,324.25	2,239.59	84.66	27.453	
4,800.00	2,724.72	2,642.09	2,601.54	83.63	4.80	-36.88	-134.48	173.69	2,423.82	2,335.39	88.43	27.409	
4,900.00	2,721.58	2,635.00	2,596.37	87.44	4.74	-37.07	-139.30	173.20	2,523.40	2,431.21	92.19	27.372	
5,000.00	2,718.43	2,622.23	2,586.91	91.26	4.66	-37.33	-147.84	172.32	2,622.98	2,527.06	95.92	27.346	
5,100.00	2,715.29	2,618.47	2,583.03	95.07	4.62	-37.57	-156.70	172.15	2,722.15	2,623.06	99.10	27.470	
5,200.00	2,712.15	2,614.00	2,579.11	98.89	4.58	-37.81	-165.56	171.77	2,821.05	2,718.15	102.89	27.417	
5,300.00	2,709.01	2,610.11	2,575.22	102.71	4.54	-38.05	-174.41	171.39	2,919.96	2,813.26	106.70	27.367	
5,400.00	2,705.87	2,606.22	2,571.33	106.53	4.50	-38.29	-183.26	171.01	3,018.90	2,908.39	110.50	27.319	
5,500.00	2,702.73	2,602.33	2,567.44	110.35	4.46	-38.53	-192.11	170.63	3,117.86	3,003.54	114.31	27.275	
5,600.00	2,699.59	2,598.44	2,563.55	114.17	4.42	-38.77	-200.96	170.25	3,216.86	3,098.73	118.14	27.230	
5,700.00	2,696.45	2,594.55	2,559.66	118.00	4.38	-39.01	-209.81	169.87	3,315.86	3,193.93	121.95	27.191	
5,800.00	2,693.31	2,590.66	2,555.77	121.82	4.34	-39.25	-218.66	169.49	3,414.94	3,289.17	125.77	27.153	
5,900.00	2,690.16	2,586.77	2,551.88	125.65	4.30	-39.49	-227.51	169.11	3,514.07	3,384.49	129.58	27.119	
6,000.00	2,687.02	2,582.88	2,547.99	129.47	4.26	-39.73	-236.36	168.73	3,613.18	3,479.77	133.41	27.084	
6,100.00	2,683.88	2,579.00	2,544.10	133.30	4.22	-39.97	-245.21	168.35	3,712.34	3,575.10	137.23	27.051	
6,200.00	2,680.74	2,575.11	2,540.21	137.13	4.18	-40.21	-254.06	167.97	3,811.54	3,670.48	141.06	27.021	
6,300.00	2,677.60	2,571.22	2,536.32	140.95	4.14	-40.45	-262.91	167.59	3,910.78	3,765.89	144.89	26.992	
6,400.00	2,674.46	2,567.33	2,532.43	144.78	4.10	-40.69	-271.76	167.21	4,009.99	3,861.28	148.71	26.966	
6,500.00	2,671.32	2,563.44	2,528.54	148.61	4.06	-40.93	-280.61	166.83	4,109.26	3,956.73	152.53	26.940	
6,600.00	2,668.18	2,559.55	2,524.65	152.44	4.02	-41.17	-289.46	166.45	4,208.56	4,052.22	156.35	26.917	
6,700.00	2,665.04	2,555.66	2,520.76	156.27	3.98	-41.41	-298.31	166.07	4,307.88	4,147.69	160.18	26.893	
6,800.00	2,661.89	2,551.77	2,516.87	160.10	3.94	-41.65	-307.16	165.69	4,407.20	4,243.19	164.02	26.871	
6,900.00	2,658.75	2,547.88	2,512.98	163.93	3.90	-41.89	-316.01	165.31	4,506.56	4,338.72	167.85	26.849	
7,000.00	2,655.61	2,543.99	2,509.09	167.76	3.86	-42.13	-324.86	164.93	4,605.93	4,434.26	171.67	26.830	
7,100.00	2,652.47	2,540.10	2,505.20	171.60	3.82	-42.37	-333.71	164.55	4,705.32	4,529.82	175.50	26.811	
7,200.00	2,649.33	2,536.21	2,501.31	175.43	3.78	-42.61	-342.56	164.17	4,804.72	4,625.39	179.33	26.792	
7,300.00	2,646.19	2,532.32	2,497.42	179.26	3.74	-42.85	-351.41	163.79	4,904.15	4,721.00	183.16	26.775	
7,400.00	2,643.05	2,528.43	2,493.53	183.09	3.70	-43.09	-360.26	163.41	5,003.57	4,816.58	186.99	26.758	
7,500.00	2,639.91	2,524.54	2,489.64	186.92	3.66	-43.33	-369.11	163.03	5,103.02	4,912.19	190.82	26.742	
7,600.00	2,636.77	2,520.65	2,485.75	190.76	3.62	-43.57	-377.96	162.65	5,202.48	5,007.82	194.66	26.727	
7,700.00	2,633.63	2,516.76	2,481.86	194.59	3.58	-43.81	-386.81	162.27	5,301.96	5,103.48	198.49	26.712	
7,783.57	2,631.00	2,514.59	2,480.00	197.79	3.54	-44.05	-395.66	161.89	5,385.12	5,183.43	201.69	26.700	



Phoenix Technology Services
Anticollision Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well #9H
Project:	Eddy County, NM (NAD27-NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #1 10-28-14	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Pinto 36 State Com - #6H - WB1 - Plan #1 09-05-13												Offset Well Error:	0.00 usft
Survey Program: 0-MWD													
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	22.00	22.00	0.00	0.02	-93.73	-216.90	-3,330.50	3,337.56				
100.00	100.00	122.00	122.00	0.15	0.16	-93.73	-216.90	-3,330.50	3,337.56	3,337.25	0.31	N/A	
200.00	200.00	222.00	222.00	0.51	0.39	-93.73	-216.90	-3,330.50	3,337.56	3,336.66	0.89	3,741.475	
300.00	300.00	322.00	322.00	0.86	0.61	-93.73	-216.90	-3,330.50	3,337.56	3,336.08	1.48	2,262.320	
400.00	400.00	422.00	422.00	1.22	0.84	-93.73	-216.90	-3,330.50	3,337.56	3,335.50	2.06	1,621.339	
500.00	500.00	522.00	522.00	1.58	1.06	-93.73	-216.90	-3,330.50	3,337.56	3,334.91	2.64	1,263.386	
600.00	600.00	622.00	622.00	1.94	1.29	-93.73	-216.90	-3,330.50	3,337.56	3,334.33	3.22	1,034.903	
700.00	700.00	722.00	722.00	2.30	1.51	-93.73	-216.90	-3,330.50	3,337.56	3,333.75	3.81	876.406	
800.00	800.00	822.00	822.00	2.66	1.74	-93.73	-216.90	-3,330.50	3,337.56	3,333.16	4.39	760.009	
900.00	900.00	922.00	922.00	3.01	1.96	-93.73	-216.90	-3,330.50	3,337.56	3,332.58	4.97	670.905	
1,000.00	1,000.00	1,022.00	1,022.00	3.37	2.18	-93.73	-216.90	-3,330.50	3,337.56	3,332.00	5.56	600.502	
1,100.00	1,100.00	1,122.00	1,122.00	3.73	2.41	-93.73	-216.90	-3,330.50	3,337.56	3,331.41	6.14	543.471	
1,200.00	1,200.00	1,222.00	1,222.00	4.09	2.63	-93.73	-216.90	-3,330.50	3,337.56	3,330.83	6.72	496.334	
1,300.00	1,300.00	1,322.00	1,322.00	4.45	2.86	-93.73	-216.90	-3,330.50	3,337.56	3,330.25	7.31	456.720	
1,400.00	1,400.00	1,422.00	1,422.00	4.81	3.08	-93.73	-216.90	-3,330.50	3,337.56	3,329.66	7.89	422.963	
1,500.00	1,500.00	1,522.00	1,522.00	5.17	3.31	-93.73	-216.90	-3,330.50	3,337.56	3,329.08	8.47	393.852	
1,600.00	1,600.00	1,622.00	1,622.00	5.52	3.53	-93.73	-216.90	-3,330.50	3,337.56	3,328.50	9.06	368.491	
1,700.00	1,700.00	1,722.00	1,722.00	5.88	3.76	-93.73	-216.90	-3,330.50	3,337.56	3,327.91	9.64	346.198	
1,800.00	1,800.00	1,822.00	1,822.00	6.24	3.98	-93.73	-216.90	-3,330.50	3,337.56	3,327.33	10.22	326.448	
1,900.00	1,900.00	1,922.00	1,922.00	6.60	4.21	-93.73	-216.90	-3,330.50	3,337.56	3,326.75	10.81	308.830	
2,000.00	2,000.00	2,022.00	2,022.00	6.96	4.43	-93.73	-216.90	-3,330.50	3,337.56	3,326.17	11.39	293.017	
2,100.00	2,100.00	2,122.00	2,122.00	7.32	4.66	-93.73	-216.90	-3,330.50	3,337.56	3,325.58	11.97	278.744	
2,200.00	2,200.00	2,316.51	2,313.60	7.67	5.14	-93.26	-189.92	-3,329.82	3,336.49	3,323.68	12.81	260.460	
2,257.74	2,257.74	2,428.42	2,415.08	7.88	5.45	-92.47	-143.30	-3,328.65	3,334.48	3,321.15	13.33	250.140	
2,300.00	2,299.95	2,495.79	2,470.54	8.03	5.75	-1.87	-105.14	-3,327.70	3,330.96	3,317.18	13.78	241.682	
2,350.00	2,349.52	2,560.35	2,518.64	8.20	6.15	-1.14	-62.15	-3,326.62	3,322.31	3,307.96	14.36	231.429	
2,400.00	2,398.24	2,611.02	2,552.45	8.38	6.54	-0.49	-24.44	-3,325.67	3,309.10	3,294.18	14.92	221.771	
2,450.00	2,445.66	2,650.72	2,576.28	8.57	6.89	0.09	7.29	-3,324.88	3,291.60	3,276.13	15.46	212.878	
2,500.00	2,491.36	2,681.97	2,593.29	8.79	7.21	0.61	33.48	-3,324.22	3,270.04	3,254.04	16.00	204.383	
2,550.00	2,534.90	2,706.71	2,605.62	9.06	7.47	1.10	54.91	-3,323.68	3,244.65	3,228.12	16.53	196.327	
2,600.00	2,575.90	2,726.40	2,614.71	9.40	7.69	1.58	72.38	-3,323.24	3,215.64	3,198.55	17.09	188.130	
2,650.00	2,613.96	2,742.14	2,621.49	9.84	7.88	2.06	86.58	-3,322.89	3,183.24	3,165.53	17.72	179.690	
2,700.00	2,648.74	2,754.70	2,626.59	10.41	8.03	2.59	98.05	-3,322.60	3,147.69	3,129.25	18.44	170.716	
2,750.00	2,679.93	2,764.67	2,630.44	11.14	8.15	3.19	107.25	-3,322.37	3,109.23	3,089.94	19.29	161.160	
2,800.00	2,707.22	2,772.49	2,633.34	12.04	8.25	3.92	114.50	-3,322.19	3,068.15	3,047.86	20.29	151.213	
2,850.00	2,730.38	2,778.47	2,635.48	13.11	8.33	4.88	120.09	-3,322.05	3,024.72	3,003.28	21.44	141.098	
2,900.00	2,749.19	2,782.85	2,637.01	14.35	8.38	6.24	124.19	-3,321.94	2,979.28	2,956.55	22.73	131.088	
2,950.00	2,763.47	2,785.80	2,638.02	15.73	8.42	8.39	126.96	-3,321.87	2,932.16	2,908.01	24.14	121.442	
3,000.00	2,773.09	2,787.43	2,638.57	17.22	8.44	12.40	128.49	-3,321.84	2,883.73	2,858.06	25.66	112.365	
3,050.00	2,777.97	2,787.81	2,638.70	18.81	8.44	22.71	128.85	-3,321.83	2,834.38	2,807.12	27.25	103.995	
3,092.29	2,778.36	2,787.18	2,638.49	20.20	8.44	59.40	128.26	-3,321.84	2,792.24	2,763.60	28.64	97.511	
3,100.00	2,778.11	2,786.98	2,638.42	20.46	8.43	59.34	128.07	-3,321.85	2,784.54	2,756.65	28.89	96.387	
3,200.00	2,774.97	2,784.46	2,637.56	23.86	8.40	58.56	125.70	-3,321.91	2,684.68	2,652.41	32.27	83.203	
3,300.00	2,771.83	2,781.92	2,636.69	27.39	8.37	57.77	123.32	-3,321.97	2,584.83	2,549.07	35.76	72.287	
3,400.00	2,768.69	2,779.37	2,635.80	30.99	8.34	56.94	120.92	-3,322.03	2,484.98	2,445.66	39.32	63.193	
3,500.00	2,765.55	2,776.79	2,634.89	34.64	8.30	56.09	118.52	-3,322.09	2,385.15	2,342.21	42.94	55.545	
3,600.00	2,762.41	2,774.21	2,633.96	38.32	8.27	55.22	116.11	-3,322.15	2,285.33	2,238.73	46.59	49.047	
3,700.00	2,759.27	2,771.61	2,633.02	42.04	8.24	54.31	113.68	-3,322.21	2,185.52	2,135.24	50.28	43.471	
3,800.00	2,756.13	2,768.99	2,632.06	45.77	8.21	53.38	111.25	-3,322.27	2,085.72	2,031.74	53.98	38.641	
3,900.00	2,752.99	2,766.36	2,631.08	49.52	8.17	52.43	108.81	-3,322.33	1,985.94	1,928.25	57.69	34.422	
4,000.00	2,749.84	2,763.71	2,630.08	53.28	8.14	51.44	106.35	-3,322.39	1,886.18	1,824.75	61.42	30.708	
4,100.00	2,746.70	2,761.04	2,629.06	57.06	8.11	50.42	103.89	-3,322.45	1,786.44	1,721.27	65.16	27.415	

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



Phoenix Technology Services
Anticollision Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well: #9H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR eepdm
Reference Design:	Plan #1-10-28-14	Offset TVD Reference:	Offset Datum

Offset Design													Pinto 36 State Com - #6H - WB1 - Plan #1-09-05-13		Offset Site Error: 0.00 usft	
Survey Program: 0-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)	Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
4,200.00	2,743.56	2,758.36	2,628.03	60.84	8.07	49.38	101.42	-3,322.52	1,686.72	1,617.81	68.91	24.478				
4,300.00	2,740.42	2,755.67	2,626.97	64.62	8.04	48.31	98.94	-3,322.58	1,587.03	1,514.37	72.66	21.841				
4,400.00	2,737.28	2,750.00	2,624.71	68.42	7.97	45.98	93.74	-3,322.71	1,487.39	1,411.00	76.38	19.473				
4,500.00	2,734.14	2,750.00	2,624.71	72.22	7.97	45.98	93.74	-3,322.71	1,387.78	1,307.60	80.18	17.308				
4,600.00	2,731.00	2,750.00	2,624.71	76.02	7.97	45.98	93.74	-3,322.71	1,288.23	1,204.24	83.98	15.339				
4,700.00	2,727.86	2,750.00	2,624.71	79.82	7.97	45.98	93.74	-3,322.71	1,188.75	1,100.96	87.79	13.541				
4,800.00	2,724.72	2,741.96	2,621.41	83.63	7.87	42.53	86.41	-3,322.89	1,089.34	997.83	91.51	11.905				
4,900.00	2,721.58	2,739.17	2,620.24	87.44	7.84	41.30	83.88	-3,322.96	990.05	894.76	95.29	10.390				
5,000.00	2,718.43	2,736.38	2,619.05	91.26	7.81	40.04	81.34	-3,323.02	890.91	791.84	99.07	8.993				
5,100.00	2,715.29	2,733.54	2,617.84	95.07	7.78	38.75	78.80	-3,323.08	791.97	689.12	102.85	7.700				
5,200.00	2,712.15	2,730.71	2,616.61	98.89	7.74	37.45	76.24	-3,323.15	693.32	586.68	106.63	6.502				
5,300.00	2,709.01	2,727.86	2,615.35	102.71	7.71	36.12	73.68	-3,323.21	595.10	484.68	110.42	5.389				
5,400.00	2,705.87	2,724.99	2,614.08	106.53	7.68	34.77	71.12	-3,323.28	497.58	383.37	114.21	4.357				
5,500.00	2,702.73	2,722.11	2,612.78	110.35	7.65	33.41	68.54	-3,323.34	401.25	283.26	118.00	3.401				
5,600.00	2,699.59	2,719.21	2,611.47	114.17	7.61	32.03	65.96	-3,323.40	307.25	185.46	121.78	2.523				
5,700.00	2,696.45	2,716.30	2,610.13	118.00	7.58	30.64	63.38	-3,323.47	218.58	93.00	125.58	1.741				
5,800.00	2,693.31	2,713.37	2,608.77	121.82	7.55	29.23	60.79	-3,323.53	145.36	16.00	129.37	1.124	Level 2			
5,883.37	2,690.69	2,710.92	2,607.62	125.01	7.52	28.05	58.62	-3,323.59	119.11	-13.42	132.53	0.899	Level 1, CC, ES, SF			
5,900.00	2,690.16	2,710.43	2,607.39	125.65	7.51	27.82	58.19	-3,323.60	120.26	-12.89	133.16	0.903	Level 1			
6,000.00	2,687.02	2,707.47	2,605.99	129.47	7.48	26.40	55.59	-3,323.66	166.66	29.71	136.95	1.217	Level 2			
6,100.00	2,683.88	2,700.00	2,602.38	133.30	7.39	22.82	49.04	-3,323.83	247.16	106.47	140.69	1.757				
6,200.00	2,680.74	2,700.00	2,602.38	137.13	7.39	22.82	49.04	-3,323.83	338.14	193.62	144.52	2.340				
6,300.00	2,677.60	2,700.00	2,602.38	140.95	7.39	22.82	49.04	-3,323.83	433.11	284.76	148.35	2.920				
6,400.00	2,674.46	2,695.50	2,600.16	144.78	7.35	20.69	45.13	-3,323.93	529.91	377.78	152.13	3.483				
6,500.00	2,671.32	2,692.47	2,598.65	148.61	7.31	19.28	42.50	-3,323.99	627.70	471.77	155.93	4.026				
6,600.00	2,668.18	2,689.42	2,597.11	152.44	7.28	17.87	39.87	-3,324.06	726.08	566.35	159.73	4.546				
6,700.00	2,665.04	2,686.36	2,595.55	156.27	7.25	16.47	37.24	-3,324.13	824.83	661.31	163.52	5.044				
6,800.00	2,661.89	2,683.29	2,593.97	160.10	7.22	15.08	34.61	-3,324.19	923.84	756.52	167.32	5.521				
6,900.00	2,658.75	2,680.20	2,592.37	163.93	7.19	13.71	31.97	-3,324.26	1,023.03	851.91	171.12	5.978				
7,000.00	2,655.61	2,677.10	2,590.74	167.76	7.16	12.36	29.33	-3,324.32	1,122.36	947.43	174.92	6.416				
7,100.00	2,652.47	2,673.98	2,589.09	171.60	7.13	11.02	26.69	-3,324.39	1,221.78	1,043.06	178.72	6.836				
7,200.00	2,649.33	2,670.85	2,587.42	175.43	7.09	9.71	24.04	-3,324.46	1,321.28	1,138.76	182.52	7.239				
7,300.00	2,646.19	2,667.71	2,585.72	179.26	7.06	8.42	21.40	-3,324.52	1,420.85	1,234.53	186.32	7.626				
7,400.00	2,643.05	2,664.55	2,584.00	183.09	7.03	7.15	18.75	-3,324.59	1,520.46	1,330.34	190.12	7.997				
7,500.00	2,639.91	2,661.38	2,582.26	186.92	7.00	5.91	16.11	-3,324.66	1,620.12	1,426.19	193.92	8.354				
7,600.00	2,636.77	2,658.20	2,580.49	190.76	6.97	4.69	13.46	-3,324.72	1,719.80	1,522.08	197.72	8.698				
7,700.00	2,633.63	2,655.00	2,578.70	194.59	6.93	3.50	10.81	-3,324.79	1,819.52	1,618.00	201.52	9.029				
7,783.57	2,631.00	2,650.00	2,575.86	197.79	6.88	1.71	6.69	-3,324.89	1,902.87	1,698.20	204.68	9.297				



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #9H
Project:	Eddy County NM (NAD27 NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #1 10-28-14	Offset TVD Reference:	Offset Datum

Offset Design Pinto 36 State Com - #7H - WB1 - Plan #1 09-05-13													Offset Site Error:	0.00 usft
Survey Program: 0-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		
0.00	0.00	1.00	1.00	0.00	0.00	-97.47	-248.20	-1,894.20	1,910.39					
100.00	100.00	101.00	101.00	0.15	0.11	-97.47	-248.20	-1,894.20	1,910.39	1,910.13	0.26	7,302.604		
200.00	200.00	201.00	201.00	0.51	0.34	-97.47	-248.20	-1,894.20	1,910.39	1,909.55	0.84	2,261.242		
300.00	300.00	301.00	301.00	0.86	0.56	-97.47	-248.20	-1,894.20	1,910.39	1,908.96	1.43	1,337.735		
400.00	400.00	401.00	401.00	1.22	0.79	-97.47	-248.20	-1,894.20	1,910.39	1,908.38	2.01	949.821		
500.00	500.00	501.00	501.00	1.58	1.01	-97.47	-248.20	-1,894.20	1,910.39	1,907.80	2.59	736.308		
600.00	600.00	601.00	601.00	1.94	1.24	-97.47	-248.20	-1,894.20	1,910.39	1,907.21	3.18	601.170		
700.00	700.00	701.00	701.00	2.30	1.46	-97.47	-248.20	-1,894.20	1,910.39	1,906.63	3.76	507.944		
800.00	800.00	801.00	801.00	2.66	1.69	-97.47	-248.20	-1,894.20	1,910.39	1,906.05	4.34	439.750		
900.00	900.00	901.00	901.00	3.01	1.91	-97.47	-248.20	-1,894.20	1,910.39	1,905.46	4.93	387.700		
1,000.00	1,000.00	1,001.00	1,001.00	3.37	2.14	-97.47	-248.20	-1,894.20	1,910.39	1,904.88	5.51	346.667		
1,100.00	1,100.00	1,101.00	1,101.00	3.73	2.36	-97.47	-248.20	-1,894.20	1,910.39	1,904.30	6.09	313.488		
1,200.00	1,200.00	1,201.00	1,201.00	4.09	2.59	-97.47	-248.20	-1,894.20	1,910.39	1,903.71	6.68	286.106		
1,300.00	1,300.00	1,301.00	1,301.00	4.45	2.81	-97.47	-248.20	-1,894.20	1,910.39	1,903.13	7.26	263.123		
1,400.00	1,400.00	1,401.00	1,401.00	4.81	3.04	-97.47	-248.20	-1,894.20	1,910.39	1,902.55	7.84	243.558		
1,500.00	1,500.00	1,501.00	1,501.00	5.17	3.26	-97.47	-248.20	-1,894.20	1,910.39	1,901.96	8.43	226.701		
1,600.00	1,600.00	1,601.00	1,601.00	5.52	3.49	-97.47	-248.20	-1,894.20	1,910.39	1,901.38	9.01	212.026		
1,700.00	1,700.00	1,701.00	1,701.00	5.88	3.71	-97.47	-248.20	-1,894.20	1,910.39	1,900.80	9.59	199.136		
1,800.00	1,800.00	1,801.00	1,801.00	6.24	3.94	-97.47	-248.20	-1,894.20	1,910.39	1,900.22	10.18	187.723		
1,900.00	1,900.00	1,901.00	1,901.00	6.60	4.16	-97.47	-248.20	-1,894.20	1,910.39	1,899.63	10.76	177.548		
2,000.00	2,000.00	2,001.00	2,001.00	6.96	4.39	-97.47	-248.20	-1,894.20	1,910.39	1,899.05	11.34	168.419		
2,100.00	2,100.00	2,101.00	2,101.00	7.32	4.61	-97.47	-248.20	-1,894.20	1,910.39	1,898.47	11.93	160.182		
2,200.00	2,200.00	2,217.90	2,217.87	7.67	4.87	-97.43	-247.04	-1,894.20	1,910.31	1,897.76	12.55	152.222		
2,257.74	2,257.74	2,326.65	2,324.84	7.88	5.15	-96.88	-228.55	-1,894.15	1,909.03	1,896.00	13.03	146.527		
2,300.00	2,299.95	2,399.27	2,393.12	8.03	5.34	-6.24	-203.99	-1,894.08	1,905.56	1,892.18	13.37	142.487		
2,350.00	2,349.52	2,474.39	2,459.44	8.20	5.57	-5.30	-168.86	-1,893.98	1,896.51	1,882.74	13.77	137.689		
2,400.00	2,398.24	2,537.07	2,510.45	8.38	5.86	-4.32	-132.49	-1,893.88	1,882.54	1,868.30	14.24	132.155		
2,450.00	2,445.66	2,588.29	2,548.64	8.57	6.17	-3.37	-98.39	-1,893.79	1,864.10	1,849.36	14.75	126.405		
2,500.00	2,491.36	2,629.76	2,577.00	8.79	6.48	-2.48	-68.15	-1,893.71	1,841.59	1,826.32	15.27	120.588		
2,550.00	2,534.90	2,663.25	2,598.08	9.06	6.76	-1.66	-42.13	-1,893.63	1,815.33	1,799.51	15.82	114.773		
2,600.00	2,575.90	2,690.32	2,613.87	9.40	7.01	-0.89	-20.15	-1,893.57	1,785.61	1,769.21	16.40	108.851		
2,650.00	2,613.96	2,712.21	2,625.79	9.84	7.22	-0.15	-1.80	-1,893.52	1,752.71	1,735.64	17.06	102.718		
2,700.00	2,648.74	2,729.90	2,634.86	10.41	7.41	0.60	13.39	-1,893.48	1,716.86	1,699.03	17.82	96.329		
2,750.00	2,679.93	2,744.14	2,641.78	11.14	7.56	1.38	25.84	-1,893.45	1,678.30	1,659.60	18.70	89.742		
2,800.00	2,707.22	2,755.50	2,647.05	12.04	7.69	2.24	35.91	-1,893.42	1,637.28	1,617.56	19.73	82.999		
2,850.00	2,730.38	2,764.42	2,651.04	13.11	7.79	3.27	43.88	-1,893.40	1,594.06	1,573.16	20.90	76.260		
2,900.00	2,749.19	2,771.21	2,653.98	14.35	7.87	4.60	50.00	-1,893.38	1,548.90	1,526.68	22.22	69.713		
2,950.00	2,763.47	2,776.11	2,656.06	15.73	7.93	6.51	54.44	-1,893.37	1,502.10	1,478.44	23.66	63.497		
3,000.00	2,773.09	2,779.28	2,657.37	17.22	7.97	9.72	57.32	-1,893.36	1,453.96	1,428.77	25.19	57.715		
3,050.00	2,777.97	2,780.81	2,658.01	18.81	7.99	16.73	58.72	-1,893.36	1,404.84	1,378.04	26.80	52.426		
3,092.29	2,778.36	2,780.88	2,658.03	20.20	7.99	36.07	58.78	-1,893.36	1,362.79	1,334.61	28.19	48.351		
3,100.00	2,778.11	2,780.79	2,658.00	20.46	7.99	36.02	58.70	-1,893.36	1,355.10	1,326.66	28.44	47.646		
3,200.00	2,774.97	2,779.61	2,657.51	23.86	7.97	35.34	57.63	-1,893.36	1,255.38	1,223.54	31.84	39.432		
3,300.00	2,771.83	2,778.43	2,657.02	27.39	7.96	34.65	56.55	-1,893.36	1,155.70	1,120.36	35.35	32.697		
3,400.00	2,768.69	2,777.23	2,656.53	30.99	7.94	33.95	55.46	-1,893.37	1,056.09	1,017.16	38.93	27.128		
3,500.00	2,765.55	2,776.03	2,656.02	34.64	7.93	33.24	54.37	-1,893.37	956.55	913.98	42.57	22.473		
3,600.00	2,762.41	2,774.81	2,655.51	38.32	7.91	32.53	53.26	-1,893.37	857.12	810.88	46.24	18.537		
3,700.00	2,759.27	2,773.58	2,654.99	42.04	7.90	31.80	52.15	-1,893.38	757.83	707.90	49.94	15.176		
3,800.00	2,756.13	2,772.35	2,654.47	45.77	7.89	31.07	51.03	-1,893.38	658.76	605.11	53.66	12.277		
3,900.00	2,752.99	2,771.10	2,653.93	49.52	7.87	30.33	49.90	-1,893.38	560.02	502.63	57.39	9.758		
4,000.00	2,749.84	2,769.84	2,653.39	53.28	7.86	29.58	48.76	-1,893.39	461.81	400.67	61.14	7.553		
4,100.00	2,746.70	2,768.57	2,652.85	57.06	7.84	28.82	47.62	-1,893.39	364.57	299.67	64.90	5.618		

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 #9H
Project:	Eddy County - NM (NAD27 NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #1 10-28-14	Offset TVD Reference:	Offset Datum

Offset Design Pinto 36 State Com - #7H - WB1 - Plan #1 09-05-13												Offset Site Error:	0.00 usft
Survey Program: 0-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	
4,200.00	2,743.56	2,767.29	2,652.29	60.84	7.83	28.05	46.46	-1,893.39	269.36	200.69	68.66	3.923	
4,300.00	2,740.42	2,765.99	2,651.73	64.62	7.81	27.28	45.30	-1,893.39	179.42	106.98	72.44	2.477	
4,400.00	2,737.28	2,764.69	2,651.16	68.42	7.80	26.50	44.12	-1,893.40	108.73	32.52	76.21	1.427 Level 3	
4,451.86	2,735.65	2,764.01	2,650.86	70.39	7.79	26.09	43.51	-1,893.40	95.57	17.40	78.18	1.223 Level 2, CC, ES, SF	
4,500.00	2,734.14	2,763.37	2,650.58	72.22	7.78	25.71	42.94	-1,893.40	107.01	27.01	80.00	1.338 Level 3	
4,600.00	2,731.00	2,762.04	2,649.99	76.02	7.76	24.91	41.75	-1,893.40	176.28	92.50	83.78	2.104	
4,700.00	2,727.86	2,760.70	2,649.40	79.82	7.75	24.11	40.55	-1,893.41	265.89	178.32	87.57	3.036	
4,800.00	2,724.72	2,759.35	2,648.79	83.63	7.73	23.30	39.34	-1,893.41	360.99	269.62	91.36	3.951	
4,900.00	2,721.58	2,757.99	2,648.18	87.44	7.72	22.49	38.12	-1,893.41	458.17	363.01	95.16	4.815	
5,000.00	2,718.43	2,756.61	2,647.56	91.26	7.70	21.67	36.89	-1,893.42	556.36	457.40	98.96	5.622	
5,100.00	2,715.29	2,755.22	2,646.93	95.07	7.68	20.84	35.66	-1,893.42	655.08	552.33	102.76	6.375	
5,200.00	2,712.15	2,753.82	2,646.29	98.89	7.67	20.01	34.41	-1,893.42	754.14	647.59	106.56	7.077	
5,300.00	2,709.01	2,750.00	2,644.53	102.71	7.62	17.77	31.02	-1,893.43	853.42	743.09	110.33	7.735	
5,400.00	2,705.87	2,750.00	2,644.53	106.53	7.62	17.77	31.02	-1,893.43	952.85	838.70	114.15	8.347	
5,500.00	2,702.73	2,750.00	2,644.53	110.35	7.62	17.77	31.02	-1,893.43	1,052.38	934.41	117.97	8.921	
5,600.00	2,699.59	2,750.00	2,644.53	114.17	7.62	17.77	31.02	-1,893.43	1,151.99	1,030.20	121.79	9.458	
5,700.00	2,696.45	2,746.62	2,642.95	118.00	7.59	15.81	28.03	-1,893.44	1,251.66	1,126.08	125.58	9.967	
5,800.00	2,693.31	2,745.14	2,642.25	121.82	7.57	14.96	26.72	-1,893.45	1,351.38	1,221.99	129.39	10.444	
5,900.00	2,690.16	2,743.65	2,641.55	125.65	7.55	14.11	25.41	-1,893.45	1,451.13	1,317.93	133.20	10.894	
6,000.00	2,687.02	2,742.14	2,640.83	129.47	7.54	13.26	24.08	-1,893.45	1,550.92	1,413.91	137.01	11.320	
6,100.00	2,683.88	2,740.62	2,640.10	133.30	7.52	12.41	22.74	-1,893.46	1,650.73	1,509.91	140.82	11.722	
6,200.00	2,680.74	2,739.08	2,639.36	137.13	7.51	11.56	21.40	-1,893.46	1,750.56	1,605.93	144.63	12.103	
6,300.00	2,677.60	2,737.53	2,638.61	140.95	7.49	10.71	20.04	-1,893.46	1,850.41	1,701.96	148.44	12.465	
6,400.00	2,674.46	2,735.96	2,637.85	144.78	7.47	9.87	18.67	-1,893.47	1,950.27	1,798.01	152.26	12.809	
6,500.00	2,671.32	2,734.38	2,637.08	148.61	7.46	9.02	17.29	-1,893.47	2,050.14	1,894.07	156.07	13.136	
6,600.00	2,668.18	2,732.79	2,636.29	152.44	7.44	8.17	15.91	-1,893.48	2,150.02	1,990.14	159.88	13.448	
6,700.00	2,665.04	2,731.18	2,635.50	156.27	7.42	7.33	14.51	-1,893.48	2,249.92	2,086.22	163.70	13.745	
6,800.00	2,661.89	2,729.55	2,634.69	160.10	7.41	6.49	13.10	-1,893.48	2,349.82	2,182.31	167.51	14.028	
6,900.00	2,658.75	2,727.91	2,633.87	163.93	7.39	5.66	11.67	-1,893.49	2,449.73	2,278.40	171.32	14.299	
7,000.00	2,655.61	2,726.26	2,633.04	167.76	7.37	4.83	10.24	-1,893.49	2,549.64	2,374.51	175.14	14.558	
7,100.00	2,652.47	2,724.58	2,632.19	171.60	7.35	4.00	8.80	-1,893.50	2,649.56	2,470.61	178.95	14.806	
7,200.00	2,649.33	2,722.90	2,631.33	175.43	7.34	3.18	7.34	-1,893.50	2,749.48	2,566.72	182.76	15.044	
7,300.00	2,646.19	2,721.19	2,630.46	179.26	7.32	2.37	5.88	-1,893.50	2,849.41	2,662.84	186.58	15.272	
7,400.00	2,643.05	2,719.47	2,629.58	183.09	7.30	1.56	4.40	-1,893.51	2,949.34	2,758.95	190.39	15.491	
7,500.00	2,639.91	2,717.73	2,628.68	186.92	7.28	0.76	2.91	-1,893.51	3,049.28	2,855.07	194.21	15.701	
7,600.00	2,636.77	2,715.98	2,627.77	190.76	7.26	-0.04	1.41	-1,893.52	3,149.22	2,951.20	198.02	15.904	
7,700.00	2,633.63	2,714.21	2,626.85	194.59	7.24	-0.83	-0.10	-1,893.52	3,249.16	3,047.33	201.83	16.098	
7,783.57	2,631.00	2,712.71	2,626.06	197.79	7.23	-1.48	-1.37	-1,893.52	3,332.69	3,127.67	205.02	16.255	



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #9H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Gnd
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #1-10-28-14	Offset TVD Reference:	Offset Datum

Offset Design Pinto 36 State Com - #8H - WB1 - Plan #1-09-05-13												Offset Site Error:	0.00 usft
Survey Program: 0-MWD												Offset Well Error:	0.00 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Measured Depth (usft)	Reference Vertical Depth (usft)	Reference Offset (usft)	Semi Major Axis 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	0.00	0.00	0.00	0.00	-117.93	-278.10	-524.60	594.24				
100.00	100.00	76.00	76.00	0.15	0.09	-117.93	-278.10	-524.60	593.75	593.52	0.23	2,554.525	
200.00	200.00	176.00	176.00	0.51	0.28	-117.93	-278.10	-524.60	593.75	592.97	0.79	752.875	
300.00	300.00	276.00	276.00	0.86	0.51	-117.93	-278.10	-524.60	593.75	592.38	1.37	432.801	
400.00	400.00	376.00	376.00	1.22	0.73	-117.93	-278.10	-524.60	593.75	591.80	1.96	303.691	
500.00	500.00	476.00	476.00	1.58	0.96	-117.93	-278.10	-524.60	593.75	591.22	2.54	233.912	
600.00	600.00	576.00	576.00	1.94	1.18	-117.93	-278.10	-524.60	593.75	590.63	3.12	190.208	
700.00	700.00	676.00	676.00	2.30	1.41	-117.93	-278.10	-524.60	593.75	590.05	3.70	160.265	
800.00	800.00	776.00	776.00	2.66	1.63	-117.93	-278.10	-524.60	593.75	589.47	4.29	138.466	
900.00	900.00	876.00	876.00	3.01	1.86	-117.93	-278.10	-524.60	593.75	588.88	4.87	121.888	
1,000.00	1,000.00	976.00	976.00	3.37	2.08	-117.93	-278.10	-524.60	593.75	588.30	5.45	108.855	
1,100.00	1,100.00	1,076.00	1,076.00	3.73	2.31	-117.93	-278.10	-524.60	593.75	587.72	6.04	98.340	
1,200.00	1,200.00	1,176.00	1,176.00	4.09	2.53	-117.93	-278.10	-524.60	593.75	587.13	6.62	89.677	
1,300.00	1,300.00	1,276.00	1,276.00	4.45	2.76	-117.93	-278.10	-524.60	593.75	586.55	7.20	82.417	
1,400.00	1,400.00	1,376.00	1,376.00	4.81	2.98	-117.93	-278.10	-524.60	593.75	585.97	7.79	76.245	
1,500.00	1,500.00	1,476.00	1,476.00	5.17	3.21	-117.93	-278.10	-524.60	593.75	585.38	8.37	70.932	
1,600.00	1,600.00	1,576.00	1,576.00	5.52	3.43	-117.93	-278.10	-524.60	593.75	584.80	8.95	66.312	
1,700.00	1,700.00	1,676.00	1,676.00	5.88	3.65	-117.93	-278.10	-524.60	593.75	584.22	9.54	62.257	
1,800.00	1,800.00	1,776.00	1,776.00	6.24	3.88	-117.93	-278.10	-524.60	593.75	583.63	10.12	58.669	
1,900.00	1,900.00	1,876.00	1,876.00	6.60	4.10	-117.93	-278.10	-524.60	593.75	583.05	10.70	55.472	
2,000.00	2,000.00	1,976.00	1,976.00	6.96	4.33	-117.93	-278.10	-524.60	593.75	582.47	11.29	52.606	
2,100.00	2,100.00	2,076.00	2,076.00	7.32	4.55	-117.93	-278.10	-524.60	593.75	581.88	11.87	50.021	
2,200.00	2,200.00	2,176.00	2,176.00	7.67	4.78	-117.93	-278.10	-524.60	593.75	581.30	12.45	47.678	
2,257.74	2,257.74	2,233.74	2,233.74	7.88	4.91	-117.93	-278.10	-524.60	593.75	580.96	12.79	46.423	
2,300.00	2,299.95	2,313.55	2,313.33	8.03	5.09	-27.86	-273.35	-524.59	591.20	578.07	13.12	45.045	
2,350.00	2,349.52	2,414.48	2,411.41	8.20	5.35	-26.94	-250.17	-524.52	580.18	566.62	13.56	42.779	
2,400.00	2,398.24	2,502.31	2,491.75	8.38	5.59	-25.35	-214.93	-524.43	561.39	547.41	13.98	40.162	
2,450.00	2,445.66	2,574.82	2,552.85	8.57	5.88	-23.34	-176.01	-524.32	536.24	521.79	14.45	37.108	
2,500.00	2,491.36	2,632.97	2,597.58	8.79	6.20	-21.12	-138.89	-524.22	506.08	491.09	14.99	33.760	
2,550.00	2,534.90	2,679.08	2,629.93	9.06	6.52	-18.80	-106.06	-524.13	472.02	456.45	15.57	30.309	
2,600.00	2,575.90	2,715.53	2,653.38	9.40	6.81	-16.40	-78.16	-524.05	434.90	418.70	16.20	26.841	
2,650.00	2,613.96	2,744.38	2,670.52	9.84	7.06	-13.86	-54.96	-523.99	395.37	378.47	16.90	23.398	
2,700.00	2,648.74	2,767.25	2,683.17	10.41	7.28	-11.08	-35.91	-523.94	353.92	336.22	17.69	20.002	
2,750.00	2,679.93	2,785.35	2,692.59	11.14	7.46	-7.88	-20.46	-523.90	310.95	292.35	18.61	16.712	
2,800.00	2,707.22	2,799.58	2,699.61	12.04	7.61	-4.03	-8.08	-523.86	266.82	247.17	19.65	13.580	
2,850.00	2,730.38	2,810.62	2,704.83	13.11	7.73	0.75	1.66	-523.84	221.88	201.04	20.85	10.644	
2,900.00	2,749.19	2,818.95	2,708.62	14.35	7.83	6.69	9.07	-523.82	176.54	154.37	22.18	7.961	
2,950.00	2,763.47	2,824.92	2,711.27	15.73	7.90	13.59	14.41	-523.80	131.47	107.84	23.62	5.565	
3,000.00	2,773.09	2,828.76	2,712.94	17.22	7.94	20.31	17.87	-523.79	88.25	63.08	25.17	3.507	
3,050.00	2,777.97	2,830.62	2,713.74	18.81	7.96	24.70	19.55	-523.79	53.07	26.30	26.77	1.982	
3,079.10	2,778.60	2,830.82	2,713.83	19.77	7.97	25.35	19.73	-523.79	45.13	17.39	27.73	1.627 CC, ES, SF	
3,092.29	2,778.36	2,830.70	2,713.77	20.20	7.96	25.12	19.63	-523.79	46.87	18.70	28.16	1.664	
3,100.00	2,778.11	2,830.59	2,713.73	20.46	7.96	24.98	19.53	-523.79	49.43	21.01	28.42	1.739	
3,200.00	2,774.97	2,829.18	2,713.12	23.86	7.95	23.20	18.26	-523.79	128.11	96.30	31.81	4.027	
3,300.00	2,771.83	2,827.76	2,712.51	27.39	7.93	21.41	16.97	-523.79	224.45	189.13	35.32	6.355	
3,400.00	2,768.69	2,826.32	2,711.88	30.99	7.91	19.60	15.68	-523.80	323.02	284.12	38.90	8.304	
3,500.00	2,765.55	2,824.87	2,711.25	34.64	7.90	17.79	14.37	-523.80	422.25	379.72	42.53	9.927	
3,600.00	2,762.41	2,823.41	2,710.60	38.32	7.88	15.98	13.06	-523.80	521.77	475.57	46.20	11.293	
3,700.00	2,759.27	2,821.93	2,709.95	42.04	7.86	14.18	11.73	-523.81	621.45	571.55	49.90	12.454	
3,800.00	2,756.13	2,820.43	2,709.28	45.77	7.85	12.38	10.39	-523.81	721.21	667.59	53.62	13.451	
3,900.00	2,752.99	2,818.92	2,708.61	49.52	7.83	10.60	9.04	-523.82	821.02	763.67	57.35	14.316	
4,000.00	2,749.84	2,817.40	2,707.92	53.28	7.81	8.82	7.68	-523.82	920.87	859.78	61.10	15.073	

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 #9H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3473.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000.GCR.epdm
Reference Design:	Plan #1 10-28-14	Offset TVD Reference:	Offset Datum

Offset Design: Pinto 36 State Com - #8H - WB1 - Plan #1 09-05-13											Offset Site Error: 0.00 usft		
Survey Program: 0-MWD											Offset Well Error: 0.00 usft		
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)	Minimum Separation (usft)	Separation Factor	
4,100.00	2,746.70	2,815.86	2,707.23	57.06	7.79	7.07	6.31	-523.82	1,020.75	955.90	64.85	15.740	
4,200.00	2,743.56	2,814.30	2,706.52	60.84	7.78	5.34	4.92	-523.83	1,120.65	1,052.04	68.61	16.333	
4,300.00	2,740.42	2,812.73	2,705.80	64.62	7.76	3.64	3.53	-523.83	1,220.56	1,148.18	72.38	16.862	
4,400.00	2,737.28	2,811.14	2,705.07	68.42	7.74	1.97	2.12	-523.83	1,320.49	1,244.33	76.16	17.339	
4,500.00	2,734.14	2,809.54	2,704.32	72.22	7.72	0.32	0.70	-523.84	1,420.42	1,340.48	79.94	17.769	
4,600.00	2,731.00	2,807.92	2,703.57	76.02	7.70	-1.29	-0.74	-523.84	1,520.36	1,436.64	83.72	18.160	
4,700.00	2,727.86	2,806.28	2,702.80	79.82	7.69	-2.86	-2.18	-523.85	1,620.31	1,532.80	87.51	18.516	
4,800.00	2,724.72	2,804.63	2,702.02	83.63	7.67	-4.39	-3.64	-523.85	1,720.26	1,628.96	91.30	18.842	
4,900.00	2,721.58	2,802.96	2,701.23	87.44	7.65	-5.89	-5.11	-523.85	1,820.21	1,725.12	95.09	19.142	
5,000.00	2,718.43	2,801.27	2,700.42	91.26	7.63	-7.35	-6.60	-523.86	1,920.17	1,821.29	98.89	19.418	
5,100.00	2,715.29	2,799.57	2,699.60	95.07	7.61	-8.77	-8.09	-523.86	2,020.13	1,917.45	102.68	19.674	
5,200.00	2,712.15	2,797.84	2,698.77	98.89	7.59	-10.14	-9.60	-523.87	2,120.09	2,013.61	106.48	19.910	
5,300.00	2,709.01	2,796.10	2,697.92	102.71	7.57	-11.47	-11.12	-523.87	2,220.06	2,109.78	110.28	20.131	
5,400.00	2,705.87	2,794.34	2,697.06	106.53	7.56	-12.77	-12.66	-523.87	2,320.03	2,205.94	114.08	20.336	
5,500.00	2,702.73	2,792.56	2,696.19	110.35	7.54	-14.02	-14.21	-523.88	2,419.99	2,302.11	117.89	20.528	
5,600.00	2,699.59	2,790.76	2,695.30	114.17	7.52	-15.23	-15.77	-523.88	2,519.96	2,398.27	121.69	20.708	
5,700.00	2,696.45	2,788.95	2,694.39	118.00	7.50	-16.39	-17.34	-523.89	2,619.93	2,494.44	125.50	20.876	
5,800.00	2,693.31	2,787.11	2,693.48	121.82	7.48	-17.52	-18.93	-523.89	2,719.91	2,590.60	129.30	21.035	
5,900.00	2,690.16	2,785.26	2,692.54	125.65	7.46	-18.61	-20.54	-523.90	2,819.88	2,686.77	133.11	21.185	
6,000.00	2,687.02	2,783.38	2,691.59	129.47	7.44	-19.66	-22.15	-523.90	2,919.85	2,782.94	136.92	21.326	
6,100.00	2,683.88	2,781.49	2,690.62	133.30	7.43	-20.67	-23.78	-523.90	3,019.83	2,879.10	140.72	21.459	
6,200.00	2,680.74	2,779.57	2,689.64	137.13	7.41	-21.65	-25.43	-523.91	3,119.80	2,975.27	144.53	21.585	
6,300.00	2,677.60	2,777.63	2,688.64	140.95	7.39	-22.59	-27.09	-523.91	3,219.78	3,071.43	148.34	21.705	
6,400.00	2,674.46	2,775.68	2,687.62	144.78	7.37	-23.49	-28.76	-523.92	3,319.75	3,167.60	152.15	21.819	
6,500.00	2,671.32	2,773.70	2,686.59	148.61	7.35	-24.36	-30.44	-523.92	3,419.73	3,263.77	155.96	21.927	
6,600.00	2,668.18	2,771.70	2,685.53	152.44	7.33	-25.19	-32.15	-523.93	3,519.70	3,359.94	159.77	22.030	
6,700.00	2,665.04	2,769.67	2,684.46	156.27	7.31	-26.00	-33.86	-523.93	3,619.68	3,456.10	163.58	22.128	
6,800.00	2,661.89	2,767.63	2,683.37	160.10	7.29	-26.77	-35.59	-523.94	3,719.66	3,552.27	167.39	22.222	
6,900.00	2,658.75	2,765.56	2,682.27	163.93	7.26	-27.51	-37.34	-523.94	3,819.63	3,648.44	171.20	22.311	
7,000.00	2,655.61	2,763.47	2,681.14	167.76	7.24	-28.23	-39.10	-523.95	3,919.61	3,744.60	175.01	22.397	
7,100.00	2,652.47	2,761.36	2,679.99	171.60	7.22	-28.91	-40.87	-523.95	4,019.59	3,840.77	178.82	22.479	
7,200.00	2,649.33	2,759.22	2,678.82	175.43	7.20	-29.57	-42.66	-523.96	4,119.57	3,936.94	182.63	22.557	
7,300.00	2,646.19	2,757.06	2,677.64	179.26	7.18	-30.20	-44.46	-523.96	4,219.54	4,033.11	186.44	22.633	
7,400.00	2,643.05	2,754.88	2,676.43	183.09	7.16	-30.81	-46.28	-523.97	4,319.52	4,129.27	190.25	22.705	
7,500.00	2,639.91	2,752.67	2,675.20	186.92	7.13	-31.39	-48.12	-523.97	4,419.50	4,225.44	194.06	22.774	
7,600.00	2,636.77	2,750.44	2,673.95	190.76	7.11	-31.95	-49.97	-523.98	4,519.48	4,321.61	197.87	22.841	
7,700.00	2,633.63	2,748.18	2,672.68	194.59	7.09	-32.48	-51.83	-523.98	4,619.45	4,417.77	201.68	22.905	
7,783.57	2,631.00	2,746.27	2,671.60	197.79	7.07	-32.91	-53.40	-523.99	4,703.01	4,498.14	204.87	22.956	



Phoenix Technology Services
Anticollision Report



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Reference Site:	Pinto 36 State Com	MD/Reference:	KB @ 3473.00usft (Silver Oak 3)
Site Error:	0.00' usft	North Reference:	Grid
Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00' usft	Output errors are at:	2.00-sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR-epdm
Reference Design:	Plan #1, 10-28-14	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3473.00usft (Silver Oak 3)

Offset Depths are relative to Offset Datum

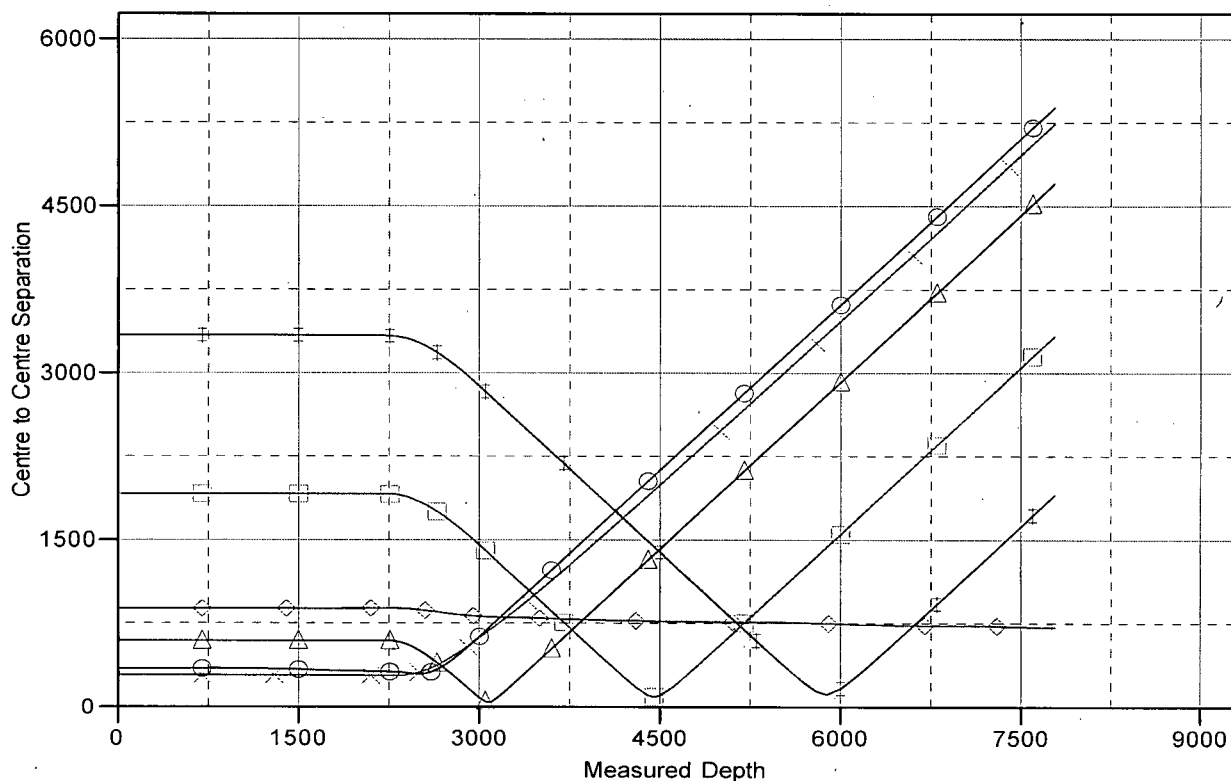
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #9H

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

Grid Convergence at Surface is: -0.05°

Ladder Plot



LEGEND

#10H, WB1/Job #1410329, Surveys (Silver Oak 3) V0 #1H, WB1/Job #1310862, Surveys (JW 4) V0 #7H, WB1, Plan #1 09-05-13 V0
#1H, WB1/Job #1310195, Surveys (JW 4) V0 #6H, WB1, Plan #1 09-05-13 V0 #8H, WB1, Plan #1 09-05-13 V0



Phoenix Technology Services
Anticollision Report



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Reference Well:	#9H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	-2.00 sigma
Reference Wellbore:	WB1	Database:	Compass 5000 GCR epdm
Reference Design:	Plan #1 10-28-14	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3473.00usft (Silver Oak 3)

Offset Depths are relative to Offset Datum

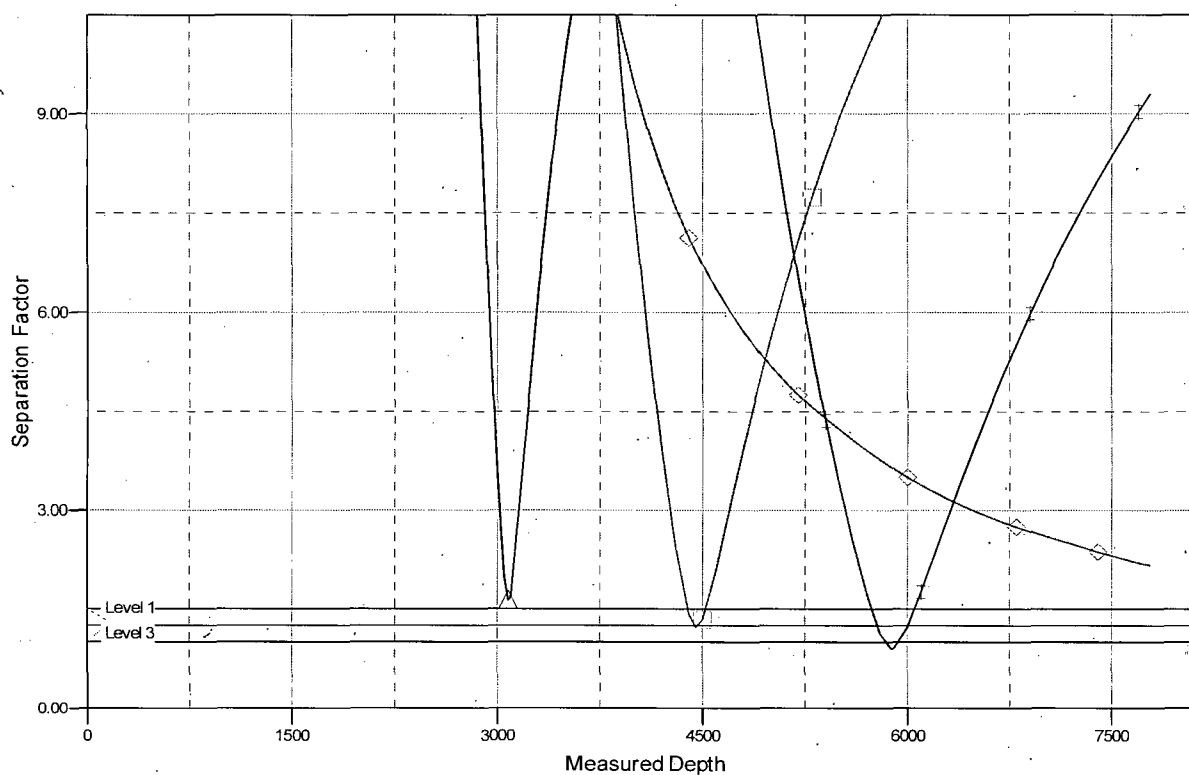
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #9H

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

Grid Convergence at Surface is: -0.05°

Separation Factor Plot



LEGEND

#10H, WB1/Job #1410329, Surveys (Silver Oak 3) V0
#11H, WB1/Job #1310195, Surveys (JW 4) V0

#1H, WB1/Job #1310862, Surveys (JW 4) V0
#6H, WB1, Plan #1 09-05-13 V0

#7H, WB1, Plan #1 09-05-13 V0
#8H, WB1, Plan #1 09-05-13 V0