

NM OIL CONSERVATION

ARTESIA DISTRICT

Form C-102

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) 748-1263 Fax: (505) 748-9720

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

DISTRICT IV
1230 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

SEP 28 2015

Revised August 1, 2011
Submit one copy to appropriate
District Office

RECEIVED

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015- 43387	Pool Code 50270	Pool Name Penasco Draw; SA-Yeso (Assoc)
Property Code 38872	Property Name CLYDESDALE 1 FEE	Well Number 8H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3389'

Surface Location

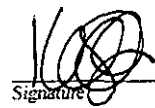
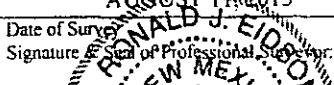
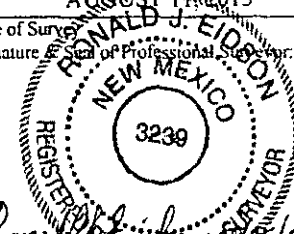
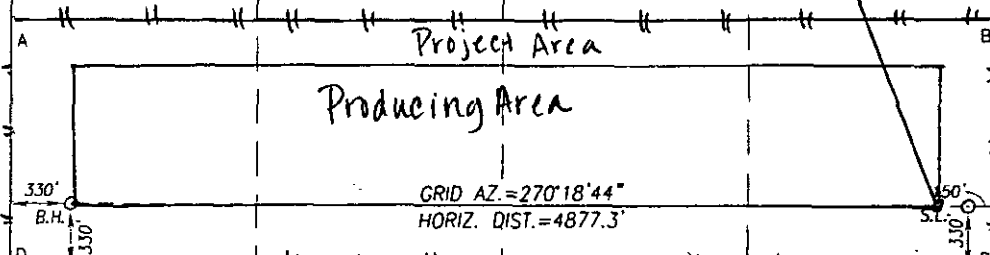
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	I	19-S	25-E		330	SOUTH	150	EAST	EDDY

Bottom Hole Location If Different From Surface

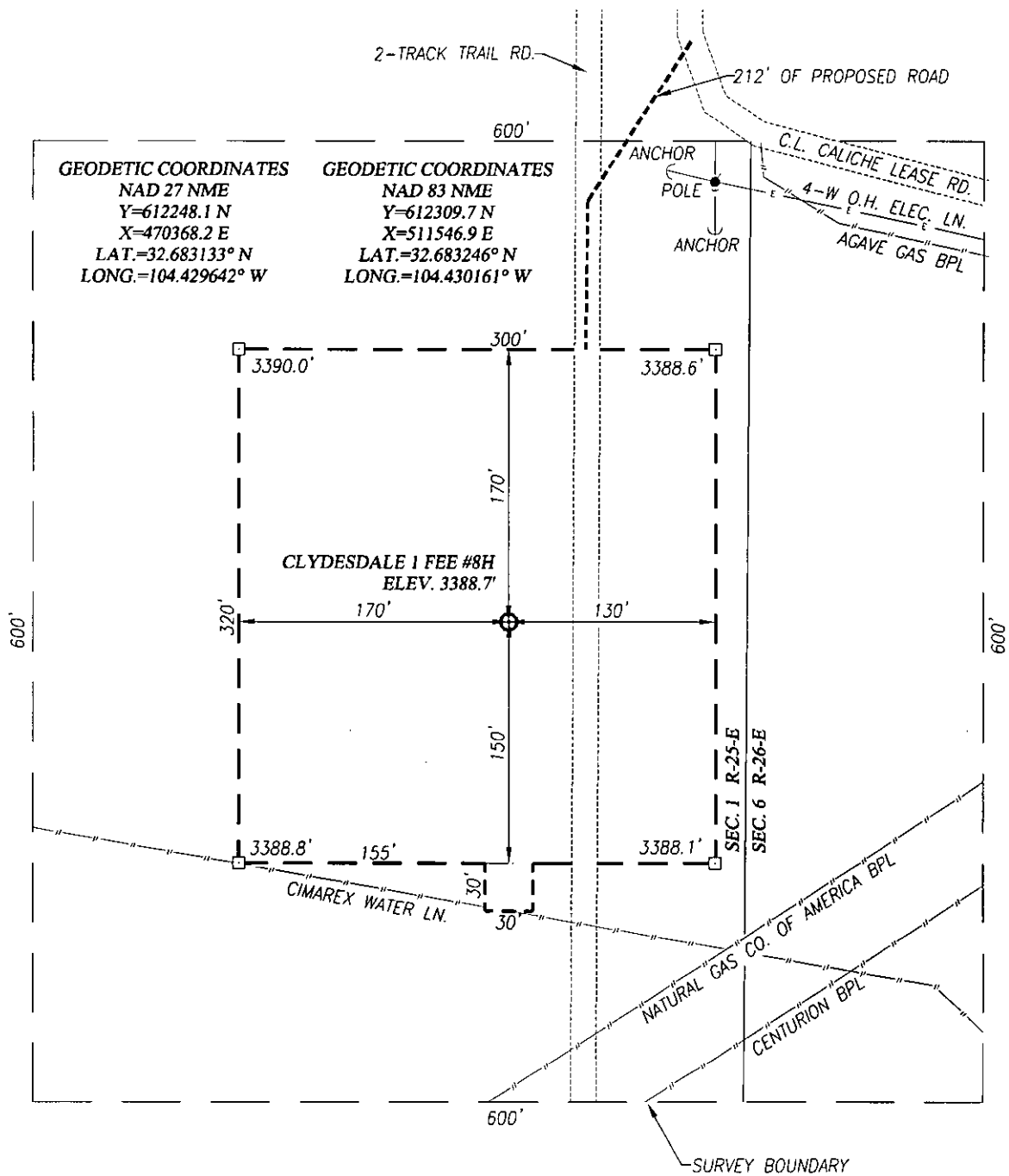
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	I	19-S	25-E		330	SOUTH	330	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

4	3	2	1	OPERATOR CERTIFICATION
GEODETTIC COORDINATES NAD 27 NME BOTTOM HOLE LOCATION Y=612274.7 N X=465492.3 E LAT.=32.683193° N LONG.=104.445490° W 39.65 AC.	GEODETTIC COORDINATES NAD 83 NME BOTTOM HOLE LOCATION Y=612335.3 N X=506670.9 E LAT.=32.683306° N LONG.=104.446009° W 39.75 AC.	GEODETTIC COORDINATES NAD 27 NME SURFACE LOCATION Y=612248.1 N X=470368.2 E LAT.=32.683133° N LONG.=104.429642° W 39.85 AC.	GEODETTIC COORDINATES NAD 83 NME SURFACE LOCATION Y=612309.7 N X=511546.9 E LAT.=32.683246° N LONG.=104.430161° W 39.95 AC.	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.  9-24-15 Date Kelly J Holly Printed Name kholly@concho.com E-mail Address
CORNER COORDINATES TABLE NAD 83 NME A - Y=613327.8 N, X=506345.9 E B - Y=613303.8 N, X=511704.1 E C - Y=611979.0 N, X=511694.4 E D - Y=612008.2 N, X=506339.3 E		CORNER COORDINATES TABLE NAD 27 NME A - Y=613266.3 N, X=465167.4 E B - Y=613242.2 N, X=470525.5 E C - Y=611917.4 N, X=470515.8 E D - Y=611946.6 N, X=465160.8 E		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. AUGUST 11 2015 Date of Survey  Signature of Professional Surveyor  3239 REGISTERED SURVEYOR August 11, 2015 Certificate Number 12641 Ronald J. Eldson 3239 ACK JWSC W.O.: 15.11.0783
Project Area Producing Area GRID AZ.=270°18'44" HORIZ. DIST.=4877.3' Estimated Completed Interval: 336 FSL 330 FEL 				

WELL SITE PLAN

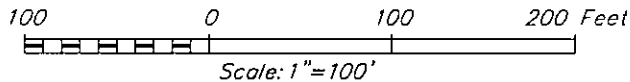


DIRECTIONS TO CLYDESDALE 1 FEE #8H:

FROM THE INTERSECTION OF U.S. HWY. 285 (SEVEN RIVERS)
AND CO. RD. #38 (KINCAID RANCH). GO WEST ON CO. RD. #38
APPROX. 2.8 MILES TO A CALICHE LEASE ROAD. TURN LEFT
AND GO SOUTH ON LEASE ROAD APPROX. 0.9 MILES. TURN
LEFT AND GO EAST APPROX. 0.9 MILES. TURN RIGHT AND GO
SOUTH APPROX. 0.9 MILES TO PROPOSED ACCESS ROAD.
FOLLOW ACCESS ROAD RIGHT AND GO SOUTHWEST APPROX.
120 FEET, TURN LEFT AND GO SOUTH APPROX. 92 FEET TO
WELL PAD.

NOTE:

1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.



COG OPERATING, LLC

CLYDESDALE 1 FEE #8H WELL
LOCATED 330 FEET FROM THE SOUTH LINE
AND 150 FEET FROM THE EAST LINE OF SECTION 1,
TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO

Survey Date: 8/12/15

CAD Date: 8/21/15

Drawn By: ACK

W.O. No.: 15110783

Rev: .

Rel. W.O.:

Sheet 1 of 1



PROVIDING SURVEYING SERVICES
SINCE 1946

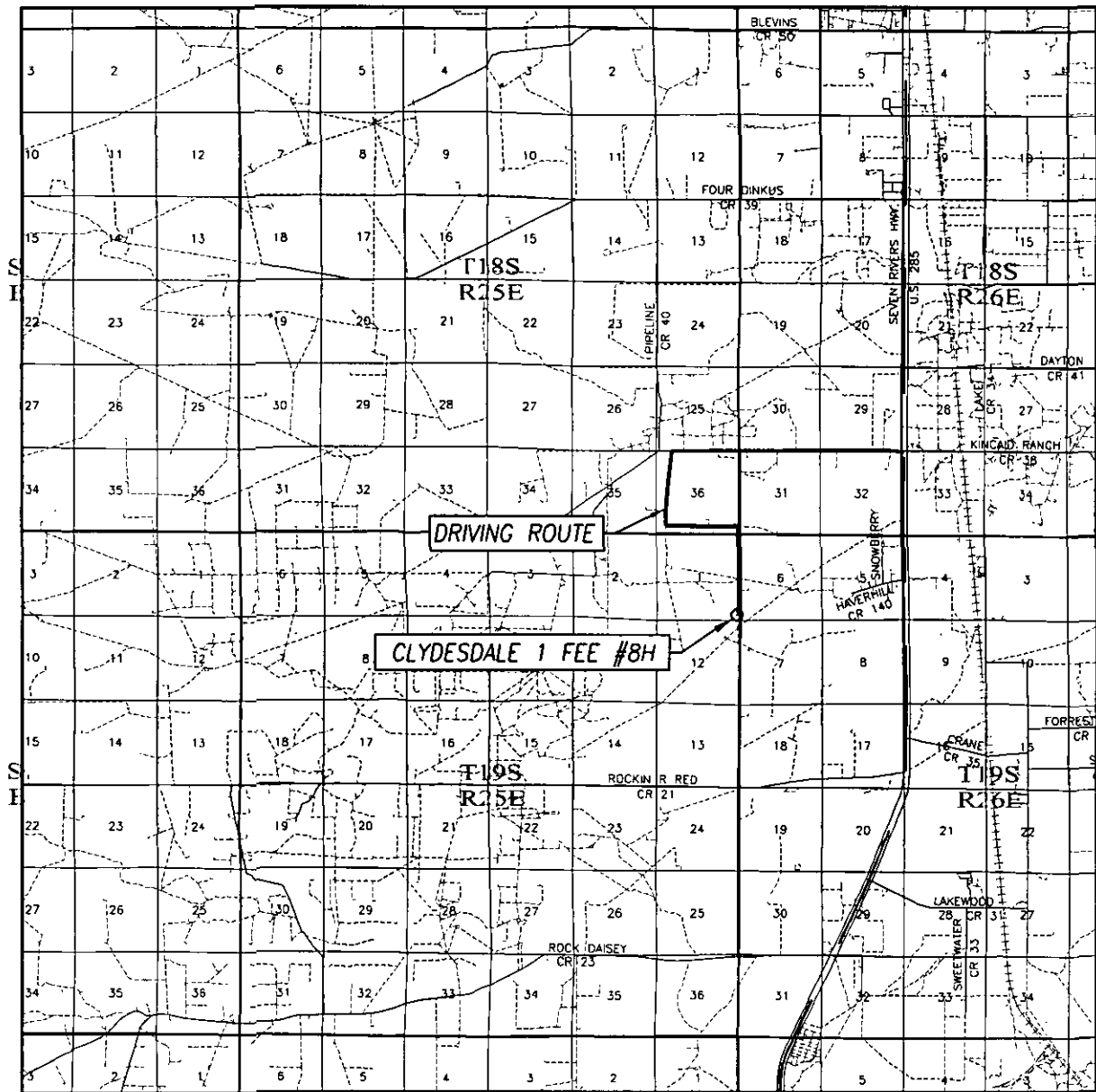
JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240

(575) 393-3117 www.jwsc.biz

TBPLS# 10021000

VICINITY MAP



SCALE: 1" = 2 MILES

DRIVING ROUTE: SEE TOPOGRAPHICAL AND ACCESS ROAD MAP

SEC. 1 TWP. 19-S RGE. 25-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 330' FSL & 150' FEL

ELEVATION 3389'

OPERATOR COG OPERATING, LLC

LEASE CLYDESDALE 1 FEE

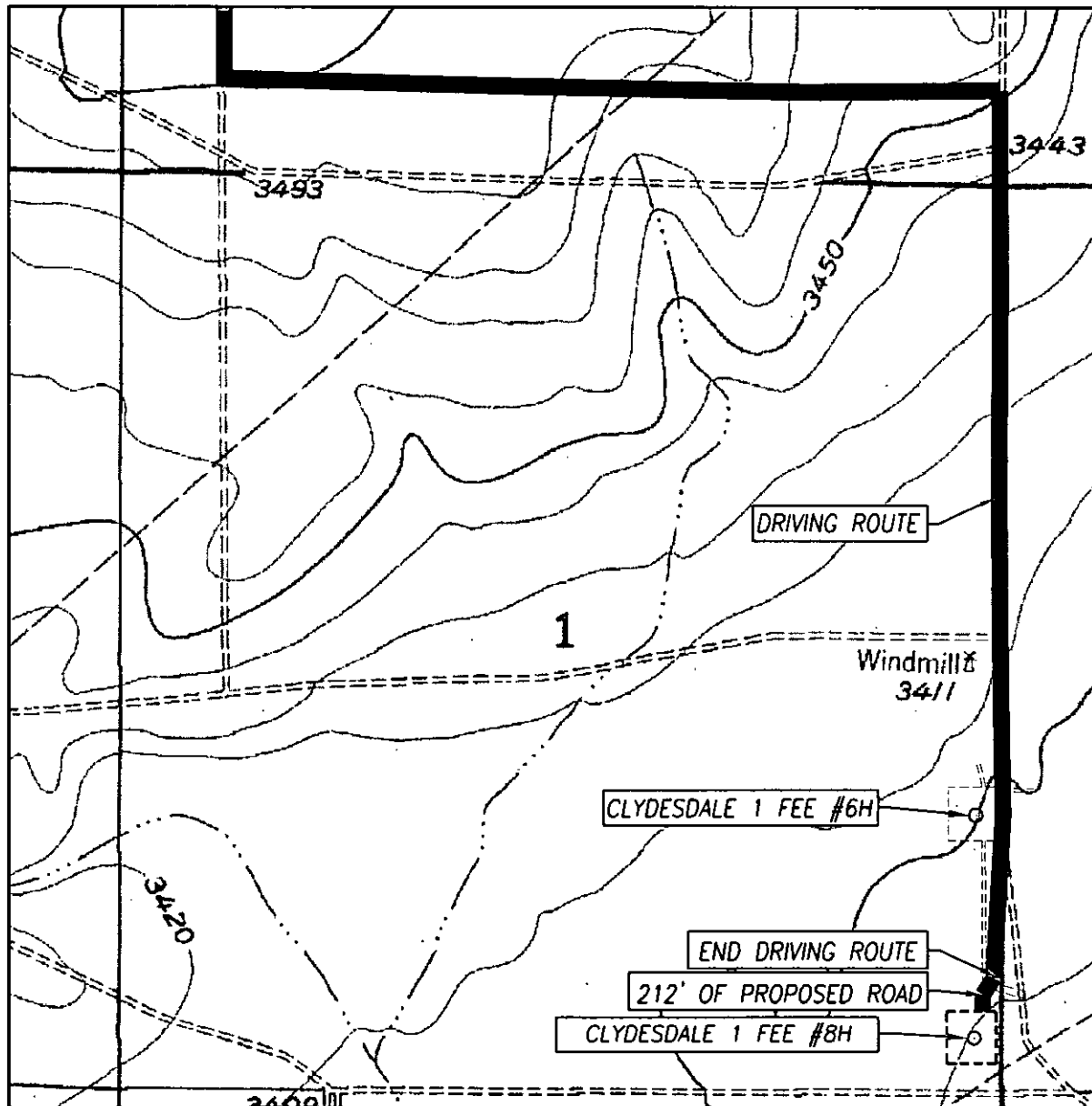


PROVIDING SURVEYING SERVICES
SINCE 1946

JOHN WEST SURVEYING COMPANY

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

TOPOGRAPHICAL AND ACCESS ROAD MAP



SCALE: 1" = 1000'

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

SEC. 1 TWP. 19-S RGE. 25-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 330' FSL & 150' FEL

ELEVATION 3389'

OPERATOR COG OPERATING, LLC

LEASE CLYDESDALE 1 FEE

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

DIRECTIONS TO CLYDESDALE 1 FEE #8H:

FROM THE INTERSECTION OF U.S. HWY. 285 (SEVEN RIVERS) AND CO. RD. #38 (KINCAID RANCH), GO WEST ON CO. RD. #38 APPROX. 2.8 MILES TO A CALICHE LEASE ROAD. TURN LEFT AND GO SOUTH ON LEASE ROAD APPROX. 0.9 MILES. TURN LEFT AND GO EAST APPROX. 0.9 MILES. TURN RIGHT AND GO SOUTH APPROX. 0.9 MILES TO PROPOSED ACCESS ROAD. FOLLOW ACCESS ROAD RIGHT AND GO SOUTHWEST APPROX. 31 FEET, TURN LEFT AND GO SOUTH APPROX. 189 FEET TO WELL PAD.



PROVIDING SURVEYING SERVICES
SINCE 1946

JOHN WEST SURVEYING COMPANY

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TBPLS# 10021000



NM OIL CONSERVATION

ARTESIA DISTRICT

SEP 28 2015

RECEIVED

COG Operating LLC

Eddy County, NM (NAD27 NME)

Clydesdale 1 Fee

#8H

OH

Plan: Plan #1 09-11-15

Surface: 330' FSL, 150' FEL, Sec 1, T19S, R25E, Unit P

PP: 336' FSL, 330' FEL, Sec 1, T19S, R25E, Unit P

BHL: 330' FSL, 330' FWL, Sec 1, T19S, R25E, Unit M

Standard Planning Report

11 September, 2015





Phoenix Technology Services LP

Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #8H
Company:	COG Operating LLC	TVD Reference:	KB @ 3407.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3407.00usft (Silver Oak 3)
Site:	Clydesdale 1 Fee	North Reference:	Grid
Well:	#8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 09-11-15		

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	Clydesdale 1 Fee		
Site Position:	Map	Northing:	616,840.10 usft
From:		Easting:	470,401.70 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 41' 44.71785 N
		Longitude:	104° 25' 46.36893 W
		Grid Convergence:	-0.05 °

Well	#8H		
Well Position	+N/-S	-4,592.00 usft	Northing:
	+E/-W	-33.50 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 40' 59.27682 N
		Longitude:	104° 25' 46.71217 W
		Ground Level:	3,389.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	HDGM	9/10/2015	7.62
			Dip Angle
			(°)
			60.53
			Field Strength
			(nT)
			48,424

Design	Plan #1 09-11-15		
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
			(°)
			270.31

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,400.63	0.00	0.00	2,400.63	0.00	0.00	0.00	0.00	0.00	0.00	
3,236.99	92.00	272.40	2,921.18	22.57	-538.58	11.00	11.00	0.00	272.40	
3,315.89	92.00	270.03	2,918.43	24.25	-617.40	3.00	0.00	-3.00	-89.96	
7,576.99	92.00	270.03	2,769.73	26.60	-4,875.90	0.00	0.00	0.00	0.00	BHL (Clydesdale 1 #8



Phoenix Technology Services LP

Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #8H
Company:	COG Operating LLC	TVD Reference:	KB @ 3407.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3407.00usft (Silver Oak 3)
Site:	Clydesdale 1 Fee	North Reference:	Grid
Well:	#8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1.09-11-15		

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
2,390.63	0.00	0.00	2,390.63	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 11°/100' Build									
2,400.63	0.00	0.00	2,400.63	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	10.93	272.40	2,499.40	0.40	-9.44	9.44	11.00	11.00	0.00
2,600.00	21.93	272.40	2,595.17	1.58	-37.66	37.67	11.00	11.00	0.00
2,700.00	32.93	272.40	2,683.79	3.50	-83.62	83.63	11.00	11.00	0.00
2,800.00	43.93	272.40	2,762.00	6.10	-145.62	145.65	11.00	11.00	0.00
2,847.42	49.15	272.40	2,794.61	7.54	-180.00	180.04	11.00	11.00	0.00
PP (Clydesdale 1 #8H)									
2,900.00	54.93	272.40	2,826.94	9.28	-221.40	221.45	11.00	11.00	0.00
3,000.00	65.93	272.40	2,876.21	12.92	-308.17	308.23	11.00	11.00	0.00
3,100.00	76.93	272.40	2,908.01	16.88	-402.73	402.82	11.00	11.00	0.00
3,200.00	87.93	272.40	2,921.16	21.02	-501.62	501.73	11.00	11.00	0.00
3,226.99	90.90	272.40	2,921.44	22.15	-528.59	528.70	11.00	11.00	0.00
LP, Begin 3°/100' Turn									
3,236.99	92.00	272.40	2,921.18	22.57	-538.58	538.69	11.00	11.00	0.00
3,300.00	92.00	270.51	2,918.98	24.17	-601.52	601.64	3.00	0.00	-3.00
3,315.89	92.00	270.03	2,918.43	24.25	-617.40	617.52	3.00	0.00	-3.00
3,320.99	92.00	270.03	2,918.25	24.25	-622.50	622.62	0.00	0.00	0.00
Begin 92° Inc Hold, 369.98° Azm									
3,400.00	92.00	270.03	2,915.49	24.29	-701.46	701.58	0.00	0.00	0.00
3,500.00	92.00	270.03	2,912.00	24.35	-801.40	801.52	0.00	0.00	0.00
3,600.00	92.00	270.03	2,908.52	24.40	-901.34	901.46	0.00	0.00	0.00
3,700.00	92.00	270.03	2,905.03	24.46	-1,001.28	1,001.40	0.00	0.00	0.00
3,800.00	92.00	270.03	2,901.54	24.51	-1,101.22	1,101.33	0.00	0.00	0.00
3,900.00	92.00	270.03	2,898.05	24.57	-1,201.16	1,201.27	0.00	0.00	0.00
4,000.00	92.00	270.03	2,894.56	24.62	-1,301.09	1,301.21	0.00	0.00	0.00
4,100.00	92.00	270.03	2,891.07	24.68	-1,401.03	1,401.15	0.00	0.00	0.00
4,200.00	92.00	270.03	2,887.58	24.73	-1,500.97	1,501.08	0.00	0.00	0.00
4,300.00	92.00	270.03	2,884.09	24.79	-1,600.91	1,601.02	0.00	0.00	0.00
4,400.00	92.00	270.03	2,880.60	24.84	-1,700.85	1,700.96	0.00	0.00	0.00
4,500.00	92.00	270.03	2,877.11	24.90	-1,800.79	1,800.90	0.00	0.00	0.00
4,600.00	92.00	270.03	2,873.62	24.96	-1,900.73	1,900.84	0.00	0.00	0.00
4,700.00	92.00	270.03	2,870.13	25.01	-2,000.67	2,000.77	0.00	0.00	0.00
4,800.00	92.00	270.03	2,866.64	25.07	-2,100.61	2,100.71	0.00	0.00	0.00
4,900.00	92.00	270.03	2,863.15	25.12	-2,200.55	2,200.65	0.00	0.00	0.00
5,000.00	92.00	270.03	2,859.66	25.18	-2,300.48	2,300.59	0.00	0.00	0.00
5,100.00	92.00	270.03	2,856.17	25.23	-2,400.42	2,400.53	0.00	0.00	0.00
5,200.00	92.00	270.03	2,852.68	25.29	-2,500.36	2,500.46	0.00	0.00	0.00
5,300.00	92.00	270.03	2,849.19	25.34	-2,600.30	2,600.40	0.00	0.00	0.00
5,400.00	92.00	270.03	2,845.70	25.40	-2,700.24	2,700.34	0.00	0.00	0.00
5,500.00	92.00	270.03	2,842.21	25.45	-2,800.18	2,800.28	0.00	0.00	0.00
5,600.00	92.00	270.03	2,838.72	25.51	-2,900.12	2,900.22	0.00	0.00	0.00
5,700.00	92.00	270.03	2,835.23	25.56	-3,000.06	3,000.15	0.00	0.00	0.00
5,800.00	92.00	270.03	2,831.74	25.62	-3,100.00	3,100.09	0.00	0.00	0.00
5,900.00	92.00	270.03	2,828.25	25.67	-3,199.94	3,200.03	0.00	0.00	0.00
6,000.00	92.00	270.03	2,824.76	25.73	-3,299.88	3,299.97	0.00	0.00	0.00
6,100.00	92.00	270.03	2,821.27	25.78	-3,399.81	3,399.90	0.00	0.00	0.00
6,200.00	92.00	270.03	2,817.78	25.84	-3,499.75	3,499.84	0.00	0.00	0.00
6,240.54	92.00	270.03	2,816.37	25.86	-3,540.27	3,540.36	0.00	0.00	0.00
TL, 2940' TVD @ 0 VZ, 92° Inc									
6,300.00	92.00	270.03	2,814.29	25.89	-3,599.69	3,599.78	0.00	0.00	0.00
6,400.00	92.00	270.03	2,810.80	25.95	-3,699.63	3,699.72	0.00	0.00	0.00



Phoenix Technology Services LP
Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #8H
Company:	COG Operating LLC	TVD Reference:	KB @ 3407.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3407.00usft (Silver Oak 3)
Site:	Clydesdale 1 Fee	North Reference:	Grid
Well:	#8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 09-11-15		

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)
6,500.00	92.00	270.03	2,807.31	26.01	-3,799.57	3,799.66	0.00	0.00	0.00
6,600.00	92.00	270.03	2,803.82	26.06	-3,899.51	3,899.59	0.00	0.00	0.00
6,700.00	92.00	270.03	2,800.33	26.12	-3,999.45	3,999.53	0.00	0.00	0.00
6,800.00	92.00	270.03	2,796.84	26.17	-4,099.39	4,099.47	0.00	0.00	0.00
6,900.00	92.00	270.03	2,793.35	26.23	-4,199.33	4,199.41	0.00	0.00	0.00
7,000.00	92.00	270.03	2,789.87	26.28	-4,299.27	4,299.35	0.00	0.00	0.00
7,100.00	92.00	270.03	2,786.38	26.34	-4,399.21	4,399.28	0.00	0.00	0.00
7,200.00	92.00	270.03	2,782.89	26.39	-4,499.14	4,499.22	0.00	0.00	0.00
7,300.00	92.00	270.03	2,779.40	26.45	-4,599.08	4,599.16	0.00	0.00	0.00
7,400.00	92.00	270.03	2,775.91	26.50	-4,699.02	4,699.10	0.00	0.00	0.00
7,500.00	92.00	270.03	2,772.42	26.56	-4,798.96	4,799.04	0.00	0.00	0.00
7,570.17	92.00	270.03	2,769.97	26.60	-4,869.09	4,869.16	0.00	0.00	0.00
TD at 7570.17' MD									
7,576.99	92.00	270.03	2,769.73	26.60	-4,875.90	4,875.97	0.00	0.00	0.00
BHL (Clydesdale 1 #8H)									

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									
BHL (Clydesdale 1 #8H)	0.00	360.00	2,769.73	26.60	-4,875.90	612,274.70	465,492.30	32° 40' 59.49265 N	104° 26' 43.76375 W
- plan hits target center									
- Point									
PP (Clydesdale 1 #8H)	0.00	360.00	2,794.61	7.54	-180.00	612,255.65	470,188.20	32° 40' 59.34986 N	104° 25' 48.81837 W
- plan hits target center									
- Point									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,240.54	2,816.37	TL, 2940' TVD @ 0 VZ, 92° Inc		-2.00	270.31	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,390.63	2,390.63	0.00	0.00	KOP, Begin 11°/100' Build
3,226.99	2,921.44	22.15	-528.59	LP, Begin 3°/100' Turn
3,320.99	2,918.25	24.25	-622.50	Begin 92° Inc Hold, 369.98° Azm
7,570.17	2,769.97	26.60	-4,869.09	TD at 7570.17' MD



Project: Eddy County, NM (NAD27 NME)
Site: Clydesdale 1 Fee
Well: #8H
Wellbore: OH
Design: Plan #1 09-11-15
Rig: Silver Oak 3



Azimuth to Grid North
True North: 0.05°
Magnetic North: 7.87°
Magnetic Field
Strength: 44.24 TmT
Dip Angle: 60.53°
Date: 9/10/2015
Model: HDGM

WELL DETAILS

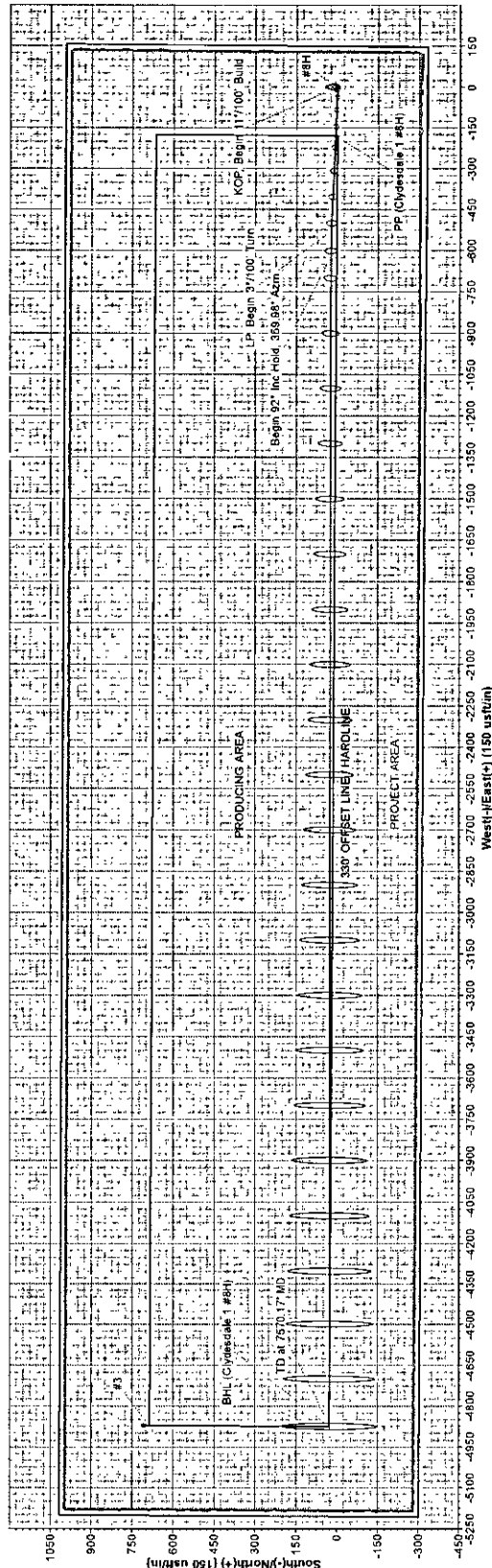
Ground Level	3389.00	Latitude	32° 40' 59.27682 N	Longitude	104° 25' 48.71217 W
Existing	470380.20				

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	WGS	True	VSect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2400.83	0.00	0.00	2400.83	0.00	0.00	0.00	0.00	
3	3238.89	92.08	272.40	2921.16	22.57	-534.53	11.00	272.40	534.69
4	3315.89	92.08	270.33	2916.43	24.25	-617.40	3.00	-48.86	517.52
5	7576.99	92.08	270.33	2763.73	26.60	-4875.90	0.00	0.00	4875.87 BHL (Clydesdale 1 #8H)

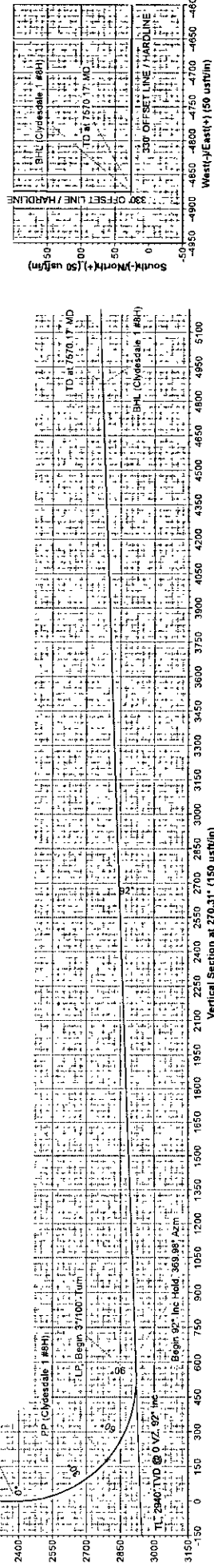
DESIGN TARGET DETAILS

Name	MD	Inc	Azi	TVD	WGS	True	VSect	Target	Annotation
BHL (Clydesdale 1 #8H)				2763.73	26.60	-4875.90	612274.70	455492.30	32° 40' 59.27682 N 104° 26' 43.76375 W Point
PP (Clydesdale 1 #8H)				2764.61	7.54	-100.00	612255.64	470168.20	32° 40' 58.34955 N 104° 25' 48.81337 W Point



True Vertical Depth (150 usft/m)

West-East (150 usft/m)



Vertical Section at 370.1° (150 usft/m)

West-East (150 usft/m)

South-North (150 usft/m)

Created By: Jule Pile Date: 8/26 September 11 2015



NM OIL CONSERVATION
ARTESIA DISTRICT
SEP 28 2015

RECEIVED

COG Operating LLC

Eddy County, NM (NAD27 NME)

Clydesdale 1 Fee

#8H

OH

Plan #1 09-11-15

Anticollision Report

11 September, 2015





Phoenix Technology Services LP
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #8H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3407.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee	MD Reference:	KB @ 3407.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#8H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH	Database:	Compass 5000 GCR
Reference Design:	Plan #1 09-11-15	Offset TVD Reference:	Offset Datum

Reference:	Plan #1 09-11-15		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999,999,999.00	Error Surface:	Circular Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	9/11/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	7,576.99	Plan #1 09-11-15 (OH)	PHX+MWD+HDGM	PHX+MWD+HDGM	

Summary	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Site Name:						
Offset Well - Wellbore - Design						
Montana "1" Fee						
#3 - OH - OH	7,574.20	2,774.77	681.47	501.43	3.785	CC
#3 - OH - OH	7,576.99	2,774.67	681.47	501.34	3.783	ES, SF

Offset Design:		Montana "1" Fee - #3 - OH - OH										Offset Site Error: 0.00 usft	
Survey Program: 176-MWD												Offset Well Error: 0.00 usft	
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	12.41	12.41	0.00	0.01	-81.98	686.69	-4,872.45	4,920.61				
100.00	100.00	107.86	107.86	0.15	0.12	-81.97	687.09	-4,872.45	4,920.66	4,920.39	0.27	N/A	
200.00	200.00	204.75	204.74	0.51	0.26	-81.96	688.11	-4,872.45	4,920.81	4,920.05	0.76	6,444.858	
300.00	300.00	305.27	305.26	0.86	0.47	-81.95	689.28	-4,872.45	4,920.97	4,919.64	1.33	3,698.635	
400.00	400.00	405.80	405.78	1.22	0.68	-81.94	690.37	-4,872.45	4,921.12	4,919.23	1.90	2,593.543	
500.00	500.00	506.33	506.30	1.58	0.88	-81.92	691.38	-4,872.45	4,921.27	4,918.80	2.48	1,996.821	
600.00	600.00	606.85	606.82	1.94	1.09	-81.91	692.32	-4,872.45	4,921.40	4,918.36	3.03	1,622.681	
700.00	700.00	708.25	708.21	2.30	1.31	-81.90	693.14	-4,872.45	4,921.51	4,917.91	3.60	1,365.248	
800.00	800.00	809.93	809.90	2.66	1.52	-81.90	693.71	-4,872.45	4,921.59	4,917.41	4.18	1,177.879	
900.00	900.00	911.62	911.58	3.01	1.74	-81.89	694.04	-4,872.45	4,921.64	4,916.88	4.75	1,035.729	
1,000.00	1,000.00	1,011.07	1,011.04	3.37	1.95	-81.89	694.27	-4,872.45	4,921.67	4,916.35	5.32	925.407	
1,100.00	1,100.00	1,110.21	1,110.18	3.73	2.15	-81.89	694.61	-4,872.45	4,921.72	4,915.83	5.88	836.466	
1,200.00	1,200.00	1,209.36	1,209.32	4.09	2.36	-81.88	695.07	-4,872.45	4,921.78	4,915.33	6.45	763.126	
1,300.00	1,300.00	1,308.50	1,308.46	4.45	2.57	-81.87	695.66	-4,872.45	4,921.87	4,914.85	7.02	701.615	
1,400.00	1,400.00	1,408.34	1,408.30	4.81	2.78	-81.87	696.34	-4,872.45	4,921.96	4,914.38	7.58	649.130	
1,500.00	1,500.00	1,508.60	1,508.55	5.17	2.99	-81.86	697.00	-4,872.45	4,922.06	4,913.90	8.15	603.875	
1,600.00	1,600.00	1,608.85	1,608.81	5.52	3.20	-81.85	697.62	-4,872.45	4,922.14	4,913.42	8.72	564.519	
1,700.00	1,700.00	1,709.11	1,709.06	5.88	3.41	-81.85	698.20	-4,872.45	4,922.23	4,912.94	9.29	529.980	
1,800.00	1,800.00	1,809.37	1,809.32	6.24	3.61	-81.84	698.75	-4,872.45	4,922.30	4,912.45	9.86	499.424	
1,900.00	1,900.00	1,908.68	1,908.63	6.60	3.82	-81.83	699.31	-4,872.45	4,922.38	4,911.96	10.42	472.276	
2,000.00	2,000.00	2,007.91	2,007.86	6.96	4.03	-81.82	699.99	-4,872.45	4,922.48	4,911.49	10.99	447.937	
2,100.00	2,100.00	2,107.13	2,107.08	7.32	4.24	-81.82	700.77	-4,872.45	4,922.59	4,911.04	11.56	425.986	
2,200.00	2,200.00	2,206.36	2,206.30	7.67	4.45	-81.81	701.67	-4,872.45	4,922.72	4,910.60	12.12	406.088	
2,300.00	2,300.00	2,305.66	2,305.60	8.03	4.66	-81.79	702.67	-4,872.45	4,922.87	4,910.18	12.69	387.959	
2,400.00	2,400.00	2,405.39	2,405.32	8.39	4.87	-81.78	703.74	-4,872.45	4,923.02	4,909.76	13.26	371.341	

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



Phoenix Technology Services LP
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #8H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3407.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee	MD Reference:	KB @ 3407.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#8H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH	Database:	Compass 5000 GCR
Reference Design:	Plan #1 09-11-15	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error: 0.00 usft
Montana 1 Fee - #3 - OH - OH													Offset Well Error: 0.00 usft
Survey Program: 176-MWD													
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)			
2,500.00	2,499.40	2,504.53	2,504.46	8.74	5.07	5.95	704.84	-4,872.45	4,913.78	4,899.96	13.82	355.638	
2,600.00	2,595.17	2,600.06	2,599.98	9.10	5.28	6.34	705.93	-4,872.45	4,885.84	4,871.46	14.38	339.858	
2,700.00	2,683.79	2,688.47	2,688.38	9.55	5.46	7.08	706.97	-4,872.45	4,840.24	4,825.23	15.01	322.492	
2,800.00	2,762.00	2,766.61	2,766.52	10.23	5.63	8.35	707.92	-4,872.45	4,778.66	4,762.80	15.86	301.304	
2,900.00	2,826.94	2,832.32	2,832.22	11.37	5.76	10.60	708.68	-4,872.45	4,703.35	4,686.21	17.14	274.437	
3,000.00	2,876.21	2,882.19	2,882.09	13.13	5.87	15.04	709.21	-4,872.45	4,617.10	4,598.10	19.00	243.019	
3,100.00	2,908.01	2,914.38	2,914.28	15.51	5.94	26.27	709.53	-4,872.45	4,523.08	4,501.63	21.44	210.946	
3,200.00	2,921.16	2,927.72	2,927.62	18.34	5.96	71.88	709.66	-4,872.45	4,424.75	4,400.45	24.31	182.045	
3,300.00	2,918.98	2,925.55	2,925.45	21.42	5.96	102.43	709.64	-4,872.45	4,325.60	4,298.21	27.38	157.971	
3,400.00	2,915.49	2,922.02	2,921.92	24.65	5.95	101.50	709.60	-4,872.45	4,226.92	4,196.33	30.60	138.149	
3,500.00	2,912.00	2,918.50	2,918.39	27.97	5.94	101.22	709.57	-4,872.45	4,128.32	4,094.41	33.92	121.720	
3,600.00	2,908.52	2,914.97	2,914.87	31.37	5.94	100.94	709.54	-4,872.45	4,029.79	3,992.49	37.31	108.022	
3,700.00	2,905.03	2,911.44	2,911.34	34.81	5.93	100.65	709.50	-4,872.45	3,931.33	3,890.59	40.74	96.491	
3,800.00	2,901.54	2,907.91	2,907.81	38.29	5.92	100.36	709.47	-4,872.45	3,832.94	3,788.73	44.22	86.687	
3,900.00	2,898.05	2,904.38	2,904.28	41.80	5.91	100.08	709.43	-4,872.45	3,734.64	3,686.92	47.72	78.269	
4,000.00	2,894.56	2,900.86	2,900.76	45.33	5.91	99.79	709.40	-4,872.45	3,636.42	3,585.19	51.24	70.974	
4,100.00	2,891.07	2,897.33	2,897.23	48.87	5.90	99.51	709.36	-4,872.45	3,538.30	3,483.53	54.77	64.601	
4,200.00	2,887.58	2,893.80	2,893.70	52.43	5.89	99.22	709.33	-4,872.45	3,440.29	3,381.97	58.32	58.989	
4,300.00	2,884.09	2,890.27	2,890.17	56.00	5.89	98.93	709.29	-4,872.45	3,342.39	3,280.51	61.88	54.014	
4,400.00	2,880.60	2,886.75	2,886.64	59.57	5.88	98.64	709.25	-4,872.45	3,244.62	3,179.17	65.45	49.575	
4,500.00	2,877.11	2,883.22	2,883.12	63.15	5.87	98.35	709.22	-4,872.45	3,146.98	3,077.95	69.02	45.593	
4,600.00	2,873.62	2,879.69	2,879.59	66.74	5.86	98.06	709.18	-4,872.45	3,049.49	2,976.88	72.60	42.001	
4,700.00	2,870.13	2,876.16	2,876.06	70.33	5.86	97.77	709.15	-4,872.45	2,952.16	2,875.97	76.19	38.747	
4,800.00	2,866.64	2,872.63	2,872.53	73.93	5.85	97.48	709.11	-4,872.45	2,855.01	2,775.23	79.78	35.786	
4,900.00	2,863.15	2,869.11	2,869.01	77.53	5.84	97.19	709.07	-4,872.45	2,758.07	2,674.69	83.37	33.080	
5,000.00	2,859.66	2,865.58	2,865.48	81.14	5.83	96.90	709.04	-4,872.45	2,661.34	2,574.37	86.97	30.600	
5,100.00	2,856.17	2,862.05	2,861.95	84.75	5.83	96.61	709.00	-4,872.45	2,564.86	2,474.29	90.57	28.319	
5,200.00	2,852.68	2,858.52	2,858.42	88.36	5.82	96.32	708.96	-4,872.45	2,468.66	2,374.49	94.17	26.214	
5,300.00	2,849.19	2,854.99	2,854.90	91.97	5.81	96.02	708.92	-4,872.45	2,372.76	2,274.99	97.78	24.267	
5,400.00	2,845.70	2,851.47	2,851.37	95.58	5.80	95.73	708.89	-4,872.45	2,277.22	2,175.83	101.38	22.461	
5,500.00	2,842.21	2,847.94	2,847.84	99.20	5.80	95.44	708.85	-4,872.45	2,182.06	2,077.07	104.99	20.783	
5,600.00	2,838.72	2,844.41	2,844.31	102.81	5.79	95.15	708.81	-4,872.45	2,087.36	1,978.75	108.60	19.220	
5,700.00	2,835.23	2,840.88	2,840.79	106.43	5.78	94.85	708.77	-4,872.45	1,993.16	1,880.95	112.21	17.762	
5,800.00	2,831.74	2,837.36	2,837.26	110.05	5.77	94.56	708.73	-4,872.45	1,899.55	1,783.73	115.83	16.400	
5,900.00	2,828.25	2,833.83	2,833.73	113.67	5.77	94.26	708.69	-4,872.45	1,806.62	1,687.18	119.44	15.126	
6,000.00	2,824.76	2,830.30	2,830.20	117.29	5.76	93.97	708.66	-4,872.45	1,714.48	1,591.43	123.05	13.933	
6,100.00	2,821.27	2,826.77	2,826.68	120.92	5.75	93.68	708.62	-4,872.45	1,623.26	1,496.59	126.67	12.815	
6,200.00	2,817.78	2,823.25	2,823.15	124.54	5.74	93.38	708.58	-4,872.45	1,533.13	1,402.85	130.29	11.768	
6,300.00	2,814.29	2,819.72	2,819.62	128.17	5.74	93.09	708.54	-4,872.45	1,444.29	1,310.39	133.90	10.786	
6,400.00	2,810.80	2,816.19	2,816.09	131.79	5.73	92.79	708.50	-4,872.45	1,357.00	1,219.48	137.52	9.868	
6,500.00	2,807.31	2,812.66	2,812.57	135.42	5.72	92.49	708.46	-4,872.45	1,271.57	1,130.43	141.14	9.009	
6,600.00	2,803.82	2,809.13	2,809.04	139.04	5.71	92.20	708.42	-4,872.45	1,188.40	1,043.64	144.76	8.210	
6,700.00	2,800.33	2,805.61	2,805.51	142.67	5.71	91.90	708.38	-4,872.45	1,108.01	959.63	148.38	7.468	
6,800.00	2,796.84	2,802.08	2,801.98	146.30	5.70	91.61	708.34	-4,872.45	1,031.04	879.04	152.00	6.783	
6,900.00	2,793.35	2,798.55	2,798.46	149.92	5.69	91.31	708.30	-4,872.45	958.32	802.71	155.62	6.158	
7,000.00	2,789.87	2,795.02	2,794.93	153.55	5.69	91.02	708.26	-4,872.45	880.90	731.66	159.24	5.595	
7,100.00	2,786.38	2,791.50	2,791.40	157.18	5.68	90.72	708.21	-4,872.45	830.05	687.19	162.86	5.097	
7,200.00	2,782.89	2,787.97	2,787.87	160.81	5.67	90.42	708.17	-4,872.45	777.33	610.85	166.48	4.669	
7,300.00	2,779.40	2,784.44	2,784.35	164.44	5.66	90.13	708.13	-4,872.45	734.50	564.40	170.10	4.318	
7,400.00	2,775.91	2,780.91	2,780.82	168.07	5.66	89.83	708.09	-4,872.45	703.35	529.63	173.73	4.049	
7,500.00	2,772.42	2,777.39	2,777.29	171.70	5.65	89.53	708.05	-4,872.45	685.49	508.14	177.35	3.865	
7,574.20	2,769.83	2,774.77	2,774.67	174.39	5.64	89.31	708.02	-4,872.45	681.47	501.43	180.04	3.785 CC	

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



Phoenix Technology Services LP
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #8H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3407.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee	MD Reference:	KB @ 3407.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#8H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	OH	Database:	Compass 5000 GCR
Reference Design:	Plan #1 09-11-15	Offset.TVD Reference:	Offset Datum

Offset Design	Montana "1" Fee - #3 - OH - OH											Offset Site Error:	0.00 usft
Survey Program:	176-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	
7,576.99	2,769.73	2,774.67	2,774.58	174.49	5.64	89.31	708.01	-4,872.45	681.47	501.34	180.14	3.783 ES, SF	



Phoenix Technology Services LP
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #8H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3407.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee	MD Reference:	KB @ 3407.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#8H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan #1 09-11-15	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3407.00usft (Silver Oak 3)

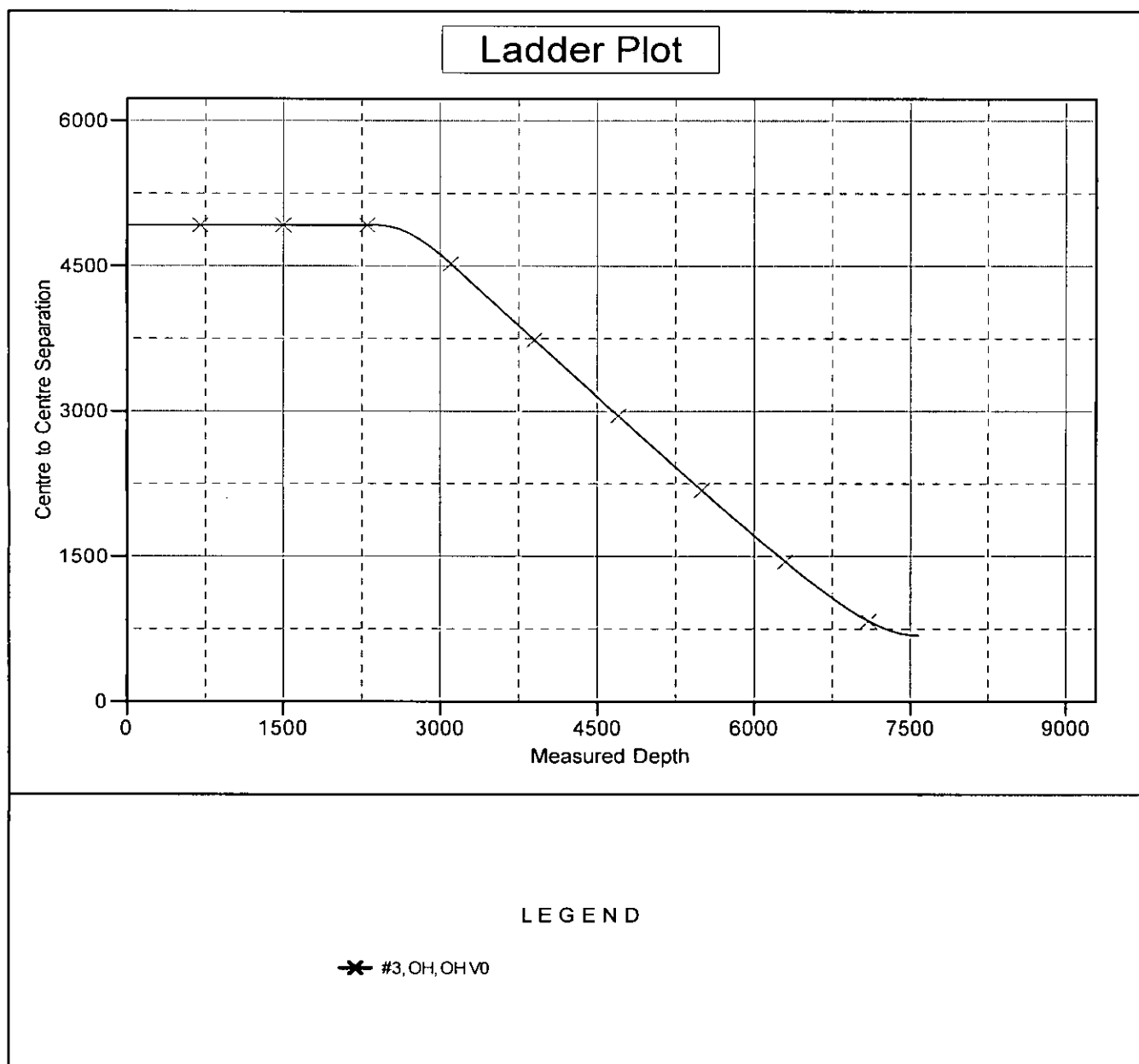
Offset Depths are relative to Offset Datum

Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #8H

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

Grid Convergence at Surface is: -0.05°





Phoenix Technology Services LP
Anticollision Report

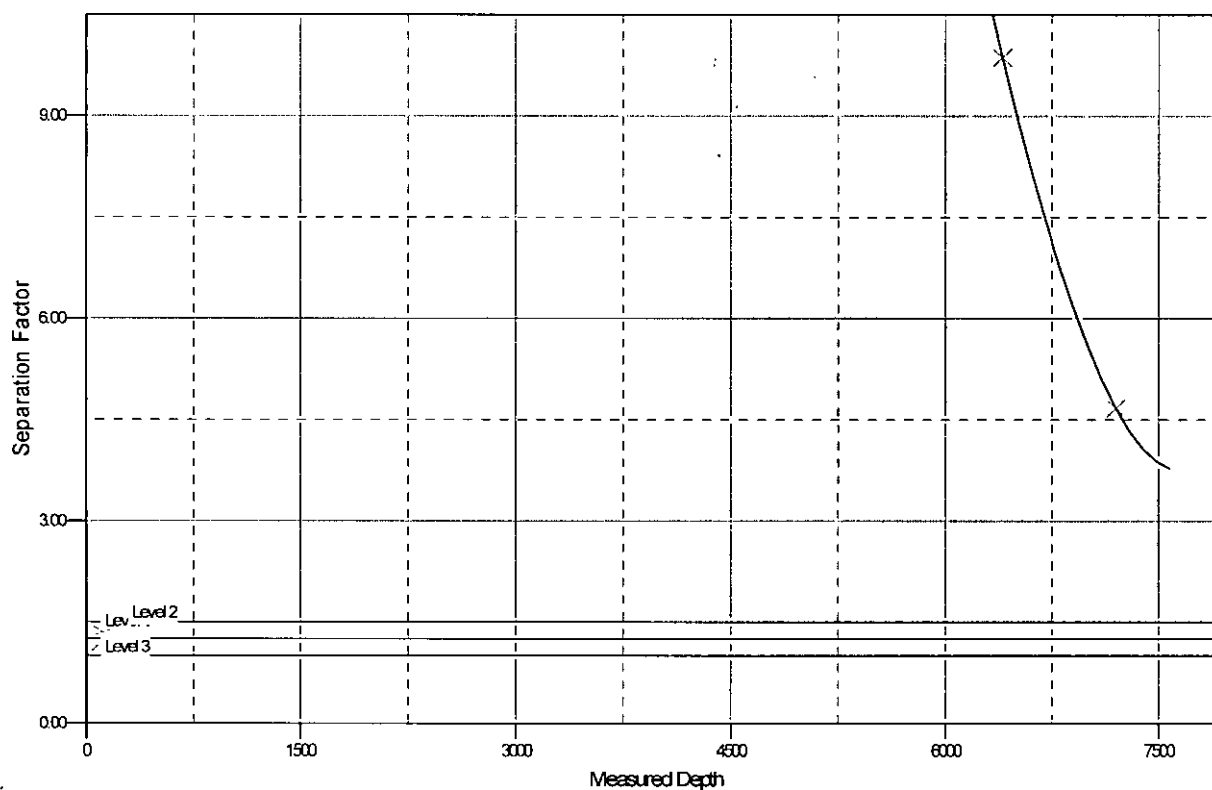


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Separation Factor Plot



LEGEND

✕ #3, OH, OHV0