

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 394-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (505) 748-1283 Fax: (575) 748-9720

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

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

NM OIL CONSERVATION
ARTESIA DISTRICT
State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

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

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-43399	Pool Code 50270	Pool Name Penasco Draw; SA-Yeso (assoc.)
Property Code 38979	Property Name PINTO 36 STATE COM	
OGRID No. 229137	Operator Name COG OPERATING, LLC	
	Well Number 27H	Elevation 3469'

Surface Location

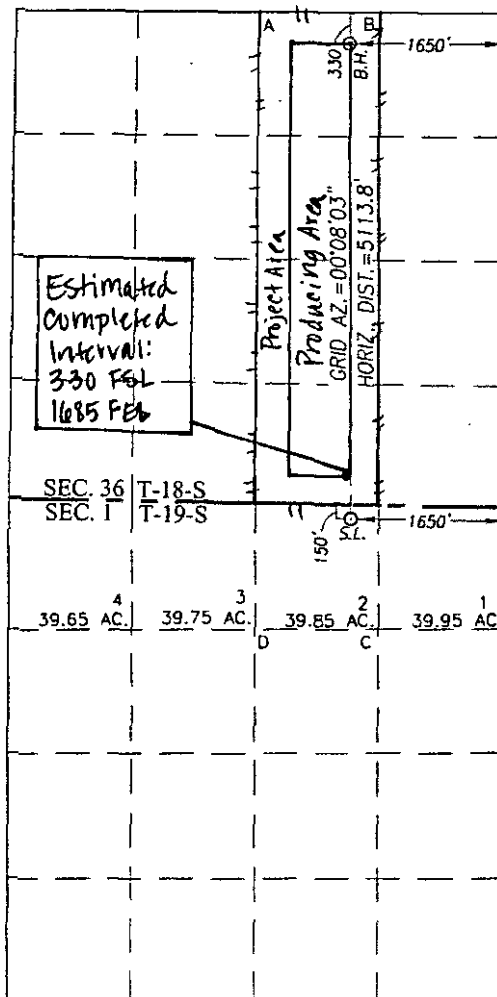
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
2	1	19-S	25-E		150	NORTH	1650	EAST	EDDY

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
B	36	18-S	25-E		330	NORTH	1650	EAST	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



SCALE: 1"=2000'

BOTTOM HOLE LOCATION NAD 83 NME Y= 622276.9 N X= 510094.6 E LAT.=32.710639° N LONG.=104.434912° W	BOTTOM HOLE LOCATION NAD 27 NME Y= 622215.0 N X= 468916.0 E LAT.=32.710526° N LONG.=104.434393° W
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CORNER COORDINATES TABLE

NAD 27 NME

A - Y= 622553.5 N, X= 467927.5 E
B - Y= 622542.1 N, X= 469248.3 E
C - Y= 615895.3 N, X= 469202.1 E
D - Y= 615898.7 N, X= 467859.5 E

CORNER COORDINATES TABLE

NAD 83 NME

A - Y= 622615.3 N, X= 509106.1 E
B - Y= 622604.0 N, X= 510426.8 E
C - Y= 615957.0 N, X= 510380.7 E
D - Y= 615960.4 N, X= 509038.1 E

GEODEIC COORDINATES

NAD 83 NME
SURFACE LOCATION
Y= 617164.4 N
X= 510082.6 E
LAT.=32.696587° N
LONG.=104.434935° W

GEODEIC COORDINATES

NAD 27 NME
SURFACE LOCATION
Y= 617102.7 N
X= 468904.0 E
LAT.=32.696473° N
LONG.=104.434416° 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.

9-29-15
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.

AUGUST-11, 2015

Date of Survey
Signature of Professional Surveyor:

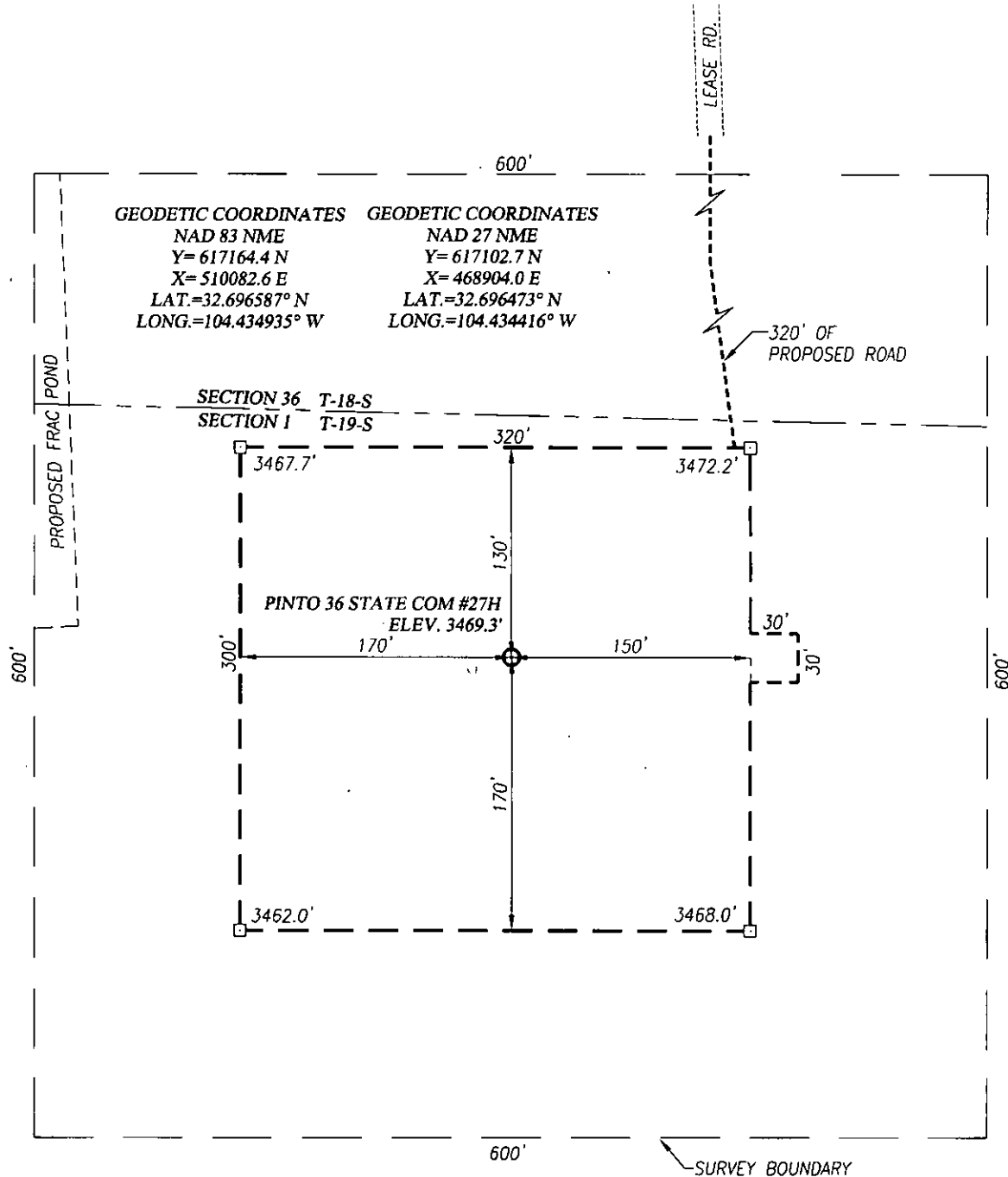
RONALD J. EIDSON
NEW MEXICO
REGISTERED SURVEYOR
3239

8/25/2015

Certificate Number: 12641
Ronald J. Eidson 3239

ACK JWSC W.O.: 15.11.0781

WELL SITE PLAN

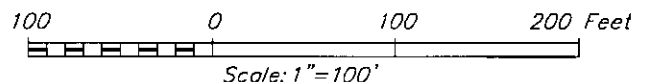


DIRECTIONS TO PINTO 36 STATE COM #27H:

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. 0.6 MILES. TURN RIGHT AND GO SOUTH APPROX. .270 FEET TO PROPOSED ACCESS ROAD. FOLLOW ACCESS ROAD SOUTH APPROX. 131 FEET. ROAD VEERS LEFT, GO SOUTHEAST APPROX. 189 FEET TO THE NORTHEAST PAD CORNER OF THIS LOCATION.

NOTE:

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



COG OPERATING, LLC

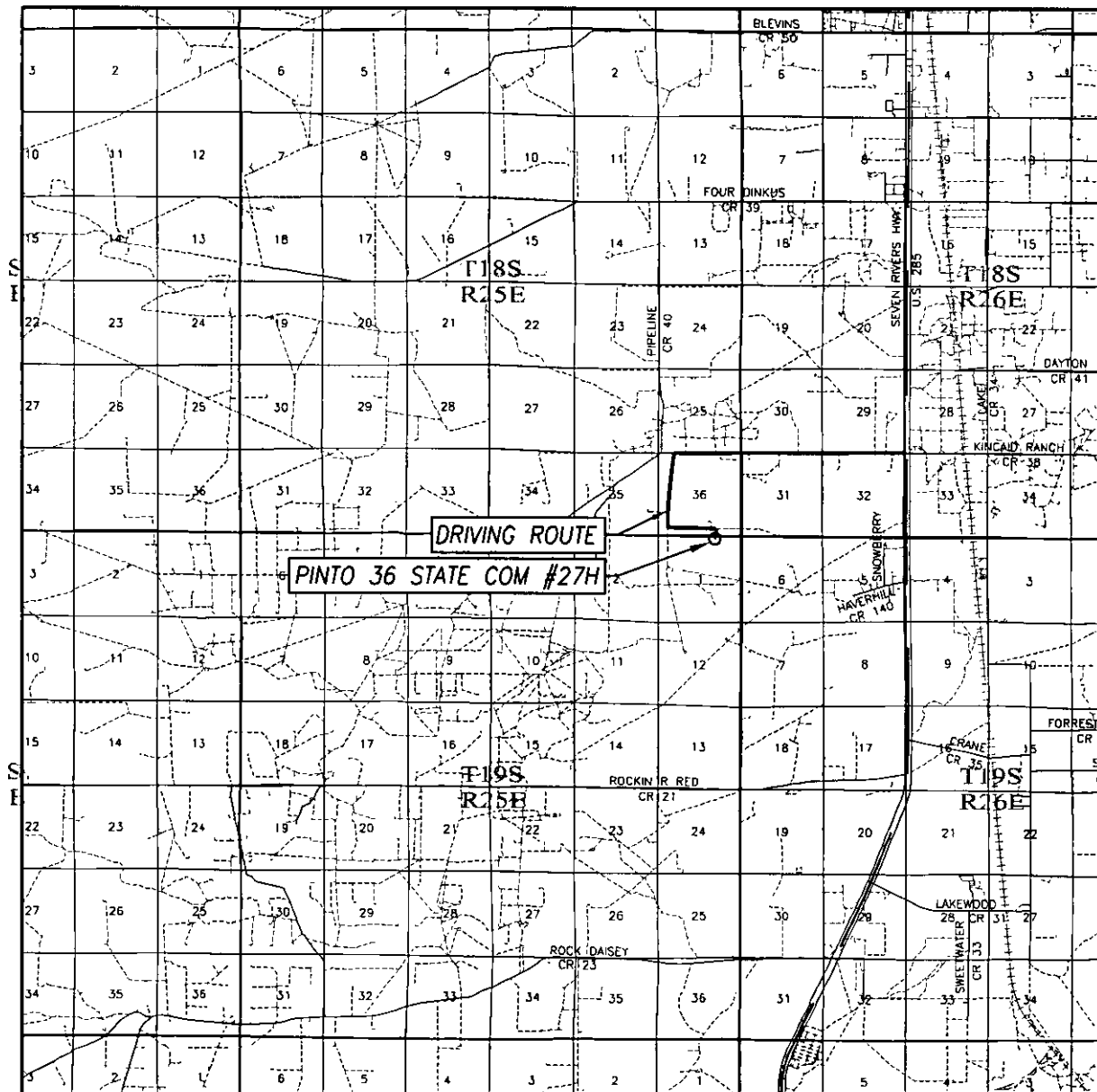
PINTO 36 STATE COM #27H WELL
LOCATED 150 FEET FROM THE NORTH LINE
AND 1650 FEET FROM THE EAST LINE OF SECTION 1,
TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO



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: 8/11/15	CAD Date: 8/24/15	Drawn By: ACK
W.O. No.: 15110781	Rev.:	Rel. W.O.:
		Sheet 1 of 1

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 150' FNL & 1650' FEL

ELEVATION 3469'

OPERATOR COG OPERATING, LLC

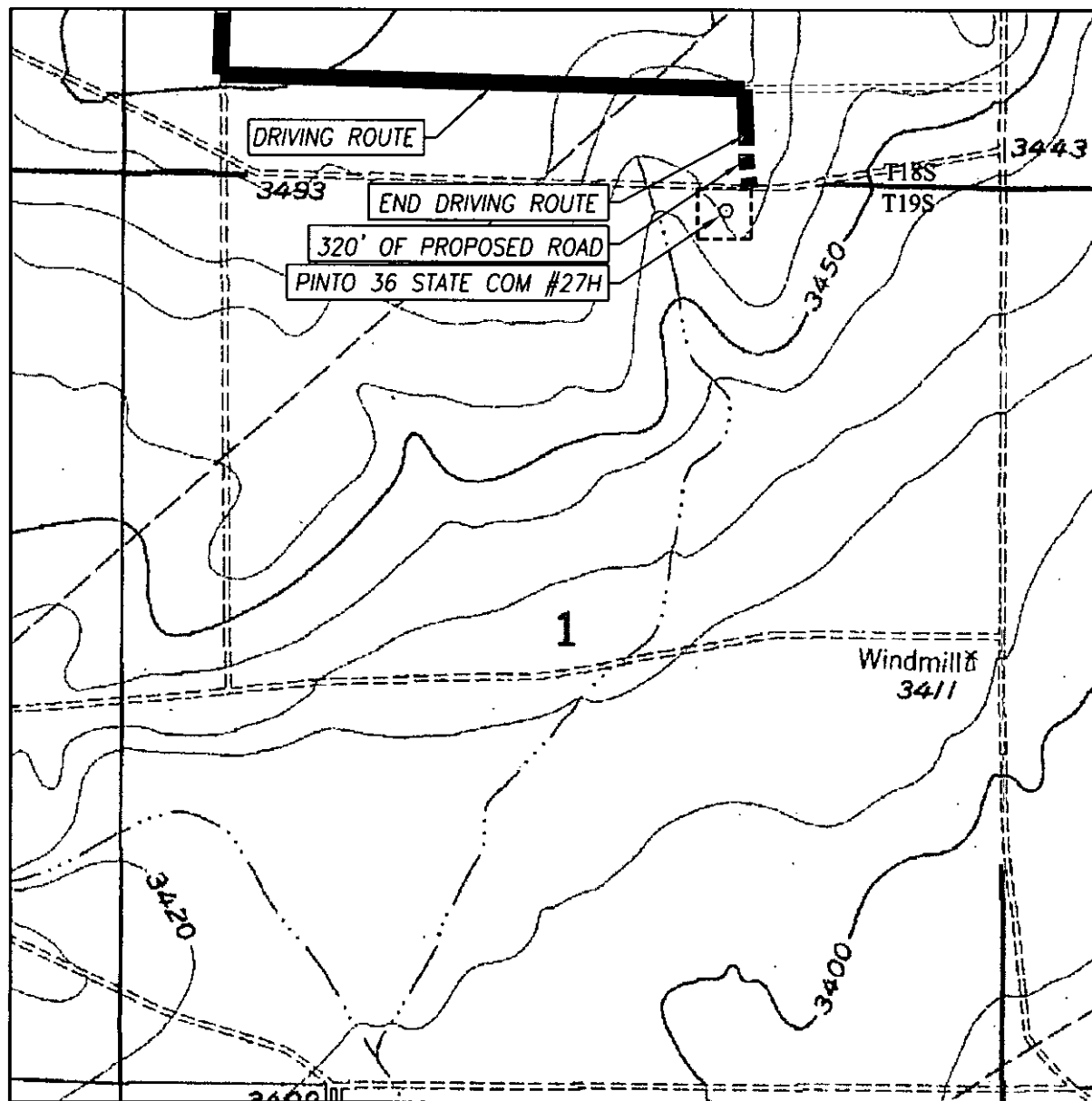
LEASE PINTO 36 STATE COM

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

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 150' FNL & 1650' FEL

ELEVATION 3469'

OPERATOR COG OPERATING, LLC

LEASE PINTO 36 STATE COM

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

DIRECTIONS TO PINTO 36 STATE COM #27H:

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. 0.6 MILES. TURN RIGHT AND GO SOUTH APPROX. 270 FEET TO PROPOSED ACCESS ROAD. FOLLOW ACCESS ROAD SOUTH APPROX. 131 FEET. ROAD VEERS LEFT, GO SOUTHEAST APPROX. 189 FEET TO THE NORTHEAST PAD CORNER OF THIS LOCATION.



PROVIDING SURVEYING SERVICES
SINCE 1946

JOHN WEST SURVEYING COMPANY

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

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TBPLS# 10021000



COG Operating LLC

Eddy County, NM (NAD27 NME)

Pinto 36 State Com

#27H

OH

Plan: Plan #1 09-21-15

Surface: 150' FNL, 1650' FEL, Sec 1, T19S, R25E, Lot #3

PP: 330' FSL, 1685' FEL, Sec 36, T19S, R25E, Unit O

BHL: 330' FNL, 1650' FEL, Sec 36, T18S, R25E, Unit B

Standard Planning Report

21 September, 2015





Phoenix Technology Services LP
Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #27H
Company:	COG Operating LLC	TVD Reference:	KB @ 3487.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3487.00usft (Silver Oak 3)
Site:	Pinto 36 State Com	North Reference:	Grid
Well:	#27H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 09-21-15		

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	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	#27H		
Well Position	+N-S	-271.20 usft	Northing:
	+E-W	-1,321.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 41' 47.30265 N
		Longitude:	104° 26' 3.89840 W
		Ground Level:	3,469.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	HDGM	9/21/2015	7.62
			Dip Angle
			(°)
			60.55
			Field Strength
			(nT)
			48,422

Design	Plan #1 09-21-15		
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
			(°)
			0.13

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	
2,768.14	0.00	0.00	2,768.14	0.00	0.00	0.00	0.00	0.00	0.00	
3,597.23	91.20	356.00	3,288.90	530.48	-37.10	11.00	11.00	0.00	356.00	
3,753.66	91.20	0.69	3,285.62	686.77	-41.61	3.00	0.00	3.00	89.95	
8,180.49	91.20	0.69	3,192.92	5,112.30	12.00	0.00	0.00	0.00	0.00	BHL (Pinto 36 State #



Phoenix Technology Services LP
Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #27H
Company:	COG Operating LLC	TVD Reference:	KB @ 3487.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3487.00usft (Silver Oak 3)
Site:	Pinto 36 State Com	North Reference:	Grid
Well:	#27H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 09-21-15		

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
2,768.14	0.00	0.00	2,768.14	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 11°/100' Build									
2,800.00	3.50	356.00	2,799.98	0.97	-0.07	0.97	11.00	11.00	0.00
2,900.00	14.50	356.00	2,898.60	16.56	-1.16	16.56	11.00	11.00	0.00
3,000.00	25.50	356.00	2,992.42	50.63	-3.54	50.63	11.00	11.00	0.00
3,100.00	36.50	356.00	3,078.00	101.94	-7.13	101.92	11.00	11.00	0.00
3,200.00	47.50	356.00	3,152.19	168.59	-11.79	168.57	11.00	11.00	0.00
3,300.00	58.50	356.00	3,212.28	248.15	-17.35	248.10	11.00	11.00	0.00
3,400.00	69.50	356.00	3,256.04	337.67	-23.61	337.62	11.00	11.00	0.00
3,500.00	80.50	356.00	3,281.87	433.88	-30.34	433.81	11.00	11.00	0.00
3,546.58	85.63	356.00	3,287.50	480.00	-33.56	479.92	11.00	11.00	0.00
PP (Pinto 36 State #27H)									
3,594.55	90.91	356.00	3,288.95	527.81	-36.91	527.72	11.00	11.00	0.00
TL, 3300' TVD @ 0 VZ, 91.2° Inc									
3,597.23	91.20	356.00	3,288.90	530.48	-37.10	530.40	11.00	11.00	0.00
Begin 3°/100' Turn									
3,600.00	91.20	356.08	3,288.84	533.25	-37.29	533.16	3.00	0.00	3.00
3,700.00	91.20	359.08	3,286.74	633.12	-41.50	633.02	3.00	0.00	3.00
3,753.66	91.20	0.69	3,285.62	686.77	-41.61	686.67	3.00	0.00	3.00
Begin 91.2° Inc Hold, 0.96° Azm									
3,800.00	91.20	0.69	3,284.65	733.10	-41.04	733.00	0.00	0.00	0.00
3,900.00	91.20	0.69	3,282.55	833.07	-39.83	832.97	0.00	0.00	0.00
4,000.00	91.20	0.69	3,280.46	933.04	-38.62	932.94	0.00	0.00	0.00
4,100.00	91.20	0.69	3,278.37	1,033.01	-37.41	1,032.92	0.00	0.00	0.00
4,200.00	91.20	0.69	3,276.27	1,132.98	-36.20	1,132.89	0.00	0.00	0.00
4,300.00	91.20	0.69	3,274.18	1,232.95	-34.99	1,232.86	0.00	0.00	0.00
4,400.00	91.20	0.69	3,272.08	1,332.92	-33.78	1,332.84	0.00	0.00	0.00
4,500.00	91.20	0.69	3,269.99	1,432.89	-32.57	1,432.81	0.00	0.00	0.00
4,600.00	91.20	0.69	3,267.90	1,532.86	-31.36	1,532.78	0.00	0.00	0.00
4,700.00	91.20	0.69	3,265.80	1,632.83	-30.15	1,632.76	0.00	0.00	0.00
4,800.00	91.20	0.69	3,263.71	1,732.80	-28.93	1,732.73	0.00	0.00	0.00
4,900.00	91.20	0.69	3,261.61	1,832.77	-27.72	1,832.70	0.00	0.00	0.00
5,000.00	91.20	0.69	3,259.52	1,932.74	-26.51	1,932.68	0.00	0.00	0.00
5,100.00	91.20	0.69	3,257.43	2,032.72	-25.30	2,032.65	0.00	0.00	0.00
5,200.00	91.20	0.69	3,255.33	2,132.69	-24.09	2,132.62	0.00	0.00	0.00
5,300.00	91.20	0.69	3,253.24	2,232.66	-22.88	2,232.60	0.00	0.00	0.00
5,400.00	91.20	0.69	3,251.14	2,332.63	-21.67	2,332.57	0.00	0.00	0.00
5,500.00	91.20	0.69	3,249.05	2,432.60	-20.46	2,432.54	0.00	0.00	0.00
5,600.00	91.20	0.69	3,246.96	2,532.57	-19.25	2,532.52	0.00	0.00	0.00
5,700.00	91.20	0.69	3,244.86	2,632.54	-18.04	2,632.49	0.00	0.00	0.00
5,800.00	91.20	0.69	3,242.77	2,732.51	-16.83	2,732.46	0.00	0.00	0.00
5,900.00	91.20	0.69	3,240.67	2,832.48	-15.61	2,832.44	0.00	0.00	0.00
6,000.00	91.20	0.69	3,238.58	2,932.45	-14.40	2,932.41	0.00	0.00	0.00
6,100.00	91.20	0.69	3,236.49	3,032.42	-13.19	3,032.38	0.00	0.00	0.00
6,200.00	91.20	0.69	3,234.39	3,132.39	-11.98	3,132.36	0.00	0.00	0.00
6,300.00	91.20	0.69	3,232.30	3,232.36	-10.77	3,232.33	0.00	0.00	0.00
6,400.00	91.20	0.69	3,230.20	3,332.34	-9.56	3,332.30	0.00	0.00	0.00
6,500.00	91.20	0.69	3,228.11	3,432.31	-8.35	3,432.28	0.00	0.00	0.00
6,600.00	91.20	0.69	3,226.02	3,532.28	-7.14	3,532.25	0.00	0.00	0.00
6,700.00	91.20	0.69	3,223.92	3,632.25	-5.93	3,632.22	0.00	0.00	0.00
6,800.00	91.20	0.69	3,221.83	3,732.22	-4.72	3,732.20	0.00	0.00	0.00
6,900.00	91.20	0.69	3,219.73	3,832.19	-3.51	3,832.17	0.00	0.00	0.00
7,000.00	91.20	0.69	3,217.64	3,932.16	-2.29	3,932.14	0.00	0.00	0.00



Phoenix Technology Services LP
Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #27H
Company:	COG Operating LLC	TVD Reference:	KB @ 3487.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3487.00usft (Silver Oak 3)
Site:	Pinto 36 State Com	North Reference:	Grid
Well:	#27H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 09-21-15		

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)
7,100.00	91.20	0.69	3,215.55	4,032.13	-1.08	4,032.12	0.00	0.00	0.00
7,200.00	91.20	0.69	3,213.45	4,132.10	0.13	4,132.09	0.00	0.00	0.00
7,300.00	91.20	0.69	3,211.36	4,232.07	1.34	4,232.06	0.00	0.00	0.00
7,400.00	91.20	0.69	3,209.26	4,332.04	2.55	4,332.04	0.00	0.00	0.00
7,500.00	91.20	0.69	3,207.17	4,432.01	3.76	4,432.01	0.00	0.00	0.00
7,600.00	91.20	0.69	3,205.08	4,531.98	4.97	4,531.98	0.00	0.00	0.00
7,700.00	91.20	0.69	3,202.98	4,631.95	6.18	4,631.96	0.00	0.00	0.00
7,800.00	91.20	0.69	3,200.89	4,731.93	7.39	4,731.93	0.00	0.00	0.00
7,900.00	91.20	0.69	3,198.79	4,831.90	8.60	4,831.90	0.00	0.00	0.00
8,000.00	91.20	0.69	3,196.70	4,931.87	9.81	4,931.88	0.00	0.00	0.00
8,100.00	91.20	0.69	3,194.61	5,031.84	11.03	5,031.85	0.00	0.00	0.00
8,180.49	91.20	0.69	3,192.92	5,112.30	12.00	5,112.31	0.00	0.00	0.00
TD at 8180.49' MD - BHL (Pinto 36 State #27H)									

Design Targets

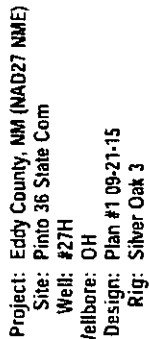
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
BHL (Pinto 36 State #27	0.00	360.00	3,192.92	5,112.30	12.00	622,215.00	468,916.00	32° 42' 37.89207 N	104° 26' 3.81499 W
- plan hits target center									
- Point									
PP (Pinto 36 State #27H	0.00	0.00	3,287.50	480.00	-33.56	617,582.70	468,870.44	32° 41' 52.05223 N	104° 26' 4.29655 W
- plan hits target center									
- Point									

Formations

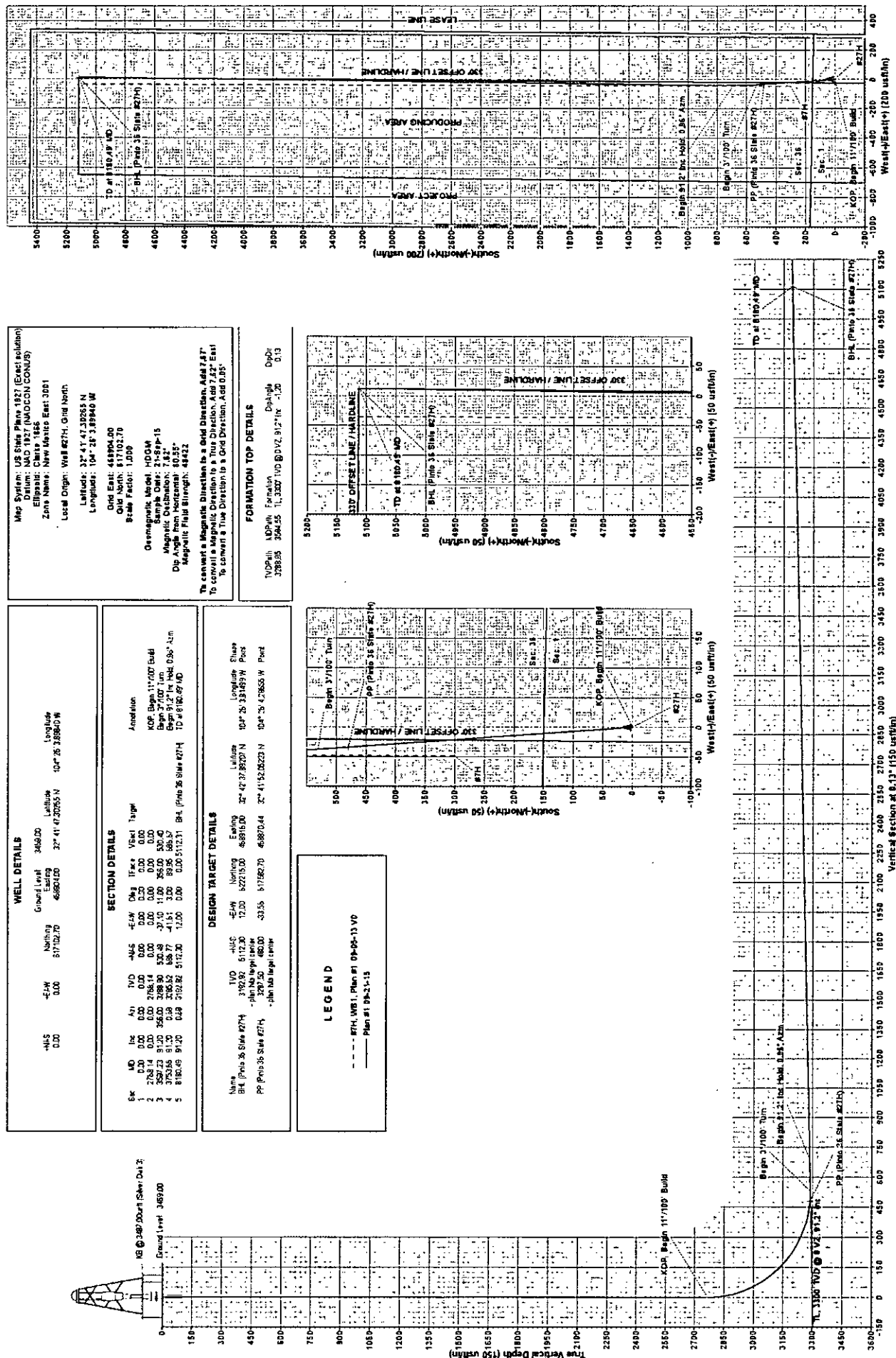
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,594.55	3,288.95	TL, 3300' TVD @ 0 VZ, 91.2° Inc		-1.20	0.13

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,768.14	2,768.14	0.00	0.00	KOP, Begin 11°/100' Build
3,597.23	3,288.90	530.48	-37.10	Begin 3°/100' Turn
3,753.66	3,285.62	686.77	-41.61	Begin 91.2° Inc Hold, 0.96° Azm
8,180.49	3,192.92	5,112.30	12.00	TD at 8180.49' MD



clauscha to Orisk North
 True North: 8.85'
 Magnetic North: 7.37'
 Magnetic Field
 Strength: 48421.5eNT
 Dip Angle: 10.35'
 Date: 8/21/2015
 Model: HDQM





COG Operating LLC

Eddy County, NM (NAD27 NME)

Pinto 36 State Com

#27H

OH

Plan #1 09-21-15

Anticollision Report

21 September, 2015





Phoenix Technology Services LP
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #27H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3487.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3487.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#27H	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 09-21-15	Offset TVD Reference:	Offset Datum

Reference	Plan #1 09-21-15		
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	9/21/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	8,180.46	Plan #1 09-21-15 (OH)	PHX+MWD+HDGM	PHX+MWD+HDGM	

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Pinto 36 State Com						
#7H - WB1 - Plan #1 09-05-13	2,165.32	2,152.32	305.00	292.72	24.845	CC
#7H - WB1 - Plan #1 09-05-13	2,200.00	2,183.11	305.02	292.55	24.462	ES
#7H - WB1 - Plan #1 09-05-13	8,180.49	7,280.86	567.56	392.55	3.243	SF

Offset Design										Pinto 36 State Com - #7H - WB1 - Plan #1 09-05-13		Offset Site Error: 0.00 usft	
Survey Program: O-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 +NAS (usft)	+EAW (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
0.00	0.00	0.00	0.00	0.00	0.00	-9.17	301.10	-48.60	305.27				
100.00	100.00	87.00	87.00	0.15	0.10	-9.17	301.10	-48.60	305.00	304.75	0.24	1,246.042	
200.00	200.00	187.00	187.00	0.51	0.31	-9.17	301.10	-48.60	305.00	304.18	0.81	374.977	
300.00	300.00	287.00	287.00	0.86	0.53	-9.17	301.10	-48.60	305.00	303.60	1.40	218.383	
400.00	400.00	387.00	387.00	1.22	0.76	-9.17	301.10	-48.60	305.00	303.02	1.98	154.051	
500.00	500.00	487.00	487.00	1.58	0.98	-9.17	301.10	-48.60	305.00	302.43	2.56	118.996	
600.00	600.00	587.00	587.00	1.94	1.21	-9.17	301.10	-48.60	305.00	301.85	3.15	96.938	
700.00	700.00	687.00	687.00	2.30	1.43	-9.17	301.10	-48.60	305.00	301.27	3.73	81.778	
800.00	800.00	787.00	787.00	2.66	1.66	-9.17	301.10	-48.60	305.00	300.68	4.31	70.719	
900.00	900.00	887.00	887.00	3.01	1.88	-9.17	301.10	-48.60	305.00	300.10	4.90	62.295	
1,000.00	1,000.00	987.00	987.00	3.37	2.11	-9.17	301.10	-48.60	305.00	299.52	5.48	55.664	
1,100.00	1,100.00	1,087.00	1,087.00	3.73	2.33	-9.17	301.10	-48.60	305.00	298.93	6.06	50.309	
1,200.00	1,200.00	1,187.00	1,187.00	4.09	2.56	-9.17	301.10	-48.60	305.00	298.35	6.65	45.894	
1,300.00	1,300.00	1,287.00	1,287.00	4.45	2.78	-9.17	301.10	-48.60	305.00	297.77	7.23	42.191	
1,400.00	1,400.00	1,387.00	1,387.00	4.81	3.01	-9.17	301.10	-48.60	305.00	297.18	7.81	39.041	
1,500.00	1,500.00	1,487.00	1,487.00	5.17	3.23	-9.17	301.10	-48.60	305.00	296.60	8.40	36.329	
1,600.00	1,600.00	1,587.00	1,587.00	5.52	3.45	-9.17	301.10	-48.60	305.00	296.02	8.98	33.969	
1,700.00	1,700.00	1,687.00	1,687.00	5.88	3.68	-9.17	301.10	-48.60	305.00	295.44	9.56	31.897	
1,800.00	1,800.00	1,787.00	1,787.00	6.24	3.90	-9.17	301.10	-48.60	305.00	294.85	10.15	30.063	
1,900.00	1,900.00	1,887.00	1,887.00	6.60	4.13	-9.17	301.10	-48.60	305.00	294.27	10.73	28.429	
2,000.00	2,000.00	1,987.00	1,987.00	6.96	4.35	-9.17	301.10	-48.60	305.00	293.69	11.31	26.963	
2,100.00	2,100.00	2,087.00	2,087.00	7.32	4.58	-9.17	301.10	-48.60	305.00	293.10	11.89	25.641	
2,165.32	2,165.32	2,152.32	2,152.32	7.55	4.73	-9.17	301.10	-48.60	305.00	292.72	12.28	24.845 CC	
2,200.00	2,200.00	2,183.11	2,183.11	7.67	4.79	-9.17	301.10	-48.60	305.02	292.55	12.47	24.462 ES	

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



Phoenix Technology Services LP
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #27H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3487.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Corn	MD Reference:	KB @ 3487.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#27H	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 09-21-15	Offset TVD Reference:	Offset Datum

Offset Design Pinto 36 State Corn - #7H - WB1 - Plan #1 09-05-13														Offset Site Error:	0.00 usft
Survey Program: O-MWD														Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Reference	Offset	Highside	Offset Wellbore Centre		Distance		Minimum	Separation	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Factor			
2,300.00	2,300.00	2,250.00	2,249.82	8.03	4.85	-9.04	305.39	-48.59	311.46	298.48	12.98	23.990			
2,400.00	2,400.00	2,309.77	2,308.53	8.39	5.10	-8.72	318.43	-48.56	329.61	318.11	13.49	24.426			
2,500.00	2,500.00	2,367.59	2,363.76	8.75	5.28	-8.28	333.43	-48.51	358.77	344.77	14.01	25.616			
2,600.00	2,600.00	2,421.03	2,412.84	9.11	5.40	-7.78	354.50	-48.45	397.93	383.42	14.51	27.425			
2,700.00	2,700.00	2,469.59	2,455.37	9.47	5.55	-7.30	377.92	-48.39	445.89	430.87	15.02	29.893			
2,800.00	2,799.98	2,513.47	2,491.76	9.83	5.74	-2.74	402.40	-48.32	500.63	485.06	15.57	32.156			
2,900.00	2,899.80	2,550.00	2,520.40	10.19	5.93	-2.16	425.06	-48.26	549.96	533.84	16.12	34.117			
3,000.00	2,992.42	2,600.00	2,566.89	10.54	6.25	-1.86	459.22	-48.17	589.46	572.87	16.79	35.104			
3,100.00	3,078.00	2,650.00	2,589.94	10.92	6.64	-1.27	496.71	-48.06	619.03	601.47	17.56	35.252			
3,200.00	3,152.19	2,700.00	2,619.24	11.39	7.09	-0.94	537.20	-47.95	638.38	619.89	18.49	34.528			
3,300.00	3,212.28	2,733.57	2,636.67	11.99	7.45	-0.73	565.88	-47.87	646.85	627.41	19.44	33.277			
3,400.00	3,256.04	2,778.08	2,656.88	12.74	7.95	-0.48	605.53	-47.76	644.92	624.22	20.69	31.165			
3,500.00	3,281.87	2,822.50	2,673.59	13.65	8.50	-0.22	646.68	-47.65	632.41	610.26	22.15	28.550			
3,600.00	3,288.84	2,866.75	2,686.70	14.68	9.09	0.04	688.92	-47.54	609.45	585.67	23.78	25.634			
3,700.00	3,288.74	2,900.00	2,694.16	15.71	9.56	-0.45	721.32	-47.45	586.29	561.02	25.26	23.207			
3,800.00	3,284.65	2,950.00	2,701.45	16.83	10.29	-0.68	770.76	-47.31	571.47	544.35	27.12	21.073			
3,900.00	3,282.55	3,006.62	2,703.95	18.08	11.15	-0.73	827.30	-47.16	565.68	536.45	29.23	19.350			
3,931.45	3,281.90	3,032.01	2,703.45	18.50	11.55	-0.76	852.69	-47.09	565.62	535.57	30.05	18.823			
4,000.00	3,280.48	3,100.55	2,702.01	19.40	12.64	-0.82	921.22	-46.90	565.63	533.59	32.04	17.653			
4,100.00	3,278.37	3,200.55	2,699.92	20.78	14.28	-0.92	1,021.19	-46.62	565.65	530.59	35.06	16.135			
4,200.00	3,276.27	3,300.55	2,697.82	22.20	15.96	-1.01	1,121.16	-46.35	565.66	527.50	38.16	14.824			
4,300.00	3,274.18	3,400.54	2,695.73	23.65	17.68	-1.11	1,221.14	-46.08	565.68	524.35	41.33	13.688			
4,400.00	3,272.08	3,500.54	2,693.63	25.14	19.41	-1.20	1,321.11	-45.80	565.70	521.15	44.55	12.699			
4,500.00	3,269.99	3,600.53	2,691.54	26.65	21.16	-1.30	1,421.08	-45.53	565.72	517.91	47.81	11.833			
4,600.00	3,267.90	3,700.53	2,689.45	28.18	22.93	-1.39	1,521.06	-45.25	565.74	514.84	51.10	11.071			
4,700.00	3,265.80	3,800.52	2,687.35	29.73	24.70	-1.49	1,621.03	-44.96	565.77	511.34	54.42	10.396			
4,800.00	3,263.71	3,900.52	2,685.26	31.29	26.48	-1.58	1,721.00	-44.70	565.79	508.02	57.77	9.794			
4,900.00	3,261.61	4,000.52	2,683.16	32.87	28.27	-1.68	1,820.98	-44.43	565.82	504.69	61.13	9.255			
5,000.00	3,259.52	4,100.51	2,681.07	34.45	30.06	-1.77	1,920.95	-44.16	565.85	501.33	64.51	8.771			
5,100.00	3,257.43	4,200.51	2,678.98	36.05	31.86	-1.87	2,020.92	-43.88	565.88	497.97	67.91	8.333			
5,200.00	3,255.33	4,300.50	2,676.88	37.66	33.66	-1.96	2,120.90	-43.61	565.91	494.59	71.32	7.935			
5,300.00	3,253.24	4,400.50	2,674.79	39.27	35.46	-2.06	2,220.87	-43.33	565.94	491.21	74.74	7.573			
5,400.00	3,251.14	4,500.49	2,672.69	40.89	37.27	-2.15	2,320.84	-43.06	565.98	487.82	78.16	7.241			
5,500.00	3,249.05	4,600.49	2,670.60	42.52	39.08	-2.25	2,420.82	-42.78	566.01	484.42	81.60	6.937			
5,600.00	3,246.96	4,700.48	2,668.51	44.15	40.89	-2.34	2,520.79	-42.51	566.05	481.01	85.04	6.666			
5,700.00	3,244.86	4,800.48	2,666.41	45.78	42.70	-2.44	2,620.76	-42.24	566.09	477.60	88.49	6.397			
5,800.00	3,242.77	4,900.48	2,664.32	47.42	44.52	-2.53	2,720.74	-41.96	566.13	474.19	91.94	6.157			
5,900.00	3,240.67	5,000.47	2,662.22	49.07	46.34	-2.62	2,820.71	-41.69	566.17	470.77	95.40	5.935			
6,000.00	3,238.58	5,100.47	2,660.13	50.71	48.15	-2.72	2,920.68	-41.41	566.22	467.35	98.87	5.727			
6,100.00	3,236.49	5,200.46	2,658.03	52.36	49.97	-2.81	3,020.66	-41.14	566.26	463.93	102.34	5.533			
6,200.00	3,234.39	5,300.46	2,655.94	54.02	51.79	-2.91	3,120.63	-40.87	566.31	460.50	105.81	5.352			
6,300.00	3,232.30	5,400.45	2,653.85	55.67	53.61	-3.00	3,220.60	-40.59	566.36	457.08	109.28	5.183			
6,400.00	3,230.20	5,500.45	2,651.75	57.33	55.43	-3.10	3,320.58	-40.32	566.41	453.65	112.76	5.023			
6,500.00	3,228.11	5,600.45	2,649.66	58.99	57.25	-3.19	3,420.55	-40.04	566.46	450.22	116.24	4.873			
6,600.00	3,226.02	5,700.44	2,647.56	60.65	59.07	-3.29	3,520.52	-39.77	566.51	446.79	119.73	4.732			
6,700.00	3,223.92	5,800.44	2,645.47	62.32	60.90	-3.38	3,620.50	-39.49	566.57	443.36	123.21	4.598			
6,800.00	3,221.83	5,900.43	2,643.38	63.98	62.72	-3.48	3,720.47	-39.22	566.63	439.93	126.70	4.472			
6,900.00	3,219.73	6,000.43	2,641.28	65.65	64.54	-3.57	3,820.44	-38.95	566.68	436.49	130.19	4.353			
7,000.00	3,217.64	6,100.42	2,639.19	67.31	66.37	-3.67	3,920.41	-38.67	566.74	433.06	133.68	4.239			
7,100.00	3,215.55	6,200.42	2,637.09	68.98	68.19	-3.76	4,020.39	-38.40	566.80	429.63	137.18	4.132			
7,200.00	3,213.45	6,300.41	2,635.00	70.65	70.02	-3.85	4,120.36	-38.12	566.87	426.19	140.67	4.030			
7,300.00	3,211.36	6,400.41	2,632.90	72.33	71.84	-3.95	4,220.33	-37.85	566.93	422.76	144.17	3.932			

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 #27H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3487.00usft (Silver Oak 3)
Reference Site:	Pinto 36 State Com	MD Reference:	KB @ 3487.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#27H	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 09-21-15	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: O-MWD													Offset Well Error:	0.00 usft
Reference	Vertical	Measured	Vertical	Semi Major Axis		Highside	Offset Wellbore Centre		Distance		Minimum	Separation	Warning	
Depth	Depth	Depth	Depth	Reference	Offset	Toolface	+N-S	+E-W	Between	Between	Separation	Factor		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	Centres	Ellipses	(usft)			
7,400.00	3,209.26	6,500.41	2,630.81	74.00	73.67	-4.04	4,320.31	-37.57	567.00	419.33	147.67	3.840		
7,500.00	3,207.17	6,600.40	2,628.72	75.67	75.49	-4.14	4,420.28	-37.30	567.06	415.90	151.17	3.751		
7,600.00	3,205.08	6,700.40	2,626.62	77.35	77.32	-4.23	4,520.25	-37.03	567.13	412.46	154.67	3.667		
7,700.00	3,202.98	6,800.39	2,624.53	79.02	79.15	-4.33	4,620.23	-36.75	567.20	409.03	158.17	3.586		
7,800.00	3,200.89	6,900.39	2,622.43	80.70	80.97	-4.42	4,720.20	-36.48	567.27	405.60	161.67	3.509		
7,900.00	3,198.79	7,000.38	2,620.34	82.38	82.80	-4.51	4,820.17	-36.20	567.35	402.17	165.18	3.435		
8,000.00	3,196.70	7,100.38	2,618.25	84.05	84.63	-4.61	4,920.15	-35.93	567.42	398.74	168.68	3.364		
8,100.00	3,194.61	7,200.38	2,616.15	85.73	86.46	-4.70	5,020.12	-35.65	567.50	395.31	172.19	3.296		
8,180.49	3,192.92	7,280.86	2,614.47	87.08	87.93	-4.78	5,100.59	-35.43	567.56	392.55	175.01	3.243 SF		

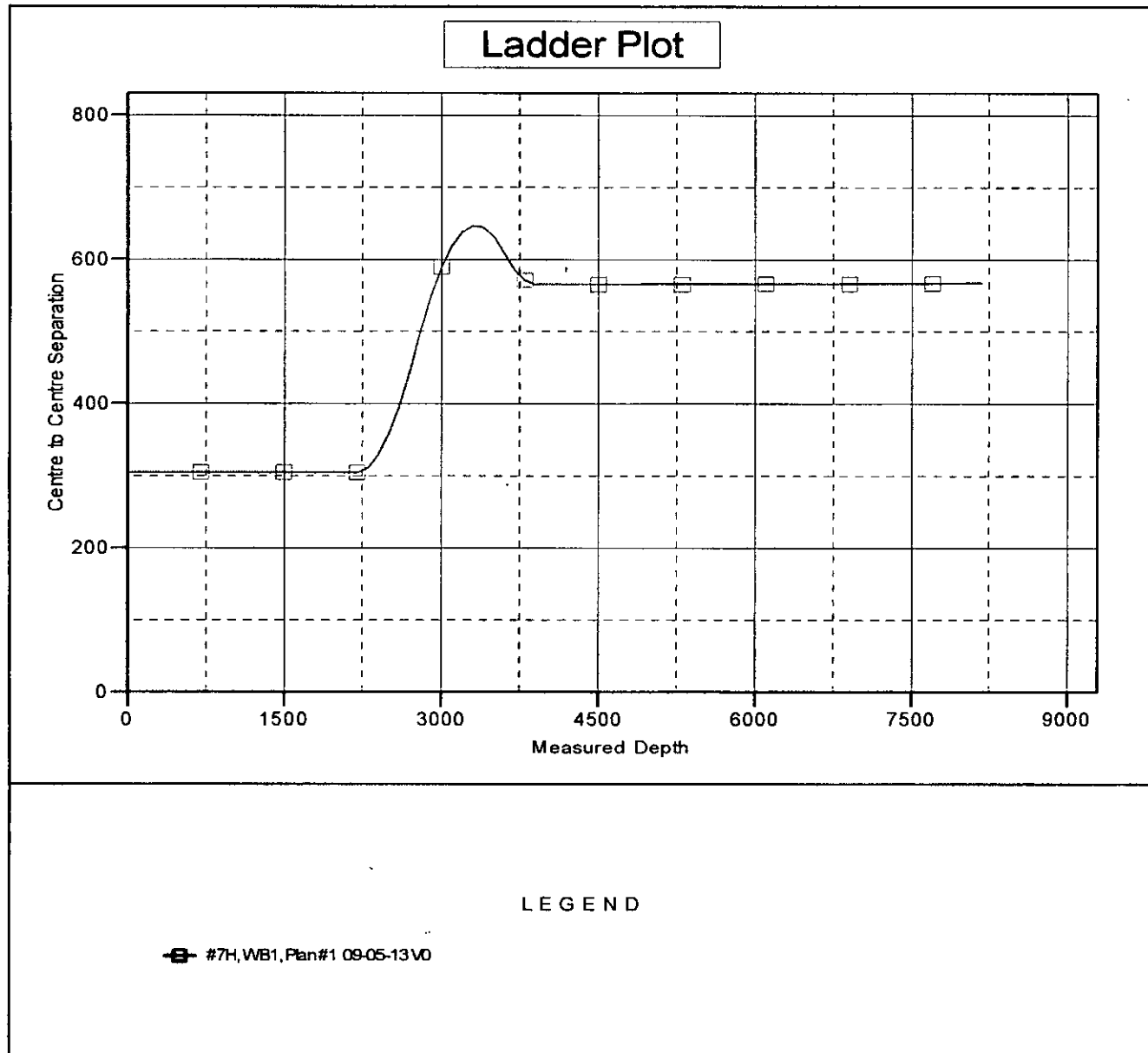
CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



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Reference Well:	#27H	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 09-21-15	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3487.00usft (Silver Oak 3)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #27H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.05°





Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #27H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3487.00usft (Silver Oak 3)
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Reference Design:	Plan #1 09-21-15	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3487.00usft (Silver Oak 3)

Offset Depths are relative to Offset Datum

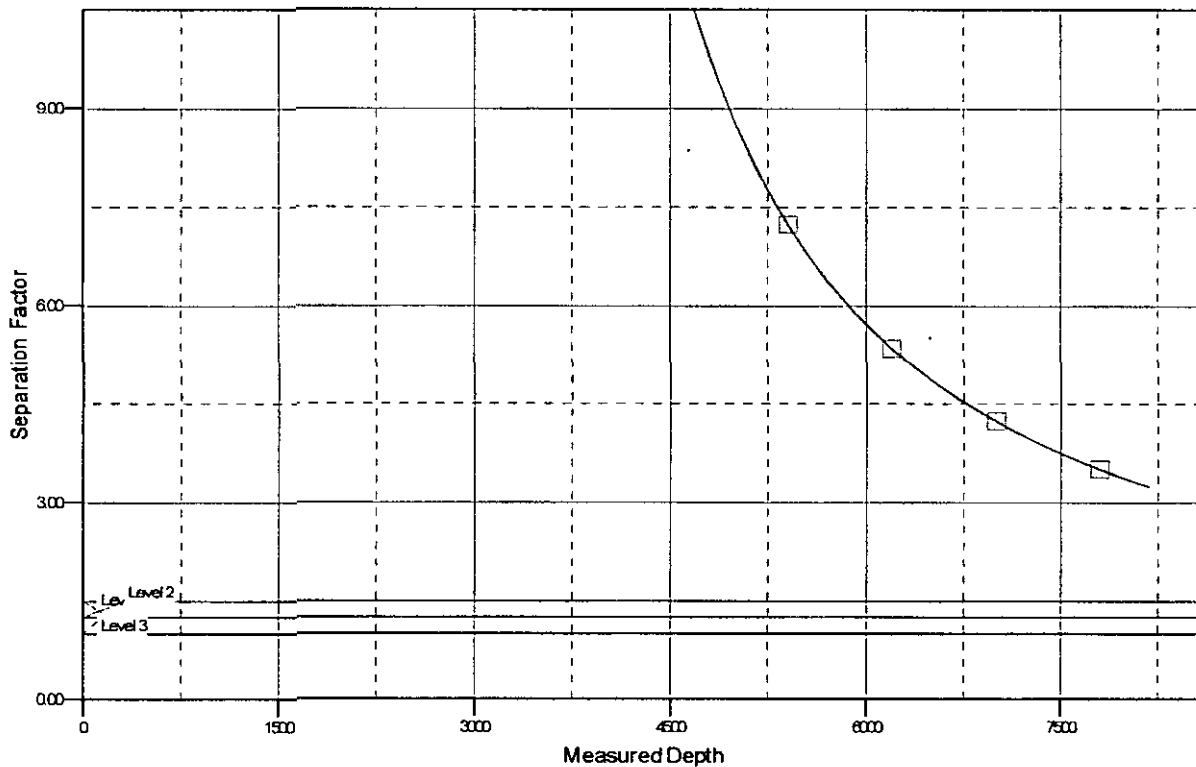
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #27H

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

Grid Convergence at Surface is: -0.05°

Separation Factor Plot



LEGEND

— #7H, WB1, Plan#1 09-05-13 V0