

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 397-6161 Fax: (575) 393-0720

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

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

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

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

NM OIL CONSERVATION
Form C-102
August 1, 2011
Submit one copy to appropriate District Office

APR 23 2015

DAMENDED REPORT

RECEIVED

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015- 43057	Pool Code 97788	Pool Name Wildcat G-01 S192617K; Glor-Yeso
Property Code 39004	Property Name BRADLEY 8 FEE	Well Number 27H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3372'

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	8	19-S	26-E		160	SOUTH	1790	EAST	EDDY

Bottom Hole Location If Different From Surface

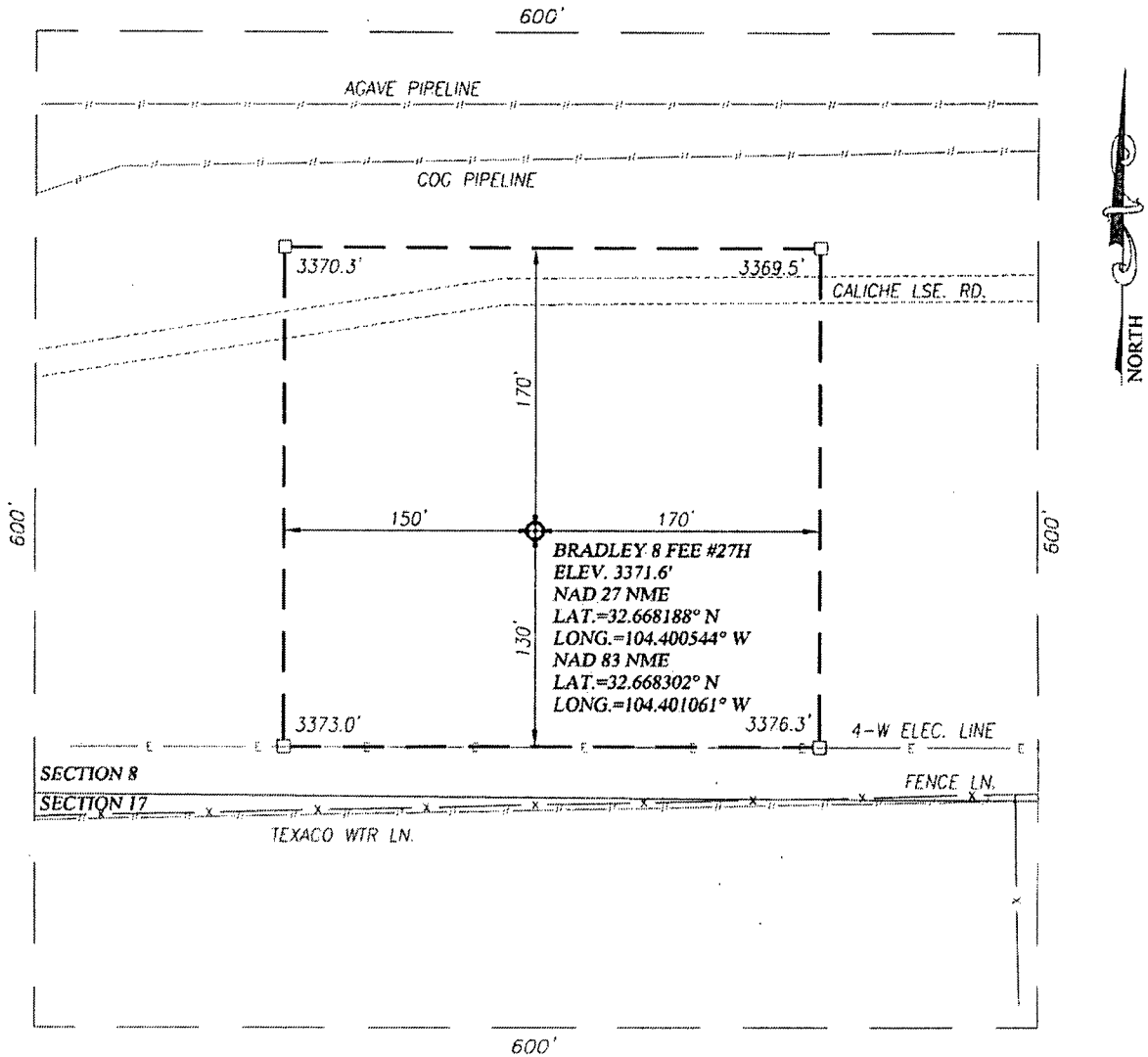
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	8	19-S	26-E		330	NORTH	1650	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

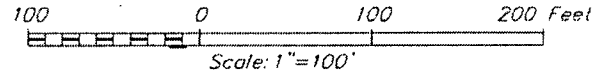
NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

BOTTOM HOLE LOCATION NAD 27 NME Y= 611643.9 N X= 479356.1 E LAT.=32.681491° N LONG.=104.400429° W	BOTTOM HOLE LOCATION NAD 83 NME Y= 611705.6 N X= 520534.9 E LAT.=32.681605° N LONG.=104.400946° 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 hereinafter entered by the division. Signature: Date: 4-23-15 Printed Name: Kelly J. Holly E-mail Address: kholly@concho.com
CORNER COORDINATES TABLE NAD 27 NME A - Y= 611973.5 N, X= 478369.2 E B - Y= 611974.0 N, X= 479684.1 E C - Y= 606641.7 N, X= 479788.6 E D - Y= 606649.7 N, X= 478466.0 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. Date of Survey: DECEMBER 15, 2014 Signature & Seal of Professional Surveyor: Certificate Number: Ronald J. Eidson 12641 Ronald J. Eidson 3239 JWSL JWSL W.O. 14.11.1378
CORNER COORDINATES TABLE NAD 83 NME A - Y= 612035.1 N, X= 519547.9 E B - Y= 612035.6 N, X= 520862.9 E C - Y= 606703.2 N, X= 520967.5 E D - Y= 606711.2 N, X= 519644.9 E			Estimated Completed Interval: 330 FSL 1789 FEL
GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y= 606804.5 N X= 479317.7 E LAT.=32.668188° N LONG.=104.400544° W	GEODETIC COORDINATES NAD 83 NME SURFACE LOCATION Y= 606866.0 N X= 520496.5 E LAT.=32.668302° N LONG.=104.401061° W		

RD
4/24/15



NOTE:
1) SEE "LOCATION VERIFICATION MAP"
FOR PROPOSED ROAD LOCATION.



DIRECTIONS TO BRADLEY 8 FEE #27H:

FROM THE INTERSECTION OF U.S. HWY. 285 AND CO. RD. 21
ROCKIN R. RED. GO WEST ON CO. RD. 21 APPROX. 0.6 MILES
TURN RIGHT AND GO NORTH APPROX. 0.9 MILES TURN RIGHT
AND GO EAST APPROX. 0.3 MILES TO THIS LOCATION.



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

COG OPERATING, LLC

BRADLEY 8 FEE #27H WELL
LOCATED 160 FEET FROM THE SOUTH LINE
AND 1790 FEET FROM THE EAST LINE OF SECTION 8,
TOWNSHIP 19 SOUTH, RANGE 26 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO

Survey Date: 12/15/14

CAD Date: 1/27/15

Drawn By: LSL

W.O. No.: 14111378

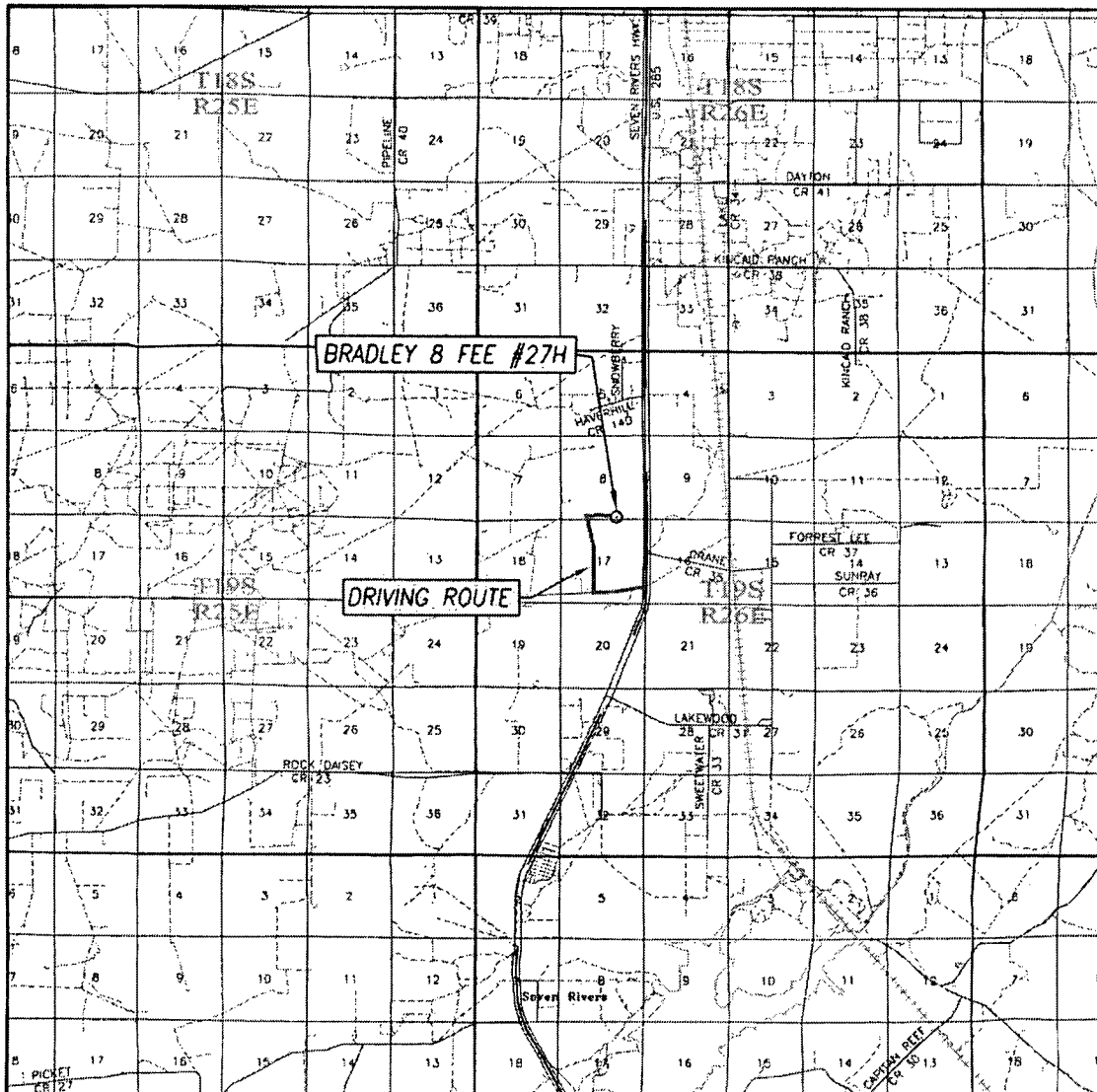
Rev. :

Rel. W.O.:

Sheet 1 of 1

© DRAFT

VICINITY MAP



SCALE: 1" = 2 MILES
DRIVING ROUTE: SEE LOCATION VERIFICATION MAP

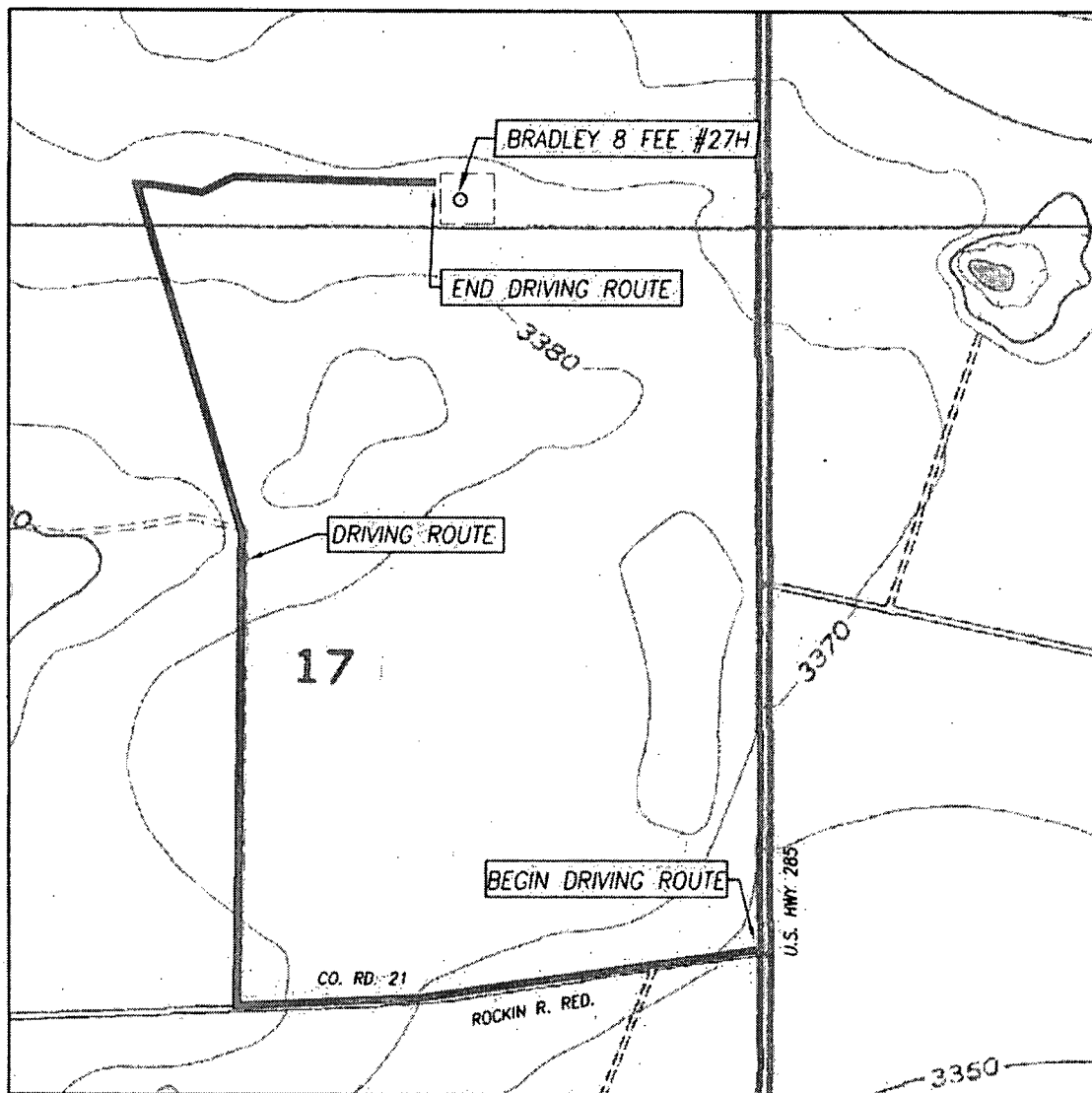
SEC. 8 TWP. 19-S RGE. 26-E
SURVEY N.M.P.M.
COUNTY EDDY STATE NEW MEXICO
DESCRIPTION 160' FSL & 1790' FEL
ELEVATION 3372'
OPERATOR COG OPERATING, LLC
LEASE BRADLEY 8 FEE

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

LOCATION VERIFICATION MAP



SCALE: 1" = 1000'

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

SEC. 8 TWP. 19-S RGE. 26-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 160' FSL & 1790' FEL

ELEVATION 3372'

OPERATOR COG OPERATING, LLC

LEASE BRADLEY 8 FEE

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

DIRECTIONS TO BRADLEY 8 FEE #27H:

FROM THE INTERSECTION OF U.S. HWY. 285 AND CO. RD. 21 ROCKIN R. RED. GO WEST ON CO. RD. 21 APPROX. 0.6 MILES TURN RIGHT AND GO NORTH APPROX. 0.9 MILES TURN RIGHT AND GO EAST APPROX. 0.3 MILES TO THIS LOCATION.



PROVIDING SURVEYING SERVICES
SINCE 1946

JOHN WEST SURVEYING COMPANY

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TBPLS# 10021000



COG Operating LLC

Eddy County, NM (NAD27 NME)

Bradley 8 Fee

#27H

WB1

Plan: Plan #1 03-24-15

Surface: 160' FSL, 1790' FEL, Sec 8, T19S, R26E, Unit O

PP: 330' FSL, 1789' FEL, Sec 8, T19S, R26E, Unit O

BHL: 330' FNL, 1650' FEL, Sec 8, T19S, R26E, Unit B

Standard Planning Report

24 March, 2015





Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #27H
Company:	COG Operating LLC	TVD Reference:	KB @ 3390.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3390.00usft (Silver Oak 3)
Site:	Bradley 8 Fee	North Reference:	Grid
Well:	#27H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 03-24-15		

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

Well:	#27H		
Well Position	+N/-S	7.00 usft	Northing:
	+E/-W	469.90 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 40' 5.47706 N
		Longitude:	104° 24' 1.95668 W
		Ground Level:	3,372.00 usft

Wellbore	WB1		
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Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2015	3/24/2015	7.61	60.36	48,342

Design	Plan #1 03-24-15		
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Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00

Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	0.45

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(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	
3,461.15	0.00	0.00	3,461.15	0.00	0.00	0.00	0.00	0.00	0.00	
4,306.60	93.00	0.45	3,981.30	548.11	4.35	11.00	11.00	0.00	0.45	
8,603.91	93.00	0.45	3,756.40	4,839.40	38.40	0.00	0.00	0.00	0.00	PBHL-Bradley 8 #27H



Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #27H
Company:	COG Operating LLC	TVD Reference:	KB @ 3390.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3390.00usft (Silver Oak 3)
Site:	Bradley 8 Fee	North Reference:	Grid
Well:	#27H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 03-24-15		

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
3,461.15	0.00	0.00	3,461.15	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Start 11°/100' Build									
3,500.00	4.27	0.45	3,499.96	1.45	0.01	1.45	11.00	11.00	0.00
3,600.00	15.27	0.45	3,598.36	18.40	0.15	18.40	11.00	11.00	0.00
3,700.00	26.27	0.45	3,691.72	53.81	0.43	53.81	11.00	11.00	0.00
3,800.00	37.27	0.45	3,776.60	106.38	0.84	106.39	11.00	11.00	0.00
3,894.37	47.66	0.45	3,846.12	170.01	1.35	170.02	11.00	11.00	0.00
PP-Bradley 8 #27H									
3,900.00	48.27	0.45	3,849.89	174.19	1.38	174.19	11.00	11.00	0.00
4,000.00	59.27	0.45	3,908.90	254.73	2.02	254.74	11.00	11.00	0.00
4,100.00	70.27	0.45	3,951.45	345.05	2.74	345.06	11.00	11.00	0.00
4,200.00	81.27	0.45	3,975.99	441.83	3.51	441.85	11.00	11.00	0.00
4,300.00	92.27	0.45	3,981.61	541.52	4.30	541.54	11.00	11.00	0.00
4,301.00	92.38	0.45	3,981.57	542.52	4.30	542.53	11.00	11.00	0.00
TL, 4010' TVD @ 0 VZ, 93° Inc									
4,306.60	93.00	0.45	3,981.30	548.11	4.35	548.13	11.00	11.00	0.00
LP, Hold 93° Inc, 0.45° Azm									
4,400.00	93.00	0.45	3,976.42	641.38	5.09	641.40	0.00	0.00	0.00
4,500.00	93.00	0.45	3,971.18	741.24	5.88	741.26	0.00	0.00	0.00
4,600.00	93.00	0.45	3,965.95	841.10	6.67	841.13	0.00	0.00	0.00
4,700.00	93.00	0.45	3,960.72	940.96	7.47	940.99	0.00	0.00	0.00
4,800.00	93.00	0.45	3,955.48	1,040.82	8.26	1,040.85	0.00	0.00	0.00
4,900.00	93.00	0.45	3,950.25	1,140.68	9.05	1,140.72	0.00	0.00	0.00
5,000.00	93.00	0.45	3,945.01	1,240.54	9.84	1,240.58	0.00	0.00	0.00
5,100.00	93.00	0.45	3,939.78	1,340.40	10.64	1,340.44	0.00	0.00	0.00
5,200.00	93.00	0.45	3,934.55	1,440.26	11.43	1,440.31	0.00	0.00	0.00
5,300.00	93.00	0.45	3,929.31	1,540.12	12.22	1,540.17	0.00	0.00	0.00
5,400.00	93.00	0.45	3,924.08	1,639.98	13.01	1,640.03	0.00	0.00	0.00
5,500.00	93.00	0.45	3,918.85	1,739.84	13.81	1,739.89	0.00	0.00	0.00
5,600.00	93.00	0.45	3,913.61	1,839.70	14.60	1,839.76	0.00	0.00	0.00
5,700.00	93.00	0.45	3,908.38	1,939.56	15.39	1,939.62	0.00	0.00	0.00
5,800.00	93.00	0.45	3,903.15	2,039.42	16.18	2,039.48	0.00	0.00	0.00
5,900.00	93.00	0.45	3,897.91	2,139.28	16.97	2,139.35	0.00	0.00	0.00
6,000.00	93.00	0.45	3,892.68	2,239.14	17.77	2,239.21	0.00	0.00	0.00
6,100.00	93.00	0.45	3,887.44	2,339.00	18.56	2,339.07	0.00	0.00	0.00
6,200.00	93.00	0.45	3,882.21	2,438.86	19.35	2,438.93	0.00	0.00	0.00
6,300.00	93.00	0.45	3,876.98	2,538.72	20.14	2,538.80	0.00	0.00	0.00
6,400.00	93.00	0.45	3,871.74	2,638.58	20.94	2,638.66	0.00	0.00	0.00
6,500.00	93.00	0.45	3,866.51	2,738.44	21.73	2,738.52	0.00	0.00	0.00
6,600.00	93.00	0.45	3,861.28	2,838.30	22.52	2,838.39	0.00	0.00	0.00
6,700.00	93.00	0.45	3,856.04	2,938.16	23.31	2,938.25	0.00	0.00	0.00
6,800.00	93.00	0.45	3,850.81	3,038.02	24.11	3,038.11	0.00	0.00	0.00
6,900.00	93.00	0.45	3,845.58	3,137.88	24.90	3,137.98	0.00	0.00	0.00
7,000.00	93.00	0.45	3,840.34	3,237.74	25.69	3,237.84	0.00	0.00	0.00
7,100.00	93.00	0.45	3,835.11	3,337.60	26.48	3,337.70	0.00	0.00	0.00
7,200.00	93.00	0.45	3,829.88	3,437.46	27.28	3,437.56	0.00	0.00	0.00
7,300.00	93.00	0.45	3,824.64	3,537.32	28.07	3,537.43	0.00	0.00	0.00
7,400.00	93.00	0.45	3,819.41	3,637.18	28.86	3,637.29	0.00	0.00	0.00
7,500.00	93.00	0.45	3,814.17	3,737.04	29.65	3,737.15	0.00	0.00	0.00
7,600.00	93.00	0.45	3,808.94	3,836.90	30.45	3,837.02	0.00	0.00	0.00
7,700.00	93.00	0.45	3,803.71	3,936.76	31.24	3,936.88	0.00	0.00	0.00
7,800.00	93.00	0.45	3,798.47	4,036.61	32.03	4,036.74	0.00	0.00	0.00
7,900.00	93.00	0.45	3,793.24	4,136.47	32.82	4,136.60	0.00	0.00	0.00



Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #27H
Company:	COG Operating LLC	TVD Reference:	KB @ 3390.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3390.00usft (Silver Oak 3)
Site:	Bradley 8 Fee	North Reference:	Grid
Well:	#27H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 03-24-15		

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)
8,000.00	93.00	0.45	3,788.01	4,236.33	33.61	4,236.47	0.00	0.00	0.00
8,100.00	93.00	0.45	3,782.77	4,336.19	34.41	4,336.33	0.00	0.00	0.00
8,200.00	93.00	0.45	3,777.54	4,436.05	35.20	4,436.19	0.00	0.00	0.00
8,300.00	93.00	0.45	3,772.31	4,535.91	35.99	4,536.06	0.00	0.00	0.00
8,400.00	93.00	0.45	3,767.07	4,635.77	36.78	4,635.92	0.00	0.00	0.00
8,500.00	93.00	0.45	3,761.84	4,735.63	37.58	4,735.78	0.00	0.00	0.00
8,600.00	93.00	0.45	3,756.60	4,835.49	38.37	4,835.65	0.00	0.00	0.00
8,603.91	93.00	0.45	3,756.40	4,839.40	38.40	4,839.55	0.00	0.00	0.00

TD at 8603.91' MD - PBHL-Bradley 8 #27H

Design Targets

Target Name	hit/miss target	Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL-Bradley 8 #27H	- plan hits target center	- Point	0.00	360.00	3,756.40	4,839.40	38.40	611,643.90	479,356.10	32° 40' 53.36636 N	104° 24' 1.54324 W
PP-Bradley 8 #27H	- plan hits target center	- Point	0.00	0.00	3,846.11	170.00	1.35	606,974.50	479,319.05	32° 40' 7.15934 N	104° 24' 1.94216 W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,301.00	3,981.57	TL, 4010' TVD @ 0 VZ, 93° Inc		-3.00	0.45

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,461.15	3,461.15	0.00	0.00	KOP, Start 11°/100' Build
4,306.60	3,981.30	548.11	4.35	LP, Hold 93° Inc, 0.45° Azm
8,603.91	3,756.40	4,839.40	38.40	TD at 8603.91' MD



Offset Design										Offset Site Error:		0.00 usft	
Bradley 8 Fee - #7H - WB1 / Job #1513074 - Surveys (Silver Oak 3)										Offset Well Error:		0.00 usft	
Survey Program: 100-NS-GYRO-MS-2412-PHX-MWD+IGRF													
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	1.01	1.01	0.00	0.00	88.28	4.20	139.90	139.96				
100.00	100.00	101.92	101.92	0.15	0.11	88.26	4.24	139.56	139.63	139.36	0.26	534.731	
200.00	200.00	202.27	202.27	0.51	0.38	88.29	4.14	138.78	138.85	137.96	0.88	157.485	
300.00	300.00	303.43	303.42	0.86	0.64	88.23	4.25	137.41	137.50	135.99	1.50	91.483	
400.00	400.00	403.33	403.30	1.22	0.89	87.84	5.12	135.66	135.78	133.67	2.11	64.239	
500.00	500.00	504.01	503.95	1.58	1.15	87.37	6.13	133.64	133.81	131.08	2.73	49.012	
600.00	600.00	603.30	603.21	1.94	1.40	86.65	7.70	131.63	131.87	128.53	3.34	39.513	
700.00	700.00	702.88	702.75	2.30	1.65	85.85	9.43	130.02	130.37	126.43	3.94	33.061	
800.00	800.00	803.39	803.25	2.66	1.90	85.14	10.91	128.34	128.82	124.26	4.56	28.245	
900.00	900.00	903.60	903.42	3.01	2.17	84.48	12.22	126.38	127.00	121.81	5.18	24.503	
1,000.00	1,000.00	1,003.65	1,003.45	3.37	2.43	83.97	13.14	124.34	125.06	119.25	5.81	21.536	
1,100.00	1,100.00	1,103.65	1,103.43	3.73	2.70	83.63	13.66	122.30	123.09	116.66	6.43	19.148	
1,200.00	1,200.00	1,203.29	1,203.05	4.09	2.96	83.35	14.04	120.43	121.26	114.22	7.05	17.205	
1,300.00	1,300.00	1,303.51	1,303.25	4.45	3.22	83.13	14.28	118.59	119.46	111.80	7.67	15.581	
1,400.00	1,400.00	1,402.98	1,402.71	4.81	3.48	82.99	14.38	116.90	117.80	109.51	8.28	14.220	
1,500.00	1,500.00	1,502.64	1,502.36	5.17	3.74	82.83	14.53	115.57	116.49	107.59	8.90	13.084	
1,600.00	1,600.00	1,602.76	1,602.47	5.52	4.00	82.64	14.77	114.30	115.26	105.73	9.53	12.100	
1,700.00	1,700.00	1,702.20	1,701.90	5.88	4.26	82.40	15.10	113.22	114.23	104.08	10.15	11.257	
1,800.00	1,800.00	1,802.48	1,802.18	6.24	4.53	82.16	15.45	112.25	113.31	102.54	10.77	10.519	
1,900.00	1,900.00	1,902.37	1,902.07	6.60	4.80	81.91	15.81	111.19	112.32	100.92	11.40	9.856	
2,000.00	2,000.00	2,002.17	2,001.86	6.96	5.06	81.58	16.32	110.25	111.46	99.44	12.02	9.276	
2,100.00	2,100.00	2,102.11	2,101.79	7.32	5.31	81.16	17.02	109.40	110.72	98.09	12.63	8.766	
2,200.00	2,200.00	2,202.79	2,202.46	7.67	5.58	80.72	17.70	108.24	109.69	96.44	13.25	8.278	
2,300.00	2,300.00	2,302.71	2,302.36	8.03	5.84	80.13	18.57	106.77	108.38	94.51	13.87	7.814	
2,400.00	2,400.00	2,402.05	2,401.69	8.39	6.01	79.60	19.38	105.66	107.42	93.03	14.40	7.461	

COMPASS 5000.1 Build 73



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #27H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3390.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3390.00usft (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	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-24-15	Offset: TVD Reference:	Offset Datum

Offset Design Bradley 8 Fee- #7H - WB1 / Job #1513074 - Surveys (Silver Oak 3)													Offset Site Error:	0.00 usft
Survey Program: 100-NS-GYRO-MS-2412-PHX+MWD+IGRF													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		
2,428.97	2,428.97	2,430.32	2,429.97	8.50	6.02	79.45	19.65	105.49	107.31	92.79	14.52	7.391	CC, ES	
2,500.00	2,500.00	2,498.39	2,497.81	8.75	6.04	76.89	24.56	105.41	108.28	93.49	14.79	7.320		
2,600.00	2,600.00	2,599.11	2,588.86	9.11	6.11	66.75	45.03	104.83	114.74	99.52	15.22	7.541		
2,700.00	2,700.00	2,677.57	2,669.17	9.47	6.21	54.11	74.88	103.49	131.64	115.96	15.68	8.395		
2,800.00	2,800.00	2,758.00	2,741.24	9.83	6.44	42.87	110.54	102.62	162.23	145.97	16.26	9.976		
2,900.00	2,900.00	2,828.80	2,801.83	10.18	6.74	35.11	147.11	103.41	205.35	188.42	16.93	12.130		
3,000.00	3,000.00	2,893.26	2,854.26	10.54	7.13	29.42	184.56	104.07	257.73	240.06	17.67	14.586		
3,100.00	3,100.00	2,946.00	2,893.81	10.90	7.53	25.29	219.42	103.67	319.10	300.66	18.43	17.311		
3,200.00	3,200.00	2,985.15	2,920.75	11.26	7.90	22.56	247.80	102.95	387.99	368.83	19.16	20.250		
3,300.00	3,300.00	3,019.39	2,942.33	11.62	8.27	20.43	274.37	102.20	463.00	443.12	19.88	23.285		
3,400.00	3,400.00	3,050.27	2,960.27	11.98	8.63	18.73	299.49	101.57	542.45	521.84	20.61	26.326		
3,461.15	3,461.15	3,073.00	2,972.60	12.20	8.91	17.61	318.58	101.12	592.77	571.66	21.11	28.083		
3,500.00	3,499.96	3,073.00	2,972.60	12.34	8.91	15.46	318.58	101.12	624.47	603.23	21.25	29.391		
3,550.00	3,549.57	3,091.13	2,981.84	12.52	9.16	13.17	334.16	100.73	663.52	641.84	21.67	30.617		
3,600.00	3,598.36	3,104.00	2,988.07	12.70	9.33	11.57	345.43	100.42	700.48	678.46	22.02	31.805		
3,650.00	3,645.89	3,120.11	2,995.45	12.87	9.56	10.26	359.74	99.97	735.19	712.76	22.43	32.774		
3,700.00	3,691.72	3,136.00	3,002.27	13.05	9.79	9.24	374.08	99.49	767.53	744.69	22.84	33.600		
3,750.00	3,735.42	3,151.24	3,008.39	13.25	10.02	8.43	388.03	99.01	797.37	774.09	23.28	34.256		
3,800.00	3,776.60	3,168.00	3,014.64	13.47	10.28	7.76	403.57	98.51	824.60	800.84	23.76	34.712		
3,850.00	3,814.87	3,185.41	3,020.65	13.72	10.56	7.22	419.91	98.04	849.09	824.81	24.28	34.964		
3,900.00	3,849.89	3,199.00	3,024.99	14.01	10.78	6.81	432.78	97.72	870.78	845.99	24.79	35.128		
3,950.00	3,881.33	3,231.00	3,034.03	14.33	11.32	6.42	463.47	97.38	889.66	864.01	25.65	34.684		
4,000.00	3,908.90	3,231.00	3,034.03	14.71	11.32	6.22	463.47	97.38	905.44	879.41	26.02	34.793		
4,050.00	3,932.34	3,262.00	3,040.87	15.13	11.85	6.01	493.70	97.67	918.45	891.47	26.98	34.041		
4,100.00	3,951.45	3,262.00	3,040.87	15.60	11.85	5.89	493.70	97.67	928.49	901.04	27.45	33.820		
4,150.00	3,966.04	3,294.00	3,045.87	16.12	12.42	5.81	525.29	98.39	935.51	906.97	28.54	32.776		
4,200.00	3,975.99	3,306.42	3,047.32	16.69	12.64	5.78	537.62	98.74	939.43	910.10	29.33	32.026		
4,250.00	3,981.19	3,332.32	3,049.66	17.30	13.11	5.81	563.39	99.62	940.18	909.77	30.41	30.916		
4,300.00	3,981.61	3,365.42	3,051.99	17.94	13.72	5.91	596.40	100.82	937.22	905.55	31.66	29.598		
4,306.60	3,981.30	3,370.12	3,052.28	18.03	13.81	5.93	601.08	100.98	936.53	904.69	31.84	29.414		
4,400.00	3,976.42	3,423.00	3,054.18	19.35	14.80	5.98	653.91	101.74	928.37	894.22	34.15	27.185		
4,500.00	3,971.18	3,502.00	3,053.98	20.87	16.33	5.93	732.91	101.18	923.17	885.96	37.20	24.814		
4,600.00	3,965.95	3,586.61	3,052.27	22.49	18.01	5.87	817.50	100.50	919.78	879.28	40.50	22.711		
4,700.00	3,960.72	3,702.20	3,050.08	24.19	20.33	5.73	933.05	98.77	916.23	871.71	44.52	20.578		
4,800.00	3,955.48	3,798.64	3,048.85	25.96	22.30	5.57	1,029.46	96.69	912.00	863.74	48.26	18.899		
4,900.00	3,950.25	3,895.33	3,047.28	27.77	24.29	5.43	1,126.12	94.88	908.15	856.09	52.06	17.444		
5,000.00	3,945.01	3,993.26	3,045.45	29.63	26.32	5.30	1,224.02	93.18	904.56	848.62	55.95	16.168		
5,100.00	3,939.78	4,089.11	3,043.36	31.52	28.32	5.16	1,319.84	91.52	901.29	841.46	59.83	15.064		
5,200.00	3,934.55	4,183.41	3,040.75	33.44	30.28	5.05	1,414.09	90.35	898.65	834.94	63.72	14.103		
5,300.00	3,929.31	4,282.43	3,037.69	35.38	32.35	4.96	1,513.06	89.57	896.37	828.64	67.73	13.234		
5,400.00	3,924.08	4,389.17	3,034.60	37.34	34.60	4.87	1,619.75	88.68	893.92	821.99	71.94	12.427		
5,500.00	3,918.85	4,498.82	3,032.70	39.32	36.91	4.88	1,729.35	86.31	890.17	813.94	76.23	11.678		
5,600.00	3,913.61	4,600.57	3,031.46	41.31	39.06	4.51	1,831.08	84.16	885.93	805.56	80.37	11.022		
5,700.00	3,908.38	4,700.72	3,030.40	43.32	41.18	4.39	1,931.21	82.74	881.60	797.10	84.50	10.433		
5,800.00	3,903.15	4,804.11	3,029.42	45.34	43.37	4.23	2,034.57	80.81	877.13	788.42	88.71	9.887		
5,900.00	3,897.91	4,896.54	3,028.39	47.37	45.35	3.96	2,126.92	77.17	872.69	779.98	92.71	9.413		
6,000.00	3,892.68	4,991.38	3,026.35	49.40	47.38	3.60	2,221.61	72.21	869.21	772.43	96.78	8.981		
6,100.00	3,887.44	5,090.33	3,023.94	51.45	49.51	3.21	2,320.39	66.92	866.06	765.10	100.95	8.579		
6,200.00	3,882.21	5,187.89	3,021.45	53.50	51.61	2.82	2,417.77	61.59	863.05	757.95	105.10	8.212		
6,300.00	3,876.98	5,290.14	3,018.79	55.55	53.80	2.44	2,519.87	56.64	860.17	750.81	109.35	7.866		
6,400.00	3,871.74	5,391.60	3,016.56	57.61	55.97	2.22	2,621.26	53.97	857.00	743.41	113.58	7.545		
6,500.00	3,866.51	5,492.79	3,014.53	59.68	58.13	2.06	2,722.42	52.28	853.68	735.88	117.81	7.247		

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #27H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3390.00usft (Silver Oak 3)
Reference Site:	Bradley 8 Fee	MD Reference:	KB @ 3390.00usft (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	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-24-15	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Bradley 8 Fee - #7H - WB1 / Job #1513074- Surveys (Silver Oak 3)													Offset Well Error:	0.00 usft
Survey Program: 100-NS-GYRO-MS, 2412-PHX-MWD-HGRF														
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)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
6.600.00	3.861.28	5.590.98	3.012.55	61.75	60.22	1.95	2.820.59	51.26	850.40	728.43	121.96	6.973		
6.700.00	3.856.04	5.687.88	3.010.33	63.82	62.28	1.85	2.917.46	50.51	847.40	721.30	126.10	6.720		
6.800.00	3.850.81	5.784.93	3.007.77	65.90	64.34	1.78	3.014.48	50.12	844.77	714.54	130.24	6.486		
6.900.00	3.845.58	5.886.73	3.004.94	67.98	66.50	1.73	3.116.24	50.14	842.29	707.82	134.48	6.263		
7.000.00	3.840.34	5.996.42	3.002.93	70.06	68.84	1.60	3.225.89	49.02	838.82	699.92	138.90	6.039		
7.100.00	3.835.11	6.092.81	3.001.41	72.14	70.89	1.47	3.322.26	47.74	835.11	692.08	143.04	5.838		
7.200.00	3.829.88	6.186.59	2.999.27	74.23	72.90	1.32	3.416.01	46.21	832.10	684.97	147.13	5.656		
7.300.00	3.824.64	6.290.38	2.996.46	76.32	75.12	1.14	3.519.75	44.41	829.53	678.09	151.44	5.478		
7.400.00	3.819.41	6.397.78	2.994.99	78.41	77.41	0.97	3.627.12	42.75	825.60	669.78	155.82	5.298		
7.500.00	3.814.17	6.493.16	2.993.58	80.51	79.45	0.84	3.722.49	41.58	821.81	661.86	159.95	5.138		
7.600.00	3.808.94	6.586.65	2.991.56	82.60	81.44	0.72	3.815.95	40.53	818.71	654.66	164.04	4.991		
7.700.00	3.803.71	6.692.93	2.988.87	84.70	83.71	0.58	3.922.18	39.31	816.01	647.60	168.41	4.845		
7.800.00	3.798.47	6.790.49	2.987.31	86.80	85.79	0.51	4.019.74	39.08	812.37	639.79	172.58	4.707		
7.900.00	3.793.24	6.891.87	2.985.08	88.90	87.94	0.44	4.121.09	38.96	809.33	632.49	176.84	4.577		
8.000.00	3.788.01	6.989.57	2.983.18	91.00	90.04	0.25	4.218.75	37.02	806.02	624.99	181.03	4.452		
8.100.00	3.782.77	7.083.99	2.980.80	93.10	92.07	-0.06	4.313.06	33.33	803.31	618.14	185.17	4.338		
8.200.00	3.777.54	7.189.92	2.978.05	95.20	94.35	-0.41	4.418.88	29.35	800.69	611.14	189.55	4.224		
8.300.00	3.772.31	7.288.57	2.975.90	97.31	96.47	-0.68	4.517.46	26.34	797.67	603.89	193.78	4.116		
8.400.00	3.767.07	7.385.64	2.973.52	99.41	98.56	-0.95	4.614.45	23.38	794.95	596.98	197.97	4.015		
8.500.00	3.761.84	7.482.41	2.970.80	101.52	100.64	-1.22	4.711.15	20.51	792.60	590.44	202.16	3.921		
8.603.91	3.756.40	7.582.66	2.967.40	103.35	102.79	-1.46	4.811.31	17.96	790.76	584.62	206.14	3.836 SF		



Anticollision Report



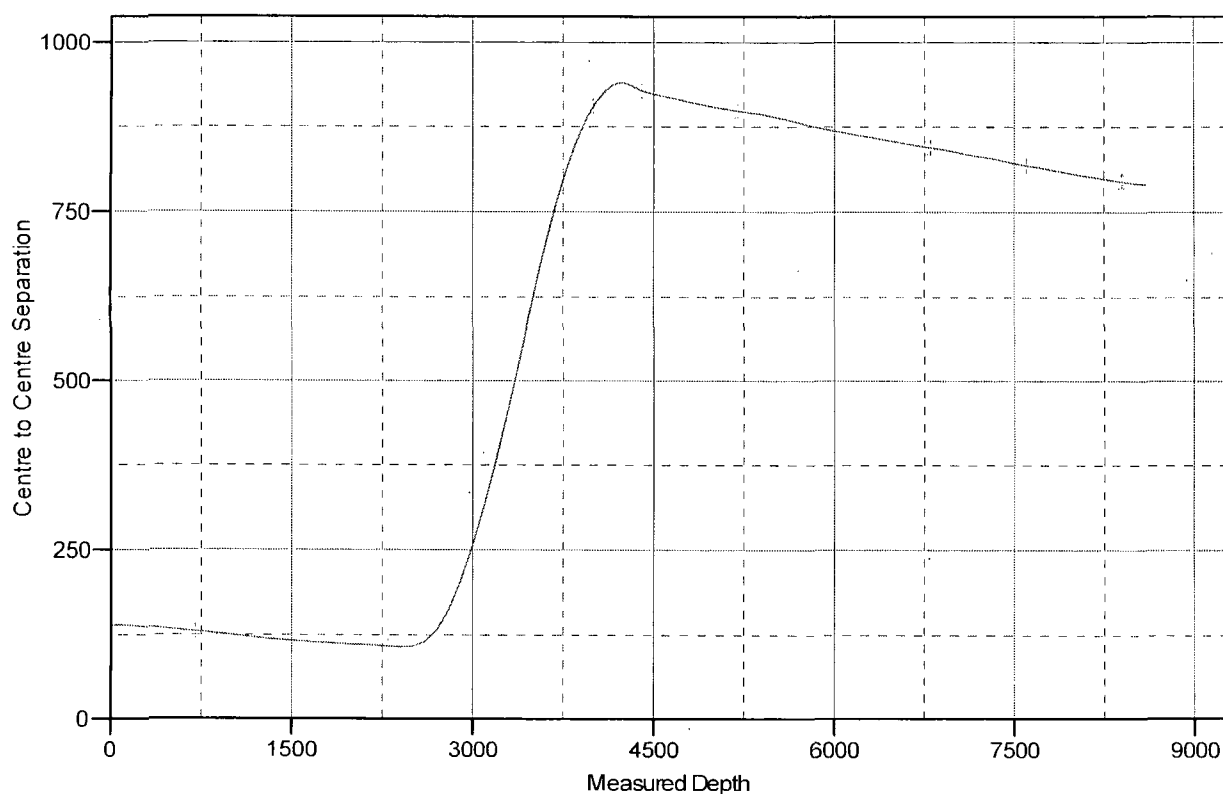
Company: COG Operating LLC
Project: Eddy County, NM (NAD27-NME)
Reference Site: Bradley 8 Fee
Site Error: 0.00-usft
Reference Well: #27H
Well Error: 0.00 usft
Reference Wellbore: WB1
Reference Design: Plan #1 03-24-15

Local Co-ordinate Reference: Well #27H
TVD Reference: KB @ 3390.00usft (Silver Oak 3)
MD Reference: KB @ 3390.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3390.00usft (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: -0.04°

Ladder Plot



LEGEND

#7H, WB1/Job #1513074, Surveys (Silver Oak 3) V0



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Bradley 8 Fee
Site Error: 0.00 usft
Reference Well: #27H
Well Error: 0.00 usft
Reference Wellbore: WB1
Reference Design: Plan #1 03-24-15

Local Co-ordinate Reference: Well #27H
TVD Reference: KB @ 3390.00usft (Silver Oak 3)
MD Reference: KB @ 3390.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3390.00usft (Silver Oak 3)

Offset Depths are relative to Offset Datum

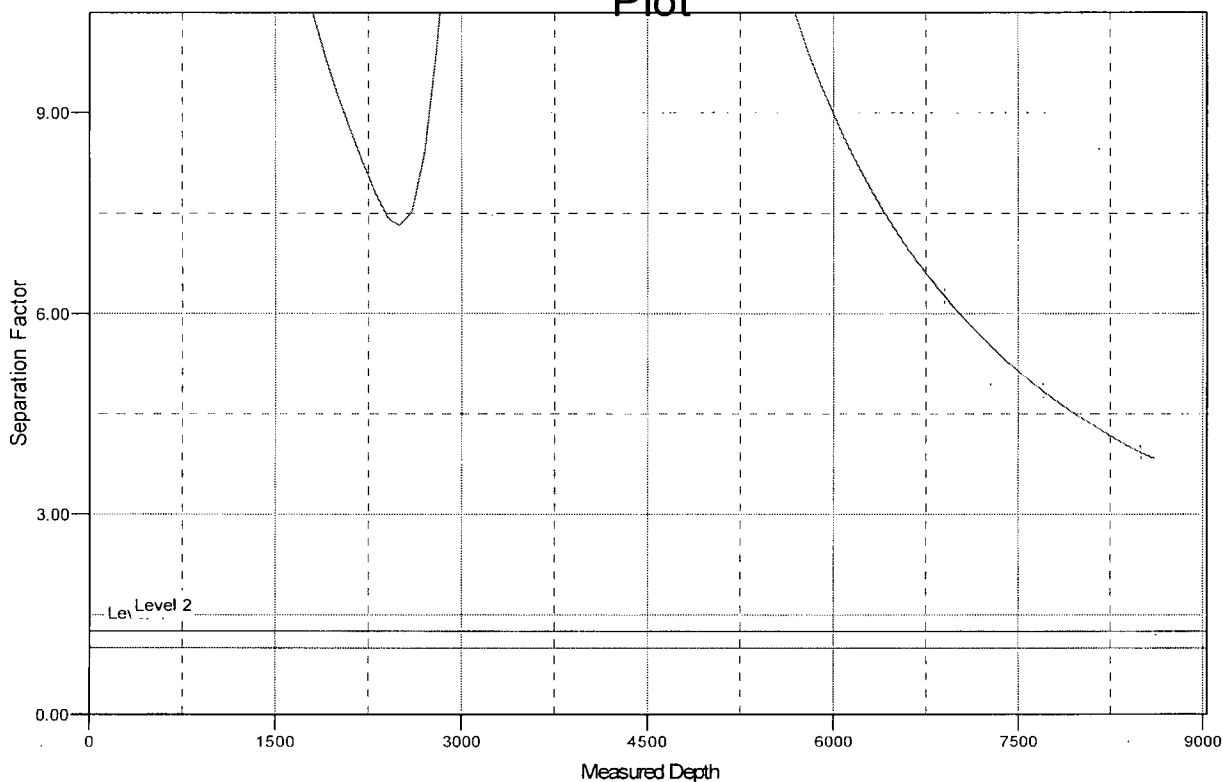
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #27H

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

Grid Convergence at Surface is: -0.04°

Separation Factor Plot



LEGEND

#7H, WB1 / Job #1513074, Surveys (Silver Oak 3) V0



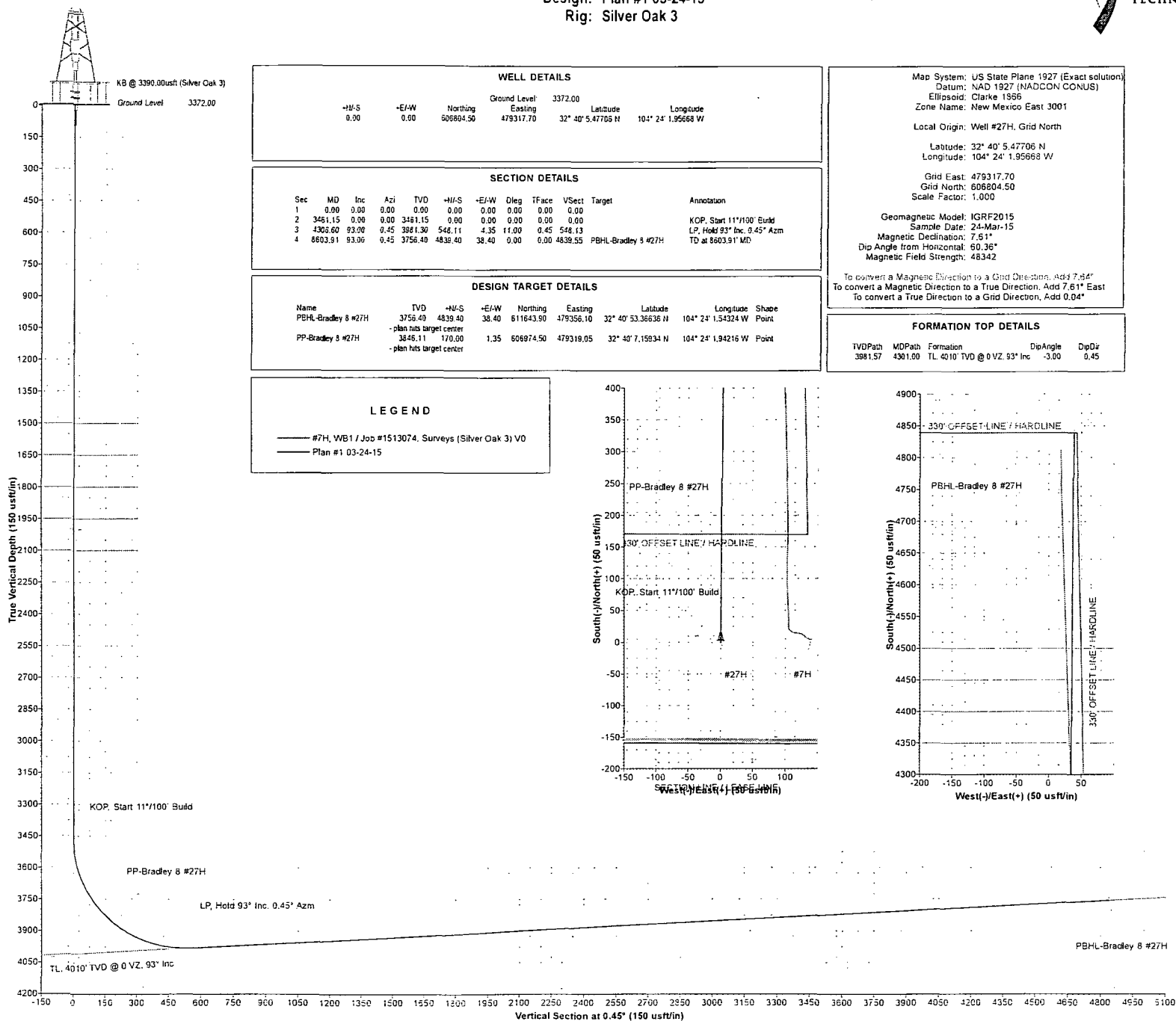
Project: Eddy County, NM (NAD27 NME)
 Site: Bradley 8 Fee
 Well: #27H
 Wellbore: WB1
 Design: Plan #1 03-24-15
 Rig: Silver Oak 3



PHOENIX
TECHNOLOGY SERVICES



Azimuths to Grid North
 True North: 0.04°
 Magnetic North: 7.54°
 Magnetic Field
 Strength: 48341.9nT
 Dip Angle: 60.36°
 Date: 3/24/2015
 Model: IGRF2015



WELL DETAILS									
	+M-S	-E-W	North	Ground Level	3372.00	Latitude	Longitude		
	0.00	0.00	506804.50	Easting	479317.70	32° 40' 5.47706 N	104° 24' 1.95668 W		

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+M-S	-E-W	Dleg	TFace	VSeet
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	3481.15	0.00	0.00	3481.15	0.00	0.00	0.00	0.00	0.00
3	4305.60	93.00	0.45	3861.30	546.11	4.35	11.00	0.45	546.13
4	6603.91	93.06	0.45	3756.40	4836.40	38.40	0.00	0.00	4839.55

DESIGN TARGET DETAILS									
Name	TVD	+M-S	-E-W	North	Easting	Latitude	Longitude	Shape	
PBHL-Bradley 8 #27H	3756.40	4839.40	38.40	611643.90	479356.10	32° 40' 53.36636 N	104° 24' 1.54324 W	Point	
PP-Bradley 8 #27H	3846.11	170.00	1.35	606974.50	479319.05	32° 40' 7.15934 N	104° 24' 1.94216 W	Point	

LEGEND	
—	#7H, WB1 / Job #1513074, Surveys (Silver Oak 3) VO
—	Plan #1 03-24-15

Map System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1956
 Zone Name: New Mexico East 3001
 Local Origin: Well #27H, Grid North
 Latitude: 32° 40' 5.47706 N
 Longitude: 104° 24' 1.95668 W
 Grid East: 479317.70
 Grid North: 606804.50
 Scale Factor: 1.000
 Geomagnetic Model: IGRF2015
 Sample Date: 24-Mar-15
 Magnetic Declination: 7.51°
 Dip Angle from Horizontal: 60.36°
 Magnetic Field Strength: 48342
 To convert a Magnetic Direction to a Grid Direction, Add 7.54°
 To convert a Magnetic Direction to a True Direction, Add 7.61° East
 To convert a True Direction to a Grid Direction, Add 0.04°

FORMATION TOP DETAILS						
TVDPath	MDPath	Formation	TVD	DipAngle	DipDir	
3981.57	4301.00	TL 4010' TVD @ 0 VZ, 93° Inc	-3.00	0.45		

