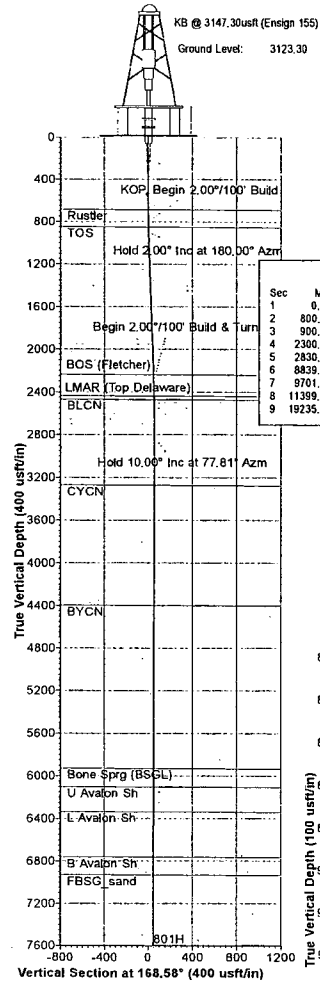




Project: Eddy County, NM (NAD27 NME)
Site: Quien Sabe Fed Com
Well: 801H
Wellbore: OH \ 65013
Design: Plan 5 09-10-19
Rig: Ensign 155



True North: 0.10°
Magnetic North: 7.01°
Magnetic Field Strength: 47853.45nT
Dip Angle: 59.92°
Date: 9/12/2019
Model: MVHD

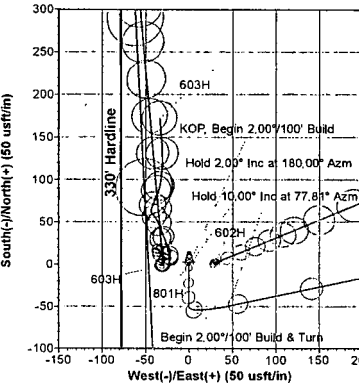
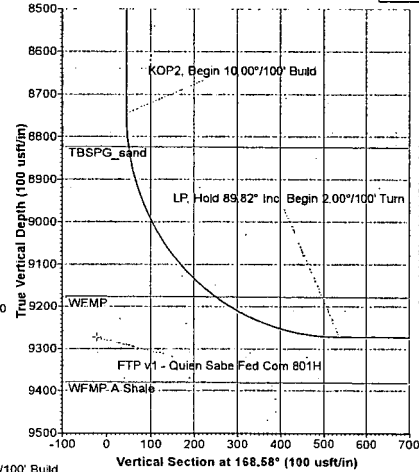
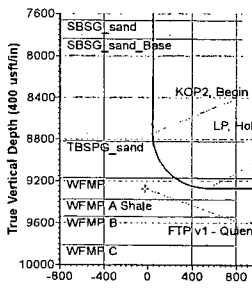


WELL DETAILS						
Ground Level: 3123.30						
+N-S	+E-W	Northing	Eastings	Latitude	Longitude	
0.00	0.00	439517.70	559072.60	32° 12' 29.545166 N	104° 8' 32.426182 W	

DESIGN TARGET DETAILS						
Name	TVD	+N-S	+E-W	Northing	Eastings	Latitude
FTP v1 - Quien Sabe Fed Com 801H	9274.00	413.90	1942.80	439931.60	561015.40	32° 12' 33.60543 N
LTP v1 - Quien Sabe Fed Com 801H	9303.82	-9559.90	1957.30	429957.80	561029.80	32° 10' 54.901889 N
BHL v1 - Quien Sabe Fed Com 801H	9304.00	-9689.90	1957.50	429827.80	561030.10	32° 10' 53.615335 N

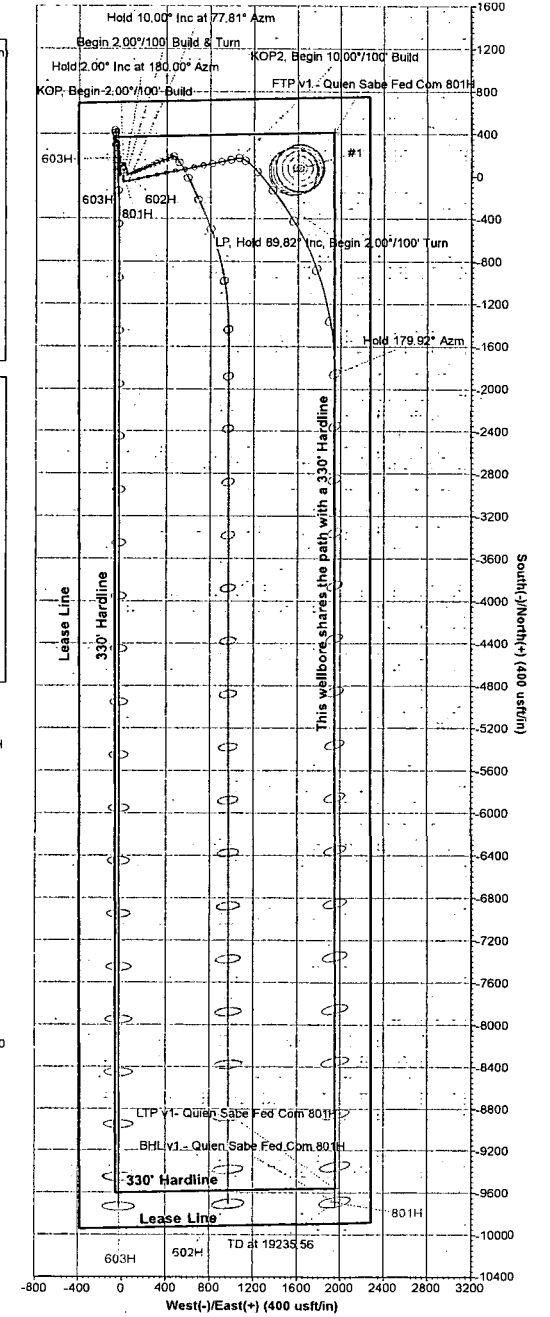
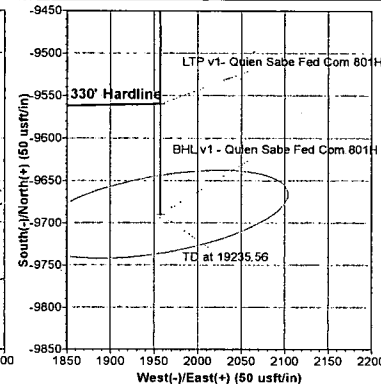
SECTION DETAILS												
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dieg	TFace	VSecl	Target	Annotation	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP, Begin 2.00°/100' Build	
2	800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	Hold 2.00° Inc at 180.00° Azm	
3	900.00	2.00	180.00	899.98	-1.75	0.00	2.00	180.00	1.71		Begin 2.00°/100' Build & Turn	
4	2300.87	2.00	180.00	2300.00	-50.63	0.00	0.00	0.00	0.00	49.63	Hold 10.00° Inc at 77.81° Azm	
5	2830.99	10.00	77.81	2827.43	-50.17	45.12	2.00	-112.70	58.11		KOP2, Begin 10.00°/100' Build	
6	8439.92	10.00	77.81	8745.07	170.16	1065.03	0.00	0.00	0.00	44.09	LP, Hold 89.82° Inc, Begin 2.00°/100' Turn	
7	9701.08	89.82	145.96	9274.00	-253.85	1455.60	10.00	68.48	537.04		Hold 179.92° Azm	
8	11399.05	89.82	179.92	9276.49	-1853.43	1946.48	2.00	90.05	2202.16		TD at 19235.56	
9	19235.56	89.82	179.92	9304.00	-9689.90	1957.50	0.00	0.00	9885.64		BHL v1 - Quien Sabe Fed Com 801H	

LEGEND	
—	602H, OH \ 65011, Plan 4 08-15-19 V0
—	602H, OH \ 65011, Surveys (Ensign 155) V0
—	603H, OH \ 65012, Plan 4 08-15-19 V0
—	603H, OH \ 65012, Surveys (Ensign 155) V0
—	801H, OH \ 65013, Surveys (Ensign 155) V0
—	#1, OH, Surveys V0
—	Plan 5 09-10-19



Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001
Local Origin: Well 801H, Grid North
Latitude: 32° 12' 29.545166 N
Longitude: 104° 8' 32.426182 W
Grid East: 559072.60
Grid North: 439517.70
Scale Factor: 1.000
Geomagnetic Model: MVHD
Sample Date: 12-Sep-19
Magnetic Declination: 7.11°
Dip Angle from Horizontal: 59.92°
Magnetic Field Strength: 47853.39015531nT
To convert a Magnetic Direction to a Grid Direction, Add 7.01°
To convert a Magnetic Direction to a True Direction, Add 7.11° East
To convert a True Direction to a Grid Direction, Subtract 0.10°

FORMATION TOP DETAILS			
TVDPath	MDPath	Formation	DipAngle
686.30	686.30	Rustle	0.18
850.30	850.30	TOS	0.18
2238.45	2237.28	BOS (Fletcher)	0.18
2438.47	2439.44	LMAR (Top Delaware)	0.18
2469.47	2470.48	BLCN	0.18
3274.48	3284.93	CYCN	0.18
4399.47	4427.28	BYCN	0.18
5931.46	5982.90	Bone Sprg (BSGL)	0.18
6103.46	6157.55	U Avalon Sh	0.18
6338.46	6398.16	L Avalon Sh	0.18
6767.45	6831.79	B Avalon Sh	0.18
6934.45	7001.37	FBSG sand	0.18
7655.45	7743.64	SBSG sand	0.18
7841.45	7922.35	SBSG sand_Base	0.18
8823.45	8920.13	TBSPG sand	0.18
9178.09	9364.26	WFMP	0.18





COG Operating LLC

Eddy County, NM (NAD27 NME)

Quien Sabe Fed Com

801H

OH \ 65013

Plan: Plan 5 09-10-19

Standard Planning Report

10 September, 2019





Planning Report



Database: USA Compass
Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Site: Quien Sabe Fed Com
Well: 801H
Wellbore: OH \ 65013
Design: Plan 5 09-10-19

Local Co-ordinate Reference: Well 801H
TVD Reference: KB @ 3147.30usft (Ensign 155)
MD Reference: KB @ 3147.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project: Eddy County, NM (NAD27 NME)

Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001

System Datum: Mean Sea Level

Site: Quien Sabe Fed Com

Site Position: Northing: 439,517.00 usft Latitude: 32° 12' 29.538766 N
From: Map Easting: 559,042.60 usft Longitude: 104° 8' 32.775379 W
Position Uncertainty: 1.00 usft Slot Radius: 13-3/16 " Grid Convergence: 0.10 °

Well: 801H

Well Position: +N-S 0.70 usft Northing: 439,517.70 usft Latitude: 32° 12' 29.545166 N
+E-W 30.00 usft Easting: 559,072.60 usft Longitude: 104° 8' 32.426182 W
Position Uncertainty: 1.00 usft Wellhead Elevation: Ground Level: 3,123.30 usft

Wellbore: OH \ 65013

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	9/12/2019	7.11	59.92	47,853.39015531

Design: Plan 5 09-10-19

Audit Notes:

Version: Phase: PLAN Tie On Depth: 0.00

Vertical Section	Depth From (TVD) (usft)	N-S (usft)	E-W (usft)	Direction (°)
	0.00	0.00	0.00	168.58

Plan Survey Tool Program Date: 9/10/2019

Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	19,235.56	Plan 5 09-10-19 (OH \ 65013)	MWD+HRGM OWSG MWD + HRGM

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	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	2.00	180.00	899.98	-1.75	0.00	2.00	2.00	0.00	180.00	
2,300.87	2.00	180.00	2,300.00	-50.63	0.00	0.00	0.00	0.00	0.00	
2,830.99	10.00	77.81	2,827.43	-50.17	45.12	2.00	1.51	-19.28	-112.70	
8,839.92	10.00	77.81	8,745.07	170.16	1,065.03	0.00	0.00	0.00	0.00	
9,701.08	89.82	145.96	9,274.00	-253.85	1,455.60	10.00	9.27	7.91	68.48	
11,399.05	89.82	179.92	9,279.49	-1,853.43	1,946.48	2.00	0.00	2.00	90.05	
19,235.56	89.82	179.92	9,304.00	-9,689.90	1,957.50	0.00	0.00	0.00	0.00	BHL v1 - Quien Sabe



Database: USA Compass
Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Site: Quien Sabe Fed Com
Well: 801H
Wellbore: OH \ 65013
Design: Plan 5 09-10-19

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well 801H
KB @ 3147.30usft (Ensign 155)
KB @ 3147.30usft (Ensign 155)
Grid
Minimum Curvature

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
686.30	0.00	0.00	686.30	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 2.00°/100' Build									
850.30	1.01	180.00	850.30	-0.44	0.00	0.43	2.00	2.00	0.00
TOS									
900.00	2.00	180.00	899.98	-1.75	0.00	1.71	2.00	2.00	0.00
Hold 2.00° Inc at 180.00° Azm									
1,000.00	2.00	180.00	999.92	-5.24	0.00	5.13	0.00	0.00	0.00
1,100.00	2.00	180.00	1,099.86	-8.73	0.00	8.55	0.00	0.00	0.00
1,200.00	2.00	180.00	1,199.80	-12.22	0.00	11.97	0.00	0.00	0.00
1,300.00	2.00	180.00	1,299.74	-15.70	0.00	15.39	0.00	0.00	0.00
1,400.00	2.00	180.00	1,399.68	-19.19	0.00	18.81	0.00	0.00	0.00
1,500.00	2.00	180.00	1,499.61	-22.68	0.00	22.24	0.00	0.00	0.00
1,600.00	2.00	180.00	1,599.55	-26.17	0.00	25.66	0.00	0.00	0.00
1,700.00	2.00	180.00	1,699.49	-29.66	0.00	29.08	0.00	0.00	0.00
1,800.00	2.00	180.00	1,799.43	-33.15	0.00	32.50	0.00	0.00	0.00
1,900.00	2.00	180.00	1,899.37	-36.64	0.00	35.92	0.00	0.00	0.00
2,000.00	2.00	180.00	1,999.31	-40.13	0.00	39.34	0.00	0.00	0.00
2,100.00	2.00	180.00	2,099.25	-43.62	0.00	42.76	0.00	0.00	0.00
2,200.00	2.00	180.00	2,199.19	-47.11	0.00	46.18	0.00	0.00	0.00
2,237.28	2.00	180.00	2,236.45	-48.42	0.00	47.46	0.00	0.00	0.00
BOS (Fletcher)									
2,300.00	2.00	180.00	2,299.13	-50.60	0.00	49.60	0.00	0.00	0.00
2,300.87	2.00	180.00	2,300.00	-50.63	0.00	49.63	0.00	0.00	0.00
Begin 2.00°/100' Build & Turn									
2,400.00	2.21	124.01	2,399.07	-53.43	1.58	52.69	2.00	0.21	-56.48
2,439.44	2.72	109.97	2,438.47	-54.18	3.09	53.72	2.00	1.30	-35.60
LMAR (Top Delaware)									
2,470.48	3.20	102.41	2,469.47	-54.61	4.63	54.45	2.00	1.56	-24.35
BLCN									
2,500.00	3.70	97.14	2,498.94	-54.91	6.38	55.09	2.00	1.69	-17.87
2,600.00	5.53	86.73	2,598.61	-55.04	14.39	56.80	2.00	1.82	-10.41
2,700.00	7.44	81.56	2,697.97	-53.81	25.61	57.82	2.00	1.91	-5.17
2,800.00	9.39	78.51	2,796.89	-51.24	40.01	58.14	2.00	1.95	-3.05
2,830.99	10.00	77.81	2,827.43	-50.17	45.12	58.11	2.00	1.96	-2.27
Hold 10.00° Inc at 77.81° Azm									
2,900.00	10.00	77.81	2,895.40	-47.63	56.83	57.94	0.00	0.00	0.00
3,000.00	10.00	77.81	2,993.88	-43.97	73.80	57.71	0.00	0.00	0.00
3,100.00	10.00	77.81	3,092.36	-40.30	90.78	57.48	0.00	0.00	0.00
3,200.00	10.00	77.81	3,190.84	-36.63	107.75	57.24	0.00	0.00	0.00
3,284.93	10.00	77.81	3,274.48	-33.52	122.17	57.05	0.00	0.00	0.00
CYCN									
3,300.00	10.00	77.81	3,289.32	-32.97	124.72	57.01	0.00	0.00	0.00
3,400.00	10.00	77.81	3,387.80	-29.30	141.70	56.78	0.00	0.00	0.00
3,500.00	10.00	77.81	3,486.28	-25.63	158.67	56.55	0.00	0.00	0.00
3,600.00	10.00	77.81	3,584.76	-21.97	175.64	56.31	0.00	0.00	0.00
3,700.00	10.00	77.81	3,683.24	-18.30	192.62	56.08	0.00	0.00	0.00
3,800.00	10.00	77.81	3,781.72	-14.63	209.59	55.85	0.00	0.00	0.00
3,900.00	10.00	77.81	3,880.20	-10.97	226.56	55.61	0.00	0.00	0.00
4,000.00	10.00	77.81	3,978.68	-7.30	243.54	55.38	0.00	0.00	0.00
4,100.00	10.00	77.81	4,077.16	-3.63	260.51	55.15	0.00	0.00	0.00



Planning Report



Database	USA Compass	Local Co-ordinate Reference	Well 801H
Company	COG Operating LLC	TVD Reference	KB @ 3147.30usft (Ensign 155)
Project	Eddy County, NM (NAD27 NME)	MD Reference	KB @ 3147.30usft (Ensign 155)
Site	Quien Sabe Fed Com	North Reference	Grid
Well	801H	Survey Calculation Method	Minimum Curvature
Wellbore	OH \ 65013		
Design	Plan 5 09-10-19		

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)	
4,200.00	10.00	77.81	4,175.65	0.03	277.48	54.91	0.00	0.00	0.00	
4,300.00	10.00	77.81	4,274.13	3.70	294.46	54.68	0.00	0.00	0.00	
4,400.00	10.00	77.81	4,372.61	7.37	311.43	54.45	0.00	0.00	0.00	
4,427.28	10.00	77.81	4,399.47	8.37	316.06	54.38	0.00	0.00	0.00	
BYCN										
4,500.00	10.00	77.81	4,471.09	11.03	328.40	54.21	0.00	0.00	0.00	
4,600.00	10.00	77.81	4,569.57	14.70	345.38	53.98	0.00	0.00	0.00	
4,700.00	10.00	77.81	4,668.05	18.37	362.35	53.75	0.00	0.00	0.00	
4,800.00	10.00	77.81	4,766.53	22.03	379.32	53.51	0.00	0.00	0.00	
4,900.00	10.00	77.81	4,865.01	25.70	396.30	53.28	0.00	0.00	0.00	
5,000.00	10.00	77.81	4,963.49	29.37	413.27	53.05	0.00	0.00	0.00	
5,100.00	10.00	77.81	5,061.97	33.03	430.24	52.81	0.00	0.00	0.00	
5,200.00	10.00	77.81	5,160.45	36.70	447.22	52.58	0.00	0.00	0.00	
5,300.00	10.00	77.81	5,258.93	40.37	464.19	52.35	0.00	0.00	0.00	
5,400.00	10.00	77.81	5,357.41	44.03	481.16	52.11	0.00	0.00	0.00	
5,500.00	10.00	77.81	5,455.90	47.70	498.14	51.88	0.00	0.00	0.00	
5,600.00	10.00	77.81	5,554.38	51.36	515.11	51.65	0.00	0.00	0.00	
5,700.00	10.00	77.81	5,652.86	55.03	532.08	51.41	0.00	0.00	0.00	
5,800.00	10.00	77.81	5,751.34	58.70	549.06	51.18	0.00	0.00	0.00	
5,900.00	10.00	77.81	5,849.82	62.36	566.03	50.95	0.00	0.00	0.00	
5,982.90	10.00	77.81	5,931.46	65.40	580.10	50.75	0.00	0.00	0.00	
Bone Sprg (BSGL)										
6,000.00	10.00	77.81	5,948.30	66.03	583.00	50.71	0.00	0.00	0.00	
6,100.00	10.00	77.81	6,046.78	69.70	599.98	50.48	0.00	0.00	0.00	
6,157.55	10.00	77.81	6,103.46	71.81	609.75	50.35	0.00	0.00	0.00	
U Avalon Sh										
6,200.00	10.00	77.81	6,145.26	73.36	616.95	50.25	0.00	0.00	0.00	
6,300.00	10.00	77.81	6,243.74	77.03	633.92	50.01	0.00	0.00	0.00	
6,396.18	10.00	77.81	6,338.46	80.56	650.25	49.79	0.00	0.00	0.00	
L Avalon Sh										
6,400.00	10.00	77.81	6,342.22	80.70	650.90	49.78	0.00	0.00	0.00	
6,500.00	10.00	77.81	6,440.70	84.36	667.87	49.55	0.00	0.00	0.00	
6,600.00	10.00	77.81	6,539.18	88.03	684.84	49.31	0.00	0.00	0.00	
6,700.00	10.00	77.81	6,637.67	91.70	701.82	49.08	0.00	0.00	0.00	
6,800.00	10.00	77.81	6,736.15	95.36	718.79	48.85	0.00	0.00	0.00	
6,831.79	10.00	77.81	6,767.45	96.53	724.19	48.77	0.00	0.00	0.00	
B Avalon Sh										
6,900.00	10.00	77.81	6,834.63	99.03	735.76	48.62	0.00	0.00	0.00	
7,000.00	10.00	77.81	6,933.11	102.70	752.74	48.38	0.00	0.00	0.00	
7,001.37	10.00	77.81	6,934.45	102.75	752.97	48.38	0.00	0.00	0.00	
FBSG_sand										
7,100.00	10.00	77.81	7,031.59	106.36	769.71	48.15	0.00	0.00	0.00	
7,200.00	10.00	77.81	7,130.07	110.03	786.68	47.92	0.00	0.00	0.00	
7,300.00	10.00	77.81	7,228.55	113.70	803.66	47.68	0.00	0.00	0.00	
7,400.00	10.00	77.81	7,327.03	117.36	820.63	47.45	0.00	0.00	0.00	
7,500.00	10.00	77.81	7,425.51	121.03	837.60	47.22	0.00	0.00	0.00	
7,600.00	10.00	77.81	7,523.99	124.70	854.58	46.98	0.00	0.00	0.00	
7,700.00	10.00	77.81	7,622.47	128.36	871.55	46.75	0.00	0.00	0.00	
7,743.64	10.00	77.81	7,665.45	129.96	878.96	46.65	0.00	0.00	0.00	
SBSG_sand										
7,800.00	10.00	77.81	7,720.95	132.03	888.52	46.52	0.00	0.00	0.00	
7,900.00	10.00	77.81	7,819.43	135.70	905.50	46.28	0.00	0.00	0.00	
7,922.35	10.00	77.81	7,841.45	136.52	909.29	46.23	0.00	0.00	0.00	



Database: USA Compass
Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Site: Quien Sabe Fed Com
Well: 801H
Wellbore: OH \ 65013
Design: Plan 5 09-10-19

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well 801H
KB @ 3147.30usft (Ensign 155)
KB @ 3147.30usft (Ensign 155)
Grid
Minimum Curvature

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)
SBSG_sand_Base									
8,000.00	10.00	77.81	7,917.92	139.36	922.47	46.05	0.00	0.00	0.00
8,100.00	10.00	77.81	8,016.40	143.03	939.44	45.82	0.00	0.00	0.00
8,200.00	10.00	77.81	8,114.88	146.70	956.42	45.58	0.00	0.00	0.00
8,300.00	10.00	77.81	8,213.36	150.36	973.39	45.35	0.00	0.00	0.00
8,400.00	10.00	77.81	8,311.84	154.03	990.36	45.12	0.00	0.00	0.00
8,500.00	10.00	77.81	8,410.32	157.70	1,007.34	44.88	0.00	0.00	0.00
8,600.00	10.00	77.81	8,508.80	161.36	1,024.31	44.65	0.00	0.00	0.00
8,700.00	10.00	77.81	8,607.28	165.03	1,041.28	44.42	0.00	0.00	0.00
8,800.00	10.00	77.81	8,705.76	168.70	1,058.26	44.18	0.00	0.00	0.00
8,839.92	10.00	77.81	8,745.07	170.16	1,065.03	44.09	0.00	0.00	0.00
KOP2, Begin 10.00°/100' Build									
8,900.00	13.41	102.63	8,803.93	169.74	1,076.94	46.86	10.00	5.68	41.32
8,920.13	14.92	108.09	8,823.45	168.42	1,081.68	49.09	10.00	7.50	27.09
TBSPG_sand									
9,000.00	21.71	121.72	8,899.26	157.45	1,104.06	64.28	10.00	8.50	17.06
9,100.00	31.00	130.18	8,988.80	131.04	1,139.56	97.20	10.00	9.29	8.47
9,200.00	40.61	134.98	9,069.82	91.32	1,182.36	144.61	10.00	9.60	4.80
9,300.00	50.34	138.19	9,139.87	39.49	1,231.17	205.07	10.00	9.74	3.21
9,364.26	56.64	139.80	9,178.09	0.51	1,265.02	249.98	10.00	9.80	2.51
WFMP									
9,400.00	60.15	140.60	9,196.81	-22.87	1,284.49	276.76	10.00	9.82	2.23
9,500.00	69.99	142.57	9,238.92	-93.87	1,340.72	357.48	10.00	9.84	1.97
9,600.00	79.85	144.31	9,264.91	-171.35	1,398.13	444.80	10.00	9.86	1.74
9,700.00	89.71	145.94	9,274.00	-252.95	1,454.99	536.04	10.00	9.87	1.63
9,701.08	89.82	145.96	9,274.00	-253.85	1,455.60	537.04	10.00	9.87	1.62
LP, Hold 89.82° Inc, Begin 2.00°/100' Turn									
9,800.00	89.82	147.94	9,274.32	-336.76	1,509.54	628.99	2.00	0.00	2.00
9,900.00	89.82	149.94	9,274.63	-422.41	1,561.13	723.16	2.00	0.00	2.00
10,000.00	89.82	151.94	9,274.96	-509.82	1,609.70	818.46	2.00	0.00	2.00
10,100.00	89.81	153.94	9,275.28	-598.86	1,655.20	914.75	2.00	0.00	2.00
10,200.00	89.81	155.94	9,275.60	-689.44	1,697.55	1,011.92	2.00	0.00	2.00
10,300.00	89.81	157.94	9,275.93	-781.45	1,736.72	1,109.86	2.00	0.00	2.00
10,400.00	89.81	159.94	9,276.26	-874.76	1,772.66	1,208.44	2.00	0.00	2.00
10,500.00	89.81	161.94	9,276.58	-969.27	1,805.32	1,307.55	2.00	0.00	2.00
10,600.00	89.81	163.94	9,276.91	-1,064.87	1,834.65	1,407.06	2.00	0.00	2.00
10,700.00	89.81	165.94	9,277.24	-1,161.43	1,860.64	1,506.85	2.00	0.00	2.00
10,800.00	89.81	167.94	9,277.57	-1,258.83	1,883.24	1,606.80	2.00	0.00	2.00
10,900.00	89.81	169.94	9,277.89	-1,356.97	1,902.42	1,706.80	2.00	0.00	2.00
11,000.00	89.81	171.94	9,278.22	-1,455.72	1,918.17	1,806.71	2.00	0.00	2.00
11,100.00	89.82	173.94	9,278.54	-1,554.95	1,930.46	1,906.41	2.00	0.00	2.00
11,200.00	89.82	175.94	9,278.86	-1,654.56	1,939.29	2,005.79	2.00	0.00	2.00
11,300.00	89.82	177.94	9,279.18	-1,754.41	1,944.63	2,104.72	2.00	0.00	2.00
11,399.05	89.82	179.92	9,279.49	-1,853.43	1,946.48	2,202.15	2.00	0.00	2.00
Hold 179.92° Azm									
11,400.00	89.82	179.92	9,279.49	-1,854.39	1,946.48	2,203.09	0.00	0.00	0.00
11,500.00	89.82	179.92	9,279.80	-1,954.39	1,946.62	2,301.13	0.00	0.00	0.00
11,600.00	89.82	179.92	9,280.12	-2,054.39	1,946.76	2,399.18	0.00	0.00	0.00
11,700.00	89.82	179.92	9,280.43	-2,154.38	1,946.90	2,497.23	0.00	0.00	0.00
11,800.00	89.82	179.92	9,280.74	-2,254.38	1,947.04	2,595.28	0.00	0.00	0.00
11,900.00	89.82	179.92	9,281.05	-2,354.38	1,947.18	2,693.32	0.00	0.00	0.00
12,000.00	89.82	179.92	9,281.37	-2,454.38	1,947.32	2,791.37	0.00	0.00	0.00
12,100.00	89.82	179.92	9,281.68	-2,554.38	1,947.46	2,889.42	0.00	0.00	0.00



Planning Report



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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)
12,200.00	89.82	179.92	9,281.99	-2,654.38	1,947.60	2,987.47	0.00	0.00	0.00
12,300.00	89.82	179.92	9,282.31	-2,754.38	1,947.74	3,085.51	0.00	0.00	0.00
12,400.00	89.82	179.92	9,282.62	-2,854.38	1,947.89	3,183.56	0.00	0.00	0.00
12,500.00	89.82	179.92	9,282.93	-2,954.38	1,948.03	3,281.61	0.00	0.00	0.00
12,600.00	89.82	179.92	9,283.24	-3,054.38	1,948.17	3,379.65	0.00	0.00	0.00
12,700.00	89.82	179.92	9,283.56	-3,154.38	1,948.31	3,477.70	0.00	0.00	0.00
12,800.00	89.82	179.92	9,283.87	-3,254.38	1,948.45	3,575.75	0.00	0.00	0.00
12,900.00	89.82	179.92	9,284.18	-3,354.38	1,948.59	3,673.80	0.00	0.00	0.00
13,000.00	89.82	179.92	9,284.50	-3,454.38	1,948.73	3,771.84	0.00	0.00	0.00
13,100.00	89.82	179.92	9,284.81	-3,554.38	1,948.87	3,869.89	0.00	0.00	0.00
13,200.00	89.82	179.92	9,285.12	-3,654.38	1,949.01	3,967.94	0.00	0.00	0.00
13,300.00	89.82	179.92	9,285.43	-3,754.38	1,949.15	4,065.99	0.00	0.00	0.00
13,400.00	89.82	179.92	9,285.75	-3,854.37	1,949.29	4,164.03	0.00	0.00	0.00
13,500.00	89.82	179.92	9,286.06	-3,954.37	1,949.43	4,262.08	0.00	0.00	0.00
13,600.00	89.82	179.92	9,286.37	-4,054.37	1,949.57	4,360.13	0.00	0.00	0.00
13,700.00	89.82	179.92	9,286.69	-4,154.37	1,949.71	4,458.18	0.00	0.00	0.00
13,800.00	89.82	179.92	9,287.00	-4,254.37	1,949.85	4,556.22	0.00	0.00	0.00
13,900.00	89.82	179.92	9,287.31	-4,354.37	1,950.00	4,654.27	0.00	0.00	0.00
14,000.00	89.82	179.92	9,287.62	-4,454.37	1,950.14	4,752.32	0.00	0.00	0.00
14,100.00	89.82	179.92	9,287.94	-4,554.37	1,950.28	4,850.37	0.00	0.00	0.00
14,200.00	89.82	179.92	9,288.25	-4,654.37	1,950.42	4,948.41	0.00	0.00	0.00
14,300.00	89.82	179.92	9,288.56	-4,754.37	1,950.56	5,046.46	0.00	0.00	0.00
14,400.00	89.82	179.92	9,288.87	-4,854.37	1,950.70	5,144.51	0.00	0.00	0.00
14,500.00	89.82	179.92	9,289.19	-4,954.37	1,950.84	5,242.55	0.00	0.00	0.00
14,600.00	89.82	179.92	9,289.50	-5,054.37	1,950.98	5,340.60	0.00	0.00	0.00
14,700.00	89.82	179.92	9,289.81	-5,154.37	1,951.12	5,438.65	0.00	0.00	0.00
14,800.00	89.82	179.92	9,290.13	-5,254.37	1,951.26	5,536.70	0.00	0.00	0.00
14,900.00	89.82	179.92	9,290.44	-5,354.37	1,951.40	5,634.74	0.00	0.00	0.00
15,000.00	89.82	179.92	9,290.75	-5,454.37	1,951.54	5,732.79	0.00	0.00	0.00
15,100.00	89.82	179.92	9,291.06	-5,554.36	1,951.68	5,830.84	0.00	0.00	0.00
15,200.00	89.82	179.92	9,291.38	-5,654.36	1,951.82	5,928.89	0.00	0.00	0.00
15,300.00	89.82	179.92	9,291.69	-5,754.36	1,951.96	6,026.93	0.00	0.00	0.00
15,400.00	89.82	179.92	9,292.00	-5,854.36	1,952.11	6,124.98	0.00	0.00	0.00
15,500.00	89.82	179.92	9,292.32	-5,954.36	1,952.25	6,223.03	0.00	0.00	0.00
15,600.00	89.82	179.92	9,292.63	-6,054.36	1,952.39	6,321.08	0.00	0.00	0.00
15,700.00	89.82	179.92	9,292.94	-6,154.36	1,952.53	6,419.12	0.00	0.00	0.00
15,800.00	89.82	179.92	9,293.25	-6,254.36	1,952.67	6,517.17	0.00	0.00	0.00
15,900.00	89.82	179.92	9,293.57	-6,354.36	1,952.81	6,615.22	0.00	0.00	0.00
16,000.00	89.82	179.92	9,293.88	-6,454.36	1,952.95	6,713.26	0.00	0.00	0.00
16,100.00	89.82	179.92	9,294.19	-6,554.36	1,953.09	6,811.31	0.00	0.00	0.00
16,200.00	89.82	179.92	9,294.51	-6,654.36	1,953.23	6,909.36	0.00	0.00	0.00
16,300.00	89.82	179.92	9,294.82	-6,754.36	1,953.37	7,007.41	0.00	0.00	0.00
16,400.00	89.82	179.92	9,295.13	-6,854.36	1,953.51	7,105.45	0.00	0.00	0.00
16,500.00	89.82	179.92	9,295.44	-6,954.36	1,953.65	7,203.50	0.00	0.00	0.00
16,600.00	89.82	179.92	9,295.76	-7,054.36	1,953.79	7,301.55	0.00	0.00	0.00
16,700.00	89.82	179.92	9,296.07	-7,154.36	1,953.93	7,399.60	0.00	0.00	0.00
16,800.00	89.82	179.92	9,296.38	-7,254.36	1,954.07	7,497.64	0.00	0.00	0.00
16,900.00	89.82	179.92	9,296.69	-7,354.35	1,954.21	7,595.69	0.00	0.00	0.00
17,000.00	89.82	179.92	9,297.01	-7,454.35	1,954.36	7,693.74	0.00	0.00	0.00
17,100.00	89.82	179.92	9,297.32	-7,554.35	1,954.50	7,791.79	0.00	0.00	0.00
17,200.00	89.82	179.92	9,297.63	-7,654.35	1,954.64	7,889.83	0.00	0.00	0.00
17,300.00	89.82	179.92	9,297.95	-7,754.35	1,954.78	7,987.88	0.00	0.00	0.00
17,400.00	89.82	179.92	9,298.26	-7,854.35	1,954.92	8,085.93	0.00	0.00	0.00
17,500.00	89.82	179.92	9,298.57	-7,954.35	1,955.06	8,183.97	0.00	0.00	0.00



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Well 801H
KB @ 3147.30usft (Ensign 155)
KB @ 3147.30usft (Ensign 155)
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Minimum Curvature

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)
17,600.00	89.82	179.92	9,298.88	-8,054.35	1,955.20	8,282.02	0.00	0.00	0.00
17,700.00	89.82	179.92	9,299.20	-8,154.35	1,955.34	8,380.07	0.00	0.00	0.00
17,800.00	89.82	179.92	9,299.51	-8,254.35	1,955.48	8,478.12	0.00	0.00	0.00
17,900.00	89.82	179.92	9,299.82	-8,354.35	1,955.62	8,576.16	0.00	0.00	0.00
18,000.00	89.82	179.92	9,300.14	-8,454.35	1,955.76	8,674.21	0.00	0.00	0.00
18,100.00	89.82	179.92	9,300.45	-8,554.35	1,955.90	8,772.26	0.00	0.00	0.00
18,200.00	89.82	179.92	9,300.76	-8,654.35	1,956.04	8,870.31	0.00	0.00	0.00
18,300.00	89.82	179.92	9,301.07	-8,754.35	1,956.18	8,968.35	0.00	0.00	0.00
18,400.00	89.82	179.92	9,301.39	-8,854.35	1,956.32	9,066.40	0.00	0.00	0.00
18,500.00	89.82	179.92	9,301.70	-8,954.35	1,956.47	9,164.45	0.00	0.00	0.00
18,600.00	89.82	179.92	9,302.01	-9,054.34	1,956.61	9,262.50	0.00	0.00	0.00
18,700.00	89.82	179.92	9,302.33	-9,154.34	1,956.75	9,360.54	0.00	0.00	0.00
18,800.00	89.82	179.92	9,302.64	-9,254.34	1,956.89	9,458.59	0.00	0.00	0.00
18,900.00	89.82	179.92	9,302.95	-9,354.34	1,957.03	9,556.64	0.00	0.00	0.00
19,000.00	89.82	179.92	9,303.26	-9,454.34	1,957.17	9,654.68	0.00	0.00	0.00
19,100.00	89.82	179.92	9,303.58	-9,554.34	1,957.31	9,752.73	0.00	0.00	0.00
19,200.00	89.82	179.92	9,303.89	-9,654.34	1,957.45	9,850.78	0.00	0.00	0.00
19,235.56	89.82	179.92	9,304.00	-9,689.90	1,957.50	9,885.64	0.00	0.00	0.00

TD at 19235.56

Design Targets

Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
FTP v1 - Quien Sabe Fe		0.00	0.01	9,274.00	413.90	1,942.80	439,931.60	561,015.40	32° 12' 33.606543 N	104° 8' 9.804290 W
- plan misses target center by 788.23usft at 9492.75usft MD (9236.40 TVD, -88.48 N, 1336.58 E)										
- Point										
LTP v1- Quien Sabe Fec		0.00	0.01	9,303.62	-9,559.90	1,957.30	429,957.80	561,029.90	32° 10' 54.901869 N	104° 8' 9.848476 W
- plan misses target center by 0.03usft at 19105.56usft MD (9303.59 TVD, -9559.90 N, 1957.32 E)										
- Point										
BHL v1 - Quien Sabe Fe		0.00	0.01	9,304.00	-9,689.90	1,957.50	429,827.80	561,030.10	32° 10' 53.615335 N	104° 8' 9.848923 W
- plan hits target center										
- Point										

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Site:	Quien Sabe Fed Com	North Reference:	Grid
Well:	801H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH \ 65013		
Design:	Plan 5 09-10-19		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
686.30	686.30	Rustler		0.18	168.58	
850.30	850.30	TOS		0.18	168.58	
2,237.28	2,236.45	BOS (Fletcher)		0.18	168.58	
2,439.44	2,438.47	LMAR (Top Delaware)		0.18	168.58	
2,470.48	2,469.47	BLCN		0.18	168.58	
3,284.93	3,274.48	CYCN		0.18	168.58	
4,427.28	4,399.47	BYCN		0.18	168.58	
5,982.90	5,931.46	Bone Sprg (BSGL)		0.18	168.58	
6,157.55	6,103.46	U Avalon Sh		0.18	168.58	
6,396.18	6,338.46	L Avalon Sh		0.18	168.58	
6,831.79	6,767.45	B Avalon Sh		0.18	168.58	
7,001.37	6,934.45	FBSG_sand		0.18	168.58	
7,743.64	7,665.45	SBSG_sand		0.18	168.58	
7,922.35	7,841.45	SBSG_sand_Base		0.18	168.58	
8,920.13	8,823.45	TBSPG_sand		0.18	168.58	
9,364.26	9,178.09	WFMP		0.18	168.58	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/S (usft)	+E/W (usft)		
800.00	800.00	0.00	0.00	KOP, Begin 2.00°/100' Build	
900.00	899.98	-1.75	0.00	Hold 2.00° Inc at 180.00° Azm	
2,300.87	2,300.00	-50.63	0.00	Begin 2.00°/100' Build & Turn	
2,830.99	2,827.43	-50.17	45.12	Hold 10.00° Inc at 77.81° Azm	
8,839.92	8,745.07	170.16	1,065.03	KOP2, Begin 10.00°/100' Build	
9,701.08	9,274.00	-253.85	1,455.60	LP, Hold 89.82° Inc, Begin 2.00°/100' Turn	
11,399.05	9,279.49	-1,853.43	1,946.48	Hold 179.92° Azm	
19,235.56	9,304.00	-9,689.90	1,957.50	TD at 19235.56	



COG Operating LLC

Eddy County, NM (NAD27 NME)

Quien Sabe Fed Com

801H

OH \ 65013

Plan 5 09-10-19

Anticollision Report

10 September, 2019





Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 801H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3147.30usft (Ensign 155)
Reference Site:	Quien Sabe Fed Com	MD Reference:	KB @ 3147.30usft (Ensign 155)
Site Error:	1.00 usft	North Reference:	Grid
Reference Well:	801H	Survey/Calculation Method:	Minimum Curvature
Well Error:	1.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH \ 65013	Database:	USA Compass
Reference Design:	Plan 5 09-10-19	Offset TVD Reference:	Offset Datum

Reference: Plan 5 09-10-19

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria	Error Model:	ISCWSA
Interpolation Method:	MD Interval 100.00usft	Scan Method:	Closest Approach 3D
Depth Range:	Unlimited	Error Surface:	Pedal Curve
Results Limited by:	Maximum center-center distance of 50,000.00 usft	Casing Method:	Not applied
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program: Date: 9/10/2019

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	19,235.56	Plan 5 09-10-19 (OH \ 65013)	MWD+HRGM	OWSG MWD + HRGM

Summary

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Quien Sabe Fed Com						
602H - OH \ 65011 - Plan 4 08-15-19	800.00	800.20	30.01	23.50	4.606	CC
602H - OH \ 65011 - Plan 4 08-15-19	1,000.00	1,000.12	30.60	22.48	3.768	ES
602H - OH \ 65011 - Plan 4 08-15-19	3,200.00	3,192.02	64.84	41.46	2.773	SF
603H - OH \ 65012 - Plan 4 08-15-19	863.33	863.93	30.00	23.42	4.556	CC
603H - OH \ 65012 - Plan 4 08-15-19	1,000.00	1,000.52	30.34	23.09	4.186	ES
603H - OH \ 65012 - Plan 4 08-15-19	1,800.00	1,800.03	44.20	31.97	3.614	SF
603H - OH \ 65012 - Surveys (Ensign 155)	361.08	361.70	28.91	25.41	8.258	CC
603H - OH \ 65012 - Surveys (Ensign 155)	400.00	400.53	28.98	25.28	7.823	ES
603H - OH \ 65012 - Surveys (Ensign 155)	2,500.00	2,500.92	66.16	47.86	3.617	SF
Woody's Hope Federal Com						
#1 - OH - Surveys	9,532.69	9,208.68	324.21	91.41	1.393	Level 3, CC, ES, SF

Offset Design: Quien Sabe Fed Com - 602H - OH \ 65011 - Plan 4 08-15-19

Reference Measured Depth (usft)	Vertical Offset (usft)	Measured Depth (usft)	Vertical Offset (usft)	Semi Major Axis (usft)	Reference Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre (N/S, E/W) (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.20	0.20	1.00	1.00	88.47	0.80 30.00	30.01				
100.00	100.00	100.20	100.20	1.04	1.04	88.47	0.80 30.00	30.01	27.96	2.05	14.640	
200.00	200.00	200.20	200.20	1.37	1.37	88.47	0.80 30.00	30.01	27.50	2.51	11.968	
300.00	300.00	300.20	300.20	1.75	1.75	88.47	0.80 30.00	30.01	26.89	3.12	9.614	
400.00	400.00	400.20	400.20	2.13	2.13	88.47	0.80 30.00	30.01	26.24	3.77	7.956	
500.00	500.00	500.20	500.20	2.50	2.50	88.47	0.80 30.00	30.01	25.57	4.44	6.754	
600.00	600.00	600.20	600.20	2.87	2.87	88.47	0.80 30.00	30.01	24.88	5.13	5.854	
700.00	700.00	700.20	700.20	3.23	3.24	88.47	0.80 30.00	30.01	24.19	5.82	5.158	
800.00	800.00	800.20	800.20	3.60	3.60	88.47	0.80 30.00	30.01	23.50	6.52	4.606	
800.00	800.00	800.20	800.20	3.60	3.60	88.47	0.80 30.00	30.01	23.50	6.52	4.606	CC
900.00	899.98	900.18	900.18	3.91	3.96	-94.85	0.80 30.00	30.11	22.87	7.23	4.162	
1,000.00	999.92	1,000.12	1,000.12	4.44	4.33	-101.37	0.80 30.00	30.60	22.48	8.12	3.768	ES
1,100.00	1,099.86	1,100.06	1,100.06	4.77	4.69	-107.60	0.80 30.00	31.48	22.49	8.99	3.503	
1,200.00	1,199.80	1,200.00	1,200.00	5.10	5.05	-113.44	0.80 30.00	32.70	22.87	9.83	3.327	
1,300.00	1,299.74	1,299.94	1,299.94	5.44	5.41	-118.80	0.80 30.00	34.24	23.60	10.64	3.217	
1,400.00	1,399.68	1,399.88	1,399.88	5.78	5.77	-123.67	0.80 30.00	36.05	24.62	11.43	3.154	

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



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Quien Sabe Fed Com
Site Error: 1.00 usft
Reference Well: 801H
Well Error: 1.00 usft
Reference Wellbore: OH \ 65013
Reference Design: Plan 5 09-10-19

Local Co-ordinate Reference: Well 801H
TVD Reference: KB @ 3147.30usft (Ensign 155)
MD Reference: KB @ 3147.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design: Quien Sabe Fed Com - 602H - OH \ 65011 - Plan 4 08-15-19														Offset Site Error: 1.00 usft
Survey Program: 10-MWD-HRGM														Offset Well Error: 1.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference Depth (usft)	Offset Depth (usft)	Highside (ft)	Offset Wellbore Centre (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
							N-S (usft)	E-W (usft)						
1,500.00	1,499.61	1,499.81	1,499.81	6.12	6.13	-128.04	0.80	30.00	38.10	25.91	12.19	3.125		
1,600.00	1,599.55	1,598.40	1,598.38	6.47	6.58	-131.14	1.46	31.56	41.97	28.96	13.01	3.225		
1,700.00	1,699.49	1,698.21	1,698.13	6.81	6.99	-133.00	2.82	34.76	47.60	33.84	13.76	3.459		
1,800.00	1,799.43	1,798.04	1,797.90	7.16	7.30	-134.46	4.18	37.97	53.28	38.87	14.41	3.696		
1,900.00	1,899.37	1,897.87	1,897.67	7.51	7.62	-135.63	5.54	41.18	58.98	43.91	15.07	3.914		
2,000.00	1,999.31	1,997.70	1,997.44	7.86	7.94	-136.60	6.91	44.38	64.71	48.98	15.73	4.114		
2,100.00	2,099.25	2,097.53	2,097.21	8.21	8.26	-137.42	8.27	47.59	70.44	54.06	16.39	4.298		
2,200.00	2,199.19	2,197.36	2,196.98	8.57	8.59	-138.10	9.63	50.80	76.20	59.14	17.06	4.467		
2,300.00	2,299.13	2,297.20	2,296.75	8.92	8.92	-138.70	10.99	54.00	81.96	64.23	17.73	4.623		
2,400.00	2,399.07	2,397.09	2,396.58	9.28	9.26	-139.23	12.35	57.21	86.19	67.70	18.50	4.659		
2,500.00	2,498.94	2,497.03	2,496.46	9.64	9.60	-139.60	13.71	60.42	87.39	68.13	19.26	4.538		
2,600.00	2,598.61	2,596.90	2,596.27	10.15	9.94	-140.00	15.08	63.63	85.71	65.84	19.88	4.312		
2,700.00	2,697.97	2,696.57	2,695.88	10.50	10.28	-140.35	16.44	66.83	81.48	60.97	20.51	3.973		
2,800.00	2,796.89	2,795.93	2,795.18	10.91	10.63	-140.63	17.79	70.03	75.29	54.20	21.09	3.570		
2,900.00	2,895.40	2,894.97	2,894.16	11.23	10.97	-140.85	19.14	73.21	68.77	47.17	21.59	3.185		
3,000.00	2,993.88	2,993.98	2,993.11	11.54	11.32	-141.00	20.49	76.39	64.52	42.41	22.11	2.918		
3,094.68	3,087.12	3,087.73	3,086.81	11.85	11.64	-141.14	21.77	79.40	63.14	40.48	22.66	2.786		
3,100.00	3,092.36	3,093.00	3,092.07	11.86	11.66	-141.14	21.84	79.57	63.15	40.45	22.70	2.782		
3,200.00	3,190.84	3,192.02	3,191.03	12.19	12.01	-141.23	23.19	82.75	64.84	41.46	23.38	2.773 SF		
3,300.00	3,289.32	3,291.03	3,289.98	12.52	12.36	-141.27	24.54	85.93	69.37	45.22	24.16	2.872		
3,400.00	3,387.80	3,390.05	3,388.94	12.85	12.71	-141.27	25.89	89.11	76.24	51.27	24.97	3.054		
3,500.00	3,486.28	3,489.06	3,487.89	13.19	13.06	-141.27	27.24	92.29	84.88	59.10	25.78	3.292		
3,600.00	3,584.76	3,588.08	3,586.85	13.53	13.41	-141.27	28.59	95.47	94.80	68.22	26.58	3.567		
3,700.00	3,683.24	3,687.10	3,685.80	13.87	13.76	-141.27	29.94	98.65	105.65	78.29	27.36	3.862		
3,800.00	3,781.72	3,786.11	3,784.76	14.22	14.12	-141.27	31.29	101.84	117.17	89.05	28.12	4.167		
3,900.00	3,880.20	3,885.13	3,883.72	14.58	14.47	-141.27	32.64	105.02	129.18	100.31	28.87	4.475		
4,000.00	3,978.68	3,984.14	3,982.67	14.95	14.82	-141.27	33.99	108.20	141.55	111.94	29.61	4.781		
4,100.00	4,077.16	4,083.16	4,081.63	15.33	15.18	-141.27	35.34	111.38	154.20	123.86	30.34	5.082		
4,200.00	4,175.65	4,182.18	4,180.58	15.72	15.53	-141.27	36.69	114.56	167.07	136.00	31.07	5.378		
4,300.00	4,274.13	4,281.19	4,279.54	16.11	15.89	-141.27	38.04	117.74	180.10	148.31	31.79	5.665		
4,400.00	4,372.61	4,380.21	4,378.49	16.50	16.24	-141.27	39.39	120.92	193.27	160.76	32.51	5.945		
4,500.00	4,471.09	4,484.86	4,483.01	16.90	16.64	-141.27	41.40	125.64	205.36	172.09	33.27	6.173		
4,600.00	4,569.57	4,588.01	4,585.82	17.29	17.02	-141.27	44.68	133.37	214.72	180.71	34.00	6.315		
4,700.00	4,668.05	4,687.60	4,685.03	17.69	17.37	-141.27	48.07	141.36	223.61	188.89	34.72	6.441		
4,800.00	4,766.53	4,787.19	4,784.24	18.10	17.72	-141.27	51.46	149.35	232.51	197.07	35.44	6.560		
4,900.00	4,865.01	4,886.79	4,883.46	18.50	18.08	-141.27	54.85	157.34	241.42	205.25	36.17	6.675		
5,000.00	4,963.49	4,986.38	4,982.67	18.90	18.44	-141.27	58.24	165.33	250.34	213.44	36.89	6.786		
5,100.00	5,061.97	5,085.97	5,081.89	19.31	18.80	-141.27	61.64	173.32	259.26	221.64	37.62	6.892		
5,200.00	5,160.45	5,185.56	5,181.10	19.72	19.16	-141.27	65.03	181.31	268.19	229.85	38.34	6.994		
5,300.00	5,258.93	5,285.16	5,280.31	20.12	19.52	-141.27	68.42	189.30	277.13	238.06	39.07	7.093		
5,400.00	5,357.41	5,384.75	5,379.53	20.53	19.88	-141.27	71.81	197.29	286.07	246.27	39.80	7.188		
5,500.00	5,455.90	5,484.34	5,478.74	20.94	20.24	-141.27	75.20	205.28	295.01	254.49	40.52	7.280		
5,600.00	5,554.38	5,583.93	5,577.95	21.35	20.60	-141.27	78.59	213.27	303.96	262.71	41.25	7.368		
5,700.00	5,652.86	5,683.53	5,677.17	21.76	20.96	-141.27	81.99	221.26	312.92	270.94	41.98	7.454		
5,800.00	5,751.34	5,783.12	5,776.38	22.18	21.33	-141.27	85.38	229.25	321.88	279.17	42.71	7.537		
5,900.00	5,849.82	5,882.71	5,875.59	22.59	21.69	-141.27	88.77	237.24	330.84	287.40	43.44	7.617		
6,000.00	5,948.30	5,982.30	5,974.81	23.00	22.05	-141.27	92.16	245.23	339.80	295.64	44.17	7.694		
6,100.00	6,046.78	6,081.90	6,074.02	23.42	22.41	-141.27	95.55	253.22	348.77	303.87	44.89	7.769		
6,200.00	6,145.26	6,181.49	6,173.24	23.83	22.78	-141.27	98.94	261.21	357.74	312.11	45.62	7.841		
6,300.00	6,243.74	6,281.08	6,272.45	24.25	23.14	-141.27	102.34	269.20	366.71	320.35	46.35	7.911		
6,400.00	6,342.22	6,380.67	6,371.66	24.66	23.50	-141.27	105.73	277.19	375.68	328.60	47.08	7.979		
6,500.00	6,440.70	6,480.27	6,470.88	25.08	23.87	-141.27	109.12	285.18	384.66	336.84	47.82	8.045		

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

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 801H
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Reference Design:	Plan 5 09-10-19	Offset TVD Reference:	Offset Datum

Offset Design Quien Sabe Fed Com - 602H - OH \ 65011 - Plan 4 08-15-19														Offset Site Error	1.00 ush
Survey Program 0-MWD-HRGM														Offset Well Error	1.00 ush
Reference		Offset		Semi Major Axis			Distance								
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre	Between	Between	Minimum	Separation				
Depth	Depth	Depth	Depth	Depth	Depth	Toolface	N-S	E-W	Centres	Ellipses	Separation	Factor	Warning		
(ush)	(ush)	(ush)	(ush)	(ush)	(ush)	(f)	(ush)	(ush)	(ush)	(ush)	(ush)				
6,600.00	6,539.18	6,579.86	6,570.09	25.50	24.23	-164.22	112.51	293.17	393.63	345.09	48.55	8.108			
6,700.00	6,637.67	6,679.45	6,669.30	25.91	24.60	-164.34	115.90	301.16	402.61	353.34	49.28	8.170			
6,800.00	6,736.15	6,779.04	6,768.52	26.33	24.96	-164.45	119.29	309.15	411.60	361.59	50.01	8.230			
6,900.00	6,834.63	6,878.64	6,867.73	26.75	25.33	-164.56	122.68	317.14	420.58	369.84	50.74	8.289			
7,000.00	6,933.11	6,978.23	6,966.94	27.17	25.69	-164.67	126.08	325.13	429.56	378.09	51.47	8.345			
7,100.00	7,031.59	7,077.82	7,066.16	27.59	26.06	-164.77	129.47	333.12	438.55	386.34	52.20	8.401			
7,200.00	7,130.07	7,177.42	7,165.37	28.00	26.42	-164.86	132.86	341.11	447.53	394.60	52.94	8.454			
7,300.00	7,228.55	7,277.01	7,264.59	28.42	26.79	-164.95	136.25	349.10	456.52	402.85	53.67	8.506			
7,400.00	7,327.03	7,376.60	7,363.80	28.84	27.16	-165.04	139.64	357.09	465.51	411.11	54.40	8.557			
7,500.00	7,425.51	7,476.19	7,463.01	29.26	27.52	-165.13	143.03	365.08	474.50	419.37	55.14	8.606			
7,600.00	7,523.99	7,575.79	7,562.23	29.68	27.89	-165.21	146.43	373.07	483.49	427.62	55.87	8.654			
7,700.00	7,622.47	7,675.38	7,661.44	30.10	28.26	-165.29	149.82	381.06	492.48	435.88	56.60	8.701			
7,800.00	7,720.95	7,774.97	7,760.65	30.53	28.62	-165.37	153.21	389.05	501.48	444.14	57.34	8.746			
7,900.00	7,819.43	7,874.56	7,859.87	30.95	28.99	-165.44	156.60	397.04	510.47	452.40	58.07	8.791			
8,000.00	7,917.92	7,974.16	7,959.08	31.37	29.36	-165.51	159.99	405.03	519.47	460.66	58.80	8.834			
8,100.00	8,016.40	8,073.75	8,058.29	31.79	29.72	-165.58	163.38	413.02	528.46	468.92	59.54	8.876			
8,200.00	8,114.88	8,173.34	8,157.51	32.21	30.09	-165.65	166.78	421.01	537.46	477.18	60.27	8.917			
8,300.00	8,213.36	8,272.93	8,256.72	32.63	30.46	-165.71	170.17	429.00	546.45	485.45	61.01	8.957			
8,400.00	8,311.84	8,372.53	8,355.94	33.06	30.83	-165.78	173.56	436.99	555.45	493.71	61.74	8.996			
8,500.00	8,410.32	8,472.12	8,455.15	33.48	31.20	-165.84	176.95	444.98	564.45	501.97	62.48	9.034			
8,600.00	8,508.80	8,571.71	8,554.36	33.90	31.57	-165.89	180.34	452.97	573.45	510.23	63.21	9.072			
8,700.00	8,607.28	8,671.30	8,653.58	34.33	31.94	-165.95	183.73	460.96	582.45	518.50	63.95	9.108			
8,800.00	8,705.76	8,771.27	8,758.34	34.75	32.56	-166.03	179.27	476.65	588.99	524.32	64.68	9.107			
8,900.00	8,803.93	8,878.17	8,849.48	35.22	33.38	-166.14	136.71	509.26	586.92	522.00	64.92	9.040			
8,990.70	8,890.60	9,107.56	9,056.83	35.85	33.94	-166.20	75.03	545.88	585.65	520.39	65.26	8.974			
9,000.00	8,899.26	9,119.98	9,066.24	35.91	33.98	-166.21	67.94	549.82	585.67	520.36	65.32	8.967			
9,100.00	8,988.80	9,244.82	9,150.30	36.56	34.39	-166.29	-13.44	592.66	588.21	522.02	66.18	8.887			
9,200.00	9,069.82	9,355.89	9,206.91	37.17	34.66	-166.31	-99.03	634.70	595.74	528.33	67.41	8.838			
9,300.00	9,139.87	9,456.39	9,241.52	37.74	34.90	-166.33	-184.40	674.55	608.48	539.81	68.67	8.860			
9,400.00	9,196.81	9,548.94	9,258.46	38.29	35.17	-166.35	-267.35	711.68	625.83	556.08	69.75	8.972			
9,500.00	9,238.92	9,631.61	9,261.66	38.83	35.48	-166.37	-343.18	744.33	646.79	576.26	70.54	9.170			
9,600.00	9,264.91	9,700.00	9,261.93	39.38	35.78	-166.39	-406.59	769.96	670.78	599.70	71.08	9.437			
9,700.00	9,274.00	9,785.36	9,262.28	39.96	36.25	-166.41	-486.55	799.82	695.67	623.68	71.99	9.664			
9,800.00	9,274.32	9,863.09	9,262.60	40.60	36.72	-166.43	-560.11	824.92	720.23	647.29	72.94	9.874			
9,900.00	9,274.63	9,940.44	9,262.91	41.31	37.22	-166.45	-633.97	847.91	744.03	670.06	73.97	10.059			
10,000.00	9,274.96	10,017.45	9,263.23	42.06	37.74	-166.47	-708.08	868.81	767.06	692.03	75.03	10.223			
10,100.00	9,275.28	10,100.00	9,263.57	42.86	38.32	-166.49	-788.13	888.99	789.32	713.09	76.23	10.354			
10,200.00	9,275.60	10,170.47	9,263.86	43.69	38.84	-166.51	-868.89	904.39	810.73	733.51	77.22	10.499			
10,300.00	9,275.93	10,246.52	9,264.18	44.54	39.41	-166.53	-931.50	919.11	831.36	753.03	78.33	10.613			
10,400.00	9,276.26	10,322.29	9,264.49	45.41	39.99	-166.55	-1,006.20	931.79	851.16	771.72	79.44	10.715			
10,500.00	9,276.58	10,400.00	9,264.81	46.30	40.59	-166.57	-1,083.13	942.75	870.13	789.54	80.59	10.797			
10,600.00	9,276.91	10,473.05	9,265.11	47.19	41.16	-166.59	-1,155.69	951.14	888.25	806.63	81.62	10.882			
10,700.00	9,277.24	10,548.06	9,265.42	48.08	41.76	-166.61	-1,230.40	957.83	905.52	822.83	82.69	10.951			
10,800.00	9,277.57	10,622.85	9,265.73	48.96	42.36	-166.63	-1,305.04	962.55	921.93	838.20	83.73	11.010			
10,900.00	9,277.89	10,700.00	9,266.04	49.84	42.98	-166.65	-1,382.13	965.37	937.47	852.64	84.82	11.052			
11,000.00	9,278.22	10,774.96	9,266.35	50.72	43.56	-166.67	-1,457.09	966.15	952.09	866.30	85.79	11.097			
11,100.00	9,278.54	10,874.21	9,266.75	51.58	44.33	-166.69	-1,556.34	966.29	964.25	876.76	87.49	11.021			
11,200.00	9,278.86	10,973.83	9,267.16	52.43	45.13	-166.71	-1,655.96	966.43	972.93	883.70	89.23	10.903			
11,300.00	9,279.18	11,073.69	9,267.57	53.26	45.97	-166.73	-1,755.81	966.57	978.13	887.12	91.01	10.747			
11,400.00	9,279.49	11,173.67	9,267.97	54.08	46.84	-166.75	-1,855.79	966.71	979.84	887.01	92.83	10.555			
11,500.00	9,279.80	11,273.67	9,268.38	54.88	47.73	-166.77	-1,955.79	966.85	979.84	885.19	94.65	10.352			
11,600.00	9,280.12	11,373.67	9,268.79	55.69	48.65	-166.79	-2,055.79	966.98	979.85	883.33	96.51	10.152			

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



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Quien Sabe Fed Com
Site Error: 1.00 usft
Reference Well: 801H
Well Error: 1.00 usft
Reference Wellbore: OH \ 65013
Reference Design: Plan 5 09-10-19

Local Co-ordinate Reference: Well 801H
TVD Reference: KB @ 3147.30usft (Ensign 155)
MD Reference: KB @ 3147.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design: Quien Sabe Fed Com - 602H - OH \ 65011 - Plan 4 08-15-19													Offset Site Error	100 usft
Survey Program: 0-MWD-HRGM													Offset Well Error	100 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 (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
11,700.00	9,280.43	11,473.67	9,269.20	56.53	49.59	89.33	-2,155.79	967.12	979.85	881.42	98.42	9.956		
11,800.00	9,280.74	11,573.67	9,269.60	57.40	50.55	89.34	-2,255.79	967.26	979.85	879.47	100.38	9.762		
11,900.00	9,281.05	11,673.67	9,270.01	58.28	51.54	89.34	-2,355.79	967.40	979.85	877.47	102.37	9.571		
12,000.00	9,281.37	11,773.67	9,270.42	59.18	52.55	89.35	-2,455.79	967.54	979.85	875.44	104.41	9.384		
12,100.00	9,281.68	11,873.67	9,270.83	60.11	53.57	89.35	-2,555.79	967.68	979.85	873.36	106.49	9.201		
12,200.00	9,281.99	11,973.67	9,271.24	61.05	54.62	89.36	-2,655.79	967.82	979.85	871.24	108.61	9.022		
12,300.00	9,282.31	12,073.67	9,271.64	62.02	55.68	89.36	-2,755.78	967.95	979.85	869.09	110.76	8.847		
12,400.00	9,282.62	12,173.67	9,272.05	63.00	56.76	89.37	-2,855.78	968.09	979.85	866.91	112.94	8.676		
12,500.00	9,282.93	12,273.67	9,272.46	63.99	57.86	89.38	-2,955.78	968.23	979.85	864.70	115.15	8.509		
12,600.00	9,283.24	12,373.67	9,272.87	65.01	58.97	89.38	-3,055.78	968.37	979.85	862.46	117.39	8.347		
12,700.00	9,283.56	12,473.67	9,273.27	66.04	60.09	89.39	-3,155.78	968.51	979.86	860.19	119.66	8.188		
12,800.00	9,283.87	12,573.67	9,273.68	67.08	61.22	89.39	-3,255.78	968.65	979.86	857.90	121.96	8.034		
12,900.00	9,284.18	12,673.67	9,274.09	68.14	62.37	89.40	-3,355.78	968.79	979.86	855.58	124.28	7.884		
13,000.00	9,284.50	12,773.67	9,274.50	69.21	63.53	89.40	-3,455.78	968.92	979.86	853.24	126.62	7.738		
13,100.00	9,284.81	12,873.67	9,274.90	70.30	64.71	89.41	-3,555.78	969.06	979.86	850.87	128.99	7.597		
13,200.00	9,285.12	12,973.67	9,275.31	71.40	65.89	89.41	-3,655.78	969.20	979.86	848.49	131.37	7.459		
13,300.00	9,285.43	13,073.67	9,275.72	72.51	67.08	89.42	-3,755.77	969.34	979.86	846.08	133.78	7.325		
13,400.00	9,285.75	13,173.67	9,276.13	73.63	68.28	89.43	-3,855.77	969.48	979.86	843.66	136.20	7.194		
13,500.00	9,286.06	13,273.67	9,276.53	74.76	69.49	89.43	-3,955.77	969.62	979.86	841.22	138.64	7.068		
13,600.00	9,286.37	13,373.67	9,276.94	75.90	70.71	89.44	-4,055.77	969.76	979.86	838.77	141.10	6.944		
13,700.00	9,286.69	13,473.67	9,277.35	77.06	71.94	89.44	-4,155.77	969.90	979.87	836.29	143.57	6.825		
13,800.00	9,287.00	13,573.67	9,277.76	78.22	73.18	89.45	-4,255.77	970.03	979.87	833.81	146.06	6.709		
13,900.00	9,287.31	13,673.67	9,278.16	79.39	74.42	89.45	-4,355.77	970.17	979.87	831.30	148.56	6.596		
14,000.00	9,287.62	13,773.67	9,278.57	80.57	75.67	89.46	-4,455.77	970.31	979.87	828.79	151.08	6.486		
14,100.00	9,287.94	13,873.67	9,278.98	81.76	76.92	89.46	-4,555.77	970.45	979.87	826.26	153.61	6.379		
14,200.00	9,288.25	13,973.67	9,279.39	82.96	78.19	89.47	-4,655.77	970.59	979.87	823.72	156.15	6.275		
14,300.00	9,288.56	14,073.67	9,279.80	84.16	79.46	89.48	-4,755.76	970.73	979.87	821.17	158.70	6.174		
14,400.00	9,288.87	14,173.67	9,280.20	85.37	80.73	89.48	-4,855.76	970.87	979.87	818.61	161.27	6.076		
14,500.00	9,289.19	14,273.67	9,280.61	86.59	82.01	89.49	-4,955.76	971.00	979.87	816.03	163.84	5.981		
14,600.00	9,289.50	14,373.67	9,281.02	87.82	83.30	89.49	-5,055.76	971.14	979.88	813.45	166.43	5.888		
14,700.00	9,289.81	14,473.67	9,281.43	89.05	84.59	89.50	-5,155.76	971.28	979.88	810.86	169.02	5.797		
14,800.00	9,290.13	14,573.67	9,281.83	90.29	85.88	89.50	-5,255.76	971.42	979.88	808.26	171.62	5.709		
14,900.00	9,290.44	14,673.67	9,282.24	91.53	87.18	89.51	-5,355.76	971.56	979.88	805.64	174.23	5.624		
15,000.00	9,290.75	14,773.67	9,282.65	92.78	88.48	89.51	-5,455.76	971.70	979.88	803.03	176.86	5.541		
15,100.00	9,291.06	14,873.67	9,283.06	94.04	89.79	89.52	-5,555.76	971.84	979.88	800.40	179.48	5.459		
15,200.00	9,291.38	14,973.67	9,283.46	95.30	91.10	89.53	-5,655.76	971.98	979.88	797.76	182.12	5.380		
15,300.00	9,291.69	15,073.67	9,283.87	96.57	92.42	89.53	-5,755.76	972.11	979.88	795.12	184.76	5.303		
15,400.00	9,292.00	15,173.67	9,284.28	97.84	93.74	89.54	-5,855.75	972.25	979.89	792.47	187.41	5.228		
15,500.00	9,292.32	15,273.67	9,284.69	99.11	95.06	89.54	-5,955.75	972.39	979.89	789.82	190.07	5.155		
15,600.00	9,292.63	15,373.67	9,285.09	100.39	96.39	89.55	-6,055.75	972.53	979.89	787.15	192.73	5.084		
15,700.00	9,292.94	15,473.67	9,285.50	101.68	97.72	89.55	-6,155.75	972.67	979.89	784.48	195.40	5.015		
15,800.00	9,293.25	15,573.67	9,285.91	102.97	99.05	89.56	-6,255.75	972.81	979.89	781.81	198.08	4.947		
15,900.00	9,293.57	15,673.67	9,286.32	104.26	100.39	89.56	-6,355.75	972.95	979.89	779.13	200.76	4.881		
16,000.00	9,293.88	15,773.67	9,286.72	105.55	101.72	89.57	-6,455.75	973.08	979.89	776.44	203.45	4.816		
16,100.00	9,294.19	15,873.67	9,287.13	106.86	103.07	89.58	-6,555.75	973.22	979.89	773.75	206.14	4.754		
16,200.00	9,294.51	15,973.67	9,287.54	108.16	104.41	89.58	-6,655.75	973.36	979.90	771.06	208.84	4.692		
16,300.00	9,294.82	16,073.67	9,287.95	109.47	105.76	89.59	-6,755.75	973.50	979.90	768.36	211.54	4.632		
16,400.00	9,295.13	16,173.67	9,288.36	110.78	107.11	89.59	-6,855.74	973.64	979.90	765.65	214.25	4.574		
16,500.00	9,295.44	16,273.67	9,288.76	112.09	108.46	89.60	-6,955.74	973.78	979.90	762.94	216.96	4.517		
16,600.00	9,295.76	16,373.67	9,289.17	113.41	109.81	89.60	-7,055.74	973.92	979.90	760.23	219.67	4.461		
16,700.00	9,296.07	16,473.67	9,289.58	114.73	111.17	89.61	-7,155.74	974.06	979.90	757.51	222.39	4.406		
16,800.00	9,296.38	16,573.67	9,289.99	116.05	112.52	89.61	-7,255.74	974.19	979.90	754.79	225.12	4.353		

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



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Quien Sabe Fed Com
Site Error: 1.00 usft
Reference Well: 801H
Well Error: 1.00 usft
Reference Wellbore: OH \ 65013
Reference Design: Plan 5 09-10-19

Local Co-ordinate Reference: Well 801H
TVD Reference: KB @ 3147.30usft (Ensign 155)
MD Reference: KB @ 3147.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design: Quien Sabe Fed Com - 602H - OH \ 65011 - Plan 4 08-15-19													Offset Site Error: 1.00 usft	
Survey Program: O-MWD-HRGM													Offset Well Error: 1.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference Depth (usft)	Offset Depth (usft)		Offset Wellbore Centre N-S (usft)	Offset Wellbore Centre E-W (usft)						
16,900.00	9,296.69	16,673.67	9,290.39	117.38	113.88	89.62	-7,355.74	974.33	979.91	752.06	227.85	4.301		
17,000.00	9,297.01	16,773.67	9,290.80	118.71	115.25	89.63	-7,455.74	974.47	979.91	749.33	230.58	4.250		
17,100.00	9,297.32	16,873.67	9,291.21	120.04	116.61	89.63	-7,555.74	974.61	979.91	746.59	233.31	4.200		
17,200.00	9,297.63	16,973.67	9,291.62	121.37	117.97	89.64	-7,655.74	974.75	979.91	743.86	236.05	4.151		
17,300.00	9,297.95	17,073.67	9,292.02	122.71	119.34	89.64	-7,755.74	974.89	979.91	741.12	238.79	4.104		
17,400.00	9,298.26	17,173.67	9,292.43	124.04	120.71	89.65	-7,855.73	975.03	979.91	738.37	241.54	4.057		
17,500.00	9,298.57	17,273.67	9,292.84	125.39	122.08	89.65	-7,955.73	975.16	979.91	735.63	244.29	4.011		
17,600.00	9,298.88	17,373.67	9,293.25	126.73	123.45	89.66	-8,055.73	975.30	979.92	732.88	247.04	3.967		
17,700.00	9,299.20	17,473.67	9,293.65	128.07	124.83	89.66	-8,155.73	975.44	979.92	730.12	249.79	3.923		
17,800.00	9,299.51	17,573.67	9,294.06	129.42	126.20	89.67	-8,255.73	975.58	979.92	727.37	252.55	3.880		
17,900.00	9,299.82	17,673.67	9,294.47	130.77	127.58	89.68	-8,355.73	975.72	979.92	724.61	255.31	3.838		
18,000.00	9,300.14	17,773.67	9,294.88	132.12	128.96	89.68	-8,455.73	975.86	979.92	721.85	258.07	3.797		
18,100.00	9,300.45	17,873.67	9,295.28	133.47	130.34	89.69	-8,555.73	976.00	979.92	719.08	260.84	3.757		
18,200.00	9,300.76	17,973.67	9,295.69	134.83	131.72	89.69	-8,655.73	976.13	979.92	716.32	263.61	3.717		
18,300.00	9,301.07	18,073.67	9,296.10	136.19	133.10	89.70	-8,755.73	976.27	979.93	713.55	266.38	3.679		
18,400.00	9,301.39	18,173.67	9,296.51	137.54	134.48	89.70	-8,855.73	976.41	979.93	710.78	269.15	3.641		
18,500.00	9,301.70	18,273.67	9,296.92	138.90	135.87	89.71	-8,955.72	976.55	979.93	708.00	271.92	3.604		
18,600.00	9,302.01	18,373.67	9,297.32	140.27	137.25	89.71	-9,055.72	976.69	979.93	705.23	274.70	3.567		
18,700.00	9,302.33	18,473.67	9,297.73	141.63	138.64	89.72	-9,155.72	976.83	979.93	702.45	277.48	3.532		
18,800.00	9,302.64	18,573.67	9,298.14	142.99	140.03	89.73	-9,255.72	976.97	979.93	699.67	280.26	3.496		
18,900.00	9,302.95	18,673.67	9,298.55	144.36	141.42	89.73	-9,355.72	977.11	979.93	696.89	283.05	3.462		
19,000.00	9,303.26	18,773.67	9,298.95	145.73	142.81	89.74	-9,455.72	977.24	979.94	694.11	285.83	3.428		
19,100.00	9,303.58	18,873.67	9,299.36	147.10	144.20	89.74	-9,555.72	977.38	979.94	691.32	288.62	3.395		
19,200.00	9,303.89	18,973.67	9,299.77	148.47	145.59	89.75	-9,655.72	977.52	979.94	688.53	291.41	3.363		
19,235.96	9,304.00	19,009.62	9,299.92	149.06	146.09	89.75	-9,691.68	977.57	979.94	687.53	292.41	3.351		

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



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Quien Sabe Fed Com
Site Error: 1.00 usft
Reference Well: 801H
Well Error: 1.00 usft
Reference Wellbore: OH \ 65013
Reference Design: Plan 5 09-10-19

Local Co-ordinate Reference: Well 801H
TVD Reference: KB @ 3147.30usft (Ensign 155)
MD Reference: KB @ 3147.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design: Quien Sabe Fed Com - 603H - OH \ 65012 - Plan 4 08-15-19														Offset Site Error: 1.00 usft
Survey Program: 0-MWD-HRGM														Offset Well Error: 1.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning						
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Footage	Offset Wellbore Centre	Between Centre	Between Ellipses	Minimum Separation	Separation Factor			
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(ft)	(usft)	(usft)	(usft)	(usft)				
0.00	0.00	100.00	100.00	1.00	1.00	-91.34	-0.70	-30.00	103.83					
100.00	100.00	100.60	100.60	1.04	1.00	-91.34	-0.70	-30.00	30.01	27.98	2.02	14.821		
200.00	200.00	200.60	200.60	1.37	1.10	-91.34	-0.70	-30.00	30.01	27.69	2.32	12.961		
300.00	300.00	300.60	300.60	1.75	1.48	-91.34	-0.70	-30.00	30.01	27.12	2.89	10.390		
400.00	400.00	400.60	400.60	2.13	1.85	-91.34	-0.70	-30.00	30.01	26.49	3.51	8.537		
500.00	500.00	500.60	500.60	2.50	2.22	-91.34	-0.70	-30.00	30.01	25.84	4.17	7.194		
600.00	600.00	600.60	600.60	2.87	2.59	-91.34	-0.70	-30.00	30.01	25.16	4.85	6.193		
700.00	700.00	700.60	700.60	3.23	2.95	-91.34	-0.70	-30.00	30.01	24.48	5.53	5.426		
800.00	800.00	800.60	800.60	3.60	3.31	-91.34	-0.70	-30.00	30.01	23.79	6.22	4.823		
863.33	863.33	863.93	863.93	3.79	3.54	90.00	-0.70	-30.00	30.00	23.42	6.58	4.556 CC		
900.00	899.98	900.58	900.58	3.91	3.67	-91.99	-0.70	-30.00	30.02	23.25	6.76	4.438		
1,000.00	999.92	1,000.52	1,000.52	4.44	4.03	98.59	-0.70	-30.00	30.34	23.09	7.25	4.186 ES		
1,100.00	1,099.86	1,100.46	1,100.46	4.77	4.39	104.97	-0.70	-30.00	31.05	23.30	7.76	4.003		
1,200.00	1,199.80	1,200.40	1,200.40	5.10	4.75	110.99	-0.70	-30.00	32.13	23.83	8.30	3.871		
1,300.00	1,299.74	1,300.34	1,300.34	5.44	5.11	116.56	-0.70	-30.00	33.54	24.66	8.88	3.776		
1,400.00	1,399.68	1,400.28	1,400.28	5.78	5.47	121.64	-0.70	-30.00	35.24	25.74	9.50	3.710		
1,500.00	1,499.61	1,500.21	1,500.21	6.12	5.83	126.22	-0.70	-30.00	37.19	27.04	10.15	3.665		
1,600.00	1,599.55	1,600.15	1,600.15	6.47	6.19	130.32	-0.70	-30.00	39.36	28.53	10.82	3.636		
1,700.00	1,699.49	1,700.09	1,700.09	6.81	6.55	133.98	-0.70	-30.00	41.70	30.18	11.52	3.620		
1,800.00	1,799.43	1,800.03	1,800.03	7.16	6.91	137.23	-0.70	-30.00	44.20	31.97	12.23	3.614 SF		
1,900.00	1,899.37	1,899.97	1,899.97	7.51	7.27	140.13	-0.70	-30.00	46.82	33.87	12.95	3.615		
2,000.00	1,999.31	1,999.91	1,999.91	7.86	7.63	142.72	-0.70	-30.00	49.55	35.87	13.68	3.623		
2,100.00	2,099.25	2,099.85	2,099.85	8.21	7.99	145.03	-0.70	-30.00	52.37	37.96	14.41	3.635		
2,200.00	2,199.19	2,199.79	2,199.79	8.57	8.34	147.11	-0.70	-30.00	55.27	40.12	15.14	3.650		
2,300.00	2,299.13	2,299.73	2,299.73	8.92	8.70	148.97	-0.70	-30.00	58.23	42.35	15.88	3.667		
2,400.00	2,399.07	2,399.67	2,399.67	9.38	9.06	-154.91	-0.70	-30.00	61.47	44.84	16.63	3.697		
2,500.00	2,498.94	2,498.82	2,498.82	9.84	9.39	-130.82	-0.48	-30.02	65.49	47.98	17.51	3.740		
2,600.00	2,598.61	2,597.12	2,597.08	10.15	9.73	-124.42	2.22	-30.26	72.64	54.27	18.37	3.954		
2,700.00	2,697.97	2,696.43	2,696.33	10.50	10.07	-124.52	5.68	-30.56	81.84	62.70	19.15	4.274		
2,800.00	2,796.89	2,795.33	2,795.17	10.91	10.43	-127.54	9.12	-30.86	93.11	73.13	19.98	4.660		
2,900.00	2,895.40	2,893.86	2,893.63	11.23	10.78	-132.84	12.54	-31.16	106.63	85.92	20.71	5.149		
3,000.00	2,993.88	2,992.35	2,992.07	11.54	11.14	-137.58	15.97	-31.46	121.15	99.70	21.46	5.646		
3,100.00	3,092.36	3,090.85	3,090.51	11.86	11.49	-141.30	19.39	-31.76	136.32	114.11	22.21	6.137		
3,200.00	3,190.84	3,189.35	3,188.94	12.19	11.85	-144.26	22.81	-32.06	151.94	128.98	22.96	6.618		
3,300.00	3,289.32	3,287.84	3,287.38	12.52	12.20	-146.67	26.24	-32.36	167.89	144.18	23.70	7.083		
3,400.00	3,387.80	3,386.34	3,385.82	12.85	12.56	-148.66	29.66	-32.66	184.07	159.63	24.44	7.531		
3,500.00	3,486.28	3,484.84	3,484.25	13.19	12.91	-150.33	33.09	-32.96	200.44	175.26	25.18	7.962		
3,600.00	3,584.76	3,583.33	3,582.69	13.53	13.26	-151.75	36.51	-33.26	216.95	191.04	25.91	8.374		
3,700.00	3,683.24	3,681.83	3,681.13	13.87	13.62	-152.96	39.94	-33.56	233.57	206.93	26.63	8.770		
3,800.00	3,781.72	3,780.33	3,779.56	14.22	13.97	-154.02	43.36	-33.85	250.27	222.91	27.36	9.148		
3,900.00	3,880.20	3,878.82	3,878.00	14.58	14.33	-154.94	46.79	-34.15	267.05	238.97	28.08	9.509		
4,000.00	3,978.68	3,977.32	3,976.44	14.95	14.66	-155.75	50.21	-34.45	283.89	255.09	28.81	9.855		
4,100.00	4,077.16	4,075.82	4,074.87	15.33	15.04	-156.48	53.63	-34.75	300.78	271.25	29.53	10.186		
4,200.00	4,175.65	4,174.31	4,173.31	15.72	15.39	-157.12	57.06	-35.05	317.71	287.46	30.25	10.503		
4,300.00	4,274.13	4,272.81	4,271.75	16.11	15.75	-157.70	60.48	-35.35	334.68	303.71	30.97	10.807		
4,400.00	4,372.61	4,371.31	4,370.18	16.50	16.10	-158.23	63.91	-35.65	351.67	319.98	31.69	11.097		
4,500.00	4,471.09	4,467.50	4,466.28	16.90	16.45	-158.54	68.22	-36.03	368.93	336.55	32.39	11.391		
4,600.00	4,569.57	4,563.46	4,561.95	17.29	16.81	-158.38	75.56	-36.67	386.95	353.88	33.08	11.699		
4,700.00	4,668.05	4,661.76	4,659.87	17.69	17.15	-158.09	84.09	-37.42	405.23	371.45	33.79	11.994		
4,800.00	4,766.53	4,760.05	4,757.79	18.10	17.50	-157.82	92.63	-38.17	423.52	389.02	34.50	12.275		
4,900.00	4,865.01	4,858.35	4,855.72	18.50	17.86	-157.58	101.16	-38.91	441.81	406.60	35.22	12.545		
5,000.00	4,963.49	4,956.64	4,953.64	18.90	18.22	-157.36	109.70	-39.66	460.12	424.18	35.94	12.803		

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



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Quien Sabe Fed Com
Site Error: 1.00 usft
Reference Well: 801H
Well Error: 1.00 usft
Reference Wellbore: OH \ 65013
Reference Design: Plan 5 09-10-19

Local Co-ordinate Reference: Well 801H
TVD Reference: KB @ 3147.30usft (Ensign 155)
MD Reference: KB @ 3147.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design: Quien Sabe Fed Com - 603H - OH \ 65012 - Plan 4 08-15-19														Offset Site Error: 1.00 usft	
Survey Program: O-MWD-HRGM														Offset Well Error: 1.00 usft	
Reference		Offset		Semi Major Axis		Highside Footface (")	Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Vertical Depth (usft)	Vertical Depth (usft)	Measured Vertical Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre N-S (usft)	Offset Wellbore Centre E-W (usft)				Between Centres (usft)	Between Ellipses (usft)		
5,100.00	5,061.97	5,054.94	5,051.56	19.31	18.57	-157.15	118.23	-40.41	478.43	441.77	36.66	13.051			
5,200.00	5,160.45	5,153.23	5,149.48	19.72	18.93	-156.96	126.77	-41.15	496.74	459.36	37.38	13.289			
5,300.00	5,258.93	5,251.53	5,247.40	20.12	19.29	-156.78	135.30	-41.90	515.06	476.96	38.10	13.517			
5,400.00	5,357.41	5,349.82	5,345.32	20.53	19.64	-156.61	143.83	-42.65	533.38	494.55	38.83	13.737			
5,500.00	5,455.90	5,448.12	5,443.24	20.94	20.00	-156.46	152.37	-43.39	551.71	512.16	39.55	13.948			
5,600.00	5,554.38	5,546.42	5,541.17	21.35	20.36	-156.31	160.90	-44.14	570.04	529.76	40.28	14.152			
5,700.00	5,652.86	5,644.71	5,639.09	21.76	20.71	-156.17	169.44	-44.89	588.38	547.37	41.01	14.348			
5,800.00	5,751.34	5,743.01	5,737.01	22.18	21.07	-156.05	177.97	-45.63	606.72	564.98	41.74	14.537			
5,900.00	5,849.82	5,841.30	5,834.93	22.59	21.43	-155.92	186.51	-46.38	625.06	582.59	42.47	14.719			
6,000.00	5,948.30	5,939.60	5,932.85	23.00	21.79	-155.81	195.04	-47.13	643.40	600.20	43.20	14.895			
6,100.00	6,046.78	6,037.89	6,030.77	23.42	22.15	-155.70	203.58	-47.87	661.75	617.82	43.93	15.064			
6,200.00	6,145.26	6,136.19	6,128.69	23.83	22.51	-155.60	212.11	-48.62	680.09	635.43	44.66	15.228			
6,300.00	6,243.74	6,234.48	6,226.62	24.25	22.87	-155.51	220.64	-49.37	698.44	653.05	45.39	15.387			
6,400.00	6,342.22	6,332.78	6,324.54	24.66	23.23	-155.41	229.18	-50.11	716.79	670.67	46.13	15.540			
6,500.00	6,440.70	6,431.07	6,422.46	25.08	23.58	-155.33	237.71	-50.86	735.15	688.29	46.86	15.688			
6,600.00	6,539.18	6,529.37	6,520.38	25.50	23.94	-155.25	246.25	-51.61	753.50	705.91	47.59	15.832			
6,700.00	6,637.67	6,627.67	6,618.30	25.91	24.30	-155.17	254.78	-52.35	771.86	723.53	48.33	15.971			
6,800.00	6,736.15	6,725.96	6,716.22	26.33	24.66	-155.09	263.32	-53.10	790.22	741.15	49.07	16.105			
6,900.00	6,834.63	6,824.26	6,814.14	26.75	25.02	-155.02	271.85	-53.85	808.57	758.77	49.80	16.236			
7,000.00	6,933.11	6,922.55	6,912.06	27.17	25.38	-154.95	280.39	-54.59	826.93	776.40	50.54	16.363			
7,100.00	7,031.59	7,020.85	7,009.99	27.59	25.74	-154.89	288.92	-55.34	845.30	794.02	51.28	16.485			
7,200.00	7,130.07	7,119.14	7,107.91	28.00	26.10	-154.82	297.45	-56.09	863.66	811.64	52.01	16.605			
7,300.00	7,228.55	7,217.44	7,205.83	28.42	26.46	-154.76	305.99	-56.83	882.02	829.27	52.75	16.720			
7,400.00	7,327.03	7,315.73	7,303.75	28.84	26.82	-154.71	314.52	-57.58	900.38	846.89	53.49	16.833			
7,500.00	7,425.51	7,414.03	7,401.67	29.26	27.19	-154.65	323.06	-58.33	918.75	864.52	54.23	16.942			
7,600.00	7,523.99	7,512.32	7,499.59	29.68	27.55	-154.60	331.59	-59.07	937.11	882.15	54.97	17.048			
7,700.00	7,622.47	7,610.62	7,597.51	30.10	27.91	-154.55	340.13	-59.82	955.48	899.77	55.71	17.152			
7,800.00	7,720.95	7,708.92	7,695.44	30.53	28.27	-154.50	348.66	-60.57	973.85	917.40	56.45	17.252			
7,900.00	7,819.43	7,807.21	7,793.36	30.95	28.63	-154.45	357.20	-61.31	992.21	935.03	57.19	17.350			
8,000.00	7,917.92	7,905.51	7,891.28	31.37	28.99	-154.41	365.73	-62.06	1,010.58	952.65	57.93	17.445			
8,100.00	8,016.40	8,003.80	7,989.20	31.79	29.35	-154.36	374.26	-62.81	1,028.95	970.28	58.67	17.538			
8,200.00	8,114.88	8,102.10	8,087.12	32.21	29.71	-154.32	382.80	-63.55	1,047.32	987.91	59.41	17.628			
8,300.00	8,213.36	8,200.39	8,185.04	32.63	30.08	-154.28	391.33	-64.30	1,065.69	1,005.54	60.15	17.716			
8,400.00	8,311.84	8,298.69	8,282.96	33.06	30.44	-154.24	399.87	-65.05	1,084.06	1,023.17	60.90	17.802			
8,500.00	8,410.32	8,396.98	8,380.89	33.48	30.80	-154.20	408.40	-65.79	1,102.43	1,040.79	61.64	17.885			
8,600.00	8,508.80	8,495.28	8,478.81	33.90	31.16	-154.16	416.94	-66.54	1,120.80	1,058.42	62.38	17.967			
8,700.00	8,607.28	8,593.57	8,576.73	34.33	31.52	-154.13	425.47	-67.29	1,139.18	1,076.05	63.12	18.047			
8,800.00	8,705.76	8,740.68	8,723.50	34.75	32.10	-154.53	428.77	-67.91	1,155.93	1,091.79	64.14	18.021			
8,900.00	8,803.93	8,961.42	8,934.10	35.22	32.98	177.19	367.60	-65.34	1,166.51	1,101.50	65.01	17.943			
9,000.00	8,899.26	9,122.50	9,064.99	35.91	33.48	153.74	274.75	-60.88	1,182.41	1,116.81	65.60	18.024			
9,100.00	8,988.80	9,251.38	9,147.87	36.56	33.75	140.38	176.52	-55.98	1,206.86	1,140.65	66.20	18.229			
9,200.00	9,069.82	9,358.31	9,198.53	37.17	33.89	130.17	82.65	-51.21	1,240.24	1,173.45	66.79	18.569			
9,300.00	9,139.87	9,451.15	9,227.71	37.74	33.97	120.97	-5.25	-46.70	1,281.62	1,214.32	67.30	19.044			
9,400.00	9,196.81	9,535.19	9,241.57	38.29	34.02	112.07	-87.96	-42.40	1,329.23	1,261.52	67.71	19.631			
9,500.00	9,238.92	9,600.00	9,244.07	38.83	34.06	103.68	-152.61	-39.06	1,381.03	1,313.02	68.01	20.305			
9,600.00	9,264.91	9,657.88	9,244.31	39.38	34.11	95.82	-210.45	-36.90	1,435.72	1,367.39	68.32	21.013			
9,700.00	9,274.00	9,712.58	9,244.54	39.96	34.17	88.80	-265.13	-35.94	1,491.28	1,422.62	68.65	21.721			
9,800.00	9,274.32	9,786.55	9,244.86	40.60	34.27	88.80	-339.10	-35.77	1,545.60	1,476.43	69.17	22.346			
9,900.00	9,274.63	9,872.28	9,245.22	41.31	34.43	88.86	-424.83	-35.64	1,597.06	1,527.19	69.87	22.858			
10,000.00	9,274.96	9,959.75	9,245.60	42.06	34.66	88.92	-512.30	-35.52	1,645.50	1,574.81	70.68	23.280			
10,100.00	9,275.28	10,048.87	9,245.98	42.86	34.96	88.96	-601.42	-35.39	1,690.85	1,619.25	71.61	23.812			
10,200.00	9,275.60	10,139.51	9,246.37	43.69	35.33	89.00	-692.06	-35.26	1,733.07	1,660.43	72.64	23.858			

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 801H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3147.30usft (Ensign 155)
Reference Site:	Quien Sabe Fed Com	MD Reference:	KB @ 3147.30usft (Ensign 155)
Site Error:	1.00 usft	North Reference:	Grid
Reference Well:	801H	Survey Calculation Method:	Minimum Curvature
Well Error:	1.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH \ 65013	Database:	USA Compass
Reference Design:	Plan 5 09-10-19	Offset TVD Reference:	Offset Datum

Offset Design: Quien Sabe Fed Com - 603H - OH \ 65012 - Plan 4 08-15-19													Offset Site Error: 1.00 usft
Survey Program: 10-MWD-HRGM													Offset Well Error: 1.00 usft
Reference	Offset	Semi-Major Axis		Distance		Warning							
Measured Vertical Depth (usft)	Reference Vertical Depth (usft)	Measured Vertical Depth (usft)	Offset Vertical Depth (usft)	Reference 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		
10,300.00	9,275.93	10,231.57	9,246.76	44.54	35.76	89.04	-784.11	-35.13	1,772.10	1,698.33	73.78	24.019	
10,400.00	9,276.26	10,324.93	9,247.16	45.41	36.26	89.07	-877.48	-34.99	1,807.90	1,732.89	75.01	24.101	
10,500.00	9,276.58	10,419.49	9,247.56	46.30	36.81	89.09	-972.04	-34.86	1,840.42	1,764.08	76.34	24.108	
10,600.00	9,276.91	10,515.13	9,247.97	47.19	37.42	89.11	-1,067.67	-34.72	1,869.61	1,791.86	77.75	24.046	
10,700.00	9,277.24	10,611.72	9,248.38	48.08	38.08	89.13	-1,164.27	-34.58	1,895.45	1,816.21	79.25	23.919	
10,800.00	9,277.57	10,709.16	9,248.80	48.96	38.79	89.14	-1,261.71	-34.44	1,917.91	1,837.10	80.81	23.733	
10,900.00	9,277.89	10,807.33	9,249.22	49.84	39.54	89.15	-1,359.87	-34.30	1,936.95	1,854.51	82.44	23.494	
11,000.00	9,278.22	10,906.10	9,249.64	50.72	40.33	89.16	-1,458.64	-34.16	1,952.55	1,868.42	84.14	23.207	
11,100.00	9,278.54	11,005.35	9,250.06	51.58	41.16	89.17	-1,557.89	-34.02	1,964.70	1,878.82	85.88	22.877	
11,200.00	9,278.86	11,104.97	9,250.49	52.43	42.03	89.17	-1,657.51	-33.88	1,973.38	1,885.71	87.67	22.509	
11,300.00	9,279.18	11,204.83	9,250.92	53.26	42.93	89.17	-1,757.37	-33.73	1,978.57	1,889.07	89.50	22.106	
11,400.00	9,279.49	11,304.81	9,251.34	54.08	43.86	89.17	-1,857.35	-33.59	1,980.28	1,888.91	91.37	21.674	
11,500.00	9,279.80	11,404.81	9,251.77	54.88	44.82	89.17	-1,957.35	-33.45	1,980.28	1,887.04	93.24	21.239	
11,600.00	9,280.12	11,504.81	9,252.20	55.69	45.80	89.17	-2,057.35	-33.30	1,980.27	1,885.13	95.14	20.814	
11,700.00	9,280.43	11,604.81	9,252.63	56.53	46.81	89.18	-2,157.34	-33.16	1,980.27	1,883.17	97.09	20.395	
11,800.00	9,280.74	11,704.81	9,253.05	57.40	47.84	89.18	-2,257.34	-33.02	1,980.26	1,881.17	99.09	19.984	
11,900.00	9,281.05	11,804.81	9,253.48	58.28	48.89	89.18	-2,357.34	-32.87	1,980.26	1,879.13	101.13	19.581	
12,000.00	9,281.37	11,904.81	9,253.91	59.18	49.97	89.19	-2,457.34	-32.73	1,980.25	1,877.04	103.21	19.186	
12,100.00	9,281.68	12,004.81	9,254.33	60.11	51.06	89.19	-2,557.34	-32.59	1,980.25	1,874.92	105.33	18.801	
12,200.00	9,281.99	12,104.81	9,254.76	61.05	52.16	89.19	-2,657.34	-32.44	1,980.25	1,872.76	107.48	18.424	
12,300.00	9,282.31	12,204.81	9,255.19	62.02	53.28	89.20	-2,757.34	-32.30	1,980.24	1,870.57	109.67	18.057	
12,400.00	9,282.62	12,304.81	9,255.62	63.00	54.42	89.20	-2,857.34	-32.16	1,980.24	1,868.35	111.89	17.699	
12,500.00	9,282.93	12,404.81	9,256.04	63.99	55.57	89.20	-2,957.34	-32.01	1,980.23	1,866.10	114.13	17.350	
12,600.00	9,283.24	12,504.81	9,256.47	65.01	56.74	89.21	-3,057.33	-31.87	1,980.23	1,863.82	116.41	17.011	
12,700.00	9,283.56	12,604.81	9,256.90	66.04	57.92	89.21	-3,157.33	-31.73	1,980.22	1,861.51	118.71	16.681	
12,800.00	9,283.87	12,704.81	9,257.33	67.08	59.11	89.21	-3,257.33	-31.58	1,980.22	1,859.18	121.04	16.360	
12,900.00	9,284.18	12,804.81	9,257.75	68.14	60.31	89.22	-3,357.33	-31.44	1,980.22	1,856.83	123.39	16.049	
13,000.00	9,284.50	12,904.81	9,258.18	69.21	61.52	89.22	-3,457.33	-31.30	1,980.21	1,854.45	125.76	15.746	
13,100.00	9,284.81	13,004.81	9,258.61	70.30	62.74	89.22	-3,557.33	-31.15	1,980.21	1,852.06	128.15	15.452	
13,200.00	9,285.12	13,104.81	9,259.03	71.40	63.97	89.23	-3,657.33	-31.01	1,980.20	1,849.64	130.56	15.167	
13,300.00	9,285.43	13,204.81	9,259.46	72.51	65.20	89.23	-3,757.33	-30.87	1,980.20	1,847.20	133.00	14.889	
13,400.00	9,285.75	13,304.81	9,259.89	73.63	66.45	89.23	-3,857.33	-30.72	1,980.20	1,844.75	135.44	14.620	
13,500.00	9,286.06	13,404.81	9,260.32	74.76	67.70	89.24	-3,957.32	-30.58	1,980.19	1,842.28	137.91	14.359	
13,600.00	9,286.37	13,504.81	9,260.74	75.90	68.97	89.24	-4,057.32	-30.44	1,980.19	1,839.80	140.39	14.105	
13,700.00	9,286.69	13,604.81	9,261.17	77.06	70.23	89.24	-4,157.32	-30.29	1,980.18	1,837.30	142.89	13.858	
13,800.00	9,287.00	13,704.81	9,261.60	78.22	71.51	89.25	-4,257.32	-30.15	1,980.18	1,834.78	145.40	13.619	
13,900.00	9,287.31	13,804.81	9,262.02	79.39	72.79	89.25	-4,357.32	-30.01	1,980.17	1,832.25	147.92	13.387	
14,000.00	9,287.62	13,904.81	9,262.45	80.57	74.08	89.25	-4,457.32	-29.86	1,980.17	1,829.71	150.46	13.161	
14,100.00	9,287.94	14,004.81	9,262.88	81.76	75.37	89.26	-4,557.32	-29.72	1,980.17	1,827.16	153.01	12.942	
14,200.00	9,288.25	14,104.81	9,263.31	82.96	76.67	89.26	-4,657.32	-29.58	1,980.16	1,824.60	155.57	12.729	
14,300.00	9,288.56	14,204.81	9,263.73	84.16	77.97	89.26	-4,757.32	-29.43	1,980.16	1,822.02	158.14	12.522	
14,400.00	9,288.87	14,304.81	9,264.16	85.37	79.28	89.27	-4,857.31	-29.29	1,980.15	1,819.43	160.72	12.321	
14,500.00	9,289.19	14,404.81	9,264.59	86.59	80.59	89.27	-4,957.31	-29.15	1,980.15	1,816.84	163.31	12.125	
14,600.00	9,289.50	14,504.81	9,265.01	87.82	81.90	89.27	-5,057.31	-29.00	1,980.15	1,814.23	165.91	11.935	
14,700.00	9,289.81	14,604.81	9,265.44	89.05	83.23	89.28	-5,157.31	-28.86	1,980.14	1,811.62	168.52	11.750	
14,800.00	9,290.13	14,704.81	9,265.87	90.29	84.55	89.28	-5,257.31	-28.72	1,980.14	1,808.99	171.14	11.570	
14,900.00	9,290.44	14,804.81	9,266.30	91.53	85.88	89.28	-5,357.31	-28.57	1,980.13	1,806.36	173.77	11.395	
15,000.00	9,290.75	14,904.81	9,266.72	92.78	87.21	89.29	-5,457.31	-28.43	1,980.13	1,803.72	176.41	11.225	
15,100.00	9,291.06	15,004.81	9,267.15	94.04	88.54	89.29	-5,557.31	-28.29	1,980.13	1,801.08	179.05	11.059	
15,200.00	9,291.38	15,104.81	9,267.58	95.30	89.88	89.29	-5,657.31	-28.14	1,980.12	1,798.42	181.70	10.898	
15,300.00	9,291.69	15,204.81	9,268.01	96.57	91.22	89.30	-5,757.31	-28.00	1,980.12	1,795.76	184.36	10.741	
15,400.00	9,292.00	15,304.81	9,268.43	97.84	92.57	89.30	-5,857.30	-27.86	1,980.11	1,793.09	187.02	10.588	

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 801H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3147.30usft (Ensign 155)
Reference Site:	Quien Sabe Fed Com	MD Reference:	KB @ 3147.30usft (Ensign 155)
Site Error:	1.00 usft	North Reference:	Grid
Reference Well:	801H	Survey Calculation Method:	Minimum Curvature
Well Error:	1.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH \ 65013	Database:	USA Compass
Reference Design:	Plan 5 09-10-19	Offset TVD Reference:	Offset Datum

Offset Design: Quien Sabe Fed Com - 603H - OH 165012 - Plan 4 08-15-19												Offset Site Error: 1.00 usft	
Survey Program: O-MWD-HRGM												Offset Well Error: 1.00 usft	
Reference		Offset		Semi Major Axis		Distance		Minimum		Separation		Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Footage	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Factor	Warning	
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(ft)	N-S (usft)	E-W (usft)	(usft)	(usft)	(usft)		
15,500.00	9,292.32	15,404.81	9,268.86	99.11	93.92	89.30	-5,957.30	-27.71	1,980.11	1,790.42	189.69	10.439	
15,600.00	9,292.63	15,504.81	9,269.29	100.39	95.27	89.31	-6,057.30	-27.57	1,980.10	1,787.74	192.37	10.293	
15,700.00	9,292.94	15,604.81	9,269.71	101.68	96.62	89.31	-6,157.30	-27.43	1,980.10	1,785.05	195.05	10.152	
15,800.00	9,293.25	15,704.81	9,270.14	102.97	97.97	89.31	-6,257.30	-27.28	1,980.10	1,782.36	197.74	10.014	
15,900.00	9,293.57	15,804.81	9,270.57	104.26	99.33	89.32	-6,357.30	-27.14	1,980.09	1,779.66	200.43	9.879	
16,000.00	9,293.88	15,904.81	9,271.00	105.55	100.69	89.32	-6,457.30	-27.00	1,980.09	1,776.96	203.13	9.748	
16,100.00	9,294.19	16,004.81	9,271.42	106.86	102.05	89.32	-6,557.30	-26.85	1,980.08	1,774.25	205.83	9.620	
16,200.00	9,294.51	16,104.81	9,271.85	108.16	103.42	89.33	-6,657.30	-26.71	1,980.08	1,771.54	208.54	9.495	
16,300.00	9,294.82	16,204.81	9,272.28	109.47	104.78	89.33	-6,757.29	-26.57	1,980.08	1,768.83	211.25	9.373	
16,400.00	9,295.13	16,304.81	9,272.70	110.78	106.15	89.33	-6,857.29	-26.42	1,980.07	1,766.11	213.97	9.254	
16,500.00	9,295.44	16,404.81	9,273.13	112.09	107.52	89.34	-6,957.29	-26.28	1,980.07	1,763.38	216.69	9.138	
16,600.00	9,295.76	16,504.81	9,273.56	113.41	108.89	89.34	-7,057.29	-26.14	1,980.06	1,760.65	219.41	9.024	
16,700.00	9,296.07	16,604.81	9,273.99	114.73	110.27	89.34	-7,157.29	-25.99	1,980.06	1,757.92	222.14	8.913	
16,800.00	9,296.38	16,704.81	9,274.41	116.05	111.64	89.35	-7,257.29	-25.85	1,980.06	1,755.18	224.88	8.805	
16,900.00	9,296.69	16,804.81	9,274.84	117.38	113.02	89.35	-7,357.29	-25.71	1,980.05	1,752.44	227.61	8.699	
17,000.00	9,297.01	16,904.81	9,275.27	118.71	114.40	89.35	-7,457.29	-25.57	1,980.05	1,749.70	230.35	8.596	
17,100.00	9,297.32	17,004.81	9,275.69	120.04	115.78	89.36	-7,557.29	-25.42	1,980.04	1,746.95	233.10	8.495	
17,200.00	9,297.63	17,104.81	9,276.12	121.37	117.16	89.36	-7,657.28	-25.28	1,980.04	1,744.20	235.84	8.396	
17,300.00	9,297.95	17,204.81	9,276.55	122.71	118.54	89.36	-7,757.28	-25.14	1,980.04	1,741.44	238.59	8.299	
17,400.00	9,298.26	17,304.81	9,276.98	124.04	119.93	89.37	-7,857.28	-24.99	1,980.03	1,738.69	241.35	8.204	
17,500.00	9,298.57	17,404.81	9,277.40	125.39	121.31	89.37	-7,957.28	-24.85	1,980.03	1,735.93	244.10	8.111	
17,600.00	9,298.88	17,504.81	9,277.83	126.73	122.70	89.37	-8,057.28	-24.71	1,980.03	1,733.16	246.86	8.021	
17,700.00	9,299.20	17,604.81	9,278.26	128.07	124.09	89.38	-8,157.28	-24.56	1,980.02	1,730.40	249.62	7.932	
17,800.00	9,299.51	17,704.81	9,278.69	129.42	125.48	89.38	-8,257.28	-24.42	1,980.02	1,727.63	252.39	7.845	
17,900.00	9,299.82	17,804.81	9,279.11	130.77	126.87	89.38	-8,357.28	-24.28	1,980.01	1,724.86	255.15	7.760	
18,000.00	9,300.14	17,904.81	9,279.54	132.12	128.26	89.39	-8,457.28	-24.13	1,980.01	1,722.09	257.92	7.677	
18,100.00	9,300.45	18,004.81	9,279.97	133.47	129.65	89.39	-8,557.27	-23.99	1,980.01	1,719.31	260.70	7.595	
18,200.00	9,300.76	18,104.81	9,280.39	134.83	131.05	89.39	-8,657.27	-23.85	1,980.00	1,716.53	263.47	7.515	
18,300.00	9,301.07	18,204.81	9,280.82	136.19	132.44	89.40	-8,757.27	-23.70	1,980.00	1,713.75	266.25	7.437	
18,400.00	9,301.39	18,304.81	9,281.25	137.54	133.84	89.40	-8,857.27	-23.56	1,979.99	1,710.97	269.03	7.360	
18,500.00	9,301.70	18,404.81	9,281.68	138.90	135.23	89.40	-8,957.27	-23.42	1,979.99	1,708.18	271.81	7.285	
18,600.00	9,302.01	18,504.81	9,282.10	140.27	136.63	89.41	-9,057.27	-23.27	1,979.99	1,705.40	274.59	7.211	
18,700.00	9,302.33	18,604.80	9,282.53	141.63	138.03	89.41	-9,157.27	-23.13	1,979.98	1,702.61	277.37	7.138	
18,800.00	9,302.64	18,704.80	9,282.96	142.99	139.43	89.41	-9,257.27	-22.99	1,979.98	1,699.82	280.16	7.067	
18,900.00	9,302.95	18,804.80	9,283.38	144.36	140.83	89.42	-9,357.27	-22.84	1,979.97	1,697.03	282.95	6.998	
19,000.00	9,303.26	18,904.80	9,283.81	145.73	142.23	89.42	-9,457.27	-22.70	1,979.97	1,694.23	285.74	6.929	
19,100.00	9,303.58	19,004.80	9,284.24	147.10	143.63	89.42	-9,557.26	-22.56	1,979.97	1,691.43	288.53	6.862	
19,200.00	9,303.89	19,104.80	9,284.67	148.47	145.03	89.43	-9,657.26	-22.41	1,979.96	1,688.64	291.33	6.796	
19,235.96	9,304.00	19,140.76	9,284.82	149.06	145.54	89.43	-9,693.22	-22.36	1,979.96	1,687.63	292.33	6.773	

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 801H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3147.30usft (Ensign 155)
Reference Site:	Quien Sabe Fed Com	MD Reference:	KB @ 3147.30usft (Ensign 155)
Site Error:	1.00 usft	North Reference:	Grid
Reference Well:	801H	Survey Calculation Method:	Minimum Curvature
Well Error:	1.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH \ 65013	Database:	USA Compass
Reference Design:	Plan 5 09-10-19	Offset TVD Reference:	Offset Datum

Offset Design: Quien Sabe Fed Com - 603H - OH \ 65012 - Surveys (Ensign 155)													Offset Site Error:	1.00 usft
Survey Program: 147-MWD-HRGM													Offset Well Error:	1.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset	Wellbore	Control	Between	Between	Minimum	Separation	Factor
Depth	Depth	Depth	Depth	Depth	Depth	Footage	Depth	Depth	Depth	Control	Ellipses	Separation	Factor	Warning
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(ft)	(usft)	(usft)	(usft)	(usft)	(usft)	(usft)		
0.00	0.00	0.60	0.60	1.00	1.00	-91.34	-0.70	-30.00	30.01					
100.00	100.00	100.68	100.68	1.04	1.10	-90.95	-0.50	-29.87	29.87	27.75	2.12	14.064		
200.00	200.00	200.73	200.73	1.37	1.39	-89.73	0.14	-29.50	29.51	26.89	2.62	11.283		
300.00	300.00	300.73	300.72	1.75	1.70	-87.28	1.38	-29.03	29.06	25.88	3.18	9.138		
361.08	361.08	361.70	361.68	1.98	1.88	-85.12	2.46	-28.80	28.91	25.41	3.50	8.258 CC		
400.00	400.00	400.53	400.50	2.13	1.99	-83.52	3.27	-28.79	28.98	25.28	3.70	7.823 ES		
500.00	500.00	500.45	500.39	2.50	2.32	-79.03	5.62	-28.97	29.51	25.29	4.22	6.999		
600.00	600.00	599.98	599.88	2.87	2.68	-75.07	8.02	-30.08	31.13	26.39	4.75	6.561		
700.00	700.00	699.93	699.80	3.23	3.05	-72.16	10.25	-31.86	33.48	28.17	5.31	6.309		
800.00	800.00	799.85	799.66	3.60	3.46	-68.60	13.12	-33.48	35.97	30.09	5.89	6.112		
900.00	899.98	900.08	899.83	3.91	3.81	117.29	16.27	-34.85	39.23	32.74	6.49	6.043		
1,000.00	999.92	1,000.73	1,000.47	4.44	4.16	122.30	17.06	-35.25	41.71	34.47	7.24	5.758		
1,100.00	1,099.86	1,100.71	1,100.46	4.77	4.46	125.89	16.90	-35.39	43.69	35.71	7.98	5.477		
1,200.00	1,199.80	1,200.57	1,200.31	5.10	4.75	129.00	16.67	-35.64	45.87	37.24	8.64	5.312		
1,300.00	1,299.74	1,300.29	1,300.03	5.44	5.08	132.37	17.02	-35.85	48.54	39.23	9.31	5.213		
1,400.00	1,399.68	1,400.02	1,399.75	5.78	5.43	135.28	17.62	-36.41	51.78	41.77	10.01	5.174		
1,500.00	1,499.61	1,499.88	1,499.61	6.12	5.78	137.86	18.41	-37.14	55.39	44.67	10.72	5.168		
1,600.00	1,599.55	1,599.89	1,599.61	6.47	6.12	139.80	18.94	-38.08	59.04	47.60	11.44	5.159		
1,700.00	1,699.49	1,700.95	1,700.67	6.81	6.44	141.09	18.37	-38.77	61.73	49.57	12.16	5.077		
1,800.00	1,799.43	1,801.76	1,801.47	7.16	6.89	143.27	17.15	-37.56	62.80	49.94	12.86	4.884		
1,900.00	1,899.37	1,901.91	1,901.57	7.51	7.30	146.25	15.92	-35.14	63.25	49.61	13.64	4.637		
2,000.00	1,999.31	2,002.32	2,001.94	7.86	7.63	149.23	14.34	-32.45	63.44	49.04	14.40	4.406		
2,100.00	2,099.25	2,102.90	2,102.41	8.21	7.98	153.12	12.18	-28.31	62.63	47.43	15.20	4.119		
2,200.00	2,199.19	2,202.49	2,201.89	8.57	8.32	157.19	10.01	-24.04	62.01	46.00	16.00	3.874		
2,215.12	2,214.30	2,217.52	2,216.90	8.62	8.37	157.75	9.70	-23.47	61.99	45.87	16.12	3.845		
2,300.00	2,299.13	2,301.76	2,301.08	8.92	8.66	160.34	8.16	-21.00	62.42	45.66	16.76	3.725		
2,400.00	2,399.07	2,401.16	2,400.48	9.38	9.00	-144.60	6.52	-20.95	64.05	46.59	17.47	3.667		
2,500.00	2,498.94	2,500.92	2,500.21	9.84	9.33	-122.18	5.01	-21.64	66.16	47.86	18.29	3.617 SF		
2,600.00	2,598.61	2,599.37	2,598.66	10.15	9.67	-118.24	4.23	-22.16	69.63	50.61	19.03	3.660		
2,700.00	2,697.97	2,697.69	2,696.96	10.50	10.09	-119.77	6.28	-22.28	76.86	57.11	19.74	3.893		
2,800.00	2,796.89	2,796.04	2,795.27	10.91	10.49	-123.88	9.19	-22.39	86.90	66.37	20.53	4.233		
2,900.00	2,895.40	2,893.55	2,892.71	11.23	10.83	-130.07	12.72	-23.11	100.22	79.01	21.21	4.725		
3,000.00	2,993.88	2,991.46	2,990.52	11.54	11.17	-135.23	17.05	-24.23	115.54	93.62	21.92	5.271		
3,100.00	3,092.36	3,089.58	3,088.52	11.86	11.51	-139.15	21.54	-25.49	131.77	109.13	22.63	5.822		
3,200.00	3,190.84	3,187.12	3,185.94	12.19	11.85	-142.13	26.25	-26.95	148.76	125.42	23.34	6.374		
3,300.00	3,289.32	3,284.44	3,283.11	12.52	12.19	-144.43	31.35	-28.84	166.63	142.59	24.04	6.932		
3,400.00	3,387.80	3,382.67	3,381.17	12.85	12.53	-146.26	36.72	-30.96	184.99	160.24	24.74	7.476		
3,500.00	3,486.28	3,480.88	3,479.22	13.19	12.88	-147.80	41.94	-33.04	203.42	177.97	25.45	7.993		
3,600.00	3,584.76	3,577.85	3,576.01	13.53	13.22	-149.02	47.34	-35.27	222.21	196.07	26.14	8.501		
3,700.00	3,683.24	3,676.72	3,674.70	13.87	13.56	-150.14	52.57	-37.78	241.22	214.37	26.85	8.985		
3,800.00	3,781.72	3,777.68	3,775.58	14.22	13.92	-151.50	56.11	-39.99	259.50	231.92	27.58	9.409		
3,900.00	3,880.20	3,874.73	3,872.57	14.58	14.27	-152.75	58.89	-42.16	277.78	249.50	28.28	9.823		
4,000.00	3,978.68	3,977.82	3,975.60	14.95	14.63	-153.86	61.93	-43.68	295.46	266.44	29.02	10.181		
4,100.00	4,077.16	4,080.75	4,078.49	15.33	15.00	-154.76	64.93	-43.29	311.44	281.67	29.77	10.460		
4,200.00	4,175.65	4,179.87	4,177.55	15.72	15.35	-155.52	67.90	-42.36	326.97	296.46	30.50	10.719		
4,300.00	4,274.13	4,279.21	4,276.82	16.11	15.69	-156.12	71.28	-41.10	342.30	311.08	31.22	10.963		
4,400.00	4,372.61	4,378.52	4,376.06	16.50	16.04	-156.62	75.02	-39.71	357.61	325.67	31.94	11.195		
4,500.00	4,471.09	4,478.35	4,475.79	16.90	16.39	-157.01	79.11	-37.94	372.63	339.97	32.67	11.407		
4,600.00	4,569.57	4,576.75	4,574.07	17.29	16.73	-157.32	83.43	-36.04	387.58	354.20	33.38	11.611		
4,700.00	4,668.05	4,673.20	4,670.33	17.69	17.07	-157.38	89.24	-34.24	402.88	368.80	34.09	11.820		
4,800.00	4,766.53	4,769.77	4,766.64	18.10	17.41	-157.28	96.27	-32.88	418.84	384.05	34.79	12.040		
4,900.00	4,865.01	4,867.00	4,863.59	18.50	17.76	-157.18	103.50	-31.87	435.18	399.68	35.50	12.260		

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



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Quien Sabe Fed Com
Site Error: 1.00 usft
Reference Well: 801H
Well Error: 1.00 usft
Reference Wellbore: OH \ 65013
Reference Design: Plan 5 09-10-19

Local Co-ordinate Reference: Well 801H
TVD Reference: KB @ 3147.30usft (Ensign 155)
MD Reference: KB @ 3147.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design: Quien Sabe Fed Com - 603H - OH \ 65012 - Surveys (Ensign 155)													Offset Site Error: 1.00 usft	
Survey Program: 147 MWD-HRGM													Offset Well Error: 1.00 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)	Offset Wellbore Centre E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,000.00	4,963.49	4,964.38	4,960.66	18.90	18.11	-157.03	111.18	-31.07	451.82	415.62	36.21	12.479		
5,100.00	5,061.97	5,059.58	5,055.52	19.31	18.45	-156.84	119.22	-30.61	468.90	432.00	36.90	12.707		
5,200.00	5,160.45	5,155.61	5,151.15	19.72	18.79	-156.60	127.99	-30.72	486.68	449.08	37.60	12.943		
5,300.00	5,258.93	5,251.57	5,246.64	20.12	19.14	-156.29	137.51	-31.10	504.89	466.59	38.30	13.182		
5,400.00	5,357.41	5,347.73	5,342.25	20.53	19.49	-155.94	147.70	-31.80	523.57	484.56	39.01	13.423		
5,500.00	5,455.90	5,444.19	5,438.09	20.94	19.84	-155.54	158.57	-32.70	542.61	502.89	39.71	13.663		
5,600.00	5,554.38	5,540.94	5,534.14	21.35	20.19	-155.11	170.13	-33.74	561.94	521.51	40.43	13.901		
5,700.00	5,652.86	5,554.00	5,547.10	21.76	20.24	-155.05	171.75	-33.88	587.58	547.50	40.08	14.662		
5,800.00	5,751.34	5,554.00	5,547.10	22.18	20.24	-155.05	171.75	-33.88	628.13	589.24	38.89	16.151		
5,900.00	5,849.82	5,554.00	5,547.10	22.59	20.24	-155.05	171.75	-33.88	681.07	643.74	37.33	18.247		
6,000.00	5,948.30	5,554.00	5,547.10	23.00	20.24	-155.05	171.75	-33.88	743.75	708.09	35.66	20.859		
6,100.00	6,046.78	5,554.00	5,547.10	23.42	20.24	-155.05	171.75	-33.88	813.92	779.86	34.06	23.899		
6,200.00	6,145.26	5,554.00	5,547.10	23.83	20.24	-155.05	171.75	-33.88	889.81	857.21	32.61	27.287		
6,300.00	6,243.74	5,554.00	5,547.10	24.25	20.24	-155.05	171.75	-33.88	970.09	938.75	31.34	30.950		
6,400.00	6,342.22	5,554.00	5,547.10	24.66	20.24	-155.05	171.75	-33.88	1,053.75	1,023.49	30.26	34.824		
6,500.00	6,440.70	5,554.00	5,547.10	25.08	20.24	-155.05	171.75	-33.88	1,140.04	1,110.70	29.34	38.855		
6,600.00	6,539.18	5,554.00	5,547.10	25.50	20.24	-155.05	171.75	-33.88	1,228.41	1,199.84	28.57	42.995		
6,700.00	6,637.67	5,554.00	5,547.10	25.91	20.24	-155.05	171.75	-33.88	1,318.44	1,290.51	27.93	47.207		
6,800.00	6,736.15	5,554.00	5,547.10	26.33	20.24	-155.05	171.75	-33.88	1,409.82	1,382.42	27.40	51.457		
6,900.00	6,834.63	5,554.00	5,547.10	26.75	20.24	-155.05	171.75	-33.88	1,502.30	1,475.34	26.96	55.720		
7,000.00	6,933.11	5,554.00	5,547.10	27.17	20.24	-155.05	171.75	-33.88	1,595.68	1,569.08	26.61	59.974		
7,100.00	7,031.59	5,554.00	5,547.10	27.59	20.24	-155.05	171.75	-33.88	1,689.83	1,663.50	26.32	64.202		
7,200.00	7,130.07	5,554.00	5,547.10	28.00	20.24	-155.05	171.75	-33.88	1,784.60	1,758.51	26.09	68.389		
7,300.00	7,228.55	5,554.00	5,547.10	28.42	20.24	-155.05	171.75	-33.88	1,879.93	1,854.00	25.92	72.525		
7,400.00	7,327.03	5,554.00	5,547.10	28.84	20.24	-155.05	171.75	-33.88	1,975.71	1,949.92	25.79	76.600		
7,500.00	7,425.51	5,554.00	5,547.10	29.26	20.24	-155.05	171.75	-33.88	2,071.89	2,046.19	25.70	80.608		
7,600.00	7,523.99	5,554.00	5,547.10	29.68	20.24	-155.05	171.75	-33.88	2,168.42	2,142.77	25.65	84.544		
7,700.00	7,622.47	5,554.00	5,547.10	30.10	20.24	-155.05	171.75	-33.88	2,265.25	2,239.62	25.62	88.403		
7,800.00	7,720.95	5,554.00	5,547.10	30.53	20.24	-155.05	171.75	-33.88	2,362.34	2,336.71	25.63	92.182		
7,900.00	7,819.43	5,554.00	5,547.10	30.95	20.24	-155.05	171.75	-33.88	2,459.66	2,434.01	25.65	95.879		
8,000.00	7,917.92	5,554.00	5,547.10	31.37	20.24	-155.05	171.75	-33.88	2,557.20	2,531.49	25.70	99.492		
8,100.00	8,016.40	5,554.00	5,547.10	31.79	20.24	-155.05	171.75	-33.88	2,654.91	2,629.14	25.77	103.022		
8,200.00	8,114.88	5,554.00	5,547.10	32.21	20.24	-155.05	171.75	-33.88	2,752.79	2,726.94	25.86	106.466		
8,300.00	8,213.36	5,554.00	5,547.10	32.63	20.24	-155.05	171.75	-33.88	2,850.82	2,824.86	25.96	109.826		
8,400.00	8,311.84	5,554.00	5,547.10	33.06	20.24	-155.05	171.75	-33.88	2,948.98	2,922.90	26.07	113.101		
8,500.00	8,410.32	5,554.00	5,547.10	33.48	20.24	-155.05	171.75	-33.88	3,047.26	3,021.05	26.20	116.292		
8,600.00	8,508.80	5,554.00	5,547.10	33.90	20.24	-155.05	171.75	-33.88	3,145.64	3,119.30	26.35	119.400		
8,700.00	8,607.28	5,554.00	5,547.10	34.33	20.24	-155.05	171.75	-33.88	3,244.13	3,217.63	26.50	122.426		
8,800.00	8,705.76	5,554.00	5,547.10	34.75	20.24	-155.05	171.75	-33.88	3,342.71	3,316.04	26.66	125.370		
8,900.00	8,803.93	5,554.00	5,547.10	35.22	20.24	-141.15	171.75	-33.88	3,441.62	3,414.78	26.85	128.198		
9,000.00	8,899.26	5,554.00	5,547.10	35.91	20.24	60.32	171.75	-33.88	3,540.64	3,513.56	27.08	130.756		
9,100.00	8,988.80	5,554.00	5,547.10	36.56	20.24	36.47	171.75	-33.88	3,637.04	3,609.67	27.36	132.913		
9,200.00	9,069.82	5,554.00	5,547.10	37.17	20.24	26.69	171.75	-33.88	3,728.21	3,700.49	27.71	134.522		
9,300.00	9,139.87	5,554.00	5,547.10	37.74	20.24	21.54	171.75	-33.88	3,811.84	3,783.70	28.14	135.463		
9,400.00	9,196.81	5,554.00	5,547.10	38.29	20.24	18.51	171.75	-33.88	3,885.97	3,857.32	28.65	135.645		
9,500.00	9,238.92	5,554.00	5,547.10	38.83	20.24	16.64	171.75	-33.88	3,948.92	3,919.68	29.25	135.018		
9,600.00	9,264.91	5,554.00	5,547.10	39.38	20.24	15.54	171.75	-33.88	3,999.37	3,969.43	29.94	133.580		
9,700.00	9,274.00	5,554.00	5,547.10	39.96	20.24	14.98	171.75	-33.88	4,036.25	4,005.52	30.73	131.338		
9,800.00	9,274.32	5,554.00	5,547.10	40.60	20.24	15.58	171.75	-33.88	4,066.61	4,035.13	31.48	129.184		
9,900.00	9,274.63	5,554.00	5,547.10	41.31	20.24	16.21	171.75	-33.88	4,098.30	4,066.29	32.01	128.040		
10,000.00	9,274.96	5,554.00	5,547.10	42.06	20.24	16.88	171.75	-33.88	4,131.26	4,098.69	32.57	126.861		
10,100.00	9,275.28	5,554.00	5,547.10	42.86	20.24	17.56	171.75	-33.88	4,165.41	4,132.26	33.15	125.668		

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 801H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3147.30usft (Ensign 155)
Reference Site:	Quien Sabe Fed Com	MD Reference:	KB @ 3147.30usft (Ensign 155)
Site Error:	1.00 usft	North Reference:	Grid
Reference Well:	801H	Survey Calculation Method:	Minimum Curvature
Well Error:	1.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH \ 65013	Database:	USA Compass
Reference Design:	Plan 5 09-10-19	Offset TVD Reference:	Offset Datum

Offset Design: Quien Sabe Fed Com - 603H - OH \ 65012 - Surveys (Ensign 155)													Offset Site Error
Survey Program: 147-MWD-HRGM													1.00 usft
Reference: 147-MWD-HRGM													Offset Well Error
Offset: 1.00 usft													1.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning		Minimum Separation		Separation Factor		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Footage (ft)	Offset Wellbore Centre (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	Warning
10,200.00	9,275.60	5,554.00	5,547.10	43.69	20.24	18.27	171.75	-33.88	4,200.68	4,166.93	33.75	124.476	
10,300.00	9,275.93	5,554.00	5,547.10	44.54	20.24	19.01	171.75	-33.88	4,237.01	4,202.65	34.36	123.299	
10,400.00	9,276.26	5,554.00	5,547.10	45.41	20.24	19.76	171.75	-33.88	4,274.32	4,239.33	34.99	122.148	
10,500.00	9,276.58	5,554.00	5,547.10	46.30	20.24	20.53	171.75	-33.88	4,312.55	4,276.92	35.63	121.030	
10,600.00	9,276.91	5,554.00	5,547.10	47.19	20.24	21.32	171.75	-33.88	4,351.62	4,315.34	36.28	119.953	
10,700.00	9,277.24	5,554.00	5,547.10	48.08	20.24	22.12	171.75	-33.88	4,391.47	4,354.54	36.93	118.921	
10,800.00	9,277.57	5,554.00	5,547.10	48.96	20.24	22.93	171.75	-33.88	4,432.01	4,394.44	37.58	117.937	
10,900.00	9,277.89	5,554.00	5,547.10	49.84	20.24	23.75	171.75	-33.88	4,473.20	4,434.97	38.23	117.002	
11,000.00	9,278.22	5,554.00	5,547.10	50.72	20.24	24.58	171.75	-33.88	4,514.96	4,476.08	38.88	116.117	
11,100.00	9,278.54	5,554.00	5,547.10	51.58	20.24	25.42	171.75	-33.88	4,557.22	4,517.69	39.53	115.282	
11,200.00	9,278.86	5,554.00	5,547.10	52.43	20.24	26.27	171.75	-33.88	4,599.92	4,559.75	40.18	114.494	
11,300.00	9,279.18	5,554.00	5,547.10	53.26	20.24	27.11	171.75	-33.88	4,643.00	4,602.18	40.82	113.752	
11,400.00	9,279.49	5,554.00	5,547.10	54.08	20.24	27.95	171.75	-33.88	4,686.39	4,644.94	41.45	113.055	
11,500.00	9,279.80	5,554.00	5,547.10	54.88	20.24	27.95	171.75	-33.88	4,730.79	4,688.72	42.07	112.447	
11,600.00	9,280.12	5,554.00	5,547.10	55.69	20.24	27.95	171.75	-33.88	4,776.87	4,734.19	42.68	111.921	
11,700.00	9,280.43	5,554.00	5,547.10	56.53	20.24	27.95	171.75	-33.88	4,824.58	4,781.29	43.29	111.448	
11,800.00	9,280.74	5,554.00	5,547.10	57.40	20.24	27.95	171.75	-33.88	4,873.88	4,829.99	43.90	111.030	
11,900.00	9,281.05	5,554.00	5,547.10	58.28	20.24	27.95	171.75	-33.88	4,924.72	4,880.22	44.50	110.667	
12,000.00	9,281.37	5,554.00	5,547.10	59.18	20.24	27.95	171.75	-33.88	4,977.04	4,931.95	45.10	110.359	
12,100.00	9,281.68	5,554.00	5,547.10	60.11	20.24	27.95	171.75	-33.88	5,030.81	4,985.12	45.69	110.107	
12,200.00	9,281.99	5,554.00	5,547.10	61.05	20.24	27.95	171.75	-33.88	5,085.98	5,039.71	46.27	109.909	
12,300.00	9,282.31	5,554.00	5,547.10	62.02	20.24	27.95	171.75	-33.88	5,142.50	5,095.65	46.85	109.765	
12,400.00	9,282.62	5,554.00	5,547.10	63.00	20.24	27.95	171.75	-33.88	5,200.33	5,152.91	47.42	109.673	
12,500.00	9,282.93	5,554.00	5,547.10	63.99	20.24	27.95	171.75	-33.88	5,259.43	5,211.45	47.97	109.631	
12,600.00	9,283.24	5,554.00	5,547.10	65.01	20.24	27.95	171.75	-33.88	5,319.74	5,271.22	48.52	109.640	
12,700.00	9,283.56	5,554.00	5,547.10	66.04	20.24	27.95	171.75	-33.88	5,381.25	5,332.19	49.06	109.696	
12,800.00	9,283.87	5,554.00	5,547.10	67.08	20.24	27.95	171.75	-33.88	5,443.89	5,394.31	49.58	109.798	
12,900.00	9,284.18	5,554.00	5,547.10	68.14	20.24	27.95	171.75	-33.88	5,507.63	5,457.54	50.09	109.945	
13,000.00	9,284.50	5,554.00	5,547.10	69.21	20.24	27.95	171.75	-33.88	5,572.45	5,521.85	50.60	110.135	
13,100.00	9,284.81	5,554.00	5,547.10	70.30	20.24	27.95	171.75	-33.88	5,638.29	5,587.20	51.09	110.366	
13,200.00	9,285.12	5,554.00	5,547.10	71.40	20.24	27.95	171.75	-33.88	5,705.12	5,653.55	51.57	110.636	
13,300.00	9,285.43	5,554.00	5,547.10	72.51	20.24	27.95	171.75	-33.88	5,772.91	5,720.88	52.03	110.944	
13,400.00	9,285.75	5,554.00	5,547.10	73.63	20.24	27.95	171.75	-33.88	5,841.63	5,789.14	52.49	111.287	
13,500.00	9,286.06	5,554.00	5,547.10	74.76	20.24	27.95	171.75	-33.88	5,911.24	5,858.30	52.94	111.666	
13,600.00	9,286.37	5,554.00	5,547.10	75.90	20.24	27.95	171.75	-33.88	5,981.71	5,928.34	53.37	112.077	
13,700.00	9,286.69	5,554.00	5,547.10	77.06	20.24	27.95	171.75	-33.88	6,053.01	5,999.22	53.79	112.520	
13,800.00	9,287.00	5,554.00	5,547.10	78.22	20.24	27.95	171.75	-33.88	6,125.12	6,070.91	54.21	112.993	
13,900.00	9,287.31	5,554.00	5,547.10	79.39	20.24	27.95	171.75	-33.88	6,198.00	6,143.39	54.61	113.495	
14,000.00	9,287.62	5,554.00	5,547.10	80.57	20.24	27.95	171.75	-33.88	6,271.63	6,216.63	55.00	114.024	
14,100.00	9,287.94	5,554.00	5,547.10	81.76	20.24	27.95	171.75	-33.88	6,345.98	6,290.59	55.39	114.579	
14,200.00	9,288.25	5,554.00	5,547.10	82.96	20.24	27.95	171.75	-33.88	6,421.03	6,365.27	55.76	115.159	
14,300.00	9,288.56	5,554.00	5,547.10	84.16	20.24	27.95	171.75	-33.88	6,496.74	6,440.62	56.12	115.763	
14,400.00	9,288.87	5,554.00	5,547.10	85.37	20.24	27.95	171.75	-33.88	6,573.11	6,516.64	56.48	116.389	
14,500.00	9,289.19	5,554.00	5,547.10	86.59	20.24	27.95	171.75	-33.88	6,650.11	6,593.29	56.82	117.037	
14,600.00	9,289.50	5,554.00	5,547.10	87.82	20.24	27.95	171.75	-33.88	6,727.71	6,670.55	57.16	117.706	
14,700.00	9,289.81	5,554.00	5,547.10	89.05	20.24	27.95	171.75	-33.88	6,805.89	6,748.41	57.48	118.394	
14,800.00	9,290.13	5,554.00	5,547.10	90.29	20.24	27.95	171.75	-33.88	6,884.64	6,826.84	57.80	119.101	
14,900.00	9,290.44	5,554.00	5,547.10	91.53	20.24	27.95	171.75	-33.88	6,963.94	6,905.82	58.12	119.826	
15,000.00	9,290.75	5,554.00	5,547.10	92.78	20.24	27.95	171.75	-33.88	7,043.76	6,985.34	58.42	120.568	
15,100.00	9,291.06	5,554.00	5,547.10	94.04	20.24	27.95	171.75	-33.88	7,124.09	7,065.37	58.72	121.326	
15,200.00	9,291.38	5,554.00	5,547.10	95.30	20.24	27.95	171.75	-33.88	7,204.91	7,145.90	59.01	122.099	
15,300.00	9,291.69	5,554.00	5,547.10	96.57	20.24	27.95	171.75	-33.88	7,286.21	7,226.92	59.29	122.887	

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

Company	COG Operating LLC	Local Co-ordinate Reference	Well 801H
Project	Eddy County, NM (NAD27 NME)	TVD Reference	KB @ 3147.30usft (Ensign 155)
Reference Site	Quien Sabe Fed Com	MD/Reference	KB @ 3147.30usft (Ensign 155)
Site Error	1.00 usft	North Reference	Grid
Reference Well	801H	Survey Calculation Method	Minimum Curvature
Well Error	1.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH \ 65013	Database	USA Compass
Reference Design	Plan 5 09-10-19	Offset TVD Reference	Offset Datum

Offset Design Quien Sabe Fed Com - 603H - OH \ 65012 - Surveys (Ensign 155)														Offset Site Error 1.00 usft	
Survey Program: 147-MWD-HRGM														Offset Well Error 1.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface	Offset Wellbore Centre		Distance		Minimum Separation	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)					
15,400.00	9,292.00	5,554.00	5,547.10	97.84	20.24	27.95	171.75	-33.88	7,367.97	7,308.40	59.57	123.689			
15,500.00	9,292.32	5,554.00	5,547.10	99.11	20.24	27.95	171.75	-33.88	7,450.17	7,390.34	59.84	124.504			
15,600.00	9,292.63	5,554.00	5,547.10	100.39	20.24	27.95	171.75	-33.88	7,532.81	7,472.71	60.10	125.332			
15,700.00	9,292.94	5,554.00	5,547.10	101.68	20.24	27.95	171.75	-33.88	7,615.86	7,555.50	60.36	126.172			
15,800.00	9,293.25	5,554.00	5,547.10	102.97	20.24	27.95	171.75	-33.88	7,699.32	7,638.70	60.61	127.024			
15,900.00	9,293.57	5,554.00	5,547.10	104.26	20.24	27.95	171.75	-33.88	7,783.16	7,722.30	60.86	127.886			
16,000.00	9,293.88	5,554.00	5,547.10	105.55	20.24	27.95	171.75	-33.88	7,867.38	7,806.28	61.10	128.759			
16,100.00	9,294.19	5,554.00	5,547.10	106.86	20.24	27.95	171.75	-33.88	7,951.97	7,890.63	61.34	129.642			
16,200.00	9,294.51	5,554.00	5,547.10	108.16	20.24	27.95	171.75	-33.88	8,036.91	7,975.34	61.57	130.534			
16,300.00	9,294.82	5,554.00	5,547.10	109.47	20.24	27.95	171.75	-33.88	8,122.19	8,060.40	61.80	131.435			
16,400.00	9,295.13	5,554.00	5,547.10	110.78	20.24	27.95	171.75	-33.88	8,207.81	8,145.79	62.02	132.345			
16,500.00	9,295.44	5,554.00	5,547.10	112.09	20.24	27.95	171.75	-33.88	8,293.75	8,231.51	62.24	133.262			
16,600.00	9,295.76	5,554.00	5,547.10	113.41	20.24	27.95	171.75	-33.88	8,380.00	8,317.55	62.45	134.188			
16,700.00	9,296.07	5,554.00	5,547.10	114.73	20.24	27.95	171.75	-33.88	8,466.55	8,403.89	62.66	135.121			
16,800.00	9,296.38	5,554.00	5,547.10	116.05	20.24	27.95	171.75	-33.88	8,553.40	8,490.53	62.86	136.060			
16,900.00	9,296.69	5,554.00	5,547.10	117.38	20.24	27.95	171.75	-33.88	8,640.53	8,577.46	63.07	137.006			
17,000.00	9,297.01	5,554.00	5,547.10	118.71	20.24	27.95	171.75	-33.88	8,727.94	8,664.67	63.26	137.959			
17,100.00	9,297.32	5,554.00	5,547.10	120.04	20.24	27.95	171.75	-33.88	8,815.61	8,752.15	63.46	138.917			
17,200.00	9,297.63	5,554.00	5,547.10	121.37	20.24	27.95	171.75	-33.88	8,903.54	8,839.89	63.65	139.881			
17,300.00	9,297.95	5,554.00	5,547.10	122.71	20.24	27.95	171.75	-33.88	8,991.73	8,927.89	63.84	140.850			
17,400.00	9,298.26	5,554.00	5,547.10	124.04	20.24	27.95	171.75	-33.88	9,080.16	9,016.14	64.02	141.824			
17,500.00	9,298.57	5,554.00	5,547.10	125.39	20.24	27.95	171.75	-33.88	9,168.83	9,104.63	64.21	142.803			
17,600.00	9,298.88	5,554.00	5,547.10	126.73	20.24	27.95	171.75	-33.88	9,257.73	9,193.35	64.39	143.786			
17,700.00	9,299.20	5,554.00	5,547.10	128.07	20.24	27.95	171.75	-33.88	9,346.86	9,282.29	64.56	144.774			
17,800.00	9,299.51	5,554.00	5,547.10	129.42	20.24	27.95	171.75	-33.88	9,436.20	9,371.46	64.74	145.765			
17,900.00	9,299.82	5,554.00	5,547.10	130.77	20.24	27.95	171.75	-33.88	9,525.75	9,460.84	64.91	146.761			
18,000.00	9,300.14	5,554.00	5,547.10	132.12	20.24	27.95	171.75	-33.88	9,615.51	9,550.44	65.08	147.759			
18,100.00	9,300.45	5,554.00	5,547.10	133.47	20.24	27.95	171.75	-33.88	9,705.47	9,640.23	65.24	148.761			
18,200.00	9,300.76	5,554.00	5,547.10	134.83	20.24	27.95	171.75	-33.88	9,795.63	9,730.22	65.41	149.766			
18,300.00	9,301.07	5,554.00	5,547.10	136.19	20.24	27.95	171.75	-33.88	9,885.97	9,820.40	65.57	150.774			
18,400.00	9,301.39	5,554.00	5,547.10	137.54	20.24	27.95	171.75	-33.88	9,976.50	9,910.77	65.73	151.784			
18,500.00	9,301.70	5,554.00	5,547.10	138.90	20.24	27.95	171.75	-33.88	10,067.21	10,001.32	65.89	152.797			
18,600.00	9,302.01	5,554.00	5,547.10	140.27	20.24	27.95	171.75	-33.88	10,158.09	10,092.05	66.04	153.812			
18,700.00	9,302.33	5,554.00	5,547.10	141.63	20.24	27.95	171.75	-33.88	10,249.14	10,182.94	66.20	154.829			
18,800.00	9,302.64	5,554.00	5,547.10	142.99	20.24	27.95	171.75	-33.88	10,340.36	10,274.01	66.35	155.848			
18,900.00	9,302.95	5,554.00	5,547.10	144.36	20.24	27.95	171.75	-33.88	10,431.74	10,365.24	66.50	156.869			
19,000.00	9,303.26	5,554.00	5,547.10	145.73	20.24	27.95	171.75	-33.88	10,523.27	10,456.62	66.65	157.892			
19,100.00	9,303.58	5,554.00	5,547.10	147.10	20.24	27.95	171.75	-33.88	10,614.96	10,548.16	66.80	158.915			
19,200.00	9,303.89	5,554.00	5,547.10	148.47	20.24	27.95	171.75	-33.88	10,706.80	10,639.85	66.94	159.941			
19,235.96	9,304.00	5,554.00	5,547.10	149.06	20.24	27.95	171.75	-33.88	10,739.86	10,670.53	69.33	154.914			



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 801H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3147.30usft (Ensign 155)
Reference Site:	Quien Sabe Fed Com	MD Reference:	KB @ 3147.30usft (Ensign 155)
Site Error:	1.00 usft	North Reference:	Grid
Reference Well:	801H	Survey Calculation Method:	Minimum Curvature
Well Error:	1.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH \ 65013	Database:	USA Compass
Reference Design:	Plan 5 09-10-19	Offset TVD Reference:	Offset Datum

Offset Design: Woody's Hope Federal Com - #1 - OH - Surveys												Offset Site Error:	0.00 usft
Survey Program: 355 - 10548												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside (usft)	Offset Wellbore Centre N/S (usft)	Offset Wellbore Centre E/W (usft)	Centres (usft)	Ellipses (usft)	Factor		
0.00	0.00	0.00	0.00	1.41	0.00	87.32	75.80	1,618.90	1,621.23				
100.00	100.00	57.70	57.70	1.44	0.73	87.32	75.80	1,618.90	1,620.67	1,618.51	2.16	749.822	
200.00	200.00	157.70	157.70	1.69	1.99	87.32	75.80	1,618.90	1,620.67	1,617.07	3.60	450.218	
300.00	300.00	257.70	257.70	2.02	3.26	87.32	75.80	1,618.90	1,620.67	1,615.56	5.12	316.768	
400.00	400.00	357.74	357.70	2.35	4.56	87.32	75.80	1,618.90	1,620.67	1,613.97	6.70	241.735	
500.00	500.00	457.74	457.70	2.69	7.31	87.32	75.80	1,618.90	1,620.67	1,610.91	9.76	166.064	
600.00	600.00	558.24	558.18	3.04	10.08	87.29	76.50	1,618.90	1,620.71	1,607.86	12.84	126.207	
700.00	700.00	657.87	657.70	3.39	12.88	87.32	75.80	1,618.90	1,620.67	1,604.70	15.97	101.468	
800.00	800.00	757.93	757.74	3.74	15.87	87.28	76.86	1,618.90	1,620.72	1,601.43	19.30	83.997	
803.51	803.51	761.48	761.29	3.75	15.98	-92.72	76.86	1,618.90	1,620.72	1,601.31	19.41	83.496	
900.00	899.98	859.13	858.92	4.03	18.90	-92.75	76.06	1,618.90	1,620.77	1,598.18	22.59	71.749	
1,000.00	999.92	957.94	957.62	4.55	21.75	-92.86	75.80	1,618.90	1,620.93	1,595.15	25.78	62.886	
1,100.00	1,099.86	1,058.62	1,058.27	4.87	24.65	-93.02	76.65	1,618.90	1,621.15	1,592.15	29.00	55.907	
1,200.00	1,199.80	1,157.95	1,157.50	5.20	27.27	-93.11	75.80	1,618.90	1,621.29	1,589.34	31.95	50.740	
1,300.00	1,299.74	1,257.93	1,257.47	5.53	29.44	-93.27	76.78	1,618.90	1,621.54	1,587.08	34.46	47.055	
1,400.00	1,399.68	1,359.09	1,358.60	5.87	31.63	-93.37	76.13	1,618.90	1,621.70	1,584.71	37.00	43.835	
1,500.00	1,499.61	1,457.82	1,457.31	6.20	33.45	-93.48	75.80	1,618.90	1,621.89	1,582.73	39.16	41.415	
1,600.00	1,599.55	1,557.93	1,557.42	6.54	35.20	-93.61	76.04	1,618.90	1,622.12	1,580.87	41.25	39.323	
1,700.00	1,699.49	1,657.72	1,657.19	6.89	36.96	-93.73	75.80	1,618.90	1,622.33	1,578.96	43.37	37.410	
1,800.00	1,799.43	1,757.72	1,757.20	7.23	38.85	-93.86	76.16	1,618.90	1,622.59	1,576.99	45.60	35.584	
1,900.00	1,899.37	1,858.35	1,857.82	7.58	40.74	-93.97	75.80	1,618.90	1,622.80	1,574.96	47.84	33.919	
2,000.00	1,999.31	1,957.55	1,957.01	7.93	43.03	-94.09	75.80	1,618.90	1,623.05	1,572.55	50.49	32.144	
2,100.00	2,099.25	2,058.12	2,057.57	8.27	45.36	-94.22	75.94	1,618.90	1,623.31	1,570.14	53.17	30.528	
2,200.00	2,199.19	2,157.49	2,156.89	8.62	47.82	-94.34	75.80	1,618.90	1,623.56	1,567.57	55.99	28.999	
2,300.00	2,299.13	2,257.48	2,256.83	8.98	50.29	-94.46	75.80	1,618.90	1,623.83	1,565.01	58.82	27.609	
2,400.00	2,399.07	2,357.42	2,356.77	9.43	52.50	-94.60	75.80	1,618.90	1,624.17	1,561.08	61.40	26.426	
2,500.00	2,498.94	2,457.29	2,456.64	9.89	54.71	-11.80	75.80	1,618.90	1,617.81	1,553.87	63.93	25.305	
2,600.00	2,598.61	2,557.18	2,556.51	10.20	56.92	-1.45	77.28	1,618.90	1,609.95	1,543.34	66.62	24.168	
2,700.00	2,697.97	2,657.08	2,656.40	10.55	59.12	3.78	76.93	1,618.90	1,598.65	1,529.27	69.38	23.043	
2,800.00	2,796.89	2,756.52	2,755.83	10.95	61.32	6.97	76.19	1,618.90	1,584.02	1,511.90	72.13	21.961	
2,900.00	2,895.40	2,853.86	2,853.10	11.27	63.41	7.79	75.80	1,618.90	1,566.94	1,492.39	74.54	21.020	
3,000.00	2,993.88	2,952.34	2,951.58	11.59	65.49	7.88	75.80	1,618.90	1,549.73	1,472.78	76.95	20.141	
3,100.00	3,092.36	3,050.84	3,050.07	11.91	67.57	7.92	76.89	1,618.90	1,532.61	1,453.25	79.36	19.313	
3,200.00	3,190.84	3,149.73	3,148.96	12.23	69.66	8.02	76.70	1,618.90	1,515.39	1,433.62	81.78	18.531	
3,300.00	3,289.32	3,248.60	3,247.82	12.56	71.75	8.14	76.17	1,618.90	1,498.16	1,413.96	84.20	17.793	
3,400.00	3,387.80	3,346.34	3,345.50	12.89	73.82	8.24	75.80	1,618.90	1,480.94	1,394.33	86.60	17.100	
3,500.00	3,486.28	3,444.82	3,443.98	13.22	75.90	8.34	75.80	1,618.90	1,463.75	1,374.72	89.03	16.442	
3,600.00	3,584.76	3,543.30	3,542.46	13.56	77.98	8.44	75.80	1,618.90	1,446.56	1,355.11	91.45	15.818	
3,700.00	3,683.24	3,642.12	3,641.27	13.91	80.07	8.51	76.73	1,618.90	1,429.44	1,335.56	93.88	15.226	
3,800.00	3,781.72	3,740.92	3,740.07	14.26	82.16	8.63	76.22	1,618.90	1,412.23	1,315.92	96.32	14.662	
3,900.00	3,880.20	3,838.82	3,837.90	14.62	84.19	8.76	75.80	1,618.90	1,395.04	1,296.34	98.70	14.135	
4,000.00	3,978.68	3,937.30	3,936.38	14.99	86.18	8.86	75.80	1,618.90	1,377.87	1,276.84	101.03	13.638	
4,100.00	4,077.16	4,035.78	4,034.86	15.36	88.17	8.98	75.80	1,618.90	1,360.71	1,257.34	103.37	13.163	
4,200.00	4,175.65	4,134.53	4,133.60	15.75	90.17	9.05	76.72	1,618.90	1,343.61	1,237.89	105.72	12.709	
4,300.00	4,274.13	4,233.28	4,232.34	16.14	92.16	9.19	76.22	1,618.90	1,326.43	1,218.36	108.07	12.274	
4,400.00	4,372.61	4,331.28	4,330.31	16.53	94.15	9.33	75.80	1,618.90	1,309.26	1,198.86	110.40	11.859	
4,500.00	4,471.09	4,429.76	4,428.79	16.93	96.14	9.46	75.80	1,618.90	1,292.12	1,179.37	112.75	11.460	
4,600.00	4,569.57	4,528.24	4,527.27	17.32	98.14	9.59	75.80	1,618.90	1,274.99	1,159.88	115.10	11.077	
4,700.00	4,668.05	4,626.86	4,625.88	17.72	100.13	9.68	76.54	1,618.90	1,257.90	1,140.44	117.46	10.709	
4,800.00	4,766.53	4,725.48	4,724.50	18.12	102.13	9.83	76.20	1,618.90	1,240.76	1,120.95	119.81	10.356	
4,900.00	4,865.01	4,823.74	4,822.71	18.53	104.15	9.99	75.80	1,618.90	1,223.63	1,101.44	122.19	10.014	
5,000.00	4,963.49	4,922.22	4,921.19	18.93	106.24	10.14	75.80	1,618.90	1,206.52	1,081.89	124.64	9.680	

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

Company	COG Operating LLC	Local Co-ordinate Reference	Well 801H
Project	Eddy County, NM (NAD27 NME)	TVD Reference	KB @ 3147.30usft (Ensign 155)
Reference Site	Quien Sabe Fed Com	MD Reference	KB @ 3147.30usft (Ensign 155)
Site Error	1.00 usft	North Reference	Grid
Reference Well	801H	Survey Calculation Method	Minimum Curvature
Well Error	1.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH \ 65013	Database	USA Compass
Reference Design	Plan 5 09-10-19	Offset TVD Reference	Offset Datum

Offset Design: Woody's Hope Federal Com - #1 - OH - Surveys												Offset Site Error	0.00 usft
Survey Program: 355-10548												Offset Well Error	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning							
Measured Vertical	Measured Vertical	Reference	Offset	Highside	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor				
Depth (usft)	Depth (usft)	Depth (usft)	Depth (usft)	Footcandle	N/S (usft)	E/W (usft)	Centres (usft)	Ellipses (usft)	Separation (usft)				
5,100.00	5,061.97	5,020.70	5,019.67	19.34	108.33	10.28	75.80	1,618.90	1,189.43	1,062.34	127.09	9.359	
5,200.00	5,160.45	5,119.32	5,118.28	19.74	110.43	10.39	76.71	1,618.90	1,172.37	1,042.82	129.54	9.050	
5,300.00	5,258.93	5,217.95	5,216.90	20.15	112.52	10.57	76.22	1,618.90	1,155.27	1,023.27	132.00	8.752	
5,400.00	5,357.41	5,316.22	5,315.11	20.56	114.53	10.75	75.80	1,618.90	1,138.18	1,003.81	134.37	8.471	
5,500.00	5,455.90	5,414.70	5,413.60	20.97	116.44	10.92	75.80	1,618.90	1,121.12	984.48	136.64	8.205	
5,600.00	5,554.38	5,513.18	5,512.08	21.38	118.34	11.09	75.80	1,618.90	1,104.06	965.15	138.91	7.948	
5,700.00	5,652.86	5,611.74	5,610.63	21.79	120.25	11.21	76.75	1,618.90	1,087.03	945.85	141.18	7.699	
5,800.00	5,751.34	5,710.30	5,709.17	22.20	122.16	11.42	76.28	1,618.90	1,069.99	926.53	143.46	7.459	
5,900.00	5,849.82	5,808.67	5,807.52	22.61	124.07	11.63	75.80	1,618.90	1,052.96	907.22	145.73	7.225	
6,000.00	5,948.30	5,907.15	5,906.00	23.02	125.98	11.82	75.80	1,618.90	1,035.94	887.93	148.01	6.999	
6,100.00	6,046.78	6,005.63	6,004.48	23.44	127.89	12.02	75.80	1,618.90	1,018.94	868.65	150.29	6.780	
6,200.00	6,145.26	6,104.12	6,102.97	23.85	129.81	12.20	76.28	1,618.90	1,001.95	849.39	152.57	6.567	
6,300.00	6,243.74	6,202.60	6,201.44	24.27	131.72	12.43	76.05	1,618.90	984.98	830.13	154.85	6.361	
6,400.00	6,342.22	6,301.11	6,299.92	24.68	133.69	12.67	75.80	1,618.90	968.02	810.83	157.19	6.158	
6,500.00	6,440.70	6,399.59	6,398.40	25.10	135.78	12.90	75.80	1,618.90	951.07	791.42	159.65	5.957	
6,600.00	6,539.18	6,498.08	6,496.88	25.51	137.88	13.13	75.80	1,618.90	934.14	772.02	162.12	5.762	
6,700.00	6,637.67	6,596.53	6,595.32	25.93	139.97	13.32	76.79	1,618.90	917.20	752.62	164.58	5.573	
6,800.00	6,736.15	6,694.96	6,693.75	26.35	142.07	13.60	76.36	1,618.90	900.31	733.26	167.05	5.390	
6,900.00	6,834.63	6,793.59	6,792.33	26.77	144.14	13.90	75.80	1,618.90	883.44	713.94	169.50	5.212	
7,000.00	6,933.11	6,892.07	6,890.81	27.18	146.15	14.18	75.80	1,618.90	866.58	694.70	171.88	5.042	
7,100.00	7,031.59	6,990.54	6,989.26	27.60	148.16	14.40	76.69	1,618.90	849.71	675.45	174.25	4.876	
7,200.00	7,130.07	7,088.90	7,087.62	28.02	150.16	14.72	76.42	1,618.90	832.90	656.26	176.63	4.715	
7,300.00	7,228.55	7,187.57	7,186.25	28.44	152.20	15.07	75.80	1,618.90	816.12	637.07	179.05	4.558	
7,400.00	7,327.03	7,286.05	7,284.73	28.86	154.25	15.39	75.80	1,618.90	799.35	617.38	181.98	4.393	
7,500.00	7,425.51	7,384.53	7,383.21	29.28	157.29	15.73	75.80	1,618.90	782.61	597.71	184.90	4.233	
7,600.00	7,523.99	7,482.95	7,481.63	29.70	159.84	16.02	76.60	1,618.90	765.84	578.02	187.82	4.078	
7,700.00	7,622.47	7,581.31	7,579.98	30.12	162.38	16.41	76.36	1,618.90	749.16	558.42	190.74	3.928	
7,800.00	7,720.95	7,679.65	7,678.32	30.54	164.92	16.83	75.87	1,618.90	732.53	538.87	193.66	3.783	
7,900.00	7,819.43	7,778.67	7,777.13	30.96	167.57	17.24	75.80	1,618.90	715.91	519.22	196.69	3.640	
8,000.00	7,917.92	7,876.55	7,874.96	31.38	170.20	17.57	76.83	1,618.90	699.23	499.53	199.70	3.501	
8,100.00	8,016.40	7,975.76	7,974.10	31.81	172.59	18.10	75.80	1,618.90	682.78	480.29	202.48	3.372	
8,200.00	8,114.88	8,074.24	8,072.58	32.23	174.50	18.56	75.80	1,618.90	666.27	461.49	204.78	3.254	
8,300.00	8,213.36	8,172.72	8,171.06	32.65	176.41	19.05	75.80	1,618.90	649.80	442.73	207.07	3.138	
8,400.00	8,311.84	8,271.01	8,269.34	33.07	178.32	19.47	76.81	1,618.90	633.26	423.90	209.37	3.025	
8,500.00	8,410.32	8,369.23	8,367.55	33.49	180.22	20.04	76.39	1,618.90	616.95	405.28	211.66	2.915	
8,600.00	8,508.80	8,468.21	8,466.50	33.92	182.13	20.67	75.80	1,618.90	600.72	386.76	213.96	2.808	
8,700.00	8,607.28	8,566.69	8,564.98	34.34	183.95	21.27	75.80	1,618.90	584.47	368.29	216.18	2.704	
8,800.00	8,705.76	8,665.17	8,663.46	34.76	185.78	21.90	75.80	1,618.90	568.29	349.89	218.40	2.602	
8,900.00	8,804.24	8,763.25	8,761.54	35.24	187.59	-2.94	76.33	1,618.90	549.95	329.34	220.61	2.493	
9,000.00	8,899.26	8,858.47	8,856.75	35.93	189.35	-24.28	76.15	1,618.90	521.22	298.45	222.77	2.340	
9,100.00	8,988.80	8,948.00	8,946.28	36.58	191.01	-37.79	75.85	1,618.90	482.51	257.78	224.72	2.147	
9,200.00	9,069.82	9,029.26	9,027.52	37.19	192.64	-50.80	75.80	1,618.90	436.81	210.26	226.55	1.928	
9,300.00	9,139.87	9,099.31	9,097.57	37.76	194.07	-64.76	75.80	1,618.90	389.43	161.25	228.18	1.707	
9,400.00	9,196.81	9,156.25	9,154.51	38.30	195.23	-78.09	75.80	1,618.90	348.66	118.80	229.86	1.517	
9,500.00	9,238.92	9,198.36	9,196.62	38.84	196.09	-87.92	75.80	1,618.90	325.84	93.83	232.02	1.404 Level 3	
9,532.69	9,249.24	9,208.68	9,206.94	39.02	196.30	-90.00	75.80	1,618.90	324.21	91.41	232.80	1.393 Level 3, CC, ES, SF	
9,600.00	9,264.91	9,224.35	9,222.61	39.40	196.62	-92.24	75.80	1,618.90	331.39	96.89	234.51	1.413 Level 3	
9,700.00	9,274.00	9,233.44	9,231.70	39.98	196.80	-90.16	75.80	1,618.90	367.35	130.94	236.41	1.554	
9,800.00	9,274.32	9,233.76	9,232.02	40.61	196.81	-90.17	75.80	1,618.90	426.81	189.38	237.42	1.798	
9,900.00	9,274.63	9,234.07	9,232.33	41.32	196.82	-90.25	75.80	1,618.90	501.55	263.64	237.91	2.108	
10,000.00	9,274.96	9,234.40	9,232.66	42.08	196.82	-90.33	75.80	1,618.90	585.69	347.59	238.10	2.460	
10,100.00	9,275.28	9,234.72	9,232.98	42.87	196.83	-90.44	75.80	1,618.90	675.64	437.48	238.16	2.837	

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 801H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3147.30usft (Ensign 155)
Reference Site:	Quien Sabe Fed Com	MD Reference:	KB @ 3147.30usft (Ensign 155)
Site Error:	1.00 usft	North Reference:	Grid
Reference Well:	801H	Survey Calculation Method:	Minimum Curvature
Well Error:	1.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH \ 65013	Database:	USA Compass
Reference Design:	Plan 5 09-10-19	Offset TVD Reference:	Offset Datum

Offset Design: Woody's Hope Federal Com - #1 - OH - Surveys													Offset Site Error:
Survey Program: 1355-10548													0.00 usft
Reference	Offset	Semi-Major Axis					Distance		Warning				Offset Well Error:
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
10,200.00	9,275.60	9,235.04	9,233.30	43.70	196.84	-90.57	75.80	1,618.90	769.28	531.10	238.17	3.230	
10,300.00	9,275.93	9,235.37	9,233.63	44.56	196.84	-90.74	75.80	1,618.90	865.31	627.14	238.16	3.633	
10,400.00	9,276.26	9,235.70	9,233.96	45.43	196.85	-90.98	75.80	1,618.90	962.92	724.77	238.15	4.043	
10,500.00	9,276.58	9,236.02	9,234.28	46.31	196.86	-91.34	75.80	1,618.90	1,061.57	823.43	238.14	4.458	
10,600.00	9,276.91	9,236.35	9,234.61	47.20	196.86	-92.00	75.80	1,618.90	1,160.89	922.75	238.14	4.875	
10,700.00	9,277.24	9,236.68	9,234.94	48.09	196.87	-93.57	75.80	1,618.90	1,260.62	1,022.47	238.15	5.293	
10,800.00	9,277.57	9,237.01	9,235.27	48.97	196.88	-102.28	75.80	1,618.90	1,360.56	1,122.40	238.16	5.713	
10,900.00	9,277.89	9,237.33	9,235.59	49.85	196.88	99.34	75.80	1,618.90	1,460.55	1,222.37	238.18	6.132	
11,000.00	9,278.22	9,237.66	9,235.92	50.73	196.89	93.54	75.80	1,618.90	1,560.48	1,322.27	238.21	6.551	
11,100.00	9,278.54	9,237.98	9,236.24	51.59	196.90	92.21	75.80	1,618.90	1,660.25	1,422.00	238.25	6.969	
11,200.00	9,278.86	9,238.30	9,236.56	52.44	196.90	91.62	75.80	1,618.90	1,759.77	1,521.48	238.29	7.385	
11,300.00	9,279.18	9,238.62	9,236.88	53.27	196.91	91.28	75.80	1,618.90	1,858.97	1,620.63	238.34	7.800	
11,400.00	9,279.49	9,238.93	9,237.19	54.09	196.92	91.06	75.80	1,618.90	1,957.79	1,719.40	238.39	8.213	
11,500.00	9,279.80	9,239.24	9,237.50	54.89	196.92	91.12	75.80	1,618.90	2,056.47	1,818.03	238.44	8.625	
11,600.00	9,280.12	9,239.56	9,237.82	55.70	196.93	91.18	75.80	1,618.90	2,155.27	1,916.78	238.49	9.037	
11,700.00	9,280.43	9,239.87	9,238.13	56.54	196.93	91.23	75.80	1,618.90	2,254.18	2,015.64	238.54	9.450	
11,800.00	9,280.74	9,240.18	9,238.44	57.40	196.94	91.29	75.80	1,618.90	2,353.18	2,114.59	238.59	9.863	
11,900.00	9,281.05	9,240.49	9,238.75	58.29	196.95	91.34	75.80	1,618.90	2,452.26	2,213.62	238.63	10.276	
12,000.00	9,281.37	9,240.81	9,239.07	59.19	196.95	91.40	75.80	1,618.90	2,551.41	2,312.73	238.68	10.690	
12,100.00	9,281.68	9,241.12	9,239.38	60.12	196.96	91.45	75.80	1,618.90	2,650.63	2,411.90	238.72	11.103	
12,200.00	9,281.99	9,241.43	9,239.69	61.06	196.97	91.51	75.80	1,618.90	2,749.90	2,511.13	238.77	11.517	
12,300.00	9,282.31	9,241.75	9,240.01	62.02	196.97	91.56	75.80	1,618.90	2,849.22	2,610.41	238.81	11.931	
12,400.00	9,282.62	9,242.06	9,240.32	63.00	196.98	91.62	75.80	1,618.90	2,948.59	2,709.74	238.85	12.345	
12,500.00	9,282.93	9,242.37	9,240.63	64.00	196.99	91.67	75.80	1,618.90	3,048.00	2,809.11	238.89	12.759	
12,600.00	9,283.24	9,242.68	9,240.94	65.02	196.99	91.73	75.80	1,618.90	3,147.45	2,908.51	238.94	13.173	
12,700.00	9,283.56	9,243.00	9,241.26	66.04	197.00	91.78	75.80	1,618.90	3,246.93	3,007.95	238.98	13.587	
12,800.00	9,283.87	9,243.31	9,241.57	67.09	197.00	91.84	75.80	1,618.90	3,346.44	3,107.42	239.02	14.001	
12,900.00	9,284.18	9,243.62	9,241.88	68.15	197.01	91.89	75.80	1,618.90	3,445.99	3,206.92	239.06	14.415	
13,000.00	9,284.50	9,243.94	9,242.20	69.22	197.02	91.95	75.80	1,618.90	3,545.55	3,306.45	239.10	14.828	
13,100.00	9,284.81	9,244.25	9,242.51	70.31	197.02	92.00	75.80	1,618.90	3,645.14	3,406.00	239.15	15.242	
13,200.00	9,285.12	9,244.56	9,242.82	71.40	197.03	92.06	75.80	1,618.90	3,744.75	3,505.56	239.19	15.656	
13,300.00	9,285.43	9,244.87	9,243.13	72.51	197.04	92.11	75.80	1,618.90	3,844.39	3,605.15	239.23	16.070	
13,400.00	9,285.75	9,245.19	9,243.45	73.63	197.04	92.17	75.80	1,618.90	3,944.04	3,704.76	239.28	16.483	
13,500.00	9,286.06	9,245.50	9,243.76	74.77	197.05	92.22	75.80	1,618.90	4,043.71	3,804.39	239.32	16.897	
13,600.00	9,286.37	9,245.81	9,244.07	75.91	197.06	92.28	75.80	1,618.90	4,143.39	3,904.02	239.36	17.310	
13,700.00	9,286.69	9,246.13	9,244.39	77.06	197.06	92.33	75.80	1,618.90	4,243.09	4,003.68	239.41	17.723	
13,800.00	9,287.00	9,246.44	9,244.70	78.22	197.07	92.39	75.80	1,618.90	4,342.80	4,103.35	239.45	18.136	
13,900.00	9,287.31	9,246.75	9,245.01	79.40	197.07	92.44	75.80	1,618.90	4,442.53	4,203.03	239.50	18.549	
14,000.00	9,287.62	9,247.06	9,245.32	80.58	197.08	92.50	75.80	1,618.90	4,542.26	4,302.72	239.55	18.962	
14,100.00	9,287.94	9,247.38	9,245.64	81.77	197.09	92.55	75.80	1,618.90	4,642.01	4,402.42	239.59	19.375	
14,200.00	9,288.25	9,247.69	9,245.95	82.96	197.09	92.61	75.80	1,618.90	4,741.77	4,502.13	239.64	19.787	
14,300.00	9,288.56	9,248.00	9,246.26	84.17	197.10	92.66	75.80	1,618.90	4,841.54	4,601.86	239.69	20.199	
14,400.00	9,288.87	9,248.31	9,246.57	85.38	197.11	92.72	75.80	1,618.90	4,941.32	4,701.59	239.74	20.612	
14,500.00	9,289.19	9,248.63	9,246.89	86.60	197.11	92.77	75.80	1,618.90	5,041.11	4,801.32	239.78	21.023	
14,600.00	9,289.50	9,248.94	9,247.20	87.82	197.12	92.83	75.80	1,618.90	5,140.90	4,901.07	239.83	21.435	
14,700.00	9,289.81	9,249.25	9,247.51	89.06	197.13	92.88	75.80	1,618.90	5,240.71	5,000.82	239.88	21.847	
14,800.00	9,290.13	9,249.57	9,247.83	90.29	197.13	92.94	75.80	1,618.90	5,340.52	5,100.58	239.93	22.258	
14,900.00	9,290.44	9,249.88	9,248.14	91.54	197.14	92.99	75.80	1,618.90	5,440.34	5,200.35	239.98	22.669	
15,000.00	9,290.75	9,250.19	9,248.45	92.79	197.14	93.05	75.80	1,618.90	5,540.16	5,300.12	240.04	23.080	
15,100.00	9,291.06	9,250.50	9,248.76	94.04	197.15	93.10	75.80	1,618.90	5,639.99	5,399.90	240.09	23.491	
15,200.00	9,291.38	9,250.82	9,249.08	95.30	197.16	93.16	75.80	1,618.90	5,739.83	5,499.69	240.14	23.902	
15,300.00	9,291.69	9,251.13	9,249.39	96.57	197.16	93.21	75.80	1,618.90	5,839.67	5,599.48	240.19	24.312	

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

Company	COG Operating LLC	Local Co-ordinate Reference	Well 801H
Project	Eddy County, NM (NAD27 NME)	TVD Reference	KB @ 3147.30usft (Ensign 155)
Reference Site	Quien Sabe Fed Com	MD Reference	KB @ 3147.30usft (Ensign 155)
Site Error	1.00 usft	North Reference	Grid
Reference Well	801H	Survey Calculation Method	Minimum Curvature
Well Error	1.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH \ 65013	Database	USA Compass
Reference Design	Plan 5 09-10-19	Offset TVD Reference	Offset Datum

Offset Design: Woody's Hope Federal Com - #1 - OH - Surveys												Offset Site Error	0.00 usft
Survey Program: 355-10548												Offset Well Error	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning							
Measured Vertical Depth (usft)	Reference Vertical Depth (usft)	Measured Vertical Depth (usft)	Offset Vertical Depth (usft)	Reference Horizontal Distance (usft)	Offset Horizontal Distance (usft)	Highside Footcandle (ft)	Offset Wellbore Centre N/S (usft)	Offset Wellbore Centre E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
15,400.00	9,292.00	9,251.44	9,249.70	97.84	197.17	93.27	75.80	1,618.90	5,939.52	5,699.27	240.25	24.722	
15,500.00	9,292.32	9,251.76	9,250.02	99.12	197.18	93.32	75.80	1,618.90	6,039.37	5,799.07	240.30	25.132	
15,600.00	9,292.63	9,252.07	9,250.33	100.40	197.18	93.38	75.80	1,618.90	6,139.23	5,898.87	240.36	25.542	
15,700.00	9,292.94	9,252.38	9,250.64	101.68	197.19	93.43	75.80	1,618.90	6,239.09	5,998.67	240.41	25.951	
15,800.00	9,293.25	9,252.69	9,250.95	102.97	197.20	93.49	75.80	1,618.90	6,338.95	6,098.48	240.47	26.361	
15,900.00	9,293.57	9,253.01	9,251.27	104.26	197.20	93.54	75.80	1,618.90	6,438.82	6,198.30	240.53	26.770	
16,000.00	9,293.88	9,253.32	9,251.58	105.56	197.21	93.60	75.80	1,618.90	6,538.70	6,298.11	240.59	27.178	
16,100.00	9,294.19	9,253.63	9,251.89	106.86	197.21	93.65	75.80	1,618.90	6,638.58	6,397.93	240.64	27.587	
16,200.00	9,294.51	9,253.95	9,252.21	108.16	197.22	93.71	75.80	1,618.90	6,738.46	6,497.76	240.70	27.995	
16,300.00	9,294.82	9,254.26	9,252.52	109.47	197.23	93.76	75.80	1,618.90	6,838.34	6,597.58	240.76	28.403	
16,400.00	9,295.13	9,254.57	9,252.83	110.78	197.23	93.82	75.80	1,618.90	6,938.23	6,697.41	240.82	28.811	
16,500.00	9,295.44	9,254.88	9,253.14	112.10	197.24	93.87	75.80	1,618.90	7,038.12	6,797.24	240.88	29.218	
16,600.00	9,295.76	9,255.20	9,253.46	113.41	197.25	93.93	75.80	1,618.90	7,138.02	6,897.07	240.94	29.625	
16,700.00	9,296.07	9,255.51	9,253.77	114.73	197.25	93.98	75.80	1,618.90	7,237.91	6,996.91	241.01	30.032	
16,800.00	9,296.38	9,255.82	9,254.08	116.06	197.26	94.04	75.80	1,618.90	7,337.81	7,096.75	241.07	30.439	
16,900.00	9,296.69	9,256.13	9,254.39	117.38	197.27	94.09	75.80	1,618.90	7,437.72	7,196.58	241.13	30.845	
17,000.00	9,297.01	9,256.45	9,254.71	118.71	197.27	94.15	75.80	1,618.90	7,537.62	7,296.43	241.20	31.251	
17,100.00	9,297.32	9,256.76	9,255.02	120.04	197.28	94.20	75.80	1,618.90	7,637.53	7,396.27	241.26	31.657	
17,200.00	9,297.63	9,257.07	9,255.33	121.37	197.28	94.26	75.80	1,618.90	7,737.44	7,496.11	241.33	32.062	
17,300.00	9,297.95	9,257.39	9,255.65	122.71	197.29	94.31	75.80	1,618.90	7,837.35	7,595.96	241.39	32.467	
17,400.00	9,298.26	9,257.70	9,255.96	124.05	197.30	94.37	75.80	1,618.90	7,937.27	7,695.81	241.46	32.872	
17,500.00	9,298.57	9,258.01	9,256.27	125.39	197.30	94.42	75.80	1,618.90	8,037.18	7,795.66	241.52	33.277	
17,600.00	9,298.88	9,258.32	9,256.58	126.73	197.31	94.48	75.80	1,618.90	8,137.10	7,895.51	241.59	33.681	
17,700.00	9,299.20	9,258.64	9,256.90	128.08	197.32	94.53	75.80	1,618.90	8,237.02	7,995.36	241.66	34.085	
17,800.00	9,299.51	9,258.95	9,257.21	129.42	197.32	94.59	75.80	1,618.90	8,336.95	8,095.22	241.73	34.489	
17,900.00	9,299.82	9,259.26	9,257.52	130.77	197.33	94.64	75.80	1,618.90	8,436.87	8,195.07	241.80	34.892	
18,000.00	9,300.14	9,259.58	9,257.84	132.12	197.34	94.70	75.80	1,618.90	8,536.80	8,294.93	241.87	35.295	
18,100.00	9,300.45	9,259.89	9,258.15	133.48	197.34	94.75	75.80	1,618.90	8,636.72	8,394.78	241.94	35.698	
18,200.00	9,300.76	9,260.20	9,258.46	134.83	197.35	94.81	75.80	1,618.90	8,736.65	8,494.64	242.01	36.100	
18,300.00	9,301.07	9,260.51	9,258.77	136.19	197.36	94.86	75.80	1,618.90	8,836.59	8,594.50	242.08	36.502	
18,400.00	9,301.39	9,260.83	9,259.09	137.55	197.36	94.91	75.80	1,618.90	8,936.52	8,694.36	242.16	36.904	
18,500.00	9,301.70	9,261.14	9,259.40	138.91	197.37	94.97	75.80	1,618.90	9,036.45	8,794.22	242.23	37.305	
18,600.00	9,302.01	9,261.45	9,259.71	140.27	197.37	95.02	75.80	1,618.90	9,136.39	8,894.08	242.30	37.706	
18,700.00	9,302.33	9,261.77	9,260.03	141.63	197.38	95.08	75.80	1,618.90	9,236.32	8,993.95	242.38	38.107	
18,800.00	9,302.64	9,262.08	9,260.34	143.00	197.39	95.13	75.80	1,618.90	9,336.26	9,093.81	242.45	38.508	
18,900.00	9,302.95	9,262.39	9,260.65	144.36	197.39	95.19	75.80	1,618.90	9,436.20	9,193.67	242.53	38.908	
19,000.00	9,303.26	9,262.70	9,260.96	145.73	197.40	95.24	75.80	1,618.90	9,536.14	9,293.54	242.60	39.307	
19,100.00	9,303.58	9,263.02	9,261.28	147.10	197.41	95.30	75.80	1,618.90	9,636.09	9,393.40	242.68	39.707	
19,200.00	9,303.89	9,263.33	9,261.59	148.47	197.41	95.35	75.80	1,618.90	9,736.03	9,493.27	242.76	40.106	
19,235.96	9,304.00	9,263.44	9,261.70	149.07	197.41	95.37	75.80	1,618.90	9,771.97	9,524.40	242.77	39.472	

Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Quien Sabe Fed Com
 Site Error: 1.00 usft
 Reference Well: 801H
 Well Error: 1.00 usft
 Reference Wellbore: OH \ 65013
 Reference Design: Plan 5 09-10-19

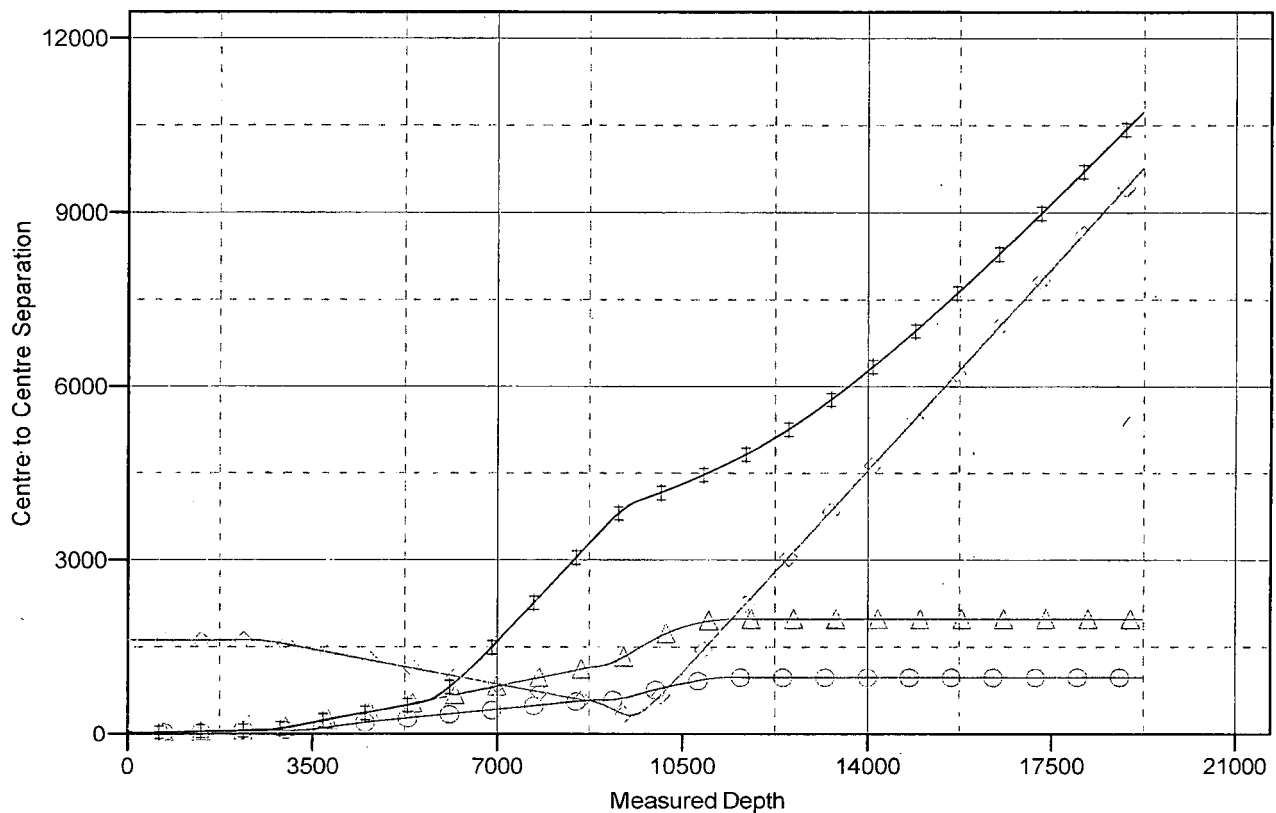
Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:
 Output errors are at:
 Database:
 Offset TVD Reference:

Well 801H
 KB @ 3147.30usft (Ensign 155)
 KB @ 3147.30usft (Ensign 155)
 Grid
 Minimum Curvature
 2.00 sigma
 USA Compass
 Offset Datum

Reference Depths are relative to KB @ 3147.30usft (Ensign 155)
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 19' 60.000000 W

Coordinates are relative to: 801H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.10°

Ladder Plot



LEGEND

- 602H, OH \65011, Plan 4 08-15-19 V0
- △ 603H, OH \65012, Plan 4 08-15-19 V0
- ✕ 603H, OH \65012, Surveys (Ensign 155) V0
- ◇ #1, OH, Surveys V0

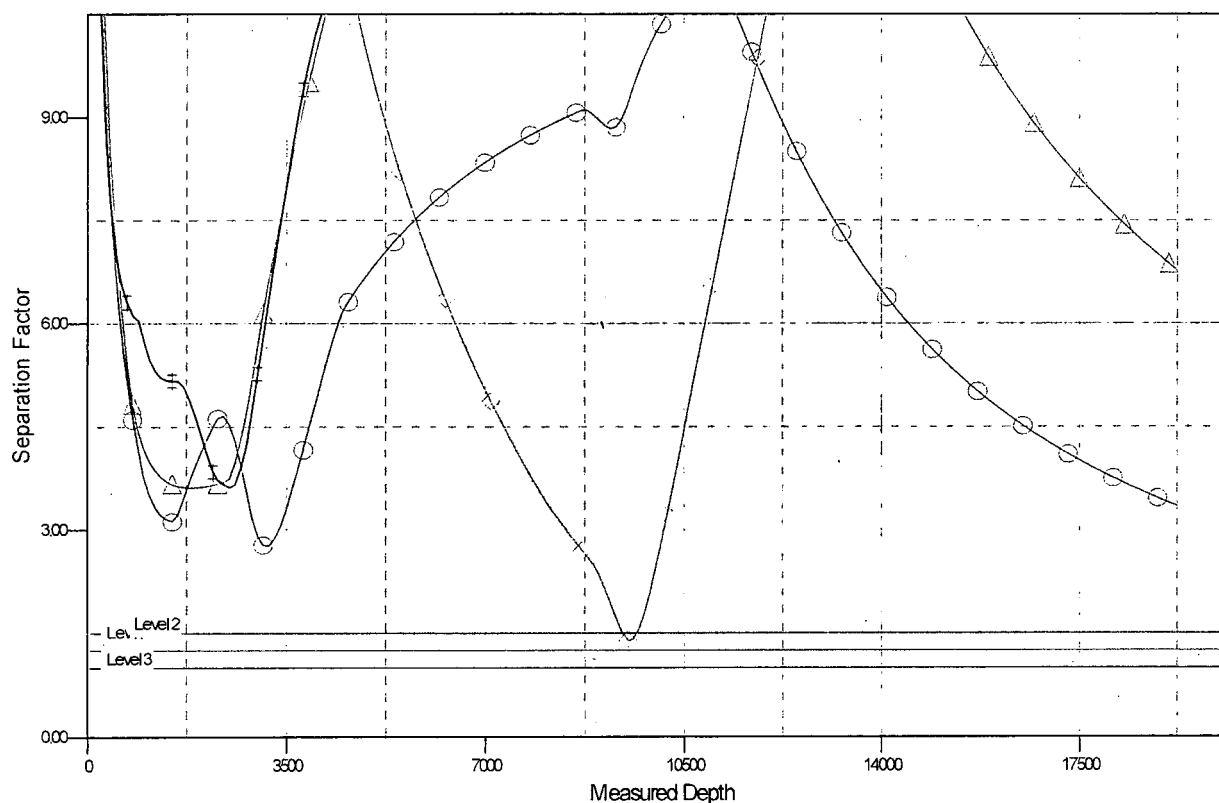
Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Quien Sabe Fed Com
 Site Error: 1.00 usft
 Reference Well: 801H
 Well Error: 1.00 usft
 Reference Wellbore: OH \ 65013
 Reference Design: Plan 5 09-10-19

Local Co-ordinate Reference:
 TVD Reference: KB @ 3147.30usft (Ensign 155)
 MD Reference: KB @ 3147.30usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset, TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3147.30usft (Ensign 155)
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 19' 60.000000 W

Coordinates are relative to: 801H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.10°

Separation Factor Plot



LEGEND

- 602H, OH \65011, Plan 4 08-15-19 V0
- 603H, OH \65012, Plan 4 08-15-19 V0
- 603H, OH \65012, Surveys (Ensign 155) V0
- #1, OH, Surveys V0