

CONCHO

COG Operating LLC

Lea County, NM (NAD-27 2015)

Zeppo 5 Federal Com #25H

SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G

PP: 2970' FNL, 2217' FEL, Sec 5, T17S, R32E, Unit J

BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O

Design #1

Anticollision Report

02 February, 2017





TDS
Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD-27 2015)
Reference Site: Zeppo 5 Federal Com #25H
Site Error: 0.00 usft
Reference Well: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
Well Error: 0.00 usft
Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O
Reference Design: Design #1
Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
TVD Reference: KB @ 4118.00usft (Patriot 6)
MD Reference: KB @ 4118.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference	Design #1
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	Stations
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 9,999.98 usft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic
Casing Method:	Not applied

Survey Tool Program Date 2/2/2017

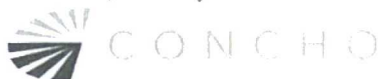
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	13,943.72	Design #1 (BHL: 121' FSL, 2308' FEL, Sec	MWD	MWD - Standard

Summary

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Lea County Offset Wells						
Grace Mitchell B #4 - OH - OH	4,100.00	4,060.00	2,143.94	2,080.80	33.958	ES
Grace Mitchell B #4 - OH - OH	4,200.00	4,060.00	2,146.64	2,083.36	33.922	SF
Grace Mitchell B #4 - OH - OH	8,129.58	4,060.00	2,140.20	2,117.40	93.876	CC
Grace Mitchell B Federal #6 - OH - OH	4,100.00	4,085.00	844.36	780.89	13.304	CC, ES, SF
Maljamar Grayburg Unit #31 - OH - OH	13,405.26	4,116.00	2,044.94	1,978.95	30.987	CC, ES
Maljamar Grayburg Unit #31 - OH - OH	13,943.72	4,116.00	2,114.64	2,039.15	28.011	SF

Offset Design Lea County Offset Wells - Grace Mitchell B #4 - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 4060-INC												Offset Well Error:	0.00 usft
Reference	Vertical	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning		
Measured Depth (usft)	Depth (usft)	Measured Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)			
0.00	0.00	0.00	0.00	0.00	173.24	-2,129.03	252.26	2,144.16					
100.00	100.00	68.00	0.09	0.91	173.24	-2,129.03	252.26	2,143.92	2,142.92	1.00	2,148.923		
200.00	200.00	168.00	0.32	2.24	173.24	-2,129.03	252.26	2,143.92	2,141.37	2.55	839.506		
300.00	300.00	268.00	0.54	3.57	173.24	-2,129.03	252.26	2,143.92	2,139.81	4.11	521.647		
400.00	400.00	368.00	0.77	4.90	173.24	-2,129.03	252.26	2,143.92	2,138.26	5.67	378.382		
500.00	500.00	468.00	0.99	6.23	173.24	-2,129.03	252.26	2,143.92	2,136.70	7.22	296.854		
600.00	600.00	568.00	1.22	7.56	173.24	-2,129.03	252.26	2,143.92	2,135.14	8.78	244.231		
700.00	700.00	668.00	1.44	8.89	173.24	-2,129.03	252.26	2,143.92	2,133.59	10.33	207.455		
800.00	800.00	768.00	1.67	10.22	173.24	-2,129.03	252.26	2,143.92	2,132.03	11.89	180.306		
900.00	900.00	868.00	1.89	11.56	173.24	-2,129.03	252.26	2,143.92	2,130.48	13.45	159.440		
1,000.00	1,000.00	968.00	2.12	12.89	173.24	-2,129.03	252.26	2,143.92	2,128.92	15.00	142.902		
1,100.00	1,100.00	1,068.00	2.34	14.22	173.24	-2,129.03	252.26	2,143.92	2,127.36	16.56	129.473		
1,200.00	1,200.00	1,168.00	2.56	15.55	173.24	-2,129.03	252.26	2,143.92	2,125.81	18.11	118.351		
1,300.00	1,300.00	1,268.00	2.79	16.88	173.24	-2,129.03	252.26	2,143.92	2,124.25	19.67	108.989		
1,400.00	1,400.00	1,368.00	3.01	18.21	173.24	-2,129.03	252.26	2,143.92	2,122.70	21.23	100.999		
1,500.00	1,500.00	1,468.00	3.24	19.54	173.24	-2,129.03	252.26	2,143.92	2,121.14	22.78	94.101		
1,600.00	1,600.00	1,568.00	3.46	20.88	173.24	-2,129.03	252.26	2,143.92	2,119.58	24.34	88.084		
1,700.00	1,700.00	1,668.00	3.69	22.21	173.24	-2,129.03	252.26	2,143.92	2,118.03	25.90	82.791		
1,800.00	1,800.00	1,768.00	3.91	23.54	173.24	-2,129.03	252.26	2,143.92	2,116.47	27.45	78.098		

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



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Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O
Reference Design: Design #1

Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
TVD Reference: KB @ 4118.00usft (Patriot 6)
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design												Offset Site Error:		0.00 usft
Survey Program: 4060-INC												Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis			Distance					Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor	
1,900.00	1,900.00	1,868.00	1,868.00	4.14	24.87	173.24	-2,129.03	252.26	2,143.92	2,114.91	29.01	73.909		
2,000.00	2,000.00	1,968.00	1,968.00	4.36	26.20	173.24	-2,129.03	252.26	2,143.92	2,113.36	30.56	70.146		
2,100.00	2,100.00	2,068.00	2,068.00	4.59	27.53	173.24	-2,129.03	252.26	2,143.92	2,111.80	32.12	66.747		
2,200.00	2,200.00	2,168.00	2,168.00	4.81	28.86	173.24	-2,129.03	252.26	2,143.92	2,110.25	33.68	63.663		
2,300.00	2,300.00	2,268.00	2,268.00	5.04	30.20	173.24	-2,129.03	252.26	2,143.92	2,108.69	35.23	60.851		
2,400.00	2,400.00	2,368.00	2,368.00	5.26	31.53	173.24	-2,129.03	252.26	2,143.92	2,107.13	36.79	58.277		
2,500.00	2,500.00	2,468.00	2,468.00	5.49	32.86	173.24	-2,129.03	252.26	2,143.92	2,105.58	38.34	55.912		
2,600.00	2,600.00	2,568.00	2,568.00	5.71	34.19	173.24	-2,129.03	252.26	2,143.92	2,104.02	39.90	53.732		
2,700.00	2,700.00	2,668.00	2,668.00	5.94	35.52	173.24	-2,129.03	252.26	2,143.92	2,102.47	41.46	51.715		
2,800.00	2,800.00	2,768.00	2,768.00	6.16	36.85	173.24	-2,129.03	252.26	2,143.92	2,100.91	43.01	49.844		
2,900.00	2,900.00	2,868.00	2,868.00	6.39	38.18	173.24	-2,129.03	252.26	2,143.92	2,099.35	44.57	48.103		
3,000.00	3,000.00	2,968.00	2,968.00	6.61	39.51	173.24	-2,129.03	252.26	2,143.92	2,097.80	46.13	46.481		
3,100.00	3,100.00	3,068.00	3,068.00	6.84	40.85	173.24	-2,129.03	252.26	2,143.92	2,096.24	47.68	44.964		
3,200.00	3,200.00	3,168.00	3,168.00	7.06	42.18	173.24	-2,129.03	252.26	2,143.92	2,094.69	49.24	43.543		
3,300.00	3,300.00	3,268.00	3,268.00	7.28	43.51	173.24	-2,129.03	252.26	2,143.92	2,093.13	50.79	42.209		
3,400.00	3,400.00	3,368.00	3,368.00	7.51	44.84	173.24	-2,129.03	252.26	2,143.92	2,091.57	52.35	40.954		
3,500.00	3,500.00	3,468.00	3,468.00	7.73	46.17	173.24	-2,129.03	252.26	2,143.92	2,090.02	53.91	39.772		
3,600.00	3,600.00	3,568.00	3,568.00	7.96	47.50	173.24	-2,129.03	252.26	2,143.92	2,088.46	55.46	38.656		
3,700.00	3,700.00	3,668.00	3,668.00	8.18	48.83	173.24	-2,129.03	252.26	2,143.92	2,086.90	57.02	37.601		
3,800.00	3,800.00	3,768.00	3,768.00	8.41	50.17	173.24	-2,129.03	252.26	2,143.92	2,085.35	58.57	36.602		
3,900.00	3,900.00	3,868.00	3,868.00	8.63	51.50	173.24	-2,129.03	252.26	2,143.92	2,083.79	60.13	35.655		
4,000.00	4,000.00	3,968.00	3,968.00	8.86	52.83	173.24	-2,129.03	252.26	2,143.92	2,082.24	61.69	34.755		
4,013.77	4,013.77	3,981.77	3,981.77	8.89	53.01	173.24	-2,129.03	252.26	2,143.92	2,082.02	61.90	34.635		
4,100.00	4,100.00	4,060.00	4,060.00	9.08	54.05	173.24	-2,129.03	252.26	2,143.94	2,080.80	63.14	33.958 ES		
4,200.00	4,200.00	4,060.00	4,060.00	9.31	54.05	173.24	-2,129.03	252.26	2,146.64	2,083.36	63.28	33.922 SF		
4,300.00	4,300.00	4,060.00	4,060.00	9.53	54.05	173.24	-2,129.03	252.26	2,153.99	2,090.70	63.29	34.033		
4,400.00	4,400.00	4,060.00	4,060.00	9.76	54.05	173.24	-2,129.03	252.26	2,165.93	2,102.77	63.17	34.288		
4,500.00	4,500.00	4,060.00	4,060.00	9.98	54.05	173.24	-2,129.03	252.26	2,182.40	2,119.48	62.92	34.687		
4,600.00	4,600.00	4,060.00	4,060.00	10.21	54.05	173.24	-2,129.03	252.26	2,203.29	2,140.74	62.55	35.227		
4,700.00	4,700.00	4,060.00	4,060.00	10.43	54.05	173.24	-2,129.03	252.26	2,228.47	2,166.41	62.06	35.907		
4,800.00	4,800.00	4,060.00	4,060.00	10.66	54.05	173.24	-2,129.03	252.26	2,257.80	2,196.32	61.48	36.726		
4,900.00	4,900.00	4,060.00	4,060.00	10.88	54.05	173.24	-2,129.03	252.26	2,291.13	2,230.33	60.80	37.681		
5,000.00	5,000.00	4,060.00	4,060.00	11.11	54.05	173.24	-2,129.03	252.26	2,328.28	2,268.23	60.05	38.772		
5,100.00	5,100.00	4,060.00	4,060.00	11.33	54.05	173.24	-2,129.03	252.26	2,369.06	2,309.83	59.23	39.996		
5,200.00	5,200.00	4,060.00	4,060.00	11.56	54.05	173.24	-2,129.03	252.26	2,413.31	2,354.95	58.36	41.353		
5,300.00	5,300.00	4,060.00	4,060.00	11.78	54.05	173.24	-2,129.03	252.26	2,460.83	2,403.38	57.44	42.840		
5,400.00	5,400.00	4,060.00	4,060.00	12.00	54.05	173.24	-2,129.03	252.26	2,511.43	2,454.93	56.49	44.456		
5,500.00	5,500.00	4,060.00	4,060.00	12.23	54.05	173.24	-2,129.03	252.26	2,564.93	2,509.41	55.52	46.199		
5,600.00	5,600.00	4,060.00	4,060.00	12.45	54.05	173.24	-2,129.03	252.26	2,621.16	2,566.63	54.53	48.067		
5,699.13	5,699.13	4,060.00	4,060.00	12.68	54.05	173.24	-2,129.03	252.26	2,679.42	2,625.87	53.54	50.041		
5,750.00	5,749.92	4,060.00	4,060.00	12.78	54.05	-6.65	-2,129.03	252.26	2,708.24	2,655.24	52.99	51.104		
5,800.00	5,799.37	4,060.00	4,060.00	12.86	54.05	-6.30	-2,129.03	252.26	2,733.16	2,680.77	52.40	52.163		
5,850.00	5,847.90	4,060.00	4,060.00	12.95	54.05	-6.02	-2,129.03	252.26	2,754.58	2,702.82	51.77	53.212		
5,900.00	5,895.06	4,060.00	4,060.00	13.04	54.05	-5.80	-2,129.03	252.26	2,772.39	2,721.28	51.11	54.246		
5,950.00	5,940.41	4,060.00	4,060.00	13.13	54.05	-5.64	-2,129.03	252.26	2,786.47	2,736.05	50.42	55.261		
6,000.00	5,983.55	4,060.00	4,060.00	13.22	54.05	-5.53	-2,129.03	252.26	2,796.77	2,747.05	49.72	56.253		
6,050.00	6,024.06	4,060.00	4,060.00	13.34	54.05	-5.46	-2,129.03	252.26	2,803.23	2,754.24	48.99	57.215		
6,100.00	6,061.58	4,060.00	4,060.00	13.50	54.05	-5.43	-2,129.03	252.26	2,805.82	2,757.56	48.26	58.140		
6,150.00	6,095.77	4,060.00	4,060.00	13.69	54.05	-5.44	-2,129.03	252.26	2,804.52	2,757.01	47.52	59.022		

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Survey Program: 4060-INC													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)						
6,200.00	6,126.30	4,060.00	4,060.00	13.91	54.05	-5.50	-2,129.03	252.26	2,799.35	2,752.58	46.77	59.850		
6,250.00	6,152.90	4,060.00	4,060.00	14.18	54.05	-5.60	-2,129.03	252.26	2,790.32	2,744.29	46.03	60.616		
6,300.00	6,175.32	4,060.00	4,060.00	14.50	54.05	-5.74	-2,129.03	252.26	2,777.49	2,732.19	45.30	61.312		
6,350.00	6,193.36	4,060.00	4,060.00	14.86	54.05	-5.94	-2,129.03	252.26	2,760.91	2,716.33	44.58	61.927		
6,400.00	6,206.85	4,060.00	4,060.00	15.27	54.05	-6.19	-2,129.03	252.26	2,740.68	2,696.80	43.89	62.451		
6,450.00	6,215.66	4,060.00	4,060.00	15.72	54.05	-6.52	-2,129.03	252.26	2,716.91	2,673.70	43.21	62.876		
6,500.00	6,219.71	4,060.00	4,060.00	16.20	54.05	-6.94	-2,129.03	252.26	2,689.72	2,647.15	42.56	63.192		
6,518.71	6,220.00	4,060.00	4,060.00	16.39	54.05	-7.13	-2,129.03	252.26	2,678.69	2,636.35	42.34	63.269		
6,600.00	6,219.78	4,060.00	4,060.00	17.27	54.05	-7.13	-2,129.03	252.26	2,630.61	2,589.33	41.28	63.724		
6,700.00	6,219.51	4,060.00	4,060.00	18.46	54.05	-7.13	-2,129.03	252.26	2,573.75	2,533.81	39.94	64.437		
6,800.00	6,219.24	4,060.00	4,060.00	19.75	54.05	-7.13	-2,129.03	252.26	2,519.58	2,481.01	38.57	65.325		
6,900.00	6,218.97	4,060.00	4,060.00	21.11	54.05	-7.13	-2,129.03	252.26	2,468.27	2,431.10	37.17	66.410		
7,000.00	6,218.70	4,060.00	4,060.00	22.55	54.05	-7.13	-2,129.03	252.26	2,420.01	2,384.27	35.74	67.715		
7,100.00	6,218.43	4,060.00	4,060.00	24.04	54.05	-7.13	-2,129.03	252.26	2,374.98	2,340.69	34.29	69.268		
7,200.00	6,218.16	4,060.00	4,060.00	25.57	54.05	-7.13	-2,129.03	252.26	2,333.36	2,300.55	32.82	71.104		
7,300.00	6,217.89	4,060.00	4,060.00	27.14	54.05	-7.13	-2,129.03	252.26	2,295.36	2,264.03	31.33	73.257		
7,400.00	6,217.63	4,060.00	4,060.00	28.74	54.05	-7.13	-2,129.03	252.26	2,261.14	2,231.30	29.84	75.766		
7,500.00	6,217.36	4,060.00	4,060.00	30.37	54.05	-7.13	-2,129.03	252.26	2,230.88	2,202.52	28.36	78.658		
7,600.00	6,217.09	4,060.00	4,060.00	32.01	54.05	-7.13	-2,129.03	252.26	2,204.75	2,177.84	26.91	81.940		
7,700.00	6,216.82	4,060.00	4,060.00	33.68	54.05	-7.13	-2,129.03	252.26	2,182.89	2,157.38	25.51	85.556		
7,800.00	6,216.55	4,060.00	4,060.00	35.37	54.05	-7.13	-2,129.03	252.26	2,165.43	2,141.19	24.24	89.315		
7,900.00	6,216.28	4,060.00	4,060.00	37.06	54.05	-7.13	-2,129.03	252.26	2,152.48	2,129.27	23.21	92.752		
8,000.00	6,216.01	4,060.00	4,060.00	38.77	54.05	-7.13	-2,129.03	252.26	2,144.12	2,121.54	22.58	94.944		
8,100.00	6,215.74	4,060.00	4,060.00	40.50	54.05	-7.13	-2,129.03	252.26	2,140.41	2,117.78	22.63	94.601		
8,129.58	6,215.66	4,060.00	4,060.00	41.01	54.05	-7.13	-2,129.03	252.26	2,140.20	2,117.40	22.80	93.876 CC		
8,200.00	6,215.47	4,060.00	4,060.00	42.23	54.05	-7.13	-2,129.03	252.26	2,141.36	2,117.85	23.51	91.070		
8,300.00	6,215.20	4,060.00	4,060.00	43.96	54.05	-7.13	-2,129.03	252.26	2,146.98	2,121.81	25.17	85.315		
8,400.00	6,214.93	4,060.00	4,060.00	45.71	54.05	-7.13	-2,129.03	252.26	2,157.22	2,129.90	27.32	78.957		
8,500.00	6,214.66	4,060.00	4,060.00	47.46	54.05	-7.13	-2,129.03	252.26	2,172.02	2,142.28	29.74	73.023		
8,600.00	6,214.39	4,060.00	4,060.00	49.22	54.05	-7.13	-2,129.03	252.26	2,191.29	2,159.01	32.28	67.884		
8,700.00	6,214.12	4,060.00	4,060.00	50.98	54.05	-7.13	-2,129.03	252.26	2,214.91	2,180.08	34.84	63.583		
8,800.00	6,213.85	4,060.00	4,060.00	52.75	54.05	-7.13	-2,129.03	252.26	2,242.75	2,205.39	37.35	60.040		
8,900.00	6,213.59	4,060.00	4,060.00	54.52	54.05	-7.13	-2,129.03	252.26	2,274.64	2,234.84	39.80	57.150		
9,000.00	6,213.32	4,060.00	4,060.00	56.30	54.05	-7.13	-2,129.03	252.26	2,310.43	2,268.28	42.15	54.809		
9,100.00	6,213.05	4,060.00	4,060.00	58.08	54.05	-7.13	-2,129.03	252.26	2,349.93	2,305.53	44.40	52.927		
9,200.00	6,212.78	4,060.00	4,060.00	59.86	54.05	-7.13	-2,129.03	252.26	2,392.96	2,346.43	46.53	51.431		
9,300.00	6,212.51	4,060.00	4,060.00	61.64	54.05	-7.13	-2,129.03	252.26	2,439.33	2,390.80	48.53	50.260		
9,400.00	6,212.24	4,060.00	4,060.00	63.43	54.05	-7.13	-2,129.03	252.26	2,488.86	2,438.44	50.42	49.362		
9,500.00	6,211.97	4,060.00	4,060.00	65.22	54.05	-7.13	-2,129.03	252.26	2,541.36	2,489.17	52.19	48.699		
9,600.00	6,211.70	4,060.00	4,060.00	67.01	54.05	-7.13	-2,129.03	252.26	2,596.65	2,542.82	53.83	48.235		
9,700.00	6,211.43	4,060.00	4,060.00	68.81	54.05	-7.13	-2,129.03	252.26	2,654.56	2,599.19	55.37	47.943		
9,800.00	6,211.16	4,060.00	4,060.00	70.61	54.05	-7.13	-2,129.03	252.26	2,714.91	2,658.12	56.80	47.801		
9,900.00	6,210.89	4,060.00	4,060.00	72.40	54.05	-7.13	-2,129.03	252.26	2,777.56	2,719.44	58.12	47.789		
10,000.00	6,210.62	4,060.00	4,060.00	74.20	54.05	-7.13	-2,129.03	252.26	2,842.34	2,782.99	59.35	47.891		
10,100.00	6,210.35	4,060.00	4,060.00	76.01	54.05	-7.13	-2,129.03	252.26	2,909.12	2,848.63	60.49	48.093		
10,200.00	6,210.08	4,060.00	4,060.00	77.81	54.05	-7.13	-2,129.03	252.26	2,977.77	2,916.22	61.54	48.384		
10,300.00	6,209.81	4,060.00	4,060.00	79.61	54.05	-7.13	-2,129.03	252.26	3,048.14	2,985.62	62.52	48.754		
10,400.00	6,209.54	4,060.00	4,060.00	81.42	54.05	-7.13	-2,129.03	252.26	3,120.14	3,056.71	63.43	49.193		
10,500.00	6,209.28	4,060.00	4,060.00	83.22	54.05	-7.13	-2,129.03	252.26	3,193.64	3,129.38	64.26	49.696		

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



TDS
Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD-27 2015)
Reference Site: Zeppo 5 Federal Com #25H
Site Error: 0.00 usft
Reference Well: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
Well Error: 0.00 usft
Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O
Reference Design: Design #1

Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
TVD Reference: KB @ 4118.00usft (Patriot 6)
MD Reference: KB @ 4118.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design													Lea County Offset Wells - Grace Mitchell B #4 - OH - OH		Offset Site Error:	0.00 usft
Survey Program: 4060-INC															Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)			
10,600.00	6,209.01	4,060.00	4,060.00	85.03	54.05	-7.13	-2,129.03	252.26	3,268.55	3,203.51	65.04	50.254				
10,700.00	6,208.74	4,060.00	4,060.00	86.84	54.05	-7.13	-2,129.03	252.26	3,344.77	3,279.01	65.76	50.864				
10,800.00	6,208.47	4,060.00	4,060.00	88.65	54.05	-7.13	-2,129.03	252.26	3,422.22	3,355.79	66.43	51.519				
10,900.00	6,208.20	4,060.00	4,060.00	90.46	54.05	-7.13	-2,129.03	252.26	3,500.81	3,433.76	67.05	52.215				
11,000.00	6,207.93	4,060.00	4,060.00	92.27	54.05	-7.13	-2,129.03	252.26	3,580.47	3,512.85	67.62	52.950				
11,100.00	6,207.66	4,060.00	4,060.00	94.08	54.05	-7.13	-2,129.03	252.26	3,661.12	3,592.97	68.15	53.718				
11,200.00	6,207.39	4,060.00	4,060.00	95.90	54.05	-7.13	-2,129.03	252.26	3,742.72	3,674.06	68.65	54.518				
11,300.00	6,207.12	4,060.00	4,060.00	97.71	54.05	-7.13	-2,129.03	252.26	3,825.18	3,756.07	69.11	55.346				
11,400.00	6,206.85	4,060.00	4,060.00	99.52	54.05	-7.13	-2,129.03	252.26	3,908.46	3,838.92	69.54	56.201				
11,500.00	6,206.58	4,060.00	4,060.00	101.34	54.05	-7.13	-2,129.03	252.26	3,992.51	3,922.57	69.95	57.080				
11,600.00	6,206.31	4,060.00	4,060.00	103.15	54.05	-7.13	-2,129.03	252.26	4,077.28	4,006.96	70.32	57.981				
11,700.00	6,206.04	4,060.00	4,060.00	104.97	54.05	-7.13	-2,129.03	252.26	4,162.73	4,092.06	70.67	58.902				
11,800.00	6,205.77	4,060.00	4,060.00	106.79	54.05	-7.13	-2,129.03	252.26	4,248.81	4,177.81	71.00	59.842				
11,900.00	6,205.50	4,060.00	4,060.00	108.60	54.05	-7.13	-2,129.03	252.26	4,335.49	4,264.18	71.31	60.799				
12,000.00	6,205.24	4,060.00	4,060.00	110.42	54.05	-7.13	-2,129.03	252.26	4,422.73	4,351.14	71.60	61.773				
12,100.00	6,204.97	4,060.00	4,060.00	112.24	54.05	-7.13	-2,129.03	252.26	4,510.51	4,438.64	71.87	62.761				
12,200.00	6,204.70	4,060.00	4,060.00	114.06	54.05	-7.13	-2,129.03	252.26	4,598.78	4,526.65	72.12	63.763				
12,300.00	6,204.43	4,060.00	4,060.00	115.87	54.05	-7.13	-2,129.03	252.26	4,687.52	4,615.16	72.36	64.778				
12,400.00	6,204.16	4,060.00	4,060.00	117.69	54.05	-7.13	-2,129.03	252.26	4,776.71	4,704.12	72.59	65.805				
12,500.00	6,203.89	4,060.00	4,060.00	119.51	54.05	-7.13	-2,129.03	252.26	4,866.31	4,793.51	72.80	66.843				
12,600.00	6,203.62	4,060.00	4,060.00	121.33	54.05	-7.13	-2,129.03	252.26	4,956.32	4,883.31	73.00	67.891				
12,700.00	6,203.35	4,060.00	4,060.00	123.15	54.05	-7.13	-2,129.03	252.26	5,046.70	4,973.50	73.19	68.949				
12,800.00	6,203.08	4,060.00	4,060.00	124.97	54.05	-7.13	-2,129.03	252.26	5,137.44	5,064.06	73.38	70.016				
12,900.00	6,202.81	4,060.00	4,060.00	126.79	54.05	-7.13	-2,129.03	252.26	5,228.51	5,154.96	73.55	71.091				
13,000.00	6,202.54	4,060.00	4,060.00	128.62	54.05	-7.13	-2,129.03	252.26	5,319.91	5,246.20	73.71	72.174				
13,100.00	6,202.27	4,060.00	4,060.00	130.44	54.05	-7.13	-2,129.03	252.26	5,411.61	5,337.74	73.86	73.264				
13,200.00	6,202.00	4,060.00	4,060.00	132.26	54.05	-7.13	-2,129.03	252.26	5,503.60	5,429.58	74.01	74.360				
13,300.00	6,201.73	4,060.00	4,060.00	134.08	54.05	-7.13	-2,129.03	252.26	5,595.86	5,521.71	74.15	75.464				
13,400.00	6,201.46	4,060.00	4,060.00	135.90	54.05	-7.13	-2,129.03	252.26	5,688.39	5,614.10	74.29	76.572				
13,500.00	6,201.20	4,060.00	4,060.00	137.73	54.05	-7.13	-2,129.03	252.26	5,781.16	5,706.75	74.42	77.687				
13,600.00	6,200.93	4,060.00	4,060.00	139.55	54.05	-7.13	-2,129.03	252.26	5,874.17	5,799.63	74.54	78.806				
13,700.00	6,200.66	4,060.00	4,060.00	141.37	54.05	-7.13	-2,129.03	252.26	5,967.41	5,892.75	74.66	79.931				
13,800.00	6,200.39	4,060.00	4,060.00	143.19	54.05	-7.13	-2,129.03	252.26	6,060.86	5,986.09	74.77	81.060				
13,900.00	6,200.12	4,060.00	4,060.00	145.02	54.05	-7.13	-2,129.03	252.26	6,154.52	6,079.64	74.88	82.192				
13,943.72	6,200.00	4,060.00	4,060.00	145.82	54.05	-7.13	-2,129.03	252.26	6,195.54	6,120.61	74.93	82.689				
13,944.59	6,200.00	4,060.00	4,060.00	145.83	54.05	-7.13	-2,129.03	252.26	6,196.35	6,121.08	75.28	82.314				

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



TDS
Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD-27 2015)
Reference Site: Zeppo 5 Federal Com #25H
Site Error: 0.00 usft
Reference Well: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
Well Error: 0.00 usft
Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O
Reference Design: Design #1

Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
TVD Reference: KB @ 4118.00usft (Patriot 6)
MD Reference: KB @ 4118.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 4085-INC													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	163.37	-809.06	241.58	844.49					
100.00	100.00	85.00	85.00	0.09	1.13	163.37	-809.06	241.58	844.36	843.13	1.22	689.833		
200.00	200.00	185.00	185.00	0.32	2.46	163.37	-809.06	241.58	844.36	841.58	2.78	303.712		
300.00	300.00	285.00	285.00	0.54	3.79	163.37	-809.06	241.58	844.36	840.02	4.34	194.721		
400.00	400.00	385.00	385.00	0.77	5.13	163.37	-809.06	241.58	844.36	838.46	5.89	143.297		
500.00	500.00	485.00	485.00	0.99	6.46	163.37	-809.06	241.58	844.36	836.91	7.45	113.360		
600.00	600.00	585.00	585.00	1.22	7.79	163.37	-809.06	241.58	844.36	835.35	9.00	93.770		
700.00	700.00	685.00	685.00	1.44	9.12	163.37	-809.06	241.58	844.36	833.80	10.56	79.953		
800.00	800.00	785.00	785.00	1.67	10.45	163.37	-809.06	241.58	844.36	832.24	12.12	69.685		
900.00	900.00	885.00	885.00	1.89	11.78	163.37	-809.06	241.58	844.36	830.68	13.67	61.754		
1,000.00	1,000.00	985.00	985.00	2.12	13.11	163.37	-809.06	241.58	844.36	829.13	15.23	55.444		
1,100.00	1,100.00	1,085.00	1,085.00	2.34	14.45	163.37	-809.06	241.58	844.36	827.57	16.79	50.304		
1,200.00	1,200.00	1,185.00	1,185.00	2.56	15.78	163.37	-809.06	241.58	844.36	826.02	18.34	46.036		
1,300.00	1,300.00	1,285.00	1,285.00	2.79	17.11	163.37	-809.06	241.58	844.36	824.46	19.90	42.436		
1,400.00	1,400.00	1,385.00	1,385.00	3.01	18.44	163.37	-809.06	241.58	844.36	822.90	21.45	39.357		
1,500.00	1,500.00	1,485.00	1,485.00	3.24	19.77	163.37	-809.06	241.58	844.36	821.35	23.01	36.696		
1,600.00	1,600.00	1,585.00	1,585.00	3.46	21.10	163.37	-809.06	241.58	844.36	819.79	24.57	34.371		
1,700.00	1,700.00	1,685.00	1,685.00	3.69	22.43	163.37	-809.06	241.58	844.36	818.24	26.12	32.324		
1,800.00	1,800.00	1,785.00	1,785.00	3.91	23.76	163.37	-809.06	241.58	844.36	816.68	27.68	30.506		
1,900.00	1,900.00	1,885.00	1,885.00	4.14	25.10	163.37	-809.06	241.58	844.36	815.12	29.23	28.883		
2,000.00	2,000.00	1,985.00	1,985.00	4.36	26.43	163.37	-809.06	241.58	844.36	813.57	30.79	27.423		
2,100.00	2,100.00	2,085.00	2,085.00	4.59	27.76	163.37	-809.06	241.58	844.36	812.01	32.35	26.104		
2,200.00	2,200.00	2,185.00	2,185.00	4.81	29.09	163.37	-809.06	241.58	844.36	810.45	33.90	24.905		
2,300.00	2,300.00	2,285.00	2,285.00	5.04	30.42	163.37	-809.06	241.58	844.36	808.90	35.46	23.812		
2,400.00	2,400.00	2,385.00	2,385.00	5.26	31.75	163.37	-809.06	241.58	844.36	807.34	37.01	22.811		
2,500.00	2,500.00	2,485.00	2,485.00	5.49	33.08	163.37	-809.06	241.58	844.36	805.79	38.57	21.891		
2,600.00	2,600.00	2,585.00	2,585.00	5.71	34.42	163.37	-809.06	241.58	844.36	804.23	40.13	21.042		
2,700.00	2,700.00	2,685.00	2,685.00	5.94	35.75	163.37	-809.06	241.58	844.36	802.67	41.68	20.257		
2,800.00	2,800.00	2,785.00	2,785.00	6.16	37.08	163.37	-809.06	241.58	844.36	801.12	43.24	19.528		
2,900.00	2,900.00	2,885.00	2,885.00	6.39	38.41	163.37	-809.06	241.58	844.36	799.56	44.80	18.849		
3,000.00	3,000.00	2,985.00	2,985.00	6.61	39.74	163.37	-809.06	241.58	844.36	798.01	46.35	18.216		
3,100.00	3,100.00	3,085.00	3,085.00	6.84	41.07	163.37	-809.06	241.58	844.36	796.45	47.91	17.625		
3,200.00	3,200.00	3,185.00	3,185.00	7.06	42.40	163.37	-809.06	241.58	844.36	794.89	49.46	17.070		
3,300.00	3,300.00	3,285.00	3,285.00	7.28	43.74	163.37	-809.06	241.58	844.36	793.34	51.02	16.550		
3,400.00	3,400.00	3,385.00	3,385.00	7.51	45.07	163.37	-809.06	241.58	844.36	791.78	52.58	16.060		
3,500.00	3,500.00	3,485.00	3,485.00	7.73	46.40	163.37	-809.06	241.58	844.36	790.23	54.13	15.598		
3,600.00	3,600.00	3,585.00	3,585.00	7.96	47.73	163.37	-809.06	241.58	844.36	788.67	55.69	15.162		
3,700.00	3,700.00	3,685.00	3,685.00	8.18	49.06	163.37	-809.06	241.58	844.36	787.11	57.24	14.750		
3,800.00	3,800.00	3,785.00	3,785.00	8.41	50.39	163.37	-809.06	241.58	844.36	785.56	58.80	14.360		
3,900.00	3,900.00	3,885.00	3,885.00	8.63	51.72	163.37	-809.06	241.58	844.36	784.00	60.36	13.990		
4,000.00	4,000.00	3,985.00	3,985.00	8.86	53.05	163.37	-809.06	241.58	844.36	782.44	61.91	13.638		
4,100.00	4,100.00	4,085.00	4,085.00	9.08	54.39	163.37	-809.06	241.58	844.36	780.89	63.47	13.304 CC, ES, SF		
4,200.00	4,200.00	4,085.00	4,085.00	9.31	54.39	163.37	-809.06	241.58	850.26	787.00	63.26	13.442		
4,300.00	4,300.00	4,085.00	4,085.00	9.53	54.39	163.37	-809.06	241.58	867.72	805.51	62.22	13.947		
4,400.00	4,400.00	4,085.00	4,085.00	9.76	54.39	163.37	-809.06	241.58	896.07	835.59	60.48	14.816		
4,500.00	4,500.00	4,085.00	4,085.00	9.98	54.39	163.37	-809.06	241.58	934.31	876.08	58.23	16.044		
4,600.00	4,600.00	4,085.00	4,085.00	10.21	54.39	163.37	-809.06	241.58	981.29	925.62	55.67	17.626		
4,700.00	4,700.00	4,085.00	4,085.00	10.43	54.39	163.37	-809.06	241.58	1,035.83	982.86	52.96	19.557		
4,800.00	4,800.00	4,085.00	4,085.00	10.66	54.39	163.37	-809.06	241.58	1,096.79	1,046.55	50.24	21.833		

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



TDS
Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD-27 2015)
Reference Site: Zeppo 5 Federal Com #25H
Site Error: 0.00 usft
Reference Well: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
Well Error: 0.00 usft
Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O
Reference Design: Design #1

Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
TVD Reference: KB @ 4118.00usft (Patriot 6)
MD Reference: KB @ 4118.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 4085-INC													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,900.00	4,900.00	4,085.00	4,085.00	10.88	54.39	163.37	-809.06	241.58	1,163.16	1,115.58	47.58	24.447		
5,000.00	5,000.00	4,085.00	4,085.00	11.11	54.39	163.37	-809.06	241.58	1,234.07	1,189.03	45.05	27.395		
5,100.00	5,100.00	4,085.00	4,085.00	11.33	54.39	163.37	-809.06	241.58	1,308.79	1,266.12	42.67	30.670		
5,200.00	5,200.00	4,085.00	4,085.00	11.56	54.39	163.37	-809.06	241.58	1,386.70	1,346.23	40.47	34.265		
5,300.00	5,300.00	4,085.00	4,085.00	11.78	54.39	163.37	-809.06	241.58	1,467.29	1,428.85	38.44	38.175		
5,400.00	5,400.00	4,085.00	4,085.00	12.00	54.39	163.37	-809.06	241.58	1,550.14	1,513.58	36.57	42.392		
5,500.00	5,500.00	4,085.00	4,085.00	12.23	54.39	163.37	-809.06	241.58	1,634.91	1,600.06	34.85	46.909		
5,600.00	5,600.00	4,085.00	4,085.00	12.45	54.39	163.37	-809.06	241.58	1,721.32	1,688.04	33.28	51.717		
5,699.13	5,699.13	4,085.00	4,085.00	12.68	54.39	163.37	-809.06	241.58	1,808.36	1,776.50	31.86	56.763		
5,750.00	5,749.92	4,085.00	4,085.00	12.78	54.39	-14.38	-809.06	241.58	1,852.34	1,821.25	31.09	59.584		
5,800.00	5,799.37	4,085.00	4,085.00	12.86	54.39	-12.53	-809.06	241.58	1,893.45	1,863.23	30.22	62.652		
5,850.00	5,847.90	4,085.00	4,085.00	12.95	54.39	-11.14	-809.06	241.58	1,932.23	1,902.95	29.28	65.997		
5,900.00	5,895.06	4,085.00	4,085.00	13.04	54.39	-10.07	-809.06	241.58	1,968.46	1,940.20	28.26	69.648		
5,950.00	5,940.41	4,085.00	4,085.00	13.13	54.39	-9.24	-809.06	241.58	2,001.97	1,974.78	27.19	73.635		
6,000.00	5,983.55	4,085.00	4,085.00	13.22	54.39	-8.58	-809.06	241.58	2,032.57	2,006.51	26.06	77.989		
6,050.00	6,024.06	4,085.00	4,085.00	13.34	54.39	-8.06	-809.06	241.58	2,060.13	2,035.23	24.90	82.747		
6,100.00	6,061.58	4,085.00	4,085.00	13.50	54.39	-7.64	-809.06	241.58	2,084.52	2,060.81	23.70	87.944		
6,150.00	6,095.77	4,085.00	4,085.00	13.69	54.39	-7.30	-809.06	241.58	2,105.62	2,083.13	22.49	93.610		
6,200.00	6,126.30	4,085.00	4,085.00	13.91	54.39	-7.04	-809.06	241.58	2,123.35	2,102.06	21.28	99.766		
6,250.00	6,152.90	4,085.00	4,085.00	14.18	54.39	-6.84	-809.06	241.58	2,137.62	2,117.53	20.09	106.418		
6,300.00	6,175.32	4,085.00	4,085.00	14.50	54.39	-6.70	-809.06	241.58	2,148.38	2,129.46	18.92	113.547		
6,350.00	6,193.36	4,085.00	4,085.00	14.86	54.39	-6.61	-809.06	241.58	2,155.57	2,137.77	17.80	121.095		
6,400.00	6,206.85	4,085.00	4,085.00	15.27	54.39	-6.56	-809.06	241.58	2,159.17	2,142.43	16.74	128.953		
6,450.00	6,215.66	4,085.00	4,085.00	15.72	54.39	-6.56	-809.06	241.58	2,159.17	2,143.40	15.77	136.941		
6,500.00	6,219.71	4,085.00	4,085.00	16.20	54.39	-6.61	-809.06	241.58	2,155.55	2,140.66	14.89	144.787		
6,518.71	6,220.00	4,085.00	4,085.00	16.39	54.39	-6.64	-809.06	241.58	2,153.27	2,138.68	14.59	147.571		
6,600.00	6,219.78	4,085.00	4,085.00	17.27	54.39	-6.64	-809.06	241.58	2,143.80	2,130.35	13.46	159.294		
6,700.00	6,219.51	4,085.00	4,085.00	18.46	54.39	-6.64	-809.06	241.58	2,136.34	2,123.73	12.61	169.352		
6,800.00	6,219.24	4,085.00	4,085.00	19.75	54.39	-6.64	-809.06	241.58	2,133.55	2,120.91	12.64	168.852		
6,809.69	6,219.22	4,085.00	4,085.00	19.88	54.39	-6.64	-809.06	241.58	2,133.52	2,120.83	12.69	168.098		
6,900.00	6,218.97	4,085.00	4,085.00	21.11	54.39	-6.64	-809.06	241.58	2,135.43	2,121.77	13.66	156.314		
7,000.00	6,218.70	4,085.00	4,085.00	22.55	54.39	-6.64	-809.06	241.58	2,141.99	2,126.48	15.51	138.064		
7,100.00	6,218.43	4,085.00	4,085.00	24.04	54.39	-6.64	-809.06	241.58	2,153.18	2,135.31	17.88	120.455		
7,200.00	6,218.16	4,085.00	4,085.00	25.57	54.39	-6.64	-809.06	241.58	2,168.93	2,148.44	20.50	105.823		
7,300.00	6,217.89	4,085.00	4,085.00	27.14	54.39	-6.64	-809.06	241.58	2,189.14	2,165.91	23.23	94.256		
7,400.00	6,217.63	4,085.00	4,085.00	28.74	54.39	-6.64	-809.06	241.58	2,213.68	2,187.71	25.98	85.223		
7,500.00	6,217.36	4,085.00	4,085.00	30.37	54.39	-6.64	-809.06	241.58	2,242.42	2,213.73	28.69	78.160		
7,600.00	6,217.09	4,085.00	4,085.00	32.01	54.39	-6.64	-809.06	241.58	2,275.20	2,243.86	31.34	72.607		
7,700.00	6,216.82	4,085.00	4,085.00	33.68	54.39	-6.64	-809.06	241.58	2,311.83	2,277.95	33.89	68.219		
7,800.00	6,216.55	4,085.00	4,085.00	35.37	54.39	-6.64	-809.06	241.58	2,352.16	2,315.82	36.33	64.737		
7,900.00	6,216.28	4,085.00	4,085.00	37.06	54.39	-6.64	-809.06	241.58	2,395.98	2,357.31	38.66	61.972		
8,000.00	6,216.01	4,085.00	4,085.00	38.77	54.39	-6.64	-809.06	241.58	2,443.11	2,402.24	40.87	59.779		
8,100.00	6,215.74	4,085.00	4,085.00	40.50	54.39	-6.64	-809.06	241.58	2,493.36	2,450.40	42.95	58.051		
8,200.00	6,215.47	4,085.00	4,085.00	42.23	54.39	-6.64	-809.06	241.58	2,546.54	2,501.63	44.91	56.702		
8,300.00	6,215.20	4,085.00	4,085.00	43.96	54.39	-6.64	-809.06	241.58	2,602.49	2,555.74	46.75	55.668		
8,400.00	6,214.93	4,085.00	4,085.00	45.71	54.39	-6.64	-809.06	241.58	2,661.02	2,612.54	48.47	54.897		
8,500.00	6,214.66	4,085.00	4,085.00	47.46	54.39	-6.64	-809.06	241.58	2,721.96	2,671.88	50.08	54.349		
8,600.00	6,214.39	4,085.00	4,085.00	49.22	54.39	-6.64	-809.06	241.58	2,785.16	2,733.58	51.59	53.991		
8,700.00	6,214.12	4,085.00	4,085.00	50.98	54.39	-6.64	-809.06	241.58	2,850.47	2,797.48	52.99	53.794		

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



TDS
Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD-27 2015)
Reference Site: Zeppo 5 Federal Com #25H
Site Error: 0.00 usft
Reference Well: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
Well Error: 0.00 usft
Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O
Reference Design: Design #1

Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
TVD Reference: KB @ 4118.00usft (Patriot 6)
MD Reference: KB @ 4118.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Lea County Offset Wells - Grace Mitchell B Federal #6 - OH - OH													Offset Well Error:	0.00 usft
Survey Program: 4085-INC														
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
8,800.00	6,213.85	4,085.00	4,085.00	52.75	54.39	-6.64	-809.06	241.58	2,917.75	2,863.45	54.30	53.738		
8,900.00	6,213.59	4,085.00	4,085.00	54.52	54.39	-6.64	-809.06	241.58	2,986.86	2,931.34	55.51	53.804		
9,000.00	6,213.32	4,085.00	4,085.00	56.30	54.39	-6.64	-809.06	241.58	3,057.68	3,001.03	56.65	53.976		
9,100.00	6,213.05	4,085.00	4,085.00	58.08	54.39	-6.64	-809.06	241.58	3,130.09	3,072.38	57.71	54.242		
9,200.00	6,212.78	4,085.00	4,085.00	59.86	54.39	-6.64	-809.06	241.58	3,203.98	3,145.29	58.69	54.591		
9,300.00	6,212.51	4,085.00	4,085.00	61.64	54.39	-6.64	-809.06	241.58	3,279.26	3,219.65	59.61	55.013		
9,400.00	6,212.24	4,085.00	4,085.00	63.43	54.39	-6.64	-809.06	241.58	3,355.84	3,295.37	60.47	55.500		
9,500.00	6,211.97	4,085.00	4,085.00	65.22	54.39	-6.64	-809.06	241.58	3,433.61	3,372.35	61.26	56.046		
9,600.00	6,211.70	4,085.00	4,085.00	67.01	54.39	-6.64	-809.06	241.58	3,512.51	3,450.50	62.01	56.645		
9,700.00	6,211.43	4,085.00	4,085.00	68.81	54.39	-6.64	-809.06	241.58	3,592.47	3,529.76	62.71	57.290		
9,800.00	6,211.16	4,085.00	4,085.00	70.61	54.39	-6.64	-809.06	241.58	3,673.40	3,610.04	63.36	57.978		
9,900.00	6,210.89	4,085.00	4,085.00	72.40	54.39	-6.64	-809.06	241.58	3,755.26	3,691.29	63.97	58.705		
10,000.00	6,210.62	4,085.00	4,085.00	74.20	54.39	-6.64	-809.06	241.58	3,837.97	3,773.43	64.54	59.467		
10,100.00	6,210.35	4,085.00	4,085.00	76.01	54.39	-6.64	-809.06	241.58	3,921.49	3,856.41	65.07	60.261		
10,200.00	6,210.08	4,085.00	4,085.00	77.81	54.39	-6.64	-809.06	241.58	4,005.76	3,940.18	65.58	61.085		
10,300.00	6,209.81	4,085.00	4,085.00	79.61	54.39	-6.64	-809.06	241.58	4,090.74	4,024.70	66.05	61.935		
10,400.00	6,209.54	4,085.00	4,085.00	81.42	54.39	-6.64	-809.06	241.58	4,176.39	4,109.90	66.49	62.809		
10,500.00	6,209.28	4,085.00	4,085.00	83.22	54.39	-6.64	-809.06	241.58	4,262.67	4,195.75	66.91	63.706		
10,600.00	6,209.01	4,085.00	4,085.00	85.03	54.39	-6.64	-809.06	241.58	4,349.53	4,282.22	67.31	64.624		
10,700.00	6,208.74	4,085.00	4,085.00	86.84	54.39	-6.64	-809.06	241.58	4,436.94	4,369.26	67.68	65.561		
10,800.00	6,208.47	4,085.00	4,085.00	88.65	54.39	-6.64	-809.06	241.58	4,524.88	4,456.85	68.03	66.515		
10,900.00	6,208.20	4,085.00	4,085.00	90.46	54.39	-6.64	-809.06	241.58	4,613.30	4,544.94	68.36	67.486		
11,000.00	6,207.93	4,085.00	4,085.00	92.27	54.39	-6.64	-809.06	241.58	4,702.19	4,633.52	68.67	68.472		
11,100.00	6,207.66	4,085.00	4,085.00	94.08	54.39	-6.64	-809.06	241.58	4,791.52	4,722.55	68.97	69.471		
11,200.00	6,207.39	4,085.00	4,085.00	95.90	54.39	-6.64	-809.06	241.58	4,881.27	4,812.01	69.25	70.484		
11,300.00	6,207.12	4,085.00	4,085.00	97.71	54.39	-6.64	-809.06	241.58	4,971.40	4,901.88	69.52	71.509		
11,400.00	6,206.85	4,085.00	4,085.00	99.52	54.39	-6.64	-809.06	241.58	5,061.90	4,992.13	69.78	72.544		
11,500.00	6,206.58	4,085.00	4,085.00	101.34	54.39	-6.64	-809.06	241.58	5,152.76	5,082.74	70.02	73.591		
11,600.00	6,206.31	4,085.00	4,085.00	103.15	54.39	-6.64	-809.06	241.58	5,243.95	5,173.70	70.25	74.647		
11,700.00	6,206.04	4,085.00	4,085.00	104.97	54.39	-6.64	-809.06	241.58	5,335.45	5,264.98	70.47	75.711		
11,800.00	6,205.77	4,085.00	4,085.00	106.79	54.39	-6.64	-809.06	241.58	5,427.26	5,356.58	70.68	76.785		
11,900.00	6,205.50	4,085.00	4,085.00	108.60	54.39	-6.64	-809.06	241.58	5,519.35	5,448.46	70.88	77.866		
12,000.00	6,205.24	4,085.00	4,085.00	110.42	54.39	-6.64	-809.06	241.58	5,611.71	5,540.63	71.08	78.954		
12,100.00	6,204.97	4,085.00	4,085.00	112.24	54.39	-6.64	-809.06	241.58	5,704.32	5,633.06	71.26	80.049		
12,200.00	6,204.70	4,085.00	4,085.00	114.06	54.39	-6.64	-809.06	241.58	5,797.19	5,725.75	71.44	81.151		
12,300.00	6,204.43	4,085.00	4,085.00	115.87	54.39	-6.64	-809.06	241.58	5,890.28	5,818.68	71.61	82.258		
12,400.00	6,204.16	4,085.00	4,085.00	117.69	54.39	-6.64	-809.06	241.58	5,983.60	5,911.83	71.77	83.371		
12,500.00	6,203.89	4,085.00	4,085.00	119.51	54.39	-6.64	-809.06	241.58	6,077.13	6,005.21	71.93	84.490		
12,600.00	6,203.62	4,085.00	4,085.00	121.33	54.39	-6.64	-809.06	241.58	6,170.87	6,098.79	72.08	85.612		
12,700.00	6,203.35	4,085.00	4,085.00	123.15	54.39	-6.64	-809.06	241.58	6,264.80	6,192.57	72.23	86.740		
12,800.00	6,203.08	4,085.00	4,085.00	124.97	54.39	-6.64	-809.06	241.58	6,358.91	6,286.54	72.37	87.872		
12,900.00	6,202.81	4,085.00	4,085.00	126.79	54.39	-6.64	-809.06	241.58	6,453.20	6,380.70	72.50	89.007		
13,000.00	6,202.54	4,085.00	4,085.00	128.62	54.39	-6.64	-809.06	241.58	6,547.66	6,475.03	72.63	90.146		
13,100.00	6,202.27	4,085.00	4,085.00	130.44	54.39	-6.64	-809.06	241.58	6,642.28	6,569.52	72.76	91.289		
13,200.00	6,202.00	4,085.00	4,085.00	132.26	54.39	-6.64	-809.06	241.58	6,737.06	6,664.18	72.88	92.435		
13,300.00	6,201.73	4,085.00	4,085.00	134.08	54.39	-6.64	-809.06	241.58	6,831.99	6,758.98	73.00	93.583		
13,400.00	6,201.46	4,085.00	4,085.00	135.90	54.39	-6.64	-809.06	241.58	6,927.06	6,853.94	73.12	94.735		
13,500.00	6,201.20	4,085.00	4,085.00	137.73	54.39	-6.64	-809.06	241.58	7,022.26	6,949.03	73.23	95.888		
13,600.00	6,200.93	4,085.00	4,085.00	139.55	54.39	-6.64	-809.06	241.58	7,117.60	7,044.26	73.34	97.045		

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



TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4118.00usft (Patriot 6)
Reference Site:	Zeppo 5 Federal Com #25H	MD Reference:	KB @ 4118.00usft (Patriot 6)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Lea County Offset Wells - Grace Mitchell B Federal #6 - OH - OH													Offset Well Error:	0.00 usft
Survey Program: 4085-INC														
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
13,700.00	6,200.66	4,085.00	4,085.00	141.37	54.39	-6.64	-809.06	241.58	7,213.06	7,139.61	73.45	98.203		
13,800.00	6,200.39	4,085.00	4,085.00	143.19	54.39	-6.64	-809.06	241.58	7,308.65	7,235.09	73.55	99.363		
13,900.00	6,200.12	4,085.00	4,085.00	145.02	54.39	-6.64	-809.06	241.58	7,404.35	7,330.70	73.66	100.525		
13,943.72	6,200.00	4,085.00	4,085.00	145.82	54.39	-6.64	-809.06	241.58	7,446.23	7,372.53	73.70	101.034		
13,944.59	6,200.00	4,085.00	4,085.00	145.83	54.39	-6.64	-809.06	241.58	7,447.07	7,372.90	74.16	100.415		



TDS
Anticollision Report



Company: COG Operating LLC Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G

Project: Lea County, NM (NAD-27 2015) TVD Reference: KB @ 4118.00usft (Patriot 6)

Reference Site: Zeppo 5 Federal Com #25H MD Reference: KB @ 4118.00usft (Patriot 6)

Site Error: 0.00 usft North Reference: Grid

Reference Well: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G Survey Calculation Method: Minimum Curvature

Well Error: 0.00 usft Output errors are at 2.00 sigma

Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O Database: EDM 5000.1 Single User Db

Reference Design: Design #1 Offset TVD Reference: Offset Datum

Offset Design Lea County Offset Wells - Maljamar Grayburg Unit #31 - OH - OH													Offset Site Error: 0.00 usft	
Survey Program: 4116-INC													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	177.87	-7,405.22	275.71	7,410.64					
100.00	100.00	34.00	34.00	0.09	0.45	177.87	-7,405.22	275.71	7,410.35	7,409.81	0.55	N/A		
200.00	200.00	134.00	134.00	0.32	1.78	177.87	-7,405.22	275.71	7,410.35	7,408.25	2.10	3,526.838		
300.00	300.00	234.00	234.00	0.54	3.12	177.87	-7,405.22	275.71	7,410.35	7,406.69	3.66	2,026.209		
400.00	400.00	334.00	334.00	0.77	4.45	177.87	-7,405.22	275.71	7,410.35	7,405.14	5.21	1,421.414		
500.00	500.00	434.00	434.00	0.99	5.78	177.87	-7,405.22	275.71	7,410.35	7,403.58	6.77	1,094.670		
600.00	600.00	534.00	534.00	1.22	7.11	177.87	-7,405.22	275.71	7,410.35	7,402.03	8.33	890.068		
700.00	700.00	634.00	634.00	1.44	8.44	177.87	-7,405.22	275.71	7,410.35	7,400.47	9.88	749.905		
800.00	800.00	734.00	734.00	1.67	9.77	177.87	-7,405.22	275.71	7,410.35	7,398.91	11.44	647.880		
900.00	900.00	834.00	834.00	1.89	11.10	177.87	-7,405.22	275.71	7,410.35	7,397.36	12.99	570.292		
1,000.00	1,000.00	934.00	934.00	2.12	12.44	177.87	-7,405.22	275.71	7,410.35	7,395.80	14.55	509.300		
1,100.00	1,100.00	1,034.00	1,034.00	2.34	13.77	177.87	-7,405.22	275.71	7,410.35	7,394.24	16.11	460.093		
1,200.00	1,200.00	1,134.00	1,134.00	2.56	15.10	177.87	-7,405.22	275.71	7,410.35	7,392.69	17.66	419.557		
1,300.00	1,300.00	1,234.00	1,234.00	2.79	16.43	177.87	-7,405.22	275.71	7,410.35	7,391.13	19.22	385.586		
1,400.00	1,400.00	1,334.00	1,334.00	3.01	17.76	177.87	-7,405.22	275.71	7,410.35	7,389.58	20.77	356.703		
1,500.00	1,500.00	1,434.00	1,434.00	3.24	19.09	177.87	-7,405.22	275.71	7,410.35	7,388.02	22.33	331.846		
1,600.00	1,600.00	1,534.00	1,534.00	3.46	20.42	177.87	-7,405.22	275.71	7,410.35	7,386.46	23.89	310.228		
1,700.00	1,700.00	1,634.00	1,634.00	3.69	21.75	177.87	-7,405.22	275.71	7,410.35	7,384.91	25.44	291.254		
1,800.00	1,800.00	1,734.00	1,734.00	3.91	23.09	177.87	-7,405.22	275.71	7,410.35	7,383.35	27.00	274.467		
1,900.00	1,900.00	1,834.00	1,834.00	4.14	24.42	177.87	-7,405.22	275.71	7,410.35	7,381.80	28.56	259.510		
2,000.00	2,000.00	1,934.00	1,934.00	4.36	25.75	177.87	-7,405.22	275.71	7,410.35	7,380.24	30.11	246.099		
2,100.00	2,100.00	2,034.00	2,034.00	4.59	27.08	177.87	-7,405.22	275.71	7,410.35	7,378.68	31.67	234.006		
2,200.00	2,200.00	2,134.00	2,134.00	4.81	28.41	177.87	-7,405.22	275.71	7,410.35	7,377.13	33.22	223.046		
2,300.00	2,300.00	2,234.00	2,234.00	5.04	29.74	177.87	-7,405.22	275.71	7,410.35	7,375.57	34.78	213.066		
2,400.00	2,400.00	2,334.00	2,334.00	5.26	31.07	177.87	-7,405.22	275.71	7,410.35	7,374.02	36.34	203.941		
2,500.00	2,500.00	2,434.00	2,434.00	5.49	32.41	177.87	-7,405.22	275.71	7,410.35	7,372.46	37.89	195.566		
2,600.00	2,600.00	2,534.00	2,534.00	5.71	33.74	177.87	-7,405.22	275.71	7,410.35	7,370.90	39.45	187.851		
2,700.00	2,700.00	2,634.00	2,634.00	5.94	35.07	177.87	-7,405.22	275.71	7,410.35	7,369.35	41.00	180.722		
2,800.00	2,800.00	2,734.00	2,734.00	6.16	36.40	177.87	-7,405.22	275.71	7,410.35	7,367.79	42.56	174.115		
2,900.00	2,900.00	2,834.00	2,834.00	6.39	37.73	177.87	-7,405.22	275.71	7,410.35	7,366.23	44.12	167.973		
3,000.00	3,000.00	2,934.00	2,934.00	6.61	39.06	177.87	-7,405.22	275.71	7,410.35	7,364.68	45.67	162.250		
3,100.00	3,100.00	3,034.00	3,034.00	6.84	40.39	177.87	-7,405.22	275.71	7,410.35	7,363.12	47.23	156.904		
3,200.00	3,200.00	3,134.00	3,134.00	7.06	41.72	177.87	-7,405.22	275.71	7,410.35	7,361.57	48.78	151.899		
3,300.00	3,300.00	3,234.00	3,234.00	7.28	43.06	177.87	-7,405.22	275.71	7,410.35	7,360.01	50.34	147.204		
3,400.00	3,400.00	3,334.00	3,334.00	7.51	44.39	177.87	-7,405.22	275.71	7,410.35	7,358.45	51.90	142.790		
3,500.00	3,500.00	3,434.00	3,434.00	7.73	45.72	177.87	-7,405.22	275.71	7,410.35	7,356.90	53.45	138.633		
3,600.00	3,600.00	3,534.00	3,534.00	7.96	47.05	177.87	-7,405.22	275.71	7,410.35	7,355.34	55.01	134.711		
3,700.00	3,700.00	3,634.00	3,634.00	8.18	48.38	177.87	-7,405.22	275.71	7,410.35	7,353.79	56.57	131.005		
3,800.00	3,800.00	3,734.00	3,734.00	8.41	49.71	177.87	-7,405.22	275.71	7,410.35	7,352.23	58.12	127.498		
3,900.00	3,900.00	3,834.00	3,834.00	8.63	51.04	177.87	-7,405.22	275.71	7,410.35	7,350.67	59.68	124.173		
4,000.00	4,000.00	3,934.00	3,934.00	8.86	52.38	177.87	-7,405.22	275.71	7,410.35	7,349.12	61.23	121.018		
4,100.00	4,100.00	4,034.00	4,034.00	9.08	53.71	177.87	-7,405.22	275.71	7,410.35	7,347.56	62.79	118.019		
4,109.35	4,109.35	4,043.35	4,043.35	9.10	53.83	177.87	-7,405.22	275.71	7,410.35	7,347.42	62.94	117.746		
4,200.00	4,200.00	4,116.00	4,116.00	9.31	54.80	177.87	-7,405.22	275.71	7,410.37	7,346.27	64.11	115.596		
4,300.00	4,300.00	4,116.00	4,116.00	9.53	54.80	177.87	-7,405.22	275.71	7,411.29	7,346.97	64.32	115.220		
4,400.00	4,400.00	4,116.00	4,116.00	9.76	54.80	177.87	-7,405.22	275.71	7,413.56	7,349.03	64.53	114.889		
4,500.00	4,500.00	4,116.00	4,116.00	9.98	54.80	177.87	-7,405.22	275.71	7,417.17	7,352.45	64.72	114.601		
4,600.00	4,600.00	4,116.00	4,116.00	10.21	54.80	177.87	-7,405.22	275.71	7,422.13	7,357.23	64.90	114.357		
4,700.00	4,700.00	4,116.00	4,116.00	10.43	54.80	177.87	-7,405.22	275.71	7,428.43	7,363.36	65.07	114.156		

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



TDS
Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD-27 2015)
Reference Site: Zeppo 5 Federal Com #25H
Site Error: 0.00 usft
Reference Well: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
Well Error: 0.00 usft
Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O
Reference Design: Design #1
Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
TVD Reference: KB @ 4118.00usft (Patriot 6)
MD Reference: KB @ 4118.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 4116-INC													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,800.00	4,800.00	4,116.00	4,116.00	10.66	54.80	177.87	-7,405.22	275.71	7,436.08	7,370.85	65.23	113.997		
4,900.00	4,900.00	4,116.00	4,116.00	10.88	54.80	177.87	-7,405.22	275.71	7,445.05	7,379.68	65.38	113.880		
5,000.00	5,000.00	4,116.00	4,116.00	11.11	54.80	177.87	-7,405.22	275.71	7,455.36	7,389.85	65.51	113.805		
5,100.00	5,100.00	4,116.00	4,116.00	11.33	54.80	177.87	-7,405.22	275.71	7,467.00	7,401.36	65.63	113.770		
5,200.00	5,200.00	4,116.00	4,116.00	11.56	54.80	177.87	-7,405.22	275.71	7,479.95	7,414.21	65.74	113.777		
5,300.00	5,300.00	4,116.00	4,116.00	11.78	54.80	177.87	-7,405.22	275.71	7,494.21	7,428.37	65.84	113.823		
5,400.00	5,400.00	4,116.00	4,116.00	12.00	54.80	177.87	-7,405.22	275.71	7,509.78	7,443.85	65.93	113.910		
5,500.00	5,500.00	4,116.00	4,116.00	12.23	54.80	177.87	-7,405.22	275.71	7,526.65	7,460.65	66.00	114.036		
5,600.00	5,600.00	4,116.00	4,116.00	12.45	54.80	177.87	-7,405.22	275.71	7,544.80	7,478.73	66.07	114.200		
5,699.13	5,699.13	4,116.00	4,116.00	12.68	54.80	177.87	-7,405.22	275.71	7,564.06	7,497.94	66.12	114.402		
5,750.00	5,749.92	4,116.00	4,116.00	12.78	54.80	-2.45	-7,405.22	275.71	7,571.98	7,505.86	66.12	114.514		
5,800.00	5,799.37	4,116.00	4,116.00	12.86	54.80	-2.44	-7,405.22	275.71	7,575.30	7,509.19	66.11	114.588		
5,850.00	5,847.90	4,116.00	4,116.00	12.95	54.80	-2.44	-7,405.22	275.71	7,574.15	7,508.05	66.10	114.594		
5,900.00	5,895.06	4,116.00	4,116.00	13.04	54.80	-2.47	-7,405.22	275.71	7,568.55	7,502.47	66.08	114.532		
5,950.00	5,940.41	4,116.00	4,116.00	13.13	54.80	-2.52	-7,405.22	275.71	7,558.54	7,492.47	66.07	114.404		
6,000.00	5,983.55	4,116.00	4,116.00	13.22	54.80	-2.59	-7,405.22	275.71	7,544.19	7,478.13	66.06	114.210		
6,050.00	6,024.06	4,116.00	4,116.00	13.34	54.80	-2.69	-7,405.22	275.71	7,525.61	7,459.57	66.04	113.950		
6,100.00	6,061.58	4,116.00	4,116.00	13.50	54.80	-2.83	-7,405.22	275.71	7,502.94	7,436.91	66.03	113.626		
6,150.00	6,095.77	4,116.00	4,116.00	13.69	54.80	-3.00	-7,405.22	275.71	7,476.36	7,410.34	66.02	113.239		
6,200.00	6,126.30	4,116.00	4,116.00	13.91	54.80	-3.23	-7,405.22	275.71	7,446.07	7,380.06	66.01	112.794		
6,250.00	6,152.90	4,116.00	4,116.00	14.18	54.80	-3.53	-7,405.22	275.71	7,412.30	7,346.29	66.01	112.293		
6,300.00	6,175.32	4,116.00	4,116.00	14.50	54.80	-3.92	-7,405.22	275.71	7,375.32	7,309.32	66.00	111.741		
6,350.00	6,193.36	4,116.00	4,116.00	14.86	54.80	-4.45	-7,405.22	275.71	7,335.43	7,269.43	66.00	111.143		
6,400.00	6,206.85	4,116.00	4,116.00	15.27	54.80	-5.20	-7,405.22	275.71	7,292.94	7,226.94	66.00	110.505		
6,450.00	6,215.66	4,116.00	4,116.00	15.72	54.80	-6.31	-7,405.22	275.71	7,248.20	7,182.21	65.99	109.832		
6,500.00	6,219.71	4,116.00	4,116.00	16.20	54.80	-8.08	-7,405.22	275.71	7,201.60	7,135.61	65.99	109.131		
6,518.71	6,220.00	4,116.00	4,116.00	16.39	54.80	-9.05	-7,405.22	275.71	7,183.76	7,117.76	65.99	108.856		
6,600.00	6,219.78	4,116.00	4,116.00	17.27	54.80	-9.05	-7,405.22	275.71	7,105.87	7,039.90	65.97	107.708		
6,700.00	6,219.51	4,116.00	4,116.00	18.46	54.80	-9.05	-7,405.22	275.71	7,010.16	6,944.21	65.95	106.296		
6,800.00	6,219.24	4,116.00	4,116.00	19.75	54.80	-9.05	-7,405.22	275.71	6,914.57	6,848.64	65.93	104.881		
6,900.00	6,218.97	4,116.00	4,116.00	21.11	54.80	-9.05	-7,405.22	275.71	6,819.11	6,753.20	65.91	103.461		
7,000.00	6,218.70	4,116.00	4,116.00	22.55	54.80	-9.05	-7,405.22	275.71	6,723.78	6,657.88	65.89	102.038		
7,100.00	6,218.43	4,116.00	4,116.00	24.04	54.80	-9.05	-7,405.22	275.71	6,628.59	6,562.70	65.88	100.610		
7,200.00	6,218.16	4,116.00	4,116.00	25.57	54.80	-9.05	-7,405.22	275.71	6,533.54	6,467.66	65.88	99.178		
7,300.00	6,217.89	4,116.00	4,116.00	27.14	54.80	-9.05	-7,405.22	275.71	6,438.64	6,372.76	65.87	97.742		
7,400.00	6,217.63	4,116.00	4,116.00	28.74	54.80	-9.05	-7,405.22	275.71	6,343.89	6,278.02	65.87	96.302		
7,500.00	6,217.36	4,116.00	4,116.00	30.37	54.80	-9.05	-7,405.22	275.71	6,249.31	6,183.43	65.88	94.859		
7,600.00	6,217.09	4,116.00	4,116.00	32.01	54.80	-9.05	-7,405.22	275.71	6,154.91	6,089.02	65.89	93.411		
7,700.00	6,216.82	4,116.00	4,116.00	33.68	54.80	-9.05	-7,405.22	275.71	6,060.68	5,994.77	65.91	91.959		
7,800.00	6,216.55	4,116.00	4,116.00	35.37	54.80	-9.05	-7,405.22	275.71	5,966.64	5,900.71	65.93	90.504		
7,900.00	6,216.28	4,116.00	4,116.00	37.06	54.80	-9.05	-7,405.22	275.71	5,872.79	5,806.84	65.95	89.045		
8,000.00	6,216.01	4,116.00	4,116.00	38.77	54.80	-9.05	-7,405.22	275.71	5,779.16	5,713.17	65.98	87.583		
8,100.00	6,215.74	4,116.00	4,116.00	40.50	54.80	-9.05	-7,405.22	275.71	5,685.74	5,619.72	66.02	86.118		
8,200.00	6,215.47	4,116.00	4,116.00	42.23	54.80	-9.05	-7,405.22	275.71	5,592.55	5,526.48	66.07	84.650		
8,300.00	6,215.20	4,116.00	4,116.00	43.96	54.80	-9.05	-7,405.22	275.71	5,499.59	5,433.47	66.12	83.179		
8,400.00	6,214.93	4,116.00	4,116.00	45.71	54.80	-9.05	-7,405.22	275.71	5,406.89	5,340.71	66.18	81.706		
8,500.00	6,214.66	4,116.00	4,116.00	47.46	54.80	-9.05	-7,405.22	275.71	5,314.45	5,248.21	66.24	80.231		
8,600.00	6,214.39	4,116.00	4,116.00	49.22	54.80	-9.05	-7,405.22	275.71	5,222.29	5,155.98	66.31	78.754		
8,700.00	6,214.12	4,116.00	4,116.00	50.98	54.80	-9.05	-7,405.22	275.71	5,130.43	5,064.04	66.39	77.276		

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



TDS
Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD-27 2015)
Reference Site: Zeppo 5 Federal Com #25H
Site Error: 0.00 usft
Reference Well: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
Well Error: 0.00 usft
Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O
Reference Design: Design #1
Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
TVD Reference: KB @ 4118.00usft (Patriot 6)
MD Reference: KB @ 4118.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design													Lea County Offset Wells - Maljamar Grayburg Unit #31 - OH - OH		Offset Site Error:	0.00 usft
Survey Program: 4116-INC															Offset Well Error:	0.00 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 (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)								
8,800.00	6,213.85	4,116.00	4,116.00	52.75	54.80	-9.05	-7,405.22	275.71	5,038.87	4,972.39	66.48	75.797				
8,900.00	6,213.59	4,116.00	4,116.00	54.52	54.80	-9.05	-7,405.22	275.71	4,947.65	4,881.07	66.57	74.318				
9,000.00	6,213.32	4,116.00	4,116.00	56.30	54.80	-9.05	-7,405.22	275.71	4,856.76	4,790.08	66.68	72.839				
9,100.00	6,213.05	4,116.00	4,116.00	58.08	54.80	-9.05	-7,405.22	275.71	4,766.24	4,699.45	66.79	71.362				
9,200.00	6,212.78	4,116.00	4,116.00	59.86	54.80	-9.05	-7,405.22	275.71	4,676.11	4,609.20	66.91	69.886				
9,300.00	6,212.51	4,116.00	4,116.00	61.64	54.80	-9.05	-7,405.22	275.71	4,586.39	4,519.35	67.04	68.412				
9,400.00	6,212.24	4,116.00	4,116.00	63.43	54.80	-9.05	-7,405.22	275.71	4,497.10	4,429.92	67.18	66.942				
9,500.00	6,211.97	4,116.00	4,116.00	65.22	54.80	-9.05	-7,405.22	275.71	4,408.27	4,340.95	67.33	65.477				
9,600.00	6,211.70	4,116.00	4,116.00	67.01	54.80	-9.05	-7,405.22	275.71	4,319.93	4,252.45	67.48	64.016				
9,700.00	6,211.43	4,116.00	4,116.00	68.81	54.80	-9.05	-7,405.22	275.71	4,232.11	4,164.46	67.65	62.561				
9,800.00	6,211.16	4,116.00	4,116.00	70.61	54.80	-9.05	-7,405.22	275.71	4,144.84	4,077.02	67.82	61.114				
9,900.00	6,210.89	4,116.00	4,116.00	72.40	54.80	-9.05	-7,405.22	275.71	4,058.16	3,990.16	68.00	59.675				
10,000.00	6,210.62	4,116.00	4,116.00	74.20	54.80	-9.05	-7,405.22	275.71	3,972.10	3,903.91	68.19	58.246				
10,100.00	6,210.35	4,116.00	4,116.00	76.01	54.80	-9.05	-7,405.22	275.71	3,886.72	3,818.32	68.39	56.829				
10,200.00	6,210.08	4,116.00	4,116.00	77.81	54.80	-9.05	-7,405.22	275.71	3,802.04	3,733.44	68.60	55.423				
10,300.00	6,209.81	4,116.00	4,116.00	79.61	54.80	-9.05	-7,405.22	275.71	3,718.12	3,649.31	68.81	54.032				
10,400.00	6,209.54	4,116.00	4,116.00	81.42	54.80	-9.05	-7,405.22	275.71	3,635.02	3,565.99	69.03	52.657				
10,500.00	6,209.28	4,116.00	4,116.00	83.22	54.80	-9.05	-7,405.22	275.71	3,552.79	3,483.54	69.26	51.299				
10,600.00	6,209.01	4,116.00	4,116.00	85.03	54.80	-9.05	-7,405.22	275.71	3,471.50	3,402.01	69.49	49.960				
10,700.00	6,208.74	4,116.00	4,116.00	86.84	54.80	-9.05	-7,405.22	275.71	3,391.20	3,321.48	69.72	48.643				
10,800.00	6,208.47	4,116.00	4,116.00	88.65	54.80	-9.05	-7,405.22	275.71	3,311.98	3,242.03	69.95	47.349				
10,900.00	6,208.20	4,116.00	4,116.00	90.46	54.80	-9.05	-7,405.22	275.71	3,233.90	3,163.72	70.18	46.081				
11,000.00	6,207.93	4,116.00	4,116.00	92.27	54.80	-9.05	-7,405.22	275.71	3,157.07	3,086.66	70.41	44.841				
11,100.00	6,207.66	4,116.00	4,116.00	94.08	54.80	-9.05	-7,405.22	275.71	3,081.56	3,010.94	70.63	43.632				
11,200.00	6,207.39	4,116.00	4,116.00	95.90	54.80	-9.05	-7,405.22	275.71	3,007.49	2,936.65	70.84	42.456				
11,300.00	6,207.12	4,116.00	4,116.00	97.71	54.80	-9.05	-7,405.22	275.71	2,934.95	2,863.91	71.04	41.316				
11,400.00	6,206.85	4,116.00	4,116.00	99.52	54.80	-9.05	-7,405.22	275.71	2,864.07	2,792.85	71.22	40.215				
11,500.00	6,206.58	4,116.00	4,116.00	101.34	54.80	-9.05	-7,405.22	275.71	2,794.96	2,723.59	71.38	39.158				
11,600.00	6,206.31	4,116.00	4,116.00	103.15	54.80	-9.05	-7,405.22	275.71	2,727.78	2,656.27	71.51	38.146				
11,700.00	6,206.04	4,116.00	4,116.00	104.97	54.80	-9.05	-7,405.22	275.71	2,662.65	2,591.04	71.61	37.184				
11,800.00	6,205.77	4,116.00	4,116.00	106.79	54.80	-9.05	-7,405.22	275.71	2,599.74	2,528.08	71.66	36.276				
11,900.00	6,205.50	4,116.00	4,116.00	108.60	54.80	-9.05	-7,405.22	275.71	2,539.21	2,467.54	71.68	35.426				
12,000.00	6,205.24	4,116.00	4,116.00	110.42	54.80	-9.05	-7,405.22	275.71	2,481.24	2,409.61	71.63	34.639				
12,100.00	6,204.97	4,116.00	4,116.00	112.24	54.80	-9.05	-7,405.22	275.71	2,426.00	2,354.48	71.53	33.918				
12,200.00	6,204.70	4,116.00	4,116.00	114.06	54.80	-9.05	-7,405.22	275.71	2,373.70	2,302.35	71.35	33.270				
12,300.00	6,204.43	4,116.00	4,116.00	115.87	54.80	-9.05	-7,405.22	275.71	2,324.52	2,253.43	71.09	32.698				
12,400.00	6,204.16	4,116.00	4,116.00	117.69	54.80	-9.05	-7,405.22	275.71	2,278.67	2,207.92	70.75	32.208				
12,500.00	6,203.89	4,116.00	4,116.00	119.51	54.80	-9.05	-7,405.22	275.71	2,236.36	2,166.04	70.32	31.804				
12,600.00	6,203.62	4,116.00	4,116.00	121.33	54.80	-9.05	-7,405.22	275.71	2,197.78	2,127.99	69.79	31.490				
12,700.00	6,203.35	4,116.00	4,116.00	123.15	54.80	-9.05	-7,405.22	275.71	2,163.14	2,093.96	69.18	31.269				
12,800.00	6,203.08	4,116.00	4,116.00	124.97	54.80	-9.05	-7,405.22	275.71	2,132.63	2,064.15	68.48	31.141				
12,900.00	6,202.81	4,116.00	4,116.00	126.79	54.80	-9.05	-7,405.22	275.71	2,106.44	2,038.70	67.73	31.099				
13,000.00	6,202.54	4,116.00	4,116.00	128.62	54.80	-9.05	-7,405.22	275.71	2,084.71	2,017.74	66.97	31.131				
13,100.00	6,202.27	4,116.00	4,116.00	130.44	54.80	-9.05	-7,405.22	275.71	2,067.60	2,001.34	66.26	31.204				
13,200.00	6,202.00	4,116.00	4,116.00	132.26	54.80	-9.05	-7,405.22	275.71	2,055.22	1,989.48	65.73	31.265				
13,300.00	6,201.73	4,116.00	4,116.00	134.08	54.80	-9.05	-7,405.22	275.71	2,047.65	1,982.08	65.57	31.229				
13,400.00	6,201.46	4,116.00	4,116.00	135.90	54.80	-9.05	-7,405.22	275.71	2,044.95	1,978.99	65.96	31.005				
13,405.26	6,201.45	4,116.00	4,116.00	136.00	54.80	-9.05	-7,405.22	275.71	2,044.94	1,978.95	65.99	30.987 CC, ES				
13,500.00	6,201.20	4,116.00	4,116.00	137.73	54.80	-9.05	-7,405.22	275.71	2,047.13	1,980.15	66.98	30.562				

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



TDS
Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD-27 2015)
Reference Site: Zeppo 5 Federal Com #25H
Site Error: 0.00 usft
Reference Well: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
Well Error: 0.00 usft
Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O
Reference Design: Design #1

Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
TVD Reference: KB @ 4118.00usft (Patriot 6)
MD Reference: KB @ 4118.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design														Offset Site Error:	0.00 usft
Lea County Offset Wells - Maljamar Grayburg Unit #31 - OH - OH														Offset Well Error:	0.00 usft
Survey Program: 4116-INC															
Reference		Offset		Semi Major Axis			Distance								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
13,600.00	6,200.93	4,116.00	4,116.00	139.55	54.80	-9.05	-7,405.22	275.71	2,054.19	1,985.64	68.55	29.966			
13,700.00	6,200.66	4,116.00	4,116.00	141.37	54.80	-9.05	-7,405.22	275.71	2,066.07	1,995.61	70.46	29.323			
13,800.00	6,200.39	4,116.00	4,116.00	143.19	54.80	-9.05	-7,405.22	275.71	2,082.69	2,010.17	72.52	28.719			
13,900.00	6,200.12	4,116.00	4,116.00	145.02	54.80	-9.05	-7,405.22	275.71	2,103.94	2,029.34	74.60	28.203			
13,943.72	6,200.00	4,116.00	4,116.00	145.82	54.80	-9.05	-7,405.22	275.71	2,114.64	2,039.15	75.49	28.011 SF			
13,944.59	6,200.00	4,116.00	4,116.00	145.83	54.80	-9.05	-7,405.22	275.71	2,114.87	2,039.42	75.45	28.031			

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

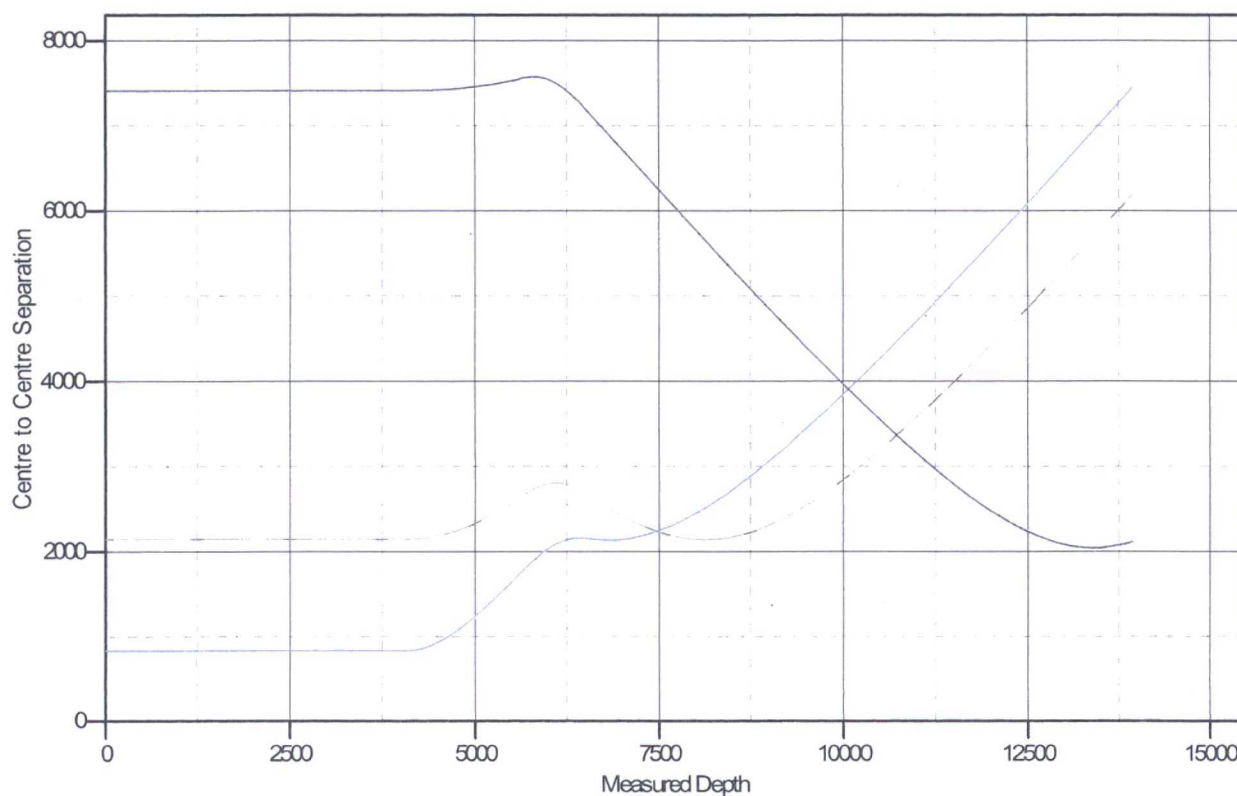
Company: COG Operating LLC
Project: Lea County, NM (NAD-27 2015)
Reference Site: Zeppo 5 Federal Com #25H
Site Error: 0.00 usft
Reference Well: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
Well Error: 0.00 usft
Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O
Reference Design: Design #1

Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G
TVD Reference: KB @ 4118.00usft (Patriot 6)
MD Reference: KB @ 4118.00usft (Patriot 6)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 4118.00usft (Patriot 6)
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.30°

Ladder Plot



LEGEND

* Grace Mitchell B Federal #6, OH, OH V0 ♦ Grace Mitchell B #4, OH, OH V0 ● Maljamar Grayburg Unit #31, OH, OH V0

Company: COG Operating LLC

Project: Lea County, NM (NAD-27 2015)

Reference Site: Zeppo 5 Federal Com #25H

Site Error: 0.00 usft

Reference Well: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G

Well Error: 0.00 usft

Reference Wellbore: BHL: 121' FSL, 2308' FEL, Sec 8, T17S, R32E, Unit O

Reference Design: Design #1

Local Co-ordinate Reference: Well SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit G

TVD Reference: KB @ 4118.00usft (Patriot 6)

MD Reference: KB @ 4118.00usft (Patriot 6)

North Reference: Grid

Survey Calculation Method: Minimum Curvature

Output errors are at 2.00 sigma

Database: EDM 5000.1 Single User Db

Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 4118.00usft (Patriot 6)

Offset Depths are relative to Offset Datum

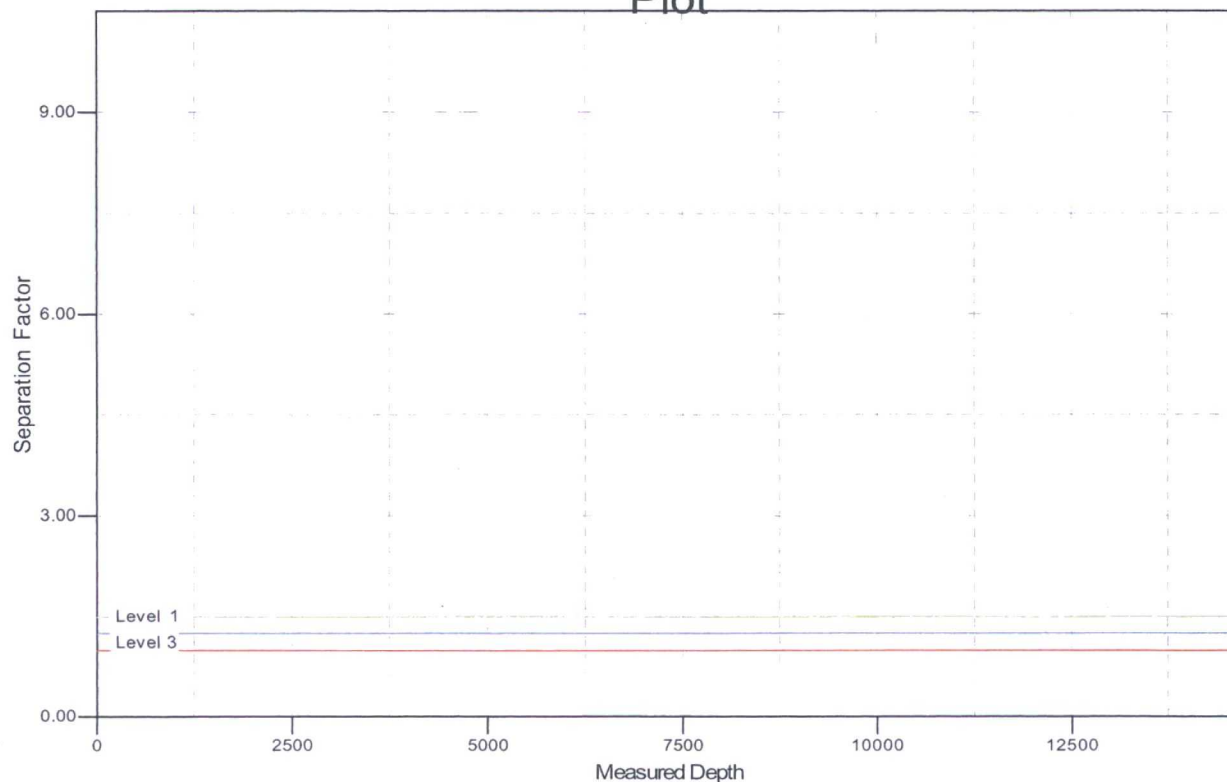
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: SHL: 2490' FNL, 2210' FEL, Sec 5, T17S, R32E, Unit

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

Grid Convergence at Surface is: 0.30°

Separation Factor Plot



LEGEND

✕ Grace Mitchell B Federal #6, OH, OHV0 ◆ Grace Mitchell B #4, OH, OHV0 ⊖ Maljamar Grayburg Unit #31, OH, OHV0