

CONCHO

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COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 16, T 25 S. , R 35 E

White Falcon 16 Federal Com 22H

Wellbore #1

Plan #1

Anticollision Report

21 March, 2017





Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 22H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Reference	Plan #1
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 100.00ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 10,000.00 ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Circular Conic
Casing Method:	Not applied

Survey Tool Program		Date	3/21/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	22,457.93	Plan #1 (Wellbore #1)	MWD	MWD - Standard	

Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec. 16, T 25 S. , R 35 E						
White Falcon 16 Federal Com 11H - Wellbore #1 - Plan #	6,000.00	5,999.90	40.04	13.35	1.500	CC
White Falcon 16 Federal Com 11H - Wellbore #1 - Plan #	22,457.97	22,209.98	384.82	11.49	1.031	Level 2, ES, SF
White Falcon 16 Federal Com 21H - Wellbore #1 - Plan #	6,000.00	5,999.80	80.04	53.36	2.999	CC, ES
White Falcon 16 Federal Com 21H - Wellbore #1 - Plan #	22,457.97	22,438.52	660.42	286.68	1.767	SF

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	89.48	0.37	40.04	40.04	39.88	0.17	240.861	
100.00	100.00	99.90	99.90	0.08	0.08	89.48	0.37	40.04	40.04	39.43	0.62	65.041	
200.00	200.00	199.90	199.90	0.31	0.31	89.48	0.37	40.04	40.04	38.98	1.07	37.592	
300.00	300.00	299.90	299.90	0.76	0.76	89.48	0.37	40.04	40.04	38.53	1.51	26.435	
400.00	400.00	399.90	399.90	0.98	0.98	89.48	0.37	40.04	40.04	38.08	1.96	20.385	
500.00	500.00	499.90	499.90	1.21	1.21	89.48	0.37	40.04	40.04	37.63	2.41	16.589	
600.00	600.00	599.90	599.90	1.43	1.43	89.48	0.37	40.04	40.04	37.18	2.86	13.984	
700.00	700.00	699.90	699.90	1.66	1.66	89.48	0.37	40.04	40.04	36.73	3.31	12.087	
800.00	800.00	799.90	799.90	1.88	1.88	89.48	0.37	40.04	40.04	36.28	3.76	10.643	
900.00	900.00	899.90	899.90	2.11	2.11	89.48	0.37	40.04	40.04	35.83	4.21	9.507	
1,000.00	1,000.00	999.90	999.90	2.33	2.33	89.48	0.37	40.04	40.04	35.38	4.66	8.590	
1,100.00	1,100.00	1,099.90	1,099.90	2.56	2.56	89.48	0.37	40.04	40.04	34.93	5.11	7.834	
1,200.00	1,200.00	1,199.90	1,199.90	2.78	2.78	89.48	0.37	40.04	40.04	34.48	5.56	7.201	
1,300.00	1,300.00	1,299.90	1,299.90	3.01	3.00	89.48	0.37	40.04	40.04	34.03	6.01	6.662	
1,400.00	1,400.00	1,399.90	1,399.90	3.23	3.23	89.48	0.37	40.04	40.04	33.58	6.46	6.199	
1,500.00	1,500.00	1,499.90	1,499.90	3.45	3.45	89.48	0.37	40.04	40.04	33.13	6.91	5.796	
1,600.00	1,600.00	1,599.90	1,599.90	3.68	3.68	89.48	0.37	40.04	40.04	32.68	7.36	5.441	
1,700.00	1,700.00	1,699.90	1,699.90	3.90	3.90	89.48	0.37	40.04	40.04	32.23	7.81	5.128	
1,800.00	1,800.00	1,799.90	1,799.90	4.13	4.13	89.48	0.37	40.04	40.04	31.78	8.26	4.849	
1,900.00	1,900.00	1,899.90	1,899.90	4.35	4.35	89.48	0.37	40.04	40.04	31.33	8.71	4.599	
2,000.00	2,000.00	1,999.90	1,999.90	4.58	4.58	89.48	0.37	40.04	40.04	30.88	9.16	4.373	
2,100.00	2,100.00	2,099.90	2,099.90	4.80	4.80	89.48	0.37	40.04	40.04	30.44	9.61	4.168	
2,200.00	2,200.00	2,199.90	2,199.90										

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



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Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 11H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
2,300.00	2,300.00	2,299.90	2,299.90	5.03	5.03	89.48	0.37	40.04	40.04	29.99	10.06	3.982		
2,400.00	2,400.00	2,399.90	2,399.90	5.25	5.25	89.48	0.37	40.04	40.04	29.54	10.51	3.812		
2,500.00	2,500.00	2,499.90	2,499.90	5.48	5.48	89.48	0.37	40.04	40.04	29.09	10.95	3.655		
2,600.00	2,600.00	2,599.90	2,599.90	5.70	5.70	89.48	0.37	40.04	40.04	28.64	11.40	3.511		
2,700.00	2,700.00	2,699.90	2,699.90	5.93	5.93	89.48	0.37	40.04	40.04	28.19	11.85	3.378		
2,800.00	2,800.00	2,799.90	2,799.90	6.15	6.15	89.48	0.37	40.04	40.04	27.74	12.30	3.254		
2,900.00	2,900.00	2,899.90	2,899.90	6.38	6.38	89.48	0.37	40.04	40.04	27.29	12.75	3.140		
3,000.00	3,000.00	2,999.90	2,999.90	6.60	6.60	89.48	0.37	40.04	40.04	26.84	13.20	3.033		
3,100.00	3,100.00	3,099.90	3,099.90	6.83	6.83	89.48	0.37	40.04	40.04	26.39	13.65	2.933		
3,200.00	3,200.00	3,199.90	3,199.90	7.05	7.05	89.48	0.37	40.04	40.04	25.94	14.10	2.840		
3,300.00	3,300.00	3,299.90	3,299.90	7.28	7.28	89.48	0.37	40.04	40.04	25.49	14.55	2.752		
3,400.00	3,400.00	3,399.90	3,399.90	7.50	7.50	89.48	0.37	40.04	40.04	25.04	15.00	2.669		
3,500.00	3,500.00	3,499.90	3,499.90	7.73	7.72	89.48	0.37	40.04	40.04	24.59	15.45	2.592		
3,600.00	3,600.00	3,599.90	3,599.90	7.95	7.95	89.48	0.37	40.04	40.04	24.14	15.90	2.518		
3,700.00	3,700.00	3,699.90	3,699.90	8.17	8.17	89.48	0.37	40.04	40.04	23.69	16.35	2.449		
3,800.00	3,800.00	3,799.90	3,799.90	8.40	8.40	89.48	0.37	40.04	40.04	23.24	16.80	2.384		
3,900.00	3,900.00	3,899.90	3,899.90	8.62	8.62	89.48	0.37	40.04	40.04	22.79	17.25	2.321		
4,000.00	4,000.00	3,999.90	3,999.90	8.85	8.85	89.48	0.37	40.04	40.04	22.34	17.70	2.263		
4,100.00	4,100.00	4,099.90	4,099.90	9.07	9.07	89.48	0.37	40.04	40.04	21.89	18.15	2.206		
4,200.00	4,200.00	4,199.90	4,199.90	9.30	9.30	89.48	0.37	40.04	40.04	21.44	18.60	2.153		
4,300.00	4,300.00	4,299.90	4,299.90	9.52	9.52	89.48	0.37	40.04	40.04	21.00	19.05	2.102		
4,400.00	4,400.00	4,399.90	4,399.90	9.75	9.75	89.48	0.37	40.04	40.04	20.55	19.50	2.054		
4,500.00	4,500.00	4,499.90	4,499.90	9.97	9.97	89.48	0.37	40.04	40.04	20.10	19.95	2.008		
4,600.00	4,600.00	4,599.90	4,599.90	10.20	10.20	89.48	0.37	40.04	40.04	19.65	20.40	1.963		
4,700.00	4,700.00	4,699.90	4,699.90	10.42	10.42	89.48	0.37	40.04	40.04	19.20	20.84	1.921		
4,800.00	4,800.00	4,799.90	4,799.90	10.65	10.65	89.48	0.37	40.04	40.04	18.75	21.29	1.880		
4,900.00	4,900.00	4,899.90	4,899.90	10.87	10.87	89.48	0.37	40.04	40.04	18.30	21.74	1.842		
5,000.00	5,000.00	4,999.90	4,999.90	11.10	11.10	89.48	0.37	40.04	40.04	17.85	22.19	1.804		
5,100.00	5,100.00	5,099.90	5,099.90	11.32	11.32	89.48	0.37	40.04	40.04	17.40	22.64	1.768		
5,200.00	5,200.00	5,199.90	5,199.90	11.55	11.55	89.48	0.37	40.04	40.04	16.95	23.09	1.734		
5,300.00	5,300.00	5,299.90	5,299.90	11.77	11.77	89.48	0.37	40.04	40.04	16.50	23.54	1.701		
5,400.00	5,400.00	5,399.90	5,399.90	12.00	12.00	89.48	0.37	40.04	40.04	16.05	23.99	1.669		
5,500.00	5,500.00	5,499.90	5,499.90	12.22	12.22	89.48	0.37	40.04	40.04	15.60	24.44	1.638		
5,600.00	5,600.00	5,599.90	5,599.90	12.45	12.45	89.48	0.37	40.04	40.04	15.15	24.89	1.609		
5,700.00	5,700.00	5,699.90	5,699.90	12.67	12.67	89.48	0.37	40.04	40.04	14.70	25.34	1.580		
5,800.00	5,800.00	5,799.90	5,799.90	12.89	12.89	89.48	0.37	40.04	40.04	14.25	25.79	1.553		
5,900.00	5,900.00	5,899.90	5,899.90	13.12	13.12	89.48	0.37	40.04	40.04	13.80	26.24	1.526		
6,000.00	6,000.00	5,999.90	5,999.90	13.34	13.34	89.48	0.37	40.04	40.04	13.35	26.69	1.500 CC		
6,100.00	6,099.98	6,099.88	6,099.88	13.56	13.57	180.00	0.37	40.04	41.79	14.66	27.12	1.541		
6,200.00	6,199.89	6,199.79	6,199.79	13.75	13.79	180.00	0.37	40.04	46.13	18.58	27.55	1.675		
6,300.00	6,299.78	6,299.68	6,299.68	13.95	14.02	180.00	0.37	40.04	50.61	22.64	27.97	1.809		
6,400.00	6,399.68	6,399.58	6,399.58	14.15	14.24	180.00	0.37	40.04	55.10	26.70	28.40	1.940		
6,500.00	6,499.58	6,499.48	6,499.48	14.36	14.47	180.00	0.37	40.04	59.58	30.76	28.82	2.067		
6,600.00	6,599.48	6,599.38	6,599.38	14.56	14.69	180.00	0.37	40.04	64.07	34.81	29.25	2.190		
6,700.00	6,699.38	6,699.28	6,699.28	14.76	14.92	180.00	0.37	40.04	68.55	38.87	29.68	2.310		
6,800.00	6,799.28	6,799.18	6,799.18	14.97	15.14	180.00	0.37	40.04	73.03	42.92	30.11	2.426		
6,900.00	6,899.18	6,899.08	6,899.08	15.17	15.37	180.00	0.37	40.04	77.52	46.98	30.54	2.538		
7,000.00	6,999.08	6,998.98	6,998.98	15.38	15.59	180.00	0.37	40.04	82.00	51.03	30.97	2.648		
7,100.00	7,098.98	7,098.88	7,098.88	15.59	15.81	180.00	0.37	40.04	86.49	55.08	31.40	2.754		
7,200.00	7,198.88	7,198.78	7,198.78	15.80	16.04	180.00	0.37	40.04	90.97	59.13	31.84	2.857		
7,300.00	7,298.78	7,298.68	7,298.68	16.01	16.26	180.00	0.37	40.04	95.45	63.18	32.27	2.958		
7,400.00	7,398.68	7,398.58	7,398.58	16.22	16.49	180.00	0.37	40.04	99.94	67.23	32.71	3.056		

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Survey Program: 0-MWD													Offset Well Error:		0.00 ft		
Reference		Offset		Semi Major Axis			Distance										
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
7,500.00	7,498.58	7,498.48	7,498.48	16.43	16.71	180.00	0.37	40.04	104.42	71.28	33.14	3.151					
7,600.00	7,598.48	7,598.38	7,598.38	16.64	16.94	180.00	0.37	40.04	108.91	75.33	33.58	3.243					
7,700.00	7,698.38	7,698.28	7,698.28	16.85	17.16	180.00	0.37	40.04	113.39	79.37	34.02	3.333					
7,800.00	7,798.28	7,798.18	7,798.18	17.07	17.39	180.00	0.37	40.04	117.87	83.42	34.45	3.421					
7,900.00	7,898.18	7,898.08	7,898.08	17.28	17.61	180.00	0.37	40.04	122.36	87.46	34.89	3.507					
8,000.00	7,998.07	7,997.97	7,997.97	17.50	17.84	180.00	0.37	40.04	126.84	91.51	35.33	3.590					
8,100.00	8,097.97	8,097.87	8,097.87	17.71	18.06	180.00	0.37	40.04	131.32	95.55	35.77	3.671					
8,200.00	8,197.87	8,197.77	8,197.77	17.93	18.28	180.00	0.37	40.04	135.81	99.60	36.21	3.750					
8,300.00	8,297.77	8,297.67	8,297.67	18.15	18.51	180.00	0.37	40.04	140.29	103.64	36.65	3.827					
8,400.00	8,397.67	8,397.57	8,397.57	18.36	18.73	180.00	0.37	40.04	144.78	107.68	37.10	3.903					
8,500.00	8,497.57	8,497.47	8,497.47	18.58	18.96	180.00	0.37	40.04	149.26	111.72	37.54	3.976					
8,600.00	8,597.47	8,597.37	8,597.37	18.80	19.18	180.00	0.37	40.04	153.74	115.76	37.98	4.048					
8,700.00	8,697.37	8,697.27	8,697.27	19.02	19.41	180.00	0.37	40.04	158.23	119.80	38.42	4.118					
8,800.00	8,797.27	8,797.17	8,797.17	19.24	19.63	180.00	0.37	40.04	162.71	123.84	38.87	4.186					
8,900.00	8,897.17	8,897.07	8,897.07	19.46	19.86	180.00	0.37	40.04	167.20	127.88	39.31	4.253					
9,000.00	8,997.07	8,996.97	8,996.97	19.68	20.08	180.00	0.37	40.04	171.68	131.92	39.76	4.318					
9,100.00	9,096.97	9,096.87	9,096.87	19.90	20.31	180.00	0.37	40.04	176.16	135.96	40.20	4.382					
9,200.00	9,196.87	9,196.77	9,196.77	20.12	20.53	180.00	0.37	40.04	180.65	140.00	40.65	4.444					
9,300.00	9,296.77	9,296.67	9,296.67	20.34	20.75	180.00	0.37	40.04	185.13	144.04	41.09	4.505					
9,400.00	9,396.67	9,396.57	9,396.57	20.56	20.98	180.00	0.37	40.04	189.62	148.08	41.54	4.565					
9,500.00	9,496.57	9,496.47	9,496.47	20.78	21.20	180.00	0.37	40.04	194.10	152.11	41.99	4.623					
9,600.00	9,596.47	9,596.37	9,596.37	21.01	21.43	180.00	0.37	40.04	198.58	156.15	42.43	4.680					
9,700.00	9,696.36	9,696.26	9,696.26	21.23	21.65	180.00	0.37	40.04	203.07	160.19	42.88	4.736					
9,800.00	9,796.26	9,796.16	9,796.16	21.45	21.88	180.00	0.37	40.04	207.55	164.22	43.33	4.790					
9,900.00	9,896.16	9,896.06	9,896.06	21.68	22.10	180.00	0.37	40.04	212.04	168.26	43.78	4.843					
10,000.00	9,996.06	9,995.96	9,995.96	21.90	22.33	180.00	0.37	40.04	216.52	172.29	44.23	4.896					
10,100.00	10,095.96	10,095.86	10,095.86	22.12	22.55	180.00	0.37	40.04	221.00	176.33	44.68	4.947					
10,200.00	10,195.86	10,195.76	10,195.76	22.35	22.78	180.00	0.37	40.04	225.49	180.36	45.12	4.997					
10,300.00	10,295.76	10,295.66	10,295.66	22.57	23.00	180.00	0.37	40.04	229.97	184.40	45.57	5.046					
10,400.00	10,395.66	10,395.56	10,395.56	22.80	23.22	180.00	0.37	40.04	234.46	188.43	46.02	5.094					
10,500.00	10,495.56	10,495.46	10,495.46	23.02	23.45	180.00	0.37	40.04	238.94	192.47	46.47	5.141					
10,600.00	10,595.46	10,595.36	10,595.36	23.25	23.67	180.00	0.37	40.04	243.42	196.50	46.92	5.188					
10,700.00	10,695.36	10,695.26	10,695.26	23.48	23.90	180.00	0.37	40.04	247.91	200.53	47.37	5.233					
10,800.00	10,795.26	10,795.16	10,795.16	23.70	24.12	180.00	0.37	40.04	252.39	204.57	47.83	5.277					
10,900.00	10,895.16	10,895.06	10,895.06	23.93	24.35	180.00	0.37	40.04	256.88	208.60	48.28	5.321					
11,000.00	10,995.06	10,994.96	10,994.96	24.16	24.57	180.00	0.37	40.04	261.36	212.63	48.73	5.364					
11,100.00	11,094.96	11,094.86	11,094.86	24.38	24.80	180.00	0.37	40.04	265.84	216.67	49.18	5.406					
11,200.00	11,194.86	11,194.76	11,194.76	24.61	25.02	180.00	0.37	40.04	270.33	220.70	49.63	5.447					
11,300.00	11,294.76	11,294.66	11,294.66	24.84	25.24	180.00	0.37	40.04	274.81	224.73	50.08	5.487					
11,400.00	11,394.66	11,394.56	11,394.56	25.07	25.47	180.00	0.37	40.04	279.30	228.76	50.53	5.527					
11,500.00	11,494.55	11,494.45	11,494.45	25.29	25.69	180.00	0.37	40.04	283.78	232.79	50.99	5.566					
11,600.00	11,594.45	11,594.35	11,594.35	25.52	25.92	180.00	0.37	40.04	288.26	236.82	51.44	5.604					
11,700.00	11,694.35	11,694.25	11,694.25	25.75	26.14	180.00	0.37	40.04	292.75	240.86	51.89	5.641					
11,800.00	11,794.25	11,794.15	11,794.15	25.98	26.37	180.00	0.37	40.04	297.23	244.89	52.35	5.678					
11,900.00	11,894.15	11,893.13	11,892.67	26.21	26.55	-178.55	-7.28	40.11	301.82	249.06	52.75	5.721					
12,000.00	11,994.05	11,985.27	11,981.20	26.44	26.70	-173.89	-32.32	40.33	308.20	255.07	53.13	5.800					
12,100.00	12,093.88	12,066.35	12,053.87	26.65	26.83	-102.53	-68.06	40.66	320.17	266.69	53.48	5.987					
12,200.00	12,191.64	12,141.93	12,115.26	26.86	26.94	-78.51	-111.99	41.05	336.56	282.76	53.80	6.256					
12,300.00	12,283.16	12,214.40	12,166.93	27.06	27.09	-69.28	-162.71	41.51	354.49	300.35	54.14	6.547					
12,400.00	12,364.44	12,284.64	12,209.13	27.27	27.26	-63.21	-218.78	42.02	371.82	317.29	54.53	6.819					
12,500.00	12,431.94	12,350.00	12,240.63	27.50	27.46	-59.04	-275.99	42.53	386.89	331.93	54.96	7.039					
12,600.00	12,482.71	12,420.85	12,265.60	27.80	27.72	-56.11	-342.22	43.13	398.48	342.96	55.52	7.177					

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 22H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design													Sec. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 11H - Wellbore #1 - Plan #1		Offset Site Error:		0.00 ft
Survey Program: 0-MWD													Offset Well Error:		0.00 ft		
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor					
12,700.00	12,514.53	12,487.71	12,279.94	28.19	28.00	-54.44	-407.47	43.72	405.83	349.64	56.19	7.223					
12,800.00	12,526.00	12,555.73	12,285.06	28.67	28.33	-53.87	-475.23	44.33	408.47	351.47	57.00	7.166					
12,900.00	12,526.87	12,655.73	12,286.37	29.24	28.91	-53.92	-575.22	45.23	408.21	350.05	58.16	7.019					
13,000.00	12,527.74	12,755.73	12,287.69	29.92	29.58	-53.97	-675.20	46.14	407.95	348.44	59.50	6.856					
13,100.00	12,528.61	12,855.72	12,289.00	30.69	30.35	-54.02	-775.19	47.04	407.69	346.64	61.04	6.679					
13,200.00	12,529.48	12,955.72	12,290.32	31.55	31.20	-54.07	-875.18	47.94	407.43	344.67	62.76	6.492					
13,300.00	12,530.35	13,055.72	12,291.63	32.49	32.14	-54.12	-975.16	48.84	407.17	342.54	64.63	6.300					
13,400.00	12,531.22	13,155.72	12,292.95	33.51	33.15	-54.17	-1,075.15	49.75	406.91	340.25	66.65	6.105					
13,500.00	12,532.09	13,255.72	12,294.26	34.59	34.22	-54.22	-1,175.14	50.65	406.65	337.84	68.81	5.910					
13,600.00	12,532.96	13,355.72	12,295.58	35.73	35.36	-54.27	-1,275.12	51.55	406.39	335.30	71.09	5.716					
13,700.00	12,533.83	13,455.72	12,296.89	36.93	36.56	-54.32	-1,375.11	52.45	406.13	332.64	73.48	5.527					
13,800.00	12,534.70	13,555.72	12,298.21	38.17	37.80	-54.38	-1,475.09	53.35	405.87	329.89	75.98	5.342					
13,900.00	12,535.57	13,655.72	12,299.52	39.47	39.10	-54.43	-1,575.08	54.26	405.61	327.05	78.56	5.163					
14,000.00	12,536.44	13,755.72	12,300.84	40.80	40.43	-54.48	-1,675.07	55.16	405.36	324.13	81.23	4.990					
14,100.00	12,537.31	13,855.71	12,302.15	42.17	41.80	-54.53	-1,775.05	56.06	405.10	321.13	83.97	4.824					
14,200.00	12,538.18	13,955.71	12,303.47	43.57	43.20	-54.58	-1,875.04	56.96	404.84	318.06	86.78	4.665					
14,300.00	12,539.04	14,055.71	12,304.78	45.01	44.64	-54.63	-1,975.03	57.87	404.58	314.94	89.65	4.513					
14,400.00	12,539.91	14,155.71	12,306.10	46.47	46.10	-54.68	-2,075.01	58.77	404.33	311.75	92.57	4.368					
14,500.00	12,540.78	14,255.71	12,307.41	47.96	47.59	-54.74	-2,175.00	59.67	404.07	308.52	95.55	4.229					
14,600.00	12,541.65	14,355.71	12,308.73	49.47	49.10	-54.79	-2,274.99	60.57	403.82	305.24	98.57	4.097					
14,700.00	12,542.52	14,455.71	12,310.04	51.00	50.64	-54.84	-2,374.97	61.47	403.56	301.93	101.63	3.971					
14,800.00	12,543.39	14,555.71	12,311.35	52.55	52.19	-54.89	-2,474.96	62.38	403.31	298.57	104.74	3.851					
14,900.00	12,544.26	14,655.71	12,312.67	54.12	53.76	-54.94	-2,574.94	63.28	403.05	295.18	107.87	3.736					
15,000.00	12,545.13	14,755.71	12,313.98	55.70	55.34	-54.99	-2,674.93	64.18	402.80	291.76	111.04	3.627					
15,100.00	12,546.00	14,855.70	12,315.30	57.30	56.94	-55.05	-2,774.92	65.08	402.54	288.30	114.24	3.524					
15,200.00	12,546.87	14,955.70	12,316.61	58.91	58.55	-55.10	-2,874.90	65.99	402.29	284.83	117.46	3.425					
15,300.00	12,547.74	15,055.70	12,317.93	60.53	60.18	-55.15	-2,974.89	66.89	402.04	281.32	120.71	3.331					
15,400.00	12,548.61	15,155.70	12,319.24	62.17	61.81	-55.20	-3,074.88	67.79	401.78	277.80	123.98	3.241					
15,500.00	12,549.48	15,255.70	12,320.56	63.81	63.46	-55.25	-3,174.86	68.69	401.53	274.25	127.27	3.155					
15,600.00	12,550.35	15,355.70	12,321.87	65.47	65.12	-55.31	-3,274.85	69.60	401.28	270.69	130.59	3.073					
15,700.00	12,551.22	15,455.70	12,323.19	67.13	66.78	-55.36	-3,374.83	70.50	401.02	267.11	133.92	2.995					
15,800.00	12,552.09	15,555.70	12,324.50	68.81	68.46	-55.41	-3,474.82	71.40	400.77	263.51	137.26	2.920					
15,900.00	12,552.96	15,655.70	12,325.82	70.49	70.14	-55.46	-3,574.81	72.30	400.52	259.90	140.62	2.848					
16,000.00	12,553.83	15,755.70	12,327.13	72.17	71.83	-55.52	-3,674.79	73.20	400.27	256.27	144.00	2.780					
16,100.00	12,554.70	15,855.69	12,328.45	73.87	73.52	-55.57	-3,774.78	74.11	400.02	252.63	147.39	2.714					
16,200.00	12,555.57	15,955.69	12,329.76	75.57	75.23	-55.62	-3,874.77	75.01	399.77	248.98	150.79	2.651					
16,300.00	12,556.44	16,055.69	12,331.08	77.27	76.93	-55.68	-3,974.75	75.91	399.52	245.31	154.21	2.591					
16,400.00	12,557.31	16,155.69	12,332.39	78.99	78.65	-55.73	-4,074.74	76.81	399.27	241.64	157.63	2.533					
16,500.00	12,558.18	16,255.69	12,333.71	80.70	80.36	-55.78	-4,174.72	77.72	399.02	237.95	161.07	2.477					
16,600.00	12,559.05	16,355.69	12,335.02	82.42	82.09	-55.83	-4,274.71	78.62	398.77	234.26	164.51	2.424					
16,700.00	12,559.92	16,455.69	12,336.34	84.15	83.81	-55.89	-4,374.70	79.52	398.52	230.56	167.96	2.373					
16,800.00	12,560.79	16,555.69	12,337.65	85.88	85.55	-55.94	-4,474.68	80.42	398.27	226.85	171.43	2.323					
16,900.00	12,561.66	16,655.69	12,338.97	87.61	87.28	-55.99	-4,574.67	81.32	398.03	223.13	174.90	2.276					
17,000.00	12,562.53	16,755.69	12,340.28	89.35	89.02	-56.05	-4,674.66	82.23	397.78	219.41	178.37	2.230					
17,100.00	12,563.40	16,855.68	12,341.60	91.09	90.76	-56.10	-4,774.64	83.13	397.53	215.67	181.86	2.186					
17,200.00	12,564.27	16,955.68	12,342.91	92.84	92.51	-56.15	-4,874.63	84.03	397.28	211.94	185.35	2.143					
17,300.00	12,565.14	17,055.68	12,344.23	94.59	94.26	-56.21	-4,974.62	84.93	397.04	208.19	188.85	2.102					
17,400.00	12,566.01	17,155.68	12,345.54	96.34	96.01	-56.26	-5,074.60	85.84	396.79	204.44	192.35	2.063					
17,500.00	12,566.88	17,255.68	12,346.86	98.09	97.76	-56.31	-5,174.59	86.74	396.55	200.69	195.86	2.025					
17,600.00	12,567.75	17,355.68	12,348.17	99.85	99.52	-56.37	-5,274.57	87.64	396.30	196.93	199.37	1.988					
17,700.00	12,568.62	17,455.68	12,349.49	101.61	101.28	-56.42	-5,374.56	88.54	396.05	193.16	202.89	1.952					
17,800.00	12,569.49	17,555.68	12,350.80	103.37	103.04	-56.47	-5,474.55	89.45	395.81	189.40	206.41	1.918					

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 22H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 11H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)							
17,900.00	12,570.36	17,655.68	12,352.12	105.13	104.81	-56.53	-5,574.53	90.35	395.56	185.62	209.94	1.884			
18,000.00	12,571.23	17,755.68	12,353.43	106.90	106.58	-56.58	-5,674.52	91.25	395.32	181.85	213.48	1.852			
18,100.00	12,572.10	17,855.67	12,354.75	108.67	108.34	-56.64	-5,774.51	92.15	395.08	178.06	217.01	1.821			
18,200.00	12,572.97	17,955.67	12,356.06	110.44	110.11	-56.69	-5,874.49	93.05	394.83	174.28	220.55	1.790			
18,300.00	12,573.84	18,055.67	12,357.38	112.21	111.89	-56.74	-5,974.48	93.96	394.59	170.49	224.10	1.761			
18,400.00	12,574.71	18,155.67	12,358.69	113.98	113.66	-56.80	-6,074.46	94.86	394.35	166.70	227.65	1.732			
18,500.00	12,575.58	18,255.67	12,360.01	115.76	115.44	-56.85	-6,174.45	95.76	394.10	162.91	231.20	1.705			
18,600.00	12,576.45	18,355.67	12,361.32	117.54	117.22	-56.91	-6,274.44	96.66	393.86	159.11	234.75	1.678			
18,700.00	12,577.32	18,455.67	12,362.64	119.31	118.99	-56.96	-6,374.42	97.57	393.62	155.31	238.31	1.652			
18,800.00	12,578.19	18,555.67	12,363.95	121.09	120.78	-57.02	-6,474.41	98.47	393.38	151.51	241.87	1.626			
18,900.00	12,579.06	18,655.67	12,365.26	122.88	122.56	-57.07	-6,574.40	99.37	393.14	147.71	245.43	1.602			
19,000.00	12,579.93	18,755.67	12,366.58	124.66	124.34	-57.13	-6,674.38	100.27	392.90	143.90	249.00	1.578			
19,100.00	12,580.80	18,855.66	12,367.89	126.44	126.13	-57.18	-6,774.37	101.17	392.66	140.09	252.57	1.555			
19,200.00	12,581.67	18,955.66	12,369.21	128.23	127.91	-57.23	-6,874.35	102.08	392.42	136.28	256.14	1.532			
19,300.00	12,582.54	19,055.66	12,370.52	130.01	129.70	-57.29	-6,974.34	102.98	392.18	132.46	259.71	1.510			
19,400.00	12,583.41	19,155.66	12,371.84	131.80	131.49	-57.34	-7,074.33	103.88	391.94	128.65	263.29	1.489 Level 3			
19,500.00	12,584.28	19,255.66	12,373.15	133.59	133.28	-57.40	-7,174.31	104.78	391.70	124.83	266.87	1.468 Level 3			
19,600.00	12,585.15	19,355.66	12,374.47	135.38	135.07	-57.45	-7,274.30	105.69	391.46	121.01	270.45	1.447 Level 3			
19,700.00	12,586.02	19,455.66	12,375.78	137.17	136.86	-57.51	-7,374.29	106.59	391.22	117.19	274.03	1.428 Level 3			
19,800.00	12,586.89	19,555.66	12,377.10	138.96	138.65	-57.56	-7,474.27	107.49	390.99	113.37	277.61	1.408 Level 3			
19,900.00	12,587.76	19,655.66	12,378.41	140.76	140.44	-57.62	-7,574.26	108.39	390.75	109.55	281.20	1.390 Level 3			
20,000.00	12,588.63	19,755.66	12,379.73	142.55	142.24	-57.67	-7,674.25	109.30	390.51	105.72	284.79	1.371 Level 3			
20,100.00	12,589.50	19,855.65	12,381.04	144.35	144.03	-57.73	-7,774.23	110.20	390.27	101.90	288.38	1.353 Level 3			
20,200.00	12,590.37	19,955.65	12,382.36	146.14	145.83	-57.79	-7,874.22	111.10	390.04	98.07	291.97	1.336 Level 3			
20,300.00	12,591.24	20,055.65	12,383.67	147.94	147.62	-57.84	-7,974.20	112.00	389.80	94.24	295.56	1.319 Level 3			
20,400.00	12,592.11	20,155.65	12,384.99	149.73	149.42	-57.90	-8,074.19	112.90	389.57	90.41	299.16	1.302 Level 3			
20,500.00	12,592.98	20,255.65	12,386.30	151.53	151.22	-57.95	-8,174.18	113.81	389.33	86.58	302.75	1.286 Level 3			
20,600.00	12,593.85	20,355.65	12,387.62	153.33	153.02	-58.01	-8,274.16	114.71	389.10	82.75	306.35	1.270 Level 3			
20,700.00	12,594.72	20,455.65	12,388.93	155.13	154.82	-58.06	-8,374.15	115.61	388.86	78.91	309.95	1.255 Level 3			
20,800.00	12,595.59	20,555.65	12,390.25	156.93	156.62	-58.12	-8,474.14	116.51	388.63	75.08	313.55	1.239 Level 2			
20,900.00	12,596.46	20,655.65	12,391.56	158.73	158.42	-58.18	-8,574.12	117.42	388.39	71.24	317.15	1.225 Level 2			
21,000.00	12,597.33	20,755.65	12,392.88	160.53	160.22	-58.23	-8,674.11	118.32	388.16	67.41	320.75	1.210 Level 2			
21,100.00	12,598.20	20,855.65	12,394.19	162.33	162.02	-58.29	-8,774.09	119.22	387.93	63.57	324.36	1.196 Level 2			
21,200.00	12,599.07	20,955.64	12,395.51	164.13	163.83	-58.34	-8,874.08	120.12	387.69	59.73	327.96	1.182 Level 2			
21,300.00	12,599.94	21,055.64	12,396.82	165.94	165.63	-58.40	-8,974.07	121.02	387.46	55.90	331.57	1.169 Level 2			
21,400.00	12,600.81	21,155.64	12,398.14	167.74	167.43	-58.46	-9,074.05	121.93	387.23	52.06	335.17	1.155 Level 2			
21,500.00	12,601.67	21,255.64	12,399.45	169.54	169.24	-58.51	-9,174.04	122.83	387.00	48.22	338.78	1.142 Level 2			
21,600.00	12,602.54	21,355.64	12,400.77	171.35	171.04	-58.57	-9,274.03	123.73	386.77	44.38	342.39	1.130 Level 2			
21,700.00	12,603.41	21,455.64	12,402.08	173.15	172.85	-58.62	-9,374.01	124.63	386.54	40.54	346.00	1.117 Level 2			
21,800.00	12,604.28	21,555.64	12,403.40	174.96	174.65	-58.68	-9,474.00	125.54	386.31	36.69	349.61	1.105 Level 2			
21,900.00	12,605.15	21,655.64	12,404.71	176.77	176.46	-58.74	-9,573.98	126.44	386.08	32.85	353.22	1.093 Level 2			
22,000.00	12,606.02	21,755.64	12,406.03	178.57	178.27	-58.79	-9,673.97	127.34	385.85	29.01	356.84	1.081 Level 2			
22,100.00	12,606.89	21,855.64	12,407.34	180.38	180.07	-58.85	-9,773.96	128.24	385.62	25.17	360.45	1.070 Level 2			
22,200.00	12,607.76	21,955.63	12,408.66	182.19	181.88	-58.91	-9,873.94	129.15	385.39	21.32	364.07	1.059 Level 2			
22,300.00	12,608.63	22,055.63	12,409.97	183.99	183.69	-58.96	-9,973.93	130.05	385.16	17.48	367.68	1.048 Level 2			
22,400.00	12,609.50	22,155.63	12,411.29	185.80	185.50	-59.02	-10,073.92	130.95	384.93	13.63	371.30	1.037 Level 2			
22,443.94	12,609.89	22,199.57	12,411.86	186.60	186.29	-59.05	-10,117.85	131.35	384.83	11.94	372.89	1.032 Level 2			
22,457.97	12,610.01	22,209.98	12,412.00	186.85	186.48	-59.05	-10,128.25	131.44	384.82	11.49	373.33	1.031 Level 2, ES, SF			

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 22H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 21H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)							
0.00	0.00	0.00	0.00	0.00	0.00	89.45	0.77	80.04	80.04						
100.00	100.00	99.80	99.80	0.08	0.08	89.45	0.77	80.04	80.04	79.88	0.17	481.724			
200.00	200.00	199.80	199.80	0.31	0.31	89.45	0.77	80.04	80.04	79.43	0.62	130.066			
300.00	300.00	299.80	299.80	0.53	0.53	89.45	0.77	80.04	80.04	78.98	1.06	75.163			
400.00	400.00	399.80	399.80	0.76	0.76	89.45	0.77	80.04	80.04	78.53	1.51	52.852			
500.00	500.00	499.80	499.80	0.98	0.98	89.45	0.77	80.04	80.04	78.08	1.96	40.755			
600.00	600.00	599.80	599.80	1.21	1.21	89.45	0.77	80.04	80.04	77.63	2.41	33.164			
700.00	700.00	699.80	699.80	1.43	1.43	89.45	0.77	80.04	80.04	77.18	2.86	27.957			
800.00	800.00	799.80	799.80	1.66	1.66	89.45	0.77	80.04	80.04	76.73	3.31	24.163			
900.00	900.00	899.80	899.80	1.88	1.88	89.45	0.77	80.04	80.04	76.28	3.76	21.276			
1,000.00	1,000.00	999.80	999.80	2.11	2.11	89.45	0.77	80.04	80.04	75.83	4.21	19.005			
1,100.00	1,100.00	1,099.80	1,099.80	2.33	2.33	89.45	0.77	80.04	80.04	75.38	4.66	17.172			
1,200.00	1,200.00	1,199.80	1,199.80	2.56	2.56	89.45	0.77	80.04	80.04	74.93	5.11	15.662			
1,300.00	1,300.00	1,299.80	1,299.80	2.78	2.78	89.45	0.77	80.04	80.04	74.48	5.56	14.396			
1,400.00	1,400.00	1,399.80	1,399.80	3.01	3.00	89.45	0.77	80.04	80.04	74.03	6.01	13.319			
1,500.00	1,500.00	1,499.80	1,499.80	3.23	3.23	89.45	0.77	80.04	80.04	73.58	6.46	12.392			
1,600.00	1,600.00	1,599.80	1,599.80	3.45	3.45	89.45	0.77	80.04	80.04	73.13	6.91	11.586			
1,700.00	1,700.00	1,699.80	1,699.80	3.68	3.68	89.45	0.77	80.04	80.04	72.69	7.36	10.878			
1,800.00	1,800.00	1,799.80	1,799.80	3.90	3.90	89.45	0.77	80.04	80.04	72.24	7.81	10.252			
1,900.00	1,900.00	1,899.80	1,899.80	4.13	4.13	89.45	0.77	80.04	80.04	71.79	8.26	9.694			
2,000.00	2,000.00	1,999.80	1,999.80	4.35	4.35	89.45	0.77	80.04	80.04	71.34	8.71	9.193			
2,100.00	2,100.00	2,099.80	2,099.80	4.58	4.58	89.45	0.77	80.04	80.04	70.89	9.16	8.742			
2,200.00	2,200.00	2,199.80	2,199.80	4.80	4.80	89.45	0.77	80.04	80.04	70.44	9.61	8.333			
2,300.00	2,300.00	2,299.80	2,299.80	5.03	5.03	89.45	0.77	80.04	80.04	69.99	10.06	7.960			
2,400.00	2,400.00	2,399.80	2,399.80	5.25	5.25	89.45	0.77	80.04	80.04	69.54	10.51	7.619			
2,500.00	2,500.00	2,499.80	2,499.80	5.48	5.48	89.45	0.77	80.04	80.04	69.09	10.95	7.307			
2,600.00	2,600.00	2,599.80	2,599.80	5.70	5.70	89.45	0.77	80.04	80.04	68.64	11.40	7.019			
2,700.00	2,700.00	2,699.80	2,699.80	5.93	5.93	89.45	0.77	80.04	80.04	68.19	11.85	6.753			
2,800.00	2,800.00	2,799.80	2,799.80	6.15	6.15	89.45	0.77	80.04	80.04	67.74	12.30	6.506			
2,900.00	2,900.00	2,899.80	2,899.80	6.38	6.38	89.45	0.77	80.04	80.04	67.29	12.75	6.277			
3,000.00	3,000.00	2,999.80	2,999.80	6.60	6.60	89.45	0.77	80.04	80.04	66.84	13.20	6.063			
3,100.00	3,100.00	3,099.80	3,099.80	6.83	6.83	89.45	0.77	80.04	80.04	66.39	13.65	5.863			
3,200.00	3,200.00	3,199.80	3,199.80	7.05	7.05	89.45	0.77	80.04	80.04	65.94	14.10	5.676			
3,300.00	3,300.00	3,299.80	3,299.80	7.28	7.28	89.45	0.77	80.04	80.04	65.49	14.55	5.501			
3,400.00	3,400.00	3,399.80	3,399.80	7.50	7.50	89.45	0.77	80.04	80.04	65.04	15.00	5.336			
3,500.00	3,500.00	3,499.80	3,499.80	7.73	7.72	89.45	0.77	80.04	80.04	64.59	15.45	5.181			
3,600.00	3,600.00	3,599.80	3,599.80	7.95	7.95	89.45	0.77	80.04	80.04	64.14	15.90	5.034			
3,700.00	3,700.00	3,699.80	3,699.80	8.17	8.17	89.45	0.77	80.04	80.04	63.69	16.35	4.896			
3,800.00	3,800.00	3,799.80	3,799.80	8.40	8.40	89.45	0.77	80.04	80.04	63.25	16.80	4.765			
3,900.00	3,900.00	3,899.80	3,899.80	8.62	8.62	89.45	0.77	80.04	80.04	62.80	17.25	4.641			
4,000.00	4,000.00	3,999.80	3,999.80	8.85	8.85	89.45	0.77	80.04	80.04	62.35	17.70	4.523			
4,100.00	4,100.00	4,099.80	4,099.80	9.07	9.07	89.45	0.77	80.04	80.04	61.90	18.15	4.411			
4,200.00	4,200.00	4,199.80	4,199.80	9.30	9.30	89.45	0.77	80.04	80.04	61.45	18.60	4.304			
4,300.00	4,300.00	4,299.80	4,299.80	9.52	9.52	89.45	0.77	80.04	80.04	61.00	19.05	4.203			
4,400.00	4,400.00	4,399.80	4,399.80	9.75	9.75	89.45	0.77	80.04	80.04	60.55	19.50	4.106			
4,500.00	4,500.00	4,499.80	4,499.80	9.97	9.97	89.45	0.77	80.04	80.04	60.10	19.95	4.013			
4,600.00	4,600.00	4,599.80	4,599.80	10.20	10.20	89.45	0.77	80.04	80.04	59.65	20.39	3.925			
4,700.00	4,700.00	4,699.80	4,699.80	10.42	10.42	89.45	0.77	80.04	80.04	59.20	20.84	3.840			
4,800.00	4,800.00	4,799.80	4,799.80	10.65	10.65	89.45	0.77	80.04	80.04	58.75	21.29	3.759			
4,900.00	4,900.00	4,899.80	4,899.80	10.87	10.87	89.45	0.77	80.04	80.04	58.30	21.74	3.681			
5,000.00	5,000.00	4,999.80	4,999.80	11.10	11.10	89.45	0.77	80.04	80.04	57.85	22.19	3.607			
5,100.00	5,100.00	5,099.80	5,099.80	11.32	11.32	89.45	0.77	80.04	80.04	57.40	22.64	3.535			

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 22H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,200.00	5,200.00	5,199.80	5,199.80	11.55	11.55	89.45	0.77	80.04	80.04	56.95	23.09	3.466		
5,300.00	5,300.00	5,299.80	5,299.80	11.77	11.77	89.45	0.77	80.04	80.04	56.50	23.54	3.400		
5,400.00	5,400.00	5,399.80	5,399.80	12.00	12.00	89.45	0.77	80.04	80.04	56.05	23.99	3.336		
5,500.00	5,500.00	5,499.80	5,499.80	12.22	12.22	89.45	0.77	80.04	80.04	55.60	24.44	3.275		
5,600.00	5,600.00	5,599.80	5,599.80	12.45	12.44	89.45	0.77	80.04	80.04	55.15	24.89	3.216		
5,700.00	5,700.00	5,699.80	5,699.80	12.67	12.67	89.45	0.77	80.04	80.04	54.70	25.34	3.159		
5,800.00	5,800.00	5,799.80	5,799.80	12.89	12.89	89.45	0.77	80.04	80.04	54.25	25.79	3.104		
5,900.00	5,900.00	5,899.80	5,899.80	13.12	13.12	89.45	0.77	80.04	80.04	53.80	26.24	3.051		
6,000.00	6,000.00	5,999.80	5,999.80	13.34	13.34	89.45	0.77	80.04	80.04	53.36	26.69	2.999 CC, ES		
6,100.00	6,099.98	6,096.97	6,096.95	13.56	13.55	179.97	0.78	81.68	83.48	56.37	27.10	3.080		
6,200.00	6,199.89	6,195.67	6,195.55	13.75	13.75	179.98	0.82	85.93	92.12	64.62	27.50	3.350		
6,300.00	6,299.78	6,295.26	6,295.05	13.95	13.94	179.98	0.86	90.40	101.08	73.18	27.90	3.623		
6,400.00	6,399.68	6,394.86	6,394.55	14.15	14.14	179.98	0.90	94.86	110.03	81.74	28.30	3.888		
6,500.00	6,499.58	6,494.46	6,494.05	14.36	14.35	179.98	0.94	99.33	118.99	90.29	28.70	4.146		
6,600.00	6,599.48	6,594.06	6,593.55	14.56	14.55	179.98	0.98	103.80	127.95	98.85	29.11	4.396		
6,700.00	6,699.38	6,693.65	6,693.04	14.76	14.75	179.98	1.02	108.26	136.91	107.40	29.52	4.639		
6,800.00	6,799.28	6,793.25	6,792.54	14.97	14.96	179.98	1.06	112.73	145.87	115.95	29.93	4.875		
6,900.00	6,899.18	6,892.85	6,892.04	15.17	15.16	179.99	1.10	117.19	154.83	124.49	30.34	5.104		
7,000.00	6,999.08	6,992.45	6,991.54	15.38	15.37	179.99	1.14	121.66	163.79	133.04	30.75	5.326		
7,100.00	7,098.98	7,092.05	7,091.03	15.59	15.58	179.99	1.18	126.13	172.75	141.58	31.17	5.543		
7,200.00	7,198.88	7,191.64	7,190.53	15.80	15.79	179.99	1.22	130.59	181.71	150.12	31.58	5.753		
7,300.00	7,298.78	7,291.24	7,290.03	16.01	15.99	179.99	1.26	135.06	190.67	158.66	32.00	5.958		
7,400.00	7,398.68	7,390.84	7,389.53	16.22	16.20	179.99	1.31	139.52	199.62	167.20	32.42	6.157		
7,500.00	7,498.58	7,490.44	7,489.02	16.43	16.41	179.99	1.35	143.99	208.58	175.74	32.84	6.351		
7,600.00	7,598.48	7,590.04	7,588.52	16.64	16.63	179.99	1.39	148.45	217.54	184.28	33.27	6.539		
7,700.00	7,698.38	7,689.63	7,688.02	16.85	16.84	179.99	1.43	152.92	226.50	192.81	33.69	6.723		
7,800.00	7,798.28	7,789.23	7,787.52	17.07	17.05	179.99	1.47	157.39	235.46	201.34	34.12	6.901		
7,900.00	7,898.18	7,888.83	7,887.02	17.28	17.26	179.99	1.51	161.85	244.42	209.87	34.55	7.075		
8,000.00	7,998.07	7,988.43	7,986.51	17.50	17.48	179.99	1.55	166.32	253.38	218.40	34.98	7.244		
8,100.00	8,097.97	8,088.02	8,086.01	17.71	17.69	179.99	1.59	170.78	262.34	226.93	35.41	7.410		
8,200.00	8,197.87	8,187.62	8,185.51	17.93	17.91	179.99	1.63	175.25	271.30	235.46	35.84	7.570		
8,300.00	8,297.77	8,287.22	8,285.01	18.15	18.12	179.99	1.67	179.71	280.26	243.99	36.27	7.727		
8,400.00	8,397.67	8,386.82	8,384.50	18.36	18.34	179.99	1.71	184.18	289.21	252.51	36.70	7.880		
8,500.00	8,497.57	8,486.42	8,484.00	18.58	18.56	179.99	1.75	188.65	298.17	261.04	37.14	8.029		
8,600.00	8,597.47	8,586.01	8,583.50	18.80	18.77	179.99	1.79	193.11	307.13	269.56	37.57	8.174		
8,700.00	8,697.37	8,685.61	8,683.00	19.02	18.99	179.99	1.83	197.58	316.09	278.08	38.01	8.316		
8,800.00	8,797.27	8,785.21	8,782.49	19.24	19.21	179.99	1.87	202.04	325.05	286.60	38.45	8.455		
8,900.00	8,897.17	8,884.81	8,881.99	19.46	19.43	179.99	1.91	206.51	334.01	295.12	38.89	8.590		
9,000.00	8,997.07	8,984.41	8,981.49	19.68	19.65	179.99	1.95	210.98	342.97	303.64	39.32	8.721		
9,100.00	9,096.97	9,084.00	9,080.99	19.90	19.87	179.99	1.99	215.44	351.93	312.16	39.76	8.850		
9,200.00	9,196.87	9,183.60	9,180.49	20.12	20.09	179.99	2.03	219.91	360.89	320.68	40.21	8.976		
9,300.00	9,296.77	9,283.20	9,279.98	20.34	20.31	179.99	2.08	224.37	369.85	329.20	40.65	9.099		
9,400.00	9,396.67	9,382.80	9,379.48	20.56	20.53	179.99	2.12	228.84	378.80	337.71	41.09	9.219		
9,500.00	9,496.57	9,482.40	9,478.98	20.78	20.75	179.99	2.16	233.30	387.76	346.23	41.53	9.336		
9,600.00	9,596.47	9,581.99	9,578.48	21.01	20.97	179.99	2.20	237.77	396.72	354.74	41.98	9.451		
9,700.00	9,696.36	9,681.59	9,677.97	21.23	21.19	179.99	2.24	242.24	405.68	363.26	42.42	9.563		
9,800.00	9,796.26	9,781.19	9,777.47	21.45	21.42	179.99	2.28	246.70	414.64	371.77	42.87	9.672		
9,900.00	9,896.16	9,880.79	9,876.97	21.68	21.64	179.99	2.32	251.17	423.60	380.29	43.31	9.780		
10,000.00	9,996.06	9,980.38	9,976.47	21.90	21.86	179.99	2.36	255.63	432.56	388.80	43.76	9.884		
10,100.00	10,095.96	10,079.98	10,075.96	22.12	22.08	179.99	2.40	260.10	441.52	397.31	44.21	9.987		
10,200.00	10,195.86	10,179.58	10,175.46	22.35	22.31	180.00	2.44	264.57	450.48	405.82	44.66	10.087		
10,300.00	10,295.76	10,279.18	10,274.96	22.57	22.53	180.00	2.48	269.03	459.44	414.33	45.11	10.186		

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well White Falcon 16 Federal Com 22H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3272.60ft
Reference Site:	Sec. 16, T 25 S. , R 35 E	MD Reference:	KB=26' @ 3272.60ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	White Falcon 16 Federal Com 22H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Sec. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 21H - Wellbore #1 - Plan #1		Offset Site Error:		0.00 ft
Survey Program: 0-MWD													Offset Well Error:		0.00 ft		
Reference		Offset		Semi Major Axis			Distance						Warning				
Measured Depth Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor					
10,400.00	10,395.66	10,378.78	10,374.46	22.80	22.76	180.00	2.52	273.50	468.39	422.84	45.56	10.282					
10,500.00	10,495.56	10,478.37	10,473.96	23.02	22.98	180.00	2.56	277.96	477.35	431.35	46.00	10.376					
10,600.00	10,595.46	10,577.97	10,573.45	23.25	23.20	180.00	2.60	282.43	486.31	439.86	46.46	10.468					
10,700.00	10,695.36	10,677.57	10,672.95	23.48	23.43	180.00	2.64	286.89	495.27	448.37	46.91	10.559					
10,800.00	10,795.26	10,777.17	10,772.45	23.70	23.65	180.00	2.68	291.36	504.23	456.87	47.36	10.647					
10,900.00	10,895.16	10,876.77	10,871.95	23.93	23.88	180.00	2.72	295.83	513.19	465.38	47.81	10.734					
11,000.00	10,995.06	10,976.36	10,971.44	24.16	24.11	180.00	2.76	300.29	522.15	473.89	48.26	10.819					
11,100.00	11,094.96	11,075.96	11,070.94	24.38	24.33	180.00	2.80	304.76	531.11	482.39	48.71	10.902					
11,200.00	11,194.86	11,175.56	11,170.44	24.61	24.56	180.00	2.85	309.22	540.07	490.90	49.17	10.984					
11,300.00	11,294.76	11,275.16	11,269.94	24.84	24.78	180.00	2.89	313.69	549.03	499.40	49.62	11.064					
11,400.00	11,394.66	11,374.75	11,369.43	25.07	25.01	180.00	2.93	318.15	557.98	507.91	50.08	11.143					
11,500.00	11,494.55	11,474.35	11,468.93	25.29	25.24	180.00	2.97	322.62	566.94	516.41	50.53	11.220					
11,600.00	11,594.45	11,573.95	11,568.43	25.52	25.46	180.00	3.01	327.09	575.90	524.92	50.99	11.295					
11,700.00	11,694.35	11,673.55	11,667.93	25.75	25.69	180.00	3.05	331.55	584.86	533.42	51.44	11.370					
11,800.00	11,794.25	11,773.15	11,767.43	25.98	25.92	180.00	3.09	336.02	593.82	541.92	51.90	11.442					
11,900.00	11,894.15	11,872.74	11,866.92	26.21	26.15	180.00	3.13	340.48	602.78	550.43	52.35	11.514					
12,000.00	11,994.05	11,972.34	11,966.42	26.44	26.37	180.00	3.17	344.95	611.74	558.93	52.81	11.584					
12,100.00	12,093.88	12,071.99	12,065.94	26.65	26.59	-115.10	1.93	349.43	620.69	567.44	53.25	11.657					
12,200.00	12,191.64	12,172.06	12,164.15	26.86	26.79	-97.26	-15.72	353.99	629.45	575.80	53.65	11.732					
12,300.00	12,283.16	12,272.65	12,256.99	27.06	27.00	-93.15	-53.68	358.48	637.64	583.58	54.06	11.795					
12,400.00	12,364.44	12,373.75	12,340.23	27.27	27.22	-91.12	-110.57	362.70	644.90	590.41	54.49	11.836					
12,500.00	12,431.94	12,475.36	12,409.97	27.50	27.47	-89.86	-184.11	366.46	650.91	595.94	54.97	11.841					
12,600.00	12,482.71	12,577.40	12,462.80	27.80	27.78	-89.07	-271.13	369.58	655.41	599.84	55.58	11.793					
12,700.00	12,514.53	12,679.75	12,496.05	28.19	28.18	-88.61	-367.69	371.89	658.20	601.84	56.36	11.678					
12,800.00	12,526.00	12,782.22	12,508.01	28.67	28.67	-88.45	-469.26	373.30	659.15	601.81	57.34	11.495					
12,900.00	12,526.87	12,882.22	12,509.30	29.24	29.26	-88.49	-569.24	374.21	659.15	600.65	58.50	11.267					
13,000.00	12,527.74	12,982.22	12,510.58	29.92	29.94	-88.53	-669.23	375.13	659.15	599.29	59.86	11.011					
13,100.00	12,528.61	13,082.22	12,511.87	30.69	30.72	-88.56	-769.22	376.04	659.15	597.74	61.41	10.733					
13,200.00	12,529.48	13,182.22	12,513.15	31.55	31.58	-88.60	-869.20	376.95	659.15	596.02	63.13	10.440					
13,300.00	12,530.35	13,282.22	12,514.43	32.49	32.52	-88.63	-969.19	377.86	659.15	594.14	65.02	10.138					
13,400.00	12,531.22	13,382.22	12,515.72	33.51	33.54	-88.67	-1,069.18	378.78	659.16	592.11	67.05	9.831					
13,500.00	12,532.09	13,482.22	12,517.00	34.59	34.62	-88.71	-1,169.16	379.69	659.16	589.95	69.21	9.524					
13,600.00	12,532.96	13,582.22	12,518.29	35.73	35.77	-88.74	-1,269.15	380.60	659.16	587.66	71.50	9.219					
13,700.00	12,533.83	13,682.22	12,519.57	36.93	36.97	-88.78	-1,369.14	381.52	659.16	585.27	73.89	8.921					
13,800.00	12,534.70	13,782.22	12,520.85	38.17	38.22	-88.81	-1,469.12	382.43	659.17	582.78	76.39	8.629					
13,900.00	12,535.57	13,882.21	12,522.14	39.47	39.51	-88.85	-1,569.11	383.34	659.17	580.20	78.97	8.347					
14,000.00	12,536.44	13,982.21	12,523.42	40.80	40.84	-88.89	-1,669.10	384.25	659.17	577.53	81.64	8.074					
14,100.00	12,537.31	14,082.21	12,524.71	42.17	42.22	-88.92	-1,769.08	385.17	659.18	574.79	84.39	7.811					
14,200.00	12,538.18	14,182.21	12,525.99	43.57	43.62	-88.96	-1,869.07	386.08	659.18	571.99	87.20	7.560					
14,300.00	12,539.04	14,282.21	12,527.27	45.01	45.06	-88.99	-1,969.06	386.99	659.19	569.12	90.07	7.319					
14,400.00	12,539.91	14,382.21	12,528.56	46.47	46.52	-89.03	-2,069.04	387.90	659.19	566.20	92.99	7.089					
14,500.00	12,540.78	14,482.21	12,529.84	47.96	48.01	-89.07	-2,169.03	388.82	659.20	563.23	95.97	6.869					
14,600.00	12,541.65	14,582.21	12,531.13	49.47	49.52	-89.10	-2,269.02	389.73	659.20	560.21	98.99	6.659					
14,700.00	12,542.52	14,682.21	12,532.41	51.00	51.05	-89.14	-2,369.00	390.64	659.21	557.15	102.05	6.460					
14,800.00	12,543.39	14,782.21	12,533.69	52.55	52.60	-89.17	-2,468.99	391.56	659.21	554.06	105.15	6.269					
14,900.00	12,544.26	14,882.21	12,534.98	54.12	54.17	-89.21	-2,568.98	392.47	659.22	550.93	108.29	6.088					
15,000.00	12,545.13	14,982.21	12,536.26	55.70	55.76	-89.25	-2,668.96	393.38	659.22	547.77	111.46	5.915					
15,100.00	12,546.00	15,082.20	12,537.55	57.30	57.36	-89.28	-2,768.95	394.29	659.23	544.58	114.65	5.750					
15,200.00	12,546.87	15,182.20	12,538.83	58.91	58.97	-89.32	-2,868.94	395.21	659.24	541.36	117.88	5.593					
15,300.00	12,547.74	15,282.20	12,540.11	60.53	60.59	-89.35	-2,968.92	396.12	659.24	538.12	121.12	5.443					
15,400.00	12,548.61	15,382.20	12,541.40	62.17	62.23	-89.39	-3,068.91	397.03	659.25	534.86	124.40	5.300					
15,500.00	12,549.48	15,482.20	12,542.68	63.81	63.87	-89.43	-3,168.90	397.95	659.26	531.57	127.69	5.163					

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Integrity Directional Services, LLC

Anticollision Report



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Reference Site:	Sec. 16, T 25 S. , R 35 E	MD Reference:	KB=26' @ 3272.60ft
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Reference Well:	White Falcon 16 Federal Com 22H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference														
Semi Major Axis														
Distance														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
15,600.00	12,550.35	15,582.20	12,543.97	65.47	65.53	-89.46	-3,268.88	398.86	659.27	528.27	131.00	5.033		
15,700.00	12,551.22	15,682.20	12,545.25	67.13	67.19	-89.50	-3,368.87	399.77	659.28	524.95	134.33	4.908		
15,800.00	12,552.09	15,782.20	12,546.53	68.81	68.87	-89.53	-3,468.86	400.68	659.28	521.61	137.67	4.789		
15,900.00	12,552.96	15,882.20	12,547.82	70.49	70.55	-89.57	-3,568.84	401.60	659.29	518.26	141.03	4.675		
16,000.00	12,553.83	15,982.20	12,549.10	72.17	72.24	-89.61	-3,668.83	402.51	659.30	514.89	144.41	4.566		
16,100.00	12,554.70	16,082.20	12,550.39	73.87	73.93	-89.64	-3,768.82	403.42	659.31	511.51	147.80	4.461		
16,200.00	12,555.57	16,182.20	12,551.67	75.57	75.63	-89.68	-3,868.80	404.33	659.32	508.12	151.20	4.361		
16,300.00	12,556.44	16,282.19	12,552.95	77.27	77.34	-89.71	-3,968.79	405.25	659.33	504.72	154.61	4.264		
16,400.00	12,557.31	16,382.19	12,554.24	78.99	79.05	-89.75	-4,068.78	406.16	659.34	501.30	158.04	4.172		
16,500.00	12,558.18	16,482.19	12,555.52	80.70	80.77	-89.79	-4,168.76	407.07	659.35	497.88	161.47	4.083		
16,600.00	12,559.05	16,582.19	12,556.81	82.42	82.49	-89.82	-4,268.75	407.99	659.36	494.45	164.91	3.998		
16,700.00	12,559.92	16,682.19	12,558.09	84.15	84.22	-89.86	-4,368.74	408.90	659.37	491.00	168.37	3.916		
16,800.00	12,560.79	16,782.19	12,559.37	85.88	85.95	-89.89	-4,468.72	409.81	659.38	487.55	171.83	3.837		
16,900.00	12,561.66	16,882.19	12,560.66	87.61	87.68	-89.93	-4,568.71	410.72	659.39	484.10	175.30	3.762		
17,000.00	12,562.53	16,982.19	12,561.94	89.35	89.42	-89.97	-4,668.70	411.64	659.40	480.63	178.77	3.688		
17,100.00	12,563.40	17,082.19	12,563.23	91.09	91.16	-90.00	-4,768.68	412.55	659.41	477.16	182.26	3.618		
17,200.00	12,564.27	17,182.19	12,564.51	92.84	92.91	-90.04	-4,868.67	413.46	659.43	473.68	185.75	3.550		
17,300.00	12,565.14	17,282.19	12,565.79	94.59	94.66	-90.07	-4,968.66	414.38	659.44	470.20	189.24	3.485		
17,400.00	12,566.01	17,382.18	12,567.08	96.34	96.41	-90.11	-5,068.64	415.29	659.45	466.71	192.75	3.421		
17,500.00	12,566.88	17,482.18	12,568.36	98.09	98.16	-90.15	-5,168.63	416.20	659.46	463.21	196.25	3.360		
17,600.00	12,567.75	17,582.18	12,569.65	99.85	99.92	-90.18	-5,268.62	417.11	659.48	459.71	199.77	3.301		
17,700.00	12,568.62	17,682.18	12,570.93	101.61	101.68	-90.22	-5,368.61	418.03	659.49	456.20	203.29	3.244		
17,800.00	12,569.49	17,782.18	12,572.21	103.37	103.44	-90.25	-5,468.59	418.94	659.50	452.69	206.81	3.189		
17,900.00	12,570.36	17,882.18	12,573.50	105.13	105.20	-90.29	-5,568.58	419.85	659.52	449.18	210.34	3.136		
18,000.00	12,571.23	17,982.18	12,574.78	106.90	106.97	-90.33	-5,668.57	420.76	659.53	445.66	213.87	3.084		
18,100.00	12,572.10	18,082.18	12,576.07	108.67	108.74	-90.36	-5,768.55	421.68	659.55	442.14	217.41	3.034		
18,200.00	12,572.97	18,182.18	12,577.35	110.44	110.51	-90.40	-5,868.54	422.59	659.56	438.61	220.95	2.985		
18,300.00	12,573.84	18,282.18	12,578.63	112.21	112.28	-90.43	-5,968.53	423.50	659.57	435.09	224.49	2.938		
18,400.00	12,574.71	18,382.18	12,579.92	113.98	114.05	-90.47	-6,068.51	424.42	659.59	431.55	228.04	2.892		
18,500.00	12,575.58	18,482.18	12,581.20	115.76	115.83	-90.51	-6,168.50	425.33	659.61	428.02	231.59	2.848		
18,600.00	12,576.45	18,582.17	12,582.49	117.54	117.61	-90.54	-6,268.49	426.24	659.62	424.48	235.14	2.805		
18,700.00	12,577.32	18,682.17	12,583.77	119.31	119.38	-90.58	-6,368.47	427.15	659.64	420.94	238.70	2.763		
18,800.00	12,578.19	18,782.17	12,585.05	121.09	121.16	-90.61	-6,468.46	428.07	659.65	417.39	242.26	2.723		
18,900.00	12,579.06	18,882.17	12,586.34	122.88	122.95	-90.65	-6,568.45	428.98	659.67	413.85	245.82	2.684		
19,000.00	12,579.93	18,982.17	12,587.62	124.66	124.73	-90.69	-6,668.43	429.89	659.69	410.30	249.39	2.645		
19,100.00	12,580.80	19,082.17	12,588.91	126.44	126.51	-90.72	-6,768.42	430.80	659.70	406.75	252.96	2.608		
19,200.00	12,581.67	19,182.17	12,590.19	128.23	128.30	-90.76	-6,868.41	431.72	659.72	403.19	256.53	2.572		
19,300.00	12,582.54	19,282.17	12,591.47	130.01	130.09	-90.79	-6,968.39	432.63	659.74	399.64	260.10	2.536		
19,400.00	12,583.41	19,382.17	12,592.76	131.80	131.87	-90.83	-7,068.38	433.54	659.75	396.08	263.68	2.502		
19,500.00	12,584.28	19,482.17	12,594.04	133.59	133.66	-90.87	-7,168.37	434.46	659.77	392.52	267.25	2.469		
19,600.00	12,585.15	19,582.17	12,595.33	135.38	135.45	-90.90	-7,268.35	435.37	659.79	388.96	270.83	2.436		
19,700.00	12,586.02	19,682.17	12,596.61	137.17	137.24	-90.94	-7,368.34	436.28	659.81	385.39	274.41	2.404		
19,800.00	12,586.89	19,782.16	12,597.89	138.96	139.03	-90.97	-7,468.33	437.19	659.83	381.83	278.00	2.373		
19,900.00	12,587.76	19,882.16	12,599.18	140.76	140.83	-91.01	-7,568.31	438.11	659.85	378.26	281.58	2.343		
20,000.00	12,588.63	19,982.16	12,600.46	142.55	142.62	-91.05	-7,668.30	439.02	659.87	374.69	285.17	2.314		
20,100.00	12,589.50	20,082.16	12,601.75	144.35	144.42	-91.08	-7,768.29	439.93	659.89	371.12	288.76	2.285		
20,200.00	12,590.37	20,182.16	12,603.03	146.14	146.21	-91.12	-7,868.27	440.85	659.91	367.55	292.35	2.257		
20,300.00	12,591.24	20,282.16	12,604.31	147.94	148.01	-91.15	-7,968.26	441.76	659.93	363.98	295.94	2.230		
20,400.00	12,592.11	20,382.16	12,605.60	149.73	149.80	-91.19	-8,068.25	442.67	659.95	360.41	299.54	2.203		
20,500.00	12,592.98	20,482.16	12,606.88	151.53	151.60	-91.22	-8,168.23	443.58	659.97	356.83	303.13	2.177		
20,600.00	12,593.85	20,582.16	12,608.17	153.33	153.40	-91.26	-8,268.22	444.50	659.99	353.26	306.73	2.152		
20,700.00	12,594.72	20,682.16	12,609.45	155.13	155.20	-91.30	-8,368.21	445.41	660.01	349.68	310.33	2.127		

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Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 21H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
20,800.00	12,595.59	20,782.16	12,610.73	156.93	157.00	-91.33	-8,468.19	446.32	660.03	346.10	313.93	2.102		
20,900.00	12,596.46	20,882.15	12,612.02	158.73	158.80	-91.37	-8,568.18	447.23	660.05	342.52	317.53	2.079		
21,000.00	12,597.33	20,982.15	12,613.30	160.53	160.60	-91.40	-8,668.17	448.15	660.07	338.94	321.13	2.055		
21,100.00	12,598.20	21,082.15	12,614.59	162.33	162.40	-91.44	-8,768.15	449.06	660.09	335.36	324.74	2.033		
21,200.00	12,599.07	21,182.15	12,615.87	164.13	164.21	-91.48	-8,868.14	449.97	660.12	331.78	328.34	2.010		
21,300.00	12,599.94	21,282.15	12,617.15	165.94	166.01	-91.51	-8,968.13	450.89	660.14	328.19	331.95	1.989		
21,400.00	12,600.81	21,382.15	12,618.44	167.74	167.81	-91.55	-9,068.11	451.80	660.16	324.61	335.55	1.967		
21,500.00	12,601.67	21,482.15	12,619.72	169.54	169.62	-91.58	-9,168.10	452.71	660.19	321.02	339.16	1.947		
21,600.00	12,602.54	21,582.15	12,621.01	171.35	171.42	-91.62	-9,268.09	453.62	660.21	317.44	342.77	1.926		
21,700.00	12,603.41	21,682.15	12,622.29	173.15	173.23	-91.66	-9,368.07	454.54	660.23	313.85	346.38	1.906		
21,800.00	12,604.28	21,782.15	12,623.57	174.96	175.03	-91.69	-9,468.06	455.45	660.26	310.27	349.99	1.886		
21,900.00	12,605.15	21,882.15	12,624.86	176.77	176.84	-91.73	-9,568.05	456.36	660.28	306.68	353.60	1.867		
22,000.00	12,606.02	21,982.15	12,626.14	178.57	178.64	-91.76	-9,668.03	457.28	660.30	303.09	357.22	1.848		
22,100.00	12,606.89	22,082.14	12,627.43	180.38	180.45	-91.80	-9,768.02	458.19	660.33	299.50	360.83	1.830		
22,200.00	12,607.76	22,182.14	12,628.71	182.19	182.26	-91.84	-9,868.01	459.10	660.35	295.91	364.44	1.812		
22,300.00	12,608.63	22,282.14	12,629.99	183.99	184.07	-91.87	-9,967.99	460.01	660.38	292.32	368.06	1.794		
22,400.00	12,609.50	22,382.14	12,631.28	185.80	185.87	-91.91	-10,067.98	460.93	660.40	288.73	371.68	1.777		
22,429.00	12,609.76	22,411.14	12,631.65	186.33	186.40	-91.92	-10,096.97	461.19	660.41	287.69	372.72	1.772		
22,457.97	12,610.01	22,438.52	12,632.00	186.85	186.89	-91.93	-10,124.35	461.44	660.42	286.68	373.74	1.767 SF		

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

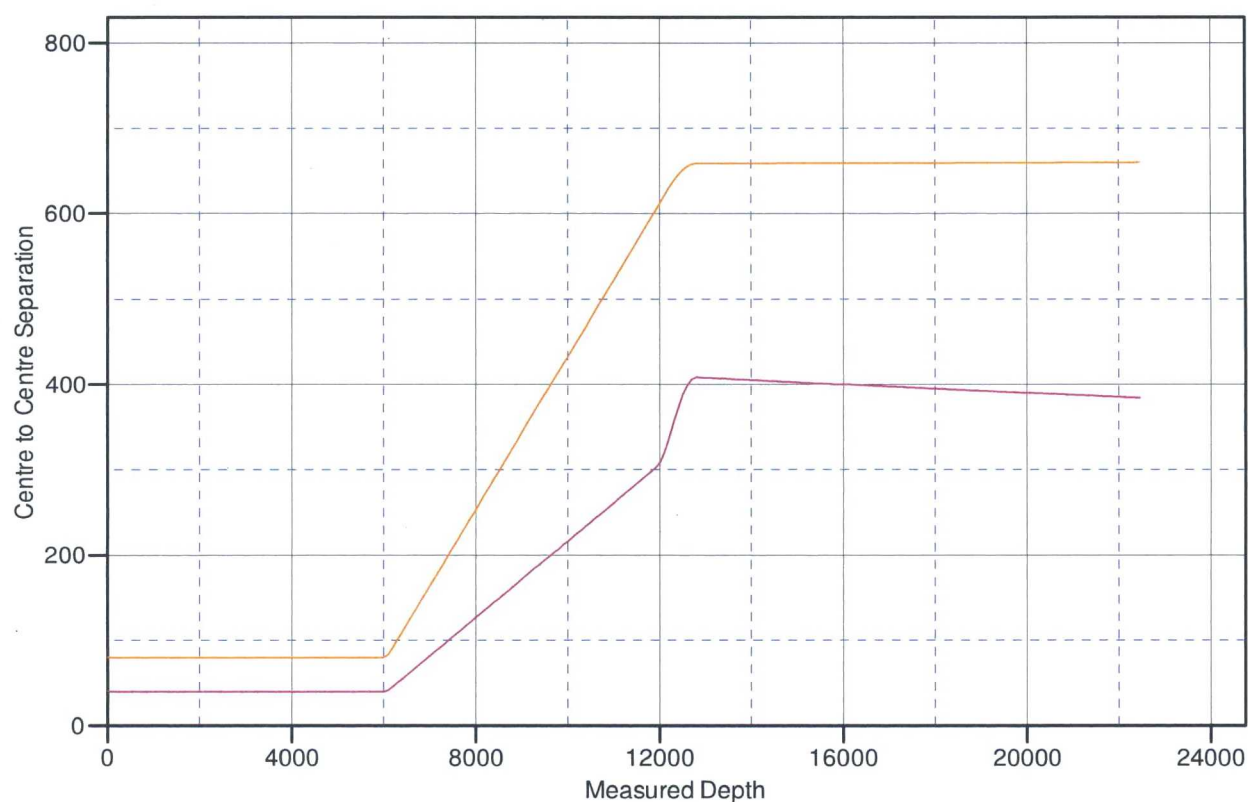
Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 22H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB=26' @ 3272.60ft
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: White Falcon 16 Federal Com 22H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.51°

Ladder Plot



LEGEND

6 Federal Com 11H, Wellbore #1, Plan #1 V0  White Falcon 16 Federal Com 21H, Wellbore #1, Plan #1 V0

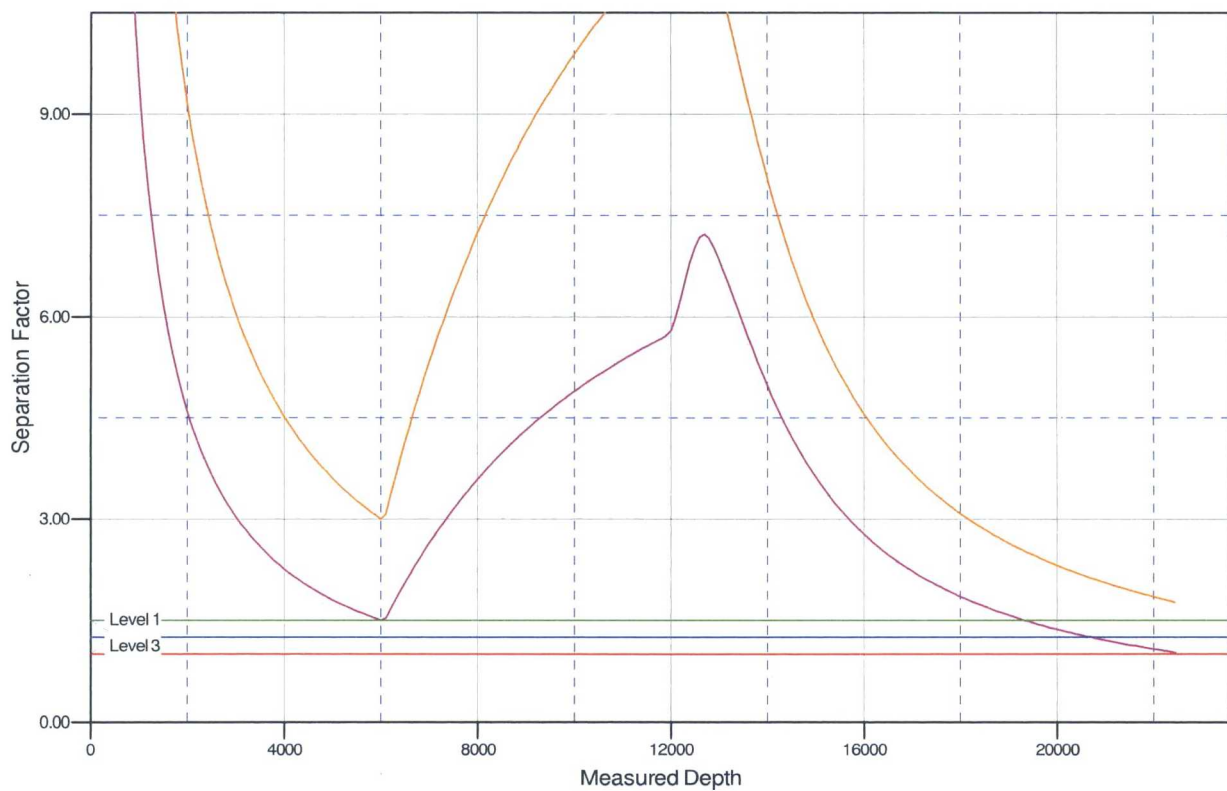
Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 22H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB=26' @ 3272.60ft
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: White Falcon 16 Federal Com 22H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.51°

Separation Factor Plot



LEGEND

6 Federal Com 11H, Wellbore #1, Plan #1 V0  White Falcon 16 Federal Com 21H, Wellbore #1, Plan #1 V0 



COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S., R 35 E
Well: White Falcon 16 Federal Com 22H
Wellbore: Wellbore #1
Plan: Plan #1 (White Falcon 16 Federal Com 22H/Wellbore #1)



WELL DETAILS: White Falcon 16 Federal Com 22H

Ground Elevation:: 3246.60
RKB Elevation: KB=26' @ 3272.60ft
Rig Name:

Northing	Easting	Latitude	Longitude
414843.8344	796861.5601	32° 8' 12.800 N	103° 22' 27.448 W

Planned Section Details

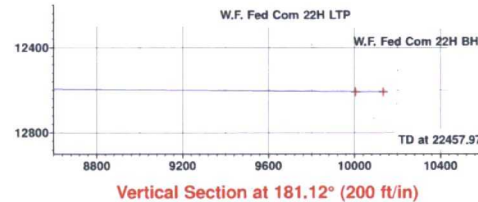
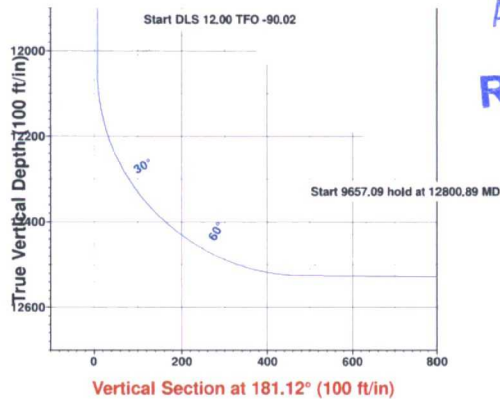
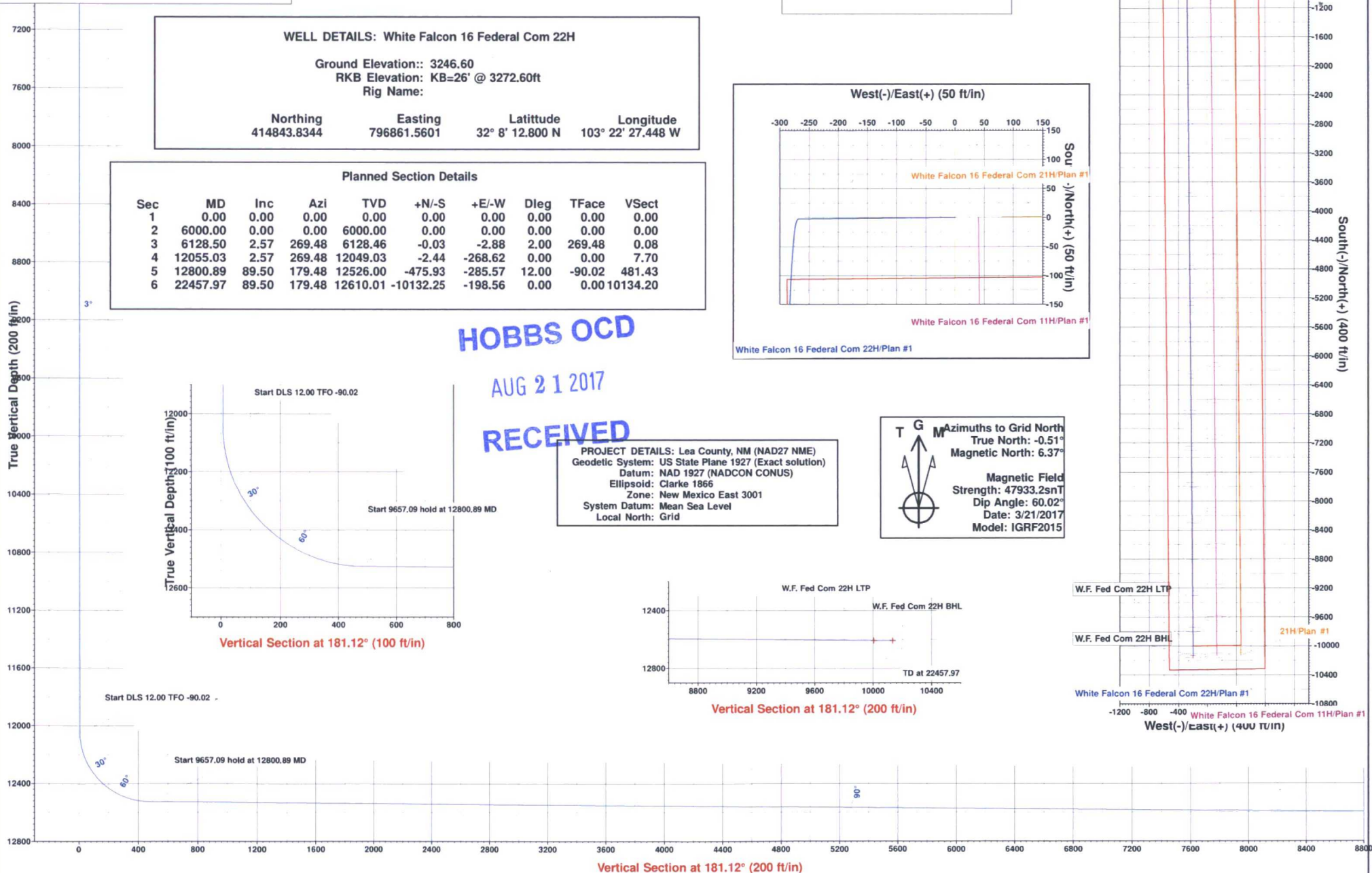
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	6000.00	0.00	0.00	6000.00	0.00	0.00	0.00	0.00	0.00
3	6128.50	2.57	269.48	6128.46	-0.03	-2.88	2.00	269.48	0.08
4	12055.03	2.57	269.48	12049.03	-2.44	-268.62	0.00	0.00	7.70
5	12800.89	89.50	179.48	12526.00	-475.93	-285.57	12.00	-90.02	481.43
6	22457.97	89.50	179.48	12610.01	-10132.25	-198.56	0.00	0.00	10134.20

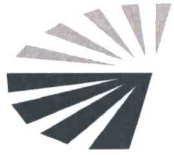
HOBBS OCD

AUG 21 2017

RECEIVED

PROJECT DETAILS: Lea County, NM (NAD27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid





CONCHO

HOBBS OCD

AUG 21 2017

RECEIVED

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 16, T 25 S. , R 35 E

White Falcon 16 Federal Com 22H

Wellbore #1

Plan: Plan #1

Standard Survey Report

21 March, 2017





Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well White Falcon 16 Federal Com 22H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3272.60ft
Site:	Sec. 16, T 25 S. , R 35 E	MD Reference:	KB=26' @ 3272.60ft
Well:	White Falcon 16 Federal Com 22H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Project	Lea County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec. 16, T 25 S. , R 35 E		
Site Position:		Northing:	414,844.2000 usft
From:	Map	Easting:	796,901.6000 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32° 8' 12.800 N
		Longitude:	103° 22' 26.982 W
		Grid Convergence:	0.51 °

Well	White Falcon 16 Federal Com 22H		
Well Position	+N/-S	0.00 ft	Northing: 414,843.8344 usft
	+E/-W	0.00 ft	Easting: 796,861.5602 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32° 8' 12.800 N
		Longitude:	103° 22' 27.448 W
		Ground Level:	3,246.60 ft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	3/21/2017	6.88
			Dip Angle (°)
			60.02
			Field Strength (nT)
			47,933

Design	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)
	0.00	0.00	0.00
			Direction (°)
			181.12

Survey Tool Program	Date 3/21/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name
0.00	22,457.93	Plan #1 (Wellbore #1)	MWD
			Description
			MWD - Standard

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	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	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S. , R 35 E
Well: White Falcon 16 Federal Com 22H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S. , R 35 E
Well: White Falcon 16 Federal Com 22H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
6,100.00	2.00	269.48	6,099.98	-0.02	-1.75	0.05	2.00	2.00	0.00
6,128.50	2.57	269.48	6,128.46	-0.03	-2.88	0.08	2.00	2.00	0.00
Start 5926.53 hold at 6128.50 MD									
6,200.00	2.57	269.48	6,199.89	-0.06	-6.09	0.17	0.00	0.00	0.00
6,300.00	2.57	269.48	6,299.78	-0.10	-10.57	0.30	0.00	0.00	0.00
6,400.00	2.57	269.48	6,399.68	-0.14	-15.05	0.43	0.00	0.00	0.00
6,500.00	2.57	269.48	6,499.58	-0.18	-19.54	0.56	0.00	0.00	0.00
6,600.00	2.57	269.48	6,599.48	-0.22	-24.02	0.69	0.00	0.00	0.00
6,700.00	2.57	269.48	6,699.38	-0.26	-28.51	0.82	0.00	0.00	0.00
6,800.00	2.57	269.48	6,799.28	-0.30	-32.99	0.95	0.00	0.00	0.00
6,900.00	2.57	269.48	6,899.18	-0.34	-37.47	1.07	0.00	0.00	0.00
7,000.00	2.57	269.48	6,999.08	-0.38	-41.96	1.20	0.00	0.00	0.00
7,100.00	2.57	269.48	7,098.98	-0.42	-46.44	1.33	0.00	0.00	0.00
7,200.00	2.57	269.48	7,198.88	-0.46	-50.93	1.46	0.00	0.00	0.00
7,300.00	2.57	269.48	7,298.78	-0.50	-55.41	1.59	0.00	0.00	0.00
7,400.00	2.57	269.48	7,398.68	-0.54	-59.89	1.72	0.00	0.00	0.00
7,500.00	2.57	269.48	7,498.58	-0.58	-64.38	1.85	0.00	0.00	0.00
7,600.00	2.57	269.48	7,598.48	-0.62	-68.86	1.97	0.00	0.00	0.00
7,700.00	2.57	269.48	7,698.38	-0.67	-73.34	2.10	0.00	0.00	0.00
7,800.00	2.57	269.48	7,798.28	-0.71	-77.83	2.23	0.00	0.00	0.00
7,900.00	2.57	269.48	7,898.18	-0.75	-82.31	2.36	0.00	0.00	0.00
8,000.00	2.57	269.48	7,998.07	-0.79	-86.80	2.49	0.00	0.00	0.00
8,100.00	2.57	269.48	8,097.97	-0.83	-91.28	2.62	0.00	0.00	0.00
8,200.00	2.57	269.48	8,197.87	-0.87	-95.76	2.75	0.00	0.00	0.00
8,300.00	2.57	269.48	8,297.77	-0.91	-100.25	2.87	0.00	0.00	0.00
8,400.00	2.57	269.48	8,397.67	-0.95	-104.73	3.00	0.00	0.00	0.00
8,500.00	2.57	269.48	8,497.57	-0.99	-109.21	3.13	0.00	0.00	0.00
8,600.00	2.57	269.48	8,597.47	-1.03	-113.70	3.26	0.00	0.00	0.00
8,700.00	2.57	269.48	8,697.37	-1.07	-118.18	3.39	0.00	0.00	0.00
8,800.00	2.57	269.48	8,797.27	-1.11	-122.67	3.52	0.00	0.00	0.00
8,900.00	2.57	269.48	8,897.17	-1.15	-127.15	3.65	0.00	0.00	0.00
9,000.00	2.57	269.48	8,997.07	-1.19	-131.63	3.77	0.00	0.00	0.00
9,100.00	2.57	269.48	9,096.97	-1.24	-136.12	3.90	0.00	0.00	0.00
9,200.00	2.57	269.48	9,196.87	-1.28	-140.60	4.03	0.00	0.00	0.00
9,300.00	2.57	269.48	9,296.77	-1.32	-145.09	4.16	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S. , R 35 E
Well: White Falcon 16 Federal Com 22H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,400.00	2.57	269.48	9,396.67	-1.36	-149.57	4.29	0.00	0.00	0.00
9,500.00	2.57	269.48	9,496.57	-1.40	-154.05	4.42	0.00	0.00	0.00
9,600.00	2.57	269.48	9,596.47	-1.44	-158.54	4.54	0.00	0.00	0.00
9,700.00	2.57	269.48	9,696.36	-1.48	-163.02	4.67	0.00	0.00	0.00
9,800.00	2.57	269.48	9,796.26	-1.52	-167.50	4.80	0.00	0.00	0.00
9,900.00	2.57	269.48	9,896.16	-1.56	-171.99	4.93	0.00	0.00	0.00
10,000.00	2.57	269.48	9,996.06	-1.60	-176.47	5.06	0.00	0.00	0.00
10,100.00	2.57	269.48	10,095.96	-1.64	-180.96	5.19	0.00	0.00	0.00
10,200.00	2.57	269.48	10,195.86	-1.68	-185.44	5.32	0.00	0.00	0.00
10,300.00	2.57	269.48	10,295.76	-1.72	-189.92	5.44	0.00	0.00	0.00
10,400.00	2.57	269.48	10,395.66	-1.76	-194.41	5.57	0.00	0.00	0.00
10,500.00	2.57	269.48	10,495.56	-1.81	-198.89	5.70	0.00	0.00	0.00
10,600.00	2.57	269.48	10,595.46	-1.85	-203.37	5.83	0.00	0.00	0.00
10,700.00	2.57	269.48	10,695.36	-1.89	-207.86	5.96	0.00	0.00	0.00
10,800.00	2.57	269.48	10,795.26	-1.93	-212.34	6.09	0.00	0.00	0.00
10,900.00	2.57	269.48	10,895.16	-1.97	-216.83	6.22	0.00	0.00	0.00
11,000.00	2.57	269.48	10,995.06	-2.01	-221.31	6.34	0.00	0.00	0.00
11,100.00	2.57	269.48	11,094.96	-2.05	-225.79	6.47	0.00	0.00	0.00
11,200.00	2.57	269.48	11,194.86	-2.09	-230.28	6.60	0.00	0.00	0.00
11,300.00	2.57	269.48	11,294.76	-2.13	-234.76	6.73	0.00	0.00	0.00
11,400.00	2.57	269.48	11,394.66	-2.17	-239.25	6.86	0.00	0.00	0.00
11,500.00	2.57	269.48	11,494.55	-2.21	-243.73	6.99	0.00	0.00	0.00
11,600.00	2.57	269.48	11,594.45	-2.25	-248.21	7.12	0.00	0.00	0.00
11,700.00	2.57	269.48	11,694.35	-2.29	-252.70	7.24	0.00	0.00	0.00
11,800.00	2.57	269.48	11,794.25	-2.33	-257.18	7.37	0.00	0.00	0.00
11,900.00	2.57	269.48	11,894.15	-2.37	-261.66	7.50	0.00	0.00	0.00
12,000.00	2.57	269.48	11,994.05	-2.42	-266.15	7.63	0.00	0.00	0.00
12,055.03	2.57	269.48	12,049.03	-2.44	-268.62	7.70	0.00	0.00	0.00
Start DLS 12.00 TFO -90.02									
12,100.00	5.97	204.86	12,093.88	-4.57	-270.61	9.87	12.00	7.57	-143.71
12,200.00	17.58	187.61	12,191.64	-24.33	-274.81	29.71	12.00	11.60	-17.25
12,300.00	29.50	184.01	12,283.16	-64.00	-278.55	69.45	12.00	11.92	-3.59
12,400.00	41.46	182.37	12,364.44	-121.85	-281.65	127.35	12.00	11.96	-1.64
12,500.00	53.44	181.37	12,431.94	-195.35	-283.99	200.87	12.00	11.98	-1.00
12,600.00	65.42	180.64	12,482.71	-281.28	-285.46	286.82	12.00	11.98	-0.73
12,700.00	77.41	180.04	12,514.53	-375.89	-286.00	381.42	12.00	11.99	-0.60
12,800.00	89.40	179.49	12,526.00	-475.04	-285.58	480.55	12.00	11.99	-0.55
12,800.89	89.50	179.48	12,526.00	-475.93	-285.57	481.43	12.00	11.99	-0.54
Start 9657.09 hold at 12800.89 MD									
12,900.00	89.50	179.48	12,526.87	-575.03	-284.68	580.50	0.00	0.00	0.00
13,000.00	89.50	179.48	12,527.74	-675.03	-283.78	680.46	0.00	0.00	0.00
13,100.00	89.50	179.48	12,528.61	-775.02	-282.88	780.41	0.00	0.00	0.00
13,200.00	89.50	179.48	12,529.48	-875.01	-281.98	880.37	0.00	0.00	0.00
13,300.00	89.50	179.48	12,530.35	-975.00	-281.08	980.32	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S., R 35 E
Well: White Falcon 16 Federal Com 22H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,400.00	89.50	179.48	12,531.22	-1,074.99	-280.18	1,080.28	0.00	0.00	0.00
13,500.00	89.50	179.48	12,532.09	-1,174.99	-279.27	1,180.23	0.00	0.00	0.00
13,600.00	89.50	179.48	12,532.96	-1,274.98	-278.37	1,280.19	0.00	0.00	0.00
13,700.00	89.50	179.48	12,533.83	-1,374.97	-277.47	1,380.14	0.00	0.00	0.00
13,800.00	89.50	179.48	12,534.70	-1,474.96	-276.57	1,480.10	0.00	0.00	0.00
13,900.00	89.50	179.48	12,535.57	-1,574.96	-275.67	1,580.05	0.00	0.00	0.00
14,000.00	89.50	179.48	12,536.44	-1,674.95	-274.77	1,680.01	0.00	0.00	0.00
14,100.00	89.50	179.48	12,537.31	-1,774.94	-273.87	1,779.96	0.00	0.00	0.00
14,200.00	89.50	179.48	12,538.18	-1,874.93	-272.97	1,879.92	0.00	0.00	0.00
14,300.00	89.50	179.48	12,539.04	-1,974.92	-272.07	1,979.88	0.00	0.00	0.00
14,400.00	89.50	179.48	12,539.91	-2,074.92	-271.17	2,079.83	0.00	0.00	0.00
14,500.00	89.50	179.48	12,540.78	-2,174.91	-270.26	2,179.79	0.00	0.00	0.00
14,600.00	89.50	179.48	12,541.65	-2,274.90	-269.36	2,279.74	0.00	0.00	0.00
14,700.00	89.50	179.48	12,542.52	-2,374.89	-268.46	2,379.70	0.00	0.00	0.00
14,800.00	89.50	179.48	12,543.39	-2,474.88	-267.56	2,479.65	0.00	0.00	0.00
14,900.00	89.50	179.48	12,544.26	-2,574.88	-266.66	2,579.61	0.00	0.00	0.00
15,000.00	89.50	179.48	12,545.13	-2,674.87	-265.76	2,679.56	0.00	0.00	0.00
15,100.00	89.50	179.48	12,546.00	-2,774.86	-264.86	2,779.52	0.00	0.00	0.00
15,200.00	89.50	179.48	12,546.87	-2,874.85	-263.96	2,879.47	0.00	0.00	0.00
15,300.00	89.50	179.48	12,547.74	-2,974.85	-263.06	2,979.43	0.00	0.00	0.00
15,400.00	89.50	179.48	12,548.61	-3,074.84	-262.16	3,079.38	0.00	0.00	0.00
15,500.00	89.50	179.48	12,549.48	-3,174.83	-261.25	3,179.34	0.00	0.00	0.00
15,600.00	89.50	179.48	12,550.35	-3,274.82	-260.35	3,279.29	0.00	0.00	0.00
15,700.00	89.50	179.48	12,551.22	-3,374.81	-259.45	3,379.25	0.00	0.00	0.00
15,800.00	89.50	179.48	12,552.09	-3,474.81	-258.55	3,479.21	0.00	0.00	0.00
15,900.00	89.50	179.48	12,552.96	-3,574.80	-257.65	3,579.16	0.00	0.00	0.00
16,000.00	89.50	179.48	12,553.83	-3,674.79	-256.75	3,679.12	0.00	0.00	0.00
16,100.00	89.50	179.48	12,554.70	-3,774.78	-255.85	3,779.07	0.00	0.00	0.00
16,200.00	89.50	179.48	12,555.57	-3,874.78	-254.95	3,879.03	0.00	0.00	0.00
16,300.00	89.50	179.48	12,556.44	-3,974.77	-254.05	3,978.98	0.00	0.00	0.00
16,400.00	89.50	179.48	12,557.31	-4,074.76	-253.14	4,078.94	0.00	0.00	0.00
16,500.00	89.50	179.48	12,558.18	-4,174.75	-252.24	4,178.89	0.00	0.00	0.00
16,600.00	89.50	179.48	12,559.05	-4,274.74	-251.34	4,278.85	0.00	0.00	0.00
16,700.00	89.50	179.48	12,559.92	-4,374.74	-250.44	4,378.80	0.00	0.00	0.00
16,800.00	89.50	179.48	12,560.79	-4,474.73	-249.54	4,478.76	0.00	0.00	0.00
16,900.00	89.50	179.48	12,561.66	-4,574.72	-248.64	4,578.71	0.00	0.00	0.00
17,000.00	89.50	179.48	12,562.53	-4,674.71	-247.74	4,678.67	0.00	0.00	0.00
17,100.00	89.50	179.48	12,563.40	-4,774.70	-246.84	4,778.62	0.00	0.00	0.00
17,200.00	89.50	179.48	12,564.27	-4,874.70	-245.94	4,878.58	0.00	0.00	0.00
17,300.00	89.50	179.48	12,565.14	-4,974.69	-245.04	4,978.53	0.00	0.00	0.00
17,400.00	89.50	179.48	12,566.01	-5,074.68	-244.13	5,078.49	0.00	0.00	0.00
17,500.00	89.50	179.48	12,566.88	-5,174.67	-243.23	5,178.45	0.00	0.00	0.00
17,600.00	89.50	179.48	12,567.75	-5,274.67	-242.33	5,278.40	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S. , R 35 E
Well: White Falcon 16 Federal Com 22H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
17,700.00	89.50	179.48	12,568.62	-5,374.66	-241.43	5,378.36	0.00	0.00	0.00
17,800.00	89.50	179.48	12,569.49	-5,474.65	-240.53	5,478.31	0.00	0.00	0.00
17,900.00	89.50	179.48	12,570.36	-5,574.64	-239.63	5,578.27	0.00	0.00	0.00
18,000.00	89.50	179.48	12,571.23	-5,674.63	-238.73	5,678.22	0.00	0.00	0.00
18,100.00	89.50	179.48	12,572.10	-5,774.63	-237.83	5,778.18	0.00	0.00	0.00
18,200.00	89.50	179.48	12,572.97	-5,874.62	-236.93	5,878.13	0.00	0.00	0.00
18,300.00	89.50	179.48	12,573.84	-5,974.61	-236.03	5,978.09	0.00	0.00	0.00
18,400.00	89.50	179.48	12,574.71	-6,074.60	-235.12	6,078.04	0.00	0.00	0.00
18,500.00	89.50	179.48	12,575.58	-6,174.59	-234.22	6,178.00	0.00	0.00	0.00
18,600.00	89.50	179.48	12,576.45	-6,274.59	-233.32	6,277.95	0.00	0.00	0.00
18,700.00	89.50	179.48	12,577.32	-6,374.58	-232.42	6,377.91	0.00	0.00	0.00
18,800.00	89.50	179.48	12,578.19	-6,474.57	-231.52	6,477.86	0.00	0.00	0.00
18,900.00	89.50	179.48	12,579.06	-6,574.56	-230.62	6,577.82	0.00	0.00	0.00
19,000.00	89.50	179.48	12,579.93	-6,674.56	-229.72	6,677.78	0.00	0.00	0.00
19,100.00	89.50	179.48	12,580.80	-6,774.55	-228.82	6,777.73	0.00	0.00	0.00
19,200.00	89.50	179.48	12,581.67	-6,874.54	-227.92	6,877.69	0.00	0.00	0.00
19,300.00	89.50	179.48	12,582.54	-6,974.53	-227.01	6,977.64	0.00	0.00	0.00
19,400.00	89.50	179.48	12,583.41	-7,074.52	-226.11	7,077.60	0.00	0.00	0.00
19,500.00	89.50	179.48	12,584.28	-7,174.52	-225.21	7,177.55	0.00	0.00	0.00
19,600.00	89.50	179.48	12,585.15	-7,274.51	-224.31	7,277.51	0.00	0.00	0.00
19,700.00	89.50	179.48	12,586.02	-7,374.50	-223.41	7,377.46	0.00	0.00	0.00
19,800.00	89.50	179.48	12,586.89	-7,474.49	-222.51	7,477.42	0.00	0.00	0.00
19,900.00	89.50	179.48	12,587.76	-7,574.48	-221.61	7,577.37	0.00	0.00	0.00
20,000.00	89.50	179.48	12,588.63	-7,674.48	-220.71	7,677.33	0.00	0.00	0.00
20,100.00	89.50	179.48	12,589.50	-7,774.47	-219.81	7,777.28	0.00	0.00	0.00
20,200.00	89.50	179.48	12,590.37	-7,874.46	-218.91	7,877.24	0.00	0.00	0.00
20,300.00	89.50	179.48	12,591.24	-7,974.45	-218.00	7,977.19	0.00	0.00	0.00
20,400.00	89.50	179.48	12,592.11	-8,074.45	-217.10	8,077.15	0.00	0.00	0.00
20,500.00	89.50	179.48	12,592.98	-8,174.44	-216.20	8,177.10	0.00	0.00	0.00
20,600.00	89.50	179.48	12,593.85	-8,274.43	-215.30	8,277.06	0.00	0.00	0.00
20,700.00	89.50	179.48	12,594.72	-8,374.42	-214.40	8,377.02	0.00	0.00	0.00
20,800.00	89.50	179.48	12,595.59	-8,474.41	-213.50	8,476.97	0.00	0.00	0.00
20,900.00	89.50	179.48	12,596.46	-8,574.41	-212.60	8,576.93	0.00	0.00	0.00
21,000.00	89.50	179.48	12,597.33	-8,674.40	-211.70	8,676.88	0.00	0.00	0.00
21,100.00	89.50	179.48	12,598.20	-8,774.39	-210.80	8,776.84	0.00	0.00	0.00
21,200.00	89.50	179.48	12,599.07	-8,874.38	-209.90	8,876.79	0.00	0.00	0.00
21,300.00	89.50	179.48	12,599.94	-8,974.38	-208.99	8,976.75	0.00	0.00	0.00
21,400.00	89.50	179.48	12,600.81	-9,074.37	-208.09	9,076.70	0.00	0.00	0.00
21,500.00	89.50	179.48	12,601.67	-9,174.36	-207.19	9,176.66	0.00	0.00	0.00
21,600.00	89.50	179.48	12,602.54	-9,274.35	-206.29	9,276.61	0.00	0.00	0.00
21,700.00	89.50	179.48	12,603.41	-9,374.34	-205.39	9,376.57	0.00	0.00	0.00
21,800.00	89.50	179.48	12,604.28	-9,474.34	-204.49	9,476.52	0.00	0.00	0.00
21,900.00	89.50	179.48	12,605.15	-9,574.33	-203.59	9,576.48	0.00	0.00	0.00
22,000.00	89.50	179.48	12,606.02	-9,674.32	-202.69	9,676.43	0.00	0.00	0.00

Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S. , R 35 E
Well: White Falcon 16 Federal Com 22H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 22H
TVD Reference: KB=26' @ 3272.60ft
MD Reference: KB=26' @ 3272.60ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
22,100.00	89.50	179.48	12,606.89	-9,774.31	-201.79	9,776.39	0.00	0.00	0.00
22,200.00	89.50	179.48	12,607.76	-9,874.30	-200.88	9,876.35	0.00	0.00	0.00
22,300.00	89.50	179.48	12,608.63	-9,974.30	-199.98	9,976.30	0.00	0.00	0.00
22,400.00	89.50	179.48	12,609.50	-10,074.29	-199.08	10,076.26	0.00	0.00	0.00
22,457.97	89.50	179.48	12,610.01	-10,132.25	-198.56	10,134.20	0.00	0.00	0.00
TD at 22457.97									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
W.F. Fed Com 22H L	0.00	0.00	12,608.88	-10,002.33	-199.58	404,841.5265	796,661.9822	32° 6' 33.844 N	103° 22' 30.803 W
- plan misses target center by 0.15ft at 22328.03ft MD (12608.88 TVD, -10002.33 N, -199.73 E)									
- Point									
W.F. Fed Com 22H B	0.00	0.00	12,610.00	-10,132.25	-198.56	404,711.6000	796,663.0000	32° 6' 32.558 N	103° 22' 30.804 W
- plan misses target center by 0.01ft at 22457.97ft MD (12610.01 TVD, -10132.25 N, -198.56 E)									
- Point									

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6000	6000	0	0	Start Build 2.00
6129	6128	0	-3	Start 5926.53 hold at 6128.50 MD
12,055	12,049	-2	-269	Start DLS 12.00 TFO -90.02
12,801	12,526	-476	-286	Start 9657.09 hold at 12800.89 MD
22,458	12,610	-10,132	-199	TD at 22457.97

Checked By: _____ Approved By: _____ Date: _____