CONCHO

COG PRODUCTION LLC

LEA COUNTY, NM
BULLDOG
AZORES FEDERAL #6H

OWB
PWP0

Anticollision Report

16 February, 2017

COG PRODUCTION LLC

Anticollision Report

Company:	COG PRODUCTION LLC	**Local Co-ordinate Reference:**	Well AZORES FEDERAL #6H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB=3496.6+20 @ 3516.6usft (PATRIOT 2)
Reference Site:	BULLDOG	**MD Reference:**	RKB=3496.6+20 @ 3516.6usft (PATRIOT 2)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	AZORES FEDERAL #6H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	3.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OWB	**Database:**	EDM_Users
Reference Design:	PWP0	**Offset TVD Reference:**	Offset Datum

Reference	PWP0		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0 usft	**Error Surface:**	Major Axis
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 2/16/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	13,894.3	PWP0 (OWB)	MWD	OWSG MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
BULLDOG						
AZORES FEDERAL #2H - OWB - ACTUAL WELLATH	1,512.6	1,516.3	183.5	171.5	15.378	CC
AZORES FEDERAL #2H - OWB - ACTUAL WELLATH	1,600.0	1,601.7	183.9	171.5	14.760	ES
AZORES FEDERAL #2H - OWB - ACTUAL WELLATH	9,000.0	8,988.9	264.1	200.6	4.161	SF

Offset Design BULLDOG - AZORES FEDERAL #2H - OWB - ACTUAL WELLATH — **Offset Site Error:** 0.0 usft

Survey Program: 100-GYRO-NS, 10093-MWD — **Offset Well Error:** 3.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	3.4	3.4	3.0	3.0	95.07	-17.8	200.5	201.3				
100.0	100.0	104.7	104.7	3.0	3.0	95.11	-17.9	200.2	201.0	195.0	6.01	33.456	
200.0	200.0	204.6	204.6	3.0	3.0	95.06	-17.7	199.6	200.4	194.3	6.08	32.939	
300.0	300.0	305.3	305.3	3.1	3.1	94.92	-17.1	198.9	199.6	193.4	6.24	31.988	
400.0	400.0	405.8	405.8	3.2	3.2	94.67	-16.2	197.9	198.6	192.1	6.47	30.677	
500.0	500.0	506.7	506.6	3.4	3.4	94.32	-14.9	196.6	197.1	190.4	6.77	29.107	
600.0	600.0	606.9	606.8	3.6	3.6	93.88	-13.2	195.0	195.5	188.3	7.13	27.408	
700.0	700.0	706.2	706.1	3.8	3.8	93.37	-11.4	193.6	194.0	186.4	7.54	25.729	
800.0	800.0	807.2	807.0	4.0	4.0	92.82	-9.5	192.1	192.3	184.3	7.99	24.069	
900.0	900.0	908.6	908.4	4.3	4.2	92.35	-7.8	189.8	190.1	181.6	8.48	22.413	
1,000.0	1,000.0	1,007.3	1,007.1	4.5	4.5	91.91	-6.3	187.7	187.8	178.8	8.99	20.887	
1,100.0	1,100.0	1,106.2	1,105.9	4.8	4.7	91.33	-4.3	186.1	186.2	176.6	9.53	19.536	
1,200.0	1,200.0	1,204.9	1,204.7	5.1	5.0	90.67	-2.2	185.1	185.2	175.1	10.09	18.358	
1,300.0	1,300.0	1,305.1	1,304.8	5.4	5.3	90.10	-0.3	184.4	184.4	173.8	10.66	17.296	
1,400.0	1,400.0	1,404.6	1,404.3	5.7	5.6	89.58	1.3	183.8	183.8	172.6	11.25	16.334	
1,500.0	1,500.0	1,504.1	1,503.8	6.0	5.9	89.10	2.9	183.5	183.5	171.6	11.86	15.476	
1,512.6	1,512.6	1,516.3	1,516.0	6.0	5.9	89.05	3.0	183.4	183.5	171.5	11.93	15.378	CC
1,600.0	1,600.0	1,601.7	1,601.4	6.3	6.2	88.62	4.4	183.9	183.9	171.5	12.46	14.760	ES
1,700.0	1,700.0	1,700.8	1,700.5	6.6	6.5	88.07	6.2	185.1	185.3	172.2	13.09	14.159	
1,800.0	1,800.0	1,801.1	1,800.7	6.9	6.8	87.56	8.0	186.6	186.8	173.1	13.72	13.613	
1,900.0	1,900.0	1,900.4	1,900.0	7.2	7.1	87.21	9.2	188.2	188.4	174.0	14.36	13.122	
2,000.0	2,000.0	1,999.5	1,999.1	7.6	7.4	86.92	10.2	190.1	190.4	175.4	15.00	12.694	
2,100.0	2,100.0	2,098.1	2,097.6	7.9	7.7	86.57	11.5	192.6	193.0	177.4	15.65	12.336	
2,200.0	2,200.0	2,195.9	2,195.4	8.2	8.1	86.15	13.2	196.0	196.6	180.3	16.30	12.059	

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

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Reference Site:	BULLDOG	**MD Reference:**	RKB=3496.6+20 @ 3516.6usft (PATRIOT 2)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	AZORES FEDERAL #6H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	3.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OWB	**Database:**	EDM_Users
Reference Design:	PWP0	**Offset TVD Reference:**	Offset Datum

Offset Design BULLDOG - AZORES FEDERAL #2H - OWB - ACTUAL WELLATH

Offset Site Error: 0.0 usft

Survey Program: 100-GYRO-NS, 10093-MWD

Offset Well Error: 3.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,300.0	2,300.0	2,294.2	2,293.5	8.6	8.4	85.64	15.3	200.2	201.1	184.1	16.96	11.855	
2,400.0	2,400.0	2,393.9	2,393.1	8.9	8.7	85.25	17.0	205.1	206.0	188.4	17.63	11.688	
2,500.0	2,500.0	2,493.4	2,492.5	9.2	9.1	85.02	18.3	210.0	211.1	192.8	18.30	11.537	
2,600.0	2,600.0	2,593.2	2,592.2	9.6	9.4	84.78	19.7	215.1	216.3	197.3	18.97	11.399	
2,700.0	2,700.0	2,693.1	2,691.9	9.9	9.7	84.69	20.5	220.2	221.5	201.8	19.65	11.270	
2,800.0	2,800.0	2,795.9	2,794.6	10.3	10.1	84.85	20.3	225.0	226.0	205.7	20.34	11.116	
2,900.0	2,900.0	2,895.0	2,893.7	10.6	10.4	84.98	20.1	229.0	230.1	209.1	21.01	10.950	
3,000.0	3,000.0	2,993.5	2,992.0	11.0	10.7	85.03	20.3	233.5	234.6	212.9	21.69	10.818	
3,100.0	3,100.0	3,093.8	3,092.3	11.3	11.1	85.03	20.7	238.2	239.4	217.0	22.37	10.700	
3,200.0	3,200.0	3,195.8	3,194.1	11.6	11.4	84.98	21.3	242.5	243.6	220.6	23.06	10.564	
3,300.0	3,300.0	3,295.8	3,294.1	12.0	11.8	84.78	22.5	246.2	247.4	223.7	23.75	10.418	
3,400.0	3,400.0	3,394.9	3,393.1	12.3	12.1	84.37	24.6	249.9	251.3	226.9	24.43	10.287	
3,500.0	3,500.0	3,492.1	3,490.2	12.7	12.4	83.88	27.2	254.2	255.9	230.8	25.11	10.192	
3,600.0	3,600.0	3,595.3	3,593.2	13.0	12.8	83.48	29.6	258.7	260.6	234.8	25.81	10.096	
3,700.0	3,700.0	3,699.2	3,697.1	13.4	13.1	83.41	30.3	261.9	263.8	237.2	26.51	9.948	
3,800.0	3,800.0	3,798.5	3,796.3	13.7	13.5	83.52	30.1	264.5	266.3	239.1	27.20	9.790	
3,900.0	3,900.0	3,899.0	3,896.8	14.1	13.8	83.55	30.2	267.1	268.8	241.0	27.89	9.639	
4,000.0	4,000.0	3,996.6	3,994.3	14.4	14.1	83.63	30.1	269.9	271.7	243.2	28.57	9.510	
4,100.0	4,100.0	4,097.2	4,094.8	14.8	14.5	83.83	29.5	273.3	275.0	245.7	29.27	9.395	
4,200.0	4,200.0	4,200.3	4,198.0	15.1	14.8	84.08	28.6	276.0	277.5	247.6	29.97	9.260	
4,300.0	4,300.0	4,301.7	4,299.3	15.5	15.2	84.41	27.2	277.9	279.2	248.6	30.67	9.105	
4,400.0	4,400.0	4,399.6	4,397.1	15.8	15.5	84.92	24.9	279.9	281.1	249.7	31.35	8.966	
4,500.0	4,500.0	4,499.7	4,497.2	16.2	15.8	85.47	22.4	282.3	283.3	251.3	32.04	8.841	
4,600.0	4,600.0	4,599.8	4,597.2	16.5	16.2	85.94	20.2	284.7	285.5	252.7	32.74	8.720	
4,700.0	4,700.0	4,701.9	4,699.3	16.9	16.5	86.38	18.1	286.7	287.3	253.8	33.44	8.591	
4,800.0	4,800.0	4,800.8	4,798.2	17.3	16.9	86.77	16.3	288.4	288.9	254.8	34.13	8.465	
4,900.0	4,900.0	4,903.0	4,900.3	17.6	17.2	87.12	14.6	290.0	290.4	255.5	34.83	8.336	
5,000.0	5,000.0	5,002.8	5,000.2	18.0	17.6	87.45	13.0	291.2	291.5	255.9	35.53	8.204	
5,100.0	5,100.0	5,102.9	5,100.2	18.3	17.9	87.69	11.8	292.3	292.6	256.4	36.22	8.077	
5,200.0	5,200.0	5,204.7	5,202.1	18.7	18.3	87.86	11.0	293.1	293.4	256.4	36.93	7.944	
5,300.0	5,300.0	5,305.0	5,302.3	19.0	18.6	88.08	9.9	293.6	293.8	256.2	37.62	7.808	
5,400.0	5,400.0	5,404.5	5,401.8	19.4	18.9	88.33	8.6	294.1	294.3	255.9	38.32	7.679	
5,500.0	5,500.0	5,506.4	5,503.7	19.7	19.3	88.59	7.2	294.4	294.5	255.5	39.02	7.547	
5,600.0	5,600.0	5,609.0	5,606.3	20.1	19.6	88.81	6.1	293.9	293.9	254.2	39.73	7.399	
5,700.0	5,700.0	5,709.4	5,706.6	20.4	20.0	88.96	5.3	292.9	292.9	252.5	40.43	7.246	
5,800.0	5,800.0	5,807.6	5,804.9	20.8	20.3	89.09	4.6	292.2	292.2	251.1	41.12	7.106	
5,900.0	5,900.0	5,909.2	5,906.4	21.1	20.7	89.16	4.3	291.4	291.4	249.6	41.82	6.968	
6,000.0	6,000.0	6,009.2	6,006.5	21.5	21.0	89.24	3.9	290.4	290.4	247.9	42.52	6.829	
6,100.0	6,100.0	6,108.6	6,105.9	21.9	21.4	89.30	3.6	289.5	289.5	246.3	43.22	6.698	
6,200.0	6,200.0	6,209.5	6,206.7	22.2	21.7	89.38	3.1	288.4	288.5	244.6	43.92	6.568	
6,300.0	6,300.0	6,310.1	6,307.4	22.6	22.1	89.48	2.6	287.2	287.2	242.6	44.63	6.436	
6,400.0	6,400.0	6,410.2	6,407.4	22.9	22.4	89.56	2.2	285.8	285.8	240.5	45.33	6.306	
6,500.0	6,500.0	6,510.4	6,507.6	23.3	22.7	89.59	2.0	284.3	284.4	238.4	46.03	6.178	
6,600.0	6,600.0	6,610.1	6,607.3	23.6	23.1	89.62	1.9	282.9	283.0	236.2	46.73	6.056	
6,700.0	6,700.0	6,709.9	6,707.1	24.0	23.4	89.68	1.6	281.6	281.6	234.2	47.43	5.938	
6,800.0	6,800.0	6,811.0	6,808.2	24.3	23.8	89.75	1.2	280.0	280.1	232.0	48.13	5.819	
6,900.0	6,900.0	6,910.1	6,907.3	24.7	24.1	89.76	1.2	278.5	278.5	229.7	48.83	5.704	
7,000.0	7,000.0	7,009.6	7,006.7	25.1	24.5	89.75	1.2	277.2	277.2	227.7	49.53	5.597	
7,100.0	7,100.0	7,108.1	7,105.3	25.4	24.8	89.80	1.0	276.4	276.4	226.1	50.23	5.502	
7,200.0	7,200.0	7,210.2	7,207.4	25.8	25.2	89.89	0.5	275.3	275.3	224.4	50.94	5.405	
7,300.0	7,300.0	7,307.0	7,304.2	26.1	25.5	90.01	-0.1	274.6	274.6	223.0	51.63	5.319	
7,400.0	7,400.0	7,408.4	7,405.6	26.5	25.9	90.10	-0.5	274.1	274.1	221.7	52.34	5.237	

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Reference Design:	PWP0	**Offset TVD Reference:**	Offset Datum

Offset Design BULLDOG - AZORES FEDERAL #2H - OWB - ACTUAL WELLATH — **Offset Site Error:** 0.0 usft

Survey Program: 100-GYRO-NS, 10093-MWD — **Offset Well Error:** 3.0 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	0.0tance Between Centres (usft)	0.0tance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,500.0	7,500.0	7,508.6	7,505.7	26.8	26.2	90.25	-1.2	273.2	273.3	220.2	53.04	5.152	
7,600.0	7,600.0	7,606.8	7,603.9	27.2	26.5	90.40	-1.9	272.8	272.8	219.1	53.74	5.076	
7,700.0	7,700.0	7,706.7	7,703.8	27.6	26.9	90.60	-2.9	272.6	272.6	218.2	54.44	5.008	
7,800.0	7,800.0	7,807.2	7,804.4	27.9	27.2	90.87	-4.1	272.4	272.4	217.2	55.14	4.940	
7,900.0	7,900.0	7,906.8	7,903.9	28.3	27.6	91.07	-5.1	272.1	272.1	216.3	55.84	4.873	
8,000.0	8,000.0	8,006.7	8,003.9	28.6	27.9	91.25	-5.9	271.9	271.9	215.4	56.55	4.809	
8,100.0	8,100.0	8,106.3	8,103.4	29.0	28.3	91.45	-6.9	271.8	271.9	214.6	57.25	4.749	
8,200.0	8,200.0	8,207.2	8,204.3	29.3	28.6	91.68	-7.9	271.6	271.7	213.7	57.96	4.688	
8,300.0	8,300.0	8,307.5	8,304.6	29.7	29.0	91.92	-9.1	271.2	271.3	212.7	58.66	4.625	
8,400.0	8,400.0	8,406.7	8,403.8	30.0	29.3	92.16	-10.2	270.9	271.1	211.7	59.36	4.566	
8,500.0	8,500.0	8,507.1	8,504.2	30.4	29.7	92.40	-11.3	270.6	270.8	210.8	60.07	4.509	
8,600.0	8,600.0	8,606.8	8,603.9	30.8	30.0	92.58	-12.2	270.3	270.6	209.9	60.77	4.453	
8,615.9	8,615.9	8,622.2	8,619.3	30.8	30.1	92.60	-12.3	270.3	270.6	209.7	60.88	4.445	
8,700.0	8,700.0	8,704.8	8,701.8	31.1	30.3	92.67	-12.6	270.6	270.9	209.4	61.47	4.407	
8,722.5	8,722.5	8,727.7	8,724.7	31.2	30.4	92.67	-12.6	270.7	271.0	209.4	61.63	4.397	
8,725.0	8,725.0	8,730.2	8,727.3	31.2	30.4	76.22	-12.6	270.7	271.0	209.4	61.64	4.396	
8,750.0	8,750.0	8,755.7	8,752.7	31.3	30.5	76.40	-12.7	270.8	270.9	209.1	61.82	4.382	
8,775.0	8,774.9	8,781.0	8,778.1	31.4	30.6	76.89	-12.7	270.8	270.5	208.5	62.00	4.362	
8,800.0	8,799.7	8,806.3	8,803.3	31.5	30.7	77.69	-12.6	270.8	269.7	207.5	62.17	4.338	
8,825.0	8,824.2	8,830.5	8,827.6	31.6	30.8	78.74	-12.6	270.8	268.7	206.4	62.35	4.310	
8,850.0	8,848.5	8,854.7	8,851.7	31.6	30.9	80.08	-12.6	270.8	267.6	205.1	62.52	4.281	
8,875.0	8,872.4	8,878.5	8,875.5	31.7	31.0	81.66	-12.5	270.9	266.4	203.7	62.68	4.250	
8,900.0	8,895.9	8,901.9	8,899.0	31.8	31.0	83.48	-12.5	270.9	265.3	202.5	62.85	4.221	
8,925.0	8,919.0	8,924.6	8,921.7	31.9	31.1	85.48	-12.4	271.0	264.3	201.3	63.01	4.196	
8,950.0	8,941.5	8,946.7	8,943.8	32.0	31.2	87.65	-12.5	271.0	263.7	200.6	63.16	4.175	
8,968.9	8,958.1	8,963.0	8,960.1	32.0	31.2	89.37	-12.6	271.1	263.6	200.3	63.28	4.165	
8,975.0	8,963.4	8,968.2	8,965.3	32.1	31.3	89.94	-12.6	271.1	263.6	200.3	63.32	4.163	
9,000.0	8,984.6	8,988.9	8,986.0	32.1	31.3	92.28	-12.8	271.2	264.1	200.6	63.47	4.161 SF	
9,025.0	9,005.2	9,009.4	9,006.5	32.2	31.4	94.69	-13.1	271.3	265.4	201.8	63.62	4.172	
9,050.0	9,024.9	9,029.8	9,026.9	32.3	31.5	97.14	-13.3	271.3	267.6	203.8	63.77	4.197	
9,075.0	9,043.8	9,049.3	9,046.4	32.4	31.5	99.49	-13.5	271.3	270.8	206.9	63.91	4.238	
9,100.0	9,061.9	9,068.0	9,065.0	32.4	31.6	101.69	-13.7	271.2	275.3	211.2	64.06	4.297	
9,125.0	9,079.0	9,085.6	9,082.7	32.5	31.7	103.69	-13.8	271.1	281.0	216.8	64.19	4.377	
9,150.0	9,095.1	9,102.3	9,099.4	32.6	31.7	105.44	-13.9	271.0	288.1	223.7	64.33	4.478	
9,175.0	9,110.3	9,118.2	9,115.3	32.7	31.8	106.97	-14.0	270.8	296.5	232.1	64.46	4.600	
9,200.0	9,124.3	9,133.1	9,130.2	32.8	31.8	108.18	-14.1	270.7	306.5	241.9	64.60	4.744	
9,225.0	9,137.3	9,146.9	9,143.9	32.8	31.9	109.05	-14.1	270.5	317.8	253.1	64.72	4.910	
9,250.0	9,149.1	9,159.4	9,156.5	32.9	31.9	109.55	-14.1	270.2	330.5	265.6	64.85	5.096	
9,275.0	9,159.7	9,170.8	9,167.9	33.0	32.0	109.64	-14.0	270.0	344.5	279.5	64.97	5.302	
9,300.0	9,169.2	9,181.0	9,178.0	33.1	32.0	109.29	-14.0	269.8	359.7	294.7	65.09	5.527	
9,325.0	9,177.4	9,189.8	9,186.9	33.2	32.0	108.47	-13.9	269.6	376.1	310.9	65.20	5.769	
9,350.0	9,184.4	9,197.4	9,194.5	33.3	32.1	107.14	-13.9	269.5	393.6	328.3	65.32	6.026	
9,375.0	9,190.1	9,203.6	9,200.7	33.3	32.1	105.25	-13.8	269.3	411.9	346.5	65.42	6.296	
9,400.0	9,194.5	9,208.5	9,205.5	33.4	32.1	102.76	-13.8	269.2	431.1	365.6	65.53	6.579	
9,425.0	9,197.6	9,212.0	9,209.0	33.5	32.1	99.62	-13.7	269.1	451.0	385.4	65.63	6.872	
9,450.0	9,199.5	9,214.0	9,211.1	33.6	32.1	95.82	-13.7	269.1	471.5	405.7	65.73	7.173	
9,472.6	9,200.0	9,214.7	9,211.7	33.7	32.1	91.82	-13.7	269.0	490.4	424.5	65.81	7.451	
9,500.0	9,200.0	9,214.8	9,211.8	33.8	32.1	91.88	-13.7	269.0	513.9	448.0	65.91	7.796	
9,600.0	9,200.0	9,215.2	9,212.2	34.2	32.1	92.21	-13.7	269.0	604.3	537.9	66.33	9.110	
9,700.0	9,199.9	9,215.7	9,212.8	34.7	32.1	92.82	-13.7	269.0	699.5	632.7	66.81	10.469	
9,800.0	9,199.7	9,216.4	9,213.5	35.2	32.1	94.12	-13.7	269.0	797.4	730.0	67.35	11.840	
9,894.5	9,199.5	9,217.3	9,214.3	35.8	32.1	97.75	-13.7	269.0	891.2	823.3	67.89	13.126	

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

Company:	COG PRODUCTION LLC	**Local Co-ordinate Reference:**	Well AZORES FEDERAL #6H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB=3496.6+20 @ 3516.6usft (PATRIOT 2)
Reference Site:	BULLDOG	**MD Reference:**	RKB=3496.6+20 @ 3516.6usft (PATRIOT 2)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	AZORES FEDERAL #6H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	3.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OWB	**Database:**	EDM_Users
Reference Design:	PWP0	**Offset TVD Reference:**	Offset Datum

Offset Design BULLDOG - AZORES FEDERAL #2H - OWB - ACTUAL WELLATH

Offset Site Error: 0.0 usft

Survey Program: 100-GYRO-NS, 10093-MWD

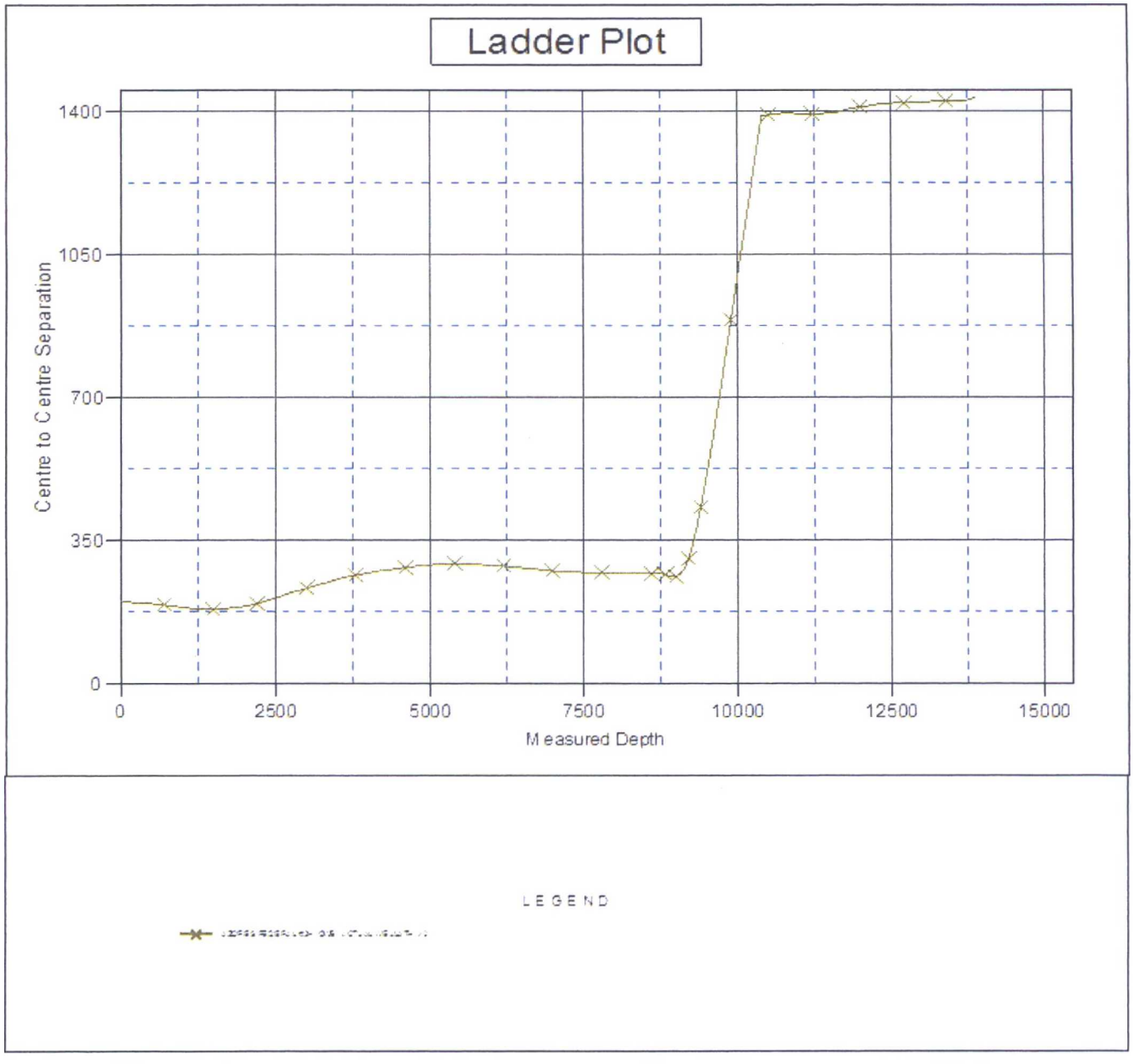
Offset Well Error: 3.0 usft

Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance				Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,900.0	9,199.5	9,217.4	9,214.4	35.8	32.1	97.80	-13.7	269.0	896.7	828.8	67.93	13.200	
10,000.0	9,199.2	9,218.4	9,215.4	36.4	32.1	98.62	-13.7	268.9	996.4	927.9	68.57	14.532	
10,100.0	9,199.0	9,219.4	9,216.4	37.1	32.1	99.47	-13.7	268.9	1,096.2	1,026.9	69.27	15.825	
10,200.0	9,198.8	9,220.5	9,217.5	37.9	32.1	100.35	-13.7	268.9	1,196.0	1,126.0	70.03	17.078	
10,300.0	9,198.5	9,215.6	9,212.7	38.7	32.1	96.37	-13.7	269.0	1,295.9	1,225.1	70.83	18.295	
10,400.0	9,198.3	11,815.8	10,590.7	39.6	42.7	-175.97	1,406.1	91.9	1,392.7	1,310.4	82.33	16.916	
10,441.6	9,198.2	11,833.9	10,590.6	40.0	42.9	-175.94	1,424.2	91.2	1,392.5	1,309.6	82.90	16.798	
10,500.0	9,198.1	11,873.0	10,590.7	40.5	43.3	-175.89	1,463.3	89.6	1,392.9	1,309.1	83.81	16.619	
10,600.0	9,197.8	11,971.4	10,591.9	41.5	44.3	-175.76	1,561.6	85.6	1,394.6	1,308.9	85.76	16.261	
10,700.0	9,197.6	12,066.7	10,593.0	42.5	45.3	-175.62	1,656.8	81.4	1,396.2	1,308.5	87.77	15.908	
10,800.0	9,197.3	12,178.5	10,594.1	43.5	46.5	-175.46	1,768.4	76.5	1,397.8	1,307.7	90.03	15.526	
10,900.0	9,197.1	12,311.7	10,592.4	44.6	48.0	-175.27	1,901.6	71.0	1,396.8	1,304.2	92.61	15.082	
11,000.0	9,196.9	12,399.0	10,591.3	45.7	49.0	-175.23	1,988.8	69.6	1,395.9	1,301.1	94.74	14.734	
11,100.0	9,196.6	12,501.6	10,590.9	46.9	50.2	-175.24	2,091.4	69.0	1,395.8	1,298.7	97.09	14.376	
11,200.0	9,196.4	12,599.3	10,589.4	48.1	51.4	-175.21	2,189.1	67.6	1,394.5	1,295.1	99.44	14.023	
11,222.4	9,196.3	12,614.7	10,589.3	48.3	51.6	-175.20	2,204.5	67.2	1,394.5	1,294.6	99.90	13.958	
11,300.0	9,196.2	12,675.1	10,589.6	49.3	52.3	-175.15	2,264.9	65.6	1,395.1	1,293.5	101.59	13.733	
11,400.0	9,195.9	12,777.3	10,590.6	50.5	53.6	-175.09	2,367.0	63.2	1,396.5	1,292.3	104.10	13.414	
11,500.0	9,195.7	12,881.7	10,590.8	51.8	54.9	-175.01	2,471.4	60.5	1,397.0	1,290.3	106.69	13.094	
11,600.0	9,195.4	12,957.7	10,591.5	53.1	55.9	-174.92	2,547.4	57.7	1,398.4	1,289.5	108.96	12.834	
11,700.0	9,195.2	13,026.0	10,593.8	54.4	56.8	-174.85	2,615.6	55.1	1,402.3	1,291.1	111.16	12.615	
11,800.0	9,195.0	13,130.1	10,598.5	55.7	58.2	-174.74	2,719.5	51.2	1,407.3	1,293.4	113.87	12.359	
11,900.0	9,194.7	13,257.9	10,601.6	57.1	59.9	-174.56	2,847.1	45.6	1,410.1	1,293.2	116.94	12.058	
12,000.0	9,194.5	13,385.6	10,603.5	58.4	61.6	-174.37	2,974.7	39.7	1,412.4	1,292.3	120.06	11.764	
12,100.0	9,194.3	13,463.1	10,603.6	59.8	62.7	-174.26	3,052.1	36.4	1,413.3	1,290.8	122.51	11.536	
12,200.0	9,194.0	13,547.7	10,605.8	61.2	63.9	-174.17	3,136.6	33.3	1,416.3	1,291.3	125.08	11.324	
12,300.0	9,193.8	13,687.9	10,608.1	62.6	65.9	-174.02	3,276.7	28.2	1,418.6	1,290.2	128.46	11.043	
12,400.0	9,193.5	13,762.7	10,608.6	64.0	66.9	-173.94	3,351.4	25.5	1,419.9	1,288.9	130.94	10.844	
12,500.0	9,193.3	13,884.4	10,610.2	65.4	68.7	-173.84	3,473.1	21.8	1,421.7	1,287.6	134.11	10.601	
12,600.0	9,193.1	13,969.7	10,610.8	66.9	69.9	-173.75	3,558.3	18.9	1,422.9	1,286.1	136.78	10.403	
12,700.0	9,192.8	14,099.4	10,609.7	68.3	71.8	-173.56	3,687.8	13.4	1,422.4	1,282.3	140.13	10.151	
12,717.3	9,192.8	14,110.7	10,609.6	68.6	72.0	-173.54	3,699.2	12.9	1,422.4	1,281.8	140.55	10.120	
12,800.0	9,192.6	14,167.8	10,609.7	69.8	72.8	-173.44	3,756.2	9.9	1,423.2	1,280.6	142.60	9.981	
12,900.0	9,192.4	14,277.1	10,610.6	71.2	74.5	-173.25	3,865.4	4.1	1,424.8	1,279.1	145.69	9.780	
13,000.0	9,192.1	14,404.7	10,610.0	72.7	76.4	-173.05	3,992.8	-1.8	1,425.0	1,276.0	149.07	9.560	
13,081.0	9,191.9	14,474.7	10,608.9	73.9	77.4	-172.95	4,062.8	-4.6	1,424.3	1,273.0	151.32	9.413	
13,100.0	9,191.9	14,486.1	10,608.9	74.2	77.6	-172.94	4,074.2	-5.1	1,424.4	1,272.6	151.77	9.385	
13,200.0	9,191.6	14,556.5	10,609.9	75.7	78.6	-172.87	4,144.5	-7.4	1,426.3	1,272.0	154.31	9.243	
13,300.0	9,191.4	14,706.1	10,610.7	77.2	80.9	-172.73	4,294.0	-12.1	1,427.4	1,269.3	158.06	9.031	
13,400.0	9,191.2	14,794.9	10,609.9	78.7	82.2	-172.67	4,382.7	-14.4	1,427.0	1,266.1	160.91	8.869	
13,450.4	9,191.1	14,844.2	10,609.7	79.5	83.0	-172.63	4,432.1	-15.6	1,427.0	1,264.6	162.42	8.786	
13,500.0	9,190.9	14,892.9	10,609.5	80.2	83.7	-172.61	4,480.7	-16.7	1,427.0	1,263.1	163.90	8.707	
13,600.0	9,190.7	14,983.2	10,609.5	81.7	85.1	-172.56	4,571.0	-18.5	1,427.4	1,260.6	166.79	8.558	
13,700.0	9,190.5	15,077.4	10,610.0	83.2	86.5	-172.52	4,665.2	-20.3	1,428.4	1,258.6	169.75	8.415	
13,800.0	9,190.2	15,140.0	10,610.6	84.8	87.5	-172.50	4,727.8	-21.3	1,430.1	1,257.8	172.23	8.303	
13,894.4	9,190.0	15,140.0	10,610.6	86.2	87.5	-172.50	4,727.8	-21.3	1,436.7	1,263.0	173.68	8.272	
13,895.0	9,190.0	15,140.0	10,610.6	86.2	87.5	-172.50	4,727.8	-21.3	1,436.8	1,263.1	173.68	8.272	

Company:	COG PRODUCTION LLC	**Local Co-ordinate Reference:**	Well AZORES FEDERAL #6H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB=3496.6+20 @ 3516.6usft (PATRIOT 2)
Reference Site:	BULLDOG	**MD Reference:**	RKB=3496.6+20 @ 3516.6usft (PATRIOT 2)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	AZORES FEDERAL #6H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	3.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OWB	**Database:**	EDM_Users
Reference Design:	PWP0	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB=3496.6+20 @ 3516.6usft (PATR
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: AZORES FEDERAL #6H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.34°



Company:	COG PRODUCTION LLC	**Local Co-ordinate Reference:**	Well AZORES FEDERAL #6H
Project:	LEA COUNTY, NM	**TVD Reference:**	RKB=3496.6+20 @ 3516.6usft (PATRIOT 2)
Reference Site:	BULLDOG	**MD Reference:**	RKB=3496.6+20 @ 3516.6usft (PATRIOT 2)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	AZORES FEDERAL #6H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	3.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OWB	**Database:**	EDM_Users
Reference Design:	PWP0	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB=3496.6+20 @ 3516.6usft (PATR
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: AZORES FEDERAL #6H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.34°