

Results of Directional Survey

API number:	30-025-41536		
OGRID:		Operator:	CAZA OPERATING, LLC
		Property:	WEST COPPERLINE 29 FED STATE COM # 3H

surface	ULSTR:	C	29	T	23S	R	34E
				150	FNL	1980	FWL

BH Loc	ULSTR:	N	29	T	23S	R	34E
15804	MD	11384.8	TVD	317	FSL	2026	FWL
				4963	FNL		

Top Perf/OH	ULSTR:	C	29	T	23S	R	34E
11600	MD	11406.0	TVD	766	FNL	1984	FWL

Bot Perf/OH	ULSTR:	N	29	T	23S	R	34E
15719	MD	11389.2	TVD	402	FSL	2023	FWL
				4878	FNL		

	MD	N/S	E/W	VD
	11575	-592.70	2.90	11397.2
TOP PERFS/OH	11600	-616.09	3.63	11405.99
	11606	-621.70	3.80	11408.10
	15686	-4695.40	41.00	11390.70
BOT PERFS/OH	15719	-4728.35	42.50	11389.15
	15750	-4759.30	43.90	11387.70

NEXT TO LAST	15750	-4759.30	43.90	11387.70
LAST READING	15804	-4813.10	46.40	11384.80
TD	15804	-4813.10	46.40	11384.80

Surface Location	150	FN	1980	FW
Projected BHL	4963	FN	2026	FW
Location of				
Top Perfs/OH	766	FN	1984	FW
Bottom Perfs/OH	4878	FN	2023	FW

SUMMARY of Subsurface Locations

Surface Location	C-29-23S-34E	150	FN	1980	FW	Vert. Depth
Top Perfs/OH	C-29-23S-34E	766	FN	1984	FW	11405.99
Bottom Perfs/OH	N-29-23S-34E	4878	FN	2023	FW	11389.15
Projected TD	N-29-23S-34E	4963	FN	2026	FW	11384.80

MAR 05 2014

HOBBS OCD

MAR 04 2014

RECEIVED

**CAZA OPERATING LLC
CASING -CEMENT DETAIL**

WEST COPPERLINE 29 #3H	Date: 2/10/2014
Supervisor: Rick Massey	Job Type:

PIPE RECEIVED

Jts	Footage	Size	Wt.	Grade	Conn.	Mill	Truck	Inspection
370	15781.75	5.5	20	P-110	cdchtq			VDP

RUNNING ORDER

Jts	Footage	Size	Wt.	Grade	Conn.	From	To	Remarks
FS	1.80	5.5	20	p-110	btc	15781	15779.2	bore hole depth = 15804'
1	44.20	5.5	20	p-110	cdchtq	15779.2	15735	casing shoe depth = 15781'
FC	2.00	5.5	20	p-110	btc	15735	15733	23' open hole below shoe.
369	15737.98	5.5	20	p-110	cdchtq	15733		
Casing Landed @		15780	RKB	18.5			20	Landing Jt. Cut off/Laid Down
Testing?								

[illegible]

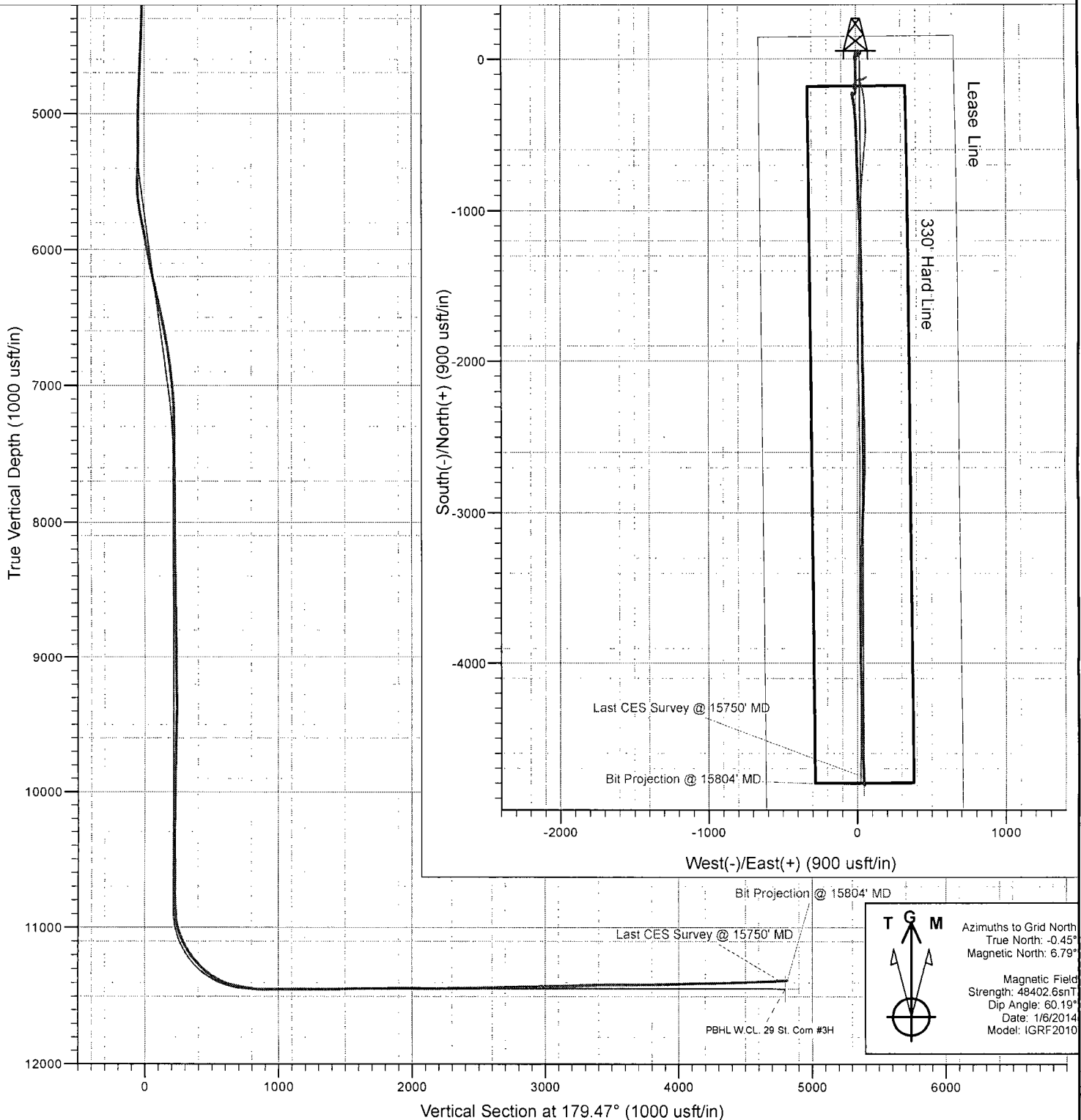


Project: Lea Co. NM
 Site: West Copperline 29 State Com
 Well: West Copperline 29 State Com #3H
 Wellbore: Wellbore
 Design: Plan #3
 Rig: Patriot #1



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation
1	5227.0	1.32	270.94	5225.5	46.1	28.1	0.00	0.00	-45.9		Tie In @ 5227' MD
2	5262.0	1.32	270.94	5260.5	46.1	27.3	0.00	0.00	-45.9		Build 3°/100'
3	5527.4	7.82	179.47	5525.1	28.1	24.4	3.00	-100.95	-27.9		EOB @ 5527.4' MD
4	7116.1	7.82	179.47	7098.9	-188.0	26.4	0.00	0.00	188.3		Drop 1.95°/100'
5	7516.1	0.00	0.00	7497.7	-215.3	26.7	1.95	180.00	215.5		EOD @ 7516.1' MD
6	10900.0	0.00	0.00	10881.6	-215.3	26.7	0.00	0.00	215.5		Build 10.17°/100'
7	11785.0	90.00	179.78	11445.0	-778.7	28.8	10.17	179.78	778.9		EOB @ 11785' MD
8	15804.1	90.00	179.78	11445.0	-4797.8	44.2	0.00	0.00	4798.0	PBHL W.C.L. 29 St. Com #3H	PBHL @ 15804.1' MD



Cathedral Energy Services

Survey Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well West Copperline 29 State Com #3H
Project:	Lea County, NM	TVD Reference:	WELL @ 3560.0usft (Patriot #1)
Site:	West Copperline 29 State Com	MD Reference:	WELL @ 3560.0usft (Patriot #1)
Well:	West Copperline 29 State Com #3H	North Reference:	Grid
Wellbore:	Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore	Database:	USA EDM 5000 Multi Users DB

Project		Lea County, NM	
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		West Copperline 29 State Com			
Site Position:		Northing:	467,259.70 usft	Latitude:	32° 16' 54.560 N
From:	Map	Easting:	759,475.60 usft	Longitude:	103° 29' 37.449 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.45 °

Well	West Copperline 29 State Com #3H					
Well Position	+N/-S	0.0 usft	Northing:	467,439.60 usft	Latitude:	32° 16' 56.340 N
	+E/-W	0.0 usft	Easting:	759,473.90 usft	Longitude:	103° 29' 37.452 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,539.0 usft

Wellbore	Wellbore				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/6/2014	7.24	60.19	48,403

Design:	Wellbore				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	179.47	

Survey Program		Date	2/8/2014	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	5,227.0	Gyro (Wellbore)	Gyro	Gyro
5,238.0	15,804.0	Survey #3 (Wellbore)	ISCWSA MWD	MWD - ISCWSA

Survey									
Measured			Vertical			Vertical	Dogleg	Build	Formations /
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Section	Rate	Rate	Comments
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(°/100usf)	(°/100u)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.32	110.29	100.0	-0.1	0.3	0.1	0.32	0.32	
200.0	0.15	114.83	200.0	-0.2	0.6	0.3	0.17	-0.17	
300.0	0.47	165.07	300.0	-0.7	0.9	0.7	0.39	0.32	
400.0	0.43	169.35	400.0	-1.5	1.0	1.5	0.05	-0.04	
500.0	0.11	173.21	500.0	-1.9	1.1	1.9	0.32	-0.32	
600.0	0.48	114.61	600.0	-2.2	1.5	2.2	0.43	0.37	
700.0	0.59	207.92	700.0	-2.8	1.7	2.8	0.78	0.11	
800.0	0.39	234.27	800.0	-3.5	1.1	3.5	0.30	-0.20	
900.0	0.79	250.70	900.0	-3.9	0.2	3.9	0.43	0.40	
1,000.0	0.19	249.65	1,000.0	-4.2	-0.6	4.2	0.60	-0.60	
1,100.0	0.57	255.84	1,100.0	-4.4	-1.2	4.4	0.38	0.38	

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Site:	West Copperline 29 State Com	MD Reference:	WELL @ 3560.0usft (Patriot #1)
Well:	West Copperline 29 State Com #3H	North Reference:	Grid
Wellbore:	Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations/ Comments
1,200.0	0.52	290.34	1,200.0	-4.3	-2.1	4.3	0.33	-0.05	
1,300.0	0.60	277.86	1,300.0	-4.1	-3.1	4.1	0.15	0.08	
1,400.0	0.09	200.10	1,400.0	-4.1	-3.6	4.1	0.59	-0.51	
1,500.0	0.14	96.92	1,500.0	-4.2	-3.5	4.2	0.18	0.05	
1,600.0	0.33	73.50	1,600.0	-4.1	-3.1	4.1	0.21	0.19	
1,700.0	0.57	57.60	1,700.0	-3.8	-2.4	3.8	0.27	0.24	
1,800.0	0.72	340.40	1,800.0	-2.9	-2.2	2.9	0.81	0.15	
1,900.0	0.95	273.45	1,899.9	-2.3	-3.3	2.3	0.94	0.23	
2,000.0	0.92	254.02	1,999.9	-2.5	-4.9	2.4	0.32	-0.03	
2,100.0	0.39	251.69	2,099.9	-2.8	-6.0	2.7	0.53	-0.53	
2,200.0	0.34	248.99	2,199.9	-3.0	-6.6	2.9	0.05	-0.05	
2,300.0	0.42	313.27	2,299.9	-2.9	-7.1	2.8	0.41	0.08	
2,400.0	0.75	323.16	2,399.9	-2.1	-7.8	2.0	0.34	0.33	
2,500.0	0.33	306.52	2,499.9	-1.4	-8.4	1.3	0.44	-0.42	
2,600.0	0.09	60.58	2,599.9	-1.2	-8.6	1.1	0.38	-0.24	
2,700.0	0.56	14.63	2,699.9	-0.7	-8.4	0.6	0.50	0.47	
2,800.0	0.45	357.38	2,799.9	0.2	-8.3	-0.3	0.19	-0.11	
2,900.0	0.68	0.08	2,899.9	1.2	-8.3	-1.3	0.23	0.23	
3,000.0	0.61	4.79	2,999.9	2.3	-8.2	-2.4	0.09	-0.07	
3,100.0	0.85	9.77	3,099.9	3.6	-8.1	-3.7	0.25	0.24	
3,200.0	0.87	17.55	3,199.9	5.0	-7.7	-5.1	0.12	0.02	
3,300.0	1.07	30.29	3,299.9	6.6	-7.0	-6.6	0.29	0.20	
3,400.0	1.46	37.46	3,399.8	8.4	-5.8	-8.4	0.42	0.39	
3,500.0	1.56	28.89	3,499.8	10.6	-4.3	-10.6	0.25	0.10	
3,600.0	1.36	28.35	3,599.8	12.8	-3.1	-12.8	0.20	-0.20	
3,700.0	0.46	28.81	3,699.8	14.2	-2.3	-14.2	0.90	-0.90	
3,800.0	0.08	47.12	3,799.8	14.6	-2.1	-14.6	0.38	-0.38	
3,900.0	0.19	54.41	3,899.8	14.8	-1.9	-14.8	0.11	0.11	
4,000.0	1.01	58.75	3,999.7	15.3	-1.0	-15.3	0.82	0.82	
4,100.0	1.75	42.37	4,099.7	16.9	0.8	-16.9	0.83	0.74	
4,200.0	1.93	68.96	4,199.7	18.6	3.4	-18.6	0.86	0.18	
4,300.0	3.28	64.60	4,299.6	20.5	7.5	-20.4	1.36	1.35	
4,400.0	4.09	58.31	4,399.4	23.6	13.1	-23.4	0.90	0.81	
4,500.0	4.21	52.44	4,499.1	27.7	19.1	-27.5	0.44	0.12	
4,600.0	3.39	47.79	4,598.9	31.9	24.2	-31.7	0.88	-0.82	
4,700.0	3.20	36.37	4,698.7	36.1	28.0	-35.9	0.68	-0.19	
4,800.0	2.65	21.39	4,798.6	40.5	30.5	-40.2	0.94	-0.55	
4,900.0	1.39	358.64	4,898.5	43.9	31.3	-43.6	1.47	-1.26	
5,000.0	0.52	327.77	4,998.5	45.5	31.1	-45.2	0.98	-0.87	
5,100.0	0.64	281.22	5,098.5	46.0	30.3	-45.7	0.47	0.12	
5,200.0	1.15	271.54	5,198.5	46.1	28.7	-45.9	0.53	0.51	
5,227.0	1.32	270.94	5,225.5	46.1	28.1	-45.9	0.63	0.63	
5,238.0	1.10	263.90	5,236.5	46.1	27.9	-45.9	2.41	-2.00	
5,333.0	1.40	305.00	5,331.5	46.7	26.0	-46.4	0.97	0.32	
5,426.0	4.10	345.00	5,424.3	50.6	24.3	-50.3	3.40	2.90	
5,521.0	4.40	270.80	5,519.1	53.9	19.7	-53.7	5.40	0.32	
5,618.0	10.50	229.30	5,615.3	48.2	9.3	-48.1	8.01	6.29	
5,713.0	10.90	212.80	5,708.7	35.0	-2.1	-35.0	3.24	0.42	
5,808.0	12.10	179.00	5,801.9	17.4	-6.8	-17.5	7.10	1.26	
5,902.0	11.30	168.70	5,894.0	-1.4	-4.9	1.4	2.38	-0.85	
5,996.0	10.40	178.90	5,986.3	-19.0	-2.9	18.9	2.25	-0.96	
6,091.0	11.40	178.90	6,079.6	-36.9	-2.5	36.9	1.05	1.05	
6,186.0	11.60	179.50	6,172.7	-55.9	-2.3	55.8	0.25	0.21	

Cathedral Energy Services

Survey Report

Company: Caza Operating, LLC
Project: Lea County, NM
Site: West Copperline 29 State Com
Well: West Copperline 29 State Com #3H
Wellbore: Wellbore
Design: Wellbore

Local Co-ordinate Reference: Well West Copperline 29 State Com #3H
TVD Reference: WELL @ 3560.0usft (Patriot #1)
MD Reference: WELL @ 3560.0usft (Patriot #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
6,281.0	13.00	178.40	6,265.5	-76.1	-1.9	76.1	1.49	1.47	
6,376.0	12.70	179.30	6,358.1	-97.2	-1.5	97.2	0.38	-0.32	
6,470.0	12.30	179.40	6,449.9	-117.6	-1.2	117.5	0.43	-0.43	
6,565.0	11.40	178.40	6,542.9	-137.1	-0.9	137.0	0.97	-0.95	
6,659.0	11.00	181.30	6,635.1	-155.3	-0.8	155.3	0.73	-0.43	
6,753.0	9.30	180.00	6,727.6	-171.9	-1.0	171.9	1.82	-1.81	
6,848.0	7.20	180.50	6,821.6	-185.5	-1.1	185.5	2.21	-2.21	
6,943.0	7.00	183.50	6,915.9	-197.2	-1.5	197.2	0.44	-0.21	
7,039.0	5.70	181.00	7,011.3	-207.8	-1.9	207.8	1.38	-1.35	
7,133.0	3.60	175.30	7,105.0	-215.4	-1.8	215.4	2.28	-2.23	
7,227.0	2.50	182.70	7,198.8	-220.4	-1.6	220.4	1.24	-1.17	
7,322.0	1.10	203.10	7,293.8	-223.3	-2.1	223.3	1.60	-1.47	
7,418.0	0.80	256.50	7,389.8	-224.3	-3.1	224.3	0.93	-0.31	
7,513.0	0.40	267.30	7,484.8	-224.5	-4.1	224.5	0.44	-0.42	
7,608.0	0.20	198.20	7,579.8	-224.7	-4.4	224.6	0.40	-0.21	
7,704.0	0.40	213.30	7,675.8	-225.1	-4.7	225.1	0.22	0.21	
7,799.0	0.60	225.70	7,770.8	-225.8	-5.2	225.7	0.24	0.21	
7,894.0	0.50	214.30	7,865.8	-226.4	-5.8	226.4	0.16	-0.11	
7,989.0	0.50	217.80	7,960.8	-227.1	-6.3	227.0	0.03	0.00	
8,085.0	0.40	178.70	8,056.7	-227.8	-6.5	227.7	0.33	-0.10	
8,180.0	0.50	189.00	8,151.7	-228.5	-6.6	228.5	0.13	0.11	
8,275.0	0.60	214.90	8,246.7	-229.3	-7.0	229.3	0.28	0.11	
8,370.0	0.70	207.70	8,341.7	-230.3	-7.5	230.2	0.14	0.11	
8,464.0	0.50	236.00	8,435.7	-231.0	-8.1	230.9	0.37	-0.21	
8,559.0	0.60	243.30	8,530.7	-231.5	-8.9	231.4	0.13	0.11	
8,653.0	0.60	228.30	8,624.7	-232.0	-9.7	231.9	0.17	0.00	
8,748.0	0.90	240.80	8,719.7	-232.7	-10.7	232.6	0.36	0.32	
8,860.0	1.10	224.10	8,831.7	-233.9	-12.2	233.8	0.31	0.18	
8,955.0	1.50	237.00	8,926.7	-235.2	-13.9	235.1	0.52	0.42	
9,049.0	0.50	272.60	9,020.7	-235.9	-15.4	235.7	1.20	-1.06	
9,144.0	0.90	237.50	9,115.6	-236.3	-16.4	236.1	0.60	0.42	
9,239.0	0.90	201.60	9,210.6	-237.4	-17.3	237.2	0.58	0.00	
9,333.0	1.80	216.90	9,304.6	-239.2	-18.5	239.0	1.02	0.96	
9,428.0	0.80	345.80	9,399.6	-239.8	-19.5	239.6	2.51	-1.05	
9,523.0	1.50	352.60	9,494.6	-237.9	-19.9	237.7	0.75	0.74	
9,618.0	0.70	347.20	9,589.6	-236.1	-20.1	235.9	0.85	-0.84	
9,713.0	0.90	354.00	9,684.6	-234.8	-20.3	234.6	0.23	0.21	
9,808.0	1.30	345.30	9,779.5	-233.0	-20.7	232.8	0.46	0.42	
9,902.0	1.10	344.20	9,873.5	-231.1	-21.2	230.9	0.21	-0.21	
9,997.0	1.00	321.10	9,968.5	-229.6	-22.0	229.4	0.45	-0.11	
10,091.0	0.70	324.10	10,062.5	-228.5	-22.8	228.3	0.32	-0.32	
10,186.0	0.60	343.70	10,157.5	-227.5	-23.3	227.3	0.25	-0.11	
10,281.0	0.40	359.10	10,252.5	-226.7	-23.5	226.5	0.25	-0.21	
10,390.0	0.10	237.80	10,361.5	-226.4	-23.5	226.2	0.42	-0.28	
10,484.0	0.30	200.90	10,455.5	-226.7	-23.7	226.4	0.24	0.21	
10,579.0	0.20	144.80	10,550.5	-227.0	-23.7	226.8	0.26	-0.11	
10,673.0	0.70	211.80	10,644.5	-227.7	-23.9	227.4	0.69	0.53	
10,768.0	0.70	209.60	10,739.5	-228.7	-24.5	228.4	0.03	0.00	
10,853.0	0.90	233.80	10,824.5	-229.5	-25.3	229.3	0.46	0.24	
10,943.0	4.70	172.30	10,914.3	-233.6	-25.4	233.3	4.83	4.22	
10,974.0	8.40	167.90	10,945.1	-237.1	-24.7	236.8	12.04	11.94	
11,006.0	11.90	166.10	10,976.6	-242.5	-23.4	242.3	10.98	10.94	
11,037.0	15.20	165.30	11,006.8	-249.6	-21.6	249.4	10.66	10.65	

Cathedral Energy Services

Survey Report

Company: Caza Operating, LLC
Project: Lea County, NM
Site: West Copperline 29 State Com
Well: West Copperline 29 State Com #3H
Wellbore: Wellbore
Design: Wellbore

Local Co-ordinate Reference: Well West Copperline 29 State Com #3H
TVD Reference: WELL @ 3560.0usft (Patriot #1)
MD Reference: WELL @ 3560.0usft (Patriot #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations / Comments
11,069.0	19.90	167.80	11,037.3	-259.0	-19.4	258.8	14.87	14.69	
11,100.0	22.90	169.10	11,066.1	-270.0	-17.2	269.9	9.80	9.68	
11,132.0	24.90	170.40	11,095.4	-282.8	-14.9	282.7	6.46	6.25	
11,164.0	27.80	172.60	11,124.1	-296.8	-12.8	296.7	9.56	9.06	
11,195.0	30.90	171.90	11,151.1	-311.9	-10.7	311.8	10.06	10.00	
11,227.0	34.30	173.00	11,178.0	-329.0	-8.5	328.9	10.78	10.62	
11,259.0	37.50	174.90	11,203.9	-347.6	-6.5	347.6	10.59	10.00	
11,290.0	40.00	176.60	11,228.1	-367.0	-5.1	366.9	8.76	8.06	
11,322.0	42.60	177.70	11,252.2	-388.1	-4.0	388.0	8.44	8.12	
11,385.0	48.00	177.40	11,296.5	-432.8	-2.1	432.8	8.58	8.57	
11,417.0	50.90	177.50	11,317.3	-457.1	-1.0	457.1	9.07	9.06	
11,449.0	54.40	177.70	11,336.7	-482.5	0.0	482.5	10.95	10.94	
11,480.0	57.80	177.70	11,354.0	-508.2	1.1	508.2	10.97	10.97	
11,512.0	61.30	178.70	11,370.2	-535.8	1.9	535.8	11.26	10.94	
11,543.0	64.60	179.40	11,384.3	-563.4	2.4	563.4	10.83	10.65	
11,575.0	67.90	178.40	11,397.2	-592.7	2.9	592.7	10.70	10.31	
11,606.0	70.90	178.10	11,408.1	-621.7	3.8	621.7	9.72	9.68	
11,638.0	74.50	177.90	11,417.6	-652.2	4.9	652.2	11.27	11.25	
11,647.0	75.10	177.90	11,419.9	-660.9	5.2	660.9	6.68	6.68	
11,678.0	78.80	178.40	11,426.9	-691.0	6.2	691.1	12.04	11.94	
11,710.0	80.50	179.00	11,432.7	-722.5	6.9	722.5	5.62	5.31	
11,741.0	81.50	178.80	11,437.5	-753.1	7.5	753.1	3.29	3.23	
11,772.0	82.50	178.80	11,441.8	-783.8	8.1	783.8	3.23	3.23	
11,803.0	83.80	178.80	11,445.5	-814.6	8.8	814.6	4.19	4.19	
11,835.0	86.20	178.10	11,448.3	-846.5	9.6	846.5	7.80	7.49	
11,898.0	90.40	177.10	11,450.2	-909.4	12.3	909.4	6.85	6.67	
11,993.0	91.20	177.10	11,448.9	-1,004.2	17.1	1,004.3	0.84	0.84	
12,086.0	90.20	178.10	11,447.7	-1,097.1	21.0	1,097.3	1.52	-1.08	
12,182.0	89.50	177.60	11,448.0	-1,193.1	24.6	1,193.2	0.90	-0.73	
12,276.0	89.30	178.10	11,449.0	-1,287.0	28.1	1,287.2	0.57	-0.21	
12,371.0	91.10	179.30	11,448.6	-1,382.0	30.3	1,382.2	2.28	1.89	
12,466.0	91.70	179.20	11,446.3	-1,476.9	31.5	1,477.2	0.64	0.63	
12,560.0	91.40	179.40	11,443.8	-1,570.9	32.7	1,571.1	0.38	-0.32	
12,654.0	89.40	179.00	11,443.1	-1,664.9	34.0	1,665.1	2.17	-2.13	
12,748.0	90.20	179.10	11,443.4	-1,758.9	35.5	1,759.1	0.86	0.85	
12,843.0	91.60	179.10	11,442.0	-1,853.8	37.0	1,854.1	1.47	1.47	
12,931.0	89.70	179.80	11,441.0	-1,941.8	37.9	1,942.1	2.30	-2.16	
13,026.0	90.10	179.70	11,441.1	-2,036.8	38.3	2,037.1	0.43	0.42	
13,121.0	89.40	178.90	11,441.5	-2,131.8	39.4	2,132.1	1.12	-0.74	
13,215.0	89.50	177.90	11,442.4	-2,225.8	42.1	2,226.1	1.07	0.11	
13,311.0	90.30	179.10	11,442.6	-2,321.7	44.6	2,322.0	1.50	0.83	
13,406.0	91.00	178.90	11,441.5	-2,416.7	46.2	2,417.0	0.77	0.74	
13,501.0	91.40	179.10	11,439.5	-2,511.7	47.9	2,512.0	0.47	0.42	
13,596.0	91.30	179.70	11,437.3	-2,606.6	48.9	2,607.0	0.64	-0.11	
13,691.0	91.30	181.20	11,435.1	-2,701.6	48.1	2,701.9	1.58	0.00	
13,787.0	91.90	181.50	11,432.5	-2,797.5	45.9	2,797.9	0.70	0.62	
13,882.0	90.50	182.00	11,430.5	-2,892.5	43.0	2,892.8	1.56	-1.47	
13,977.0	90.90	182.00	11,429.3	-2,987.4	39.7	2,987.7	0.42	0.42	
14,072.0	91.30	181.80	11,427.5	-3,082.3	36.5	3,082.6	0.47	0.42	
14,167.0	91.60	182.00	11,425.1	-3,177.3	33.4	3,177.4	0.38	0.32	
14,262.0	91.70	181.80	11,422.3	-3,272.2	30.2	3,272.3	0.24	0.11	
14,357.0	91.80	181.40	11,419.4	-3,367.1	27.6	3,367.2	0.43	0.11	
14,452.0	90.20	181.40	11,417.8	-3,462.0	25.2	3,462.1	1.68	-1.68	

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Design: Wellbore

Local Co-ordinate Reference: Well West Copperline 29 State Com #3H
TVD Reference: WELL @ 3560.0usft (Patriot #1)
MD Reference: WELL @ 3560.0usft (Patriot #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
14,548.0	90.20	180.70	11,417.5	-3,558.0	23.5	3,558.1	0.73	0.00	
14,643.0	90.20	180.40	11,417.1	-3,653.0	22.6	3,653.1	0.32	0.00	
14,738.0	90.60	180.00	11,416.5	-3,748.0	22.2	3,748.1	0.60	0.42	
14,833.0	90.90	179.70	11,415.2	-3,843.0	22.5	3,843.1	0.45	0.32	
14,929.0	91.30	179.00	11,413.4	-3,939.0	23.6	3,939.0	0.84	0.42	
15,024.0	91.60	179.00	11,411.0	-4,033.9	25.2	4,034.0	0.32	0.32	
15,119.0	92.10	178.90	11,407.9	-4,128.9	27.0	4,128.9	0.54	0.53	
15,211.0	90.60	178.90	11,405.7	-4,220.8	28.7	4,220.9	1.63	-1.63	
15,306.0	91.30	179.00	11,404.2	-4,315.8	30.5	4,315.9	0.74	0.74	
15,401.0	91.50	178.90	11,401.8	-4,410.8	32.2	4,410.9	0.24	0.21	
15,496.0	92.40	178.60	11,398.6	-4,505.7	34.3	4,505.8	1.00	0.95	
15,591.0	92.30	177.90	11,394.7	-4,600.6	37.2	4,600.7	0.74	-0.11	
15,686.0	92.50	177.50	11,390.7	-4,695.4	41.0	4,695.6	0.47	0.21	
15,750.0	93.00	177.30	11,387.7	-4,759.3	43.9	4,759.5	0.84	0.78	Last CES Survey @ 15750' MD
15,804.0	93.00	177.30	11,384.8	-4,813.1	46.4	4,813.3	0.00	0.00	Bit Projection @ 15804' MD

Targets

Target Name

hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Shape									
PBHL W.CL. 29 St. Corr	0.00	0.00	11,445.0	-4,797.8	44.2	462,641.80	759,518.10	32° 16' 8.862 N	103° 29' 37.375 W
- actual wellpath misses target center by 59.3usft at 15785.5usft MD (11385.8 TVD, -4794.6 N, 45.6 E)									
- Point									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates	Comment
+N/-S (usft)	+E/-W (usft)		
15,750.0	11,387.7	-4,759.3	43.9 Last CES Survey @ 15750' MD
15,804.0	11,384.8	-4,813.1	46.4 Bit Projection @ 15804' MD

Checked By: _____ Approved By: _____ Date: _____

HOBBS OCD

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Caza Operating, LLC

Lea County, NM

West Copperline 29 State Com

West Copperline 29 State Com #3H

Wellbore

Wellbore

Anticollision Report

08 February, 2014

Cathedral Energy Services

Anticollision Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well West Copperline 29 State Com #3H
Project:	Lea County, NM	TVD Reference:	WELL @ 3560.0usft (Patriot #1)
Reference Site:	West Copperline 29 State Com	MD Reference:	WELL @ 3560.0usft (Patriot #1)
Site Error:	0.0usft	North Reference:	Grid
Reference Well:	West Copperline 29 State Com #3H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Wellbore	Offset TVD Reference:	Offset Datum

Reference	Wellbore		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 751.8usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Program	Date 2/8/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	5,227.0	Gyro (Wellbore)	Gyro	Gyro
5,238.0	15,804.0	Survey #3 (Wellbore)	ISCWSA MWD	MWD - ISCWSA

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
West Copperline 29 State Com						
West Copperline 29 State Com #1H - Curve & Lateral - F	10,384.4	10,375.3	72.5	51.1	3.387	CC, ES
West Copperline 29 State Com #1H - Curve & Lateral - F	10,400.0	10,389.0	72.9	51.4	3.387	SF
West Copperline 29 State Com #1H - Pilot Hole - Pilot H	6,493.3	6,476.3	72.6	60.9	6.221	CC, ES
West Copperline 29 State Com #1H - Pilot Hole - Pilot H	11,000.0	10,977.3	98.4	73.7	3.978	SF

Cathedral Energy Services

Anticollision Report

Company: Caza Operating, LLC
Project: Lea County, NM
Reference Site: West Copperline 29 State Com
Site Error: 0.0usft
Reference Well: West Copperline 29 State Com #3H
Well Error: 0.0usft
Reference Wellbore: Wellbore
Reference Design: Wellbore

Local Co-ordinate Reference: Well West Copperline 29 State Com #3H
TVD Reference: WELL @ 3560.0usft (Patriot #1)
MD Reference: WELL @ 3560.0usft (Patriot #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design West Copperline 29 State Com - West Copperline 29 State Com #1H - Curve & Lateral - Final													Offset Site Error:
Survey Program: 100-Gyro, 10048-ISCWSA MWD													Offset Well Error:
Reference	Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis	Factor	
0.0	0.0	0.0	0.0	0.0	0.0	179.46	-179.9	1.7	179.9				
100.0	100.0	98.6	98.6	0.1	0.1	69.25	-180.5	1.7	180.5	180.3	0.14	1,316.815	
200.0	200.0	198.2	198.2	0.2	0.2	64.75	-182.0	2.0	181.8	181.4	0.31	584.413	
300.0	300.0	298.3	298.3	0.2	0.2	14.48	-183.5	2.3	182.8	182.3	0.49	376.397	
400.0	400.0	398.4	398.3	0.3	0.3	10.22	-184.9	2.4	183.5	182.8	0.66	277.924	
500.0	500.0	499.1	499.1	0.4	0.4	6.30	-186.2	2.7	184.3	183.5	0.84	220.579	
600.0	600.0	598.9	598.9	0.5	0.5	64.89	-187.3	3.1	185.1	184.1	1.01	183.277	
700.0	700.0	698.9	698.9	0.6	0.6	-28.47	-188.4	3.4	185.6	184.5	1.18	156.725	
800.0	800.0	798.9	798.8	0.7	0.7	-55.11	-189.6	3.9	186.2	184.8	1.36	136.979	
900.0	900.0	898.9	898.8	0.8	0.8	-71.99	-190.8	4.4	186.9	185.4	1.53	121.880	
1,000.0	1,000.0	998.6	998.5	0.9	0.9	-71.32	-192.0	4.9	187.9	186.2	1.71	110.018	
1,100.0	1,100.0	1,098.4	1,098.3	0.9	0.9	-77.81	-193.4	5.3	189.1	187.2	1.88	100.453	
1,200.0	1,200.0	1,198.4	1,198.3	1.0	1.0	-112.67	-194.7	5.6	190.6	188.5	2.06	92.638	
1,300.0	1,300.0	1,298.9	1,298.8	1.1	1.1	-100.46	-196.0	5.7	192.1	189.9	2.23	86.063	
1,400.0	1,400.0	1,399.2	1,399.0	1.2	1.2	-22.75	-197.1	5.3	193.2	190.8	2.41	80.271	
1,500.0	1,500.0	1,499.3	1,499.1	1.3	1.3	80.65	-198.1	4.7	194.1	191.5	2.58	75.184	
1,600.0	1,600.0	1,599.2	1,599.1	1.4	1.4	104.39	-199.1	4.0	195.1	192.3	2.76	70.791	
1,700.0	1,700.0	1,699.1	1,699.0	1.5	1.5	120.75	-200.1	3.2	196.4	193.5	2.93	67.029	
1,800.0	1,800.0	1,799.2	1,799.1	1.6	1.6	-161.64	-201.1	2.1	198.2	195.1	3.10	63.847	
1,900.0	1,899.9	1,899.0	1,898.8	1.6	1.7	-94.56	-202.1	0.6	199.9	196.6	3.28	60.955	
2,000.0	1,999.9	1,999.6	1,999.4	1.7	1.7	-75.11	-203.1	-1.0	200.7	197.2	3.45	58.079	
2,100.0	2,099.9	2,100.2	2,100.0	1.8	1.8	-72.54	-203.7	-3.0	201.0	197.3	3.63	55.356	
2,200.0	2,199.9	2,201.5	2,201.3	1.9	1.9	-69.42	-203.9	-5.0	200.9	197.1	3.81	52.777	
2,300.0	2,299.9	2,303.3	2,303.1	2.0	2.0	-133.24	-203.3	-7.2	200.4	196.4	3.98	50.313	
2,400.0	2,399.9	2,404.4	2,404.1	2.1	2.1	-142.71	-201.9	-9.3	199.9	195.7	4.16	48.043	
2,500.0	2,499.9	2,506.0	2,505.7	2.2	2.2	-125.64	-199.8	-11.5	198.5	194.2	4.34	45.783	
2,600.0	2,599.9	2,607.6	2,607.2	2.3	2.3	120.82	-197.0	-13.3	195.9	191.4	4.51	43.417	
2,700.0	2,699.9	2,708.9	2,708.4	2.3	2.4	167.27	-193.3	-14.7	192.9	188.2	4.69	41.139	
2,800.0	2,799.9	2,809.8	2,809.2	2.4	2.4	-175.16	-189.1	-15.6	189.6	184.7	4.86	38.975	
2,900.0	2,899.9	2,909.5	2,908.9	2.5	2.5	-177.69	-184.7	-16.0	186.2	181.2	5.04	36.959	
3,000.0	2,999.9	3,009.2	3,008.4	2.6	2.6	177.70	-180.5	-16.2	183.2	178.0	5.21	35.135	
3,100.0	3,099.9	3,108.8	3,108.0	2.7	2.7	172.70	-176.5	-15.8	180.4	175.0	5.39	33.491	
3,200.0	3,199.9	3,208.9	3,208.0	2.8	2.8	164.80	-172.6	-15.0	177.9	172.3	5.56	31.989	
3,300.0	3,299.9	3,308.7	3,307.8	2.9	2.9	152.02	-168.6	-14.0	175.5	169.7	5.73	30.601	
3,400.0	3,399.8	3,409.2	3,408.1	3.0	3.0	144.75	-164.6	-12.4	173.3	167.4	5.91	29.325	
3,500.0	3,499.8	3,509.3	3,508.1	3.0	3.1	153.12	-160.4	-10.3	171.3	165.2	6.08	28.159	
3,600.0	3,599.8	3,609.5	3,608.2	3.1	3.1	153.35	-156.2	-8.1	169.2	163.0	6.26	27.046	
3,700.0	3,699.8	3,709.7	3,708.3	3.2	3.2	152.32	-151.7	-5.6	166.1	159.7	6.43	25.837	
3,800.0	3,799.8	3,809.6	3,808.0	3.3	3.3	133.23	-147.2	-3.1	162.0	155.4	6.60	24.526	
3,900.0	3,899.8	3,908.0	3,906.3	3.4	3.4	125.13	-143.2	-0.6	158.1	151.3	6.78	23.329	
4,000.0	3,999.7	4,005.9	4,004.1	3.5	3.5	120.22	-140.4	1.8	155.8	148.9	6.95	22.419	
4,050.9	4,050.6	4,055.8	4,054.0	3.5	3.5	130.53	-139.5	3.2	155.5	148.5	7.04	22.092	
4,100.0	4,099.7	4,104.0	4,102.2	3.6	3.6	136.13	-138.8	4.8	155.8	148.7	7.12	21.870	
4,200.0	4,199.7	4,202.5	4,200.6	3.7	3.7	109.03	-138.3	8.8	157.0	149.7	7.30	21.512	
4,300.0	4,299.6	4,301.1	4,299.1	3.7	3.8	113.18	-138.6	13.5	159.2	151.7	7.47	21.297	
4,400.0	4,399.4	4,400.0	4,397.9	3.8	3.8	119.82	-139.8	18.1	163.4	155.8	7.65	21.360	
4,500.0	4,499.1	4,500.3	4,498.1	3.9	3.9	126.27	-141.2	22.5	168.9	161.0	7.83	21.568	
4,600.0	4,598.9	4,602.1	4,599.8	4.0	4.0	131.18	-141.7	27.1	173.6	165.6	8.01	21.678	
4,700.0	4,698.7	4,704.5	4,702.0	4.1	4.1	142.25	-141.0	32.2	177.2	169.0	8.19	21.626	
4,800.0	4,798.6	4,805.6	4,802.9	4.2	4.2	156.33	-139.2	37.6	179.9	171.5	8.37	21.484	
4,900.0	4,898.5	4,905.4	4,902.6	4.3	4.3	177.71	-137.1	42.9	181.4	172.8	8.55	21.215	
5,000.0	4,998.5	5,005.1	5,002.2	4.4	4.4	-152.91	-135.2	47.3	181.4	172.7	8.73	20.783	

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

Cathedral Energy Services

Anticollision Report

Company: Caza Operating, LLC
Project: Lea County, NM
Reference Site: West Copperline 29 State Com
Site Error: 0.0usft
Reference Well: West Copperline 29 State Com #3H
Well Error: 0.0usft
Reference Wellbore: Wellbore
Reference Design: Wellbore

Local Co-ordinate Reference: Well West Copperline 29 State Com #3H
TVD Reference: WELL @ 3560.0usft (Patriot #1)
MD Reference: WELL @ 3560.0usft (Patriot #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design West Copperline 29 State Com - West Copperline 29 State Com #1H - Curve & Lateral - Final											Offset Site Error: 0.0 usft		
Survey Program: 100-Gyro 10048-ISCWSA MWD											Offset Well Error: 0.0 usft		
Reference		Offset		Semi Major Axis			Distance					Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis		Separation Factor
5,100.0	5,098.5	5,104.5	5,101.5	4.5	4.5	-107.86	-133.5	51.2	180.7	171.8	8.91	20.286	
5,200.0	5,198.5	5,203.8	5,200.8	4.5	4.6	-99.66	-132.2	54.1	180.1	171.0	9.08	19.832	
5,261.3	5,259.8	5,264.7	5,261.7	4.6	4.6	-114.11	-131.6	55.5	180.1	170.9	9.18	19.629	
5,300.0	5,298.5	5,303.2	5,300.2	4.6	4.7	-122.64	-131.3	56.3	180.1	170.9	9.23	19.507	
5,400.0	5,398.4	5,403.3	5,400.2	4.6	4.7	-171.15	-130.5	58.3	182.6	173.1	9.51	19.201	
5,500.0	5,498.2	5,502.8	5,499.7	4.6	4.8	-116.16	-129.8	60.3	187.6	178.1	9.51	19.731	
5,600.0	5,597.6	5,601.9	5,598.7	4.6	4.9	-68.74	-129.1	62.4	186.3	176.7	9.56	19.490	
5,700.0	5,695.9	5,699.6	5,696.4	4.7	5.0	-56.79	-128.7	64.1	177.9	168.2	9.73	18.292	
5,800.0	5,794.1	5,797.6	5,794.5	4.8	5.1	-28.11	-128.4	65.6	164.3	154.3	9.94	16.523	
5,900.0	5,892.0	5,896.2	5,893.0	4.9	5.2	-18.77	-127.9	66.8	145.7	135.6	10.12	14.405	
6,000.0	5,990.2	5,994.5	5,991.3	5.0	5.3	-32.62	-127.3	67.8	128.7	118.4	10.28	12.519	
6,100.0	6,088.4	6,092.5	6,089.3	5.2	5.4	-38.46	-126.7	68.6	113.1	102.6	10.51	10.768	
6,200.0	6,186.4	6,190.4	6,187.2	5.3	5.4	-46.72	-126.0	69.5	98.4	87.6	10.76	9.139	
6,300.0	6,284.0	6,288.1	6,284.9	5.6	5.5	-57.24	-125.3	70.2	84.9	73.8	11.07	7.663	
6,400.0	6,381.5	6,385.4	6,382.2	5.8	5.6	-72.62	-124.6	70.7	75.5	64.1	11.39	6.624	
6,493.3	6,472.6	6,476.3	6,473.1	6.0	5.7	-87.90	-123.9	71.4	72.6	60.9	11.67	6.221	
6,500.0	6,479.2	6,482.8	6,479.6	6.0	5.7	-89.08	-123.8	71.5	72.6	61.0	11.69	6.217	
6,600.0	6,577.2	6,580.6	6,577.3	6.3	5.8	-105.11	-122.9	72.3	76.0	64.0	11.99	6.339	
6,700.0	6,675.4	6,678.8	6,675.6	6.6	5.9	-119.20	-122.0	73.0	84.5	72.2	12.32	6.861	
6,800.0	6,774.0	6,777.4	6,774.2	6.8	6.0	-127.58	-121.3	73.6	94.3	81.9	12.44	7.582	
6,900.0	6,873.2	6,876.9	6,873.7	7.0	6.0	-135.19	-120.9	74.2	103.6	91.0	12.60	8.223	
7,000.0	6,972.5	6,976.7	6,973.4	7.3	6.1	-139.49	-120.7	74.3	112.7	100.0	12.74	8.847	
7,100.0	7,072.0	7,076.5	7,073.3	7.5	6.2	-138.53	-120.5	74.0	119.8	106.9	12.81	9.349	
7,200.0	7,171.9	7,176.5	7,173.2	7.6	6.3	-142.72	-120.4	73.5	124.0	111.0	13.01	9.535	
7,300.0	7,271.8	7,276.9	7,273.7	7.8	6.4	-158.69	-120.5	72.8	126.7	113.5	13.22	9.588	
7,400.0	7,371.8	7,377.8	7,374.6	7.9	6.5	151.44	-121.1	71.7	127.3	113.9	13.44	9.477	
7,500.0	7,471.8	7,478.1	7,474.8	8.1	6.6	130.94	-121.6	69.8	126.6	113.0	13.65	9.273	
7,600.0	7,571.8	7,577.6	7,574.3	8.2	6.6	-172.16	-122.1	67.9	125.6	111.7	13.87	9.053	
7,700.0	7,671.8	7,677.3	7,674.0	8.3	6.7	-178.25	-122.4	66.5	125.0	110.9	14.09	8.870	
7,800.0	7,771.8	7,777.4	7,774.1	8.5	6.8	168.67	-122.7	65.2	124.8	110.5	14.31	8.720	
7,900.0	7,871.8	7,877.4	7,874.1	8.6	6.9	179.52	-123.2	63.9	124.6	110.1	14.54	8.571	
8,000.0	7,971.8	7,977.3	7,974.0	8.7	7.0	179.35	-123.6	62.7	124.5	109.7	14.78	8.423	
8,100.0	8,071.7	8,077.4	8,074.0	8.9	7.1	-147.43	-124.0	61.5	124.2	109.2	15.01	8.271	
8,200.0	8,171.7	8,177.8	8,174.4	9.0	7.2	-162.34	-124.8	60.5	123.7	108.5	15.25	8.111	
8,300.0	8,271.7	8,277.6	8,274.3	9.2	7.2	-179.97	-125.9	59.8	123.4	107.9	15.50	7.958	
8,400.0	8,371.7	8,377.6	8,374.3	9.3	7.3	178.16	-127.0	59.2	123.3	107.5	15.75	7.828	
8,500.0	8,471.7	8,477.7	8,474.3	9.5	7.4	153.87	-128.0	58.5	122.9	106.9	16.00	7.680	
8,600.0	8,571.7	8,577.9	8,574.5	9.6	7.5	156.43	-129.2	57.8	122.4	106.2	16.26	7.530	
8,700.0	8,671.7	8,677.8	8,674.4	9.8	7.6	157.58	-130.4	56.9	122.1	105.5	16.52	7.389	
8,800.0	8,771.7	8,778.6	8,775.2	10.0	7.7	161.38	-131.7	56.0	121.9	105.1	16.78	7.262	
8,891.2	8,862.9	8,869.8	8,866.4	10.1	7.7	163.08	-133.1	54.7	121.6	104.6	17.02	7.146	
8,900.0	8,871.7	8,878.6	8,875.1	10.1	7.8	163.16	-133.3	54.6	121.6	104.6	17.04	7.136	
9,000.0	8,971.7	8,978.8	8,975.4	10.3	7.8	148.87	-134.9	53.2	121.6	104.3	17.30	7.031	
9,100.0	9,071.7	9,079.1	9,075.6	10.5	7.9	145.17	-136.3	51.0	120.1	102.6	17.56	6.843	
9,200.0	9,171.6	9,178.6	9,175.1	10.6	8.0	177.13	-137.3	48.5	119.2	101.4	17.81	6.690	
9,243.0	9,214.7	9,221.3	9,217.8	10.7	8.0	178.31	-137.7	47.5	119.1	101.2	17.92	6.644	
9,300.0	9,271.6	9,277.8	9,274.2	10.8	8.1	178.91	-137.9	46.3	119.3	101.2	18.07	6.602	
9,400.0	9,371.6	9,377.1	9,373.6	11.0	8.2	106.83	-137.8	44.1	120.3	102.0	18.31	6.570	
9,500.0	9,471.6	9,476.6	9,473.0	11.1	8.3	39.63	-137.0	41.7	118.6	100.1	18.56	6.393	
9,600.0	9,571.6	9,576.1	9,572.4	11.3	8.4	41.27	-135.4	38.8	116.9	98.1	18.81	6.212	
9,700.0	9,671.6	9,676.2	9,672.5	11.5	8.4	35.79	-133.6	36.0	115.9	96.9	19.06	6.083	
9,800.0	9,771.5	9,777.5	9,773.7	11.6	8.5	42.06	-132.3	32.7	114.1	94.8	19.32	5.908	

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

Cathedral Energy Services

Anticollision Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well West Copperline 29 State Com #3H
Project:	Lea County, NM	TVD Reference:	WELL @ 3560.0usft (Patriot #1)
Reference Site:	West Copperline 29 State Com	MD Reference:	WELL @ 3560.0usft (Patriot #1)
Site Error:	0.0usft	North Reference:	Grid
Reference Well:	West Copperline 29 State Com #3H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Wellbore	Offset TVD Reference:	Offset Datum

Offset Design West Copperline 29 State Com - West Copperline 29 State Com #1H - Curve & Lateral - Final													Offset Site Error:	0.0 usft
Survey Program: 100-Gyro, 10048-ISCWSA MWD													Offset Well Error:	0.0 usft
Reference	Offset	Semi Major Axis		Distance		Total		Separation		Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis	Factor		
9,900.0	9,871.5	9,877.8	9,874.0	11.8	8.6	42.52	-131.9	29.0	111.3	91.7	19.57	5.684		
10,000.0	9,971.5	9,978.3	9,974.4	11.9	8.7	64.59	-131.6	25.2	108.7	88.9	19.84	5.482		
10,100.0	10,071.5	10,080.1	10,076.2	12.1	8.7	60.25	-132.9	23.5	106.2	86.2	20.04	5.301		
10,200.0	10,171.5	10,189.2	10,184.2	12.3	8.7	47.72	-145.8	29.5	98.0	77.7	20.30	4.825		
10,300.0	10,271.5	10,296.3	10,286.7	12.4	8.8	53.81	-175.2	38.3	81.6	60.9	20.75	3.933		
10,384.4	10,355.9	10,375.3	10,367.0	12.6	8.9	178.12	-209.7	47.0	72.5	51.1	21.41	3.387 CC, ES		
10,400.0	10,371.5	10,389.0	10,388.6	12.6	8.9	-145.77	-217.0	48.7	72.9	51.4	21.54	3.387 SF		
10,500.0	10,471.5	10,466.6	10,429.9	12.8	9.1	-79.76	-263.9	55.7	97.5	75.6	21.91	4.450		
10,600.0	10,571.5	10,526.4	10,471.1	13.0	9.4	-44.67	-306.9	60.0	153.8	131.8	21.92	7.015		
10,700.0	10,671.5	10,572.0	10,498.9	13.2	9.6	-67.15	-343.0	61.8	225.2	203.3	21.95	10.259		
10,800.0	10,771.5	10,604.0	10,516.4	13.4	9.8	-70.88	-369.8	62.7	305.0	282.9	22.11	13.799		
10,900.0	10,871.4	10,636.0	10,531.6	13.6	10.1	-26.28	-397.9	63.2	389.8	367.5	22.28	17.498		
11,000.0	10,970.8	10,667.0	10,544.2	13.8	10.3	-8.35	-426.2	63.4	473.9	451.5	22.47	21.095		
11,100.0	11,066.1	10,686.9	10,551.0	14.1	10.5	-7.04	-444.9	63.4	550.8	528.3	22.50	24.482		
11,200.0	11,155.3	10,714.3	10,558.9	14.6	10.8	-6.49	-471.2	63.4	622.1	599.5	22.50	27.642		
11,300.0	11,235.7	10,744.2	10,565.4	15.2	11.1	-6.44	-500.4	62.8	686.6	664.2	22.35	30.713		
11,400.0	11,306.4	10,778.7	10,570.4	16.0	11.5	-5.38	-534.3	60.8	745.1	722.9	22.17	33.611		

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

Cathedral Energy Services

Anticollision Report

Company: Caza Operating, LLC
Project: Lea County, NM
Reference Site: West Copperline 29 State Com
Site Error: 0.0usft
Reference Well: West Copperline 29 State Com #3H
Well Error: 0.0usft
Reference Wellbore: Wellbore
Reference Design: Wellbore

Local Co-ordinate Reference: Well West Copperline 29 State Com #3H
TVD Reference: WELL @ 3560.0usft (Patriot #1)
MD Reference: WELL @ 3560.0usft (Patriot #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design		West Copperline 29 State Com - West Copperline 29 State Com #1H - Pilot Hole - Pilot Hole										Offset Site Error:		0.0 usft		
Survey Program:		100-Gyro												Offset Well Error:		0.0 usft
Reference		Offset		Semi Major Axis		Distance										Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor				
0.0	0.0	0.0	0.0	0.0	0.0	179.46	-179.9	1.7	179.9							
100.0	100.0	98.6	98.6	0.1	0.1	69.25	-180.5	1.7	180.5	180.3	0.14	1,316.815				
200.0	200.0	198.2	198.2	0.2	0.2	64.75	-182.0	2.0	181.8	181.4	0.31	584.413				
300.0	300.0	298.3	298.3	0.2	0.2	14.48	-183.5	2.3	182.8	182.3	0.49	376.397				
400.0	400.0	398.4	398.3	0.3	0.3	10.22	-184.9	2.4	183.5	182.8	0.66	277.924				
500.0	500.0	499.1	499.1	0.4	0.4	6.30	-186.2	2.7	184.3	183.5	0.84	220.579				
600.0	600.0	598.9	598.9	0.5	0.5	64.89	-187.3	3.1	185.1	184.1	1.01	183.277				
700.0	700.0	698.9	698.9	0.6	0.6	-28.47	-188.4	3.4	185.6	184.5	1.18	156.725				
800.0	800.0	798.9	798.8	0.7	0.7	-55.11	-189.6	3.9	186.2	184.8	1.36	136.979				
900.0	900.0	898.9	898.8	0.8	0.8	-71.99	-190.8	4.4	186.9	185.4	1.53	121.880				
1,000.0	1,000.0	998.6	998.5	0.9	0.9	-71.32	-192.0	4.9	187.9	186.2	1.71	110.018				
1,100.0	1,100.0	1,098.4	1,098.3	0.9	0.9	-77.81	-193.4	5.3	189.1	187.2	1.88	100.453				
1,200.0	1,200.0	1,198.4	1,198.3	1.0	1.0	-112.67	-194.7	5.6	190.6	188.5	2.06	92.638				
1,300.0	1,300.0	1,298.9	1,298.8	1.1	1.1	-100.46	-196.0	5.7	192.1	189.9	2.23	86.063				
1,400.0	1,400.0	1,399.2	1,399.0	1.2	1.2	-22.75	-197.1	5.3	193.2	190.8	2.41	80.271				
1,500.0	1,500.0	1,499.3	1,499.1	1.3	1.3	80.65	-198.1	4.7	194.1	191.5	2.58	75.184				
1,600.0	1,600.0	1,599.2	1,599.1	1.4	1.4	104.39	-199.1	4.0	195.1	192.3	2.76	70.791				
1,700.0	1,700.0	1,699.1	1,699.0	1.5	1.5	120.75	-200.1	3.2	196.4	193.5	2.93	67.029				
1,800.0	1,800.0	1,799.2	1,799.1	1.6	1.6	-161.64	-201.1	2.1	198.2	195.1	3.10	63.847				
1,900.0	1,899.9	1,899.0	1,898.8	1.6	1.7	-94.56	-202.1	0.6	199.9	196.6	3.28	60.955				
2,000.0	1,999.9	1,999.6	1,999.4	1.7	1.7	-75.11	-203.1	-1.0	200.7	197.2	3.45	58.079				
2,100.0	2,099.9	2,100.2	2,100.0	1.8	1.8	-72.54	-203.7	-3.0	201.0	197.3	3.63	55.356				
2,200.0	2,199.9	2,201.5	2,201.3	1.9	1.9	-69.42	-203.9	-5.0	200.9	197.1	3.81	52.777				
2,300.0	2,299.9	2,303.3	2,303.1	2.0	2.0	-133.24	-203.3	-7.2	200.4	196.4	3.98	50.313				
2,400.0	2,399.9	2,404.4	2,404.1	2.1	2.1	-142.71	-201.9	-9.3	199.9	195.7	4.16	48.043				
2,500.0	2,499.9	2,506.0	2,505.7	2.2	2.2	-125.64	-199.8	-11.5	198.5	194.2	4.34	45.783				
2,600.0	2,599.9	2,607.6	2,607.2	2.3	2.3	120.82	-197.0	-13.3	195.9	191.4	4.51	43.417				
2,700.0	2,699.9	2,708.9	2,708.4	2.3	2.4	167.27	-193.3	-14.7	192.9	188.2	4.69	41.139				
2,800.0	2,799.9	2,809.8	2,809.2	2.4	2.4	-175.16	-189.1	-15.6	189.6	184.7	4.86	38.975				
2,900.0	2,899.9	2,909.5	2,908.9	2.5	2.5	-177.69	-184.7	-16.0	186.2	181.2	5.04	36.959				
3,000.0	2,999.9	3,009.2	3,008.4	2.6	2.6	177.70	-180.5	-16.2	183.2	178.0	5.21	35.135				
3,100.0	3,099.9	3,108.8	3,108.0	2.7	2.7	172.70	-176.5	-15.8	180.4	175.0	5.39	33.491				
3,200.0	3,199.9	3,208.9	3,208.0	2.8	2.8	164.80	-172.6	-15.0	177.9	172.3	5.56	31.989				
3,300.0	3,299.9	3,308.7	3,307.8	2.9	2.9	152.02	-168.6	-14.0	175.5	169.7	5.73	30.601				
3,400.0	3,399.8	3,409.2	3,408.1	3.0	3.0	144.75	-164.6	-12.4	173.3	167.4	5.91	29.325				
3,500.0	3,499.8	3,509.3	3,508.1	3.0	3.1	153.12	-160.4	-10.3	171.3	165.2	6.08	28.159				
3,600.0	3,599.8	3,609.5	3,608.2	3.1	3.1	153.35	-156.2	-8.1	169.2	163.0	6.26	27.046				
3,700.0	3,699.8	3,709.7	3,708.3	3.2	3.2	152.32	-151.7	-5.6	166.1	159.7	6.43	25.837				
3,800.0	3,799.8	3,809.6	3,808.0	3.3	3.3	133.23	-147.2	-3.1	162.0	155.4	6.60	24.526				
3,900.0	3,899.8	3,908.0	3,906.3	3.4	3.4	125.13	-143.2	-0.6	158.1	151.3	6.78	23.329				
4,000.0	3,999.7	4,005.9	4,004.1	3.5	3.5	120.22	-140.4	1.8	155.8	148.9	6.95	22.419				
4,050.9	4,050.6	4,055.8	4,054.0	3.5	3.5	130.53	-139.5	3.2	155.5	148.5	7.04	22.092				
4,100.0	4,099.7	4,104.0	4,102.2	3.6	3.6	136.13	-138.8	4.8	155.8	148.7	7.12	21.870				
4,200.0	4,199.7	4,202.5	4,200.6	3.7	3.7	109.03	-138.3	8.8	157.0	149.7	7.30	21.512				
4,300.0	4,299.6	4,301.1	4,299.1	3.7	3.8	113.18	-138.6	13.5	159.2	151.7	7.47	21.297				
4,400.0	4,399.4	4,400.0	4,397.9	3.8	3.8	119.82	-139.8	18.1	163.4	155.8	7.65	21.360				
4,500.0	4,499.1	4,500.3	4,498.1	3.9	3.9	126.27	-141.2	22.5	168.9	161.0	7.83	21.568				
4,600.0	4,598.9	4,602.1	4,599.8	4.0	4.0	131.18	-141.7	27.1	173.6	165.6	8.01	21.678				
4,700.0	4,698.7	4,704.5	4,702.0	4.1	4.1	142.25	-141.0	32.2	177.2	169.0	8.19	21.626				
4,800.0	4,798.6	4,805.6	4,802.9	4.2	4.2	156.33	-139.2	37.6	179.9	171.5	8.37	21.484				
4,900.0	4,898.5	4,905.4	4,902.6	4.3	4.3	177.71	-137.1	42.9	181.4	172.8	8.55	21.215				
5,000.0	4,998.5	5,005.1	5,002.2	4.4	4.4	-152.91	-135.2	47.3	181.4	172.7	8.73	20.783				

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

Cathedral Energy Services

Anticollision Report

Company: Caza Operating, LLC
Project: Lea County, NM
Reference Site: West Copperline 29 State Com
Site Error: 0.0usft
Reference Well: West Copperline 29 State Com #3H
Well Error: 0.0usft
Reference Wellbore: Wellbore
Reference Design: Wellbore

Local Co-ordinate Reference: Well West Copperline 29 State Com #3H
TVD Reference: WELL @ 3560.0usft (Patriot #1)
MD Reference: WELL @ 3560.0usft (Patriot #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

West Copperline 29 State Com - West Copperline 29 State Com #1H - Pilot Hole - Pilot Hole														Offset Site Error:	0.0 usft
Survey Program: 100-Gyro														Offset Well Error:	0.0 usft
Reference	Offset	Semi Major Axis		Distance		Total		Separation		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis	Factor			
5,100.0	5,098.5	5,104.5	5,101.5	4.5	4.5	-107.86	-133.5	51.2	180.7	171.8	8.91	20.286			
5,200.0	5,198.5	5,203.8	5,200.8	4.5	4.6	-99.66	-132.2	54.1	180.1	171.0	9.08	19.832			
5,261.3	5,259.8	5,264.7	5,261.7	4.6	4.6	-114.11	-131.6	55.5	180.1	170.9	9.18	19.629			
5,300.0	5,298.5	5,303.2	5,300.2	4.6	4.7	-122.64	-131.3	56.3	180.1	170.9	9.23	19.507			
5,400.0	5,398.4	5,403.3	5,400.2	4.6	4.7	-171.15	-130.5	58.3	182.6	173.1	9.51	19.201			
5,500.0	5,498.2	5,502.8	5,499.7	4.6	4.8	-116.16	-129.8	60.3	187.6	178.1	9.51	19.731			
5,600.0	5,597.6	5,601.9	5,598.7	4.6	4.9	-68.74	-129.1	62.4	186.3	176.7	9.56	19.490			
5,700.0	5,695.9	5,699.6	5,696.4	4.7	5.0	-56.79	-128.7	64.1	177.9	168.2	9.73	18.292			
5,800.0	5,794.1	5,797.6	5,794.5	4.8	5.1	-28.11	-128.4	65.6	164.3	154.3	9.94	16.523			
5,900.0	5,892.0	5,896.2	5,893.0	4.9	5.2	-18.77	-127.9	66.8	145.7	135.6	10.12	14.405			
6,000.0	5,990.2	5,994.5	5,991.3	5.0	5.3	-32.62	-127.3	67.8	128.7	118.4	10.28	12.519			
6,100.0	6,088.4	6,092.5	6,089.3	5.2	5.4	-38.46	-126.7	68.6	113.1	102.6	10.51	10.768			
6,200.0	6,186.4	6,190.4	6,187.2	5.3	5.4	-46.72	-126.0	69.5	98.4	87.6	10.76	9.139			
6,300.0	6,284.0	6,288.1	6,284.9	5.6	5.5	-57.24	-125.3	70.2	84.9	73.8	11.07	7.663			
6,400.0	6,381.5	6,385.4	6,382.2	5.8	5.6	-72.62	-124.6	70.7	75.5	64.1	11.39	6.624			
6,493.3	6,472.6	6,476.3	6,473.1	6.0	5.7	-87.90	-123.9	71.4	72.6	60.9	11.67	6.221 CC, ES			
6,500.0	6,479.2	6,482.8	6,479.6	6.0	5.7	-89.08	-123.8	71.5	72.6	61.0	11.69	6.217			
6,600.0	6,577.2	6,580.6	6,577.3	6.3	5.8	-105.11	-122.9	72.3	76.0	64.0	11.99	6.339			
6,700.0	6,675.4	6,678.8	6,675.6	6.6	5.9	-119.20	-122.0	73.0	84.5	72.2	12.32	6.861			
6,800.0	6,774.0	6,777.4	6,774.2	6.8	6.0	-127.58	-121.3	73.6	94.3	81.9	12.44	7.582			
6,900.0	6,873.2	6,876.9	6,873.7	7.0	6.0	-135.19	-120.9	74.2	103.6	91.0	12.60	8.223			
7,000.0	6,972.5	6,976.7	6,973.4	7.3	6.1	-139.49	-120.7	74.3	112.7	100.0	12.74	8.847			
7,100.0	7,072.0	7,076.5	7,073.3	7.5	6.2	-138.53	-120.5	74.0	119.8	106.9	12.81	9.349			
7,200.0	7,171.9	7,176.5	7,173.2	7.6	6.3	-142.72	-120.4	73.5	124.0	111.0	13.01	9.535			
7,300.0	7,271.8	7,276.9	7,273.7	7.8	6.4	-158.69	-120.5	72.8	126.7	113.5	13.22	9.588			
7,400.0	7,371.8	7,377.8	7,374.6	7.9	6.5	151.44	-121.1	71.7	127.3	113.9	13.44	9.477			
7,500.0	7,471.8	7,478.1	7,474.8	8.1	6.6	130.94	-121.6	69.8	126.6	113.0	13.65	9.273			
7,600.0	7,571.8	7,577.6	7,574.3	8.2	6.6	-172.16	-122.1	67.9	125.6	111.7	13.87	9.053			
7,700.0	7,671.8	7,677.3	7,674.0	8.3	6.7	-178.25	-122.4	66.5	125.0	110.9	14.09	8.870			
7,800.0	7,771.8	7,777.4	7,774.1	8.5	6.8	168.67	-122.7	65.2	124.8	110.5	14.31	8.720			
7,900.0	7,871.8	7,877.4	7,874.1	8.6	6.9	179.52	-123.2	63.9	124.6	110.1	14.54	8.571			
8,000.0	7,971.8	7,977.3	7,974.0	8.7	7.0	179.35	-123.6	62.7	124.5	109.7	14.78	8.423			
8,100.0	8,071.7	8,077.4	8,074.0	8.9	7.1	-147.43	-124.0	61.5	124.2	109.2	15.01	8.271			
8,200.0	8,171.7	8,177.8	8,174.4	9.0	7.2	-162.34	-124.8	60.5	123.7	108.5	15.25	8.111			
8,300.0	8,271.7	8,277.6	8,274.3	9.2	7.2	-179.97	-125.9	59.8	123.4	107.9	15.50	7.958			
8,400.0	8,371.7	8,377.6	8,374.3	9.3	7.3	178.16	-127.0	59.2	123.3	107.5	15.75	7.828			
8,500.0	8,471.7	8,477.7	8,474.3	9.5	7.4	153.87	-128.0	58.5	122.9	106.9	16.00	7.680			
8,600.0	8,571.7	8,577.9	8,574.5	9.6	7.5	156.43	-129.2	57.8	122.4	106.2	16.26	7.530			
8,700.0	8,671.7	8,677.8	8,674.4	9.8	7.6	157.58	-130.4	56.9	122.1	105.5	16.52	7.389			
8,800.0	8,771.7	8,778.6	8,775.2	10.0	7.7	161.38	-131.7	56.0	121.9	105.1	16.78	7.262			
8,891.2	8,862.9	8,869.8	8,866.4	10.1	7.7	163.08	-133.1	54.7	121.6	104.6	17.02	7.146			
8,900.0	8,871.7	8,878.6	8,875.1	10.1	7.8	163.16	-133.3	54.6	121.6	104.6	17.04	7.136			
9,000.0	8,971.7	8,978.8	8,975.4	10.3	7.8	148.87	-134.9	53.2	121.6	104.3	17.30	7.031			
9,100.0	9,071.7	9,079.1	9,075.6	10.5	7.9	145.17	-136.3	51.0	120.1	102.6	17.56	6.843			
9,200.0	9,171.6	9,178.6	9,175.1	10.6	8.0	177.13	-137.3	48.5	119.2	101.4	17.81	6.690			
9,243.0	9,214.7	9,221.3	9,217.8	10.7	8.0	178.31	-137.7	47.5	119.1	101.2	17.92	6.644			
9,300.0	9,271.6	9,277.8	9,274.2	10.8	8.1	178.91	-137.9	46.3	119.3	101.2	18.07	6.602			
9,400.0	9,371.6	9,377.1	9,373.6	11.0	8.2	106.83	-137.8	44.1	120.3	102.0	18.31	6.570			
9,500.0	9,471.6	9,476.6	9,473.0	11.1	8.3	39.63	-137.0	41.7	118.6	100.1	18.56	6.393			
9,600.0	9,571.6	9,576.1	9,572.4	11.3	8.4	41.27	-135.4	38.8	116.9	98.1	18.81	6.212			
9,700.0	9,671.6	9,676.2	9,672.5	11.5	8.4	35.79	-133.6	36.0	115.9	96.9	19.06	6.083			
9,800.0	9,771.5	9,777.5	9,773.7	11.6	8.5	42.06	-132.3	32.7	114.1	94.8	19.32	5.908			

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

Cathedral Energy Services

Anticollision Report

Company: Caza Operating, LLC
Project: Lea County, NM
Reference Site: West Copperline 29 State Com
Site Error: 0.0usft
Reference Well: West Copperline 29 State Com #3H
Well Error: 0.0usft
Reference Wellbore: Wellbore
Reference Design: Wellbore

Local Co-ordinate Reference: Well West Copperline 29 State Com #3H
TVD Reference: WELL @ 3560.0usft (Patriot #1)
MD Reference: WELL @ 3560.0usft (Patriot #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design West Copperline 29 State Com - West Copperline 29 State Com #1H - Pilot Hole - Pilot Hole													Offset Site Error: 0.0 usft
Survey Program: 100-Gyro													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
9,900.0	9,871.5	9,877.8	9,874.0	11.8	8.6	42.62	-131.9	29.0	111.3	91.7	19.57	5.684	
10,000.0	9,971.5	9,978.3	9,974.4	11.9	8.7	64.59	-131.6	25.2	108.7	88.9	19.84	5.482	
10,100.0	10,071.5	10,078.5	10,074.5	12.1	8.8	59.02	-131.9	21.5	106.2	86.1	20.10	5.284	
10,200.0	10,171.5	10,178.7	10,174.7	12.3	8.9	38.56	-132.8	18.4	103.4	83.1	20.36	5.081	
10,300.0	10,271.5	10,278.6	10,274.5	12.4	9.0	26.90	-134.2	16.4	100.7	80.0	20.63	4.880	
10,400.0	10,371.5	10,378.9	10,374.8	12.6	9.0	154.52	-135.8	14.6	98.4	77.5	20.90	4.708	
10,500.0	10,471.5	10,478.9	10,474.8	12.8	9.1	-172.52	-137.7	13.0	96.4	75.2	21.18	4.551	
10,600.0	10,571.5	10,578.9	10,574.8	13.0	9.2	-156.48	-139.7	11.6	94.3	72.9	21.45	4.396	
10,700.0	10,671.5	10,679.0	10,674.8	13.2	9.3	170.32	-141.7	9.9	92.7	71.0	21.73	4.267	
10,800.0	10,771.5	10,779.1	10,774.9	13.4	9.4	160.96	-143.8	8.2	91.4	69.4	22.01	4.151	
10,871.2	10,842.7	10,850.2	10,845.9	13.5	9.5	-163.66	-145.3	6.9	91.2	68.9	22.24	4.100	
10,900.0	10,871.4	10,878.8	10,874.6	13.6	9.5	-159.79	-145.8	6.4	90.8	68.4	22.47	4.042	
11,000.0	10,970.8	10,977.3	10,973.0	13.8	9.6	-149.32	-147.1	4.4	98.4	73.7	24.73	3.978 SF	
11,100.0	11,066.1	11,071.9	11,067.6	14.1	9.6	-158.27	-147.5	2.9	124.2	96.2	28.01	4.435	
11,200.0	11,155.3	11,160.5	11,156.2	14.6	9.7	-165.78	-147.5	2.1	167.4	137.0	30.40	5.508	
11,300.0	11,235.7	11,240.6	11,236.3	15.2	9.8	-173.88	-147.3	1.6	226.3	193.6	32.66	6.927	
11,400.0	11,306.4	11,311.4	11,307.1	16.0	9.9	-175.23	-147.2	1.3	296.9	262.6	34.28	8.660	
11,500.0	11,364.3	11,369.4	11,365.1	16.9	9.9	-176.85	-147.2	1.0	378.2	342.4	35.74	10.581	
11,600.0	11,406.1	11,412.2	11,407.9	17.9	9.9	-175.59	-147.2	0.8	468.9	432.2	36.65	12.792	
11,700.0	11,431.0	11,439.7	11,435.4	19.1	10.0	-176.86	-147.3	0.6	565.5	528.3	37.15	15.219	
11,800.0	11,445.2	11,456.3	11,452.0	20.4	10.0	-175.90	-147.4	0.5	664.3	626.8	37.49	17.718	

Cathedral Energy Services

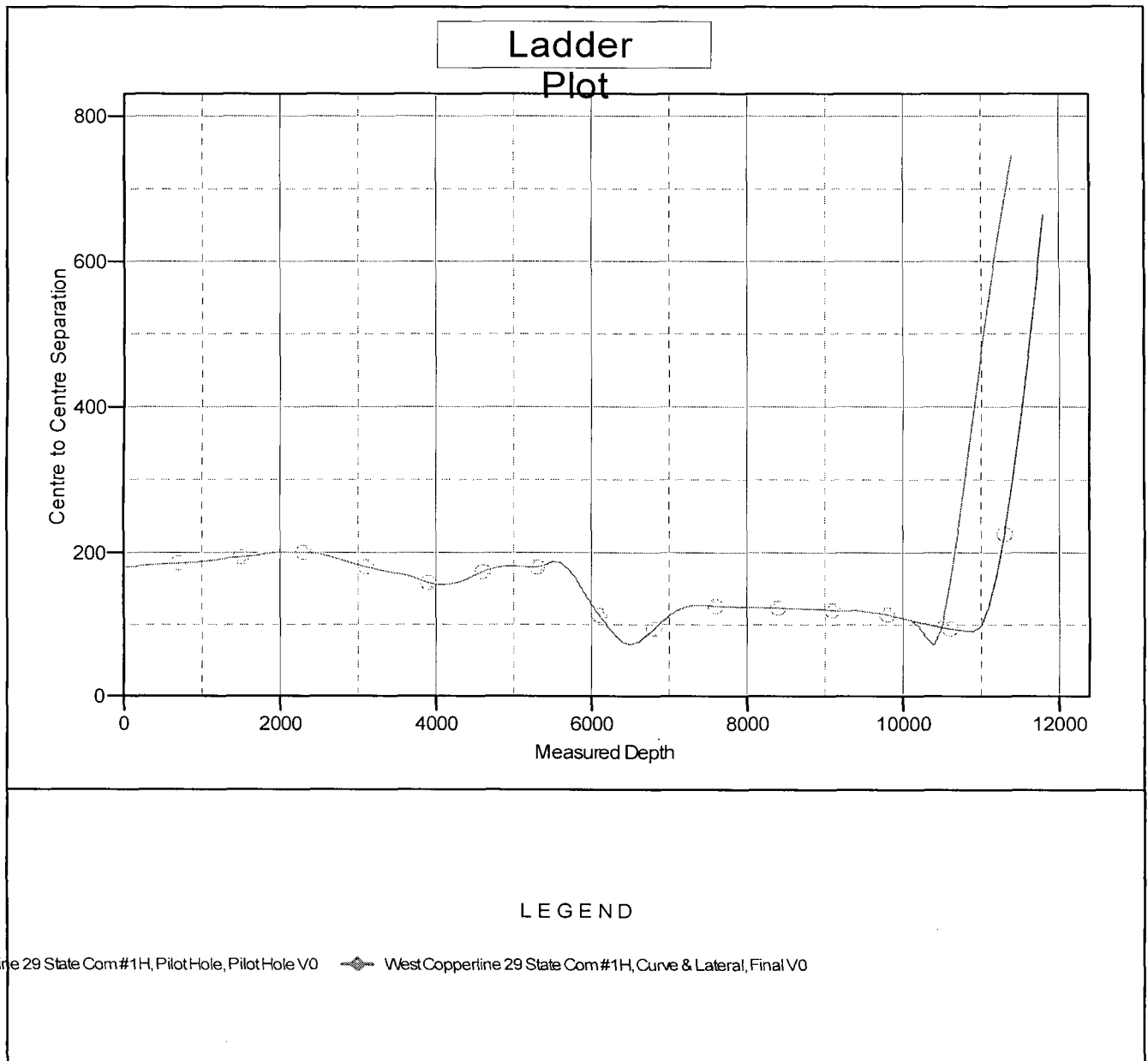
Anticollision Report

Company: Caza Operating, LLC
Project: Lea County, NM
Reference Site: West Copperline 29 State Com
Site Error: 0.0usft
Reference Well: West Copperline 29 State Com #3H
Well Error: 0.0usft
Reference Wellbore: Wellbore
Reference Design: Wellbore

Local Co-ordinate Reference: Well West Copperline 29 State Com #3H
TVD Reference: WELL @ 3560.0usft (Patriot #1)
MD Reference: WELL @ 3560.0usft (Patriot #1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to WELL @ 3560.0usft (Patriot #1)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W °

Coordinates are relative to: West Copperline 29 State Com #3H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.45°



Cathedral Energy Services

Survey Report

HOBBS OCD

MAR 04 2014

RECEIVED

Company: Caza Operating, LLC
 Project: Lea County, NM
 Site: West Copperline 29 State Com
 Well: West Copperline 29 State Com #3H
 Wellbore: Wellbore
 Design: Wellbore

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

Well West Copperline 29 State Com #3H
 WELL @ 3560.0usft (Patriot #1)
 WELL @ 3560.0usft (Patriot #1)
 Grid
 Minimum Curvature
 USA EDM 5000 Multi Users DB

Project Lea County, NM

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

System Datum: Mean Sea Level

Site West Copperline 29 State Com

Site Position: Northing: 467,259.70 usft Latitude: 32° 16' 54.560 N
 From: Map Easting: 759,475.60 usft Longitude: 103° 29' 37.449 W
 Position Uncertainty: 0.0 usft Slot Radius: 13-3/16 " Grid Convergence: 0.45 °

Well West Copperline 29 State Com #3H

Well Position +N/-S 0.0 usft Northing: 467,439.60 usft Latitude: 32° 16' 56.340 N
 +E/-W 0.0 usft Easting: 759,473.90 usft Longitude: 103° 29' 37.452 W
 Position Uncertainty 0.0 usft Wellhead Elevation: usft Ground Level: 3,539.0 usft

Wellbore Wellbore

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/6/2014	7.24	60.19	48,403

Design Wellbore

Audit Notes:

Version: 1.0 Phase: ACTUAL Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	179.47

Survey Program Date 2/8/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	5,227.0	Gyro (Wellbore)	Gyro	Gyro
5,238.0	15,804.0	Survey #3 (Wellbore)	ISCWSA MWD	MWD - ISCWSA

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.32	110.29	100.0	-0.1	0.3	0.1	0.32	0.32	
200.0	0.15	114.83	200.0	-0.2	0.6	0.3	0.17	-0.17	
300.0	0.47	165.07	300.0	-0.7	0.9	0.7	0.39	0.32	
400.0	0.43	169.35	400.0	-1.5	1.0	1.5	0.05	-0.04	
500.0	0.11	173.21	500.0	-1.9	1.1	1.9	0.32	-0.32	
600.0	0.48	114.61	600.0	-2.2	1.5	2.2	0.43	0.37	
700.0	0.59	207.92	700.0	-2.8	1.7	2.8	0.78	0.11	
800.0	0.39	234.27	800.0	-3.5	1.1	3.5	0.30	-0.20	
900.0	0.79	250.70	900.0	-3.9	0.2	3.9	0.43	0.40	
1,000.0	0.19	249.65	1,000.0	-4.2	-0.6	4.2	0.60	-0.60	
1,100.0	0.57	255.84	1,100.0	-4.4	-1.2	4.4	0.38	0.38	

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,200.0	0.52	290.34	1,200.0	-4.3	-2.1	4.3	0.33	-0.05	
1,300.0	0.60	277.86	1,300.0	-4.1	-3.1	4.1	0.15	0.08	
1,400.0	0.09	200.10	1,400.0	-4.1	-3.6	4.1	0.59	-0.51	
1,500.0	0.14	96.92	1,500.0	-4.2	-3.5	4.2	0.18	0.05	
1,600.0	0.33	73.50	1,600.0	-4.1	-3.1	4.1	0.21	0.19	
1,700.0	0.57	57.60	1,700.0	-3.8	-2.4	3.8	0.27	0.24	
1,800.0	0.72	340.40	1,800.0	-2.9	-2.2	2.9	0.81	0.15	
1,900.0	0.95	273.45	1,899.9	-2.3	-3.3	2.3	0.94	0.23	
2,000.0	0.92	254.02	1,999.9	-2.5	-4.9	2.4	0.32	-0.03	
2,100.0	0.39	251.69	2,099.9	-2.8	-6.0	2.7	0.53	-0.53	
2,200.0	0.34	248.99	2,199.9	-3.0	-6.6	2.9	0.05	-0.05	
2,300.0	0.42	313.27	2,299.9	-2.9	-7.1	2.8	0.41	0.08	
2,400.0	0.75	323.16	2,399.9	-2.1	-7.8	2.0	0.34	0.33	
2,500.0	0.33	306.52	2,499.9	-1.4	-8.4	1.3	0.44	-0.42	
2,600.0	0.09	60.58	2,599.9	-1.2	-8.6	1.1	0.38	-0.24	
2,700.0	0.56	14.63	2,699.9	-0.7	-8.4	0.6	0.50	0.47	
2,800.0	0.45	357.38	2,799.9	0.2	-8.3	-0.3	0.19	-0.11	

2,900.0	0.68	0.08	2,899.9	1.2	-8.3	-1.3	0.23	0.23
3,000.0	0.61	4.79	2,999.9	2.3	-8.2	-2.4	0.09	-0.07
3,100.0	0.85	9.77	3,099.9	3.6	-8.1	-3.7	0.25	0.24
3,200.0	0.87	17.55	3,199.9	5.0	-7.7	-5.1	0.12	0.02
3,300.0	1.07	30.29	3,299.9	6.6	-7.0	-6.6	0.29	0.20
3,400.0	1.46	37.46	3,399.8	8.4	-5.8	-8.4	0.42	0.39
3,500.0	1.56	28.89	3,499.8	10.6	-4.3	-10.6	0.25	0.10
3,600.0	1.36	28.35	3,599.8	12.8	-3.1	-12.8	0.20	-0.20
3,700.0	0.46	28.81	3,699.8	14.2	-2.3	-14.2	0.90	-0.90
3,800.0	0.08	47.12	3,799.8	14.6	-2.1	-14.6	0.38	-0.38
3,900.0	0.19	54.41	3,899.8	14.8	-1.9	-14.8	0.11	0.11
4,000.0	1.01	58.75	3,999.7	15.3	-1.0	-15.3	0.82	0.82
4,100.0	1.75	42.37	4,099.7	16.9	0.8	-16.9	0.83	0.74
4,200.0	1.93	68.96	4,199.7	18.6	3.4	-18.6	0.86	0.18
4,300.0	3.28	64.60	4,299.6	20.5	7.5	-20.4	1.36	1.35
4,400.0	4.09	58.31	4,399.4	23.6	13.1	-23.4	0.90	0.81
4,500.0	4.21	52.44	4,499.1	27.7	19.1	-27.5	0.44	0.12
4,600.0	3.39	47.79	4,598.9	31.9	24.2	-31.7	0.88	-0.82
4,700.0	3.20	36.37	4,698.7	36.1	28.0	-35.9	0.68	-0.19
4,800.0	2.65	21.39	4,798.6	40.5	30.5	-40.2	0.94	-0.55
4,900.0	1.39	358.64	4,898.5	43.9	31.3	-43.6	1.47	-1.26
5,000.0	0.52	327.77	4,998.5	45.5	31.1	-45.2	0.98	-0.87
5,100.0	0.64	281.22	5,098.5	46.0	30.3	-45.7	0.47	0.12
5,200.0	1.15	271.54	5,198.5	46.1	28.7	-45.9	0.53	0.51
5,227.0	1.32	270.94	5,225.5	46.1	28.1	-45.9	0.63	0.63
5,238.0	1.10	263.90	5,236.5	46.1	27.9	-45.9	2.41	-2.00
5,333.0	1.40	305.00	5,331.5	46.7	26.0	-46.4	0.97	0.32
5,426.0	4.10	345.00	5,424.3	50.6	24.3	-50.3	3.40	2.90
5,521.0	4.40	270.80	5,519.1	53.9	19.7	-53.7	5.40	0.32
5,618.0	10.50	229.30	5,615.3	48.2	9.3	-48.1	8.01	6.29
5,713.0	10.90	212.80	5,708.7	35.0	-2.1	-35.0	3.24	0.42
5,808.0	12.10	179.00	5,801.9	17.4	-6.8	-17.5	7.10	1.26
5,902.0	11.30	168.70	5,894.0	-1.4	-4.9	1.4	2.38	-0.85
5,996.0	10.40	178.90	5,986.3	-19.0	-2.9	18.9	2.25	-0.96
6,091.0	11.40	178.90	6,079.6	-36.9	-2.5	36.9	1.05	1.05
6,186.0	11.60	179.50	6,172.7	-55.9	-2.3	55.8	0.25	0.21

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
6,281.0	13.00	178.40	6,265.5	-76.1	-1.9	76.1	1.49	1.47	
6,376.0	12.70	179.30	6,358.1	-97.2	-1.5	97.2	0.38	-0.32	
6,470.0	12.30	179.40	6,449.9	-117.6	-1.2	117.5	0.43	-0.43	
6,565.0	11.40	178.40	6,542.9	-137.1	-0.9	137.0	0.97	-0.95	
6,659.0	11.00	181.30	6,635.1	-155.3	-0.8	155.3	0.73	-0.43	
6,753.0	9.30	180.00	6,727.6	-171.9	-1.0	171.9	1.82	-1.81	
6,848.0	7.20	180.50	6,821.6	-185.5	-1.1	185.5	2.21	-2.21	
6,943.0	7.00	183.50	6,915.9	-197.2	-1.5	197.2	0.44	-0.21	
7,039.0	5.70	181.00	7,011.3	-207.8	-1.9	207.8	1.38	-1.35	
7,133.0	3.60	175.30	7,105.0	-215.4	-1.8	215.4	2.28	-2.23	
7,227.0	2.50	182.70	7,198.8	-220.4	-1.6	220.4	1.24	-1.17	
7,322.0	1.10	203.10	7,293.8	-223.3	-2.1	223.3	1.60	-1.47	
7,418.0	0.80	256.50	7,389.8	-224.3	-3.1	224.3	0.93	-0.31	
7,513.0	0.40	267.30	7,484.8	-224.5	-4.1	224.5	0.44	-0.42	
7,608.0	0.20	198.20	7,579.8	-224.7	-4.4	224.6	0.40	-0.21	
7,704.0	0.40	213.30	7,675.8	-225.1	-4.7	225.1	0.22	0.21	
7,799.0	0.60	225.70	7,770.8	-225.8	-5.2	225.7	0.24	0.21	
7,894.0	0.50	214.30	7,865.8	-226.4	-5.8	226.4	0.16	-0.11	
7,989.0	0.50	217.80	7,960.8	-227.1	-6.3	227.0	0.03	0.00	
8,085.0	0.40	178.70	8,056.7	-227.8	-6.5	227.7	0.33	-0.10	
8,180.0	0.50	189.00	8,151.7	-228.5	-6.6	228.5	0.13	0.11	
8,275.0	0.60	214.90	8,246.7	-229.3	-7.0	229.3	0.28	0.11	
8,370.0	0.70	207.70	8,341.7	-230.3	-7.5	230.2	0.14	0.11	
8,464.0	0.50	236.00	8,435.7	-231.0	-8.1	230.9	0.37	-0.21	
8,559.0	0.60	243.30	8,530.7	-231.5	-8.9	231.4	0.13	0.11	
8,653.0	0.60	228.30	8,624.7	-232.0	-9.7	231.9	0.17	0.00	
8,748.0	0.90	240.80	8,719.7	-232.7	-10.7	232.6	0.36	0.32	
8,860.0	1.10	224.10	8,831.7	-233.9	-12.2	233.8	0.31	0.18	
8,955.0	1.50	237.00	8,926.7	-235.2	-13.9	235.1	0.52	0.42	
9,049.0	0.50	272.60	9,020.7	-235.9	-15.4	235.7	1.20	-1.06	
9,144.0	0.90	237.50	9,115.6	-236.3	-16.4	236.1	0.60	0.42	
9,239.0	0.90	201.60	9,210.6	-237.4	-17.3	237.2	0.58	0.00	
9,333.0	1.80	216.90	9,304.6	-239.2	-18.5	239.0	1.02	0.96	
9,428.0	0.80	345.80	9,399.6	-239.8	-19.5	239.6	2.51	-1.05	
9,523.0	1.50	352.60	9,494.6	-237.9	-19.9	237.7	0.75	0.74	
9,618.0	0.70	347.20	9,589.6	-236.1	-20.1	235.9	0.85	-0.84	
9,713.0	0.90	354.00	9,684.6	-234.8	-20.3	234.6	0.23	0.21	
9,808.0	1.30	345.30	9,779.5	-233.0	-20.7	232.8	0.46	0.42	
9,902.0	1.10	344.20	9,873.5	-231.1	-21.2	230.9	0.21	-0.21	
9,997.0	1.00	321.10	9,968.5	-229.6	-22.0	229.4	0.45	-0.11	
10,091.0	0.70	324.10	10,062.5	-228.5	-22.8	228.3	0.32	-0.32	
10,186.0	0.60	343.70	10,157.5	-227.5	-23.3	227.3	0.25	-0.11	
10,281.0	0.40	359.10	10,252.5	-226.7	-23.5	226.5	0.25	-0.21	
10,390.0	0.10	237.80	10,361.5	-226.4	-23.5	226.2	0.42	-0.28	
10,484.0	0.30	200.90	10,455.5	-226.7	-23.7	226.4	0.24	0.21	
10,579.0	0.20	144.80	10,550.5	-227.0	-23.7	226.8	0.26	-0.11	
10,673.0	0.70	211.80	10,644.5	-227.7	-23.9	227.4	0.69	0.53	
10,768.0	0.70	209.60	10,739.5	-228.7	-24.5	228.4	0.03	0.00	
10,853.0	0.90	233.80	10,824.5	-229.5	-25.3	229.3	0.46	0.24	

10,943.0	4.70	172.30	10,914.3	-233.6	-25.4	233.3	4.83	4.22
10,974.0	8.40	167.90	10,945.1	-237.1	-24.7	236.8	12.04	11.94
11,006.0	11.90	166.10	10,976.6	-242.5	-23.4	242.3	10.98	10.94
11,037.0	15.20	165.30	11,006.8	-249.6	-21.6	249.4	10.66	10.65

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u	Formations / Comments
11,069.0	19.90	167.80	11,037.3	-259.0	-19.4	258.8	14.87	14.69	
11,100.0	22.90	169.10	11,066.1	-270.0	-17.2	269.9	9.80	9.68	
11,132.0	24.90	170.40	11,095.4	-282.8	-14.9	282.7	6.46	6.25	
11,164.0	27.80	172.60	11,124.1	-296.8	-12.8	296.7	9.56	9.06	
11,195.0	30.90	171.90	11,151.1	-311.9	-10.7	311.8	10.06	10.00	
11,227.0	34.30	173.00	11,178.0	-329.0	-8.5	328.9	10.78	10.62	
11,259.0	37.50	174.90	11,203.9	-347.6	-6.5	347.6	10.59	10.00	
11,290.0	40.00	176.60	11,228.1	-367.0	-5.1	366.9	8.76	8.06	
11,322.0	42.60	177.70	11,252.2	-388.1	-4.0	388.0	8.44	8.12	
11,385.0	48.00	177.40	11,296.5	-432.8	-2.1	432.8	8.58	8.57	
11,417.0	50.90	177.50	11,317.3	-457.1	-1.0	457.1	9.07	9.06	
11,449.0	54.40	177.70	11,336.7	-482.5	0.0	482.5	10.95	10.94	
11,480.0	57.80	177.70	11,354.0	-508.2	1.1	508.2	10.97	10.97	
11,512.0	61.30	178.70	11,370.2	-535.8	1.9	535.8	11.26	10.94	
11,543.0	64.60	179.40	11,384.3	-563.4	2.4	563.4	10.83	10.65	
11,575.0	67.90	178.40	11,397.2	-592.7	2.9	592.7	10.70	10.31	
11,606.0	70.90	178.10	11,408.1	-621.7	3.8	621.7	9.72	9.68	
11,638.0	74.50	177.90	11,417.6	-652.2	4.9	652.2	11.27	11.25	
11,647.0	75.10	177.90	11,419.9	-660.9	5.2	660.9	6.68	6.68	
11,678.0	78.80	178.40	11,426.9	-691.0	6.2	691.1	12.04	11.94	
11,710.0	80.50	179.00	11,432.7	-722.5	6.9	722.5	5.62	5.31	
11,741.0	81.50	178.80	11,437.5	-753.1	7.5	753.1	3.29	3.23	
11,772.0	82.50	178.80	11,441.8	-783.8	8.1	783.8	3.23	3.23	
11,803.0	83.80	178.80	11,445.5	-814.6	8.8	814.6	4.19	4.19	
11,835.0	86.20	178.10	11,448.3	-846.5	9.6	846.5	7.80	7.49	
11,898.0	90.40	177.10	11,450.2	-909.4	12.3	909.4	6.85	6.67	
11,993.0	91.20	177.10	11,448.9	-1,004.2	17.1	1,004.3	0.84	0.84	
12,086.0	90.20	178.10	11,447.7	-1,097.1	21.0	1,097.3	1.52	-1.08	
12,182.0	89.50	177.60	11,448.0	-1,193.1	24.6	1,193.2	0.90	-0.73	
12,276.0	89.30	178.10	11,449.0	-1,287.0	28.1	1,287.2	0.57	-0.21	
12,371.0	91.10	179.30	11,448.6	-1,382.0	30.3	1,382.2	2.28	1.89	
12,466.0	91.70	179.20	11,446.3	-1,476.9	31.5	1,477.2	0.64	0.63	
12,560.0	91.40	179.40	11,443.8	-1,570.9	32.7	1,571.1	0.38	-0.32	
12,654.0	89.40	179.00	11,443.1	-1,664.9	34.0	1,665.1	2.17	-2.13	
12,748.0	90.20	179.10	11,443.4	-1,758.9	35.5	1,759.1	0.86	0.85	
12,843.0	91.60	179.10	11,442.0	-1,853.8	37.0	1,854.1	1.47	1.47	
12,931.0	89.70	179.80	11,441.0	-1,941.8	37.9	1,942.1	2.30	-2.16	
13,026.0	90.10	179.70	11,441.1	-2,036.8	38.3	2,037.1	0.43	0.42	
13,121.0	89.40	178.90	11,441.5	-2,131.8	39.4	2,132.1	1.12	-0.74	
13,215.0	89.50	177.90	11,442.4	-2,225.8	42.1	2,226.1	1.07	0.11	
13,311.0	90.30	179.10	11,442.6	-2,321.7	44.6	2,322.0	1.50	0.83	
13,406.0	91.00	178.90	11,441.5	-2,416.7	46.2	2,417.0	0.77	0.74	
13,501.0	91.40	179.10	11,439.5	-2,511.7	47.9	2,512.0	0.47	0.42	
13,596.0	91.30	179.70	11,437.3	-2,606.6	48.9	2,607.0	0.64	-0.11	
13,691.0	91.30	181.20	11,435.1	-2,701.6	48.1	2,701.9	1.58	0.00	
13,787.0	91.90	181.50	11,432.5	-2,797.5	45.9	2,797.9	0.70	0.62	
13,882.0	90.50	182.00	11,430.5	-2,892.5	43.0	2,892.8	1.56	-1.47	
13,977.0	90.90	182.00	11,429.3	-2,987.4	39.7	2,987.7	0.42	0.42	
14,072.0	91.30	181.80	11,427.5	-3,082.3	36.5	3,082.6	0.47	0.42	
14,167.0	91.60	182.00	11,425.1	-3,177.3	33.4	3,177.4	0.38	0.32	
14,262.0	91.70	181.80	11,422.3	-3,272.2	30.2	3,272.3	0.24	0.11	
14,357.0	91.80	181.40	11,419.4	-3,367.1	27.6	3,367.2	0.43	0.11	
14,452.0	90.20	181.40	11,417.8	-3,462.0	25.2	3,462.1	1.68	-1.68	

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
14,548.0	90.20	180.70	11,417.5	-3,558.0	23.5	3,558.1	0.73	0.00	
14,643.0	90.20	180.40	11,417.1	-3,653.0	22.6	3,653.1	0.32	0.00	
14,738.0	90.60	180.00	11,416.5	-3,748.0	22.2	3,748.1	0.60	0.42	
14,833.0	90.90	179.70	11,415.2	-3,843.0	22.5	3,843.1	0.45	0.32	
14,929.0	91.30	179.00	11,413.4	-3,939.0	23.6	3,939.0	0.84	0.42	
15,024.0	91.60	179.00	11,411.0	-4,033.9	25.2	4,034.0	0.32	0.32	
15,119.0	92.10	178.90	11,407.9	-4,128.9	27.0	4,128.9	0.54	0.53	
15,211.0	90.60	178.90	11,405.7	-4,220.8	28.7	4,220.9	1.63	-1.63	
15,306.0	91.30	179.00	11,404.2	-4,315.8	30.5	4,315.9	0.74	0.74	
15,401.0	91.50	178.90	11,401.8	-4,410.8	32.2	4,410.9	0.24	0.21	
15,496.0	92.40	178.60	11,398.6	-4,505.7	34.3	4,505.8	1.00	0.95	
15,591.0	92.30	177.90	11,394.7	-4,600.6	37.2	4,600.7	0.74	-0.11	
15,686.0	92.50	177.50	11,390.7	-4,695.4	41.0	4,695.6	0.47	0.21	
15,750.0	93.00	177.30	11,387.7	-4,759.3	43.9	4,759.5	0.84	0.78	Last CES Survey @ 15750' MD
15,804.0	93.00	177.30	11,384.8	-4,813.1	46.4	4,813.3	0.00	0.00	Bit Projection @ 15804' MD

Targets

[illegible]

PBHL W.CL. 29 St. Com #3H 0.00 0.00 11,445.0 -4,797.8 44.2 462,641.80 759,518.10 32° 16' 8.862 N 103° 29' 37.375 W
- actual wellpath misses target center by 59.3usft at 15785.5usft MD (11385.8 TVD, -4794.6 N, 45.6 E)
- Point

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
15,750.0	11,387.7	-4,759.3		43.9 Last CES Survey @ 15750' MD
15,804.0	11,384.8	-4,813.1		46.4 Bit Projection @ 15804' MD

Checked By: Approved By: Date: