Caza Oil&Gas, Inc.

Caza Operating, LLC

Lea County, NM (NAD 27 NME)
Gramma 27 State
#3H

OH

Design: OH

Standard Survey Report

08 February, 2017

Scientific Drilling

Company:	Caza Operating, LLC	**Local Co-ordinate Reference:**	Well #3H
Project:	Lea County, NM (NAD 27 NME)	**TVD Reference:**	KB= 27' @ 3715.00usft
Site:	Gramma 27 State	**MD Reference:**	KB= 27' @ 3715.00usft
Well:	#3H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Midland District

Project Lea County, NM (NAD 27 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 Gramma 27 State

Site Position:		**Northing:**	526,245.40 usft	**Latitude:**	32° 26' 37.344 N
From:	Map	**Easting:**	770,595.20 usft	**Longitude:**	103° 27' 22.302 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.47 °

Well #3H

Well Position	**+N/-S**	0.00 usft	**Northing:**	526,245.40 usft	**Latitude:**	32° 26' 37.344 N
	+E/-W	0.00 usft	**Easting:**	770,595.20 usft	**Longitude:**	103° 27' 22.302 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	0.00 usft	**Ground Level:**	3,688.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/5/2017	6.85	60.40	48,308

Design OH

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (bearing)
	0.00	0.00	0.00	3.67

Survey Program **Date** 2/8/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
193.00	14,752.00	SDI MWD (OH)	MWD+HDGM	OWSG MWD + HDGM

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
193.00	0.64	65.12	193.00	0.45	0.98	0.52	0.33	0.33	0.00
320.00	0.60	77.38	319.99	0.90	2.27	1.04	0.11	-0.03	9.65
502.00	0.45	96.01	501.98	1.03	3.91	1.28	0.12	-0.08	10.24
688.00	0.36	73.71	687.98	1.12	5.20	1.45	0.10	-0.05	-11.99
873.00	0.66	77.15	872.97	1.52	6.79	1.95	0.16	0.16	1.86
1,056.00	0.57	81.04	1,055.96	1.89	8.72	2.45	0.05	-0.05	2.13
1,239.00	0.57	90.27	1,238.95	2.03	10.53	2.70	0.05	0.00	5.04
1,428.00	0.43	88.58	1,427.94	2.04	12.18	2.82	0.07	-0.07	-0.89
1,616.00	0.64	130.28	1,615.93	1.38	13.69	2.26	0.23	0.11	22.18

Company:	Caza Operating, LLC	**Local Co-ordinate Reference:**	Well #3H
Project:	Lea County, NM (NAD 27 NME)	**TVD Reference:**	KB= 27' @ 3715.00usft
Site:	Gramma 27 State	**MD Reference:**	KB= 27' @ 3715.00usft
Well:	#3H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Midland District

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,749.00	0.56	101.20	1,748.93	0.78	14.89	1.73	0.23	-0.06	-21.86
1,900.00	0.81	104.62	1,899.92	0.36	16.65	1.43	0.17	0.17	2.26
2,090.00	1.07	88.81	2,089.89	0.06	19.72	1.32	0.19	0.14	-8.32
2,278.00	1.28	90.79	2,277.85	0.07	23.57	1.58	0.11	0.11	1.05
2,465.00	1.46	118.72	2,464.80	-1.10	27.75	0.67	0.37	0.10	14.94
2,653.00	1.38	123.92	2,652.74	-3.52	31.73	-1.48	0.08	-0.04	2.77
2,843.00	1.39	103.78	2,842.69	-5.34	35.87	-3.04	0.25	0.01	-10.60
3,033.00	2.13	92.45	3,032.60	-6.04	41.63	-3.37	0.43	0.39	-5.96
3,224.00	2.88	87.97	3,223.41	-6.03	49.98	-2.81	0.41	0.39	-2.35
3,413.00	3.29	84.32	3,412.14	-5.32	60.12	-1.46	0.24	0.22	-1.93
3,602.00	3.03	80.23	3,600.85	-3.94	70.44	0.58	0.18	-0.14	-2.16
3,790.00	2.37	110.99	3,788.65	-4.49	78.96	0.58	0.83	-0.35	16.36
3,978.00	2.08	149.28	3,976.52	-8.81	84.34	-3.39	0.79	-0.15	20.37
4,168.00	1.44	147.35	4,166.43	-13.79	87.39	-8.16	0.34	-0.34	-1.02
4,357.00	1.61	142.10	4,355.36	-17.88	90.30	-12.06	0.12	0.09	-2.78
4,546.00	1.62	133.49	4,544.29	-21.81	93.87	-15.76	0.13	0.01	-4.56
4,734.00	2.10	125.19	4,732.19	-25.63	98.61	-19.26	0.29	0.26	-4.41
4,901.00	2.17	153.63	4,899.08	-30.22	102.51	-23.60	0.63	0.04	17.03
5,090.00	1.76	151.41	5,087.97	-35.98	105.49	-29.15	0.22	-0.22	-1.17
5,280.00	1.24	148.11	5,277.90	-40.29	107.98	-33.29	0.28	-0.27	-1.74
5,468.00	0.90	148.57	5,465.87	-43.27	109.82	-36.15	0.18	-0.18	0.24
5,656.00	0.68	151.34	5,653.85	-45.51	111.12	-38.31	0.12	-0.12	1.47
5,786.00	0.44	162.32	5,783.84	-46.66	111.65	-39.42	0.20	-0.18	8.45
5,975.00	0.36	156.46	5,972.84	-47.90	112.10	-40.63	0.05	-0.04	-3.10
6,165.00	0.44	143.04	6,162.83	-49.03	112.78	-41.71	0.06	0.04	-7.06
6,354.00	2.01	188.14	6,351.79	-52.89	112.75	-45.57	0.91	0.83	23.86
6,544.00	1.96	194.52	6,541.67	-59.33	111.46	-52.08	0.12	-0.03	3.36
6,734.00	2.09	195.22	6,731.56	-65.82	109.74	-58.66	0.07	0.07	0.37
6,924.00	1.58	204.40	6,921.46	-71.55	107.75	-64.51	0.31	-0.27	4.83
7,113.00	1.64	207.23	7,110.38	-76.33	105.43	-69.42	0.05	0.03	1.50
7,302.00	1.54	208.97	7,299.31	-80.96	102.96	-74.20	0.06	-0.05	0.92
7,491.00	1.57	208.18	7,488.24	-85.46	100.51	-78.85	0.02	0.02	-0.42
7,681.00	1.45	202.83	7,678.17	-89.97	98.35	-83.49	0.10	-0.06	-2.82
7,870.00	1.08	223.00	7,867.13	-93.48	96.21	-87.13	0.30	-0.20	10.67
8,061.00	1.06	242.60	8,058.10	-95.61	93.41	-89.43	0.19	-0.01	10.26
8,251.00	0.80	252.62	8,248.07	-96.81	90.58	-90.81	0.16	-0.14	5.27
8,438.00	0.34	254.56	8,435.06	-97.35	88.80	-91.47	0.25	-0.25	1.04
8,626.00	0.67	168.59	8,623.06	-98.58	88.48	-92.71	0.39	0.18	-45.73
8,815.00	1.62	133.28	8,812.02	-101.49	90.65	-95.48	0.60	0.50	-18.68
9,003.00	0.72	161.11	8,999.98	-104.43	92.96	-98.26	0.55	-0.48	14.80
9,193.00	0.37	160.24	9,189.97	-106.14	93.56	-99.93	0.18	-0.18	-0.46
9,382.00	0.31	158.65	9,378.97	-107.19	93.95	-100.95	0.03	-0.03	-0.84
9,572.00	1.11	119.48	9,568.95	-108.57	95.74	-102.22	0.47	0.42	-20.62
9,725.00	3.50	131.96	9,721.82	-112.42	100.50	-105.76	1.59	1.56	8.16

Company:	Caza Operating, LLC	**Local Co-ordinate Reference:**	Well #3H
Project:	Lea County, NM (NAD 27 NME)	**TVD Reference:**	KB= 27' @ 3715.00usft
Site:	Gramma 27 State	**MD Reference:**	KB= 27' @ 3715.00usft
Well:	#3H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Midland District

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,792.00	2.13	117.18	9,788.73	-114.36	103.13	-107.52	2.30	-2.04	-22.06
9,839.00	3.87	347.61	9,835.70	-113.21	103.57	-106.35	11.66	3.70	-275.68
9,887.00	11.28	357.15	9,883.25	-106.93	102.99	-100.12	15.61	15.44	19.88
9,934.00	18.50	1.64	9,928.64	-94.87	102.97	-88.08	15.55	15.36	9.55
9,948.85	20.21	1.32	9,942.65	-89.95	103.10	-83.17	11.52	11.50	-2.19
Production Entrance (9948.85' MD)									
9,982.00	24.02	0.75	9,973.36	-77.47	103.32	-70.70	11.52	11.50	-1.70
10,029.00	28.34	1.35	10,015.53	-56.75	103.71	-49.99	9.21	9.19	1.28
10,077.00	33.78	3.44	10,056.63	-32.02	104.78	-25.25	11.55	11.33	4.35
10,124.00	39.10	6.69	10,094.43	-4.23	107.29	2.64	12.04	11.32	6.91
10,172.00	43.58	10.37	10,130.47	27.10	112.03	34.21	10.62	9.33	7.67
10,219.00	48.53	11.33	10,163.07	60.32	118.41	67.77	10.63	10.53	2.04
10,267.00	52.21	9.67	10,193.69	96.66	125.13	104.47	8.12	7.67	-3.46
10,314.00	57.46	8.59	10,220.75	134.58	131.22	142.71	11.33	11.17	-2.30
10,363.00	61.98	8.09	10,245.45	176.44	137.35	184.87	9.27	9.22	-1.02
10,410.00	63.75	8.24	10,266.88	217.84	143.29	226.57	3.78	3.77	0.32
10,458.00	66.61	8.39	10,287.03	260.95	149.59	269.99	5.97	5.96	0.31
10,505.00	69.85	7.96	10,304.46	304.15	155.79	313.49	6.95	6.89	-0.91
10,553.00	70.70	8.29	10,320.66	348.87	162.18	358.54	1.89	1.77	0.69
10,600.00	73.79	7.87	10,334.99	393.19	168.47	403.16	6.63	6.57	-0.89
10,648.00	76.06	8.47	10,347.47	439.06	175.06	449.37	4.88	4.73	1.25
10,695.00	78.98	8.53	10,357.63	484.44	181.84	495.09	6.21	6.21	0.13
10,743.00	80.58	8.66	10,366.14	531.15	188.90	542.15	3.34	3.33	0.27
10,790.00	82.90	8.01	10,372.90	577.17	195.64	588.50	5.12	4.94	-1.38
10,838.00	85.39	7.02	10,377.79	624.50	201.88	636.14	5.58	5.19	-2.06
10,885.00	87.85	4.54	10,380.56	671.17	206.61	683.02	7.43	5.23	-5.28
10,934.00	90.17	3.22	10,381.41	720.05	209.92	732.01	5.45	4.73	-2.69
10,981.00	92.01	2.96	10,380.52	766.97	212.45	779.00	3.95	3.91	-0.55
11,029.00	91.11	0.30	10,379.21	814.93	213.82	826.94	5.85	-1.88	-5.54
11,093.00	90.84	358.45	10,378.12	878.91	213.12	890.75	2.92	-0.42	-2.89
11,123.00	90.98	358.64	10,377.64	908.90	212.36	920.63	0.79	0.47	0.63
11,218.00	89.33	357.30	10,377.39	1,003.83	208.99	1,015.15	2.24	-1.74	-1.41
11,313.00	87.28	358.89	10,380.20	1,098.73	205.84	1,109.65	2.73	-2.16	1.67
11,408.00	87.15	359.01	10,384.81	1,193.60	204.10	1,204.22	0.19	-0.14	0.13
11,503.00	88.02	359.65	10,388.82	1,288.51	202.99	1,298.86	1.14	0.92	0.67
11,598.00	88.46	0.07	10,391.73	1,383.47	202.76	1,393.61	0.64	0.46	0.44
11,694.00	88.69	359.56	10,394.12	1,479.43	202.45	1,489.36	0.58	0.24	-0.53
11,884.00	89.60	0.21	10,396.96	1,669.41	202.07	1,678.92	0.59	0.48	0.34
11,979.00	89.60	0.38	10,397.62	1,764.41	202.55	1,773.75	0.18	0.00	0.18
12,074.00	90.97	0.90	10,397.15	1,859.40	203.62	1,868.62	1.54	1.44	0.55
12,169.00	88.82	0.70	10,397.32	1,954.38	204.94	1,963.49	2.27	-2.26	-0.21
12,264.00	89.29	0.60	10,398.89	2,049.36	206.02	2,058.35	0.51	0.49	-0.11
12,359.00	89.43	1.38	10,399.95	2,144.34	207.66	2,153.24	0.83	0.15	0.82

Company:	Caza Operating, LLC	**Local Co-ordinate Reference:**	Well #3H
Project:	Lea County, NM (NAD 27 NME)	**TVD Reference:**	KB= 27' @ 3715.00usft
Site:	Gramma 27 State	**MD Reference:**	KB= 27' @ 3715.00usft
Well:	#3H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Midland District

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,454.00	89.83	0.87	10,400.56	2,239.32	209.53	2,248.14	0.68	0.42	-0.54
12,549.00	90.20	1.53	10,400.54	2,334.30	211.52	2,343.05	0.80	0.39	0.69
12,644.00	90.44	1.17	10,400.01	2,429.27	213.75	2,437.97	0.46	0.25	-0.38
12,739.00	89.46	1.54	10,400.09	2,524.24	216.00	2,532.89	1.10	-1.03	0.39
12,834.00	87.92	3.46	10,402.26	2,619.12	220.14	2,627.84	2.59	-1.62	2.02
12,929.00	88.29	2.93	10,405.40	2,713.92	225.43	2,722.79	0.68	0.39	-0.56
13,024.00	88.66	3.26	10,407.93	2,808.75	230.56	2,817.75	0.52	0.39	0.35
13,119.00	89.43	4.36	10,409.51	2,903.52	236.87	2,912.73	1.41	0.81	1.16
13,213.00	89.87	4.67	10,410.09	2,997.23	244.27	3,006.72	0.57	0.47	0.33
13,307.00	90.20	5.02	10,410.03	3,090.89	252.21	3,100.70	0.51	0.35	0.37
13,403.00	91.31	3.32	10,408.77	3,186.63	259.19	3,196.68	2.11	1.16	-1.77
13,498.00	91.14	359.69	10,406.73	3,281.56	261.69	3,291.58	3.82	-0.18	-3.82
13,592.00	87.69	359.08	10,407.69	3,375.53	260.68	3,385.29	3.73	-3.67	-0.65
13,688.00	87.39	358.48	10,411.81	3,471.42	258.64	3,480.86	0.70	-0.31	-0.63
13,783.00	87.79	358.59	10,415.81	3,566.30	256.21	3,575.39	0.44	0.42	0.12
13,878.00	88.05	358.16	10,419.26	3,661.20	253.52	3,669.92	0.53	0.27	-0.45
13,972.00	88.19	0.41	10,422.34	3,755.14	252.34	3,763.59	2.40	0.15	2.39
14,067.00	90.17	1.63	10,423.70	3,850.11	254.04	3,858.47	2.45	2.08	1.28
14,163.00	91.34	1.92	10,422.44	3,946.05	257.01	3,954.41	1.26	1.22	0.30
14,257.00	92.02	1.75	10,419.68	4,039.96	260.02	4,048.32	0.75	0.72	-0.18
14,352.00	90.54	1.36	10,417.56	4,134.90	262.59	4,143.23	1.61	-1.56	-0.41
14,447.00	90.64	1.93	10,416.58	4,229.86	265.32	4,238.17	0.61	0.11	0.60
14,543.00	91.78	1.38	10,414.55	4,325.79	268.09	4,334.08	1.32	1.19	-0.57
14,638.00	89.87	1.33	10,413.18	4,420.75	270.34	4,428.99	2.01	-2.01	-0.05
14,702.00	90.17	2.02	10,413.16	4,484.72	272.21	4,492.95	1.18	0.47	1.08
Final MWD Survey (14702.00' MD)									
14,752.00	90.17	2.02	10,413.01	4,534.69	273.97	4,542.93	0.00	0.00	0.00
Final Projection to Bit (14752.00' MD) - PBHL (G R 27 #3H)									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
9,948.85	9,942.65	-89.95	103.10	Production Entrance (9948.85' MD)
14,702.00	10,413.16	4,484.72	272.21	Final MWD Survey (14702.00' MD)
14,752.00	10,413.01	4,534.69	273.97	Final Projection to Bit (14752.00' MD)

Checked By: _____ Approved By: _____ Date: _____

This survey is correct to the best of my knowledge and is supported by actual field data.
Steve Morris