eog resources

EOG Resources - Midland

Lea County, NM (NAD 27 NME)
Nautilus 16 State Com
#704H
OH

Survey: Crescent MWD #1

EOG PVA

30 April, 2016

30-025-43130

Company:	EOG Resources - Midland	**Local Co-ordinate Reference:**	Well #704H
Project:	Lea County, NM (NAD 27 NME)	**TVD Reference:**	KB = 25 @ 3365.0usft (H&P 651)
Site:	Nautilus 16 State Com	**MD Reference:**	KB = 25 @ 3365.0usft (H&P 651)
Well:	#704H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Single User Db

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 Nautilus 16 State Com

Site Position:		**Northing:**	382,984.00 usft	**Latitude:**	32° 2' 59.921 N
From:	Map	**Easting:**	768,397.00 usft	**Longitude:**	103° 28' 1.438 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.46 °

Well #704H

Well Position	**+N/-S**	0.0 usft	**Northing:**	382,728.00 usft	**Latitude:**	32° 2' 57.713 N
	+E/-W	0.0 usft	**Easting:**	764,271.00 usft	**Longitude:**	103° 28' 49.397 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	0.0 usft	**Ground Level:**	3,340.0 usft

Wellbore OH

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	4/16/2016	7.03	59.93	47,964

Design OH

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	176.86

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Survey Program **Date** 4/30/2016

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
82.4	835.3	Gyro #1 (OH)	NSG-CT_D/P	Continuous north-seeking gyro in drillpipe
983.0	17,630.0	Crescent MWD #1 (OH)	MWD	MWD - Standard

Survey

MD (usft)	Inc (°)	Azi (grid_north_azim	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)
835.3	1.50	259.66	835.2	-1.9	-11.3	0.00	0.00	0.00	-11.5	-0.1
983.0	1.32	265.47	982.8	-2.4	-14.9	0.16	-0.12	3.93	-15.1	1.2
1,171.0	3.34	30.10	1,170.7	2.2	-14.3	2.25	1.07	66.29	5.3	13.5
1,358.0	6.16	30.37	1,357.1	15.5	-6.5	1.51	1.51	0.14	-10.1	13.5
1,545.0	6.77	32.56	1,542.9	33.5	4.5	0.35	0.33	1.17	-30.4	14.3
1,733.0	6.95	35.38	1,729.5	52.1	17.0	0.20	0.10	1.50	-47.7	15.7
1,920.0	7.03	36.69	1,915.1	70.5	30.4	0.10	0.04	0.70	-59.6	15.5
2,107.0	6.42	34.41	2,100.9	88.3	43.2	0.36	-0.33	-1.22	-66.5	10.9
2,294.0	6.77	39.24	2,286.6	105.5	56.0	0.35	0.19	2.58	-70.8	14.2
2,339.0	6.56	39.20	2,331.3	109.5	59.3	0.47	-0.47	-0.08	-72.2	13.4
HL Crossing.2339.0' MD; 2331.3' TVD; 109.5'; 59.3'; 6.56										
2,481.0	5.89	39.07	2,472.5	121.4	69.1	0.47	-0.47	-0.09	-75.5	10.8
2,668.0	5.98	45.31	2,658.5	135.7	82.0	0.35	0.05	3.34	-77.6	15.2
2,856.0	5.45	36.34	2,845.5	149.8	94.3	0.55	-0.28	-4.77	-81.4	-0.9
3,044.0	5.54	27.47	3,032.7	165.1	103.8	0.45	0.05	-4.72	-81.8	-14.6
3,231.0	6.16	19.82	3,218.7	182.5	111.3	0.53	0.33	-4.09	-82.0	-24.2
3,418.0	6.86	30.37	3,404.5	201.6	120.4	0.74	0.37	5.64	-89.8	-7.6
3,606.0	5.45	28.87	3,591.4	219.1	130.4	0.75	-0.75	-0.80	-93.4	-10.5
3,794.0	5.80	31.77	3,778.5	235.0	139.7	0.24	0.19	1.54	-95.9	-6.3
3,982.0	5.54	66.31	3,965.6	246.7	153.0	1.79	-0.14	18.37	-86.7	44.2
4,169.0	4.57	50.32	4,151.9	255.1	167.0	0.91	-0.52	-8.55	-96.5	10.1

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Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Single User Db

Survey

MD (usft)	Inc (°)	Azi (grid_north_azim	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)
4,356.0	5.45	30.10	4,338.2	267.5	177.2	1.05	0.47	-10.81	-93.7	-26.9
4,543.0	5.72	37.84	4,524.3	282.6	187.4	0.43	0.14	4.14	-98.5	-15.7
4,731.0	5.19	358.02	4,711.6	298.5	192.8	1.99	-0.28	-21.18	-67.4	-72.7
4,918.0	5.54	6.64	4,897.7	315.9	193.6	0.47	0.19	4.61	-79.7	-54.6
5,105.0	4.84	27.47	5,084.0	331.9	198.2	1.07	-0.37	11.14	-93.9	-19.4
5,294.0	2.73	3.65	5,272.6	343.4	202.2	1.37	-1.12	-12.60	-74.9	-52.0
5,481.0	2.02	354.86	5,459.4	351.2	202.2	0.43	-0.38	-4.70	-60.1	-54.6
5,667.0	2.02	0.66	5,645.3	357.7	201.9	0.11	0.00	3.12	-57.5	-40.4
5,854.0	2.11	357.76	5,832.2	364.4	201.8	0.07	0.05	-1.55	-48.0	-35.2
6,041.0	2.81	354.68	6,019.0	372.4	201.3	0.38	0.37	-1.65	-40.5	-28.9
6,228.0	0.79	11.47	6,205.9	378.3	201.1	1.10	-1.08	8.98	-37.1	-10.0
6,416.0	0.62	359.43	6,393.9	380.6	201.4	0.12	-0.09	-6.40	-22.1	-10.0
6,602.0	0.44	4.70	6,579.9	382.3	201.4	0.10	-0.10	2.83	-9.8	-1.4
6,790.0	1.06	197.36	6,767.9	381.3	200.9	0.79	0.33	-89.01	-5.1	-3.6
6,977.0	1.32	209.05	6,954.8	377.8	199.4	0.19	0.14	6.25	-12.9	-2.1
7,164.0	1.41	224.17	7,141.8	374.3	196.7	0.20	0.05	8.09	-17.4	1.9
7,351.0	1.14	231.90	7,328.7	371.5	193.7	0.17	-0.14	4.13	-21.1	4.5
7,538.0	1.14	211.16	7,515.7	368.7	191.2	0.22	0.00	-11.09	-25.0	-3.9
7,725.0	0.26	258.62	7,702.7	367.1	189.9	0.53	-0.47	25.38	-21.4	17.1
7,911.0	0.26	166.60	7,888.7	366.6	189.6	0.20	0.00	-49.47	-16.8	-22.4
8,097.0	0.79	194.11	8,074.7	364.9	189.3	0.31	0.28	14.79	-26.9	-12.0
8,268.0	1.76	192.52	8,245.6	361.2	188.5	0.57	0.57	-0.93	-30.4	-12.7
8,454.0	2.02	186.11	8,431.5	355.2	187.5	0.18	0.14	-3.45	-34.9	-16.4
8,642.0	0.44	245.00	8,619.5	351.6	186.5	0.97	-0.84	31.32	-34.5	24.2
8,830.0	1.67	223.02	8,807.4	349.2	184.0	0.68	0.65	-11.69	-44.4	9.3
9,017.0	0.97	345.45	8,994.4	348.8	181.7	1.25	-0.37	65.47	31.6	34.8
9,204.0	1.76	37.66	9,181.4	352.6	183.1	0.75	0.42	27.92	43.0	-2.4

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Survey

MD (usft)	Inc (°)	Azi (grid_north_azim	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)
9,391.0	1.85	48.21	9,368.3	356.9	187.1	0.18	0.05	5.64	36.0	-9.7
9,578.0	1.58	33.53	9,555.2	361.0	190.8	0.27	-0.14	-7.85	31.8	-1.0
9,765.0	1.58	14.46	9,742.1	365.7	192.8	0.28	0.00	-10.20	25.4	8.6
9,952.0	1.14	12.70	9,929.1	370.0	193.9	0.24	-0.24	-0.94	20.6	9.3
10,139.0	0.97	335.08	10,116.0	373.2	193.6	0.37	-0.09	-20.12	7.6	18.8
10,325.0	2.20	320.23	10,302.0	377.4	190.7	0.69	0.66	-7.98	-2.6	19.8
10,512.0	0.18	77.04	10,488.9	380.2	188.7	1.22	-1.08	62.47	20.1	-3.4
10,699.0	0.62	324.36	10,675.9	381.1	188.4	0.38	0.24	-60.26	-5.5	19.6
10,886.0	0.97	13.49	10,862.9	383.5	188.1	0.39	0.19	26.27	9.0	17.8
11,073.0	1.14	340.44	11,049.9	386.8	187.9	0.33	0.09	-17.67	-5.3	18.9
11,261.0	1.58	335.08	11,237.8	390.9	186.2	0.24	0.23	-2.85	-11.5	18.2
11,354.0	1.85	326.03	11,330.8	393.3	184.8	0.41	0.29	-9.73	-17.0	15.9
11,464.0	2.20	330.42	11,440.7	396.6	182.8	0.35	0.32	3.99	-19.6	17.3
11,652.0	1.32	322.16	11,628.6	401.5	179.6	0.49	-0.47	-4.39	-27.6	13.8
11,841.0	0.70	154.82	11,817.6	402.1	178.8	1.06	-0.33	-88.54	24.9	-20.0
12,028.0	1.41	225.84	12,004.6	399.5	177.6	0.72	0.38	37.98	-13.5	-29.0
12,216.0	1.32	242.89	12,192.5	396.9	174.1	0.22	-0.05	9.07	-25.8	-23.1
12,310.0	1.58	205.97	12,286.5	395.2	172.5	1.01	0.28	-39.28	-8.9	-34.6
12,403.0	6.42	164.84	12,379.3	389.1	173.3	5.73	5.20	-44.23	11.0	-32.5
12,450.0	13.98	165.63	12,425.5	381.0	175.4	16.09	16.09	1.68	7.4	-31.3
12,497.0	19.35	166.07	12,470.5	368.0	178.7	11.43	11.43	0.94	3.3	-29.0
12,543.0	24.62	167.92	12,513.1	351.2	182.5	11.55	11.46	4.02	-1.2	-25.9
12,590.0	30.07	170.99	12,554.9	330.0	186.4	11.97	11.60	6.53	-5.8	-22.5
12,637.0	38.51	171.87	12,593.7	303.8	190.4	17.99	17.96	1.87	-10.4	-19.1
12,684.0	46.87	173.63	12,628.2	272.2	194.3	17.97	17.79	3.74	-17.2	-15.7
12,730.0	51.09	180.84	12,658.4	237.6	195.9	14.96	9.17	15.67	-25.0	-12.6
12,777.0	51.97	181.71	12,687.6	200.8	195.1	2.37	1.87	1.85	-29.1	-13.4

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12,824.0	56.19	181.63	12,715.2	162.8	194.0	8.98	8.98	-0.17	-30.2	-14.9
12,871.0	61.11	179.34	12,739.6	122.6	193.7	11.26	10.47	-4.87	-29.8	-16.3
12,884.5	61.49	178.88	12,746.1	110.8	193.9	4.08	2.79	-3.39	-29.5	-16.3
HL Crossing.12884.5' MD; 12746.1' TVD; 110.8'; 193.9'; 61.49										
12,918.0	62.43	177.76	12,761.9	81.2	194.7	4.08	2.81	-3.35	-27.2	-15.9
12,918.5	62.47	177.74	12,762.1	80.8	194.8	8.43	7.85	-3.47	-27.2	-15.9
FTP(Naut 16 State Com #704H)										
12,965.0	66.13	176.18	12,782.3	39.0	197.0	8.43	7.87	-3.36	-21.9	-14.2
13,011.0	73.86	175.56	12,798.0	-4.1	200.1	16.85	16.80	-1.35	-16.8	-11.2
13,058.0	81.78	176.70	12,807.9	-49.9	203.2	17.02	16.85	2.43	-13.3	-8.3
13,105.0	85.30	177.41	12,813.2	-96.5	205.6	7.64	7.49	1.51	-9.8	-6.3
13,152.0	90.22	179.87	12,815.0	-143.5	206.7	11.70	10.47	5.23	-7.9	-5.6
13,245.0	89.60	180.13	12,815.2	-236.5	206.7	0.72	-0.67	0.28	-7.8	-6.5
13,338.0	87.41	182.33	12,817.6	-329.4	204.7	3.34	-2.35	2.37	-5.4	-9.3
13,432.0	89.60	185.58	12,820.0	-423.1	198.2	4.17	2.33	3.46	-3.0	-16.6
13,526.0	84.33	184.09	12,825.0	-516.6	190.3	5.83	-5.61	-1.59	1.8	-25.4
13,619.0	88.02	179.08	12,831.2	-609.3	187.8	6.68	3.97	-5.39	8.3	-28.8
13,713.0	89.08	179.43	12,833.6	-703.3	189.0	1.19	1.13	0.37	10.6	-28.4
13,806.0	92.51	178.02	12,832.3	-796.3	191.1	3.99	3.69	-1.52	9.3	-27.2
13,899.0	92.59	178.11	12,828.2	-889.1	194.2	0.13	0.09	0.10	5.2	-24.9
13,992.0	94.35	178.20	12,822.6	-981.9	197.2	1.89	1.89	0.10	-0.5	-22.8
14,086.0	90.31	176.09	12,818.7	-1,075.7	201.9	4.85	-4.30	-2.24	-4.3	-18.9
14,180.0	91.54	176.09	12,817.2	-1,169.4	208.3	1.31	1.31	0.00	-5.8	-13.4
14,273.0	92.77	177.32	12,813.7	-1,262.2	213.6	1.87	1.32	1.32	-9.3	-8.9
14,366.0	94.35	182.94	12,807.9	-1,355.0	213.4	6.27	1.70	6.04	-15.0	-10.0
14,459.0	91.54	181.71	12,803.2	-1,447.8	209.6	3.30	-3.02	-1.32	-19.8	-14.6

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14,500.7	90.00	181.91	12,802.6	-1,489.4	208.3	3.72	-3.69	0.47	-20.4	-16.2
TGT#1(Naut 16 State Com #704H))										
14,552.0	88.11	182.15	12,803.4	-1,540.7	206.5	3.72	-3.69	0.47	-19.7	-18.5
14,583.0	88.55	182.07	12,804.3	-1,571.7	205.4	1.44	1.42	-0.26	-18.9	-19.9
14,676.0	88.11	180.13	12,807.1	-1,664.6	203.6	2.14	-0.47	-2.09	-16.5	-22.6
14,770.0	88.72	178.11	12,809.7	-1,758.6	205.0	2.24	0.65	-2.15	-14.2	-22.0
14,862.0	89.87	175.83	12,810.8	-1,850.4	209.9	2.78	1.25	-2.48	-13.4	-18.0
14,956.0	91.63	175.74	12,809.6	-1,944.2	216.8	1.87	1.87	-0.10	-15.0	-11.9
15,049.0	89.52	173.19	12,808.6	-2,036.7	225.8	3.56	-2.27	-2.74	-16.2	-3.8
15,143.0	92.07	177.93	12,807.3	-2,130.4	233.0	5.73	2.71	5.04	-17.8	2.6
15,235.0	88.99	178.46	12,806.5	-2,222.3	235.9	3.40	-3.35	0.58	-19.0	4.7
15,329.0	90.92	179.25	12,806.5	-2,316.3	237.8	2.22	2.05	0.84	-19.2	5.7
15,423.0	89.34	180.75	12,806.3	-2,410.3	237.8	2.32	-1.68	1.60	-19.7	4.9
15,516.0	90.40	182.59	12,806.5	-2,503.2	235.1	2.28	1.14	1.98	-19.8	1.3
15,609.0	89.43	183.12	12,806.7	-2,596.1	230.5	1.19	-1.04	0.57	-20.0	-4.2
15,702.0	89.34	183.65	12,807.7	-2,689.0	225.0	0.58	-0.10	0.57	-19.3	-10.5
15,796.0	89.43	183.03	12,808.7	-2,782.8	219.5	0.67	0.10	-0.66	-18.6	-16.8
15,889.0	88.20	181.89	12,810.6	-2,875.7	215.5	1.80	-1.32	-1.23	-17.0	-21.7
15,983.0	87.76	176.53	12,813.9	-2,969.6	216.8	5.72	-0.47	-5.70	-14.0	-21.3
16,006.6	88.12	176.24	12,814.8	-2,993.2	218.3	1.94	1.51	-1.23	-13.2	-20.0
TGT#2(Naut 16 State Com #704H)										
16,076.0	89.16	175.39	12,816.4	-3,062.3	223.4	1.94	1.51	-1.23	-11.6	-15.5
16,169.0	90.84	178.81	12,816.4	-3,155.2	228.1	4.10	1.81	3.68	-11.6	-11.7
16,263.0	90.31	176.62	12,815.5	-3,249.1	231.8	2.40	-0.56	-2.33	-12.5	-8.8
16,357.0	89.60	176.88	12,815.6	-3,342.9	237.1	0.80	-0.76	0.28	-12.5	-4.3
16,450.0	90.75	178.55	12,815.3	-3,435.9	240.9	2.18	1.24	1.80	-12.7	-1.5
16,544.0	90.66	180.31	12,814.1	-3,529.8	241.8	1.87	-0.10	1.87	-13.9	-1.4

Company:	EOG Resources - Midland	**Local Co-ordinate Reference:**	Well #704H
Project:	Lea County, NM (NAD 27 NME)	**TVD Reference:**	KB = 25 @ 3365.0usft (H&P 651)
Site:	Nautilus 16 State Com	**MD Reference:**	KB = 25 @ 3365.0usft (H&P 651)
Well:	#704H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Single User Db

Survey

MD (usft)	Inc (°)	Azi (grid_north_azim	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)
16,638.0	88.72	179.87	12,814.6	-3,623.8	241.6	2.12	-2.06	-0.47	-13.4	-2.4
16,732.0	88.90	179.60	12,816.6	-3,717.8	242.1	0.35	0.19	-0.29	-11.4	-2.8
16,826.0	90.48	178.99	12,817.1	-3,811.8	243.2	1.80	1.68	-0.65	-10.9	-2.5
16,920.0	90.40	178.29	12,816.4	-3,905.8	245.5	0.75	-0.09	-0.74	-11.6	-1.1
17,013.0	90.04	179.69	12,816.0	-3,998.8	247.1	1.55	-0.39	1.51	-12.0	-0.3
17,106.0	89.34	180.57	12,816.5	-4,091.8	246.9	1.21	-0.75	0.95	-11.5	-1.4
17,199.0	91.10	182.50	12,816.2	-4,184.7	244.4	2.81	1.89	2.08	-11.9	-4.7
17,294.0	88.11	181.89	12,816.8	-4,279.6	240.8	3.21	-3.15	-0.64	-11.2	-9.2
17,387.0	87.41	181.01	12,820.4	-4,372.5	238.4	1.21	-0.75	-0.95	-7.6	-12.4
17,479.0	91.54	180.84	12,821.3	-4,464.5	236.9	4.49	4.49	-0.18	-6.7	-14.8
17,525.9	90.09	179.39	12,820.6	-4,511.4	236.8	4.37	-3.09	-3.10	-7.4	-15.3
HL Crossing.17525.9' MD; 12820.6' TVD; -4511.4'; 236.8'; 90.09										
17,573.0	88.64	177.93	12,821.1	-4,558.5	237.9	4.37	-3.09	-3.10	-6.9	-14.6
17,588.0	88.29	177.50	12,821.5	-4,573.5	238.5	3.70	-2.33	-2.87	-6.4	-14.1
Last MWD Survey										
17,625.3	88.29	177.50	12,822.7	-4,610.7	240.2	0.00	0.00	0.00	-5.3	-12.9
PBHL(Naut 16 State Com #704H)										
17,630.0	88.29	177.50	12,822.8	-4,615.4	240.4	0.00	0.00	0.00	-5.6	-13.6
Projection To Bit										

Company:	EOG Resources - Midland	**Local Co-ordinate Reference:**	Well #704H
Project:	Lea County, NM (NAD 27 NME)	**TVD Reference:**	KB = 25 @ 3365.0usft (H&P 651)
Site:	Nautilus 16 State Com	**MD Reference:**	KB = 25 @ 3365.0usft (H&P 651)
Well:	#704H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	EDM 5000.1 Single User Db

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
2,339.0	2,331.3	109.5	59.3	HL Crossing.2339.0' MD; 2331.3' TVD; 109.5'; 59.3'; 6.56
12,884.5	12,746.1	110.8	193.9	HL Crossing.12884.5' MD; 12746.1' TVD; 110.8'; 193.9'; 61.49
17,525.9	12,820.6	-4,511.4	236.8	HL Crossing.17525.9' MD; 12820.6' TVD; -4511.4'; 236.8'; 90.09
17,588.0	12,821.5	-4,573.5	238.5	Last MWD Survey
17,630.0	12,822.8	-4,615.4	240.4	Projection To Bit

Checked By: _____ Approved By: _____ Date: _____