



EOG Resources - Midland

Lea County, NM (NAD 83 NME)

Cobalt 32 State

#709H

ST #01

Design: ST

Final PVA

18 December, 2018

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JAN 23 2019
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Final PVA

Company: EOG Resources - Midland		Local Co-ordinate Reference: Well #709H	
Project: Lea County, NM (NAD 83 NME)		TVD Reference: KB = 25 @ 3450.0usft	
Site: Cobalt 32 State		MD Reference: KB = 25 @ 3450.0usft	
Well: #709H		North Reference: Grid	
Wellbore: ST #01		Survey Calculation Method: Minimum Curvature	
Design: ST		Database: EDM 5000.14	

Project Lea County, NM (NAD 83 NME)			
Map System: US State Plane 1983		System Datum: Mean Sea Level	
Geo Datum: North American Datum 1983			
Map Zone: New Mexico Eastern Zone			

Site Cobalt 32 State			
Site Position:		Northing: 425,645.00 usft	Latitude: 32° 10' 2.406 N
From: Map		Easting: 803,691.00 usft	Longitude: 103° 29' 7.689 W
Position Uncertainty:	0.0 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.45 "

Well #709H			
Well Position	+N-S 0.0 usft	Northing: 425,616.00 usft	Latitude: 32° 10' 2.430 N
	+E-W 0.0 usft	Easting: 799,679.00 usft	Longitude: 103° 29' 54.364 W
Position Uncertainty	0.0 usft	Wellhead Elevation: usft	Ground Level: 3,425.0 usft

Wellbore ST #01			
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2015	12/2/2018	6.76
			Dip Angle (°)
			60.00
			Field Strength (nT)
			47,761.99469931

Design ST			
Audit Notes:			
Version: 1.0	Phase: ACTUAL	Tie On Depth: 11,875.0	
Vertical Section:	Depth From (TVD)	+N-S	+E-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			356.14



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Well:	#709H	North Reference:	Grid
Wellbore:	ST #01	Survey Calculation Method:	Minimum Curvature
Design:	ST	Database:	EDM 5000.14

Survey Program		Date	12/18/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
185.0	11,875.0	Total MWD #1 (OH)	MWD	OWSG MWD - Standard	
11,926.0	17,261.0	Total MWD #2 (ST #01)	MWD	OWSG MWD - Standard	

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0
185.0	0.90	261.30	185.0	-0.2	-1.4	0.49	0.49	0.00	0.0	0.0
340.0	1.10	254.50	340.0	-0.8	-4.1	0.15	0.13	-4.39	0.0	0.0
528.0	1.00	247.90	527.9	-1.9	-7.3	0.08	-0.05	-3.51	0.0	0.0
704.0	0.90	235.80	703.9	-3.3	-9.9	0.13	-0.06	-6.87	0.0	0.0
891.0	0.30	252.00	890.9	-4.2	-11.6	0.33	-0.32	8.66	0.0	0.0
1,079.0	0.30	227.00	1,078.9	-4.7	-12.4	0.07	0.00	-13.30	0.0	0.0
1,125.0	0.30	255.00	1,124.9	-4.8	-12.6	0.32	0.00	60.87	0.0	0.0
1,258.0	0.10	220.40	1,257.9	-5.0	-13.0	0.17	-0.15	-26.02	0.0	0.0
1,353.0	0.70	263.10	1,352.9	-5.1	-13.7	0.66	0.63	44.95	0.0	0.0
1,447.0	1.00	275.60	1,446.9	-5.1	-15.0	0.37	0.32	13.30	0.0	0.0
1,540.0	1.20	280.80	1,539.9	-4.9	-16.8	0.24	0.22	5.59	0.0	0.0
1,634.0	1.00	279.90	1,633.9	-4.5	-18.6	0.21	-0.21	-0.96	0.0	0.0
1,728.0	1.30	269.80	1,727.8	-4.4	-20.5	0.38	0.32	-10.74	0.0	0.0
1,821.0	1.20	277.00	1,820.8	-4.3	-22.5	0.20	-0.11	7.74	0.0	0.0
1,915.0	1.40	282.90	1,914.8	-3.9	-24.6	0.26	0.21	6.28	0.0	0.0
2,009.0	1.50	284.40	2,008.8	-3.4	-26.9	0.11	0.11	1.60	0.0	0.0
2,102.0	1.40	284.10	2,101.7	-2.8	-29.2	0.11	-0.11	-0.32	0.0	0.0
2,196.0	3.20	250.00	2,195.6	-3.4	-32.7	2.33	1.91	-36.28	0.0	0.0
2,290.0	7.10	252.00	2,289.3	-6.1	-40.7	4.15	4.15	2.13	0.0	0.0
2,383.0	7.50	252.00	2,381.5	-9.7	-52.0	0.43	0.43	0.00	0.0	0.0



Final PVA

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Site:	Cobalt 32 State	MD Reference:	KB = 25 @ 3450.0usft
Well:	#709H	North Reference:	Grid
Wellbore:	ST #01	Survey Calculation Method:	Minimum Curvature
Design:	ST	Database:	EDM 5000.14

Survey											
MD (usft)	Inc (°)	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	EW (usft)	DLeg (°/100usft)	Solid (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)	
2,476.0	7.40	239.30	2,473.7	-14.7	-62.9	1.77	-0.11	-13.66	0.0	0.0	
2,571.0	7.50	236.30	2,567.9	-21.2	-73.3	0.42	0.11	-3.16	0.0	0.0	
2,665.0	7.20	234.80	2,661.1	-28.0	-83.2	0.38	-0.32	-1.60	0.0	0.0	
2,759.0	6.70	230.70	2,754.5	-34.9	-92.3	0.75	-0.53	-4.36	0.0	0.0	
2,852.0	6.60	229.60	2,846.8	-41.8	-100.6	0.17	-0.11	-1.18	0.0	0.0	
2,945.0	6.40	225.30	2,939.2	-48.9	-108.3	0.57	-0.22	-4.62	0.0	0.0	
3,039.0	6.30	224.20	3,032.7	-56.3	-115.6	0.17	-0.11	-1.17	0.0	0.0	
3,133.0	5.90	221.50	3,126.1	-63.6	-122.4	0.52	-0.43	-2.87	0.0	0.0	
3,226.0	5.70	215.60	3,218.6	-70.9	-128.3	0.68	-0.22	-6.34	0.0	0.0	
3,319.0	5.20	210.40	3,311.2	-78.3	-133.1	0.76	-0.54	-5.59	0.0	0.0	
3,413.0	5.00	203.20	3,404.9	-85.8	-136.9	0.71	-0.21	-7.66	0.0	0.0	
3,507.0	3.00	214.10	3,498.6	-91.6	-139.9	2.27	-2.13	11.60	0.0	0.0	
3,601.0	4.00	251.50	3,592.5	-94.7	-144.4	2.59	1.06	39.79	0.0	0.0	
3,695.0	4.20	248.60	3,686.2	-97.0	-150.7	0.31	0.21	-3.09	0.0	0.0	
3,788.0	4.10	240.10	3,779.0	-99.9	-156.7	0.67	-0.11	-9.14	0.0	0.0	
3,883.0	5.80	248.30	3,873.6	-103.3	-164.1	1.93	1.79	8.63	0.0	0.0	
3,976.0	6.40	249.50	3,966.1	-106.9	-173.3	0.66	0.65	1.29	0.0	0.0	
4,069.0	6.30	247.20	4,058.5	-110.7	-182.9	0.29	-0.11	-2.47	0.0	0.0	
4,164.0	6.00	243.10	4,153.0	-114.9	-192.1	0.56	-0.32	-4.32	0.0	0.0	
4,257.0	6.10	235.10	4,245.5	-120.0	-200.5	0.91	0.11	-8.60	0.0	0.0	
4,351.0	6.20	230.30	4,338.9	-126.1	-208.5	0.56	0.11	-5.11	0.0	0.0	
4,445.0	5.80	222.10	4,432.4	-132.8	-215.6	1.01	-0.43	-8.72	0.0	0.0	
4,538.0	4.90	214.40	4,525.0	-139.6	-221.0	1.24	-0.97	-8.28	0.0	0.0	
4,632.0	4.50	205.50	4,618.7	-146.2	-224.9	0.88	-0.43	-9.47	0.0	0.0	
4,727.0	5.00	216.60	4,713.4	-152.9	-228.9	1.10	0.53	11.68	0.0	0.0	
4,821.0	5.10	222.30	4,807.0	-159.3	-234.2	0.54	0.11	6.06	0.0	0.0	
4,915.0	5.00	217.90	4,800.6	-165.6	-239.5	0.43	-0.11	-4.68	0.0	0.0	



Final PVA

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Well:	#709H	North Reference:	Grid
Wellbore:	ST #01	Survey Calculation Method:	Minimum Curvature
Design:	ST	Database:	EDM 5000.14

Survey											
MD (usft)	Inc (°)	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	EW (usft)	DLeg (°/100usft)	Buld (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)	
5,009.0	5.30	228.40	4,994.3	-171.7	-245.3	1.05	0.32	11.17	0.0	0.0	
5,103.0	6.60	260.30	5,087.8	-175.5	-253.9	3.72	1.38	33.94	0.0	0.0	
5,197.0	6.90	272.40	5,181.1	-176.2	-264.8	1.54	0.32	12.87	0.0	0.0	
5,290.0	6.50	272.30	5,273.5	-175.8	-275.7	0.43	-0.43	-0.11	0.0	0.0	
5,384.0	6.60	267.50	5,366.9	-175.8	-286.4	0.59	0.11	-5.11	0.0	0.0	
5,478.0	5.30	260.90	5,460.4	-176.7	-296.1	1.56	-1.38	-7.02	0.0	0.0	
5,571.0	3.20	279.70	5,553.1	-176.9	-302.9	2.68	-2.26	20.22	0.0	0.0	
5,665.0	2.60	265.10	5,647.0	-176.7	-307.6	1.01	-0.64	-15.53	0.0	0.0	
5,760.0	2.20	235.10	5,741.9	-177.9	-311.2	1.37	-0.42	-31.58	0.0	0.0	
5,853.0	1.90	200.20	5,834.9	-180.4	-313.2	1.36	-0.32	-37.53	0.0	0.0	
5,947.0	1.60	199.40	5,928.8	-183.1	-314.2	0.32	-0.32	-0.85	0.0	0.0	
6,041.0	0.90	181.10	6,022.8	-185.1	-314.6	0.85	-0.74	-19.47	0.0	0.0	
6,134.0	1.00	143.70	6,115.8	-186.4	-314.2	0.66	0.11	-40.22	0.0	0.0	
6,228.0	0.50	155.60	6,209.8	-187.5	-313.5	0.55	-0.53	12.66	0.0	0.0	
6,321.0	0.50	161.20	6,302.8	-188.2	-313.2	0.05	0.00	6.02	0.0	0.0	
6,415.0	0.80	156.50	6,396.8	-189.2	-312.8	0.32	0.32	-5.00	0.0	0.0	
6,509.0	1.70	43.50	6,490.7	-188.8	-311.6	2.28	0.96	-120.21	0.0	0.0	
6,603.0	2.00	35.60	6,584.7	-186.5	-309.7	0.42	0.32	-8.40	0.0	0.0	
6,697.0	1.60	36.30	6,678.7	-184.1	-308.0	0.43	-0.43	0.74	0.0	0.0	
6,791.0	1.50	45.20	6,772.6	-182.1	-306.3	0.28	-0.11	9.47	0.0	0.0	
6,885.0	1.70	45.30	6,866.6	-180.3	-304.4	0.21	0.21	0.11	0.0	0.0	
6,979.0	1.70	40.70	6,960.5	-178.3	-302.5	0.15	0.00	-4.89	0.0	0.0	
7,073.0	1.90	35.30	7,054.5	-175.9	-300.7	0.28	0.21	-5.74	0.0	0.0	
7,167.0	1.70	33.00	7,148.4	-173.5	-299.1	0.23	-0.21	-2.45	0.0	0.0	
7,261.0	1.50	26.60	7,242.4	-171.2	-297.8	0.29	-0.21	-6.81	0.0	0.0	
7,355.0	1.00	33.90	7,336.4	-169.4	-296.8	0.56	-0.53	7.77	0.0	0.0	
7,448.0	1.00	34.20	7,429.4	-168.1	-295.9	0.01	0.00	0.32	0.0	0.0	



Final PVA

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Well:	#709H	North Reference:	Grid
Wellbore:	ST #01	Survey Calculation Method:	Minimum Curvature
Design:	ST	Database:	EDM 5000.14

Survey											
MD (usft)	Inc (")	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	EW (usft)	DLeg ("/100usft)	Build ("/100usft)	Turn ("/100usft)	High to Plan (usft)	Right to Plan (usft)	
7,543.0	0.80	21.50	7,524.4	-166.8	-295.1	0.30	-0.21	-13.37	0.0	0.0	
7,636.0	1.00	6.50	7,617.3	-165.4	-294.8	0.33	0.22	-16.13	0.0	0.0	
7,730.0	0.90	13.60	7,711.3	-163.9	-294.5	0.16	-0.11	7.55	0.0	0.0	
7,824.0	0.80	15.40	7,805.3	-162.5	-294.2	0.11	-0.11	1.91	0.0	0.0	
7,918.0	1.00	353.70	7,899.3	-161.1	-294.1	0.42	0.21	-23.09	0.0	0.0	
8,011.0	0.80	9.10	7,992.3	-159.6	-294.1	0.34	-0.22	16.56	0.0	0.0	
8,105.0	0.70	353.40	8,086.3	-158.4	-294.1	0.24	-0.11	-16.70	0.0	0.0	
8,199.0	0.70	359.30	8,180.3	-157.2	-294.1	0.08	0.00	6.28	0.0	0.0	
8,293.0	0.30	1.20	8,274.3	-156.4	-294.1	0.43	-0.43	2.02	0.0	0.0	
8,387.0	0.40	20.50	8,368.3	-155.9	-294.0	0.16	0.11	20.53	0.0	0.0	
8,481.0	0.40	2.90	8,462.3	-155.2	-293.9	0.13	0.00	-18.72	0.0	0.0	
8,575.0	0.30	11.80	8,556.3	-154.7	-293.8	0.12	-0.11	9.47	0.0	0.0	
8,668.0	0.30	18.80	8,649.3	-154.2	-293.7	0.04	0.00	7.53	0.0	0.0	
8,761.0	0.50	350.40	8,742.3	-153.6	-293.7	0.30	0.22	-30.54	0.0	0.0	
8,855.0	0.30	294.80	8,836.3	-153.1	-294.0	0.44	-0.21	-59.15	0.0	0.0	
8,949.0	0.40	296.70	8,930.3	-152.8	-294.5	0.11	0.11	2.02	0.0	0.0	
9,043.0	0.20	298.90	9,024.3	-152.6	-294.9	0.21	-0.21	2.34	0.0	0.0	
9,137.0	0.70	259.30	9,118.3	-152.6	-295.6	0.60	0.53	-42.13	0.0	0.0	
9,231.0	1.00	267.50	9,212.3	-152.8	-297.0	0.34	0.32	8.72	0.0	0.0	
9,325.0	0.90	254.00	9,306.2	-153.0	-298.5	0.26	-0.11	-14.36	0.0	0.0	
9,419.0	0.80	239.30	9,400.2	-153.5	-299.8	0.25	-0.11	-15.64	0.0	0.0	
9,513.0	1.30	219.20	9,494.2	-154.7	-301.1	0.65	0.53	-21.38	0.0	0.0	
9,607.0	1.70	214.20	9,588.2	-156.7	-302.5	0.45	0.43	-5.32	0.0	0.0	
9,700.0	0.30	244.40	9,681.2	-157.9	-303.5	1.56	-1.51	32.47	0.0	0.0	
9,794.0	0.50	334.70	9,775.2	-157.7	-303.9	0.62	0.21	96.06	0.0	0.0	
9,889.0	0.70	336.80	9,870.2	-156.7	-304.3	0.21	0.21	2.21	0.0	0.0	
9,982.0	0.80	354.00	9,963.2	-155.6	-304.6	0.26	0.11	18.49	0.0	0.0	



Final PVA

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Well:	#709H	North Reference:	Grid
Wellbore:	ST #01	Survey Calculation Method:	Minimum Curvature
Design:	ST	Database:	EDM 5000.14

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)	
10,076.0	1.60	18.70	10,057.1	-153.7	-304.3	0.99	0.85	26.28	0.0	0.0	
10,171.0	2.30	2.70	10,152.1	-150.5	-303.7	0.93	0.74	-16.84	0.0	0.0	
10,265.0	1.60	26.10	10,246.0	-147.5	-303.1	1.11	-0.74	24.89	0.0	0.0	
10,359.0	1.10	11.90	10,340.0	-145.4	-302.3	0.64	-0.53	-15.11	0.0	0.0	
10,453.0	1.20	165.30	10,434.0	-145.5	-301.9	2.38	0.11	163.19	0.0	0.0	
10,548.0	1.50	134.20	10,529.0	-147.3	-300.7	0.82	0.32	-32.74	0.0	0.0	
10,642.0	1.50	104.70	10,622.9	-148.5	-298.7	0.81	0.00	-31.38	0.0	0.0	
10,736.0	2.10	95.40	10,716.9	-148.9	-295.8	0.71	0.64	-9.89	0.0	0.0	
10,830.0	2.40	88.40	10,810.8	-149.0	-292.1	0.43	0.32	-7.45	0.0	0.0	
10,925.0	3.10	84.50	10,905.7	-148.7	-287.5	0.76	0.74	-4.11	0.0	0.0	
11,018.0	2.10	99.80	10,998.6	-148.8	-283.3	1.30	-1.08	16.45	0.0	0.0	
11,113.0	0.50	187.50	11,093.6	-149.5	-281.7	2.25	-1.68	92.32	0.0	0.0	
11,300.0	1.40	300.40	11,280.6	-149.2	-283.8	0.89	0.48	60.37	0.0	0.0	
11,393.0	2.50	261.00	11,373.5	-148.9	-286.7	1.80	1.18	-42.37	0.0	0.0	
11,487.0	3.20	304.10	11,467.4	-147.7	-290.9	2.33	0.74	45.85	0.0	0.0	
11,582.0	2.20	337.50	11,562.3	-144.6	-293.8	1.92	-1.05	35.16	0.0	0.0	
11,676.0	2.10	359.00	11,656.2	-141.2	-294.6	0.86	-0.11	22.87	0.0	0.0	
11,703.0	2.00	2.10	11,683.2	-140.2	-294.5	0.55	-0.37	11.48	0.0	0.0	
11,781.0	1.60	1.80	11,761.2	-137.8	-294.5	0.51	-0.51	-0.38	0.0	0.0	
11,875.0	2.50	11.50	11,855.1	-134.4	-294.0	1.02	0.96	10.32	0.0	0.0	
11,926.0	11.00	13.00	11,905.7	-128.6	-292.7	16.67	16.67	2.94	-1.5	-0.6	
KOP (Cobalt 32 State #709H)											
11,973.0	17.30	14.30	11,951.3	-117.5	-290.0	13.42	13.40	2.77	-4.8	-2.2	
12,017.9	22.65	14.01	11,993.5	-102.6	-286.2	11.92	11.91	-0.65	-8.9	-4.8	
HL Crossing, MD:12017.9, TVD:11993.5, N/S:-102.6, E/W:-286.2, INC:22.65											
12,020.0	22.90	14.00	11,995.4	-101.8	-286.0	11.92	11.92	-0.49	-9.1	-4.9	
12,067.0	28.70	9.80	12,037.7	-81.8	-281.9	12.93	12.34	-8.94	-13.5	-8.7	



Final PVA

Company:	EOG Resources - Midland	Local Co-ordinate Reference:	Well #709H
Project:	Lea County, NM (NAD 83 NME)	TVD Reference:	KB = 25 @ 3450.0usft
Site:	Cobalt 32 State	MD Reference:	KB = 25 @ 3450.0usft
Well:	#709H	North Reference:	Grid
Wellbore:	ST #01	Survey Calculation Method:	Minimum Curvature
Design:	ST	Database:	EDM 5000.14

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)	
12,114.0	32.10	2.80	12,078.2	-58.2	-279.3	10.44	7.23	-14.89	-16.7	-12.2	
12,160.0	35.90	359.80	12,116.4	-32.5	-278.8	9.03	8.26	-6.52	-19.3	-13.3	
12,207.0	38.20	2.00	12,153.9	-4.2	-278.3	5.65	4.89	4.68	-21.3	-12.9	
12,254.0	41.10	3.60	12,190.1	25.8	-276.9	6.54	6.17	3.40	-21.1	-13.8	
12,301.0	45.50	2.60	12,224.3	58.0	-275.1	9.47	9.36	-2.13	-19.2	-15.8	
FTP (Cobalt 32 State #709H)											
12,347.0	50.90	0.70	12,254.9	92.2	-274.2	12.14	11.74	-4.13	-17.2	-17.1	
12,394.0	54.30	356.80	12,283.5	128.5	-275.0	9.78	7.23	-8.30	-14.2	-16.9	
12,441.0	58.00	355.50	12,309.6	168.5	-277.6	8.20	7.87	-2.77	-10.7	-14.0	
12,488.0	61.80	358.90	12,333.2	209.1	-279.6	10.22	8.09	7.23	-6.7	-10.1	
12,536.0	67.40	3.10	12,353.8	252.4	-278.8	14.09	11.67	8.75	-2.1	-7.7	
12,583.0	74.20	6.80	12,369.3	296.6	-274.9	16.26	14.47	7.87	1.5	-7.3	
12,629.0	79.60	8.30	12,379.7	341.0	-269.1	12.16	11.74	3.26	4.2	-7.7	
12,676.0	87.70	7.60	12,384.9	387.2	-262.6	17.30	17.23	-1.49	5.4	-7.2	
12,723.0	90.70	8.10	12,385.5	433.7	-256.2	6.47	6.38	1.06	5.6	-5.8	
12,817.0	92.40	8.30	12,383.0	526.7	-242.8	1.82	1.81	0.21	3.4	-7.5	
12,911.0	91.30	6.90	12,380.0	619.9	-230.4	1.89	-1.17	-1.49	0.9	-14.3	
13,005.0	89.60	4.80	12,379.2	713.4	-220.8	2.87	-1.81	-2.23	1.0	-23.7	
13,098.0	93.90	2.40	12,376.4	806.1	-214.9	5.29	4.62	-2.58	-0.7	-30.3	
13,192.0	91.70	358.10	12,371.8	900.0	-214.5	5.13	-2.34	-4.57	-4.5	-31.5	
13,286.0	90.50	356.60	12,370.0	993.8	-218.9	2.04	-1.28	-1.60	-5.4	-27.9	
13,380.0	90.20	358.00	12,369.4	1,087.7	-223.3	1.52	-0.32	1.49	-5.0	-24.2	
13,474.0	91.00	357.70	12,368.4	1,181.7	-226.8	0.91	0.85	-0.32	-5.0	-21.5	
13,567.0	90.70	356.90	12,367.0	1,274.6	-231.2	0.92	-0.32	-0.86	-5.5	-17.8	
13,660.0	88.90	357.90	12,367.4	1,367.5	-235.4	2.21	-1.94	1.08	-4.2	-14.4	
13,676.5	89.30	358.09	12,367.6	1,383.9	-236.0	2.71	2.45	1.17	-3.7	-13.9	
TOT 1 (Cobalt 32 State #709H)											



Final PVA

Company:	EOG Resources - Midland	Local Co-ordinate Reference:	Well #709H
Project:	Lea County, NM (NAD 83 NME)	TVD Reference:	KB = 25 @ 3450.0usft
Site:	Cobalt 32 State	MD Reference:	KB = 25 @ 3450.0usft
Well:	#709H	North Reference:	Grid
Wellbore:	ST #01	Survey Calculation Method:	Minimum Curvature
Design:	ST	Database:	EDM 5000.14

Survey											
MD (usft)	Inc (°)	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	ENW (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)	
13,754.0	91.20	359.00	12,367.3	1,461.4	-238.0	2.71	2.45	1.17	-3.3	-12.6	
13,848.0	88.60	358.70	12,367.4	1,555.4	-239.9	2.78	-2.77	-0.32	-2.2	-11.5	
13,942.0	89.50	359.20	12,369.0	1,649.4	-241.6	1.10	0.96	0.53	0.3	-10.5	
14,035.0	90.00	359.00	12,369.4	1,742.3	-243.0	0.58	0.54	-0.22	1.7	-9.8	
14,128.0	91.70	358.70	12,368.0	1,835.3	-244.9	1.86	1.83	-0.32	1.2	-8.7	
14,221.0	89.90	358.10	12,366.7	1,928.3	-247.5	2.04	-1.94	-0.65	0.9	-6.8	
14,314.0	90.00	354.50	12,366.8	2,021.0	-253.5	3.87	0.11	-3.87	1.9	-1.6	
14,406.0	90.70	350.90	12,366.3	2,112.3	-265.2	3.99	0.76	-3.91	2.3	9.3	
14,500.0	88.00	353.20	12,367.3	2,205.4	-278.2	3.77	-2.87	2.45	4.2	21.6	
14,594.0	91.30	356.80	12,367.9	2,299.0	-286.4	5.19	3.51	3.83	5.8	29.0	
14,687.0	95.10	358.90	12,362.7	2,391.7	-289.9	4.67	4.09	2.26	1.6	31.8	
14,780.0	95.60	1.70	12,354.0	2,484.3	-289.4	3.05	0.54	3.01	-6.3	30.5	
14,874.0	92.90	3.20	12,347.1	2,578.0	-285.4	3.28	-2.87	1.60	-12.3	25.7	
14,967.0	90.90	2.60	12,344.0	2,670.8	-280.7	2.25	-2.15	-0.65	-14.4	20.3	
15,061.0	90.60	2.20	12,342.7	2,764.7	-276.7	0.53	-0.32	-0.43	-14.7	15.6	
15,100.9	90.35	2.54	12,342.4	2,804.6	-275.1	1.06	-0.64	0.85	-14.6	13.6	
ST Target 1 (Cobalt 32 State #709H)											
15,155.0	90.00	3.00	12,342.3	2,858.6	-272.5	1.06	-0.64	0.85	-14.3	10.0	
15,249.0	89.80	3.00	12,342.4	2,952.5	-267.6	0.21	-0.21	0.00	-13.5	0.9	
15,343.0	88.10	0.60	12,343.3	3,046.4	-264.6	2.66	-0.74	-2.55	-12.5	-9.3	
15,437.0	92.70	359.80	12,341.8	3,140.4	-264.3	3.92	3.83	-0.85	-14.1	-20.2	
15,531.0	93.80	356.80	12,336.5	3,234.2	-267.1	3.39	1.17	-3.19	-19.9	-31.0	
15,583.7	93.13	355.34	12,333.3	3,286.6	-270.7	3.04	-1.28	-2.77	-23.5	-36.3	
TGT 2 (Cobalt 32 State #709H)											
15,625.0	92.60	354.20	12,331.3	3,327.7	-274.4	3.04	-1.28	-2.76	-26.0	-39.4	
15,719.0	88.20	355.40	12,330.6	3,421.3	-282.9	4.85	-4.68	1.28	-27.4	-44.3	
15,812.0	87.60	355.40	12,334.0	3,514.0	-290.4	0.65	-0.65	0.00	-24.3	-47.1	



Final PVA

Company:	EOG Resources - Midland	Local Co-ordinate Reference:	Well #709H
Project:	Lea County, NM (NAD 83 NME)	TVD Reference:	KB = 25 @ 3450.0usft
Site:	Cobalt 32 State	MD Reference:	KB = 25 @ 3450.0usft
Well:	#709H	North Reference:	Grid
Wellbore:	ST #01	Survey Calculation Method:	Minimum Curvature
Design:	ST	Database:	EDM 5000.14

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)	
15,905.0	88.20	355.00	12,337.4	3,606.6	-298.2	0.78	0.65	-0.43	-21.0	-46.6	
15,999.0	91.00	354.60	12,338.1	3,700.2	-306.7	3.01	2.98	-0.43	-20.2	-42.2	
16,092.0	90.60	356.70	12,336.8	3,792.9	-313.7	2.30	-0.43	2.26	-21.1	-36.3	
16,186.0	90.50	357.70	12,335.9	3,886.8	-318.3	1.07	-0.11	1.06	-21.4	-31.3	
16,280.0	89.00	358.60	12,336.3	3,980.7	-321.4	1.86	-1.60	0.96	-20.4	-27.9	
16,373.0	92.80	357.30	12,334.8	4,073.6	-324.7	4.32	4.09	-1.40	-21.4	-24.1	
16,466.0	91.60	357.90	12,331.3	4,166.5	-328.6	1.44	-1.29	0.65	-24.4	-19.8	
16,560.0	93.20	358.50	12,327.3	4,260.3	-331.5	1.82	1.70	0.64	-27.8	-16.5	
16,653.0	91.80	358.00	12,323.3	4,353.2	-334.4	1.60	-1.51	-0.54	-31.3	-13.2	
16,748.0	91.10	358.10	12,320.9	4,448.1	-337.6	0.74	-0.74	0.11	-33.2	-9.6	
16,841.0	89.30	358.60	12,320.5	4,541.1	-340.3	2.01	-1.94	0.54	-33.0	-6.5	
16,935.0	90.80	359.70	12,320.5	4,635.1	-341.7	1.98	1.60	1.17	-32.5	-4.8	
17,029.0	93.80	1.00	12,316.7	4,729.0	-341.1	3.48	3.19	1.38	-35.7	-4.9	
17,123.0	92.30	0.80	12,311.7	4,822.8	-339.6	1.61	-1.60	-0.21	-40.2	-6.0	
17,207.0	91.90	2.80	12,308.6	4,906.7	-337.0	2.43	-0.48	2.38	-42.8	-8.3	
Final MWD Survey (MD=17207.0')											
17,261.0	91.90	2.80	12,306.8	4,960.6	-334.4	0.00	0.00	0.00	-44.2	-10.7	
Final Projection to Bit (MD=17261.0') - PBHL (Cobalt 32 State #709H)											

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
12,017.9	11,993.5	-102.6	-286.2	HL Crossing, MD:12017.9', TVD:11993.5', N/S:-102.6', E/W:-286.2', INC:22.65
17,207.0	12,308.6	4,906.7	-337.0	Final MWD Survey (MD=17207.0')
17,261.0	12,306.8	4,960.6	-334.4	Final Projection to Bit (MD=17261.0')



Final PVA

Company:	EOG Resources - Midland	Local Co-ordinate Reference:	Well #709H
Project:	Les County, NM (NAD 83 NME)	TVD Reference:	KB = 25 @ 3450.0usft
Site:	Cobalt 32 State	MD Reference:	KB = 25 @ 3450.0usft
Well:	#709H	North Reference:	Grid
Wellbore:	ST #01	Survey Calculation Method:	Minimum Curvature
Design:	ST	Database:	EDM 5000.14

Checked By: _____ Approved By: _____ Date: _____



Lea County, NM (NAD 83 NME)

Cobalt 32 State #709H

ST #01

Lease Line
100' Hardline

PROJECT DETAILS: Lea County, NM (NAD 83 NME)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

WELL DETAILS: #709H

KB = 25 @ 3450.0usft 3425.0
Northing 425816.00 Easting 799879.00 Latitude 32° 10' 2.430 N Longitude 103° 29' 54.354 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dlog	TFace	Vsect	Target
1	11875.0	2.50	11.50	11855.1	-134.4	-294.0	0.00	0.00	-113.8	
2	12425.7	60.00	0.00	12306.5	139.2	-291.4	10.45	-11.81	159.0	
3	12711.9	90.00	10.00	12379.9	410.9	-265.9	11.00	19.43	428.3	
4	12973.9	90.58	359.54	12378.8	671.6	-244.2	4.00	-86.81	586.9	
5	15106.5	90.58	359.54	12357.0	2804.1	-261.4	0.00	0.00	2815.4	
6	15564.9	88.48	350.09	12356.8	3280.1	-302.8	2.07	-96.64	3273.2	
7	15590.3	89.48	350.09	12357.0	3285.1	-307.2	0.00	0.00	3298.5	ST Target 1 (Cobalt 32 State #709H)
8	16099.6	90.33	0.24	12357.8	3791.9	-350.0	2.00	85.21	3807.1	TGT 2 (Cobalt 32 State #709H)
9	17277.7	90.33	0.24	12351.0	4970.0	-345.0	0.00	0.00	4982.0	PBHL (Cobalt 32 State #709H)

CASING DETAILS

No casing data is available

WELLBORE TARGET DETAILS (MAP COORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
KOP (Cobalt 32 State #709H)	11808.6	-152.0	-291.0	425846.00	799388.00
PBHL (Cobalt 32 State #709H)	12351.0	4970.0	-345.0	425998.00	799334.00
ST Target 1 (Cobalt 32 State #709H)	12357.0	2804.1	-261.4	425820.07	799417.55
TGT 2 (Cobalt 32 State #709H)	12357.0	3285.1	-307.2	425901.10	799371.80
TGT 1 (Cobalt 32 State #709H)	12356.8	3280.1	-302.8	425998.00	799371.83
FTP (Cobalt 32 State #709H)	12356.0	-102.0	-291.0	425514.00	799388.00

