

HOBBS OCD
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30-025-43897

EOG Resources - Midland

Lea County, NM (NAD 83 NME)

Thor 21

#709H

OH

Design: OH

PVA Report

06 February, 2018

PVA Report

Company:	EOG Resources - Midland			Local Co-ordinate Reference:	Well #709H
Project:	Lea County, NM (NAD 83 NME)			TVD Reference:	KB = 25' @ 3278.0usft (HP 481)
Site:	Thor 21			MD Reference:	KB = 25' @ 3278.0usft (HP 481)
Well:	#709H			North Reference:	Grid
Wellbore:	OH			Survey Calculation Method:	Minimum Curvature
Design:	OH			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						Thor 21					
Site Position:				Northing:		372,646.00 usft		Latitude:		32° 1' 19.875 N	
From:		Map		Easting:		777,866.00 usft		Longitude:		103° 34' 12.486 W	
Position Uncertainty:		0.0 usft		Slot Radius:		13-3/16 "		Grid Convergence:		0.40 "	

Well						#709H							
Well Position		+N/-S		0.0 usft		Northing:		372,646.00 usft		Latitude:		32° 1' 19.875 N	
		+E/-W		0.0 usft		Easting:		777,866.00 usft		Longitude:		103° 34' 12.486 W	
Position Uncertainty		0.0 usft				Wellhead Elevation:		usft		Ground Level:		3,253.0 usft	

Wellbore						OH					
Magnetics											
Model Name		Sample Date		Declination (°)		Dip Angle (°)		Field Strength (nT)			
IGRF2015		7/17/2017		6.93		59.88		47,811.00403003			

Design						OH					
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		353.50			

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Design:	OH	Database:	EDM 5000.14

Survey Program		Date	2/6/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
202.0	920.0	Olebrook MWD (OH)	MWD	MWD - Standard	
1,117.0	17,628.0	Sperry MWD (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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.0
202.0	0.44	251.23	202.0	-0.2	-0.7	0.22	0.22	0.00	-0.8	0.0	0.0
324.0	0.70	206.58	324.0	-1.1	-1.5	0.41	0.21	-36.60	-1.6	-0.9	-0.9
367.0	0.53	237.61	387.0	-1.6	-1.9	0.58	-0.27	49.25	-2.5	0.3	0.3
482.0	0.35	327.43	482.0	-1.6	-2.5	0.67	-0.19	94.55	0.0	2.9	2.9
545.0	0.35	327.43	545.0	-1.2	-2.7	0.00	0.00	0.00	-0.4	2.9	2.9
703.0	0.24	266.90	703.0	-0.8	-3.3	0.20	-0.07	-38.31	-3.3	0.7	0.7
766.0	0.18	152.44	766.0	-0.9	-3.3	0.56	-0.10	-181.68	0.7	-3.4	-3.4
861.0	0.79	24.91	861.0	-0.5	-3.0	0.96	0.64	-134.24	1.7	2.5	2.5
920.0	0.35	93.29	920.0	-0.1	-2.6	1.25	-0.75	115.90	2.6	-0.3	-0.3
1,117.0	0.48	26.33	1,117.0	0.6	-1.7	0.24	0.07	-33.99	0.2	1.8	1.8
1,256.0	0.35	44.24	1,256.0	1.4	-1.1	0.13	-0.09	12.88	-0.2	1.8	1.8
1,444.0	0.13	86.90	1,444.0	1.8	-0.5	0.15	-0.12	23.76	0.5	1.8	1.8
1,632.0	0.04	170.56	1,632.0	1.8	-0.3	0.07	-0.05	43.44	1.8	0.0	0.0
1,820.0	0.22	206.49	1,820.0	1.4	-0.4	0.10	0.10	19.11	1.0	-1.0	-1.0
2,008.0	0.26	224.31	2,008.0	0.8	-0.9	0.04	0.02	9.48	-0.1	-1.2	-1.2
2,101.0	0.57	241.72	2,101.0	0.4	-1.4	0.36	0.33	18.72	-1.1	-1.0	-1.0
2,289.0	0.57	231.46	2,289.0	-0.6	-3.0	0.05	0.00	-5.46	-2.8	-1.4	-1.4
2,478.0	0.35	201.29	2,477.9	-1.8	-3.9	0.17	-0.12	-15.96	-3.1	-3.0	-3.0
2,666.0	0.57	189.22	2,665.9	-3.2	-4.3	0.13	0.12	-6.42	-3.9	-3.7	-3.7
2,853.0	0.48	175.70	2,852.9	-4.9	-4.4	0.08	-0.05	-7.23	-4.6	-4.8	-4.8

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Well:	#709H			North Reference:				Grid			
Wellbore:	OH			Survey Calculation Method:				Minimum Curvature			
Design:	OH			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)	
3,041.0	0.57	151.29	3,040.9	-8.5	-3.9	0.13	0.05	-12.98	-3.9	-6.5	
3,228.0	0.62	126.46	3,227.9	-7.9	-2.6	0.14	0.03	-13.28	-2.6	-8.0	
3,417.0	0.79	139.13	3,416.9	-9.5	-1.0	0.12	0.09	6.70	-8.6	-7.0	
3,604.0	1.27	103.63	3,603.9	-11.0	1.9	0.42	0.26	-18.98	-4.4	-10.2	
3,791.0	1.76	123.87	3,790.8	-13.1	6.3	0.38	0.26	10.82	-12.5	-7.4	
3,979.0	1.80	116.22	3,978.7	-16.0	11.3	0.13	0.02	-4.07	-17.3	-9.4	
4,166.0	0.62	168.42	4,165.7	-18.3	14.2	0.80	-0.63	27.91	-20.8	10.2	
4,353.0	1.36	112.48	4,352.7	-20.1	16.4	0.61	0.40	-29.91	-22.9	-12.3	
4,541.0	0.66	160.89	4,540.6	-22.0	18.9	0.56	-0.37	25.75	-27.0	10.6	
4,728.0	1.85	131.66	4,727.6	-25.0	21.5	0.70	0.64	-15.63	-32.7	-4.4	
4,791.0	1.67	137.00	4,790.5	-26.4	22.8	0.39	-0.29	8.48	-34.9	-1.3	
4,906.0	1.93	135.42	4,905.5	-29.0	25.4	0.23	0.23	-1.37	-38.4	-2.3	
5,093.0	1.32	41.11	5,092.4	-29.6	29.0	1.29	-0.33	-50.43	3.3	-41.3	
5,281.0	2.33	5.60	5,280.3	-24.2	30.8	0.78	0.54	-18.89	21.0	-33.0	
5,469.0	2.20	8.15	5,468.2	-16.8	31.7	0.09	-0.07	1.36	12.1	-33.7	
5,657.0	2.24	4.37	5,656.1	-9.6	32.5	0.08	0.02	-2.01	7.1	-33.1	
5,845.0	2.15	341.08	5,843.9	-2.6	31.6	0.47	-0.05	-12.39	12.7	-29.1	
6,033.0	2.20	329.66	6,031.8	3.9	28.6	0.23	0.03	-6.07	11.1	-26.7	
6,221.0	2.11	327.46	6,219.7	9.9	24.9	0.07	-0.05	-1.17	5.0	-26.4	
6,409.0	1.98	328.16	6,407.5	15.6	21.4	0.07	-0.07	0.37	-2.0	-26.4	
6,597.0	2.07	327.37	6,595.4	21.2	17.8	0.05	0.05	-0.42	-8.3	-26.4	
6,785.0	1.71	321.04	6,783.3	26.3	14.2	0.22	-0.19	-3.37	-11.5	-27.6	
6,973.0	1.27	320.95	6,971.3	30.1	11.1	0.23	-0.23	-0.05	-16.3	-27.6	
7,161.0	1.23	243.79	7,159.2	30.6	8.0	0.83	-0.02	-41.04	20.8	-24.1	
7,349.0	1.63	192.20	7,347.2	27.3	5.6	0.69	0.21	-27.44	27.9	-0.2	
7,538.0	1.93	184.20	7,536.1	21.5	4.8	0.21	0.16	-4.23	21.8	3.3	
7,727.0	1.80	174.18	7,725.0	15.3	4.9	0.19	-0.07	-5.30	14.8	6.4	

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7,915.0	1.89	177.61	7,912.9	9.3	5.3	0.08	0.05	1.82	9.1	5.7	
8,103.0	2.02	170.49	8,100.8	2.9	6.0	0.15	0.07	-3.79	1.9	6.4	
8,291.0	1.23	251.78	8,288.7	-1.0	4.7	1.17	-0.42	43.24	4.1	2.4	
8,478.0	1.27	246.86	8,475.7	-2.4	0.8	0.06	0.02	-2.63	-0.2	2.5	
8,666.0	0.97	222.96	8,663.6	-4.4	-2.2	0.29	-0.16	-12.71	-4.7	1.4	
8,854.0	0.84	215.05	8,851.6	-6.7	-4.0	0.10	-0.07	-4.21	-7.8	0.5	
9,041.0	1.45	232.01	9,038.6	-9.2	-6.7	0.37	0.33	9.07	-11.0	3.2	
9,230.0	1.32	225.33	9,227.5	-12.3	-10.1	0.11	-0.07	-3.53	-15.8	1.6	
9,417.0	1.54	210.83	9,414.5	-15.9	-12.9	0.23	0.12	-7.75	-20.3	-3.0	
9,512.0	3.12	223.22	9,509.4	-18.9	-15.4	1.74	1.66	13.04	-23.9	2.0	
9,606.0	5.01	243.87	9,603.1	-22.6	-20.8	2.51	2.01	21.97	-25.1	11.7	
9,698.0	7.87	255.21	9,694.6	-26.0	-30.5	3.39	3.11	12.33	-26.5	17.1	
9,792.0	10.20	261.98	9,787.4	-28.8	-45.0	2.72	2.48	7.20	-29.9	19.5	
9,979.0	7.52	258.64	9,972.1	-33.5	-73.4	1.46	-1.43	-1.79	-32.3	14.3	
10,167.0	7.60	257.67	10,158.5	-38.6	-97.6	0.08	0.04	-0.52	-24.6	11.3	
10,353.0	5.41	265.76	10,343.3	-41.8	-118.3	1.27	-1.18	4.35	-12.0	9.5	
10,540.0	6.33	272.26	10,529.3	-42.1	-137.4	0.61	0.49	3.48	1.0	1.5	
10,727.0	8.70	267.17	10,714.7	-42.4	-161.9	1.32	1.27	-2.72	8.1	-7.0	
10,915.0	8.26	260.40	10,900.7	-45.3	-189.4	0.58	-0.23	-3.60	13.7	-11.5	
11,102.0	9.27	252.49	11,085.5	-52.1	-217.0	0.84	0.54	-4.23	19.3	-10.7	
11,289.0	8.22	251.52	11,270.3	-60.9	-244.0	0.57	-0.56	-0.52	23.5	-9.4	
11,476.0	8.92	240.01	11,455.2	-72.4	-269.3	0.99	0.37	-6.16	29.0	0.4	
11,662.0	9.19	249.85	11,638.9	-84.7	-295.7	0.84	0.15	5.29	31.8	0.1	
11,849.0	11.21	258.46	11,823.0	-93.5	-327.5	1.35	1.08	4.60	30.9	-5.1	
11,943.0	14.24	252.14	11,914.6	-98.8	-347.5	3.54	3.22	-6.72	26.8	-2.3	
12,037.0	13.19	251.52	12,006.0	-105.8	-368.7	1.13	-1.12	-0.66	20.8	-1.5	
12,131.0	11.69	252.22	12,097.8	-112.1	-367.9	1.60	-1.60	0.74	16.7	-1.2	

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12.223.0	13.41	262.24	12.187.6	-116.4	-407.4	3.01	1.87	10.89	12.1	-4.9	
12.253.0	13.58	268.92	12.216.7	-116.9	-414.3	5.22	0.57	22.27	9.5	-7.0	
12.284.0	15.52	275.69	12.246.7	-116.6	-422.1	8.31	6.26	21.84	6.0	-8.4	
12.315.0	17.19	280.44	12.276.5	-115.3	-430.7	6.90	5.39	15.32	1.8	-8.4	
12.409.0	16.84	282.20	12.366.4	-109.9	-457.7	0.66	-0.37	1.87	-7.9	-0.1	
12.428.0	16.44	282.02	12.384.6	-108.8	-463.0	2.12	-2.11	-0.95	-9.4	2.9	
12.520.0	16.53	290.11	12.472.8	-101.6	-488.0	2.50	0.10	8.79	-11.1	24.4	
12.552.0	22.11	296.35	12.503.0	-97.3	-497.7	18.57	17.44	19.50	-7.8	34.6	
12.583.0	25.54	301.53	12.531.4	-91.2	-508.7	12.95	11.06	16.71	-4.9	44.5	
12.614.0	27.52	311.29	12.559.1	-83.0	-519.7	15.42	6.39	31.48	2.8	53.8	
12.646.0	30.07	324.91	12.587.2	-71.6	-529.9	21.94	7.97	42.56	16.3	59.5	
12.677.0	34.55	336.07	12.613.4	-57.2	-538.0	24.01	14.45	36.00	28.6	60.5	
12.708.0	38.95	344.42	12.638.2	-39.7	-544.1	21.45	14.19	26.94	37.5	59.0	
12.740.0	43.91	353.47	12.662.2	-19.0	-548.1	24.27	15.50	28.28	45.3	54.0	
12.771.0	48.92	359.36	12.683.6	3.4	-549.5	21.21	16.16	19.00	48.8	48.2	
12.802.0	54.07	0.51	12.702.9	27.7	-549.5	16.86	16.61	3.71	47.9	44.3	
12.833.0	59.80	0.42	12.719.9	53.6	-549.3	17.84	17.84	-0.29	45.3	41.1	
12.864.0	62.64	3.85	12.734.8	80.7	-548.3	13.78	9.81	11.06	43.6	35.7	
12.896.0	65.98	6.83	12.748.7	109.4	-545.6	13.39	10.44	9.31	41.4	29.3	
12.927.0	68.35	9.73	12.760.7	137.7	-541.4	11.52	7.65	9.35	39.2	22.1	
12.943.8	70.16	9.88	12.766.7	153.2	-538.8	10.81	10.77	0.88	37.7	18.4	
HL Crossing, MD:12943.8, TVD:12766.7, N/S:153.2, E/W:-538.8, INC:70.16											
12.949.9	70.81	9.93	12.768.7	158.8	-537.8	10.81	10.77	0.87	37.2	17.1	
FTP (Thor 21 #709H)											
12.958.0	71.69	10.00	12.771.3	166.4	-536.5	10.81	10.77	0.86	36.5	15.3	
12.989.0	74.07	11.14	12.780.5	195.5	-531.0	8.44	7.68	3.68	34.2	8.2	
13.020.0	78.46	8.50	12.787.8	225.2	-525.9	16.40	14.16	-8.52	31.9	2.5	

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13,051.0	84.09	5.43	12,792.5	255.6	-522.2	20.63	18.16	-9.90	29.1	-1.8	
13,083.0	90.33	1.91	12,794.1	287.4	-520.1	22.38	19.50	-11.00	24.9	-4.6	
13,176.0	92.31	359.36	12,791.9	380.4	-519.1	3.47	2.13	-2.74	17.3	-6.9	
13,221.0	92.00	359.10	12,790.2	425.4	-519.7	0.90	-0.69	-0.58	16.2	-6.4	
13,270.0	90.42	0.59	12,789.2	474.4	-519.8	4.43	-3.22	3.04	15.8	-6.5	
13,317.0	90.81	0.59	12,788.7	521.3	-519.4	0.83	0.83	0.00	15.9	-7.1	
13,364.0	89.54	0.33	12,788.6	568.3	-519.0	2.76	-2.70	-0.55	16.4	-7.6	
13,409.0	87.96	359.45	12,789.5	613.3	-519.1	4.02	-3.51	-1.96	17.9	-7.7	
13,458.0	87.34	0.33	12,791.6	662.3	-519.2	2.20	-1.27	1.60	20.6	-7.7	
13,552.0	90.33	359.80	12,793.5	756.3	-519.1	3.23	3.18	-0.56	23.7	-8.1	
13,646.0	92.75	359.01	12,790.9	850.2	-520.0	2.71	2.57	-0.84	22.4	-7.4	
13,740.0	91.82	359.28	12,787.2	944.1	-521.4	1.03	-0.99	0.29	19.9	-6.3	
13,833.0	91.56	0.59	12,784.5	1,037.1	-521.5	1.44	-0.28	1.41	18.4	-6.5	
13,927.0	88.09	2.44	12,784.7	1,131.0	-519.1	4.18	-3.69	1.97	19.9	-9.3	
13,988.0	88.34	1.81	12,786.6	1,191.9	-516.8	1.11	0.41	-1.03	22.6	-11.7	
TGT 1 (Thor 21 #709H)											
14,021.0	88.48	1.47	12,787.6	1,224.9	-515.9	1.11	0.42	-1.03	23.9	-12.9	
14,115.0	90.33	0.07	12,788.5	1,318.9	-514.6	2.47	1.97	-1.49	26.0	-14.8	
14,210.0	94.11	2.26	12,784.8	1,413.8	-512.7	4.60	3.98	2.31	23.4	-17.4	
14,304.0	87.16	358.48	12,783.8	1,507.7	-512.1	8.42	-7.39	-4.02	23.5	-18.7	
14,398.0	89.32	358.48	12,786.7	1,601.6	-514.5	2.30	2.30	0.00	27.4	-16.9	
14,492.0	88.97	359.01	12,788.1	1,695.6	-516.6	0.68	-0.37	0.56	29.9	-15.5	
14,586.0	90.55	359.19	12,788.5	1,789.6	-518.1	1.69	1.68	0.19	31.4	-14.7	
14,679.0	91.74	0.42	12,786.6	1,882.6	-518.4	1.84	1.28	1.32	30.7	-15.1	
14,773.0	92.84	359.45	12,782.9	1,976.5	-518.5	1.56	1.17	-1.03	28.0	-15.7	
14,850.5	89.00	355.47	12,781.6	2,053.9	-521.9	7.14	-4.96	-5.14	27.6	-12.8	
TGT 2 (Thor 21 #709H)											

PVA Report

Company:	EOG Resources - Midland	Local Co-ordinate Reference:	Well #709H
Project:	Lea County, NM (NAD 83 NME)	TVD Reference:	KB = 25' @ 3278.0usft (HP 481)
Site:	Thor 21	MD Reference:	KB = 25' @ 3278.0usft (HP 481)
Well:	#709H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	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)	
14,867.0	88.18	354.62	12,782.0	2,070.3	-523.4	7.14	-4.96	-5.14	28.3	-11.5	
14,961.0	95.21	356.64	12,779.3	2,163.9	-530.5	7.78	7.48	2.15	26.7	-5.0	
15,055.0	94.46	356.37	12,771.3	2,257.4	-536.2	0.85	-0.80	-0.29	20.0	0.0	
15,149.0	93.89	357.52	12,764.5	2,351.0	-541.2	1.36	-0.61	1.22	14.4	4.4	
15,243.0	91.43	0.95	12,760.1	2,444.9	-542.5	4.49	-2.62	3.65	11.3	4.9	
15,338.0	90.99	0.42	12,758.1	2,539.9	-541.3	0.72	-0.46	-0.56	10.6	3.1	
15,431.0	90.37	359.98	12,757.0	2,632.9	-541.0	0.82	-0.67	-0.47	10.7	2.1	
15,525.0	92.86	1.12	12,754.4	2,726.8	-540.1	2.93	2.67	1.21	9.3	0.6	
15,605.5	92.21	0.98	12,750.8	2,807.3	-538.6	0.85	-0.83	-0.18	6.8	-1.5	
TGT 3 (Thor 21 #709H)											
15,620.0	92.09	0.95	12,750.2	2,821.7	-538.4	0.85	-0.83	-0.18	6.5	-1.8	
15,714.0	91.25	0.51	12,747.5	2,915.7	-537.2	1.01	-0.89	-0.47	5.3	-3.7	
15,807.0	90.84	359.98	12,748.0	3,008.6	-536.8	0.87	-0.66	-0.57	5.3	-4.8	
15,901.0	88.62	0.24	12,748.6	3,102.6	-536.6	2.17	-2.15	0.28	7.5	-5.6	
15,996.0	89.87	359.98	12,748.0	3,197.6	-536.4	1.14	1.11	-0.27	10.5	-6.5	
16,089.0	88.66	359.01	12,749.3	3,290.6	-537.3	1.51	-1.09	-1.04	13.4	-6.4	
16,183.0	92.57	359.10	12,748.3	3,384.6	-538.8	4.16	4.16	0.10	14.0	-5.5	
16,204.7	93.16	359.26	12,747.2	3,406.2	-539.1	2.81	2.71	0.74	13.3	-5.3	
TGT 4 (Thor 21 #709H)											
16,277.0	95.12	359.80	12,742.0	3,478.3	-539.7	2.81	2.71	0.75	8.8	-5.3	
16,371.0	90.02	357.52	12,737.8	3,572.2	-541.9	5.94	-5.43	-2.43	5.5	-3.7	
16,464.0	92.97	357.87	12,735.4	3,665.1	-545.7	3.19	3.17	0.38	3.9	-0.7	
16,558.0	89.45	0.07	12,733.4	3,759.0	-547.3	4.42	-3.74	2.34	2.8	0.4	
16,651.0	89.63	0.77	12,734.2	3,852.0	-546.7	0.78	0.19	0.75	4.5	-1.0	
16,745.0	91.12	0.33	12,733.5	3,946.0	-545.8	1.65	1.59	-0.47	4.7	-2.6	
16,839.0	90.20	359.54	12,732.5	4,040.0	-545.9	1.29	-0.98	-0.84	4.5	-3.1	
16,932.0	89.05	358.13	12,733.1	4,133.0	-547.8	1.96	-1.24	-1.52	6.0	-1.9	

PVA Report

Company:	EOG Resources - Midland	Local Co-ordinate Reference:	Well #709H
Project:	Lee County, NM (NAD 83 NME)	TVD Reference:	KB = 25' @ 3278.0usft (HP 481)
Site:	Thor 21	MD Reference:	KB = 25' @ 3278.0usft (HP 481)
Well:	#709H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	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)	
17,026.0	89.32	357.08	12,734.4	4,226.9	-551.7	1.15	0.29	-1.12	8.3	1.3	
17,120.0	89.85	356.02	12,735.1	4,320.7	-557.3	1.26	0.56	-1.13	9.8	6.3	
17,215.0	89.19	354.88	12,735.9	4,415.4	-564.9	1.39	-0.69	-1.20	11.5	13.2	
17,309.0	89.14	356.55	12,737.2	4,509.1	-571.9	1.78	-0.05	1.78	13.8	19.5	
17,403.0	90.02	358.84	12,737.9	4,603.0	-575.7	2.61	0.94	2.44	15.4	22.6	
17,496.0	90.95	0.77	12,737.1	4,696.0	-576.0	2.30	1.00	2.08	15.5	22.3	
17,562.0	91.21	0.24	12,735.9	4,762.0	-575.4	0.89	0.39	-0.80	14.8	21.2	
Final MWD Survey (MD=17562.0')											
17,573.6	91.21	0.24	12,735.7	4,773.6	-575.4	0.00	0.00	0.00	14.7	21.1	
HL Crossing, MD:17573.6', TVD:12735.7', N/S:4773.6', E/W:-575.4', INC:91.21											
17,628.0	91.21	0.24	12,734.5	4,828.0	-575.1	0.00	0.00	0.00	14.1	20.5	
Final Projection to Bit (MD=17628.0') - PBHL (Thor 21 #709H)											

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
12,943.8	12,766.7	153.2	-538.8	HL Crossing, MD:12943.8', TVD:12766.7', N/S:153.2', E/W:-538.8', INC:70.16
17,562.0	12,735.9	4,762.0	-575.4	Final MWD Survey (MD=17562.0')
17,573.6	12,735.7	4,773.6	-575.4	HL Crossing, MD:17573.6', TVD:12735.7', N/S:4773.6', E/W:-575.4', INC:91.21
17,628.0	12,734.5	4,828.0	-575.1	Final Projection to Bit (MD=17628.0')

Checked By: _____ Approved By: _____ Date: _____



Lea County, NM (NAD 83 NME)

Thor 21 #709H

HP 481

Plan #4

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' @ 3278.0ush (HP 481)
Northing 372646.00 Easting 777866.00 Latitude 32° 1' 19.875 N Longitude 103° 34' 12.486 W

Alignments to Grid North
True North: -8.41°
Magnetic North: 6.52°
Magnetic Field
Strength: 47811.0nT
Dip Angle: 59.88°
Date: 7/17/2017
Model: IGRF2015

To convert a Magnetic Direction to a Grid Direction, Add 6.52°
To convert a Magnetic Direction to a True Direction, Add 6.52° East
To convert a True Direction to a Grid Direction, Subtract 6.40°

SECTION DETAILS

Sec	MD	Inc	Asl	TVD	+N-S	+E-W	Dleg	TFace	VSeet	Target	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0		
2	8481.0	0.00	0.00	8481.0	0.0	0.0	0.00	0.00	0.0		
3	8961.0	10.00	252.65	9958.5	-12.3	-41.8	2.00	253.65	-7.4		
4	12238.1	10.00	253.65	12201.0	-123.6	-421.3	0.50	0.00	-76.1		
5	12498.7	20.00	336.00	12444.6	-92.3	-483.9	0.00	104.13	-38.2		
6	13101.0	60.75	358.82	12774.8	369.7	-426.0	12.00	31.34	426.8		
7	13924.4	90.75	358.82	12764.0	1191.0	-528.5	0.00	0.00	1245.1		TGT 1 (Thor 21 #709H)
8	13977.0	90.67	359.69	12763.9	1205.6	-528.6	2.00	-110.14	1387.6		TGT 2 (Thor 21 #709H)
9	14784.5	90.67	359.69	12754.0	3053.0	-634.7	0.00	0.00	2106.3		TGT 3 (Thor 21 #709H)
10	14789.2	90.78	358.59	12753.9	2057.7	-534.8	2.00	1.05	2105.0		TGT 4 (Thor 21 #709H)
11	15025.6	90.75	356.50	12744.0	2907.0	-640.1	0.00	0.00	2698.1		
12	15043.6	90.90	358.59	12743.9	2917.0	-640.3	2.00	0.00	2699.0		
13	16137.0	90.98	358.59	12734.0	3456.3	-644.4	0.00	0.00	3446.0		
14	16157.0	90.54	358.59	12723.7	3456.1	-644.6	2.00	180.80	3445.7		
15	17605.8	90.54	358.59	12720.0	6674.0	-655.0	0.00	0.00	4905.5		PBHL (Thor 21 #709H)

CASING DETAILS

No casing data is available

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N-S	+E-W	Northing	Easting
TGT 1 (Thor 21 #709H)	12764.0	1191.0	-528.6	374689.00	777337.47
TGT 2 (Thor 21 #709H)	12754.0	2053.0	-534.7	374689.00	777331.38
TGT 3 (Thor 21 #709H)	12744.0	2907.0	-640.1	374683.00	777325.86
TGT 4 (Thor 21 #709H)	12734.0	3456.3	-644.4	374681.36	777321.56
PBHL (Thor 21 #709H)	12720.0	6674.0	-655.0	377320.00	777311.00
FTP (Thor 21 #709H)	12714.0	154.0	-521.0	373800.00	777345.00

