



EOG Resources - Midland

Lea County, NM (NAD 83 NME)

Gem 36 State Com

#201H

75422

OH

Design: OH

Standard Survey Report

15 April, 2019

Company:	EOG Resources - Midland	Local Co-ordinate Reference:	Well #201H
Project:	Lea County, NM (NAD 83 NME)	TVD Reference:	KB =25 @ 3451.0usft
Site:	Gem 36 State Com	MD Reference:	KB =25 @ 3451.0usft
Well:	#201H	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		Gem 36 State Com			
Site Position:		Northing:	393,686.00 usft	Latitude:	32° 4' 49.331 N
From:	Map	Easting:	759,213.00 usft	Longitude:	103° 37' 47.552 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.37 °

Well	#201H					
Well Position	+N/-S	0.0 usft	Northing:	398,146.00 usft	Latitude:	32° 5' 33.343 N
	+E/-W	0.0 usft	Easting:	761,085.00 usft	Longitude:	103° 37' 25.453 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,426.0 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/14/2019	6.80	59.91	47,692.55426318

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	176.73	

Survey Program	Date 4/15/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
251.0	14,678.0	Leam MWD #1 (OH)	MWD	OWSG MWD - Standard

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
251.0	1.00	251.00	251.0	-0.7	-2.1	0.6	0.40	0.40	0.00
438.0	1.80	254.70	437.9	-2.0	-6.4	1.6	0.43	0.43	1.98
612.0	1.80	249.90	611.8	-3.7	-11.6	3.0	0.09	0.00	-2.76
799.0	1.60	242.60	798.8	-5.9	-16.7	4.9	0.16	-0.11	-3.90
974.0	1.70	226.40	973.7	-8.8	-20.8	7.6	0.27	0.06	-9.26
1,070.0	2.00	219.90	1,069.6	-11.1	-22.9	9.7	0.38	0.31	-6.77
1,259.0	1.20	351.90	1,258.6	-11.6	-25.3	10.2	1.56	-0.42	69.84
1,447.0	1.10	19.80	1,446.6	-8.0	-24.9	6.6	0.30	-0.05	14.84
1,636.0	1.60	43.20	1,635.5	-4.4	-22.5	3.1	0.39	0.28	12.38

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Well:	#201H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,825.0	1.20	51.50	1,824.5	-1.2	-19.2	0.1	0.24	-0.21	4.39
2,013.0	1.40	345.40	2,012.4	2.2	-18.2	-3.3	0.76	0.11	-35.16
2,203.0	1.20	334.50	2,202.4	6.3	-19.6	-7.4	0.17	-0.11	-5.74
2,392.0	2.80	3.70	2,391.3	12.7	-20.2	-13.8	0.98	0.85	15.45
2,582.0	3.00	14.00	2,581.0	22.1	-18.7	-23.2	0.29	0.11	5.42
2,771.0	2.80	23.90	2,769.8	31.1	-15.6	-32.0	0.28	-0.11	5.24
2,960.0	4.10	19.70	2,958.4	41.7	-11.5	-42.3	0.70	0.69	-2.22
3,150.0	4.50	22.50	3,147.9	55.0	-6.3	-55.3	0.24	0.21	1.47
3,337.0	6.50	14.70	3,334.0	72.0	-0.8	-72.0	1.14	1.07	-4.17
3,524.0	9.60	10.00	3,519.2	97.6	4.5	-97.2	1.69	1.66	-2.51
3,713.0	8.70	11.90	3,705.8	127.1	10.2	-126.3	0.50	-0.48	1.01
3,902.0	8.20	12.10	3,892.7	154.3	16.0	-153.1	0.27	-0.26	0.11
4,090.0	7.70	19.50	4,078.9	179.3	23.0	-177.7	0.61	-0.27	3.94
4,279.0	7.10	31.40	4,266.3	201.2	33.3	-199.0	0.87	-0.32	6.30
4,467.0	7.30	27.40	4,452.9	221.7	44.9	-218.8	0.29	0.11	-2.13
4,652.0	5.80	39.70	4,636.6	239.3	56.3	-235.7	1.11	-0.81	6.65
4,844.0	7.90	17.60	4,827.3	259.4	66.5	-255.2	1.74	1.09	-11.51
5,032.0	10.20	0.90	5,013.0	288.4	70.6	-283.9	1.85	1.22	-8.88
5,222.0	9.80	359.80	5,200.1	321.3	70.8	-316.8	0.23	-0.21	-0.58
5,411.0	10.00	357.50	5,386.3	353.8	70.1	-349.3	0.23	0.11	-1.22
5,600.0	9.50	357.00	5,572.5	385.8	68.5	-381.3	0.27	-0.26	-0.26
5,788.0	9.10	4.60	5,758.1	416.1	68.9	-411.5	0.69	-0.21	4.04
5,977.0	9.80	2.60	5,944.5	447.1	70.8	-442.3	0.41	0.37	-1.06
6,164.0	10.40	11.80	6,128.6	479.5	75.0	-474.4	0.92	0.32	4.92
6,351.0	10.60	18.40	6,312.5	512.3	83.9	-506.7	0.65	0.11	3.53
6,539.0	8.60	15.80	6,497.9	542.3	93.2	-536.1	1.09	-1.06	-1.38
6,726.0	7.80	17.60	6,683.0	567.8	100.8	-561.1	0.45	-0.43	0.96
6,913.0	6.10	8.40	6,868.6	589.8	106.1	-582.7	1.08	-0.91	-4.92
7,102.0	1.50	18.80	7,057.1	602.0	108.4	-594.9	2.45	-2.43	5.50
7,291.0	2.30	201.10	7,246.1	600.8	107.8	-593.7	2.01	0.42	-94.02
7,479.0	2.20	202.70	7,433.9	594.0	105.1	-587.0	0.06	-0.05	0.85
7,667.0	1.80	215.30	7,621.8	588.3	102.0	-581.5	0.31	-0.21	6.70
7,855.0	1.50	213.40	7,809.7	583.8	98.9	-577.2	0.16	-0.16	-1.01
8,042.0	1.50	193.30	7,996.7	579.4	97.0	-572.9	0.28	0.00	-10.75
8,230.0	1.20	209.50	8,184.6	575.3	95.5	-568.9	0.26	-0.16	8.62
8,419.0	1.60	199.30	8,373.6	571.0	93.6	-564.8	0.25	0.21	-5.40
8,606.0	1.50	204.80	8,560.5	566.4	91.7	-560.2	0.10	-0.05	2.94
8,794.0	1.10	203.40	8,748.4	562.5	90.0	-556.4	0.21	-0.21	-0.74
8,982.0	1.10	190.70	8,936.4	559.0	88.9	-553.1	0.13	0.00	-6.76
9,077.0	0.70	193.70	9,031.4	557.6	88.6	-551.6	0.42	-0.42	3.16
9,182.0	5.30	138.00	9,136.2	553.3	91.7	-547.2	4.70	4.38	-53.05
9,195.4	5.96	140.33	9,149.6	552.4	92.6	-546.2	5.22	4.94	17.36
Interp @ 9152.0 (#201H OH Plan #2)									
9,195.5	5.97	140.34	9,149.7	552.3	92.6	-546.2	5.22	4.97	15.42

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
KOP (Gem 36 State Com #201H)									
9,277.0	10.10	147.80	9,230.4	543.0	99.1	-536.5	5.22	5.07	9.15
9,371.0	15.00	148.50	9,322.1	525.7	109.8	-518.5	5.22	5.21	0.74
9,418.0	17.90	146.20	9,367.2	514.5	117.0	-507.0	6.32	6.17	-4.89
9,465.0	21.60	146.60	9,411.4	501.3	125.8	-493.3	7.88	7.87	0.85
9,559.0	25.60	149.60	9,497.5	469.3	145.6	-460.2	4.44	4.26	3.19
9,653.0	38.30	162.20	9,577.2	423.8	164.9	-413.7	15.20	13.51	13.40
9,696.5	44.43	169.04	9,609.8	396.0	171.9	-385.5	17.50	14.09	15.74
50' HL Crossing, MD:9696.5', TVD:9609.8', N/S:396.0', E/W:171.9', INC:44.43 - FTP (Gem 36 State Com #201H)									
9,748.0	52.10	175.40	9,644.1	357.9	177.0	-347.3	17.50	14.89	12.34
9,842.0	67.10	181.40	9,691.6	277.2	178.9	-268.5	16.87	15.96	6.38
9,872.0	73.00	181.70	9,701.8	249.0	178.2	-238.4	19.69	19.67	1.00
9,937.0	81.60	181.20	9,716.1	185.7	176.6	-175.3	13.25	13.23	-0.77
10,031.0	83.90	177.70	9,728.0	92.4	177.5	-82.2	4.43	2.45	-3.72
10,125.0	87.80	175.10	9,734.8	-1.1	183.4	11.6	4.98	4.15	-2.77
10,220.0	86.30	175.10	9,739.6	-95.6	191.5	106.4	1.58	-1.58	0.00
10,314.0	85.70	174.90	9,746.2	-189.0	199.6	200.1	0.67	-0.64	-0.21
10,409.0	84.70	174.40	9,754.2	-283.3	208.5	294.7	1.18	-1.05	-0.53
10,502.0	88.60	176.30	9,759.6	-375.8	216.0	387.5	4.66	4.19	2.04
10,596.0	90.10	177.20	9,760.7	-469.6	221.3	481.5	1.86	1.60	0.96
10,599.8	90.07	177.16	9,760.6	-473.4	221.5	485.3	1.23	-0.75	-0.97
TGT 1 (Gem 36 State Com #201H)									
10,689.0	89.40	176.30	9,761.1	-562.5	226.6	574.5	1.23	-0.75	-0.97
10,784.0	86.70	175.10	9,764.3	-657.2	233.7	669.4	3.11	-2.84	-1.26
10,878.0	87.40	175.90	9,769.1	-750.7	241.1	763.3	1.13	0.74	0.85
10,972.0	89.10	178.80	9,772.0	-844.6	245.4	857.2	3.57	1.81	3.09
11,066.0	88.60	180.70	9,773.9	-938.6	245.8	951.1	2.09	-0.53	2.02
11,160.0	87.50	181.00	9,777.1	-1,032.5	244.4	1,044.8	1.21	-1.17	0.32
11,254.0	91.00	180.90	9,778.3	-1,126.5	242.9	1,138.5	3.72	3.72	-0.11
11,277.8	91.25	180.80	9,777.8	-1,150.2	242.5	1,162.2	1.15	1.06	-0.43
TGT 2 (Gem 36 State Com #201H)									
11,348.0	92.00	180.50	9,775.9	-1,220.4	241.7	1,232.2	1.15	1.06	-0.43
11,442.0	89.30	180.90	9,774.8	-1,314.4	240.6	1,326.0	2.90	-2.87	0.43
11,537.0	88.40	180.90	9,776.7	-1,409.4	239.1	1,420.7	0.95	-0.95	0.00
11,631.0	86.40	180.90	9,781.0	-1,503.2	237.6	1,514.4	2.13	-2.13	0.00
11,724.0	91.10	181.20	9,783.0	-1,596.2	235.9	1,607.0	5.06	5.05	0.32
11,819.0	91.90	180.90	9,780.5	-1,691.1	234.2	1,701.7	0.90	0.84	-0.32
11,912.0	88.80	180.50	9,779.9	-1,784.1	233.0	1,794.5	3.36	-3.33	-0.43
12,005.0	88.00	180.50	9,782.5	-1,877.1	232.2	1,887.3	0.86	-0.86	0.00
12,099.0	86.40	179.60	9,787.1	-1,971.0	232.1	1,981.0	1.95	-1.70	-0.96
12,193.0	86.40	180.20	9,793.0	-2,064.8	232.3	2,074.7	0.64	0.00	0.64
12,286.0	85.60	179.60	9,799.5	-2,157.5	232.5	2,167.3	1.07	-0.86	-0.65
12,317.0	85.86	179.05	9,801.8	-2,188.4	232.8	2,198.2	1.97	0.84	-1.79
TGT 3 (Gem 36 State Com #201H)									

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Well:	#201H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
12,381.0	86.40	177.90	9,806.1	-2,252.3	234.5	2,262.0	1.97	0.84	-1.79	
12,475.0	88.40	178.60	9,810.4	-2,346.1	237.4	2,355.9	2.25	2.13	0.74	
12,570.0	87.50	178.00	9,813.8	-2,441.0	240.2	2,450.8	1.14	-0.95	-0.63	
12,664.0	89.00	177.70	9,816.7	-2,534.9	243.7	2,544.7	1.63	1.60	-0.32	
12,758.0	90.60	177.20	9,817.0	-2,628.8	247.9	2,638.7	1.78	1.70	-0.53	
12,852.0	90.00	176.60	9,816.5	-2,722.7	253.0	2,732.7	0.90	-0.64	-0.64	
12,945.0	91.00	176.30	9,815.7	-2,815.5	258.8	2,825.7	1.12	1.08	-0.32	
13,040.0	89.60	177.20	9,815.2	-2,910.3	264.1	2,920.7	1.75	-1.47	0.95	
13,133.0	89.70	177.20	9,815.8	-3,003.2	268.7	3,013.7	0.11	0.11	0.00	
13,227.0	87.80	176.60	9,817.8	-3,097.1	273.8	3,107.6	2.12	-2.02	-0.64	
13,321.0	88.50	176.60	9,820.8	-3,190.9	279.3	3,201.6	0.74	0.74	0.00	
13,416.0	89.00	176.60	9,822.9	-3,285.7	285.0	3,296.6	0.53	0.53	0.00	
13,424.8	88.85	176.98	9,823.1	-3,294.5	285.5	3,305.4	4.68	-1.71	4.36	
TGT 4 (Gem 36 State Com #201H)										
13,510.0	87.40	180.70	9,825.9	-3,379.6	287.2	3,390.5	4.68	-1.70	4.36	
13,604.0	90.70	181.40	9,827.4	-3,473.5	285.5	3,484.2	3.59	3.51	0.74	
13,698.0	91.20	181.00	9,825.9	-3,567.5	283.5	3,577.9	0.68	0.53	-0.43	
13,792.0	92.80	180.90	9,822.6	-3,661.4	281.9	3,671.5	1.71	1.70	-0.11	
13,886.0	93.60	181.60	9,817.3	-3,755.2	279.9	3,765.1	1.13	0.85	0.74	
13,980.0	92.40	180.50	9,812.4	-3,849.1	278.2	3,858.7	1.73	-1.28	-1.17	
14,073.0	89.70	180.00	9,810.7	-3,942.1	277.8	3,951.5	2.95	-2.90	-0.54	
14,167.0	87.90	179.50	9,812.7	-4,036.0	278.2	4,045.3	1.89	-1.91	-0.53	
14,261.0	88.50	179.10	9,815.6	-4,130.0	279.3	4,139.2	0.77	0.64	-0.43	
14,356.0	87.60	178.40	9,818.9	-4,224.9	281.4	4,234.1	1.20	-0.95	-0.74	
14,449.0	91.50	178.90	9,819.6	-4,317.9	283.6	4,327.0	4.23	4.19	0.54	
14,543.0	92.00	178.20	9,816.7	-4,411.8	286.0	4,420.9	0.91	0.53	-0.74	
14,622.0	92.00	177.70	9,814.0	-4,490.7	288.8	4,499.9	0.63	0.00	-0.63	
Final MWD Survey (MD=14622.0')										
14,678.0	92.00	177.70	9,812.0	-4,546.6	291.0	4,555.8	0.00	0.00	0.00	
Final Projection to Bit (MD=14678.0') - PBHL (Gem 36 State Com #201H)										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
9,696.5	9,609.8	396.0	171.9	50' HL Crossing, MD:9696.5', TVD:9609.8', N/S:396.0', E/W:171.9', INC:44.43	
14,622.0	9,814.0	-4,490.7	288.8	Final MWD Survey (MD=14622.0')	
14,678.0	9,812.0	-4,546.6	291.0	Final Projection to Bit (MD=14678.0')	

Checked By: _____ Approved By: _____ Date: _____



Lea County, NM (NAD 83 NME)

Gem 36 State Com #201H

Plan #2

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: #201H

KB = 25 @ 3451.0ust
Northing 398146.00 Easting 781055.00
Latitude 32° 5' 33.343 N Longitude 103° 37' 25.453 W

To convert a Magnetic Direction to a Grid Direction, Add 0.42°
To convert a Magnetic Direction to a True Direction, Add 0.80° East
To convert a True Direction to a Grid Direction, Subtract 0.38°

SECTION DETAILS

Sec	MD	Inc	Adj	TVD	+W-S	+E-W	Diag	TFace	VFace	Target	Annotation
1	7948.0	2.27	201.88	7964.0	686.7	107.0	0.00	0.00	-578.1		
2	7482.4	0.00	0.00	7417.4	686.8	108.1	2.00	150.00	-578.1		
3	9197.0	0.00	0.00	9152.0	686.8	108.1	0.00	0.00	-578.1		
4	10091.3	83.43	170.24	9724.9	67.5	202.3	10.00	170.34	-6.1		
5	10223.0	88.43	178.81	9727.2	-115.0	223.0	4.00	90.02	223.0		
6	10803.4	83.43	179.51	9730.0	-473.3	225.4	0.00	0.00	500.0		
7	10817.8	83.16	179.51	9730.2	-487.5	225.5	2.00	178.31	614.1		TOT 1 (Gem 36 State Com #201H)
8	11279.3	83.16	179.51	9740.0	-1149.1	231.1	0.00	0.00	1170.0		TOT 2 (Gem 36 State Com #201H)
9	11294.4	83.45	179.51	9740.2	-1164.2	231.3	2.00	-0.01	1188.1		TOT 3 (Gem 36 State Com #201H)
10	12322.2	83.45	179.51	9750.0	-2191.8	240.0	0.00	0.00	2254.0		TOT 4 (Gem 36 State Com #201H)
11	12323.8	83.45	179.51	9750.0	-2193.3	240.0	2.00	0.00	2256.4		
12	13427.8	83.45	179.51	9750.0	-3237.3	248.4	0.00	0.00	3300.0		
13	13430.8	83.54	179.51	9750.0	-3250.3	248.4	2.00	0.00	3303.2		
14	14477.4	83.54	179.51	9770.0	-4547.5	250.0	0.00	0.00	4533.2		PEHL (Gem 36 State Com #201H)

CASING DETAILS

No casing data is available

WELLBORE TARGET DETAILS (MAP COORDINATES)

Name	TVD	+W-S	+E-W	Northing	Easting
TOT 1 (Gem 36 State Com #201H)	9730.0	-474.3	225.4	397873.70	781310.20
TOT 2 (Gem 36 State Com #201H)	9740.0	-1149.1	231.1	398098.80	781318.12
TOT 3 (Gem 36 State Com #201H)	9750.0	-2191.8	240.0	398394.10	781324.98
TOT 4 (Gem 36 State Com #201H)	9760.0	-3237.3	248.4	398645.70	781334.38
PEHL (Gem 36 State Com #201H)	9770.0	-4547.5	250.0	398939.00	781345.00
FTP (Gem 36 State Com #201H)	9728.0	621.0	218.0	398587.00	781304.00
KDP (Gem 36 State Com #201H)	9183.0	671.0	83.0	398717.00	781174.00

