

EOG RESOURCES, INC.  
ANTIETAM 9 FED NO. 701H

30-025-42915

1. GEOLOGIC NAME OF SURFACE FORMATION:

Permian

2. ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:

Rustler	1,103'
Top of Salt	1,468'
Base of Salt / Top Anhydrite	5,018'
Lamar	5,018'
Bell Canyon	5,053'
Cherry Canyon	6,128'
Brushy Canyon	7,618'
Bone Spring Lime	9,198'
1 <sup>st</sup> Bone Spring Sand	10,158'
2 <sup>nd</sup> Bone Spring Lime	10,383'
2 <sup>nd</sup> Bone Spring Sand	10,748'
3 <sup>rd</sup> Bone Spring Carb	11,218'
3 <sup>rd</sup> Bone Spring Sand	11,878'
Wolfcamp	12,328'
TD	12,430'

3. ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:

Upper Permian Sands	0- 400'	Fresh Water
Cherry Canyon	6,128'	Oil
Brushy Canyon	7,618'	Oil
1 <sup>st</sup> Bone Spring Sand	10,158'	Oil
2 <sup>nd</sup> Bone Spring Lime	10,383'	Oil
2 <sup>nd</sup> Bone Spring Sand	10,748'	Oil
3 <sup>rd</sup> Bone Spring Carb	11,218'	Oil
3 <sup>rd</sup> Bone Spring Sand	11,878'	Oil
Wolfcamp	12,328'	Oil

No other Formations are expected to give up oil, gas or fresh water in measurable quantities. Surface fresh water sands will be protected by setting 13.375" casing at 1,190' and circulating cement back to surface.

JAN 25 2018

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**4. CASING PROGRAM - NEW**

Hole Size	Interval	Csg OD	Weight	Grade	Conn	DF <sub>min</sub> Collapse	DF <sub>min</sub> Burst	DF <sub>min</sub> Tension
17.5"	0 - 1,190'	13.375"	54.5#	J55	STC	1.125	1.25	1.60
12.25"	0-4,000'	9.625"	40#	J55	LTC	1.125	1.25	1.60
12.25"	4,000' - 5,040'	9.625"	40#	HCK55	LTC	1.125	1.25	1.60
8.75"	0'-17,240'	5.5"	17#	HCP-110	BTC	1.125	1.25	1.60

**Cementing Program:**

Depth	No. Sacks	Wt. ppg	Yld Ft <sup>3</sup> /ft	Mix Water Gal/sk	Slurry Description
13-3/8" 1,190'	700	13.5	1.73	9.13	Class C + 4.0% Bentonite + 0.6% CD-32 + 0.5% CaCl <sub>2</sub> + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	300	14.8	1.34	6.34	Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate
9-5/8" 5,040'	1000	12.7	2.22	12.38	Lead: Class 'C' + 1.50% R-3 + 0.25 lb/sk Cello-Flake + 2.0% Sodium Metasilicate + 10% Salt + 0.005 lb/sk Static Free (TOC @ surface)
	200	14.8	1.32	6.33	Tail: Class 'C' + 0.25 lb/sk Cello Flake + 0.005 lb/sk Static Free
5-1/2" 17,240'	775	9.0	2.79	10.12	Lead: LiteCRETE + 0.10% D-065 + 0.20% D-046 + 0.40% D-167 + 0.20% D-198 + 0.04% D-208 + 2.0% D-174 (TOC @ 4,540')
	2100	14.4	1.28	5.69	Tail: Class H + 47.01 pps D-909 + 37.01 pps + 5.0% D-020 + 0.30% D-013 + 0.20% D-046 + 0.10% D-065 + 0.50% D-167 + 2.0% D-174

Note: Cement volumes based on bit size plus at least 25% excess in the open hole plus 10% excess in the cased-hole overlap section.

**5. MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL:**

*See  
COA*

Variance is requested to use a co-flex line between the BOP and choke manifold (instead of using a 4" OD steel line).

The minimum blowout preventer equipment (BOPE) shown in Exhibit #1 will consist of a single ram, mud cross and double ram-type (10,000 psi WP) preventer and an annular preventer (5000-psi WP). Both units will be hydraulically operated and the ram-type will be equipped with blind rams on bottom and drill pipe rams on top. All BOPE will be tested in accordance with Onshore Oil & Gas order No. 2.

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Before drilling out of the surface casing, the ram-type BOP and accessory equipment will be tested to 5000/ 250 psig and the annular preventer to 5000/ 250 psig. The surface casing will be tested to 1500 psi for 30 minutes.

Before drilling out of the intermediate casing, the ram-type BOP and accessory equipment will be tested to 5000/ 250 psig and the annular preventer to 5000/ 250 psig. The intermediate casing will be tested to 2000 psi for 30 minutes.

Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

A hydraulically operated choke will be installed prior to drilling out of the intermediate casing shoe.

**6. TYPES AND CHARACTERISTICS OF THE PROPOSED MUD SYSTEM:**

During this procedure we plan to use a Closed-Loop System and haul contents to the required disposal.

The applicable depths and properties of the drilling fluid systems are as follows.

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0 – 1,190'	Fresh - Gel	8.6-8.8	28-34	N/c
1,190' – 5,040'	Oil Base	8.7-9.4	58-68	N/c - 6
5,040' – 11,951'	Oil Base	8.7-9.4	58-68	N/c - 6
11,951' – 17,240' Lateral	Oil Base	10.0-10.5	58-68	N/c - 6

An electronic pit volume totalizer (PVT) will be utilized on the circulating system, to monitor pit volume, flow rate, pump pressure and stroke rate.

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept at the wellsite at all times.



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**7. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT:**

- (A) A kelly cock will be kept in the drill string at all times.
- (B) A full opening drill pipe-stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times.
- (C) H<sub>2</sub>S monitoring and detection equipment will be utilized from surface casing point to TD.

**8. LOGGING, TESTING AND CORING PROGRAM:**

Open-hole logs are not planned for this well.

GR-CCL Will be run in cased hole during completions phase of operations.

**9. ABNORMAL CONDITIONS, PRESSURES, TEMPERATURES AND POTENTIAL HAZARDS:**

See COA  
The estimated bottom-hole temperature (BHT) at TD is 181 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 5382 psig. No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported or are known to exist at this depth in this area. No major loss circulation zones have been reported in offsetting wells.

**10. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS:**

The drilling operation should be finished in approximately one month. If the well is productive, an additional 60-90 days will be required for completion and testing before a decision is made to install permanent facilities.

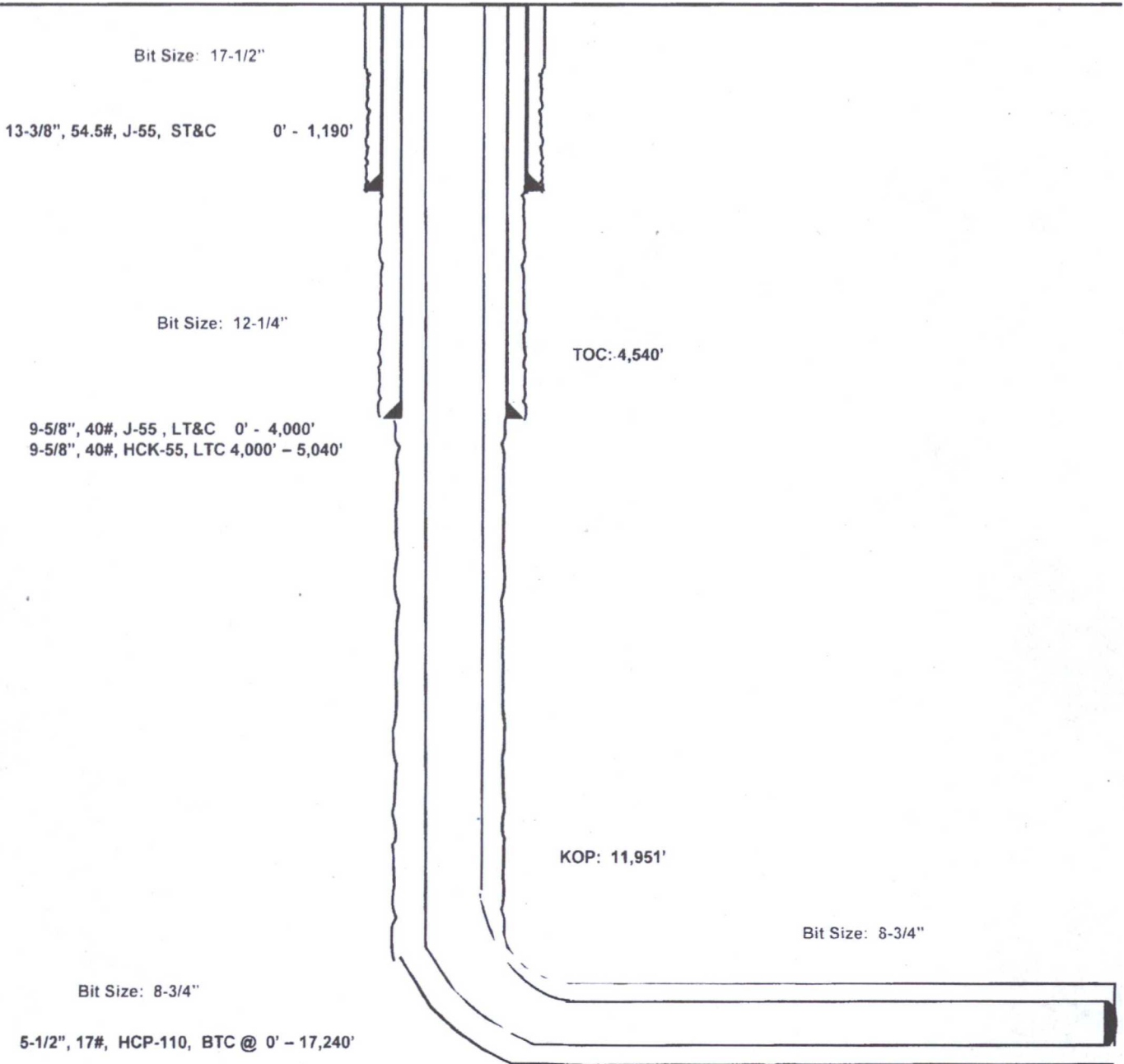
- (A) EOG Resources requests the option to contract a Surface Rig to drill, set surface casing, and cement on the subject well. If the timing between rigs is such that EOG Resources would not be able to preset the surface, the Primary Rig will MIRU and drill the well in its entirety per the APD.

Antietam 9 Fed #701H

Lea County, New Mexico  
Proposed Wellbore  
Revised 11/6/15  
API: 30-025-42915

220' FSL  
685' FEL  
Section 9  
T-25-S, R-33-E

KB: 3,318'  
GL: 3,393'



Lateral: 17,240' MD, 12,430' TVD  
Upper Most Perf:  
330' FSL & 330' FEL Sec. 9  
Lower Most Perf:  
330' FNL & 330' FEL Sec. 9  
BH Location: 230' FNL & 330' FEL  
Section 9  
T-25-S, R-33-E



Lea County, NM (NAD 27 NME)

Antietam 9 Fed #701H

Precision #612

Plan #0.1

PROJECT DETAILS: Lea County, NM (NAD 27 NME)

Geodetic System: US State Plane 1927 (Exact solution)  
Datum: NAD 1927 (NADCON CONUS)  
Fillipsoid: Clarke 1866  
Zone: New Mexico East 3001  
System Datum: Mean Sea Level

WELL DETAILS: #701H

Ground Level: 3393.0  
KB = 25 @ 3418.0usR (Precision #612)  
Northing: 414873.00 Easting: 736116.00 32° 8' 17.894 N 103° 34' 13.886 W

Azimuths to Grid North  
True North: -0.41°  
Magnetic North: 8.87°  
Magnetic Field  
Strength: 48005.5nT  
Dip Angle: 60.00°  
Date: 4/23/2016  
Model: IGRF2015

To convert a Magnetic Direction to a Grid Direction: Add 6.67°  
To convert a Magnetic Direction to a True Direction: Add 7.07° East  
To convert a True Direction to a Grid Direction: Subtract 0.41°

#### SECTION DETAILS

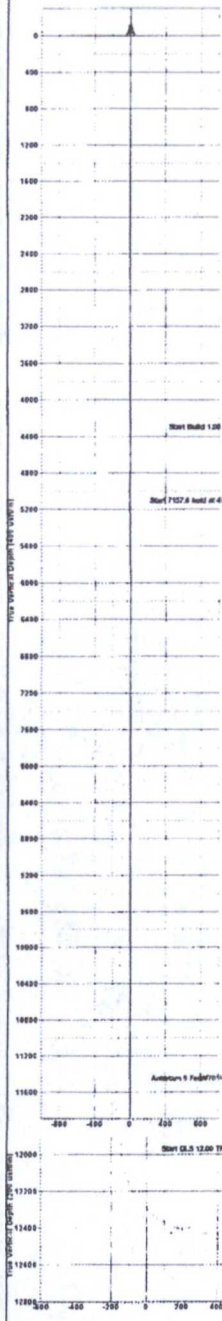
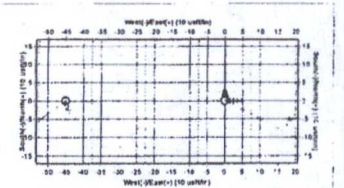
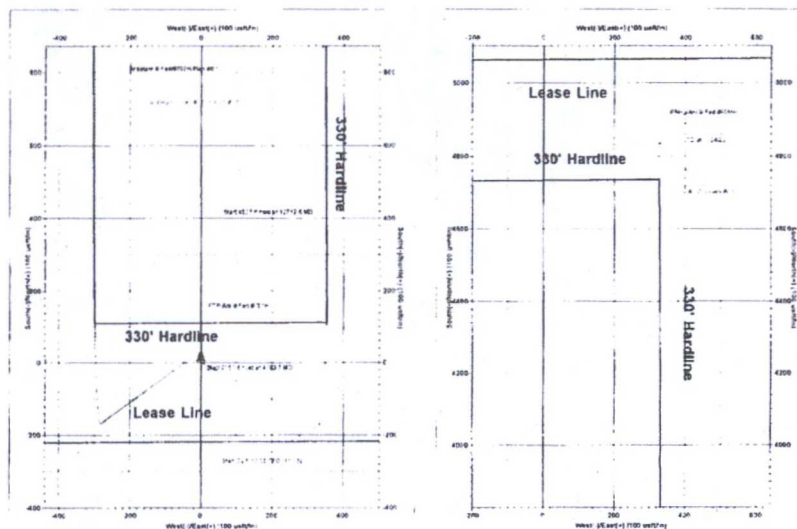
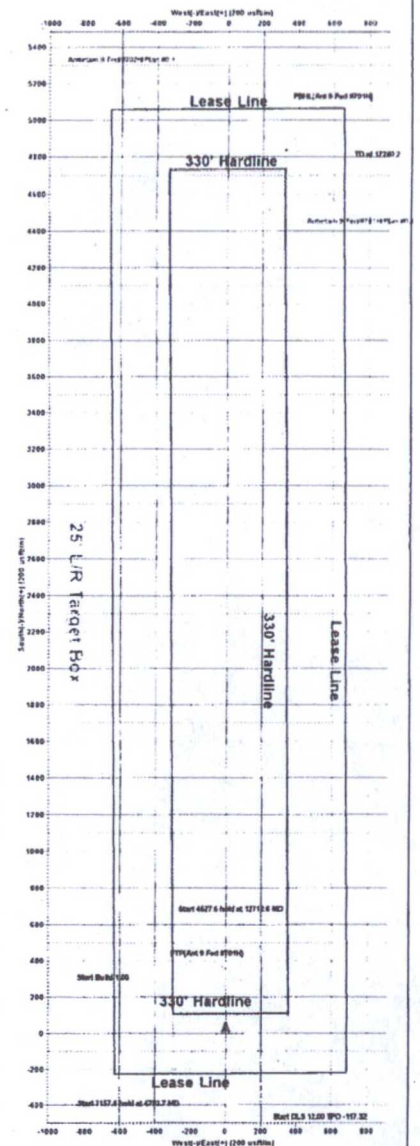
Seq	MD	Inc	Asp	TVD	+N-S	+E-W	Deg	TFace	VFace	Target	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0		
2	4500.0	0.00	0.00	4500.0	0.0	0.0	0.00	0.00	0.0		
3	4793.7	2.94	117.01	4793.6	-3.4	6.7	1.00	117.01	2.0		
4	11951.3	2.84	117.01	11941.8	-17.0	33.4	0.00	0.00	-147.2		
5	12712.6	90.00	358.66	12630.0	307.5	352.6	12.00	-117.27	330.8		
6	17240.2	90.00	358.66	12630.0	4835.0	326.0	0.00	0.00	4846.0		PBL(Ant 9 Fed #701H)

#### CASING DETAILS

No casing data is available

#### WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N-S	+E-W	Northing	Easting
PBL(Ant 9 Fed #701H)	12430.0	4235.0	326.0	418708.00	736442.00
FTP(Ant 9 Fed #701H)					







## **EOG Resources - Midland**

Lea County, NM (NAD 27 NME)

Antietam 9 Fed

#701H

OH

Plan: Plan #0.1

## **Standard Planning Report**

09 November, 2015



# EOG Resources, Inc.

## Planning Report

Database: EDM 5000.1 Single User Db  
Company: EOG Resources - Midland  
Project: Lea County, NM (NAD 27 NME)  
Site: Antietam 9 Fed  
Well: #701H  
Wellbore: OH  
Design: Plan #0.1

Local Co-ordinate Reference: Well #701H  
TVD Reference: KB = 25 @ 3418.0usft (Precision #612)  
MD Reference: KB = 25 @ 3418.0usft (Precision #612)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

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	Antietam 9 Fed				
Site Position:		Northing:	414,873.00 usft	Latitude:	32° 8' 17.894 N
From:	Map	Easting:	736,116.00 usft	Longitude:	103° 34' 13.866 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.41°

Well	#701H					
Well Position	+N/-S	0.0 usft	Northing:	414,873.00 usft	Latitude:	32° 8' 17.894 N
	+E/-W	0.0 usft	Easting:	736,116.00 usft	Longitude:	103° 34' 13.866 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,393.0 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	4/23/2016	7.07	60.00	48,006

Design	Plan #0.1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	3.86	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,793.7	2.94	117.01	4,793.6	-3.4	6.7	1.00	1.00	0.00	117.01	
11,951.3	2.94	117.01	11,941.8	-170.0	333.4	0.00	0.00	0.00	0.00	
12,712.6	90.00	359.66	12,430.0	307.5	352.8	12.00	11.44	-15.42	-117.32	
17,240.2	90.00	359.66	12,430.0	4,835.0	326.0	0.00	0.00	0.00	0.00	PBHL(Ant 9 Fed #701)





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Local Co-ordinate Reference: Well #701H  
 TVD Reference: KB = 25 @ 3418.0usft (Precision #612)  
 MD Reference: KB = 25 @ 3418.0usft (Precision #612)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

### Planned 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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	1.00	117.01	4,600.0	-0.4	0.8	-0.3	1.00	1.00	0.00
4,700.0	2.00	117.01	4,700.0	-1.6	3.1	-1.4	1.00	1.00	0.00
4,793.7	2.94	117.01	4,793.6	-3.4	6.7	-3.0	1.00	1.00	0.00
4,800.0	2.94	117.01	4,799.9	-3.6	7.0	-3.1	0.00	0.00	0.00
4,900.0	2.94	117.01	4,899.7	-5.9	11.6	-5.1	0.00	0.00	0.00
5,000.0	2.94	117.01	4,999.6	-8.2	16.1	-7.1	0.00	0.00	0.00
5,100.0	2.94	117.01	5,099.5	-10.5	20.7	-9.1	0.00	0.00	0.00
5,200.0	2.94	117.01	5,199.3	-12.9	25.3	-11.1	0.00	0.00	0.00



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## Planning Report

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Wellbore: OH  
Design: Plan #0.1

Local Co-ordinate Reference: Well #701H  
TVD Reference: KB = 25 @ 3418.0usft (Precision #612)  
MD Reference: KB = 25 @ 3418.0usft (Precision #612)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

### Planned 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)
5,300.0	2.94	117.01	5,299.2	-15.2	29.8	-13.2	0.00	0.00	0.00
5,400.0	2.94	117.01	5,399.1	-17.5	34.4	-15.2	0.00	0.00	0.00
5,500.0	2.94	117.01	5,498.9	-19.9	38.9	-17.2	0.00	0.00	0.00
5,600.0	2.94	117.01	5,598.8	-22.2	43.5	-19.2	0.00	0.00	0.00
5,700.0	2.94	117.01	5,698.7	-24.5	48.1	-21.2	0.00	0.00	0.00
5,800.0	2.94	117.01	5,798.5	-26.8	52.6	-23.2	0.00	0.00	0.00
5,900.0	2.94	117.01	5,898.4	-29.2	57.2	-25.2	0.00	0.00	0.00
6,000.0	2.94	117.01	5,998.3	-31.5	61.8	-27.3	0.00	0.00	0.00
6,100.0	2.94	117.01	6,098.2	-33.8	66.3	-29.3	0.00	0.00	0.00
6,200.0	2.94	117.01	6,198.0	-36.1	70.9	-31.3	0.00	0.00	0.00
6,300.0	2.94	117.01	6,297.9	-38.5	75.5	-33.3	0.00	0.00	0.00
6,400.0	2.94	117.01	6,397.8	-40.8	80.0	-35.3	0.00	0.00	0.00
6,500.0	2.94	117.01	6,497.6	-43.1	84.6	-37.3	0.00	0.00	0.00
6,600.0	2.94	117.01	6,597.5	-45.5	89.2	-39.4	0.00	0.00	0.00
6,700.0	2.94	117.01	6,697.4	-47.8	93.7	-41.4	0.00	0.00	0.00
6,800.0	2.94	117.01	6,797.2	-50.1	98.3	-43.4	0.00	0.00	0.00
6,900.0	2.94	117.01	6,897.1	-52.4	102.9	-45.4	0.00	0.00	0.00
7,000.0	2.94	117.01	6,997.0	-54.8	107.4	-47.4	0.00	0.00	0.00
7,100.0	2.94	117.01	7,096.8	-57.1	112.0	-49.4	0.00	0.00	0.00
7,200.0	2.94	117.01	7,196.7	-59.4	116.5	-51.4	0.00	0.00	0.00
7,300.0	2.94	117.01	7,296.6	-61.7	121.1	-53.5	0.00	0.00	0.00
7,400.0	2.94	117.01	7,396.4	-64.1	125.7	-55.5	0.00	0.00	0.00
7,500.0	2.94	117.01	7,496.3	-66.4	130.2	-57.5	0.00	0.00	0.00
7,600.0	2.94	117.01	7,596.2	-68.7	134.8	-59.5	0.00	0.00	0.00
7,700.0	2.94	117.01	7,696.1	-71.0	139.4	-61.5	0.00	0.00	0.00
7,800.0	2.94	117.01	7,795.9	-73.4	143.9	-63.5	0.00	0.00	0.00
7,900.0	2.94	117.01	7,895.8	-75.7	148.5	-65.5	0.00	0.00	0.00
8,000.0	2.94	117.01	7,995.7	-78.0	153.1	-67.6	0.00	0.00	0.00
8,100.0	2.94	117.01	8,095.5	-80.4	157.6	-69.6	0.00	0.00	0.00
8,200.0	2.94	117.01	8,195.4	-82.7	162.2	-71.6	0.00	0.00	0.00
8,300.0	2.94	117.01	8,295.3	-85.0	166.8	-73.6	0.00	0.00	0.00
8,400.0	2.94	117.01	8,395.1	-87.3	171.3	-75.6	0.00	0.00	0.00
8,500.0	2.94	117.01	8,495.0	-89.7	175.9	-77.6	0.00	0.00	0.00
8,600.0	2.94	117.01	8,594.9	-92.0	180.4	-79.6	0.00	0.00	0.00
8,700.0	2.94	117.01	8,694.7	-94.3	185.0	-81.7	0.00	0.00	0.00
8,800.0	2.94	117.01	8,794.6	-96.6	189.6	-83.7	0.00	0.00	0.00
8,900.0	2.94	117.01	8,894.5	-99.0	194.1	-85.7	0.00	0.00	0.00
9,000.0	2.94	117.01	8,994.3	-101.3	198.7	-87.7	0.00	0.00	0.00
9,100.0	2.94	117.01	9,094.2	-103.6	203.3	-89.7	0.00	0.00	0.00
9,200.0	2.94	117.01	9,194.1	-106.0	207.8	-91.7	0.00	0.00	0.00
9,300.0	2.94	117.01	9,294.0	-108.3	212.4	-93.7	0.00	0.00	0.00
9,400.0	2.94	117.01	9,393.8	-110.6	217.0	-95.8	0.00	0.00	0.00
9,500.0	2.94	117.01	9,493.7	-112.9	221.5	-97.8	0.00	0.00	0.00
9,600.0	2.94	117.01	9,593.6	-115.3	226.1	-99.8	0.00	0.00	0.00
9,700.0	2.94	117.01	9,693.4	-117.6	230.7	-101.8	0.00	0.00	0.00
9,800.0	2.94	117.01	9,793.3	-119.9	235.2	-103.8	0.00	0.00	0.00
9,900.0	2.94	117.01	9,893.2	-122.2	239.8	-105.8	0.00	0.00	0.00
10,000.0	2.94	117.01	9,993.0	-124.6	244.4	-107.8	0.00	0.00	0.00
10,100.0	2.94	117.01	10,092.9	-126.9	248.9	-109.9	0.00	0.00	0.00
10,200.0	2.94	117.01	10,192.8	-129.2	253.5	-111.9	0.00	0.00	0.00
10,300.0	2.94	117.01	10,292.6	-131.5	258.0	-113.9	0.00	0.00	0.00
10,400.0	2.94	117.01	10,392.5	-133.9	262.6	-115.9	0.00	0.00	0.00
10,500.0	2.94	117.01	10,492.4	-136.2	267.2	-117.9	0.00	0.00	0.00
10,600.0	2.94	117.01	10,592.2	-138.5	271.7	-119.9	0.00	0.00	0.00





# EOG Resources, Inc.

## Planning Report

Database: EDM 5000.1 Single User Db  
 Company: EOG Resources - Midland  
 Project: Lea County, NM (NAD 27 NME)  
 Site: Antietam 9 Fed  
 Well: #701H  
 Wellbore: OH  
 Design: Plan #0.1

Local Co-ordinate Reference: Well #701H  
 TVD Reference: KB = 25 @ 3418 0usft (Precision #612)  
 MD Reference: KB = 25 @ 3418 0usft (Precision #612)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

### Planned 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)
10.700.0	2.94	117.01	10.692.1	-140.9	276.3	-122.0	0.00	0.00	0.00
10.800.0	2.94	117.01	10.792.0	-143.2	280.9	-124.0	0.00	0.00	0.00
10.900.0	2.94	117.01	10.891.9	-145.5	285.4	-126.0	0.00	0.00	0.00
11.000.0	2.94	117.01	10.991.7	-147.8	290.0	-128.0	0.00	0.00	0.00
11.100.0	2.94	117.01	11.091.6	-150.2	294.6	-130.0	0.00	0.00	0.00
11.200.0	2.94	117.01	11.191.5	-152.5	299.1	-132.0	0.00	0.00	0.00
11.300.0	2.94	117.01	11.291.3	-154.8	303.7	-134.0	0.00	0.00	0.00
11.400.0	2.94	117.01	11.391.2	-157.1	308.3	-136.1	0.00	0.00	0.00
11.500.0	2.94	117.01	11.491.1	-159.5	312.8	-138.1	0.00	0.00	0.00
11.600.0	2.94	117.01	11.590.9	-161.8	317.4	-140.1	0.00	0.00	0.00
11.700.0	2.94	117.01	11.690.8	-164.1	322.0	-142.1	0.00	0.00	0.00
11.800.0	2.94	117.01	11.790.7	-166.5	326.5	-144.1	0.00	0.00	0.00
11.900.0	2.94	117.01	11.890.5	-168.8	331.1	-146.1	0.00	0.00	0.00
11.951.3	2.94	117.01	11.941.8	-170.0	333.4	-147.2	0.00	0.00	0.00
11.975.0	3.00	59.89	11.965.4	-169.9	334.5	-147.1	12.00	0.29	-241.33
12.000.0	5.19	29.75	11.990.4	-168.6	335.6	-145.7	12.00	8.75	-120.56
12.025.0	7.93	18.75	12.015.2	-166.0	336.7	-143.0	12.00	10.95	-43.99
12.050.0	10.81	13.47	12.039.9	-162.1	337.8	-139.0	12.00	11.51	-21.14
12.075.0	13.74	10.40	12.064.3	-156.9	338.9	-133.7	12.00	11.72	-12.27
12.100.0	16.69	8.40	12.088.4	-150.4	340.0	-127.2	12.00	11.82	-8.01
12.125.0	19.66	6.99	12.112.2	-142.7	341.0	-119.4	12.00	11.87	-5.65
12.150.0	22.63	5.93	12.135.5	-133.7	342.0	-110.4	12.00	11.90	-4.22
12.175.0	25.62	5.11	12.158.3	-123.6	343.0	-100.2	12.00	11.93	-3.28
12.200.0	28.60	4.45	12.180.6	-112.2	344.0	-88.8	12.00	11.94	-2.64
12.225.0	31.59	3.91	12.202.2	-99.7	344.9	-76.3	12.00	11.95	-2.18
12.250.0	34.58	3.45	12.223.1	-86.1	345.7	-62.6	12.00	11.96	-1.84
12.275.0	37.57	3.06	12.243.3	-71.4	346.6	-47.9	12.00	11.96	-1.58
12.300.0	40.56	2.71	12.262.7	-55.7	347.4	-32.2	12.00	11.97	-1.38
12.325.0	43.55	2.41	12.281.3	-38.9	348.1	-15.4	12.00	11.97	-1.22
12.350.0	46.55	2.13	12.299.0	-21.3	348.8	2.2	12.00	11.98	-1.09
12.375.0	49.54	1.89	12.315.7	-2.7	349.5	20.8	12.00	11.98	-0.99
12.400.0	52.54	1.66	12.331.4	16.7	350.1	40.3	12.00	11.98	-0.90
12.425.0	55.53	1.45	12.346.1	37.0	350.6	60.5	12.00	11.98	-0.83
12.450.0	58.53	1.26	12.359.7	57.9	351.1	81.4	12.00	11.98	-0.78
12.475.0	61.52	1.08	12.372.2	79.6	351.6	103.0	12.00	11.98	-0.73
12.500.0	64.52	0.90	12.383.5	101.9	351.9	125.3	12.00	11.98	-0.69
12.525.0	67.52	0.74	12.393.7	124.7	352.3	148.1	12.00	11.99	-0.65
12.526.2	67.66	0.73	12.394.1	125.8	352.3	149.2	12.00	11.99	-0.64
FTP(Ant 9 Fed #701H)									
12.550.0	70.51	0.58	12.402.6	148.0	352.5	171.4	12.00	11.99	-0.63
12.575.0	73.51	0.43	12.410.3	171.8	352.7	195.1	12.00	11.99	-0.60
12.600.0	76.51	0.29	12.416.8	195.9	352.9	219.2	12.00	11.99	-0.59
12.625.0	79.50	0.14	12.422.0	220.4	353.0	243.6	12.00	11.99	-0.57
12.650.0	82.50	0.00	12.425.9	245.1	353.0	268.3	12.00	11.99	-0.56
12.675.0	85.50	359.87	12.428.5	269.9	353.0	293.1	12.00	11.99	-0.55
12.700.0	88.49	359.73	12.429.8	294.9	352.9	318.0	12.00	11.99	-0.55
12.712.6	90.00	359.66	12.430.0	307.5	352.8	330.5	12.00	11.99	-0.55
12.800.0	90.00	359.66	12.430.0	394.9	352.3	417.7	0.00	0.00	0.00
12.900.0	90.00	359.66	12.430.0	494.9	351.7	517.4	0.00	0.00	0.00
13.000.0	90.00	359.66	12.430.0	594.9	351.1	617.2	0.00	0.00	0.00
13.100.0	90.00	359.66	12.430.0	694.9	350.5	716.9	0.00	0.00	0.00
13.200.0	90.00	359.66	12.430.0	794.9	350.0	816.6	0.00	0.00	0.00
13.300.0	90.00	359.66	12.430.0	894.9	349.4	916.4	0.00	0.00	0.00





# EOG Resources, Inc.

## Planning Report

Database: EDM 5000.1 Single User Db  
 Company: EOG Resources - Midland  
 Project: Lea County, NM (NAD 27 NME)  
 Site: Antietam 9 Fed  
 Well: #701H  
 Wellbore: OH  
 Design: Plan #0.1

Local Co-ordinate Reference: Well #701H  
 TVD Reference: KB = 25 @ 3418.0usft (Precision #612)  
 MD Reference: KB = 25 @ 3418.0usft (Precision #612)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

### Planned 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)
13.400.0	90.00	359.66	12,430.0	994.9	348.8	1,016.1	0.00	0.00	0.00
13.500.0	90.00	359.66	12,430.0	1,094.9	348.2	1,115.8	0.00	0.00	0.00
13.600.0	90.00	359.66	12,430.0	1,194.9	347.6	1,215.6	0.00	0.00	0.00
13.700.0	90.00	359.66	12,430.0	1,294.9	347.0	1,315.3	0.00	0.00	0.00
13.800.0	90.00	359.66	12,430.0	1,394.9	346.4	1,415.0	0.00	0.00	0.00
13.900.0	90.00	359.66	12,430.0	1,494.9	345.8	1,514.8	0.00	0.00	0.00
14.000.0	90.00	359.66	12,430.0	1,594.9	345.2	1,614.5	0.00	0.00	0.00
14.100.0	90.00	359.66	12,430.0	1,694.9	344.6	1,714.2	0.00	0.00	0.00
14.200.0	90.00	359.66	12,430.0	1,794.9	344.0	1,814.0	0.00	0.00	0.00
14.300.0	90.00	359.66	12,430.0	1,894.9	343.4	1,913.7	0.00	0.00	0.00
14.400.0	90.00	359.66	12,430.0	1,994.9	342.8	2,013.4	0.00	0.00	0.00
14.500.0	90.00	359.66	12,430.0	2,094.9	342.2	2,113.2	0.00	0.00	0.00
14.600.0	90.00	359.66	12,430.0	2,194.9	341.7	2,212.9	0.00	0.00	0.00
14.700.0	90.00	359.66	12,430.0	2,294.9	341.1	2,312.6	0.00	0.00	0.00
14.800.0	90.00	359.66	12,430.0	2,394.9	340.5	2,412.3	0.00	0.00	0.00
14.900.0	90.00	359.66	12,430.0	2,494.9	339.9	2,512.1	0.00	0.00	0.00
15.000.0	90.00	359.66	12,430.0	2,594.9	339.3	2,611.8	0.00	0.00	0.00
15.100.0	90.00	359.66	12,430.0	2,694.9	338.7	2,711.5	0.00	0.00	0.00
15.200.0	90.00	359.66	12,430.0	2,794.9	338.1	2,811.3	0.00	0.00	0.00
15.300.0	90.00	359.66	12,430.0	2,894.9	337.5	2,911.0	0.00	0.00	0.00
15.400.0	90.00	359.66	12,430.0	2,994.9	336.9	3,010.7	0.00	0.00	0.00
15.500.0	90.00	359.66	12,430.0	3,094.9	336.3	3,110.5	0.00	0.00	0.00
15.600.0	90.00	359.66	12,430.0	3,194.9	335.7	3,210.2	0.00	0.00	0.00
15.700.0	90.00	359.66	12,430.0	3,294.9	335.1	3,309.9	0.00	0.00	0.00
15.800.0	90.00	359.66	12,430.0	3,394.9	334.5	3,409.7	0.00	0.00	0.00
15.900.0	90.00	359.66	12,430.0	3,494.9	333.9	3,509.4	0.00	0.00	0.00
16.000.0	90.00	359.66	12,430.0	3,594.8	333.4	3,609.1	0.00	0.00	0.00
16.100.0	90.00	359.66	12,430.0	3,694.8	332.8	3,708.9	0.00	0.00	0.00
16.200.0	90.00	359.66	12,430.0	3,794.8	332.2	3,808.6	0.00	0.00	0.00
16.300.0	90.00	359.66	12,430.0	3,894.8	331.6	3,908.3	0.00	0.00	0.00
16.400.0	90.00	359.66	12,430.0	3,994.8	331.0	4,008.1	0.00	0.00	0.00
16.500.0	90.00	359.66	12,430.0	4,094.8	330.4	4,107.8	0.00	0.00	0.00
16.600.0	90.00	359.66	12,430.0	4,194.8	329.8	4,207.5	0.00	0.00	0.00
16.700.0	90.00	359.66	12,430.0	4,294.8	329.2	4,307.3	0.00	0.00	0.00
16.800.0	90.00	359.66	12,430.0	4,394.8	328.6	4,407.0	0.00	0.00	0.00
16.900.0	90.00	359.66	12,430.0	4,494.8	328.0	4,506.7	0.00	0.00	0.00
17.000.0	90.00	359.66	12,430.0	4,594.8	327.4	4,606.4	0.00	0.00	0.00
17.100.0	90.00	359.66	12,430.0	4,694.8	326.8	4,706.2	0.00	0.00	0.00
17.200.0	90.00	359.66	12,430.0	4,794.8	326.2	4,805.9	0.00	0.00	0.00
17.240.2	90.00	359.66	12,430.0	4,835.0	326.0	4,846.0	0.00	0.00	0.00

PBHL(Ant 9 Fed #701H)



# EOG Resources, Inc.

## Planning Report

**Database:** EDM 5000.1 Single User Db  
**Company:** EOG Resources - Midland  
**Project:** Lea County, NM (NAD 27 NME)  
**Site:** Antietam 9 Fed  
**Well:** #701H  
**Wellbore:** OH  
**Design:** Plan #0.1

**Local Co-ordinate Reference:** Well #701H  
**TVD Reference:** KB = 25 @ 3418.0usft (Precision #612)  
**MD Reference:** KB = 25 @ 3418.0usft (Precision #612)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

### Design Targets

Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
PBHL(Ant 9 Fed #701H)	0.00	0.00	12.430.0	4.835.0	326.0	419,708.00	736,442.00	32° 9' 5.717 N	103° 34' 9.676 W
- plan hits target center									
- Point									
FTP(Ant 9 Fed #701H)	0.00	0.00	12.430.0	112.0	354.0	414,985.00	736,470.00	32° 8' 18.978 N	103° 34' 9.740 W
- plan misses target center by 38.5usft at 12526.2usft MD (12394.1 TVD, 125.8 N, 352.3 E)									
- Point									

## PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Roadrunner Oil & Gas
LEASE NO.:	NMNM-118726
WELL NAME & NO.:	Antietam 9 Fed 701H
SURFACE HOLE FOOTAGE:	220'/S & 685'/E
BOTTOM HOLE FOOTAGE:	230'/N & 330'/E
LOCATION:	Section 9, T. 25 S., R. 33 E., NMPM
COUNTY:	Lea County, New Mexico

**The original COAs still stand with the following drilling modifications:**

### I. DRILLING

#### A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ **Lea County**

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240,  
(575) 393-3612

1. **Although there are no measured amounts of Hydrogen Sulfide reported, it is always a potential hazard. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.



4. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

## **B. CASING**

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

### **Wait on cement (WOC) for Water Basin:**

After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. **DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE.**

Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Possibility of water flows in the Salado and in the Delaware.

Possibility of lost circulation in the Red Beds, in the Rustler and in the Delaware.

Possibility of abnormal pressure when entering the 3<sup>rd</sup> Bone Spring Sandstone and all subsequent formations.

1. The **13-3/8** inch surface casing shall be set at approximately **1190** feet (**in a competent bed below the Magenta Dolomite, which is a Member of the Rustler, and if salt is encountered, set casing at least 25 feet above the salt**) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
  - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
  - d. If cement falls back, remedial cementing will be done prior to drilling out that string.

**Formation below the 13-3/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.**

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing, which shall be set at approximately **5040** feet (**in a competent bed above the Delaware Sands, which is the Lamar Limestone**), is:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

**Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.**

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.



4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

### C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M) psi. 5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**
4. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
  - b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer.**



- c. The test shall be run on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- d. The results of the test shall be reported to the appropriate BLM office.
- e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp** formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

#### **D. DRILLING MUD**

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented.

#### **E. DRILL STEM TEST**

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

#### **F. WASTE MATERIAL AND FLUIDS**

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

**JAM 011816**