

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

OCD Artesia

FORM APPROVED  
OMB NO. 1004-0137  
Expires October 31, 2014

SUNDRY NOTICES AND REPORTS ON WELLS

**Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.**

**SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		5. Lease Serial No. NMNM0438001
2. Name of Operator EOG Resources, Inc.		6. If Indian, Allottee or Tribe Name
3a. Address P.O. Box 2267 Midland, TX 79702	3b. Phone No. (include area code) 432-686-3689	7. If Unit or CA/Agreement, Name and/or No.
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) 330 FNL & 520 FWL, NWNW (D) Sec 8, T26S, R31E		8. Well Name and No. Ross Draw 8 Fed 1H
		9. API Well No. 30-015-39148-39248
		10. Field and Pool, or Exploratory Area Wildcat; Bone Spring
		11. County or Parish, State Eddy NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input checked="" type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the final site is ready for final inspection.)

EOG Resources, Inc. requests an amendment to our approved APD to reflect a change in BHL and TD.

BHL will change to 230' FSL & 380' FWL, SWSW (M), Section 8, T26S, R31E.

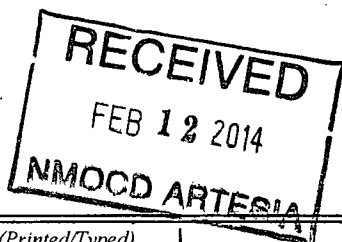
The new TD is 13208' TMD, 8350' TVD.

A new C-102, directional plan, and drill plan are attached.

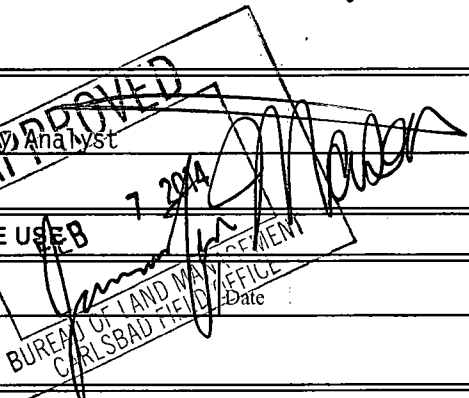
SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

Accepted for record

NMOCD TOS  
2-12-2014



14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed) Stan Wagner		Title Regulatory Analyst
Signature <i>Stan Wagner</i>		Date 10/22/2013
THIS SPACE FOR FEDERAL OR STATE OFFICE USE		
Approved by		Title Date
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office
Title 18 U.S.C. Section 1001, and Title 43 U.S.C. Section 1212, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.		



District I  
1625 N. French Dr., Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720  
District II  
811 S. First St., Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico  
Energy, Minerals & Natural Resources  
Department  
OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

FORM C-102

Revised August 1, 2011

Submit one copy to appropriate

District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

<sup>1</sup> API Number 30-015-39248	<sup>2</sup> Pool Code 96403	<sup>3</sup> Pool Name Wildcat; Bone Spring
<sup>4</sup> Property Code 38727	<sup>5</sup> Property Name ROSS DRAW 8 FED	
<sup>7</sup> OGRID No. 7377	<sup>8</sup> Operator Name EOG RESOURCES, INC.	<sup>6</sup> Well Number #1H  <sup>9</sup> Elevation 3278'

<sup>10</sup>Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	8	26-S	31-E	-	330'	NORTH	520'	WEST	EDDY

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	8	26-S	31-E	-	230'	SOUTH	380'	WEST	EDDY

<sup>12</sup> Dedicated Acres 160	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

**SURFACE LOCATION**  
NEW MEXICO EAST  
NAD 1927  
X=663111  
Y=387290  
LAT.: N 32.0636811  
LONG.: W 103.8068000

**UPPER MOST PERF.**  
NEW MEXICO EAST  
NAD 1927  
X=662968  
Y=387292  
LAT.: N 32.0636899  
LONG.: W 103.8072602

**LOWER MOST PERF.**  
NEW MEXICO EAST  
NAD 1927  
X=662983  
Y=382624  
LAT.: N 32.0508569  
LONG.: W 103.8072840

**BOTTOM HOLE LOCATION**  
NEW MEXICO EAST  
NAD 1927  
X=662984  
Y=382524  
LAT.: N 32.0505810  
LONG.: W 103.8072847

**<sup>17</sup>OPERATOR CERTIFICATION**

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

*Stan Wagner* 10/22/13  
Signature Date

Stan Wagner  
Printed Name

E-mail Address

**<sup>18</sup>SURVEYOR CERTIFICATION**

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true to the best of my belief.

9/15/2013  
Date of Survey  
Signature and Seal of Professional Surveyor

**MICHAEL B. BROWN**  
NEW MEXICO  
18329  
PROFESSIONAL SURVEYOR

Certificate Number

**EOG RESOURCES, INC.**  
**ROSS DRAW 8 FEDERAL NO. 1H**  
**REVISED 10/15/13**

**1. GEOLOGIC NAME OF SURFACE FORMATION:**

Permian

**2. ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:**

Rustler	1,365'
Top of Salt	1,750'
Base of Salt	3,780'
Lamar	3,990'
Bell Canyon	4,020'
Cherry Canyon	4,930'
Brushy Canyon	6,260'
Bone Spring Lime	7,950'
Bone Spring Sand 1	8,930'
Bone Spring 2 Carb	9,270'
TD	8,350'

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

Upper Permian Sands	0- 400'	Fresh Water
Brushy Canyon	6,260'	Oil
Bone Spring Lime	7,950'	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 1100' and circulating cement back to surface.

**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 – 1100'	13.375"	54.5#	J55	STC	1.125	1.25	1.60
12.25"	0-4000'	9.625"	40#	J55	LTC	1.125	1.25	1.60
8.75"	0'-13,203'	5.500"	17#	P110 or HCP110	LTC	1.125	1.25	1.60

**EOG RESOURCES, INC.**  
**ROSS DRAW 8 FEDERAL NO. 1H**  
**REVISED 10/15/13**

**Cementing Program:**

Depth	No. Sacks	Wt. lb/gal	Yld Ft <sup>3</sup> /ft	Slurry Description
1100'	400	13.5	1.73	Lead: 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	Tail: Class C + 0.005 pps Static Free + 2% CaCl <sub>2</sub> + 0.25 pps CelloFlake + 0.005 gps FP-6L
4,000'	700	12.7	2.22	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	Tail: Class 'C' + 0.25 lb/sk Cello Flake + 0.005 lb/sk Static Free
13,203'	150	10.8	3.67	Lead: 60:40:0 Class 'C' + 15.00 lb/sk BA-90 + 4.00% MPA-5 + 3.00% SMS + 5.00% A-10 + 1.00% BA-10A + 0.80% ASA-301 + 2.90% R-21 + 8.00 lb/sk LCM-1 + 0.005 lb/sk Static Free (TOC @ 3500')
	300	11.8	2.38	Middle: 50:50:10 Class 'H' + 0.80% FL-52 + 0.45% ASA-301 + 0.40% SMS + 2.00% Salt + 3.00 lb/sx LCM-1 + 0.20% R-21 + 0.25 lb/sk Cello Flake + 0.005 lb/sk Static Free
	1325	14.2	1.28	Tail: 50:50:2 Class 'H' + 0.65% FL-52 + 0.20% CD-32 + 0.15% SMS + 2.00% Salt + 0.10% R-3 + 0.005 lb/sk Static Free

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:**

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 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.

3000 psi BOPE is adequate for this application. Due to the 3000 psi BOPE requirement no FIT tests are planned.

Before drilling out of the surface casing, the ram-type BOP and accessory equipment will be tested to 2000/ 250 psig and the annular preventer to 2000/ 250 psig. The surface casing will be tested to 1500 psi for 30 minutes.

**EOG RESOURCES, INC.**  
**ROSS DRAW 8 FEDERAL NO. 1H**  
**REVISED 10/15/13**

Before drilling out of the intermediate casing, the ram-type BOP and accessory equipment will be tested to 3000/ 250 psig and the annular preventer to 3000/ 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:**

The applicable depths and properties of the drilling fluid systems are as follows. Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0 – 1100'	Fresh Water Gel	8.6-8.8	28-34	N/c
1100' – 4,000'	Saturated Brine	10.0-10.2	28-34	N/c
4,000' – 7,885'	Fresh Water	8.4-8.6	28-34	N/c
7,885' – 13,203' Lateral	Cut Brine Water	9.0-9.5	28-34	N/c

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

**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) A mud logging unit will be continuously monitoring drill penetration rate and hydrocarbon shows from intermediate casing point to TD.
- (D) H<sub>2</sub>S monitoring and detection equipment will be utilized from surface casing point to TD.

**EOG RESOURCES, INC.**  
**ROSS DRAW 8 FEDERAL NO. 1H**  
**REVISED 10/15/13**

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

Open-hole logging is anticipated in the 8-3/4" hole section. The logging suites scheduled for this hole section are listed below:

NGT-CNL-LDT w/ Pe	From TD to previous casing shoe. At casing pull GR – Neutron to surface.
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HR Laterolog Array	From TD to previous casing shoe.
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**9. ABNORMAL CONDITIONS, PRESSURES, TEMPERATURES AND POTENTIAL HAZARDS:**

The estimated bottom-hole temperature (BHT) at TD is 145 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 3615 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:**

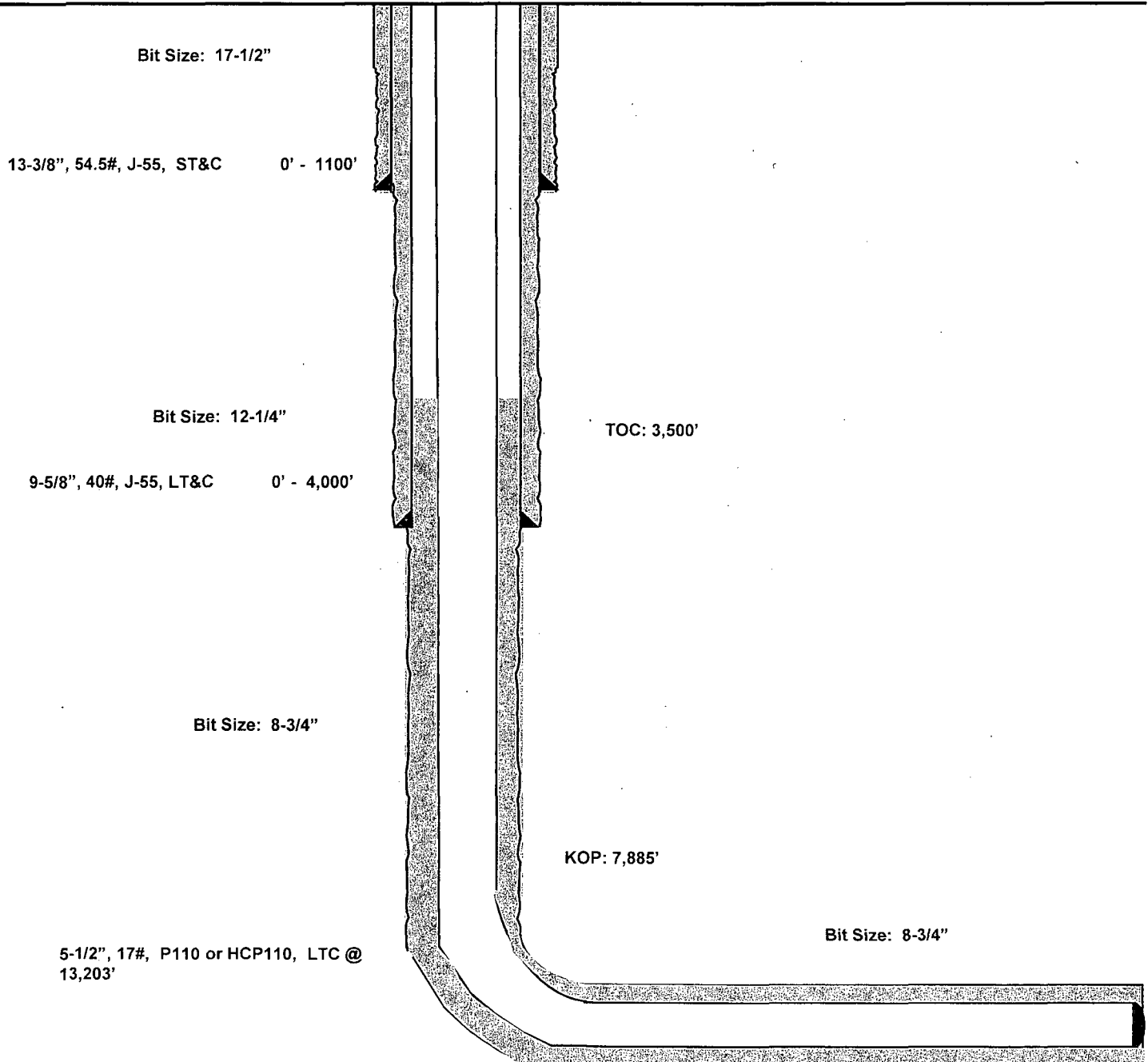
The drilling operation should be finished in approximately one month. If the well is productive, an additional 60-90 days will be required for completion and testing before a decision is made to install permanent facilities.

Ross Draw 8 Fed #1H  
Eddy County, New Mexico  
Proposed Wellbore  
Revised 10/15/13

330' FNL  
520' FWL  
Section 8  
T-26-S, R-31-E

API: 30-015-39248

KB: 3,308'  
GL: 3,278'



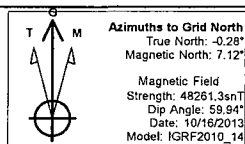
Lateral:  
13,203' MD, 8,350' TVD

BH Location: 230' FSL & 380' FWL  
Section 8  
T-26-S, R-31-E

# EOG Resources

**Project:** Eddy County, NM (NAD27 NME)  
**Site:** Ross Draw 8 Fed  
**Well:** Ross Draw 8 Fed 1H  
**Wellbore:** Wellbore #1  
**Plan:** Plan #3 101613  
**Rig:** Cactus Rig No. 123

**PROJECT DETAILS:** Eddy County, NM (NAD27 NME)  
 Geodetic System: US State Plane 1927 (Exact solution)  
 Datum: NAD 1927 (NADCON CONUS)  
 Ellipsoid: Clarke 1866  
 Zone: New Mexico East 3001  
 System Datum: Mean Sea Level  
 Location North: Grid



## WELL DETAILS: Ross Draw 8 Fed 1H

Ground Level: 3278.00  
 Northing: 387290.00 Easting: 663111.00 32° 3' 49.25431 N 103° 48' 24.47573 W

## ANNOTATIONS

TVD	MD	Annotation
3816.47	3816.47	Start Build 2.50
4016.22	4016.47	Start 3335.56 hold at 4016.47 MD
7339.09	7352.04	Start Drop -1.50
7672.00	7685.37	Start 200.54 hold at 7685.37 MD
7872.54	7885.90	Start Build 12.00
8350.00	8635.90	Start 4567.56 hold at 8635.90 MD
8350.00	13203.47	TD at 13203.47

## FORMATION TOP DETAILS

No formation data is available

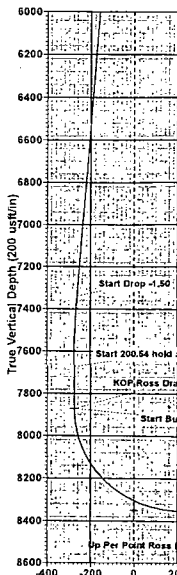
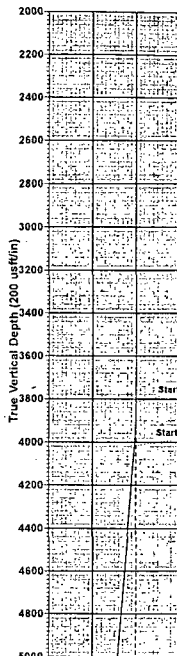
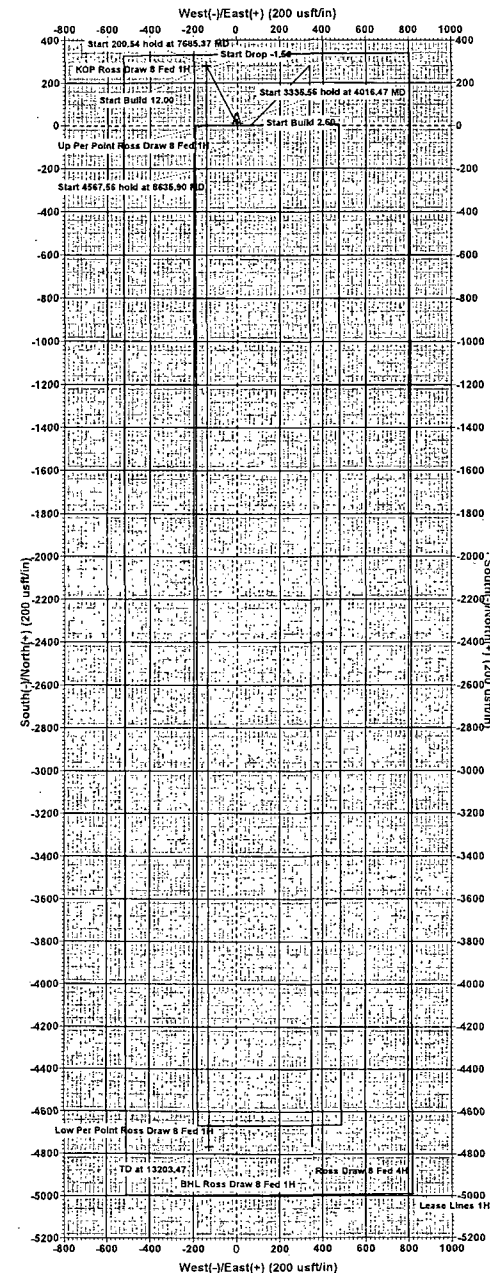
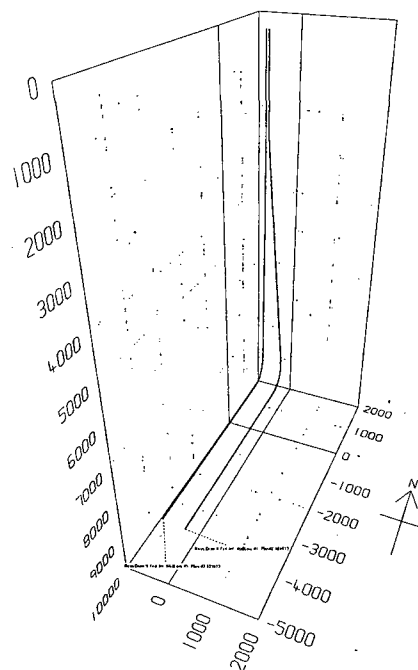
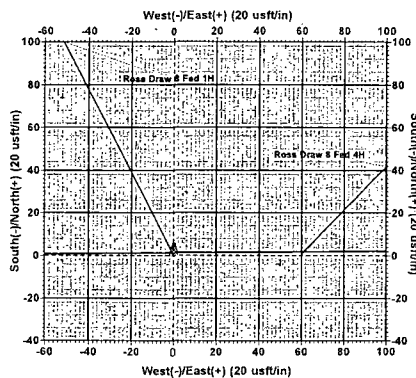
## WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
KOP Ross Draw 8 Fed 1H	7872.61	279.00	-144.00	387569.00	662967.00	Point
BHL Ross Draw 8 Fed 1H	8350.00	-4766.00	-127.00	382524.00	662984.00	Point
Low Per Point Ross Draw 8 Fed 1H	8350.00	-4868.00	-128.00	382524.00	662983.00	Point
Up Per Point Ross Draw 8 Fed 1H	8350.00	2.00	-143.00	387292.00	662968.00	Point

## SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3816.47	0.00	0.00	3816.47	0.00	0.00	0.00	0.00	0.00
4016.47	5.00	332.70	4016.22	7.75	-4.00	2.50	332.70	-7.64
7352.04	5.00	332.70	7339.09	266.08	-137.33	0.00	0.00	-262.33
7685.37	0.00	0.00	7672.00	278.00	-144.00	1.50	180.00	-275.07
7885.90	0.00	0.00	7872.54	278.00	-144.00	0.00	0.00	-275.07
8635.90	90.00	179.81	8350.00	-198.46	-142.39	12.00	179.81	202.18
13203.47	90.00	179.81	8350.00	-4766.00	-127.00	0.00	0.00	4767.69

BHL Ross Draw 8 Fed 1H



Vertical Section at 181.53° (200 usft/in)





## **EOG Resources**

**Eddy County, NM (NAD27 NME)**

**Ross Draw 8 Fed**

**Ross Draw 8 Fed 1H**

**Wellbore #1**

**Plan: Plan #3 101613**

## **Standard Survey Report**

**16 October, 2013**

<b>Company:</b>	EOG Resources	<b>Local Co-ordinate Reference:</b>	Well Ross Draw 8 Fed 1H
<b>Project:</b>	Eddy County, NM (NAD27 NME)	<b>TVD Reference:</b>	WELL @ 3310.50usft (Original Well Elev + 30' KB)
<b>Site:</b>	Ross Draw 8 Fed	<b>MD Reference:</b>	WELL @ 3310.50usft (Original Well Elev + 30' KB)
<b>Well:</b>	Ross Draw 8 Fed 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Plan #3 101613	<b>Database:</b>	Compass 5000 GCR DB

<b>Project:</b>	Eddy County, NM (NAD27 NME)		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	New Mexico East 3001		

<b>Site:</b>	Ross Draw 8 Fed		
<b>Site Position:</b>		<b>Northing:</b>	387,290.50 usft
<b>From:</b>	Map	<b>Easting:</b>	663,109.60 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	32° 3' 49.25933 N
		<b>Longitude:</b>	103° 48' 24.49197 W
		<b>Grid Convergence:</b>	0.28 °

<b>Well:</b>	Ross Draw 8 Fed 1H		
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b> 387,290.00 usft
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b> 663,111.00 usft
<b>Position Uncertainty</b>	0.00 usft		<b>Wellhead Elevation:</b> usft
			<b>Latitude:</b> 32° 3' 49.25431 N
			<b>Longitude:</b> 103° 48' 24.47573 W
			<b>Ground Level:</b> 3,278.00 usft

<b>Wellbore:</b>	Wellbore #1		
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>
	IGRF2010_14	10/16/13	(°)
			7.40
			Dip Angle (°)
			59.94
			Field Strength (nT)
			48,261

<b>Design:</b>	Plan #3 101613		
<b>Audit Notes:</b>			
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b> 0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>
	0.00	0.00	0.00
			<b>Direction (°)</b>
			181.53

<b>Survey Tool Program</b>	<b>Date</b> 10/16/13		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>
0.00	13,203.47	Plan #3 101613 (Wellbore #1)	MWD
			<b>Description</b>
			MWD - Standard

<b>Planned Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	

<b>Company:</b>	EOG Resources	<b>Local Co-ordinate Reference:</b>	Well Ross Draw 8 Fed 1H
<b>Project:</b>	Eddy County, NM (NAD27 NME)	<b>TVD Reference:</b>	WELL @ 3310.50usft (Original Well Elev + 30' KB)
<b>Site:</b>	Ross Draw - 8 Fed	<b>MD Reference:</b>	WELL @ 3310.50usft (Original Well Elev + 30' KB)
<b>Well:</b>	Ross Draw 8 Fed 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Plan #3 101613	<b>Database:</b>	Compass 5000 GCR DB

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)	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,816.47	0.00	0.00	3,816.47	0.00	0.00	0.00	0.00	0.00	0.00	
Start Build 2.50										
3,900.00	2.09	332.70	3,899.98	1.35	-0.70	-1.33	2.50	2.50	0.00	
4,000.00	4.59	332.70	3,999.80	6.53	-3.37	-6.43	2.50	2.50	0.00	
4,016.47	5.00	332.70	4,016.22	7.75	-4.00	-7.64	2.50	2.50	0.00	
Start 3335.56 hold at 4016.47 MD										
4,100.00	5.00	332.70	4,099.43	14.22	-7.34	-14.02	0.00	0.00	0.00	
4,200.00	5.00	332.70	4,199.05	21.96	-11.34	-21.65	0.00	0.00	0.00	
4,300.00	5.00	332.70	4,298.67	29.71	-15.33	-29.29	0.00	0.00	0.00	
4,400.00	5.00	332.70	4,398.29	37.45	-19.33	-36.93	0.00	0.00	0.00	
4,500.00	5.00	332.70	4,497.91	45.20	-23.33	-44.56	0.00	0.00	0.00	
4,600.00	5.00	332.70	4,597.53	52.94	-27.33	-52.20	0.00	0.00	0.00	

**Company:** EOG Resources  
**Project:** Eddy County, NM (NAD27 NME)  
**Site:** Ross Draw 8 Fed  
**Well:** Ross Draw 8 Fed 1H  
**Wellbore:** Wellbore #1  
**Design:** Plan #3 101613

**Local Co-ordinate Reference:** Well Ross Draw 8 Fed 1H  
**TVD Reference:** WELL @ 3310.50usft (Original Well Elev + 30' KB)  
**MD Reference:** WELL @ 3310.50usft (Original Well Elev + 30' KB)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** Compass 5000 GCR DB

## 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)
4,700.00	5.00	332.70	4,697.15	60.69	-31.32	-59.83	0.00	0.00	0.00
4,800.00	5.00	332.70	4,796.76	68.43	-35.32	-67.47	0.00	0.00	0.00
4,900.00	5.00	332.70	4,896.38	76.18	-39.32	-75.10	0.00	0.00	0.00
5,000.00	5.00	332.70	4,996.00	83.92	-43.31	-82.74	0.00	0.00	0.00
5,100.00	5.00	332.70	5,095.62	91.67	-47.31	-90.37	0.00	0.00	0.00
5,200.00	5.00	332.70	5,195.24	99.41	-51.31	-98.01	0.00	0.00	0.00
5,300.00	5.00	332.70	5,294.86	107.16	-55.31	-105.65	0.00	0.00	0.00
5,400.00	5.00	332.70	5,394.48	114.90	-59.30	-113.28	0.00	0.00	0.00
5,500.00	5.00	332.70	5,494.10	122.65	-63.30	-120.92	0.00	0.00	0.00
5,600.00	5.00	332.70	5,593.72	130.39	-67.30	-128.55	0.00	0.00	0.00
5,700.00	5.00	332.70	5,693.34	138.14	-71.30	-136.19	0.00	0.00	0.00
5,800.00	5.00	332.70	5,792.96	145.88	-75.29	-143.82	0.00	0.00	0.00
5,900.00	5.00	332.70	5,892.58	153.63	-79.29	-151.46	0.00	0.00	0.00
6,000.00	5.00	332.70	5,992.20	161.37	-83.29	-159.09	0.00	0.00	0.00
6,100.00	5.00	332.70	6,091.82	169.12	-87.29	-166.73	0.00	0.00	0.00
6,200.00	5.00	332.70	6,191.44	176.86	-91.28	-174.37	0.00	0.00	0.00
6,300.00	5.00	332.70	6,291.06	184.61	-95.28	-182.00	0.00	0.00	0.00
6,400.00	5.00	332.70	6,390.68	192.35	-99.28	-189.64	0.00	0.00	0.00
6,500.00	5.00	332.70	6,490.30	200.09	-103.27	-197.27	0.00	0.00	0.00
6,600.00	5.00	332.70	6,589.92	207.84	-107.27	-204.91	0.00	0.00	0.00
6,700.00	5.00	332.70	6,689.53	215.58	-111.27	-212.54	0.00	0.00	0.00
6,800.00	5.00	332.70	6,789.15	223.33	-115.27	-220.18	0.00	0.00	0.00
6,900.00	5.00	332.70	6,888.77	231.07	-119.26	-227.82	0.00	0.00	0.00
7,000.00	5.00	332.70	6,988.39	238.82	-123.26	-235.45	0.00	0.00	0.00
7,100.00	5.00	332.70	7,088.01	246.56	-127.26	-243.09	0.00	0.00	0.00
7,200.00	5.00	332.70	7,187.63	254.31	-131.26	-250.72	0.00	0.00	0.00
7,300.00	5.00	332.70	7,287.25	262.05	-135.25	-258.36	0.00	0.00	0.00
7,352.04	5.00	332.70	7,339.09	266.08	-137.33	-262.33	0.00	0.00	0.00
Start Drop -1.50									
7,400.00	4.28	332.70	7,386.90	269.53	-139.11	-265.73	1.50	-1.50	0.00
7,500.00	2.78	332.70	7,486.70	275.00	-141.94	-271.13	1.50	-1.50	0.00
7,600.00	1.28	332.70	7,586.64	278.15	-143.56	-274.23	1.50	-1.50	0.00
7,685.37	0.00	0.00	7,672.00	279.00	-144.00	-275.07	1.50	-1.50	31.98
Start 200.54 hold at 7685.37 MD									
7,700.00	0.00	0.00	7,686.63	279.00	-144.00	-275.07	0.00	0.00	0.00
7,800.00	0.00	0.00	7,786.63	279.00	-144.00	-275.07	0.00	0.00	0.00
7,885.90	0.00	0.00	7,872.54	279.00	-144.00	-275.07	0.00	0.00	0.00
Start Build 12.00									
7,900.00	1.69	179.81	7,886.63	278.79	-144.00	-274.86	12.00	12.00	0.00
8,000.00	13.69	179.81	7,985.55	265.43	-143.95	-261.50	12.00	12.00	0.00
8,100.00	25.69	179.81	8,079.53	231.80	-143.84	-227.89	12.00	12.00	0.00
8,200.00	37.69	179.81	8,164.46	179.36	-143.66	-175.47	12.00	12.00	0.00



## Survey Report

Company: EOG Resources  
Project: Eddy County, NM (NAD27 NME)  
Site: Ross Draw 8 Fed  
Well: Ross Draw 8 Fed 1H  
Wellbore: Wellbore #1  
Design: Plan #3 101613

Local Co-ordinate Reference: Well Ross Draw 8 Fed 1H  
TVD Reference: WELL @ 3310.50usft (Original Well Elev + 30' KB)  
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### 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)
8,300.00	49.69	179.81	8,236.64	110.41	-143.43	-106.55	12.00	12.00	0.00
8,400.00	61.69	179.81	8,292.90	27.96	-143.15	-24.14	12.00	12.00	0.00
8,500.00	73.69	179.81	8,330.79	-64.39	-142.84	68.17	12.00	12.00	0.00
8,600.00	85.69	179.81	8,348.65	-162.59	-142.51	166.33	12.00	12.00	0.00
8,635.90	90.00	179.81	8,350.00	-198.46	-142.39	202.18	12.00	12.00	0.00
Start 4567.56 hold at 8635.90 MD									
8,700.00	90.00	179.81	8,350.00	-262.56	-142.18	266.25	0.00	0.00	0.00
8,800.00	90.00	179.81	8,350.00	-362.56	-141.84	366.21	0.00	0.00	0.00
8,900.00	90.00	179.81	8,350.00	-462.56	-141.50	466.16	0.00	0.00	0.00
9,000.00	90.00	179.81	8,350.00	-562.56	-141.16	566.12	0.00	0.00	0.00
9,100.00	90.00	179.81	8,350.00	-662.55	-140.83	666.07	0.00	0.00	0.00
9,200.00	90.00	179.81	8,350.00	-762.55	-140.49	766.03	0.00	0.00	0.00
9,300.00	90.00	179.81	8,350.00	-862.55	-140.15	865.98	0.00	0.00	0.00
9,400.00	90.00	179.81	8,350.00	-962.55	-139.82	965.94	0.00	0.00	0.00
9,500.00	90.00	179.81	8,350.00	-1,062.55	-139.48	1,065.89	0.00	0.00	0.00
9,600.00	90.00	179.81	8,350.00	-1,162.55	-139.14	1,165.85	0.00	0.00	0.00
9,700.00	90.00	179.81	8,350.00	-1,262.55	-138.81	1,265.80	0.00	0.00	0.00
9,800.00	90.00	179.81	8,350.00	-1,362.55	-138.47	1,365.76	0.00	0.00	0.00
9,900.00	90.00	179.81	8,350.00	-1,462.55	-138.13	1,465.71	0.00	0.00	0.00
10,000.00	90.00	179.81	8,350.00	-1,562.55	-137.79	1,565.67	0.00	0.00	0.00
10,100.00	90.00	179.81	8,350.00	-1,662.55	-137.46	1,665.62	0.00	0.00	0.00
10,200.00	90.00	179.81	8,350.00	-1,762.55	-137.12	1,765.58	0.00	0.00	0.00
10,300.00	90.00	179.81	8,350.00	-1,862.55	-136.78	1,865.53	0.00	0.00	0.00
10,400.00	90.00	179.81	8,350.00	-1,962.55	-136.45	1,965.49	0.00	0.00	0.00
10,500.00	90.00	179.81	8,350.00	-2,062.55	-136.11	2,065.44	0.00	0.00	0.00
10,600.00	90.00	179.81	8,350.00	-2,162.55	-135.77	2,165.40	0.00	0.00	0.00
10,700.00	90.00	179.81	8,350.00	-2,262.55	-135.44	2,265.35	0.00	0.00	0.00
10,800.00	90.00	179.81	8,350.00	-2,362.55	-135.10	2,365.31	0.00	0.00	0.00
10,900.00	90.00	179.81	8,350.00	-2,462.54	-134.76	2,465.26	0.00	0.00	0.00
11,000.00	90.00	179.81	8,350.00	-2,562.54	-134.42	2,565.22	0.00	0.00	0.00
11,100.00	90.00	179.81	8,350.00	-2,662.54	-134.09	2,665.17	0.00	0.00	0.00
11,200.00	90.00	179.81	8,350.00	-2,762.54	-133.75	2,765.13	0.00	0.00	0.00
11,300.00	90.00	179.81	8,350.00	-2,862.54	-133.41	2,865.08	0.00	0.00	0.00
11,400.00	90.00	179.81	8,350.00	-2,962.54	-133.08	2,965.04	0.00	0.00	0.00
11,500.00	90.00	179.81	8,350.00	-3,062.54	-132.74	3,064.99	0.00	0.00	0.00
11,600.00	90.00	179.81	8,350.00	-3,162.54	-132.40	3,164.95	0.00	0.00	0.00
11,700.00	90.00	179.81	8,350.00	-3,262.54	-132.07	3,264.90	0.00	0.00	0.00
11,800.00	90.00	179.81	8,350.00	-3,362.54	-131.73	3,364.86	0.00	0.00	0.00
11,900.00	90.00	179.81	8,350.00	-3,462.54	-131.39	3,464.81	0.00	0.00	0.00
12,000.00	90.00	179.81	8,350.00	-3,562.54	-131.06	3,564.77	0.00	0.00	0.00
12,100.00	90.00	179.81	8,350.00	-3,662.54	-130.72	3,664.72	0.00	0.00	0.00
12,200.00	90.00	179.81	8,350.00	-3,762.54	-130.38	3,764.68	0.00	0.00	0.00

**Company:** EOG Resources  
**Project:** Eddy County, NM (NAD27 NME)  
**Site:** Ross Draw 8 Fed  
**Well:** Ross Draw 8 Fed 1H  
**Wellbore:** Wellbore #1  
**Design:** Plan #3 101613

**Local Co-ordinate Reference:** Well Ross Draw 8 Fed 1H  
**TVD Reference:** WELL @ 3310.50usft (Original Well Elev + 30' KB)  
**MD Reference:** WELL @ 3310.50usft (Original Well Elev + 30' KB)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** Compass 5000 GCR DB

## 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)
12,300.00	90.00	179.81	8,350.00	-3,862.54	-130.04	3,864.63	0.00	0.00	0.00
12,400.00	90.00	179.81	8,350.00	-3,962.54	-129.71	3,964.59	0.00	0.00	0.00
12,500.00	90.00	179.81	8,350.00	-4,062.54	-129.37	4,064.54	0.00	0.00	0.00
12,600.00	90.00	179.81	8,350.00	-4,162.54	-129.03	4,164.50	0.00	0.00	0.00
12,700.00	90.00	179.81	8,350.00	-4,262.53	-128.70	4,264.45	0.00	0.00	0.00
12,800.00	90.00	179.81	8,350.00	-4,362.53	-128.36	4,364.41	0.00	0.00	0.00
12,900.00	90.00	179.81	8,350.00	-4,462.53	-128.02	4,464.36	0.00	0.00	0.00
13,000.00	90.00	179.81	8,350.00	-4,562.53	-127.69	4,564.32	0.00	0.00	0.00
13,100.00	90.00	179.81	8,350.00	-4,662.53	-127.35	4,664.27	0.00	0.00	0.00
13,200.00	90.00	179.81	8,350.00	-4,762.53	-127.01	4,764.22	0.00	0.00	0.00
13,203.47	90.00	179.81	8,350.00	-4,766.00	-127.00	4,767.69	0.00	0.00	0.00
TD at 13203.47									

## Design Targets

Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
KOP Ross Draw 8 Fed 1		0.00	0.00	7,872.61	279.00	-144.00	387,569.00	662,967.00	32° 3' 52.02231 N	103° 48' 26.13330 W
- plan hits target center										
- Point										
Low Per Point Ross Dra		0.00	0.00	8,350.00	-4,666.00	-128.00	382,624.00	662,983.00	32° 3' 3.08469 N	103° 48' 26.22741 W
- plan misses target center by 0.66usft at 13103.47usft MD (8350.00 TVD, -4666.00 N, -127.34 E)										
- Point										
Up Per Point Ross Draw		0.00	0.00	8,350.00	2.00	-143.00	387,292.00	662,968.00	32° 3' 49.28101 N	103° 48' 26.13737 W
- plan misses target center by 40.38usft at 8445.78usft MD (8312.64 TVD, -13.32 N, -143.01 E)										
- Point										
BHL Ross Draw 8 Fed 1		0.00	0.00	8,350.00	-4,766.00	-127.00	382,524.00	662,984.00	32° 3' 2.09501 N	103° 48' 26.22145 W
- plan hits target center										
- Point										

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
3816	3816	0	0	Start Build 2.50
4016	4016	8	-4	Start 3335.56 hold at 4016.47 MD
7352	7339	266	-137	Start Drop -1.50
7685	7672	279	-144	Start 200.54 hold at 7685.37 MD
7886	7873	279	-144	Start Build 12.00
8636	8350	-198	-142	Start 4567.56 hold at 8635.90 MD
13,203	8350	-4766	-127	TD at 13203.47



## Survey Report

**Company:** EOG Resources  
**Project:** Eddy County, NM (NAD27 NME)  
**Site:** Ross Draw 8 Fed  
**Well:** Ross Draw 8 Fed 1H  
**Wellbore:** Wellbore #1  
**Design:** Plan #3 101613

**Local Co-ordinate Reference:** Well Ross Draw 8 Fed 1H  
**TVD Reference:** WELL @ 3310.50usft (Original Well Elev + 30' KB)  
**MD Reference:** WELL @ 3310.50usft (Original Well Elev + 30' KB)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** Compass 5000 GCR DB

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

**M I D W E S T**  
**HOSE AND SPECIALTY INC.**

INTERNAL HYDROSTATIC TEST REPORT			
<b>Customer:</b> CACTUS		<b>P.O. Number:</b> RIG #123	
Asset # M10761			
HOSE SPECIFICATIONS			
<b>Type:</b> CHOKER LINE		<b>Length:</b> 35'	
<b>I.D.</b> 4" INCHES		<b>O.D.</b> 8" INCHES	
<b>WORKING PRESSURE</b> 10,000 PSI	<b>TEST PRESSURE</b> 15,000 PSI		<b>BURST PRESSURE</b> PSI
COUPLINGS			
<b>Type of End Fitting</b> 4 1/16 10K FLANGE			
<b>Type of Coupling:</b> SWEDGED		<b>MANUFACTURED BY</b> MIDWEST HOSE & SPECIALTY	
PROCEDURE			
<i>Hose assembly pressure tested with water at ambient temperature.</i>			
<b>TIME HELD AT TEST PRESSURE</b> 1 MIN.		<b>ACTUAL BURST PRESSURE:</b> 0 PSI	
<b>COMMENTS:</b> SN#90087 M10761 Hose is covered with stainless steel armour cover and wrapped with fire resistant vermiculite coated fiberglass insulation rated for 1500 degrees complete with lifting eyes			
<b>Date:</b> 6/6/2011	<b>Tested By:</b> BOBBY FINK		<b>Approved:</b> MENDI JACKSON



**Manufacturer: Midwest Hose & Specialty**

**Serial Number: SN#90067**

**Length: 35'**

**Size: OD = 8" ID = 4"**

**Ends: Flanges Size: 4-1/16"**

**WP Rating: 10,000 psi    Anchors required by manufacturer: No**



Midwest Hose  
& Specialty, Inc.

## Internal Hydrostatic Test Graph

Customer: CACTUS

SALES ORDER# 90067

### Hose Specifications

#### Hose Type

C & K

#### I.D.

4"

#### Working Pressure

10000 PSI

#### Length

35'

#### O.D.

8"

#### Burst Pressure

Standard Safety Multiplier Applies

### Verification

#### Type of Fitting

4 1/16 10K

#### Die Size

6.62"

#### Hose Serial #

#### Coupling Method

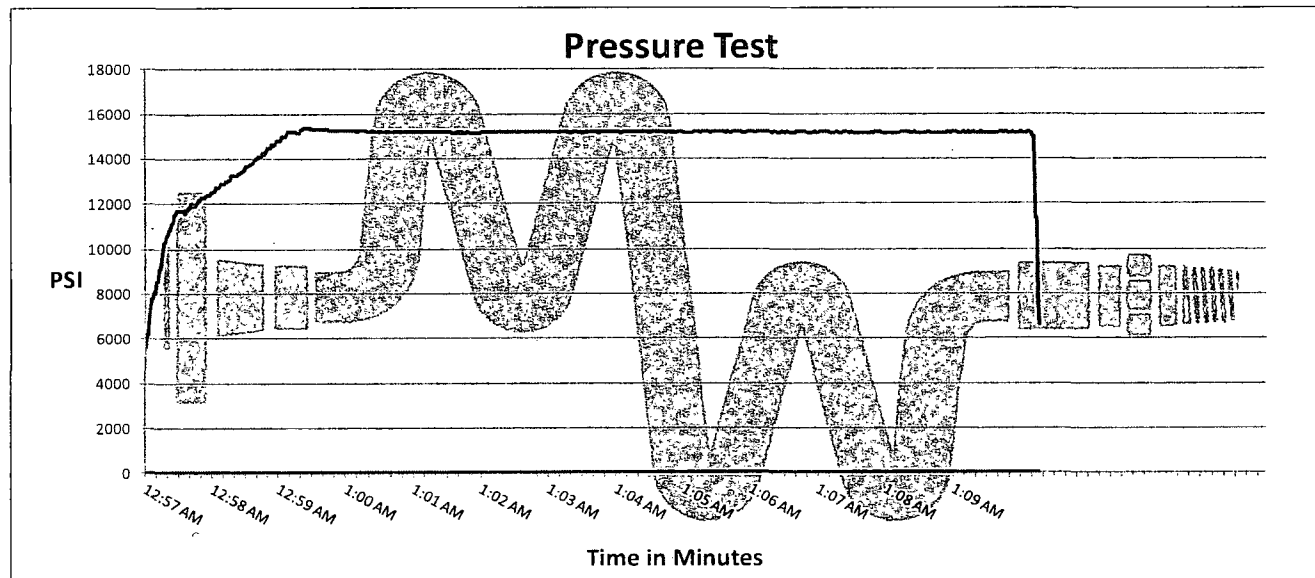
Swage

#### Final O.D.

6.68"

#### Hose Assembly Serial #

90067



#### Test Pressure

15000 PSI

#### Time Held at Test Pressure

11 1/4 Minutes

#### Actual Burst Pressure

#### Peak Pressure

15439 PSI

**Comments:** Hose assembly pressure tested with water at ambient temperature.

**Tested By:** Bobby Fink

**Approved By:** Mendi Jackson

*Bobby Fink*

*Mendi Jackson*

**PECOS DISTRICT  
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	EOG Resources, Inc.
LEASE NO.:	NM-0438001
WELL NAME & NO.:	Ross Draw 8 Fed. #1H
SURFACE HOLE FOOTAGE:	330'FNL & 520'FWL
BOTTOM HOLE FOOTAGE:	230'FSL & 412'FWL
LOCATION:	Section 08, T. 26 S., R. 31 E., NMPM
COUNTY:	Eddy County, New Mexico

**The COAs from 09/13/2013 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)

☒ **Eddy County**

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,  
(575) 361-2822

1. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. Operator has stated that they will have monitoring equipment in place prior to drilling out of the surface shoe. If Hydrogen Sulfide is encountered, please report measured amounts 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.).**

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

**Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. 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. IF OPERATOR DOES NOT HAVE THE WELL SPECIFIC CEMENT DETAILS ONSITE PRIOR TO PUMPING THE CEMENT FOR EACH CASING STRING, THE WOC WILL BE 30 HOURS. See individual casing strings for details regarding lead cement slurry requirements.**

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

**Possible lost circulation in the Redbeds, evaporates, Delaware and Bone Spring.**

1. **The 13-3/8 inch surface casing shall be set at approximately 1100 feet (a minimum of 25 feet into the Rustler Anhydrite and 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.
2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
- ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

**Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.**

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 **3000 (3M) psi (Installing 5M system testing to 3,000 psi)**.
  - a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.
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**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
  - c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, 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 with a corresponding chart (i.e. two hour clock-two hour chart, one hour clock-one hour chart).
  - 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.

#### **D. DRILL STEM TEST**

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

#### **E. 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 012414**