Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

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

HOBBS OCD
JUN 13 2018
RECEIVED

5. Lease Serial No.
NMNM118727

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
ORRTANNA 20 FED 710H

2. Name of Operator
EOG RESOURCES INCORPORATED

Contact: STAN WAGNER
E-Mail: stan_wagner@eogresources.com

9. API Well No.
30-025-44617-00-X1

3a. Address
MIDLAND, TX 79702

3b. Phone No. (include area code)
Ph: 432-686-3689

10. Field and Pool or Exploratory Area
RED HILLS-WOLFCAMP, WEST (GAS)

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 20 T26S R33E SWSE 557FSL 2408FEL
32.023296 N Lat, 103.593513 W Lon

11. County or Parish, State
LEA COUNTY, NM

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

Carlsbad Field Office
OCD Hobbs

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Change to Original APD
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ 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 recomplete 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 must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

EOG Resources requests an amendment to our approved APD for this well to reflect a change in BHL.

Change BHL to: 230' FNL & 1342' FEL, 20-26S-33E Lea County

ANTICIPATED SPUD DATE IS 6-26-18

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #421047 verified by the BLM Well Information System
For EOG RESOURCES INCORPORATED, sent to the Hobbs
Committed to AFMSS for processing by PRISCILLA PEREZ on 05/29/2018 (18PP1097SE)

Name *(Printed/Typed)* STAN WAGNER — Title REGULATORY ANALYST

Signature (Electronic Submission) — Date 05/22/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ZOTA STEVENS — Title PETROLEUM ENGINEER — Date 05/31/2018

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 Hobbs

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make 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.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

Requires NSL

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., Sante 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.
Sante 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

[1]API Number	[2]Pool Code	[3]Pool Name
30-025-44617	98097	Sanders Tank; Upper Wolfcamp

[4]Property Code	[5]Property Name	[6]Well Number
316102	ORRTANNA 20 FED	#710H

[7]OGRID No.	[8]Operator Name	[9]Elevation
7377	EOG RESOURCES, INC.	3254'

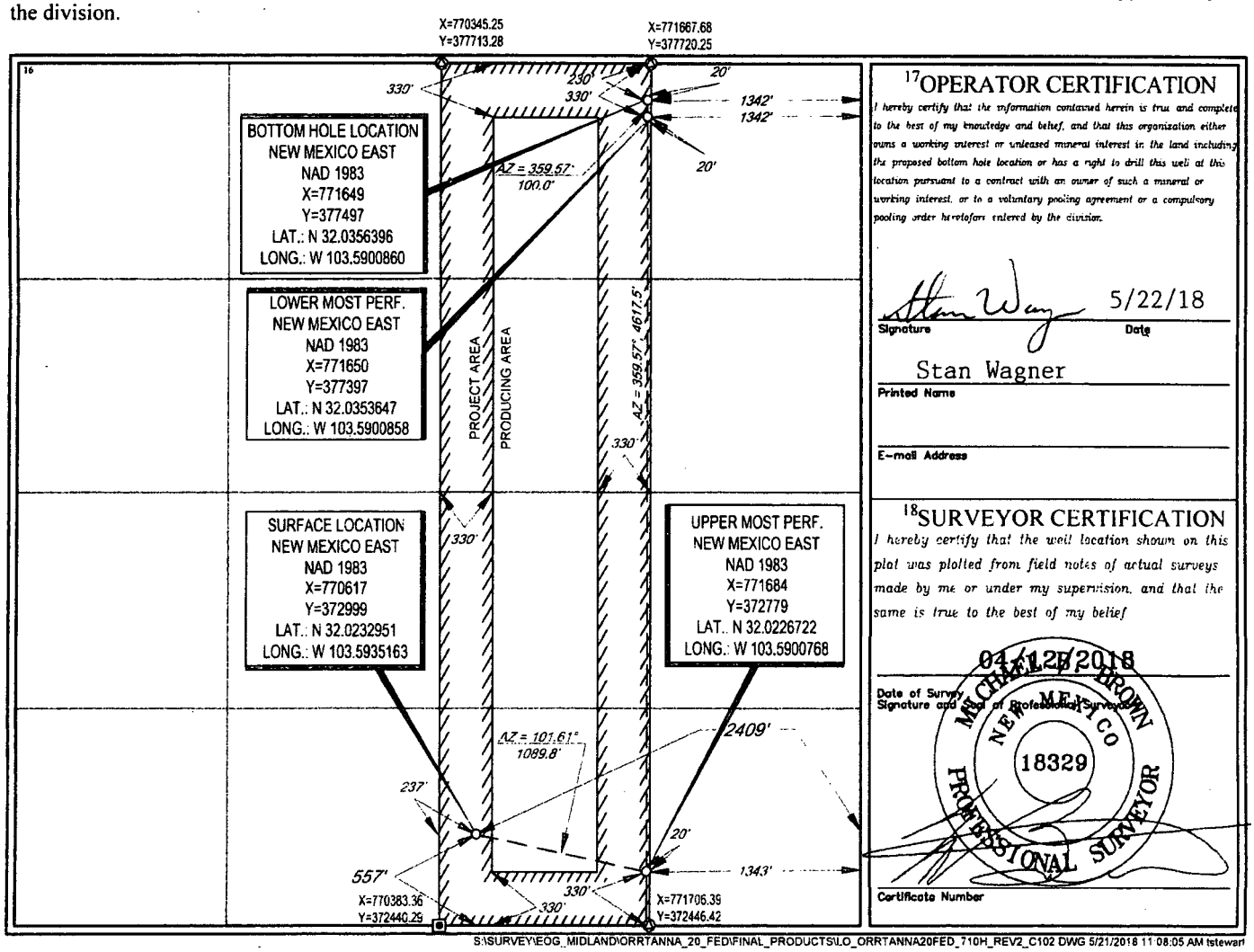
[10]Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	20	26-S	33-E	-	557'	SOUTH	2409'	EAST	LEA

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	20	26-S	33-E	-	230'	NORTH	1342'	EAST	LEA

[12]Dedicated Acres	[13]Joint or Infill	[14]Consolidation Code	[15]Order No.
160.00			

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.



[17]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.

Signature — Date: 5/22/18

Stan Wagner
Printed Name

E-mail Address

[18]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

04/12/2018
Date of Survey
Signature and Seal of Professional Surveyor:

MICHAEL BROWN
NEW MEXICO
18329
PROFESSIONAL SURVEYOR

Certificate Number

S:\SURVEY\EOG_MIDLAND\ORRTANNA_20_FED\FINAL_PRODUCTS\LO_ORRTANNA20FED_710H_REV2_C102.DWG 5/21/2018 11:08:05 AM tstewart

Revised Permit Information 5/21/18:

Well Name: Orrtanna 20 Fed No. 710H

Location:

SL: 557' FSL & 2409' FEL, Section 20, T-26-S, R-33-E, Lea Co., N.M.

BHL: 230' FNL & 1342' FEL, Section 20, T-26-S, R-33-E, Lea Co., N.M.

Casing Program:

Hole Size	Interval	Csg OD	Weight	Grade	Conn	DF_{min} Collapse	DF_{min} Burst	DF_{min} Tension
17.5"	0 – 850'	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' – 4,800'	9.625"	40#	HCK55	LTC	1.125	1.25	1.60
8.75"	0 – 11,200'	7.625"	29.7#	HCP110	FXL	1.125	1.25	1.60
6.75"	0 – 10,700'	5.5"	20#	P110EC	DWC CIS MS	1.125	1.25	1.60
6.75"	0'-17,240'	5.5"	20#	P110EC	VAM SFC	1.125	1.25	1.60

Variance is requested for annular clearance of the 5-1/2" x 7-5/8" to the top of cement.

Cement Program:

Depth	No. Sacks	Wt. lb/gal	Yld Ft^3/ft	Slurry Description
850'	697	13.5	1.74	Lead: Class 'C' + 4.00% Bentonite + 2.00% CaCl2 (TOC @ Surface)
	333	14.8	1.35	Tail: Class 'C' + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate + 2.0% KCl (1.06 lb/sk)
4,800'	692	12.7	2.22	Lead: Class C + 0.15% C-20 + 11.63 pps Salt + 0.1% C-51 + 0.75% C-41P (TOC @ Surface)
	303	14.8	1.32	Tail: Class C + 0.13% C-20
11,200'	375	10.8	3.67	Lead: Class C + 0.40% D013 + 0.20% D046 + 0.10% D065 + 0.20% D167 (TOC @ 4,300')
	400	14.8	2.38	Tail: Class H + 94.0 pps D909 + 0.25% D065 + 0.30% D167 + 0.02% D208 + 0.15% D800
17,240'	1000	14.8	1.31	Class H + 0.1% C-20 + 0.05% CSA-1000 + 0.20% C-49 + 0.40% C-17 (TOC @ 10,700')

Mud Program:

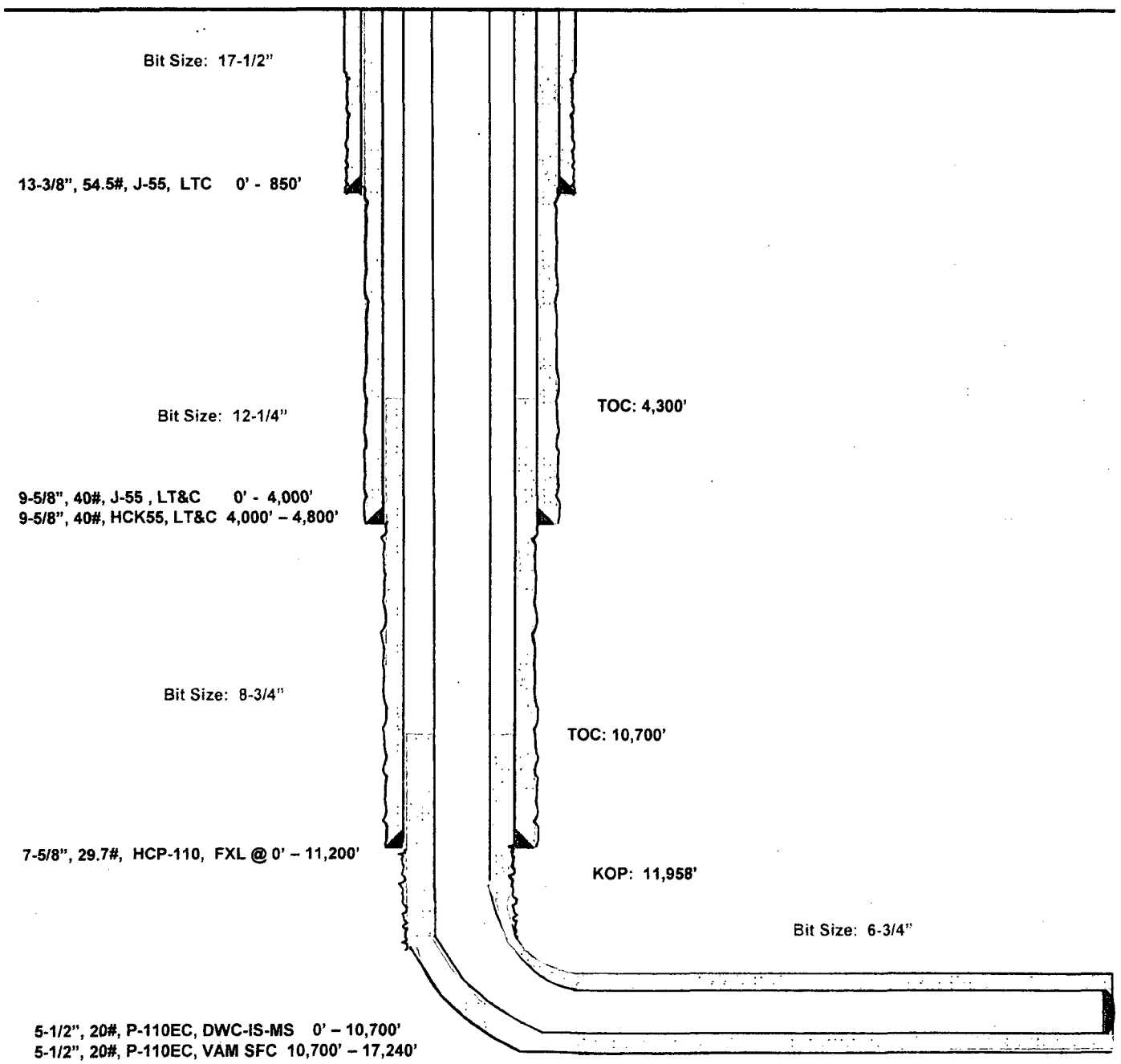
Depth	Type	Weight (ppg)	Viscosity	Water Loss
0 – 850'	Fresh - Gel	8.6-8.8	28-34	N/c
850' – 4,800'	Brine	10.0-10.2	28-34	N/c
4,800'– 11,200'	Oil Base	8.7-9.4	58-68	N/c - 6
11,200'– 17,240' Lateral	Oil Base	10.0-11.5	58-68	3 - 6

Orrtanna 20 Fed #710H
Lea County, New Mexico

557' FSL
2409' FEL
Section 20
T-26-S, R-33-E

Proposed Wellbore
Revised 4/21/18
API: 30-025-44617

KB: 3,279'
GL: 3,254'



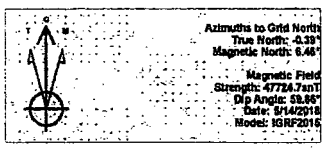
Lateral: 17,240' MD, 12,330' TVD
Upper Most Perf:
330' FSL & 1343' FEL Sec. 20
Lower Most Perf:
330' FNL & 1342' FEL Sec. 20
BH Location: 230' FNL & 1342' FEL
Section 20
T-26-S, R-33-E

eog resourcess

Lea County, NM (NAD 83 NME)

Orrtanna 20 Fed #710H

Plan #0.2



To convert a Magnetic Direction to a Grid Direction, Add 6.46°
To convert a Magnetic Direction to a True Direction, Add 6.85° East
To convert a True Direction to a Grid Direction, Subtract 0.39°

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: #710H

3284.0
KB = 25 @ 3279.0usft

Northing	Easting	Latitude	Longitude
6209389.00	770617.00	32° 1' 23.887 N	103° 35' 36.656 W

SECTION DETAILS

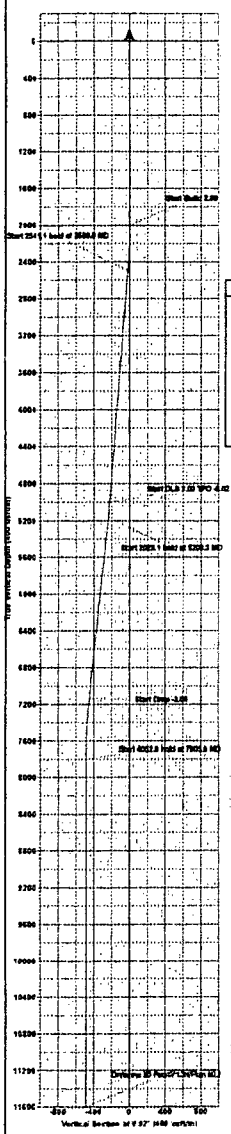
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0		
2	2000.0	0.00	0.00	2000.0	0.0	0.0	0.00	0.00	0.0		
3	2500.0	10.00	118.17	2497.5	-20.5	38.4	2.00	118.17	-11.4		
4	6041.1	10.00	118.17	6000.0	-228.9	427.4	0.00	0.00	-127.5		
5	6209.3	13.36	118.17	6164.7	-244.9	457.4	2.00	-0.02	-136.4		
6	7237.4	13.36	118.17	7137.9	-468.2	870.6	0.00	0.00	-259.7		
7	7905.8	0.00	0.00	7800.0	-502.8	938.0	2.00	180.00	-280.1		
8	11958.2	0.00	0.00	11852.5	-502.8	938.0	0.00	0.00	-280.1		
9	12708.2	90.00	5.15	12330.0	-30.2	1006.7	12.00	5.15	198.7		
10	13030.8	90.00	5.15	12330.0	289.1	1062.4	0.00	0.00	517.2		
11	13180.2	90.00	359.57	12330.0	438.1	1062.5	6.74	-90.03	664.6		
12	17240.2	90.00	359.57	12330.0	4498.0	1032.0	0.00	0.00	4614.9	PBHL (Orrtanna 20 Fed #710H)	

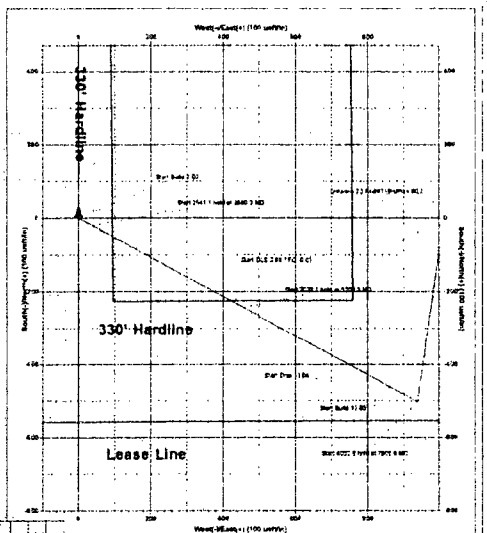
CASING DETAILS

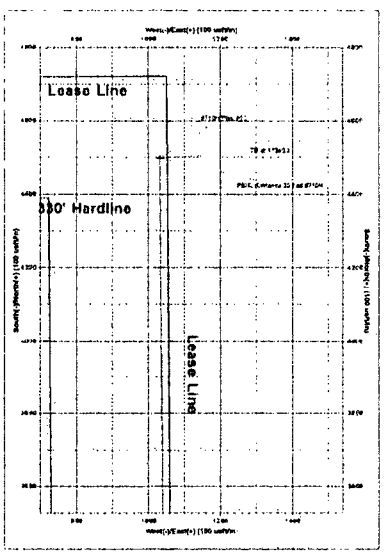
No casing data is available

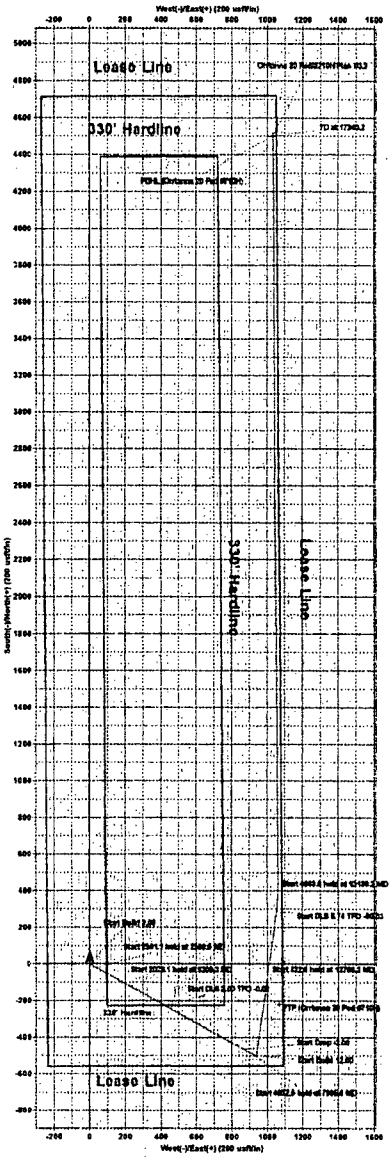
WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

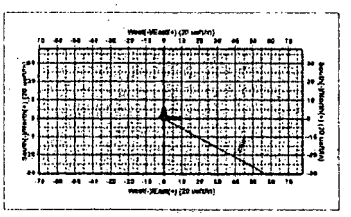
Name	TVD	+N/-S	+E/-W	Northing	Easting
PBHL (Orrtanna 20 Fed #710H)	12330.0	4498.0	1032.0	377497.00	771649.00
FTP (Orrtanna 20 Fed #710H)	12330.0	-220.0	1067.0	372779.00	771684.00

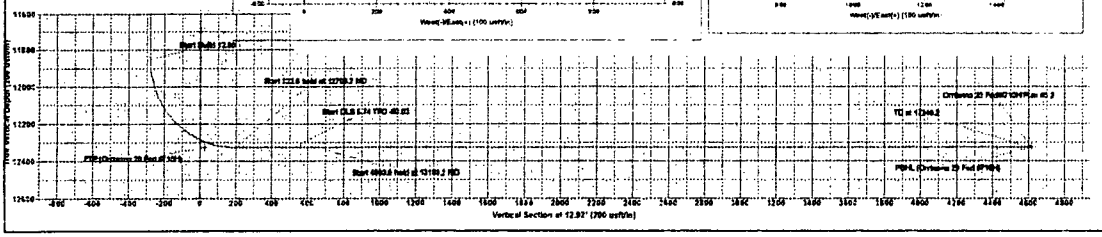


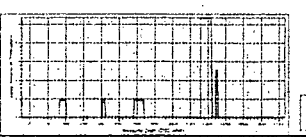












eog resources

EOG Resources - Midland

Lea County, NM (NAD 83 NME)
Orrtanna 20 Fed
#710H

OH

Plan: Plan #0.2

Standard Planning Report

22 May, 2018

Database:	EDM 5000.14	**Local Co-ordinate Reference:**	Well #710H
Company:	EOG Resources - Midland	**TVD Reference:**	KB = 25 @ 3279.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	KB = 25 @ 3279.0usft
Site:	Orrtanna 20 Fed	**North Reference:**	Grid
Well:	#710H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

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	Orrtanna 20 Fed				
Site Position:		**Northing:**	373,025.00 usft	**Latitude:**	32° 1' 24.126 N
From:	Map	**Easting:**	770,593.00 usft	**Longitude:**	103° 35' 36.933 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.39 °

Well	#710H					
Well Position	**+N/-S**	-26.0 usft	**Northing:**	372,999.00 usft	**Latitude:**	32° 1' 23.867 N
	+E/-W	24.0 usft	**Easting:**	770,617.00 usft	**Longitude:**	103° 35' 36.656 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	3,254.0 usft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	5/14/2018	6.85	59.86	47,724.65618676

Design	Plan #0.2				
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	12.92	

Plan Survey Tool Program		**Date** 5/22/2018			
	Depth From (usft)	**Depth To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Remarks**
1	0.0	17,240.1	Plan #0.2 (OH)	MWD	
				OWSG MWD - Standard	

Database:	EDM 5000.14	**Local Co-ordinate Reference:**	Well #710H
Company:	EOG Resources - Midland	**TVD Reference:**	KB = 25 @ 3279.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	KB = 25 @ 3279.0usft
Site:	Orrtanna 20 Fed	**North Reference:**	Grid
Well:	#710H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

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	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,500.0	10.00	118.17	2,497.5	-20.5	38.4	2.00	2.00	0.00	118.17	
5,041.1	10.00	118.17	5,000.0	-228.9	427.4	0.00	0.00	0.00	0.00	
5,209.3	13.36	118.17	5,164.7	-244.9	457.4	2.00	2.00	0.00	-0.02	
7,237.4	13.36	118.17	7,137.9	-466.2	870.6	0.00	0.00	0.00	0.00	
7,905.6	0.00	0.00	7,800.0	-502.8	939.0	2.00	-2.00	0.00	180.00	
11,958.2	0.00	0.00	11,852.6	-502.8	939.0	0.00	0.00	0.00	0.00	
12,708.2	90.00	8.15	12,330.0	-30.2	1,006.7	12.00	12.00	0.00	8.15	
13,030.8	90.00	8.15	12,330.0	289.1	1,052.4	0.00	0.00	0.00	0.00	
13,180.2	90.00	359.57	12,330.0	438.1	1,062.5	5.74	0.00	-5.74	-90.03	
17,240.2	90.00	359.57	12,330.0	4,498.0	1,032.0	0.00	0.00	0.00	0.00	PBHL (Orrtanna 20 F

Database:	EDM 5000.14	**Local Co-ordinate Reference:**	Well #710H
Company:	EOG Resources - Midland	**TVD Reference:**	KB = 25 @ 3279.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	KB = 25 @ 3279.0usft
Site:	Orrtanna 20 Fed	**North Reference:**	Grid
Well:	#710H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

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	2.00	118.17	2,100.0	-0.8	1.5	-0.5	2.00	2.00	0.00
2,200.0	4.00	118.17	2,199.8	-3.3	6.2	-1.8	2.00	2.00	0.00
2,300.0	6.00	118.17	2,299.5	-7.4	13.8	-4.1	2.00	2.00	0.00
2,400.0	8.00	118.17	2,398.7	-13.2	24.6	-7.3	2.00	2.00	0.00
2,500.0	10.00	118.17	2,497.5	-20.5	38.4	-11.4	2.00	2.00	0.00
2,600.0	10.00	118.17	2,595.9	-28.7	53.7	-16.0	0.00	0.00	0.00
2,700.0	10.00	118.17	2,694.4	-36.9	69.0	-20.6	0.00	0.00	0.00
2,800.0	10.00	118.17	2,792.9	-45.1	84.3	-25.1	0.00	0.00	0.00
2,900.0	10.00	118.17	2,891.4	-53.3	99.6	-29.7	0.00	0.00	0.00
3,000.0	10.00	118.17	2,989.9	-61.5	114.9	-34.3	0.00	0.00	0.00
3,100.0	10.00	118.17	3,088.3	-69.7	130.2	-38.8	0.00	0.00	0.00
3,200.0	10.00	118.17	3,186.8	-77.9	145.5	-43.4	0.00	0.00	0.00
3,300.0	10.00	118.17	3,285.3	-86.1	160.8	-48.0	0.00	0.00	0.00
3,400.0	10.00	118.17	3,383.8	-94.3	176.1	-52.5	0.00	0.00	0.00
3,500.0	10.00	118.17	3,482.3	-102.5	191.4	-57.1	0.00	0.00	0.00
3,600.0	10.00	118.17	3,580.8	-110.7	206.8	-61.7	0.00	0.00	0.00
3,700.0	10.00	118.17	3,679.2	-118.9	222.1	-66.2	0.00	0.00	0.00
3,800.0	10.00	118.17	3,777.7	-127.1	237.4	-70.8	0.00	0.00	0.00
3,900.0	10.00	118.17	3,876.2	-135.3	252.7	-75.4	0.00	0.00	0.00
4,000.0	10.00	118.17	3,974.7	-143.5	268.0	-79.9	0.00	0.00	0.00
4,100.0	10.00	118.17	4,073.2	-151.7	283.3	-84.5	0.00	0.00	0.00
4,200.0	10.00	118.17	4,171.6	-159.9	298.6	-89.1	0.00	0.00	0.00
4,300.0	10.00	118.17	4,270.1	-168.1	313.9	-93.7	0.00	0.00	0.00
4,400.0	10.00	118.17	4,368.6	-176.3	329.2	-98.2	0.00	0.00	0.00
4,500.0	10.00	118.17	4,467.1	-184.5	344.5	-102.8	0.00	0.00	0.00
4,600.0	10.00	118.17	4,565.6	-192.7	359.8	-107.4	0.00	0.00	0.00
4,700.0	10.00	118.17	4,664.0	-200.9	375.1	-111.9	0.00	0.00	0.00
4,800.0	10.00	118.17	4,762.5	-209.1	390.5	-116.5	0.00	0.00	0.00
4,900.0	10.00	118.17	4,861.0	-217.3	405.8	-121.1	0.00	0.00	0.00
5,000.0	10.00	118.17	4,959.5	-225.5	421.1	-125.6	0.00	0.00	0.00
5,041.1	10.00	118.17	5,000.0	-228.9	427.4	-127.5	0.00	0.00	0.00
5,100.0	11.18	118.17	5,057.9	-234.0	436.9	-130.3	2.00	2.00	0.00
5,209.3	13.36	118.17	5,164.7	-244.9	457.4	-136.4	2.00	2.00	0.00

Database:	EDM 5000.14	**Local Co-ordinate Reference:**	Well #710H
Company:	EOG Resources - Midland	**TVD Reference:**	KB = 25 @ 3279.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	KB = 25 @ 3279.0usft
Site:	Orrtanna 20 Fed	**North Reference:**	Grid
Well:	#710H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

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	13.36	118.17	5,252.9	-254.8	475.9	-142.0	0.00	0.00	0.00
5,400.0	13.36	118.17	5,350.2	-265.7	496.2	-148.0	0.00	0.00	0.00
5,500.0	13.36	118.17	5,447.5	-276.6	516.6	-154.1	0.00	0.00	0.00
5,600.0	13.36	118.17	5,544.8	-287.6	537.0	-160.2	0.00	0.00	0.00
5,700.0	13.36	118.17	5,642.1	-298.5	557.4	-166.3	0.00	0.00	0.00
5,800.0	13.36	118.17	5,739.4	-309.4	577.7	-172.3	0.00	0.00	0.00
5,900.0	13.36	118.17	5,836.7	-320.3	598.1	-178.4	0.00	0.00	0.00
6,000.0	13.36	118.17	5,933.9	-331.2	618.5	-184.5	0.00	0.00	0.00
6,100.0	13.36	118.17	6,031.2	-342.1	638.9	-190.6	0.00	0.00	0.00
6,200.0	13.36	118.17	6,128.5	-353.0	659.2	-196.7	0.00	0.00	0.00
6,300.0	13.36	118.17	6,225.8	-363.9	679.6	-202.7	0.00	0.00	0.00
6,400.0	13.36	118.17	6,323.1	-374.8	700.0	-208.8	0.00	0.00	0.00
6,500.0	13.36	118.17	6,420.4	-385.7	720.4	-214.9	0.00	0.00	0.00
6,600.0	13.36	118.17	6,517.7	-396.7	740.7	-221.0	0.00	0.00	0.00
6,700.0	13.36	118.17	6,615.0	-407.6	761.1	-227.0	0.00	0.00	0.00
6,800.0	13.36	118.17	6,712.3	-418.5	781.5	-233.1	0.00	0.00	0.00
6,900.0	13.36	118.17	6,809.6	-429.4	801.9	-239.2	0.00	0.00	0.00
7,000.0	13.36	118.17	6,906.9	-440.3	822.2	-245.3	0.00	0.00	0.00
7,100.0	13.36	118.17	7,004.2	-451.2	842.6	-251.3	0.00	0.00	0.00
7,200.0	13.36	118.17	7,101.5	-462.1	863.0	-257.4	0.00	0.00	0.00
7,237.4	13.36	118.17	7,137.9	-466.2	870.6	-259.7	0.00	0.00	0.00
7,300.0	12.11	118.17	7,198.9	-472.7	882.8	-263.3	2.00	-2.00	0.00
7,400.0	10.11	118.17	7,297.0	-481.8	899.8	-268.4	2.00	-2.00	0.00
7,500.0	8.11	118.17	7,395.8	-489.3	913.7	-272.6	2.00	-2.00	0.00
7,600.0	6.11	118.17	7,495.0	-495.1	924.6	-275.8	2.00	-2.00	0.00
7,700.0	4.11	118.17	7,594.6	-499.3	932.5	-278.2	2.00	-2.00	0.00
7,800.0	2.11	118.17	7,694.4	-501.9	937.3	-279.6	2.00	-2.00	0.00
7,905.6	0.00	0.00	7,800.0	-502.8	939.0	-280.1	2.00	-2.00	0.00
8,000.0	0.00	0.00	7,894.4	-502.8	939.0	-280.1	0.00	0.00	0.00
8,100.0	0.00	0.00	7,994.4	-502.8	939.0	-280.1	0.00	0.00	0.00
8,200.0	0.00	0.00	8,094.4	-502.8	939.0	-280.1	0.00	0.00	0.00
8,300.0	0.00	0.00	8,194.4	-502.8	939.0	-280.1	0.00	0.00	0.00
8,400.0	0.00	0.00	8,294.4	-502.8	939.0	-280.1	0.00	0.00	0.00
8,500.0	0.00	0.00	8,394.4	-502.8	939.0	-280.1	0.00	0.00	0.00
8,600.0	0.00	0.00	8,494.4	-502.8	939.0	-280.1	0.00	0.00	0.00
8,700.0	0.00	0.00	8,594.4	-502.8	939.0	-280.1	0.00	0.00	0.00
8,800.0	0.00	0.00	8,694.4	-502.8	939.0	-280.1	0.00	0.00	0.00
8,900.0	0.00	0.00	8,794.4	-502.8	939.0	-280.1	0.00	0.00	0.00
9,000.0	0.00	0.00	8,894.4	-502.8	939.0	-280.1	0.00	0.00	0.00
9,100.0	0.00	0.00	8,994.4	-502.8	939.0	-280.1	0.00	0.00	0.00
9,200.0	0.00	0.00	9,094.4	-502.8	939.0	-280.1	0.00	0.00	0.00
9,300.0	0.00	0.00	9,194.4	-502.8	939.0	-280.1	0.00	0.00	0.00
9,400.0	0.00	0.00	9,294.4	-502.8	939.0	-280.1	0.00	0.00	0.00
9,500.0	0.00	0.00	9,394.4	-502.8	939.0	-280.1	0.00	0.00	0.00
9,600.0	0.00	0.00	9,494.4	-502.8	939.0	-280.1	0.00	0.00	0.00
9,700.0	0.00	0.00	9,594.4	-502.8	939.0	-280.1	0.00	0.00	0.00
9,800.0	0.00	0.00	9,694.4	-502.8	939.0	-280.1	0.00	0.00	0.00
9,900.0	0.00	0.00	9,794.4	-502.8	939.0	-280.1	0.00	0.00	0.00
10,000.0	0.00	0.00	9,894.4	-502.8	939.0	-280.1	0.00	0.00	0.00
10,100.0	0.00	0.00	9,994.4	-502.8	939.0	-280.1	0.00	0.00	0.00
10,200.0	0.00	0.00	10,094.4	-502.8	939.0	-280.1	0.00	0.00	0.00
10,300.0	0.00	0.00	10,194.4	-502.8	939.0	-280.1	0.00	0.00	0.00
10,400.0	0.00	0.00	10,294.4	-502.8	939.0	-280.1	0.00	0.00	0.00
10,500.0	0.00	0.00	10,394.4	-502.8	939.0	-280.1	0.00	0.00	0.00

Database:	EDM 5000.14	**Local Co-ordinate Reference:**	Well #710H
Company:	EOG Resources - Midland	**TVD Reference:**	KB = 25 @ 3279.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	KB = 25 @ 3279.0usft
Site:	Orrtanna 20 Fed	**North Reference:**	Grid
Well:	#710H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

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)
10,600.0	0.00	0.00	10,494.4	-502.8	939.0	-280.1	0.00	0.00	0.00
10,700.0	0.00	0.00	10,594.4	-502.8	939.0	-280.1	0.00	0.00	0.00
10,800.0	0.00	0.00	10,694.4	-502.8	939.0	-280.1	0.00	0.00	0.00
10,900.0	0.00	0.00	10,794.4	-502.8	939.0	-280.1	0.00	0.00	0.00
11,000.0	0.00	0.00	10,894.4	-502.8	939.0	-280.1	0.00	0.00	0.00
11,100.0	0.00	0.00	10,994.4	-502.8	939.0	-280.1	0.00	0.00	0.00
11,200.0	0.00	0.00	11,094.4	-502.8	939.0	-280.1	0.00	0.00	0.00
11,300.0	0.00	0.00	11,194.4	-502.8	939.0	-280.1	0.00	0.00	0.00
11,400.0	0.00	0.00	11,294.4	-502.8	939.0	-280.1	0.00	0.00	0.00
11,500.0	0.00	0.00	11,394.4	-502.8	939.0	-280.1	0.00	0.00	0.00
11,600.0	0.00	0.00	11,494.4	-502.8	939.0	-280.1	0.00	0.00	0.00
11,700.0	0.00	0.00	11,594.4	-502.8	939.0	-280.1	0.00	0.00	0.00
11,800.0	0.00	0.00	11,694.4	-502.8	939.0	-280.1	0.00	0.00	0.00
11,900.0	0.00	0.00	11,794.4	-502.8	939.0	-280.1	0.00	0.00	0.00
11,958.2	0.00	0.00	11,852.6	-502.8	939.0	-280.1	0.00	0.00	0.00
11,975.0	2.02	8.15	11,869.4	-502.5	939.0	-279.8	12.00	12.00	0.00
12,000.0	5.02	8.15	11,894.3	-501.0	939.3	-278.3	12.00	12.00	0.00
12,025.0	8.02	8.15	11,919.2	-498.2	939.7	-275.4	12.00	12.00	0.00
12,050.0	11.02	8.15	11,943.8	-494.1	940.2	-271.3	12.00	12.00	0.00
12,075.0	14.02	8.15	11,968.2	-488.7	941.0	-265.9	12.00	12.00	0.00
12,100.0	17.02	8.15	11,992.3	-482.1	942.0	-259.3	12.00	12.00	0.00
12,125.0	20.02	8.15	12,016.0	-474.3	943.1	-251.4	12.00	12.00	0.00
12,150.0	23.02	8.15	12,039.3	-465.2	944.4	-242.2	12.00	12.00	0.00
12,175.0	26.02	8.15	12,062.0	-454.9	945.9	-231.9	12.00	12.00	0.00
12,200.0	29.02	8.15	12,084.2	-443.5	947.5	-220.4	12.00	12.00	0.00
12,225.0	32.02	8.15	12,105.7	-430.9	949.3	-207.7	12.00	12.00	0.00
12,250.0	35.02	8.15	12,126.6	-417.3	951.3	-194.0	12.00	12.00	0.00
12,275.0	38.02	8.15	12,146.7	-402.5	953.4	-179.1	12.00	12.00	0.00
12,300.0	41.02	8.15	12,165.9	-386.8	955.6	-163.3	12.00	12.00	0.00
12,325.0	44.02	8.15	12,184.4	-370.1	958.0	-146.5	12.00	12.00	0.00
12,350.0	47.02	8.15	12,201.9	-352.4	960.5	-128.7	12.00	12.00	0.00
12,375.0	50.02	8.15	12,218.4	-333.9	963.2	-110.0	12.00	12.00	0.00
12,400.0	53.02	8.15	12,234.0	-314.5	966.0	-90.5	12.00	12.00	0.00
12,425.0	56.02	8.15	12,248.5	-294.4	968.9	-70.2	12.00	12.00	0.00
12,450.0	59.02	8.15	12,261.9	-273.5	971.8	-49.2	12.00	12.00	0.00
12,475.0	62.02	8.15	12,274.2	-251.9	974.9	-27.5	12.00	12.00	0.00
12,500.0	65.02	8.15	12,285.4	-229.8	978.1	-5.2	12.00	12.00	0.00
12,525.0	68.02	8.15	12,295.3	-207.1	981.3	17.6	12.00	12.00	0.00
12,536.5	69.40	8.15	12,299.5	-196.5	982.9	28.3	12.00	12.00	0.00
FTP (Orrtanna 20 Fed #710H)									
12,550.0	71.02	8.15	12,304.1	-183.9	984.7	40.9	12.00	12.00	0.00
12,575.0	74.02	8.15	12,311.6	-160.3	988.0	64.7	12.00	12.00	0.00
12,600.0	77.02	8.15	12,317.9	-136.4	991.5	88.8	12.00	12.00	0.00
12,625.0	80.02	8.15	12,322.8	-112.1	995.0	113.2	12.00	12.00	0.00
12,650.0	83.02	8.15	12,326.5	-87.6	998.5	137.9	12.00	12.00	0.00
12,675.0	86.02	8.15	12,328.9	-63.0	1,002.0	162.7	12.00	12.00	0.00
12,700.0	89.02	8.15	12,330.0	-38.3	1,005.5	187.5	12.00	12.00	0.00
12,708.2	90.00	8.15	12,330.0	-30.2	1,006.7	195.7	12.05	12.05	0.00
12,800.0	90.00	8.15	12,330.0	60.7	1,019.7	287.2	0.00	0.00	0.00
12,900.0	90.00	8.15	12,330.0	159.7	1,033.9	386.9	0.00	0.00	0.00
13,000.0	90.00	8.15	12,330.0	258.7	1,048.1	486.5	0.00	0.00	0.00
13,030.8	90.00	8.15	12,330.0	289.1	1,052.4	517.2	0.00	0.00	0.00
13,050.0	90.00	7.05	12,330.0	308.2	1,055.0	536.3	5.74	0.00	-5.74

Database:	EDM 5000.14	**Local Co-ordinate Reference:**	Well #710H
Company:	EOG Resources - Midland	**TVD Reference:**	KB = 25 @ 3279.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	KB = 25 @ 3279.0usft
Site:	Orrtanna 20 Fed	**North Reference:**	Grid
Well:	#710H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

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)
13,100.0	90.00	4.18	12,330.0	358.0	1,059.8	585.9	5.74	0.00	-5.74
13,150.0	90.00	1.30	12,330.0	407.9	1,062.2	635.1	5.74	0.00	-5.74
13,180.2	90.00	359.57	12,330.0	438.1	1,062.5	664.6	5.74	0.00	-5.74
13,200.0	90.00	359.57	12,330.0	457.9	1,062.3	683.9	0.00	0.00	0.00
13,300.0	90.00	359.57	12,330.0	557.9	1,061.6	781.2	0.00	0.00	0.00
13,400.0	90.00	359.57	12,330.0	657.9	1,060.8	878.5	0.00	0.00	0.00
13,500.0	90.00	359.57	12,330.0	757.9	1,060.1	975.8	0.00	0.00	0.00
13,600.0	90.00	359.57	12,330.0	857.9	1,059.3	1,073.0	0.00	0.00	0.00
13,700.0	90.00	359.57	12,330.0	957.9	1,058.6	1,170.3	0.00	0.00	0.00
13,800.0	90.00	359.57	12,330.0	1,057.9	1,057.8	1,267.6	0.00	0.00	0.00
13,900.0	90.00	359.57	12,330.0	1,157.9	1,057.1	1,364.9	0.00	0.00	0.00
14,000.0	90.00	359.57	12,330.0	1,257.9	1,056.3	1,462.2	0.00	0.00	0.00
14,100.0	90.00	359.57	12,330.0	1,357.9	1,055.6	1,559.5	0.00	0.00	0.00
14,200.0	90.00	359.57	12,330.0	1,457.9	1,054.8	1,656.8	0.00	0.00	0.00
14,300.0	90.00	359.57	12,330.0	1,557.9	1,054.1	1,754.1	0.00	0.00	0.00
14,400.0	90.00	359.57	12,330.0	1,657.9	1,053.3	1,851.4	0.00	0.00	0.00
14,500.0	90.00	359.57	12,330.0	1,757.9	1,052.6	1,948.7	0.00	0.00	0.00
14,600.0	90.00	359.57	12,330.0	1,857.9	1,051.8	2,046.0	0.00	0.00	0.00
14,700.0	90.00	359.57	12,330.0	1,957.9	1,051.1	2,143.3	0.00	0.00	0.00
14,800.0	90.00	359.57	12,330.0	2,057.8	1,050.3	2,240.6	0.00	0.00	0.00
14,900.0	90.00	359.57	12,330.0	2,157.8	1,049.6	2,337.9	0.00	0.00	0.00
15,000.0	90.00	359.57	12,330.0	2,257.8	1,048.8	2,435.2	0.00	0.00	0.00
15,100.0	90.00	359.57	12,330.0	2,357.8	1,048.1	2,532.5	0.00	0.00	0.00
15,200.0	90.00	359.57	12,330.0	2,457.8	1,047.3	2,629.8	0.00	0.00	0.00
15,300.0	90.00	359.57	12,330.0	2,557.8	1,046.6	2,727.1	0.00	0.00	0.00
15,400.0	90.00	359.57	12,330.0	2,657.8	1,045.8	2,824.4	0.00	0.00	0.00
15,500.0	90.00	359.57	12,330.0	2,757.8	1,045.1	2,921.7	0.00	0.00	0.00
15,600.0	90.00	359.57	12,330.0	2,857.8	1,044.3	3,019.0	0.00	0.00	0.00
15,700.0	90.00	359.57	12,330.0	2,957.8	1,043.6	3,116.3	0.00	0.00	0.00
15,800.0	90.00	359.57	12,330.0	3,057.8	1,042.8	3,213.6	0.00	0.00	0.00
15,900.0	90.00	359.57	12,330.0	3,157.8	1,042.1	3,310.9	0.00	0.00	0.00
16,000.0	90.00	359.57	12,330.0	3,257.8	1,041.3	3,408.2	0.00	0.00	0.00
16,100.0	90.00	359.57	12,330.0	3,357.8	1,040.6	3,505.5	0.00	0.00	0.00
16,200.0	90.00	359.57	12,330.0	3,457.8	1,039.8	3,602.8	0.00	0.00	0.00
16,300.0	90.00	359.57	12,330.0	3,557.8	1,039.1	3,700.1	0.00	0.00	0.00
16,400.0	90.00	359.57	12,330.0	3,657.8	1,038.3	3,797.4	0.00	0.00	0.00
16,500.0	90.00	359.57	12,330.0	3,757.8	1,037.6	3,894.7	0.00	0.00	0.00
16,600.0	90.00	359.57	12,330.0	3,857.8	1,036.8	3,992.0	0.00	0.00	0.00
16,700.0	90.00	359.57	12,330.0	3,957.8	1,036.1	4,089.3	0.00	0.00	0.00
16,800.0	90.00	359.57	12,330.0	4,057.8	1,035.3	4,186.6	0.00	0.00	0.00
16,900.0	90.00	359.57	12,330.0	4,157.8	1,034.6	4,283.8	0.00	0.00	0.00
17,000.0	90.00	359.57	12,330.0	4,257.8	1,033.8	4,381.1	0.00	0.00	0.00
17,100.0	90.00	359.57	12,330.0	4,357.8	1,033.1	4,478.4	0.00	0.00	0.00
17,200.0	90.00	359.57	12,330.0	4,457.8	1,032.3	4,575.7	0.00	0.00	0.00
17,240.2	90.00	359.57	12,330.0	4,498.0	1,032.0	4,614.9	0.00	0.00	0.00
PBHL (Orrtanna 20 Fed #710H)									

Database:	EDM 5000.14	**Local Co-ordinate Reference:**	Well #710H
Company:	EOG Resources - Midland	**TVD Reference:**	KB = 25 @ 3279.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	KB = 25 @ 3279.0usft
Site:	Orrtanna 20 Fed	**North Reference:**	Grid
Well:	#710H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
FTP (Orrtanna 20 Fed #	0.00	0.00	12,330.0	-220.0	1,067.0	372,779.00	771,684.00	32° 1' 21.618 N	103° 35' 24.280 W
- plan misses target center by 92.5usft at 12536.5usft MD (12299.5 TVD, -196.5 N, 982.9 E) - Point									
PBHL (Orrtanna 20 Fed - plan hits target center - Point	0.00	0.00	12,330.0	4,498.0	1,032.0	377,497.00	771,649.00	32° 2' 8.307 N	103° 35' 24.309 W

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**EOG Resources Inc**
LEASE NO.:	**NM118727**
WELL NAME & NO.:	**Orrtanna 20 Fed – 710H**
SURFACE HOLE FOOTAGE:	**557'/FSL & 2409'/FEL**
BOTTOM HOLE FOOTAGE	**230'/FNL & 1342'/FEL**
LOCATION:	**Sec. 20, T. 26 S, R. 33 E**
COUNTY:	**Lea County,New Mexico**

COA

All pervious COAs still apply expect the following:

H2S	○ Yes	◉ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	○ Low	◉ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP

A. Hydrogen Sulfide

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **850** 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 will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

    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 **1st** intermediate casing is:
   - Cement to surface. If cement does not circulate see B.1.a, c-d above.**Additional cement maybe required. Excess calculates to 24%**

   ❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings , the cement on the 3rd casing string must come to surface.

3. The minimum required fill of cement behind the **7-5/8** inch **2nd** intermediate casing is: Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

Variance for annular spacing between 5.5" x 7.625" casing is approved.

4. The minimum required fill of cement behind the **5-1/2** inch production casing is:
   - Cement should tie-back 200' into the previous casing. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** 1st intermediate casing shoe shall be **3000 (3M)** psi.

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **7-5/8** 2nd intermediate casing shoe shall be **5000 (5M)** psi.

GENERAL 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. 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.
   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. 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 are located, this does not include the dog house or stairway area.

3. 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.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. 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.

2. Wait on cement (WOC) for Potash Areas: 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 for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. 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. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. 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.

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

6. **On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.**

7. 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.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. 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. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. 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.

3. 5M or higher 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. **If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:**
    a. **Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.**
    b. **If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.**
    c. **Manufacturer representative shall install the test plug for the initial BOP test.**
    d. **If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.**
    e. **Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.**

5. 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. In potash areas, 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. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

    c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.

    d. 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. 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.

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. 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.

C. 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.

D. 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.

Waste Minimization Plan (WMP)

In the interest of resource development, submission of additional well gas capture development plan information is deferred but may be required by the BLM Authorized Officer at a later date.

ZS 053118

263320C SUNDRY-421047 ORRTANNA 20 FED 710H 30015 NMNM118727 EOG 12-55
421047 05312018 ZS

13 3/8	surface csg in a	17 1/2	inch hole.		Design Factors		SURFACE	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	54.50	J 55	ST&C	11.10	2.91	1.07	850	46,325
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,500			Tail Cmt	does not	circ to sfc.		Totals: 850	46,325

Comparison of Proposed to Minimum Required Cement Volumes

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
17 1/2	0.6946	1030	1662	645	158	8.80	1487	2M	1.56

9 5/8	casing inside the	13 3/8			Design Factors		INTERMEDIATE	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	40.00	J 55	LT&C	2.71	1.21	0.73	4,000	160,000
"B"	40.00	HCK 55	LT&C	14.22	3.10	0.73	800	32,000
w/8.4#/g mud, 30min Sfc Csg Test psig:						Totals:	4,800	192,000
The cement volume(s) are intended to achieve a top of				0	ft from surface or a		850	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0.3132	995	1936	1564	24	10.20	2977	3M	0.81

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.99, 0.82, c, d
All > 0.70, OK.

Tail cmt

7 5/8	casing inside the	9 5/8			Design Factors		INTERMEDIATE	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	29.70	HCP 110	FXL	2.27	1.42	1.17	10,600	314,820
"B"	29.70	HCP 110	FXL	50.91	1.36	1.17	600	17,820
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,186						Totals:	11,200	332,640
The cement volume(s) are intended to achieve a top of				4600	ft from surface or a		200	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 3/4	0.1005	775	2328	676	244	9.40	4653	5M	0.56

Class 'H' tail cmt yld > 1.20 MASP is within 10% of 5000psig, need exrta equip?

Tail cmt

5 1/2	casing inside the	7 5/8			Design Factors		PRODUCTION	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	20.00	P 110	DWC CI	2.96	1.69	1.95	11,958	239,160
"B"	20.00	P 110	VAM SFC	5.62	1.50	1.95	5,282	105,640
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,631						Totals:	17,240	344,800
B egment Design Factors would be:				68.55	1.64	if it were a vertical wellbore.		

No Pilot Hole Planned	MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
	17240	12330	12330	11958	90	12	12708

The cement volume(s) are intended to achieve a top of				11000	ft from surface or a		200	overlap.
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
6 3/4	0.0835	1000	1310	528	148	11.50			0.52

Class 'H' tail cmt yld > 1.20 Capitan Reef est top XXXX. MASP is within 10% of 5000psig, need exrta equip?