

Form 3160-5
(June 2019)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2021**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.

5. Lease Serial No. NMNM108503

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator EOG RESOURCES INCORPORATED

3a. Address 1111 BAGBY SKY LOBBY 2, HOUSTON, TX 77030 3b. Phone No. (include area code)
(713) 651-70004. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC 23/T25S/R33E/NMP

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

8. Well Name and No. CABALLO 23 FED/502H

9. API Well No. 3002547296

10. Field and Pool or Exploratory Area
RED HILLS; LOWER BONE SPRING11. Country or Parish, State
LEA/NM

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

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 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 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 must 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 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 detennined that the site is ready for final inspection.)

EOG respectfully requests an amendment to our approved APD for this well to reflect the following changes:

API #: 30-025-47296

Change name from Caballo 23 Fed 502H to Caballo 23 Fed 407H.

Change SHL from T-25-S, R-33-E, Sec 23, 300' FSL, 1351' FEL, Lea Co., NM, to T-25-S, R-33-E, Sec 23, 300' FSL, 2557' FEL, Lea Co., N.M.

Change BHL from T-25-S, R-33-E, Sec 14, 2541' FSL, 1100' FEL, Lea Co., NM, to T-25-S, R-33-E, Sec 14, 2541' FSL, 1980' FWL, Lea Co., N.M.

Continued on page 3 additional information

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed) STAR HARRELL / Ph: (432) 848-9161	Title Regulatory Specialist
Signature	Date 12/21/2022

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by CHRISTOPHER WALLS / Ph: (575) 234-2234 / Approved	Title Petroleum Engineer	Date 01/31/2023
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 CARLSBAD	

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)

GENERAL INSTRUCTIONS

This form is designed for submitting proposals to perform certain well operations and reports of such operations when completed as indicated on Federal and Indian lands pursuant to applicable Federal law and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local area or regional procedures and practices, are either shown below, will be issued by or may be obtained from the local Federal office.

SPECIFIC INSTRUCTIONS

Item 4 - Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult the local Federal office for specific instructions.

Item 13: Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by the local Federal office. In addition, such proposals and reports should include reasons for the abandonment; data on any former or present productive zones or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to the top of any tubing left in the hole; method of closing top of well and date well site conditioned for final inspection looking for approval of the abandonment. If the proposal will involve **hydraulic fracturing operations**, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 351 et seq., 25 U.S.C. 396; 43 CFR 3160.

PRINCIPAL PURPOSE: The information is used to: (1) Evaluate, when appropriate, approve applications, and report completion of subsequent well operations, on a Federal or Indian lease; and (2) document for administrative use, information for the management, disposal and use of National Resource lands and resources, such as: (a) evaluating the equipment and procedures to be used during a proposed subsequent well operation and reviewing the completed well operations for compliance with the approved plan; (b) requesting and granting approval to perform those actions covered by 43 CFR 3162.3-2, 3162.3-3, and 3162.3-4; (c) reporting the beginning or resumption of production, as required by 43 CFR 3162.4-1(c) and (d) analyzing future applications to drill or modify operations in light of data obtained and methods used.

ROUTINE USES: Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions in connection with congressional inquiries or to consumer reporting agencies to facilitate collection of debts owed the Government.

EFFECT OF NOT PROVIDING THE INFORMATION: Filing of this notice and report and disclosure of the information is mandatory for those subsequent well operations specified in 43 CFR 3162.3-2, 3162.3-3, 3162.3-4.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM collects this information to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.

Response to this request is mandatory.

The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C St., N.W., Mail Stop 401 LS, Washington, D.C. 20240

Additional Information

Additional Remarks

Change target formation to Second Bone Spring Shale.

Update casing and cement program to current design.

Location of Well

0. SHL: SWSE / 300 FSL / 1351 FEL / TWSP: 25S / RANGE: 33E / SECTION: 23 / LAT: 32.1095956 / LONG: -103.5389635 (TVD: 0 feet, MD: 0 feet)

PPP: SESE / 100 FSL / 1100 FEL / TWSP: 25S / RANGE: 33E / SECTION: 23 / LAT: 32.1090451 / LONG: -103.5381515 (TVD: 10913 feet, MD: 10928 feet)

BHL: NESE / 2541 FSL / 1100 FEL / TWSP: 25S / RANGE: 33E / SECTION: 14 / LAT: 32.1302728 / LONG: -103.5381593 (TVD: 11178 feet, MD: 18753 feet)

CONFIDENTIAL

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) 746-3460 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

¹ API Number 30-025-47296	² Pool Code 51020	³ Pool Name Red Hills; Lower Bone Spring
⁴ Property Code 38481	⁵ Property Name CABALLO 23 FED	
⁷ OGRID No. 7377	⁸ Operator Name EOG RESOURCES, INC.	⁶ Well Number 407H ⁹ Elevation 3343'

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
0	23	25-S	33-E	-	300'	SOUTH	2557'	EAST	LEA

¹¹Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
K	14	25-S	33-E	-	2541'	SOUTH	1980'	WEST	LEA

¹² Dedicated Acres 480.00	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ 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.



Caballo 23 Fed 407H

Revised Permit Information 11/30/2022:

Well Name: Caballo 23 Fed 407H

Location: SHL: 300' FSL & 2557' FEL, Section 23, T-25-S, R-33-E, Lea Co., N.M.

BHL: 2541' FSL & 1980' FWL, Section 14, T-25-S, R-33-E, Lea Co., N.M.

Casing Program A:

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
16"	0	1,070	0	1,070	13-3/8"	54.5#	J-55	STC
11"	0	4,053	0	4,000	9-5/8"	40#	J-55	LTC
11"	4,053	5,083	4,000	5,030	9-5/8"	40#	HCK-55	LTC
6-3/4"	0	18,011	0	10,392	5-1/2"	17#	HCP-110	LTC

Variance is requested to waive the centralizer requirements for the 9-5/8" casing in the 11" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 11" hole interval to maximize cement bond and zonal isolation.

Variance is also requested to waive any centralizer requirements for the 5-1/2" casing in the 6-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 6-3/4" hole interval to maximize cement bond and zonal isolation.

EOG requests permission to allow deviation from the 0.422" annulus clearance requirement for the intermediate (salt) section from Onshore Order #2 under the following conditions:

- The variance is not applicable within the Potash Boundaries or Capitan Reef areas.
- Operator takes responsibility to get casing to set point in the event that the clearance causes stuck pipe issues.

Cementing Program:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
1,070' 13-3/8"	320	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl ₂ + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	100	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 870')
5,030' 9-5/8"	470	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	170	14.8	1.32	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 4,020')
18,011' 5-1/2"	350	11.0	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 4,530')
	570	13.2	1.52	Tail: Class H + 5% NEX-020 + 0.2% NAC-102 + 0.15% NAS-725 + 0.5% NFL-549 + 0.2% NFP-703 + 1% NBE-737 + 0.3% NRT-241 (TOC @ 9970')



Caballo 23 Fed 407H

Additive	Purpose
Bentonite Gel	Lightweight/Lost circulation prevention
Calcium Chloride	Accelerator
Cello-flake	Lost circulation prevention
Sodium Metasilicate	Accelerator
MagOx	Expansive agent
Pre-Mag-M	Expansive agent
Sodium Chloride	Accelerator
FL-62	Fluid loss control
Halad-344	Fluid loss control
Halad-9	Fluid loss control
HR-601	Retarder
Microbond	Expansive Agent

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.

Mud Program:

Depth (TVD)	Type	Weight (ppg)	Viscosity	Water Loss
0 – 1,070'	Fresh - Gel	8.6-8.8	28-34	N/c
1,070' – 5,030'	Brine	8.6-8.8	28-34	N/c
5,030' – 18,011'	Oil Base	8.8-9.5	58-68	N/c - 6

Wellhead & Offline Cementing:

EOG Resources Inc. (EOG) respectfully requests a variance from the minimum standards for well control equipment testing of Onshore Order No. 2 (item III.A.2.a.i) to allow a testing schedule of the blow out preventer (BOP) and blow out prevention equipment (BOPE) along with Batch Drilling & Offline cement operations to include the following:

- Full BOPE test at first installation on the pad.
- Full BOPE test every 21 days per Onshore Order No. 2.
- Function test BOP elements per Onshore Order No. 2.
- Break testing BOP and BOPE coupled with batch drilling operations and option to offline cement and/or remediate (if needed) any surface or intermediate sections, according to attached offline cementing support documentation.
- After the well section is secured, the BOP will be disconnected from the wellhead and walked with the rig to another well on the pad.
- TA cap will also be installed per Wellhead vendor procedure and pressure inside the casing will be monitored via the valve on the TA cap as per standard batch drilling ops.
- See attached "EOG BLM Variance 3a -Offline Cement Intermediate Operational Procedure"

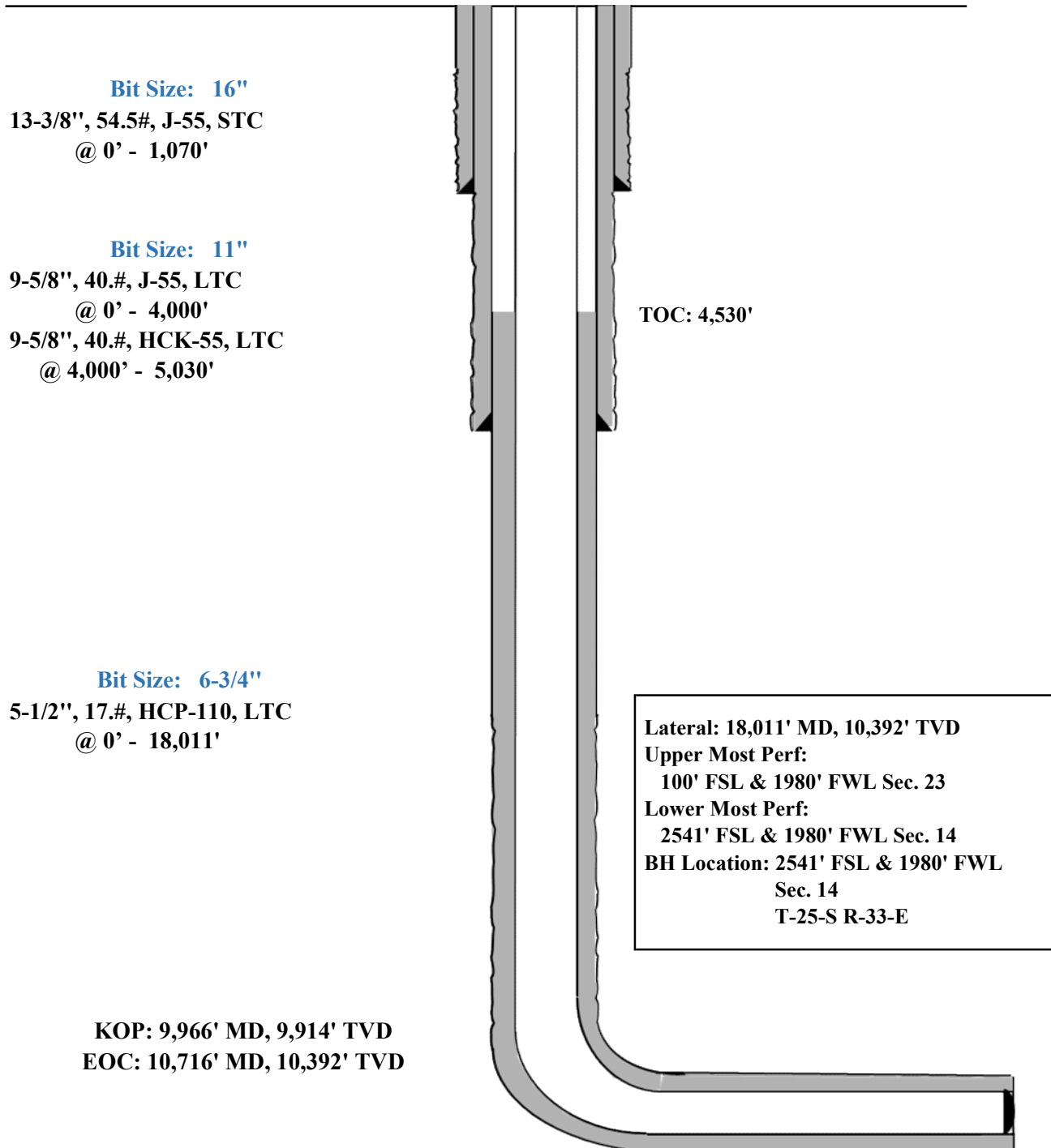


300' FSL
2557' FEL
Section 23
T-25-S, R-33-E

Revised Wellbore A:

KB: 3368'
GL: 3343'

API: 30-025-47296





Caballo 23 Fed 407H

Revised Permit Information 11/30/2022:

Well Name: Caballo 23 Fed 407H

Location: SHL: 300' FSL & 2557' FEL, Section 23, T-25-S, R-33-E, Lea Co., N.M.

BHL: 2541' FSL & 1980' FWL, Section 14, T-25-S, R-33-E, Lea Co., N.M.

Casing Program B:

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
13-1/2"	0	1,070	0	1,070	10-3/4"	40.5#	J-55	STC
9-7/8"	0	4,053	0	4,000	8-5/8"	32#	J-55	BTC-SC
9-7/8"	4,053	5,083	4,000	5,030	8-5/8"	32#	P110-EC	BTC-SC
6-3/4"	0	18,011	0	10,392	5-1/2"	17#	HCP-110	LTC

Cementing Program:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
1,070' 10-3/4"	360	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl ₂ + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	110	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 870')
5,030' 8-5/8"	340	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	160	14.8	1.32	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 4,020')
18,011' 5-1/2"	550	11.0	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 4,530')
	590	13.2	1.52	Tail: Class H + 5% NEX-020 + 0.2% NAC-102 + 0.15% NAS-725 + 0.5% NFL-549 + 0.2% NFP-703 + 1% NBE-737 + 0.3% NRT-241 (TOC @ 9970')



Caballo 23 Fed 407H

Additive	Purpose
Bentonite Gel	Lightweight/Lost circulation prevention
Calcium Chloride	Accelerator
Cello-flake	Lost circulation prevention
Sodium Metasilicate	Accelerator
MagOx	Expansive agent
Pre-Mag-M	Expansive agent
Sodium Chloride	Accelerator
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Halad-344	Fluid loss control
Halad-9	Fluid loss control
HR-601	Retarder
Microbond	Expansive Agent

Wellhead & Offline Cementing:

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- Function test BOP elements per Onshore Order No. 2.
- Break testing BOP and BOPE coupled with batch drilling operations and option to offline cement and/or remediate (if needed) any surface or intermediate sections, according to attached offline cementing support documentation.
- After the well section is secured, the BOP will be disconnected from the wellhead and walked with the rig to another well on the pad.
- TA cap will also be installed per Wellhead vendor procedure and pressure inside the casing will be monitored via the valve on the TA cap as per standard batch drilling ops.
- See attached "EOG BLM Variance 3a -Offline Cement Intermediate Operational Procedure"

 eogresources
Caballo 23 Fed 407H

300'
2557'

Revised Wellbore B:

KB: 3368'
GL: 3343'

Section 23

T-25-S, R-33-E

API: 30-025-47296

Bit Size: 13-1/2"
10-3/4", 40.5#, J-55, STC
@ 0' - 1,070'

Bit Size: 9-7/8"
8-5/8", 32.#, J-55, BTC-SC
@ 0' - 4,000'
8-5/8", 32.#, P110-EC, BTC-SC
@ 4,000' - 5,030'

TOC: 4,530'

Bit Size: 6-3/4"
5-1/2", 17.#, HCP-110, LTC
@ 0' - 18,011'

Lateral: 18,011' MD, 10,392' TVD
Upper Most Perf:
100' FSL & 1980' FWL Sec. 23
Lower Most Perf:
2541' FSL & 1980' FWL Sec. 14
BH Location: 2541' FSL & 1980'
FWL

Sec. 14
T-25-S R-33-E

KOP: 9,966' MD, 9,914' TVD
EOC: 10,716' MD, 10,392' TVD

**GEOLOGIC NAME OF SURFACE FORMATION:**

Permian

ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:

Rustler	954'
Tamarisk Anhydrite	1,045'
Top of Salt	1,342'
Base of Salt	4,934'
Lamar	5,041'
Bell Canyon	5,079'
Cherry Canyon	6,117'
Brushy Canyon	7,702'
Bone Spring Lime	9,235'
Leonard (Avalon) Shale	9,261'
1st Bone Spring Sand	10,195'
2nd Bone Spring Shale	10,392'
2nd Bone Spring Sand	10,741'
3rd Bone Spring Carb	11,220'
3rd Bone Spring Sand	11,813'
TD	10,392'

ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:

Upper Permian Sands	0- 400'	Fresh Water
Bell Canyon	5,079'	Oil
Cherry Canyon	6,117'	Oil
Brushy Canyon	7,702'	Oil
Leonard (Avalon) Shale	9,261'	Oil
1st Bone Spring Sand	10,195'	Oil
2nd Bone Spring Shale	10,392'	Oil
2nd Bone Spring Sand	10,741'	Oil



Midland

Lea County, NM (NAD 83 NME)

Caballo 23 Fed

#407H

OH

Plan: Plan #0.2

Standard Planning Report

21 December, 2022



Planning Report

Database:	PEDM	Local Co-ordinate Reference:	Well #407H
Company:	Midland	TVD Reference:	kb @ 3368.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb @ 3368.0usft
Site:	Caballo 23 Fed	North Reference:	Grid
Well:	#407H	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	Caballo 23 Fed				
Site Position:		Northing:	404,499.00 usft	Latitude:	32° 6' 34.558 N
From:	Map	Easting:	785,117.00 usft	Longitude:	103° 32' 45.566 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "		

Well	#407H					
Well Position	+N/-S	0.0 usft	Northing:	404,506.00 usft	Latitude:	32° 6' 34.557 N
	+E/-W	0.0 usft	Easting:	786,087.00 usft	Longitude:	103° 32' 34.288 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,343.0 usft
Grid Convergence:		0.42 °				

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2/21/2019	6.75	59.94	47,701.52642425

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	353.93	

Plan Survey Tool Program	Date	12/21/2022			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.0	18,011.0 Plan #0.2 (OH)	MWD		
			OWSG MWD - Standard		



Planning Report

Database:	PEDM	Local Co-ordinate Reference:	Well #407H
Company:	Midland	TVD Reference:	kb @ 3368.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb @ 3368.0usft
Site:	Caballo 23 Fed	North Reference:	Grid
Well:	#407H	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	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,885.0	7.70	251.08	1,883.9	-8.4	-24.4	2.00	2.00	0.00	251.08	
7,368.7	7.70	251.08	7,318.1	-246.6	-719.6	0.00	0.00	0.00	0.00	
7,753.8	0.00	0.00	7,702.0	-255.0	-744.0	2.00	-2.00	0.00	180.00	
9,966.3	0.00	0.00	9,914.5	-255.0	-744.0	0.00	0.00	0.00	0.00	KOP (Caballo 23 Fed
10,186.7	26.46	0.00	10,127.2	-205.0	-744.0	12.00	12.00	0.00	0.00	FTP (Caballo 23 Fed
10,716.3	90.00	359.58	10,391.9	222.5	-746.1	12.00	12.00	-0.08	-0.46	
18,011.0	90.00	359.58	10,392.0	7,517.0	-799.0	0.00	0.00	0.00	0.00	PBHL (Caballo 23 Fed



Planning Report

Database:	PEDM	Local Co-ordinate Reference:	Well #407H
Company:	Midland	TVD Reference:	kb @ 3368.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb @ 3368.0usft
Site:	Caballo 23 Fed	North Reference:	Grid
Well:	#407H	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	2.00	251.08	1,600.0	-0.6	-1.7	-0.4	2.00	2.00	0.00
1,700.0	4.00	251.08	1,699.8	-2.3	-6.6	-1.6	2.00	2.00	0.00
1,800.0	6.00	251.08	1,799.5	-5.1	-14.8	-3.5	2.00	2.00	0.00
1,885.0	7.70	251.08	1,883.9	-8.4	-24.4	-5.7	2.00	2.00	0.00
1,900.0	7.70	251.08	1,898.7	-9.0	-26.3	-6.2	0.00	0.00	0.00
2,000.0	7.70	251.08	1,997.8	-13.4	-39.0	-9.2	0.00	0.00	0.00
2,100.0	7.70	251.08	2,096.9	-17.7	-51.7	-12.2	0.00	0.00	0.00
2,200.0	7.70	251.08	2,196.0	-22.1	-64.4	-15.1	0.00	0.00	0.00
2,300.0	7.70	251.08	2,295.1	-26.4	-77.0	-18.1	0.00	0.00	0.00
2,400.0	7.70	251.08	2,394.2	-30.8	-89.7	-21.1	0.00	0.00	0.00
2,500.0	7.70	251.08	2,493.3	-35.1	-102.4	-24.1	0.00	0.00	0.00
2,600.0	7.70	251.08	2,592.4	-39.4	-115.1	-27.1	0.00	0.00	0.00
2,700.0	7.70	251.08	2,691.5	-43.8	-127.7	-30.0	0.00	0.00	0.00
2,800.0	7.70	251.08	2,790.6	-48.1	-140.4	-33.0	0.00	0.00	0.00
2,900.0	7.70	251.08	2,889.7	-52.5	-153.1	-36.0	0.00	0.00	0.00
3,000.0	7.70	251.08	2,988.8	-56.8	-165.8	-39.0	0.00	0.00	0.00
3,100.0	7.70	251.08	3,087.9	-61.2	-178.5	-42.0	0.00	0.00	0.00
3,200.0	7.70	251.08	3,187.0	-65.5	-191.1	-44.9	0.00	0.00	0.00
3,300.0	7.70	251.08	3,286.1	-69.9	-203.8	-47.9	0.00	0.00	0.00
3,400.0	7.70	251.08	3,385.2	-74.2	-216.5	-50.9	0.00	0.00	0.00
3,500.0	7.70	251.08	3,484.3	-78.5	-229.2	-53.9	0.00	0.00	0.00
3,600.0	7.70	251.08	3,583.4	-82.9	-241.8	-56.9	0.00	0.00	0.00
3,700.0	7.70	251.08	3,682.5	-87.2	-254.5	-59.8	0.00	0.00	0.00
3,800.0	7.70	251.08	3,781.6	-91.6	-267.2	-62.8	0.00	0.00	0.00
3,900.0	7.70	251.08	3,880.7	-95.9	-279.9	-65.8	0.00	0.00	0.00
4,000.0	7.70	251.08	3,979.8	-100.3	-292.5	-68.8	0.00	0.00	0.00
4,100.0	7.70	251.08	4,078.9	-104.6	-305.2	-71.8	0.00	0.00	0.00
4,200.0	7.70	251.08	4,178.0	-109.0	-317.9	-74.7	0.00	0.00	0.00
4,300.0	7.70	251.08	4,277.1	-113.3	-330.6	-77.7	0.00	0.00	0.00
4,400.0	7.70	251.08	4,376.2	-117.6	-343.2	-80.7	0.00	0.00	0.00
4,500.0	7.70	251.08	4,475.3	-122.0	-355.9	-83.7	0.00	0.00	0.00
4,600.0	7.70	251.08	4,574.4	-126.3	-368.6	-86.7	0.00	0.00	0.00
4,700.0	7.70	251.08	4,673.5	-130.7	-381.3	-89.6	0.00	0.00	0.00
4,800.0	7.70	251.08	4,772.6	-135.0	-393.9	-92.6	0.00	0.00	0.00
4,900.0	7.70	251.08	4,871.7	-139.4	-406.6	-95.6	0.00	0.00	0.00
5,000.0	7.70	251.08	4,970.7	-143.7	-419.3	-98.6	0.00	0.00	0.00
5,100.0	7.70	251.08	5,069.8	-148.1	-432.0	-101.6	0.00	0.00	0.00
5,200.0	7.70	251.08	5,168.9	-152.4	-444.6	-104.5	0.00	0.00	0.00



Planning Report

Database:	PEDM	Local Co-ordinate Reference:	Well #407H
Company:	Midland	TVD Reference:	kb @ 3368.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb @ 3368.0usft
Site:	Caballo 23 Fed	North Reference:	Grid
Well:	#407H	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	7.70	251.08	5,268.0	-156.7	-457.3	-107.5	0.00	0.00	0.00
5,400.0	7.70	251.08	5,367.1	-161.1	-470.0	-110.5	0.00	0.00	0.00
5,500.0	7.70	251.08	5,466.2	-165.4	-482.7	-113.5	0.00	0.00	0.00
5,600.0	7.70	251.08	5,565.3	-169.8	-495.4	-116.5	0.00	0.00	0.00
5,700.0	7.70	251.08	5,664.4	-174.1	-508.0	-119.5	0.00	0.00	0.00
5,800.0	7.70	251.08	5,763.5	-178.5	-520.7	-122.4	0.00	0.00	0.00
5,900.0	7.70	251.08	5,862.6	-182.8	-533.4	-125.4	0.00	0.00	0.00
6,000.0	7.70	251.08	5,961.7	-187.2	-546.1	-128.4	0.00	0.00	0.00
6,100.0	7.70	251.08	6,060.8	-191.5	-558.7	-131.4	0.00	0.00	0.00
6,200.0	7.70	251.08	6,159.9	-195.8	-571.4	-134.4	0.00	0.00	0.00
6,300.0	7.70	251.08	6,259.0	-200.2	-584.1	-137.3	0.00	0.00	0.00
6,400.0	7.70	251.08	6,358.1	-204.5	-596.8	-140.3	0.00	0.00	0.00
6,500.0	7.70	251.08	6,457.2	-208.9	-609.4	-143.3	0.00	0.00	0.00
6,600.0	7.70	251.08	6,556.3	-213.2	-622.1	-146.3	0.00	0.00	0.00
6,700.0	7.70	251.08	6,655.4	-217.6	-634.8	-149.3	0.00	0.00	0.00
6,800.0	7.70	251.08	6,754.5	-221.9	-647.5	-152.2	0.00	0.00	0.00
6,900.0	7.70	251.08	6,853.6	-226.3	-660.1	-155.2	0.00	0.00	0.00
7,000.0	7.70	251.08	6,952.7	-230.6	-672.8	-158.2	0.00	0.00	0.00
7,100.0	7.70	251.08	7,051.8	-234.9	-685.5	-161.2	0.00	0.00	0.00
7,200.0	7.70	251.08	7,150.9	-239.3	-698.2	-164.2	0.00	0.00	0.00
7,300.0	7.70	251.08	7,250.0	-243.6	-710.8	-167.1	0.00	0.00	0.00
7,368.7	7.70	251.08	7,318.1	-246.6	-719.6	-169.2	0.00	0.00	0.00
7,400.0	7.08	251.08	7,349.1	-247.9	-723.4	-170.1	2.00	-2.00	0.00
7,500.0	5.08	251.08	7,448.6	-251.4	-733.4	-172.4	2.00	-2.00	0.00
7,600.0	3.08	251.08	7,548.3	-253.7	-740.1	-174.0	2.00	-2.00	0.00
7,700.0	1.08	251.08	7,648.2	-254.8	-743.5	-174.8	2.00	-2.00	0.00
7,753.8	0.00	0.00	7,702.0	-255.0	-744.0	-174.9	2.00	-2.00	0.00
7,800.0	0.00	0.00	7,748.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
7,900.0	0.00	0.00	7,848.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
8,000.0	0.00	0.00	7,948.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
8,100.0	0.00	0.00	8,048.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
8,200.0	0.00	0.00	8,148.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
8,300.0	0.00	0.00	8,248.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
8,400.0	0.00	0.00	8,348.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
8,500.0	0.00	0.00	8,448.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
8,600.0	0.00	0.00	8,548.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
8,700.0	0.00	0.00	8,648.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
8,800.0	0.00	0.00	8,748.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
8,900.0	0.00	0.00	8,848.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,000.0	0.00	0.00	8,948.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,100.0	0.00	0.00	9,048.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,200.0	0.00	0.00	9,148.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,300.0	0.00	0.00	9,248.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,400.0	0.00	0.00	9,348.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,500.0	0.00	0.00	9,448.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,600.0	0.00	0.00	9,548.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,700.0	0.00	0.00	9,648.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,800.0	0.00	0.00	9,748.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,900.0	0.00	0.00	9,848.2	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,966.3	0.00	0.00	9,914.5	-255.0	-744.0	-174.9	0.00	0.00	0.00
9,975.0	1.05	0.00	9,923.2	-254.9	-744.0	-174.9	12.00	12.00	0.00
10,000.0	4.05	0.00	9,948.2	-253.8	-744.0	-173.7	12.00	12.00	0.00
10,025.0	7.05	0.00	9,973.1	-251.4	-744.0	-171.3	12.00	12.00	0.00
10,050.0	10.05	0.00	9,997.8	-247.7	-744.0	-167.7	12.00	12.00	0.00



Planning Report

Database:	PEDM	Local Co-ordinate Reference:	Well #407H
Company:	Midland	TVD Reference:	kb @ 3368.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb @ 3368.0usft
Site:	Caballo 23 Fed	North Reference:	Grid
Well:	#407H	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)	
10,075.0	13.05	0.00	10,022.3	-242.7	-744.0	-162.7	12.00	12.00	0.00	
10,100.0	16.05	0.00	10,046.5	-236.4	-744.0	-156.4	12.00	12.00	0.00	
10,125.0	19.05	0.00	10,070.3	-228.9	-744.0	-148.9	12.00	12.00	0.00	
10,150.0	22.05	0.00	10,093.7	-220.1	-744.0	-140.2	12.00	12.00	0.00	
10,175.0	25.05	0.00	10,116.6	-210.1	-744.0	-130.3	12.00	12.00	0.00	
10,186.7	26.46	0.00	10,127.2	-205.0	-744.0	-125.2	12.00	12.00	0.00	
10,200.0	28.05	359.97	10,139.0	-198.9	-744.0	-119.2	12.00	12.00	-0.21	
10,225.0	31.05	359.93	10,160.7	-186.6	-744.0	-106.9	12.00	12.00	-0.18	
10,250.0	34.05	359.89	10,181.8	-173.1	-744.0	-93.5	12.00	12.00	-0.15	
10,275.0	37.05	359.86	10,202.2	-158.6	-744.1	-79.1	12.00	12.00	-0.13	
10,300.0	40.05	359.83	10,221.7	-143.0	-744.1	-63.6	12.00	12.00	-0.11	
10,325.0	43.05	359.81	10,240.4	-126.5	-744.2	-47.1	12.00	12.00	-0.10	
10,350.0	46.05	359.78	10,258.2	-108.9	-744.2	-29.6	12.00	12.00	-0.09	
10,375.0	49.05	359.76	10,275.1	-90.5	-744.3	-11.3	12.00	12.00	-0.08	
10,400.0	52.05	359.75	10,291.0	-71.2	-744.4	7.9	12.00	12.00	-0.07	
10,425.0	55.05	359.73	10,305.8	-51.1	-744.5	27.9	12.00	12.00	-0.07	
10,450.0	58.05	359.71	10,319.6	-30.2	-744.6	48.7	12.00	12.00	-0.06	
10,475.0	61.05	359.70	10,332.3	-8.7	-744.7	70.1	12.00	12.00	-0.06	
10,500.0	64.05	359.69	10,343.8	13.5	-744.8	92.2	12.00	12.00	-0.05	
10,525.0	67.05	359.67	10,354.2	36.3	-744.9	114.8	12.00	12.00	-0.05	
10,550.0	70.05	359.66	10,363.3	59.5	-745.1	138.0	12.00	12.00	-0.05	
10,575.0	73.05	359.65	10,371.2	83.3	-745.2	161.6	12.00	12.00	-0.05	
10,600.0	76.05	359.64	10,377.9	107.4	-745.4	185.5	12.00	12.00	-0.05	
10,625.0	79.05	359.62	10,383.3	131.8	-745.5	209.8	12.00	12.00	-0.05	
10,650.0	82.05	359.61	10,387.4	156.4	-745.7	234.4	12.00	12.00	-0.04	
10,675.0	85.05	359.60	10,390.2	181.3	-745.9	259.1	12.00	12.00	-0.04	
10,700.0	88.05	359.59	10,391.7	206.2	-746.0	283.9	12.00	12.00	-0.04	
10,716.3	90.00	359.58	10,391.9	222.5	-746.1	300.1	12.00	12.00	-0.04	
10,800.0	90.00	359.58	10,391.9	306.2	-746.7	383.4	0.00	0.00	0.00	
10,900.0	90.00	359.58	10,391.9	406.2	-747.5	482.9	0.00	0.00	0.00	
11,000.0	90.00	359.58	10,391.9	506.2	-748.2	582.4	0.00	0.00	0.00	
11,100.0	90.00	359.58	10,391.9	606.2	-748.9	682.0	0.00	0.00	0.00	
11,200.0	90.00	359.58	10,391.9	706.2	-749.6	781.5	0.00	0.00	0.00	
11,300.0	90.00	359.58	10,391.9	806.2	-750.4	881.0	0.00	0.00	0.00	
11,400.0	90.00	359.58	10,392.0	906.2	-751.1	980.5	0.00	0.00	0.00	
11,500.0	90.00	359.58	10,392.0	1,006.2	-751.8	1,080.0	0.00	0.00	0.00	
11,600.0	90.00	359.58	10,392.0	1,106.2	-752.5	1,179.5	0.00	0.00	0.00	
11,700.0	90.00	359.58	10,392.0	1,206.2	-753.3	1,279.0	0.00	0.00	0.00	
11,800.0	90.00	359.58	10,392.0	1,306.2	-754.0	1,378.6	0.00	0.00	0.00	
11,900.0	90.00	359.58	10,392.0	1,406.2	-754.7	1,478.1	0.00	0.00	0.00	
12,000.0	90.00	359.58	10,392.0	1,506.2	-755.4	1,577.6	0.00	0.00	0.00	
12,100.0	90.00	359.58	10,392.0	1,606.2	-756.2	1,677.1	0.00	0.00	0.00	
12,200.0	90.00	359.58	10,392.0	1,706.2	-756.9	1,776.6	0.00	0.00	0.00	
12,300.0	90.00	359.58	10,392.0	1,806.2	-757.6	1,876.1	0.00	0.00	0.00	
12,400.0	90.00	359.58	10,392.0	1,906.2	-758.3	1,975.6	0.00	0.00	0.00	
12,500.0	90.00	359.58	10,392.0	2,006.2	-759.1	2,075.2	0.00	0.00	0.00	
12,600.0	90.00	359.58	10,392.0	2,106.2	-759.8	2,174.7	0.00	0.00	0.00	
12,700.0	90.00	359.58	10,392.0	2,206.2	-760.5	2,274.2	0.00	0.00	0.00	
12,800.0	90.00	359.58	10,392.0	2,306.1	-761.2	2,373.7	0.00	0.00	0.00	
12,900.0	90.00	359.58	10,392.0	2,406.1	-762.0	2,473.2	0.00	0.00	0.00	
13,000.0	90.00	359.58	10,392.0	2,506.1	-762.7	2,572.7	0.00	0.00	0.00	
13,100.0	90.00	359.58	10,392.0	2,606.1	-763.4	2,672.2	0.00	0.00	0.00	
13,200.0	90.00	359.58	10,392.0	2,706.1	-764.1	2,771.7	0.00	0.00	0.00	
13,300.0	90.00	359.58	10,392.0	2,806.1	-764.9	2,871.3	0.00	0.00	0.00	



Planning Report

Database:	PEDM	Local Co-ordinate Reference:	Well #407H
Company:	Midland	TVD Reference:	kb @ 3368.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb @ 3368.0usft
Site:	Caballo 23 Fed	North Reference:	Grid
Well:	#407H	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)
13,400.0	90.00	359.58	10,392.0	2,906.1	-765.6	2,970.8	0.00	0.00	0.00
13,500.0	90.00	359.58	10,392.0	3,006.1	-766.3	3,070.3	0.00	0.00	0.00
13,600.0	90.00	359.58	10,392.0	3,106.1	-767.0	3,169.8	0.00	0.00	0.00
13,700.0	90.00	359.58	10,392.0	3,206.1	-767.8	3,269.3	0.00	0.00	0.00
13,800.0	90.00	359.58	10,392.0	3,306.1	-768.5	3,368.8	0.00	0.00	0.00
13,900.0	90.00	359.58	10,392.0	3,406.1	-769.2	3,468.3	0.00	0.00	0.00
14,000.0	90.00	359.58	10,392.0	3,506.1	-769.9	3,567.9	0.00	0.00	0.00
14,100.0	90.00	359.58	10,392.0	3,606.1	-770.7	3,667.4	0.00	0.00	0.00
14,200.0	90.00	359.58	10,392.0	3,706.1	-771.4	3,766.9	0.00	0.00	0.00
14,300.0	90.00	359.58	10,392.0	3,806.1	-772.1	3,866.4	0.00	0.00	0.00
14,400.0	90.00	359.58	10,392.0	3,906.1	-772.8	3,965.9	0.00	0.00	0.00
14,500.0	90.00	359.58	10,392.0	4,006.1	-773.6	4,065.4	0.00	0.00	0.00
14,600.0	90.00	359.58	10,392.0	4,106.1	-774.3	4,164.9	0.00	0.00	0.00
14,700.0	90.00	359.58	10,392.0	4,206.1	-775.0	4,264.5	0.00	0.00	0.00
14,800.0	90.00	359.58	10,392.0	4,306.1	-775.7	4,364.0	0.00	0.00	0.00
14,900.0	90.00	359.58	10,392.0	4,406.1	-776.5	4,463.5	0.00	0.00	0.00
15,000.0	90.00	359.58	10,392.0	4,506.1	-777.2	4,563.0	0.00	0.00	0.00
15,100.0	90.00	359.58	10,392.0	4,606.1	-777.9	4,662.5	0.00	0.00	0.00
15,200.0	90.00	359.58	10,392.0	4,706.1	-778.6	4,762.0	0.00	0.00	0.00
15,300.0	90.00	359.58	10,392.0	4,806.1	-779.4	4,861.5	0.00	0.00	0.00
15,400.0	90.00	359.58	10,392.0	4,906.1	-780.1	4,961.1	0.00	0.00	0.00
15,500.0	90.00	359.58	10,392.0	5,006.1	-780.8	5,060.6	0.00	0.00	0.00
15,600.0	90.00	359.58	10,392.0	5,106.1	-781.5	5,160.1	0.00	0.00	0.00
15,700.0	90.00	359.58	10,392.0	5,206.1	-782.3	5,259.6	0.00	0.00	0.00
15,800.0	90.00	359.58	10,392.0	5,306.1	-783.0	5,359.1	0.00	0.00	0.00
15,900.0	90.00	359.58	10,392.0	5,406.1	-783.7	5,458.6	0.00	0.00	0.00
16,000.0	90.00	359.58	10,392.0	5,506.1	-784.4	5,558.1	0.00	0.00	0.00
16,100.0	90.00	359.58	10,392.0	5,606.1	-785.2	5,657.6	0.00	0.00	0.00
16,200.0	90.00	359.58	10,392.0	5,706.1	-785.9	5,757.2	0.00	0.00	0.00
16,300.0	90.00	359.58	10,392.0	5,806.1	-786.6	5,856.7	0.00	0.00	0.00
16,400.0	90.00	359.58	10,392.0	5,906.1	-787.3	5,956.2	0.00	0.00	0.00
16,500.0	90.00	359.58	10,392.0	6,006.1	-788.1	6,055.7	0.00	0.00	0.00
16,600.0	90.00	359.58	10,392.0	6,106.0	-788.8	6,155.2	0.00	0.00	0.00
16,700.0	90.00	359.58	10,392.0	6,206.0	-789.5	6,254.7	0.00	0.00	0.00
16,800.0	90.00	359.58	10,392.0	6,306.0	-790.2	6,354.2	0.00	0.00	0.00
16,900.0	90.00	359.58	10,392.0	6,406.0	-790.9	6,453.8	0.00	0.00	0.00
17,000.0	90.00	359.58	10,392.0	6,506.0	-791.7	6,553.3	0.00	0.00	0.00
17,100.0	90.00	359.58	10,392.0	6,606.0	-792.4	6,652.8	0.00	0.00	0.00
17,200.0	90.00	359.58	10,392.0	6,706.0	-793.1	6,752.3	0.00	0.00	0.00
17,300.0	90.00	359.58	10,392.0	6,806.0	-793.8	6,851.8	0.00	0.00	0.00
17,400.0	90.00	359.58	10,392.0	6,906.0	-794.6	6,951.3	0.00	0.00	0.00
17,500.0	90.00	359.58	10,392.0	7,006.0	-795.3	7,050.8	0.00	0.00	0.00
17,600.0	90.00	359.58	10,392.0	7,106.0	-796.0	7,150.4	0.00	0.00	0.00
17,700.0	90.00	359.58	10,392.0	7,206.0	-796.7	7,249.9	0.00	0.00	0.00
17,800.0	90.00	359.58	10,392.0	7,306.0	-797.5	7,349.4	0.00	0.00	0.00
17,900.0	90.00	359.58	10,392.0	7,406.0	-798.2	7,448.9	0.00	0.00	0.00
18,000.0	90.00	359.58	10,392.0	7,506.0	-798.9	7,548.4	0.00	0.00	0.00
18,011.0	90.00	359.58	10,392.0	7,517.0	-799.0	7,559.3	0.00	0.00	0.00



Planning Report

Database:	PEDM	Local Co-ordinate Reference:	Well #407H
Company:	Midland	TVD Reference:	kb @ 3368.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb @ 3368.0usft
Site:	Caballo 23 Fed	North Reference:	Grid
Well:	#407H	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
KOP (Caballo 23 Fed Co - plan hits target center - Point	0.00	0.00	9,914.5	-255.0	-744.0	404,251.00	785,343.00	32° 6' 32.088 N	103° 32' 42.959 W
FTP (Caballo 23 Fed Co - plan hits target center - Point	0.00	0.00	10,127.2	-205.0	-744.0	404,301.00	785,343.00	32° 6' 32.582 N	103° 32' 42.955 W
PBHL (Caballo 23 Fed C - plan hits target center - Point	0.00	0.00	10,392.0	7,517.0	-799.0	412,023.00	785,288.00	32° 7' 48.998 N	103° 32' 42.938 W





Salt Section Annular Clearance Variance Request

Daniel Moose

Current Design (Salt Strings)

0.422" Annular clearance requirement

- Casing collars shall have a minimum clearance of 0.422 inches on all sides in the hole/casing annulus, with recognition that variances can be granted for justified exceptions.

- 12.25" Hole x 9.625" 40# J55/HCK55 LTC Casing
 - 1.3125" Clearance to casing OD
 - 0.8125" Clearance to coupling OD
- 9.875" Hole x 8.75" 38.5# P110 Sprint-SF Casing
 - 0.5625" Clearance to casing OD
 - 0.433" Clearance to coupling OD

Annular Clearance Variance Request

EOG request permission to allow deviation from the 0.422" annulus clearance requirement for the intermediate (salt) section from Onshore Order #2 under the following conditions:

- The variance is not applicable within the Potash Boundaries or Capitan Reef areas.
- Operator takes responsibility to get casing to set point in the event that the clearance causes stuck pipe issues

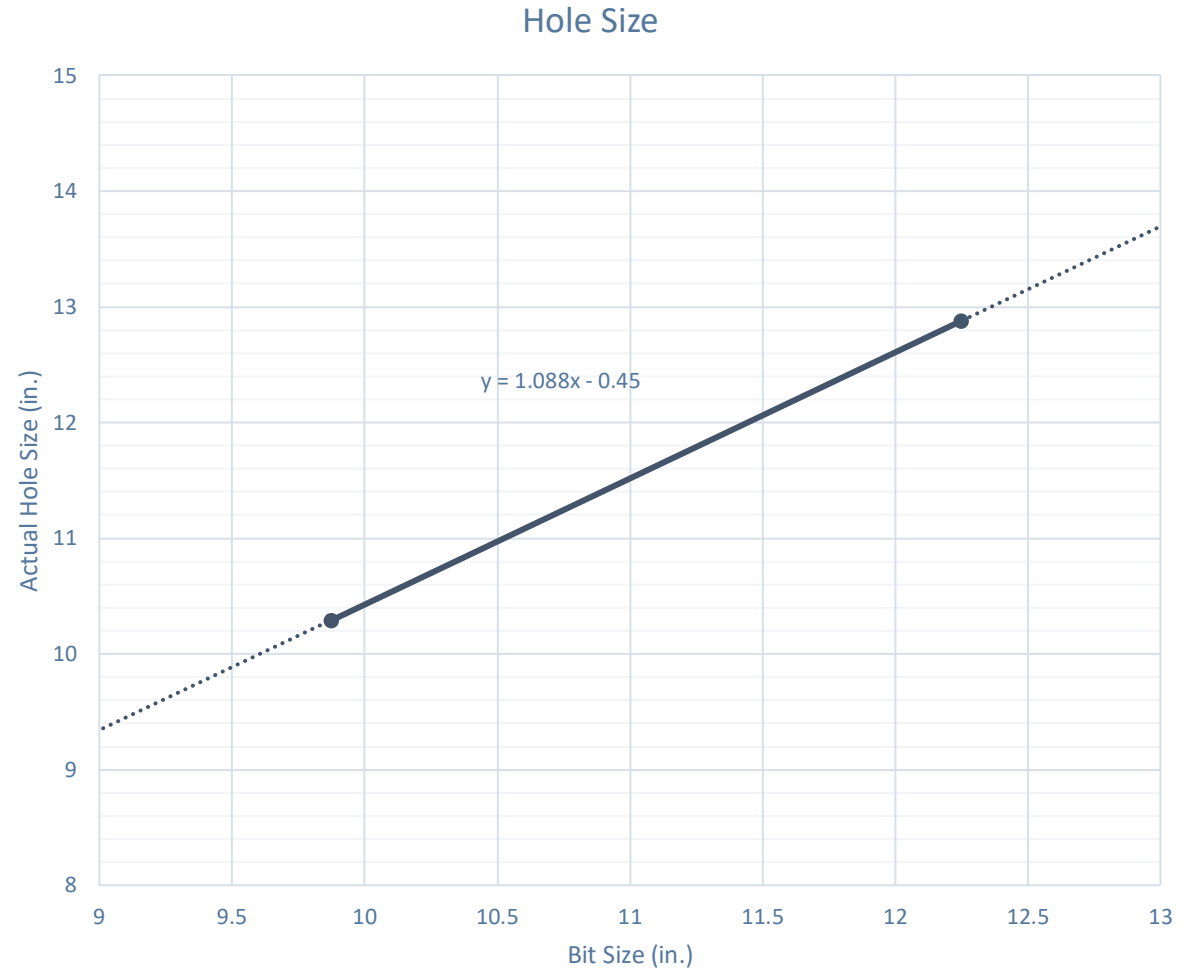
Volumetric Hole Size Calculation

Hole Size Calculations Off Cement Volumes

- Known volume of cement pumped
- Known volume of cement returned to surface
- Must not have had any losses
- Must have bumped plug

Average Hole Size

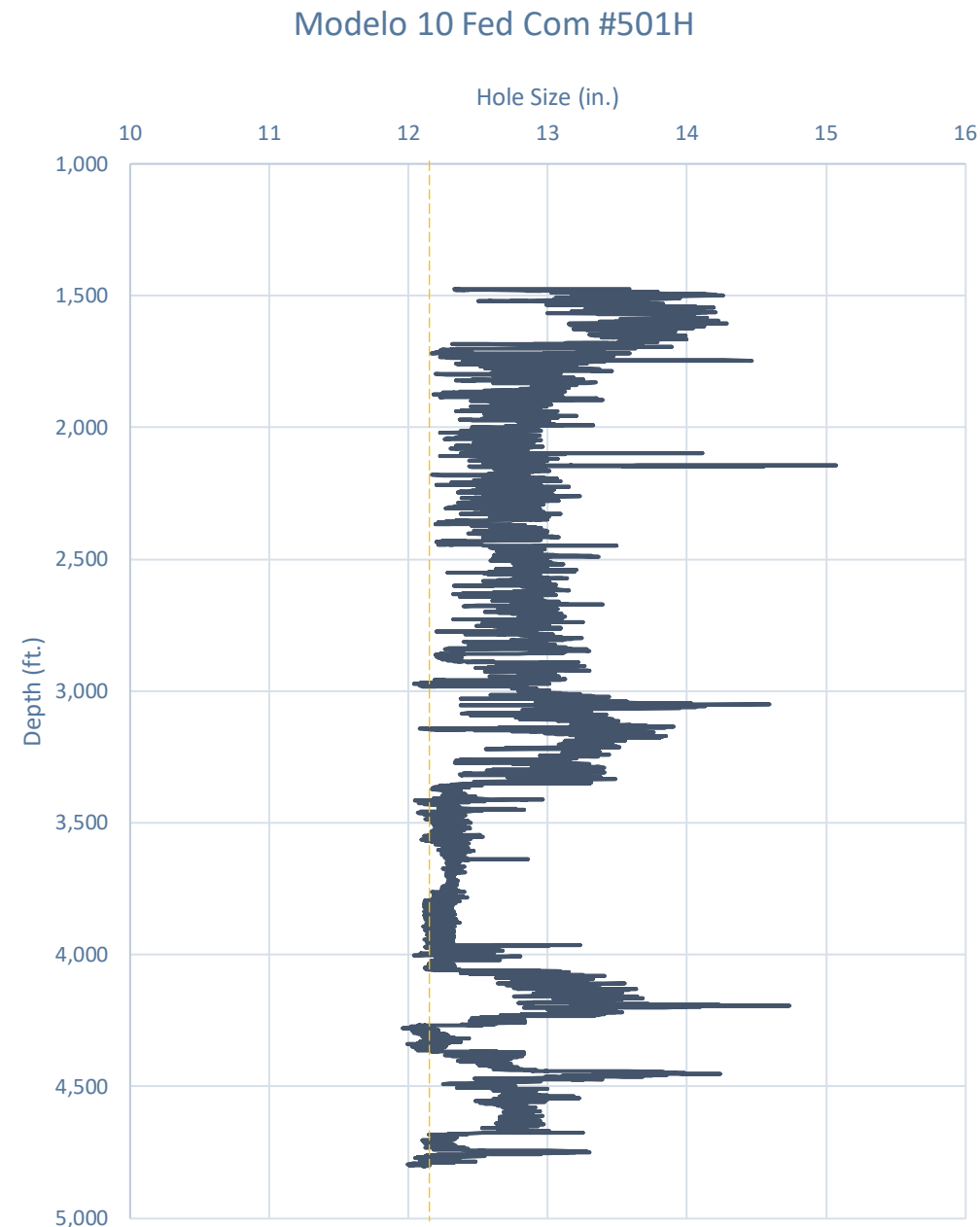
- 12.25" Hole
 - 12.88" Hole
 - 5.13% diameter increase
 - 10.52% area increase
 - 0.63" Average enlargement
 - 0.58" Median enlargement
 - 179 Well Count
- 9.875" Hole
 - 10.30" Hole
 - 4.24% diameter increase
 - 9.64% area increase
 - 0.42" Average enlargement
 - 0.46" Median enlargement
 - 11 Well Count



Caliper Hole Size (12.25")

Average Hole Size

- 12.25" Bit
 - 12.76" Hole
 - 4.14% diameter increase
 - 8.44% area increase
 - 0.51" Average enlargement
 - 0.52" Median enlargement
 - Brine

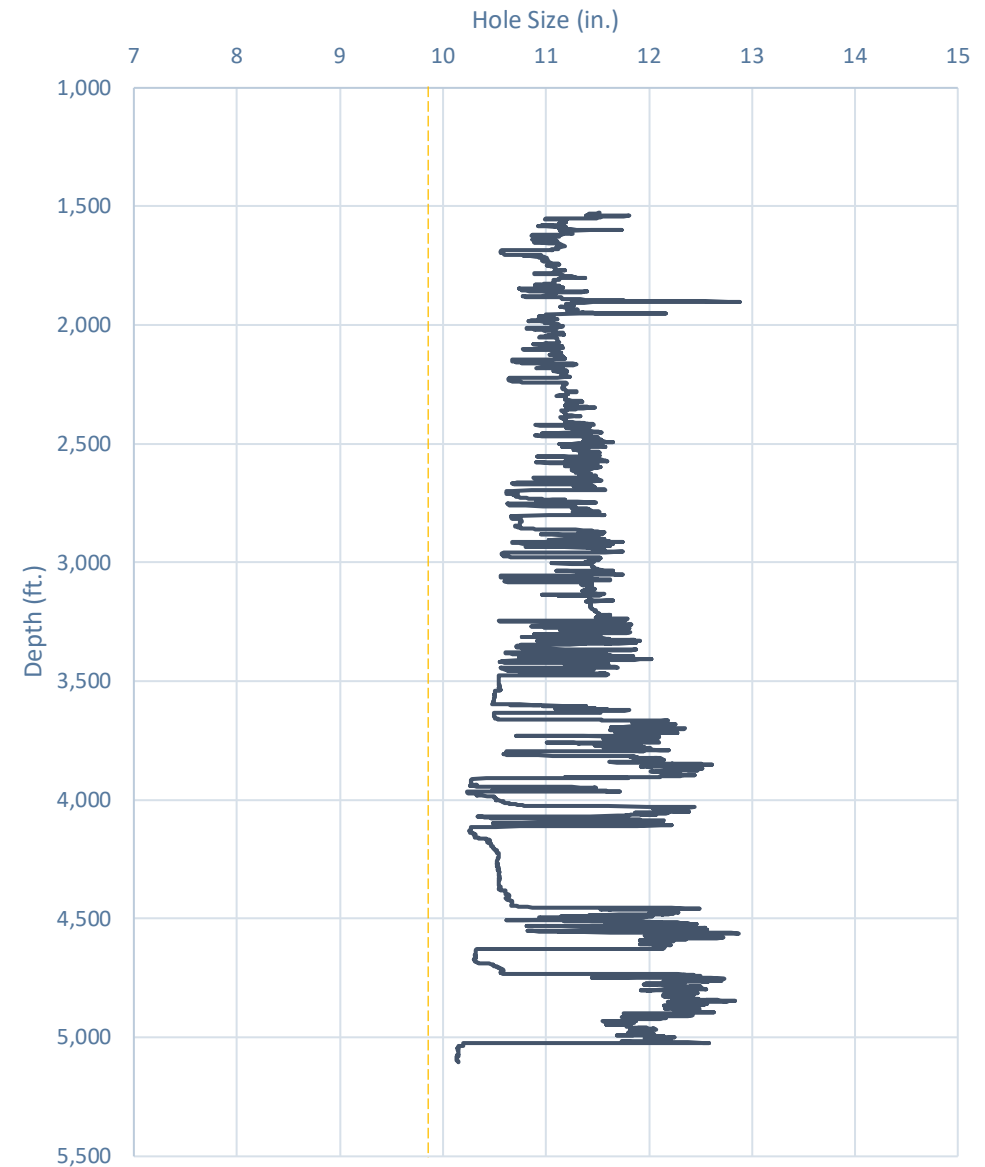


Caliper Hole Size (9.875")

Average Hole Size

- 9.875" Hole
 - 11.21" Hole
 - 13.54% diameter increase
 - 28.92% area increase
 - 1.33" Average enlargement
 - 1.30" Median enlargement
 - EnerLite

Whirling Wind 11 Fed Com #744H



Design A

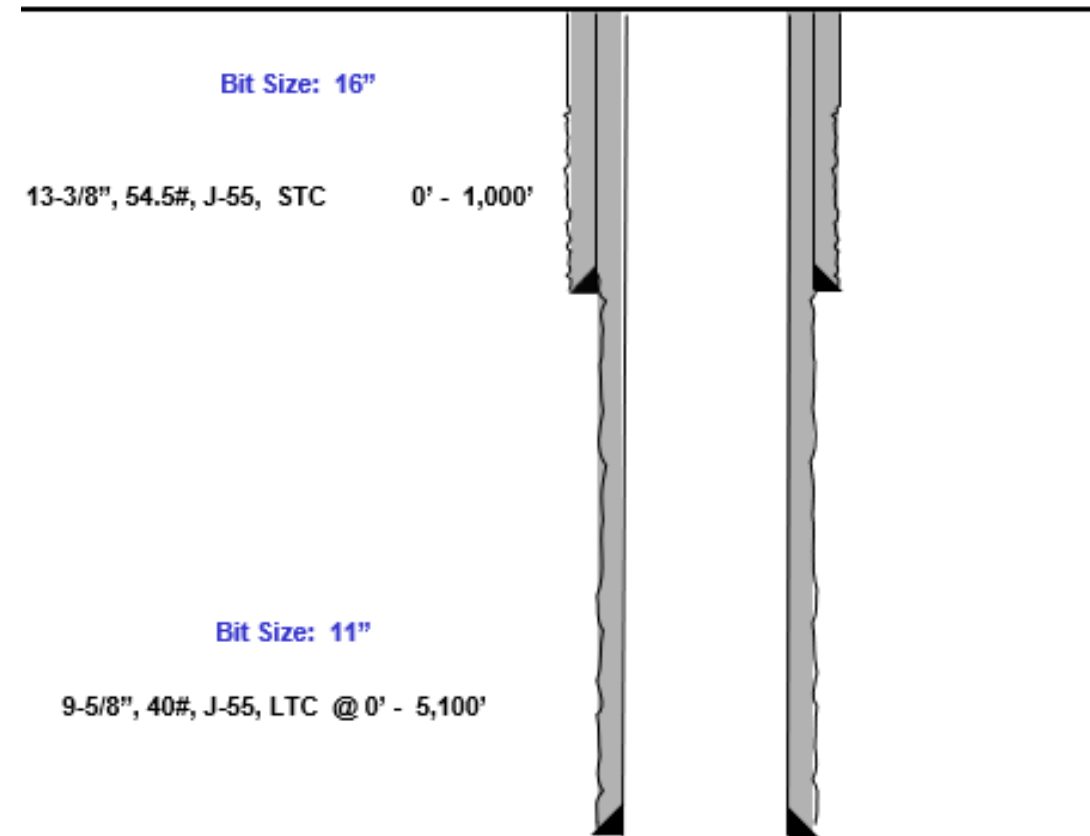
Proposed 11" Hole with 9.625" 40# J55/HCK55 LTC Casing

- 11" Bit + 0.52" Average hole enlargement = 11.52" Hole Size
 - 0.9475" Clearance to casing OD

$$= \frac{11.52 - 9.625}{2}$$
 - 0.4475" Clearance to coupling OD

$$= \frac{11.52 - 10.625}{2}$$
- Previous Shoe – 13.375" 54.5# J55 STC
 - 0.995" Clearance to coupling OD (~1,200' overlap)

$$= \frac{12.615 - 10.625}{2}$$



Design B

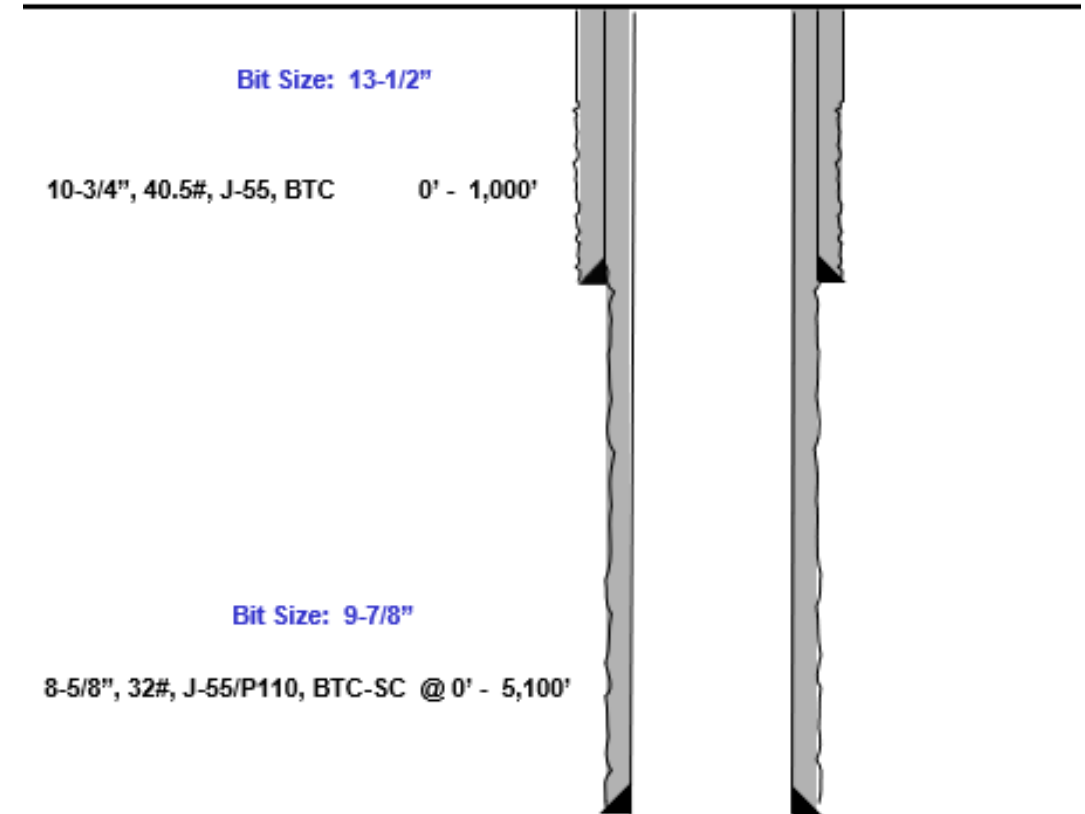
Proposed 9.875" Hole with 8.625" 32# J55/P110 BTC-SC Casing

- 9.875" Bit + 0.42" Average hole enlargement = 10.295" Hole Size
 - 0.835" Clearance to casing OD

$$= \frac{10.295 - 8.625}{2}$$
 - 0.585" Clearance to coupling OD

$$= \frac{10.295 - 9.125}{2}$$
- Previous Shoe – 10.75" 40.5# J55 STC
 - 0.4625" Clearance to coupling OD (~1,200' overlap)

$$= \frac{10.05 - 9.125}{2}$$





Index

Casing Spec Sheets

PERFORMANCE DATA

API LTC

Technical Data Sheet

9.625 in

40.00 lbs/ft

K55 HC

Tubular Parameters

Size	9.625	in	Minimum Yield	55	ksi
Nominal Weight	40.00	lbs/ft	Minimum Tensile	95	ksi
Grade	K55 HC		Yield Load	629	kips
PE Weight	38.94	lbs/ft	Tensile Load	1088	kips
Wall Thickness	0.395	in	Min. Internal Yield Pressure	3,950	psi
Nominal ID	8.835	in	Collapse Pressure	3600	psi
Drift Diameter	8.750	in			
Nom. Pipe Body Area	11.454	in²			

Connection Parameters

Connection OD	10.625	in
Coupling Length	10.500	in
Threads Per Inch	8	tpi
Standoff Thread Turns	3.50	turns
Make-Up Loss	4.750	in
Min. Internal Yield Pressure	3,950	psi

Pipe Body and API Connections Performance Data

13.375 54.50/0.380 J55

PDF

New Search »

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USC ☒ Metric

6/8/2015 10:04:37 AM

Mechanical Properties	Pipe	BTC	LTC	STC	
Minimum Yield Strength	55,000	--	--	--	psi
Maximum Yield Strength	80,000	--	--	--	psi
Minimum Tensile Strength	75,000	--	--	--	psi
Dimensions	Pipe	BTC	LTC	STC	
Outside Diameter	13.375	14.375	--	14.375	in.
Wall Thickness	0.380	--	--	--	in.
Inside Diameter	12.615	12.615	--	12.615	in.
Standard Drift	12.459	12.459	--	12.459	in.
Alternate Drift	--	--	--	--	in.
Nominal Linear Weight, T&C	54.50	--	--	--	lbs/ft
Plain End Weight	52.79	--	--	--	lbs/ft
Performance	Pipe	BTC	LTC	STC	
Minimum Collapse Pressure	1,130	1,130	--	1,130	psi
Minimum Internal Yield Pressure	2,740	2,740	--	2,740	psi
Minimum Pipe Body Yield Strength	853.00	--	--	--	1000 lbs
Joint Strength	--	909	--	514	1000 lbs
Reference Length	--	11,125	--	6,290	ft
Make-Up Data	Pipe	BTC	LTC	STC	
Make-Up Loss	--	4.81	--	3.50	in.
Minimum Make-Up Torque	--	--	--	3,860	ft-lbs
Maximum Make-Up Torque	--	--	--	6,430	ft-lbs



Casing Spec Sheets

Pipe Body and API Connections Performance Data

10.750 40.50/0.350 J55

PDF

New Search »

« Back to Previous List

USC ☒ Metric

6/8/2015 10:14:05 AM

Mechanical Properties	Pipe	BTC	LTC	STC	
Minimum Yield Strength	55,000	--	--	--	psi
Maximum Yield Strength	80,000	--	--	--	psi
Minimum Tensile Strength	75,000	--	--	--	psi
Dimensions	Pipe	BTC	LTC	STC	
Outside Diameter	10.750	11.750	--	11.750	in.
Wall Thickness	0.350	--	--	--	in.
Inside Diameter	10.050	10.050	--	10.050	in.
Standard Drift	9.894	9.894	--	9.894	in.
Alternate Drift	--	--	--	--	in.
Nominal Linear Weight, T&C	40.50	--	--	--	lbs/ft
Plain End Weight	38.91	--	--	--	lbs/ft
Performance	Pipe	BTC	LTC	STC	
Minimum Collapse Pressure	1,580	1,580	--	1,580	psi
Minimum Internal Yield Pressure	3,130	3,130	--	3,130	psi
Minimum Pipe Body Yield Strength	629.00	--	--	--	1000 lbs
Joint Strength	--	700	--	420	1000 lbs
Reference Length	--	11,522	--	6,915	ft
Make-Up Data	Pipe	BTC	LTC	STC	
Make-Up Loss	--	4.81	--	3.50	in.
Minimum Make-Up Torque	--	--	--	3,150	ft-lbs
Maximum Make-Up Torque	--	--	--	5,250	ft-lbs



API 5CT, 10th Ed. Connection Data Sheet

O.D. (in)	WEIGHT (lb/ft)	WALL (in)	GRADE	*API DRIFT (in)	RBW %
8.625	Nominal: 32.00 Plain End: 31.13	0.352	J55	7.796	87.5

Material Properties (PE)		Pipe Body Data (PE)	
Pipe		Geometry	
Minimum Yield Strength:	55 ksi	Nominal ID:	7.92 inch
Maximum Yield Strength:	80 ksi	Nominal Area:	9.149 in ²
Minimum Tensile Strength:	75 ksi	*Special/Alt. Drift:	7.875 inch
Coupling		Performance	
Minimum Yield Strength:	55 ksi	Pipe Body Yield Strength:	503 kips
Maximum Yield Strength:	80 ksi	Collapse Resistance:	2,530 psi
Minimum Tensile Strength:	75 ksi	Internal Yield Pressure: (API Historical)	3,930 psi

API Connection Data		API Connection Torque	
Coupling OD: 9.625"		STC Torque (ft-lbs)	
STC Performance		Min: 2,793 Opti: 3,724 Max: 4,655	
STC Internal Pressure:		LTC Torque (ft-lbs)	
STC Joint Strength:		Min: 3,130 Opti: 4,174 Max: 5,217	
LTC Performance		BTC Torque (ft-lbs)	
LTC Internal Pressure:		follow API guidelines regarding positional make up	
LTC Joint Strength:			
SC-BTC Performance - Cplg OD = 9.125"			
BTC Internal Pressure:			
BTC Joint Strength:			

*Alt. Drift will be used unless API Drift is specified on order.

**If above API connections do not suit your needs, VAM® premium connections are available up to 100% of pipe body ratings.

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Rev 3, 7/30/2021

10/21/2022 15:24



Annular Clearance Variance



Offline Intermediate Cementing Procedure

2/24/2022

Cement Program

1. No changes to the cement program will take place for offline cementing.

Summarized Operational Procedure for Intermediate Casing

1. Run casing as per normal operations. While running casing, conduct negative pressure test and confirm integrity of the float equipment back pressure valves.
 - a. Float equipment is equipped with two back pressure valves rated to a minimum of 5,000 psi.
2. Land production casing on mandrel hanger through BOP.
 - a. If casing is unable to be landed with a mandrel hanger, then the **casing will be cemented online**.
3. Break circulation and confirm no restrictions.
 - a. Ensure no blockage of float equipment and appropriate annular returns.
 - b. Perform flow check to confirm well is static.
4. Set pack-off
 - a. If utilizing a fluted/ported mandrel hanger, ensure well is static on the annulus and inside the casing by filling the pipe with kill weight fluid, remove landing joint, and set annular packoff through BOP. Pressure test to 5,000 psi for 10 min.
 - b. If utilizing a solid mandrel hanger, ensure well is static on the annulus and inside the casing by filling the pipe with kill weight fluid. Pressure test seals to 5,000 psi for 10 min. Remove landing joint through BOP.
5. After confirmation of both annular barriers and the two casing barriers, install TA plug and pressure test to 5,000 psi for 10 min. Notify the BLM with intent to proceed with nipple down and offline cementing.
 - a. Minimum 4 hrs notice.
6. With the well secured and BLM notified, nipple down BOP and secure on hydraulic carrier or cradle.
 - a. **Note, if any of the barriers fail to test, the BOP stack will not be nipples down until after the cement job has concluded and both lead and tail slurry have reached 500 psi.**
7. Skid/Walk rig off current well.
8. Confirm well is static before removing TA Plug.
 - a. Cementing operations will not proceed until well is under control. (If well is not static, notify BLM and proceed to kill)
 - b. Casing outlet valves will provide access to both the casing ID and annulus. Rig or third party pump truck will kill well prior to cementing.
 - c. Well control plan can be seen in Section B, Well Control Procedures.
 - d. If need be, rig can be moved back over well and BOP nipples back up for any further remediation.



Offline Intermediate Cementing Procedure

2/24/2022

- e. Diagram for rig positioning relative to offline cementing can be seen in Figure 4.
9. Rig up return lines to take returns from wellhead to pits and rig choke.
 - a. Test all connections and lines from wellhead to choke manifold to 5,000 psi high for 10 min.
 - b. If either test fails, perform corrections and retest before proceeding.
 - c. Return line schematics can be seen in Figure 3.
10. Remove TA Plug from the casing.
11. Install offline cement tool.
 - a. Current offline cement tool schematics can be seen in Figure 1 (Cameron) and Figure 2 (Cactus).
12. Rig up cement head and cementing lines.
 - a. Pressure test cement lines against cement head to 80% of casing burst for 10 min.
13. Break circulation on well to confirm no restrictions.
 - a. If gas is present on circulation, well will be shut in and returns rerouted through gas buster.
 - b. Max anticipated time before circulating with cement truck is 6 hrs.
14. Pump cement job as per plan.
 - a. At plug bump, test casing to 0.22 psi/ft or 1500 psi, whichever is greater.
 - b. If plug does not bump on calculated, shut down and wait 8 hrs or 500 psi compressive strength, whichever is greater before testing casing.
15. Confirm well is static and floats are holding after cement job.
 - a. With floats holding and backside static:
 - i. Remove cement head.
 - b. If floats are leaking:
 - i. Shut-in well and WOC (Wait on Cement) until tail slurry reaches 500 psi compressive strength and the casing is static prior to removing cement head.
 - c. If there is flow on the backside:
 - i. Shut in well and WOC until tail slurry reaches 500 psi compressive strength. Ensure that the casing is static prior to removing cement head.
16. Remove offline cement tool.
17. Install night cap with pressure gauge for monitoring.
18. Test night cap to 5,000 psi for 10 min.



Offline Intermediate Cementing Procedure

2/24/2022

Example Well Control Plan Content

A. Well Control Component Table

The table below, which covers the cementing of the **5M MASP (Maximum Allowable Surface Pressure) portion of the well**, outlines the well control component rating in use. This table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the BOP nipped up to the wellhead.

Intermediate hole section, 5M requirement

Component	RWP
Pack-off	10M
Casing Wellhead Valves	10M
Annular Wellhead Valves	5M
TA Plug	10M
Float Valves	5M
2" 1502 Lo-Torque Valves	15M

B. Well Control Procedures

Well control procedures are specific to the rig equipment and the operation at the time the kick occurs. Below are the minimal high-level tasks prescribed to assure a proper shut-in while circulating and cementing through the Offline Cement Adapter.

General Procedure While Circulating

1. Sound alarm (alert crew).
2. Shut down pumps.
3. Shut-in Well (close valves to rig pits and open valve to rig choke line. Rig choke will already be in the closed position).
4. Confirm shut-in.
5. Notify tool pusher/company representative.



Offline Intermediate Cementing Procedure

2/24/2022

6. Read and record the following:
 - a. SICP (Shut in Casing Pressure) and AP (Annular Pressure)
 - b. Pit gain
 - c. Time
 - d. Regroup and identify forward plan to continue circulating out kick via rig choke and mud/gas separator. Circulate and adjust mud density as needed to control well.

General Procedure While Cementing

1. Sound alarm (alert crew).
2. Shut down pumps.
3. Shut-in Well (close valves to rig pits and open valve to rig choke line. Rig choke will already be in the closed position).
4. Confirm shut-in.
5. Notify tool pusher/company representative.
6. Open rig choke and begin pumping again taking returns through choke manifold and mud/gas separator.
7. Continue to place cement until plug bumps.
8. At plug bump close rig choke and cement head.
9. Read and record the following
 - a. SICP and AP
 - b. Pit gain
 - c. Time
 - d. Shut-in annulus valves on wellhead

General Procedure After Cementing

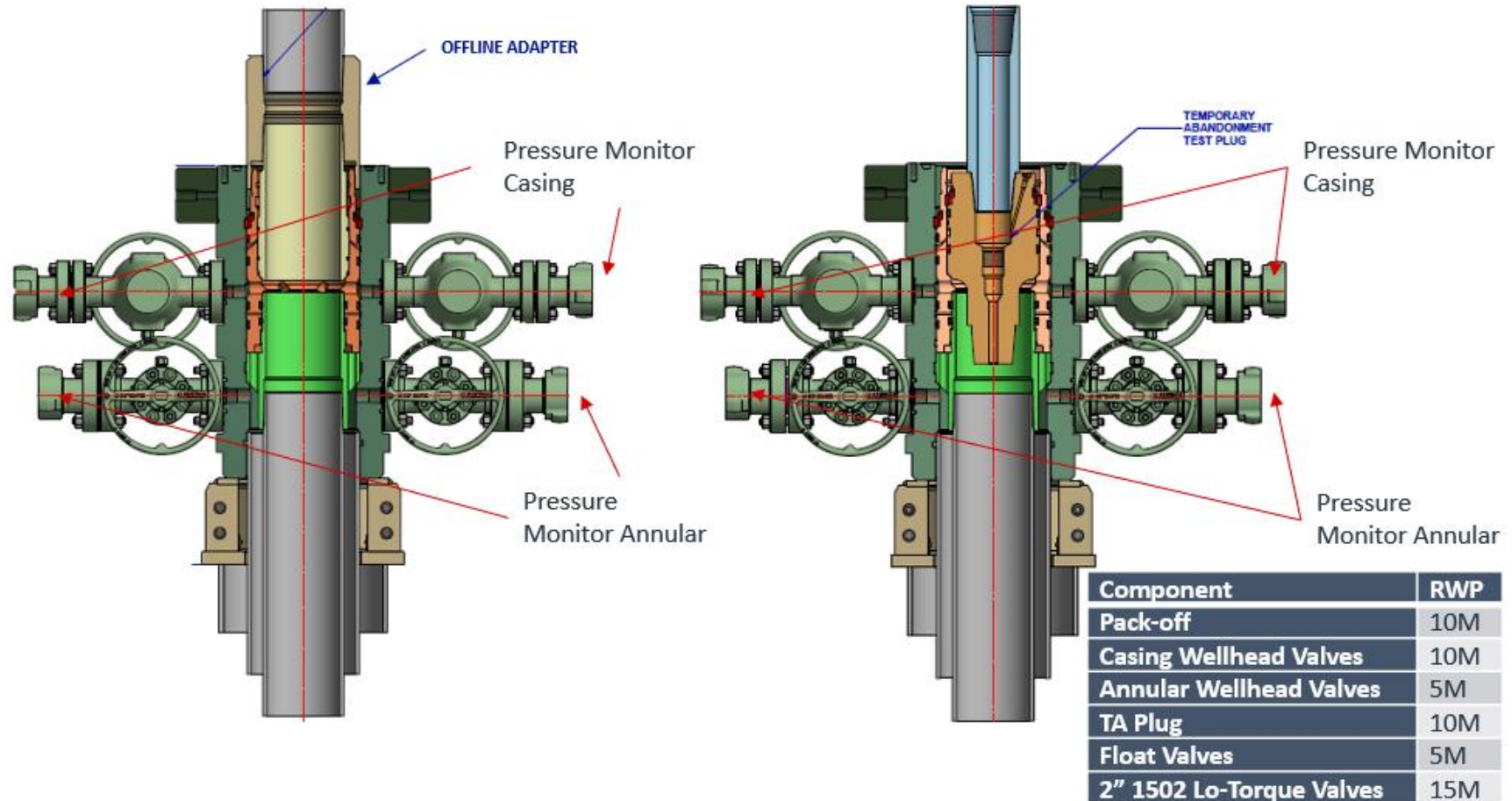
1. Sound alarm (alert crew).
2. Shut-in Well (close valves to rig pits and open valve to rig choke line. Rig choke will already be in the closed position).
3. Confirm shut-in.
4. Notify tool pusher/company representative.
5. Read and record the following:
 - a. SICP and AP
 - b. Pit gain
 - c. Time
 - d. Shut-in annulus valves on wellhead



Offline Intermediate Cementing Procedure

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Figure 1: Cameron TA Plug and Offline Adapter Schematic

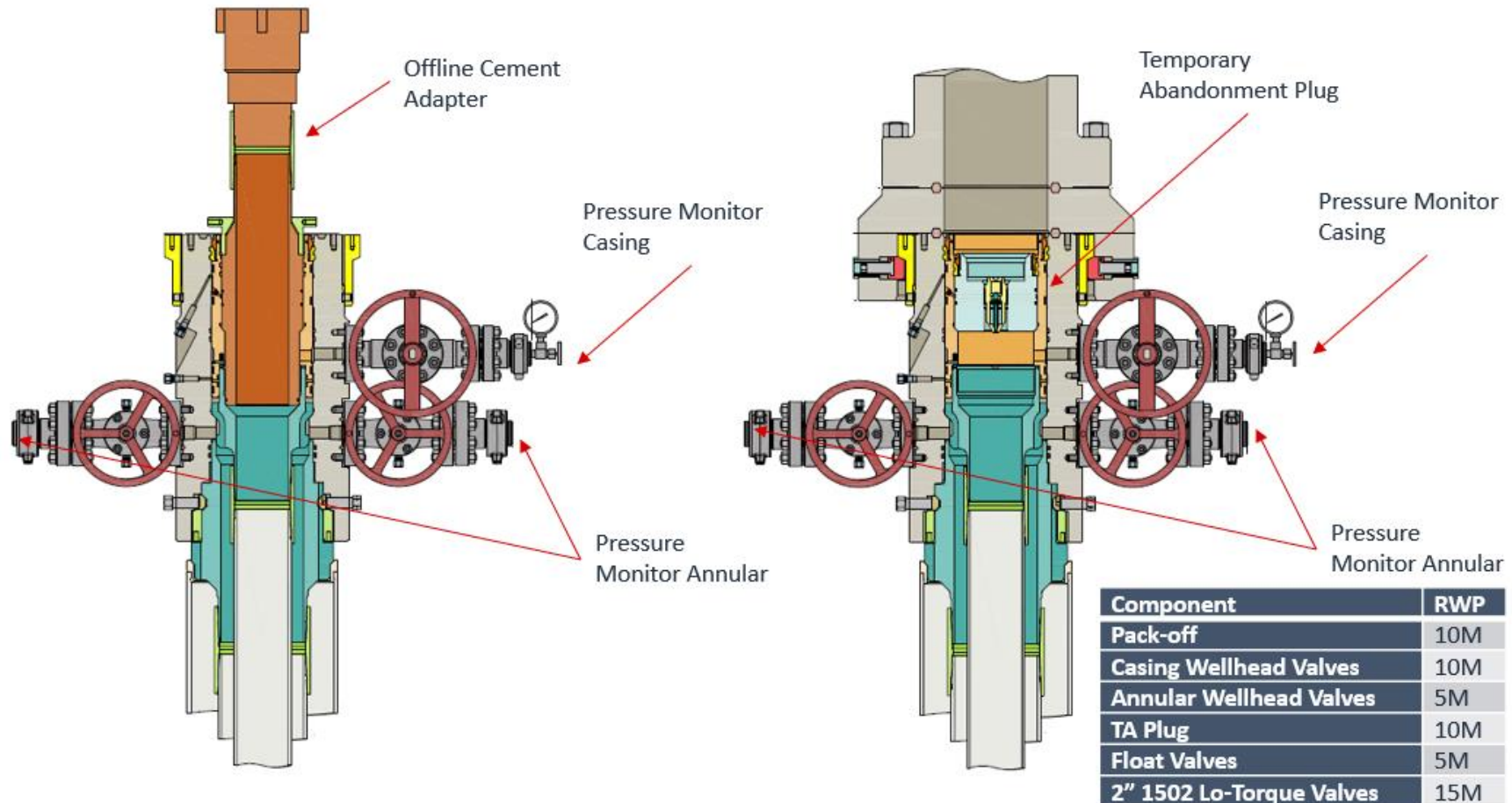




Offline Intermediate Cementing Procedure

2/24/2022

Figure 2: Cactus TA Plug and Offline Adapter Schematic

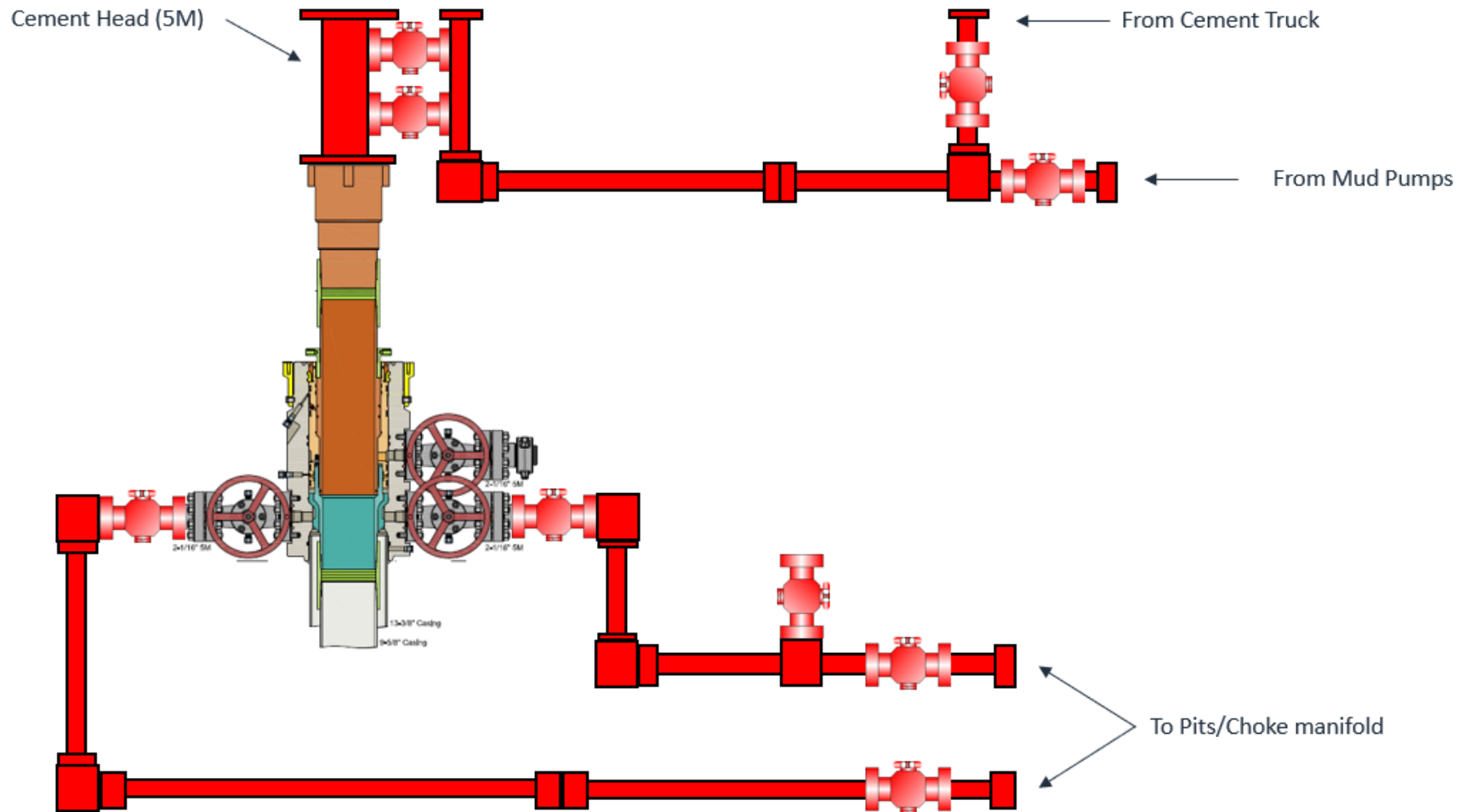




Offline Intermediate Cementing Procedure

2/24/2022

Figure 3: Back Yard Rig Up



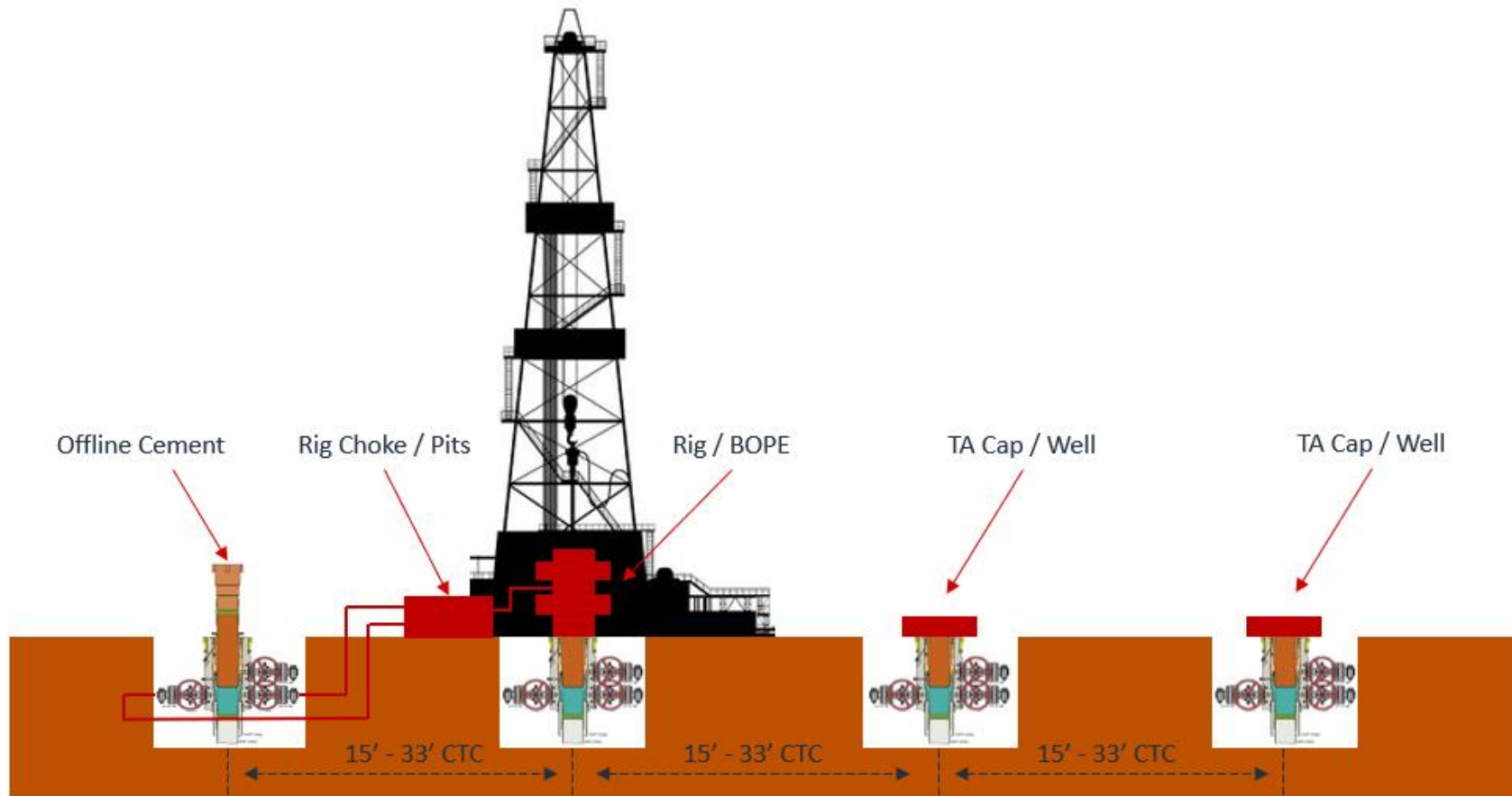
*** All Lines 10M rated working pressure



Offline Intermediate Cementing Procedure

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Figure 4: Rig Placement Diagram



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 Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 181408

CONDITIONS

Operator: EOG RESOURCES INC P.O. Box 2267 Midland, TX 79702	OGRID: 7377
	Action Number: 181408
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
pkautz	None	2/2/2023