



U.S. Department of the Interior

Bureau of Land Management

## Application for Permit to Drill

### APD Package Report

Date Printed: 11/05/2025 12:29 PM

APD ID: 10400101263

Well Status: AAPD

APD Received Date: 09/27/2024 09:20 AM

Well Name: ROSS DRAW 17 FED COM

Operator: EOG RESOURCES INCORPORATED

Well Number: 516H

#### APD Package Report Contents

- Form 3160-3
- Operator Certification Report
- Application Report
- Application Attachments
  - Well Plat: 1 file(s)
- Drilling Plan Report
- Drilling Plan Attachments
  - Blowout Prevention Choke Diagram Attachment: 2 file(s)
  - Blowout Prevention BOP Diagram Attachment: 11 file(s)
  - Casing Design Assumptions and Worksheet(s): 4 file(s)
  - Hydrogen sulfide drilling operations plan: 1 file(s)
  - Proposed horizontal/directional/multi-lateral plan submission: 2 file(s)
  - Other Facets: 12 file(s)
  - Other Variances: 10 file(s)
- SUPO Report
- SUPO Attachments
  - Existing Road Map: 1 file(s)
  - New Road Map: 5 file(s)
  - Attach Well map: 1 file(s)
  - Production Facilities map: 5 file(s)
  - Water source and transportation map: 1 file(s)
  - Construction Materials source location attachment: 1 file(s)
  - Well Site Layout Diagram: 4 file(s)
  - Recontouring attachment: 1 file(s)
  - Other SUPO Attachment: 2 file(s)
- PWD Report
- PWD Attachments
  - None

- Bond Report
- Bond Attachments
- None

Form 3160-3  
(October 2024)FORM APPROVED  
OMB No. 1004-0220  
Expires: October 31, 2027

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**APPLICATION FOR PERMIT TO DRILL OR REENTER**

1a. Type of work:	<input checked="" type="checkbox"/> DRILL	<input type="checkbox"/> REENTER	7. If Unit or CA Agreement, Name and No.
1b. Type of Well:	<input checked="" type="checkbox"/> Oil Well	<input type="checkbox"/> Gas Well	8. Lease Name and Well No.
1c. Type of Completion:	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Single Zone	<input checked="" type="checkbox"/> Multiple Zone
2. Name of Operator	EOG RESOURCES INCORPORATED		9. API Well No. <b>30-015-57526</b>
3a. Address	3b. Phone No. (include area code)		10. Field and Pool, or Exploratory
1111 BAGBY SKY LOBBY 2, HOUSTON, TX 77002	(713) 651-7000		JENNINGS;/BONE SPRING, WEST
4. Location of Well (Report location clearly and in accordance with any State requirements. *)	11. Sec., T. R. M. or Blk. and Survey or Area SEC 17/T26S/R31E/NMP		
At surface TR G / 2621 FNL / 2458 FEL / LAT 32.042881 / LONG -103.799775			
At proposed prod. zone TR B / 100 FNL / 2384 FEL / LAT 32.064454 / LONG -103.799489			
14. Distance in miles and direction from nearest town or post office*	12. County or Parish EDDY		13. State NM
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	100 feet	16. No of acres in lease	17. Spacing Unit dedicated to this well 960.0
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	33 feet	19. Proposed Depth 10343 feet / 17980 feet	20. BLM/BIA Bond No. in file FED: NM2308
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3247 feet	22. Approximate date work will start* 06/01/2025		23. Estimated duration 25 days
24. Attachments			

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

1. Well plat certified by a registered surveyor.	4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
2. A Drilling Plan.	
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).	5. Operator certification. 6. Such other site specific information and/or plans as may be requested by the BLM.

25. Signature (Electronic Submission)	Name (Printed/Typed) SHEA BAILEY / Ph: (713) 651-7000	Date 09/27/2024
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Title

Regulatory Contractor

Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) CODY LAYTON / Ph: (575) 234-5959	Date 08/08/2025
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Title

Assistant Field Manager Lands &amp; Minerals

Office

Carlsbad Field Office

Application approval 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.

Conditions of approval, if any, are attached.

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.

(Continued on page 2)

\*(Instructions on page 2)

## INSTRUCTIONS

**GENERAL:** This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws 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, either are shown below or will be issued by, or may be obtained from local Federal offices.

**ITEM I:** If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

**ITEM 4:** Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

**ITEM 14:** Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

**ITEMS 15 AND 18:** If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

**ITEM 22:** Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

**ITEM 24:** 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 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., 25 U.S.C. 396; 43 CFR 3160

**PRINCIPAL PURPOSES:** The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

**ROUTINE USE:** Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

**EFFECT OF NOT PROVIDING INFORMATION:** Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

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

The BLM collects this information to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. 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 Connection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

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(Form 3160-3, page 2)

(Continued on page 3)

## Additional Operator Remarks

### Location of Well

0. SHL: TR G / 2621 FNL / 2458 FEL / TWSP: 26S / RANGE: 31E / SECTION: 17 / LAT: 32.042881 / LONG: -103.799775 ( TVD: 0 feet, MD: 0 feet )

PPP: TR G / 2563 FNL / 2384 FEL / TWSP: 26S / RANGE: 31E / SECTION: 17 / LAT: 32.043039 / LONG: -103.799538 ( TVD: 10078 feet, MD: 10087 feet )

BHL: TR B / 100 FNL / 2384 FEL / TWSP: 26S / RANGE: 31E / SECTION: 8 / LAT: 32.064454 / LONG: -103.799489 ( TVD: 10343 feet, MD: 17980 feet )

### BLM Point of Contact

Name: JANET D ESTES

Title: ADJUDICATOR

Phone: (575) 234-6233

Email: JESTES@BLM.GOV

**PECOS DISTRICT**  
**SURFACE USE**  
**CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	EOG Resources Incorporated
LEASE NO.:	NMNM 059060 and NMNM 0438001
COUNTY:	Eddy County, New Mexico

Wells:

**Well Pad A**

Ross Draw 17 Fed Com 111H

Surface Hole Location: 2393 feet from south line (FSL) and  
920 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
330 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

Ross Draw 17 Fed Com 210H

Surface Hole Location: 2327 feet from south line (FSL) and  
920 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
2385 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

Ross Draw 17 Fed Com 211H

Surface Hole Location: 2360 feet from south line (FSL) and  
920 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
1000 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

Ross Draw 17 Fed Com 513H

Surface Hole Location: 2453 feet from south line (FSL) and  
980 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
330 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

Ross Draw 17 Fed Com 518H

Surface Hole Location: 2453 feet from south line (FSL) and

1013 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
330 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 768H

Surface Hole Location: 2453 feet from south line (FSL) and  
1046 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 230 feet from north line (FNL) and  
660 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 758H

Surface Hole Location: 2393 feet from south line (FSL) and  
1106 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 230 feet from north line (FNL) and  
330 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 525H

Surface Hole Location: 2393 feet from south line (FSL) and  
1139 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
845 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 512H

Surface Hole Location: 2393 feet from south line (FSL) and  
1172 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
845 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

### **Well Pad B**

#### Ross Draw 17 Fed Com 510H

Surface Hole Location: 2464 feet from north line (FNL) and  
1682 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
1871 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 757H

Surface Hole Location: 2464 feet from north line (FNL) and

1649 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 230 feet from north line (FNL) and  
1444 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 511H

Surface Hole Location: 2404 feet from north line (FNL) and  
1589 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
1357 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 517H

Surface Hole Location: 2404 feet from north line (FNL) and  
1556 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
1358 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 754H

Surface Hole Location: 2404 feet from north line (FNL) and  
1523 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 230 feet from north line (FNL) and  
888 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

### Well Pad C

#### Ross Draw 17 Fed Com 523H

Surface Hole Location: 2572 feet from north line (FNL) and  
2544 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
2383 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 760H

Surface Hole Location: 2588 feet from north line (FNL) and  
2515 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 230 feet from north line (FNL) and  
2383 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 509H

Surface Hole Location: 2605 feet from north line (FNL) and

2486 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
2383 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 516H

Surface Hole Location: 2624 feet from north line (FNL) and  
2458 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
2384 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 753H

Surface Hole Location: 2623 feet from south line (FSL) and  
2435 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 230 feet from north line (FNL) and  
2001 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 524H

Surface Hole Location: 2594 feet from south line (FSL) and  
2451 feet from east line (FEL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
1871 feet from east line (FEL), Section 8, T. 26 S, R 31 E.

### Well Pad D

#### Ross Draw 17 Fed Com 508H

Surface Hole Location: 2202 feet from north line (FNL) and  
1858 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 100 feet from north line (FNL) and  
2383 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 756H

Surface Hole Location: 2185 feet from north line (FNL) and  
1829 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.

Bottom Hole Location: 230 feet from north line (FNL) and  
2170 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 515H

Surface Hole Location: 2339 feet from north line (FNL) and  
1736 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 100 feet from north line (FNL) and  
1870 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 506H

Surface Hole Location: 2367 feet from north line (FNL) and  
1719 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 100 feet from north line (FNL) and  
1357 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 522H

Surface Hole Location: 2395 feet from north line (FNL) and  
1702 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 100 feet from north line (FNL) and  
1357 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 752H

Surface Hole Location: 2423 feet from north line (FNL) and  
1685 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 230 feet from north line (FNL) and  
1444 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

#### Ross Draw 17 Fed Com 507H

Surface Hole Location: 2451 feet from north line (FNL) and  
1667 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 100 feet from north line (FNL) and  
1871 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

### Well Pad E

#### Ross Draw 17 Fed Com 751H

Surface Hole Location: 2402 feet from north line (FNL) and  
650 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 230 feet from north line (FNL) and  
330 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

Ross Draw 17 Fed Com 521H

Surface Hole Location: 2402 feet from north line (FNL) and  
683 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 100 feet from north line (FNL) and  
330 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

Ross Draw 17 Fed Com 759H

Surface Hole Location: 2402 feet from north line (FNL) and  
716 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 230 feet from north line (FNL) and  
610 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

Ross Draw 17 Fed Com 110H

Surface Hole Location: 2435 feet from north line (FNL) and  
856 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 100 feet from north line (FNL) and  
2180 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

Ross Draw 17 Fed Com 209H

Surface Hole Location: 2402 feet from north line (FNL) and  
856 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 100 feet from north line (FNL) and  
330 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

Ross Draw 17 Fed Com 514H

Surface Hole Location: 2342 feet from north line (FNL) and  
776 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 100 feet from north line (FNL) and  
844 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

Ross Draw 17 Fed Com 755H

Surface Hole Location: 2342 feet from north line (FNL) and  
796 feet from west line (FWL), Section 17, T. 26 S., R. 31 E.  
Bottom Hole Location: 230 feet from north line (FNL) and  
1027 feet from west line (FWL), Section 8, T. 26 S, R 31 E.

## TABLE OF CONTENTS

1. GENERAL PROVISIONS .....	10
1.1. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES .....	10
1.2. RANGELAND RESOURCES .....	10
1.2.1. Cattleguards .....	10
1.2.2. Fence Requirement .....	11
1.2.3. Livestock Watering Requirement .....	11
1.3. NOXIOUS WEEDS .....	11
1.4. LIGHT POLLUTION .....	11
1.4.1. Downfacing .....	11
1.4.2. Shielding .....	11
1.4.3. Lighting Color .....	12
2. SPECIAL REQUIREMENTS .....	12
2.1. WATERSHED .....	12
2.1.1. Tank Battery .....	12
2.1.2. Buried/Surface Line(s) .....	12
2.1.3. Electric Line(s) .....	<a href="#">Error! Bookmark not defined.</a>
2.1.4. Temporary Use Fresh Water Frac Line(s) .....	<a href="#">Error! Bookmark not defined.</a>
2.2. CAVE/KARST .....	12
2.2.1. General Construction .....	12
2.2.2. Pad Construction .....	13
2.2.3. Road Construction .....	13
2.2.4. Buried Pipeline/Cable Construction .....	13
2.2.5. Powerline Construction .....	13
2.2.6. Surface Flowlines Installation .....	13
2.2.7. Production Mitigation .....	14
2.2.8. Residual and Cumulative Mitigation .....	14
2.2.9. Plugging and Abandonment Mitigation .....	14
2.3. WILDLIFE .....	<a href="#">Error! Bookmark not defined.</a>
2.3.1. Lesser Prairie Chicken .....	<a href="#">Error! Bookmark not defined.</a>
2.3.2. Texas Hornshell Mussel .....	<a href="#">Error! Bookmark not defined.</a>

2.3.3 Dunes Sagebrush Lizard.....	<a href="#">Error! Bookmark not defined.</a>
2.4 SPECIAL STATUS PLANT SPECIES .....	14
2.5 VISUAL RESOURCE MANAGEMENT.....	14
2.5.1 VRM IV .....	14
2.5.2 VRM III Facility Requirement .....	14
3. CONSTRUCTION REQUIREMENTS .....	14
3.1 CONSTRCUTION NOTIFICATION .....	14
3.2 TOPSOIL .....	14
3.3 CLOSED LOOP SYSTEM .....	15
3.4 FEDERAL MINERAL PIT .....	15
3.5 WELL PAD & SURFACING .....	15
3.6 EXCLOSURE FENCING (CELLARS & PITS) .....	15
3.7 ON LEASE ACESST ROAD .....	15
3.7.1 Road Width .....	15
3.7.2 Surfacing.....	15
3.7.3 Crownig .....	15
3.7.4 Ditching .....	15
3.7.5 Turnouts .....	16
3.7.6 Drainage.....	16
3.7.7 Public Access .....	16
4. PIPELINES .....	18
4.1 TEMPORARY FRESHWATER PIPELINES .....	<a href="#">Error! Bookmark not defined.</a>
4.2 BURIED PIPELINES.....	18
4.3 SURFACE PIPELINES .....	<a href="#">Error! Bookmark not defined.</a>
4.4 OVERHEAD ELECTRIC LINES.....	<a href="#">Error! Bookmark not defined.</a>
4.5 RANGLAND MITIGATION FOR PIPELINES .....	20
4.5.1 Fence Requirement .....	20
4.5.2 Cattleguards .....	20
4.5.3 Livestock Watering Requirement .....	20
5. PRODUCTION (POST DRILLING) .....	21
5.1 WELL STRUCTURES & FACILITIES.....	21
5.1.1 Placement of Production Facilities .....	21
5.1.2 Exclosure Netting (Open-top Tanks) .....	21
5.1.3. Chemical and Fuel Secondary Containment and Exclosure Screening .....	21
5.1.4. Open-Vent Exhaust Stack Exclosures .....	21
5.1.5. Containment Structures .....	22
6. RECLAMATION .....	22

6.1 ROAD AND SITE RECLAMATION .....	22
6.2 EROSION CONTROL .....	22
6.3 INTERIM RECLAMATION .....	22
6.4 FINAL ABANDONMENT & RECLAMATION .....	23
6.5 SEEDING TECHNIQUES.....	23
6.6 SOIL SPECIFIC SEED MIXTURE.....	23

## 1. GENERAL PROVISIONS

The failure of the operator to comply with these requirements may result in the assessment of liquidated damages or penalties pursuant to 43 CFR 3163.1 or 3163.2. A copy of these conditions of approval shall be present on the location during construction, drilling and reclamation activity. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

### 1.1. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural resource (historic or prehistoric site or object) discovered by the operator, or any person working on the operator's behalf, on the public or federal land shall be immediately reported to the Authorized Officer. The operator shall suspend all operations in the immediate area (within 100ft) of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer, in conjunction with a BLM Cultural Resource Specialist, to determine appropriate actions to prevent the loss of significant scientific values. The operator shall be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the operator.

Traditional Cultural Properties (TCPs) are protected by NHPA as codified in 36 CFR 800 for possessing traditional, religious, and cultural significance tied to a certain group of individuals. Though there are currently no designated TCPs within the project area or within a mile of the project area, but it is possible for a TCP to be designated after the approval of this project. **If a TCP is designated in the project area after the project's approval, the BLM Authorized Officer will notify the operator of the following conditions and the duration for which these conditions are required.**

1. Temporary halting of all construction, drilling, and production activities to lower noise.
2. Temporary shut-off of all artificial lights at night.

The operator is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA), specifically NAGPRA Subpart B regarding discoveries, to protect human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered during project work. If any human skeletal remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during construction, all construction activities shall halt and a BLM-CFO Authorized Officer will be notified immediately. The BLM will then be required to be notified, in writing, within 24 hours of the discovery. The written notification should include the geographic location by county and state, the contents of the discovery, and the steps taken to protect said discovery. You must also include any potential threats to the discovery and a conformation that all activity within 100ft of the discovery has ceased and work will not resume until written certification is issued. All work on the entire project must halt for a minimum of 3 days and work cannot resume until an Authorized Officer grants permission to do so.

Any paleontological resource discovered by the operator, or any person working on the operator's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. The operator will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the operator.

### 1.2. RANGELAND RESOURCES

#### 1.2.1. Cattleguards

Where a permanent cattleguard is approved, an appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s). Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations. A gate shall be constructed on one side of the cattleguard and fastened securely to H-braces.

### 1.2.2. Fence Requirement

Where entry granted across a fence line, the fence must be braced and tied off on both sides of the passageway prior to cutting. Once the work is completed, the fence will be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

### 1.2.3. Livestock Watering Requirement

Any damage to structures that provide water to livestock throughout the life of the well, caused by operations from the well site, must be immediately corrected by the operator. The operator must notify the BLM office (575-234-5972) and the private surface landowner or the grazing allotment holder if any damage occurs to structures that provide water to livestock.

## 1.3. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA, New Mexico Department of Agriculture, and BLM requirements and policies.

### 1.3.1 African Rue (*Peganum harmala*)

**Spraying:** The spraying of African Rue must be completed by a licensed or certified applicator. In order to attempt to kill or remove African Rue the proper mix of chemical is needed. The mix consists of 2% Arsenal (Imazapyr) and 2% Roundup (Glyphosate) along with a nonionic surfactant. Any other chemicals or combinations shall be approved by the BLM Noxious Weeds Coordinator prior to treatment. African Rue shall be sprayed in connection to any dirt working activities or disturbances to the site being sprayed. Spraying of African Rue shall be done on immature plants at initial growth through flowering and mature plants between budding and flowering stages. Spraying shall not be conducted after flowering when plant is fruiting. This will ensure optimal intake of chemical and decrease chances of developing herbicide resistance. After spraying, the operator or necessary parties must contact the Carlsbad Field Office to inspect the effectiveness of the application treatment to the plant species. No ground disturbing activities can take place until the inspection by the authorized officer is complete. The operator may contact the Environmental Protection Department or the BLM Noxious Weed Coordinator at (575) 234-5972 or BLM\_NM\_CFO\_NoxiousWeeds@blm.gov.

**Management Practices:** In addition to spraying for African Rue, good management practices should be followed. All equipment should be washed off using a power washer in a designated containment area. The containment area shall be bermed to allow for containment of the seed to prevent it from entering any open areas of the nearby landscape. The containment area shall be excavated near or adjacent to the well pad at a depth of three feet and just large enough to get equipment inside it to be washed off. This will allow all seeds to be in a centrally located area that can be treated at a later date if the need arises.

## 1.4. LIGHT POLLUTION

### 1.4.1. Downfacing

All permanent lighting will be pointed straight down at the ground in order to prevent light spill beyond the edge of approved surface disturbance.

### 1.4.2. Shielding

All permanent lighting will use full cutoff luminaires, which are fully shielded (i.e., not emitting direct or indirect light above an imaginary horizontal plane passing through the lowest part of the light source).

#### 1.4.3. Lighting Color

Lighting shall be 3,500 Kelvin or less (Warm White) except during drilling, completion, and workover operations. No bluish-white lighting shall be used in permanent outdoor lighting.

## 2. SPECIAL REQUIREMENTS

### 2.1. WATERSHED

The entire well pad(s) will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. The compacted berm shall be constructed at a minimum of 12 inches with impermeable mineral material (e.g. caliche). Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed. Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Stockpiling of topsoil is required. The topsoil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berthing or erosion control. If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.

#### 2.1.1. Tank Battery

Tank battery locations will be lined and bermed. A 20-mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Secondary containment holding capacity must be large enough to contain 1 ½ times the content of the largest tank or 24-hour production, whichever is greater (displaced volume from all tanks within the berms MUST be subtracted from total volume of containment in calculating holding capacity). Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

#### 2.1.2. Buried/Surface Line(s)

When crossing ephemeral drainages, the pipeline(s) will be buried to a minimum depth of 48 inches from the top of pipe to ground level. Erosion control methods such as gabions and/or rock aprons must be placed on both up and downstream sides of the pipeline crossing. In addition, curled (weed free) wood/straw fiber wattles/logs and/or silt fences must be placed on the downstream side for sediment control during construction and maintained until soils and vegetation have stabilized. Water bars must be placed within the corridor to divert and dissipate surface runoff. A pipeline access road is not permitted to cross ephemeral drainages. Traffic must be diverted to a preexisting route. Additional seeding may be required in floodplains and drainages to restore energy dissipating vegetation.

Prior to pipeline installation/construction a leak detection plan will be developed. The method(s) could incorporate gauges to detect pressure drops, situating valves and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

### 2.2. CAVE/KARST

#### 2.2.1. General Construction

- No blasting
- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction, and no additional construction shall occur until clearance has been issued by the Authorized Officer.
- All linear surface disturbance activities will avoid sinkholes and other karst features to lessen the possibility of encountering near surface voids during construction, minimize changes to runoff, and prevent untimely leaks and spills from entering the karst drainage system.

- This is a sensitive area and all spills or leaks will be reported to the BLM immediately for their immediate and proper treatment, as defined in NTL 3A for Major Undesirable Events.

#### 2.2.2. Pad Construction

- The pad will be constructed and leveled by adding the necessary fill and caliche. No blasting will be used for any construction or leveling activities.
- The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.
- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g., caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.
- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised (i.e. an access road crossing the berm cannot be lower than the berm height).
- Following a rain event, all fluids will be vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

#### 2.2.3. Road Construction

- Turnout ditches and drainage leadoffs will not be constructed in such a manner as to alter the natural flow of water into or out of cave or karst features.
- Special restoration stipulations or realignment may be required if subsurface features are discovered during construction.

#### 2.2.4. Buried Pipeline/Cable Construction

- Rerouting of the buried line(s) may be required if a subsurface void is encountered during construction to minimize the potential subsidence/collapse of the feature(s) as well as the possibility of leaks/spills entering the karst drainage system.

#### 2.2.5. Powerline Construction

- Smaller powerlines will be routed around sinkholes and other karst features to avoid or lessen the possibility of encountering near surface voids and to minimize changes to runoff or possible leaks and spills from entering karst systems.
- Larger powerlines will adjust their pole spacing to avoid cave and karst features.
- Special restoration stipulations or realignment may be required if subsurface voids are encountered.

#### 2.2.6. Surface Flowlines Installation

- Flowlines will be routed around sinkholes and other karst features to minimize the possibility of leaks/spills from entering the karst drainage system.

### 2.2.7. Production Mitigation

- Tank battery locations and facilities will be bermed and lined with a 20-mil thick permanent liner that has a 4 oz. felt backing, or equivalent, to prevent tears or punctures. Secondary containment holding capacity must be large enough to contain 1 ½ times the content of the largest tank or 24-hour production, whichever is greater (displaced volume from all tanks within the berms MUST be subtracted from total volume of containment in calculating holding capacity).
- Implementation of a leak detection system to provide an early alert to operators when a leak has occurred.
- Automatic shut off, check valves, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

### 2.2.8. Residual and Cumulative Mitigation

The operator will perform annual pressure monitoring on all casing annuli. If the test results indicate a casing failure has occurred, contact a BLM Engineer immediately, and take remedial action to correct the problem.

### 2.2.9. Plugging and Abandonment Mitigation

Upon well abandonment in high cave karst areas, additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

## SPECIAL STATUS PLANT SPECIES

All SSPS within the project area must be fenced.

## 2.3 VISUAL RESOURCE MANAGEMENT

### 2.5.1 VRM IV

Above-ground structures including meter housing that are not subject to safety requirements are painted a flat non-reflective paint color, Shale Green from the BLM Standard Environmental Color Chart (CC-001: June 2008).

### 2.5.2 VRM III Facility Requirement

Above-ground structures including meter housing that are not subject to safety requirements are painted a flat non-reflective paint color, Shale Green from the BLM Standard Environmental Color Chart (CC-001: June 2008).

## 3. CONSTRUCTION REQUIREMENTS

### 3.1 CONSTRCUTION NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at BLM\_NM\_CFO\_Construction\_Reclamation@blm.gov at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and COAs on the well site and they shall be made available upon request by the Authorized Officer.

### 3.2 TOPSOIL

The operator shall strip the topsoil (the A horizon) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. No more than the top 6 inches of topsoil shall be removed. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berthing the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (the B horizon and below) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

### 3.3 CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No reserve pits will be used for drill cuttings. The operator shall properly dispose of drilling contents at an authorized disposal site.

### 3.4 FEDERAL MINERAL PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

### 3.5 WELL PAD & SURFACING

Any surfacing material used to surface the well pad will be removed at the time of interim and final reclamation.

### 3.6 EXCLOSURE FENCING (CELLARS & PITS)

The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the well cellar is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

The operator will also install and maintain mesh netting for all open well cellars to prevent access to smaller wildlife before and after drilling operations until the well cellar is free of fluids and the operator. Use a maximum netting mesh size of 1 ½ inches. The netting must not have holes or gaps.

### 3.7 ON LEASE ACESST ROAD

#### 3.7.1 Road Width

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed twenty (20) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed thirty(30) feet.

#### 3.7.2 Surfacing

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements will be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

#### 3.7.3 Crowning

Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

#### 3.7.4 Ditching

Ditching shall be required on both sides of the road.

### 3.7.5 Turnouts

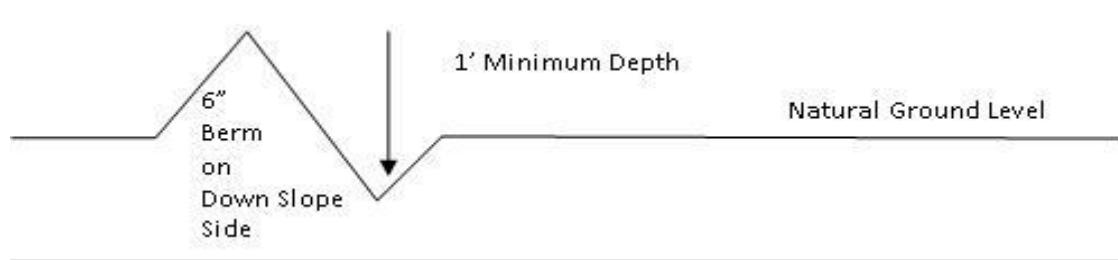
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

### 3.7.6 Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, leadoff ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

**Cross Section of a Typical Lead-off Ditch**



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing intervals are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

#### **Formula for Spacing Interval of Lead-off Ditches**

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$400 \text{ foot road with 4\% road slope: } \frac{400'}{4} + 100' = 200' \text{ lead-off ditch interval}$$

### 3.7.7 Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

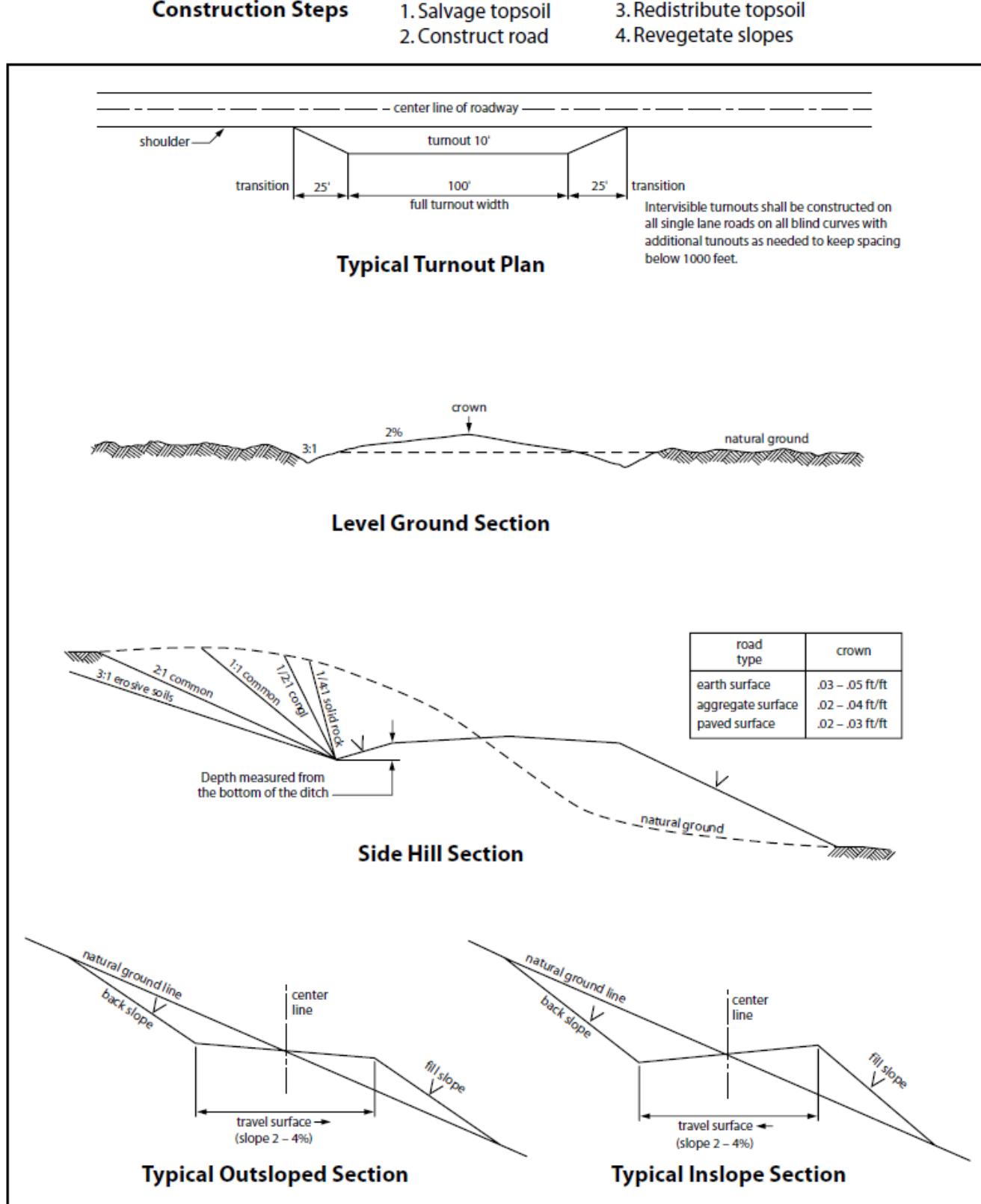


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

## 4. PIPELINES

- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, passages, or voids are intersected by trenching, and no pipe will be laid in the trench at that point until clearance has been issued by the Authorized Officer.
- A leak detection plan **will be submitted to the BLM Carlsbad Field Office for approval** prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating valves and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.
- Regular monitoring is required to quickly identify leaks for their immediate and proper treatment.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

### 4.1 BURIED PIPELINES

A copy of the application (APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request a copy of your permit during construction to ensure compliance with all stipulations.

Operator agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The Operator shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this APD.
2. The Operator shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the operator shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the pipeline corridor or on facilities authorized under this APD. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The operator agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Pipeline corridor (unless the release or threatened release is wholly unrelated to the operator's activity on the pipeline corridor), or resulting from the activity of the Operator on the pipeline corridor. This agreement applies without regard to whether a release is caused by the operator, its agent, or unrelated third parties.
4. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil or other pollutant is discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of operator, regardless of fault. Upon failure of operator to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including where appropriate, the aquatic environment and

fish and wildlife habitats, at the full expense of the operator. Such action by the Authorized Officer shall not relieve operator of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized pipeline corridor.
6. The pipeline will be buried with a minimum cover of 36 inches between the top of the pipe and ground level.
7. The maximum allowable disturbance for construction in this pipeline corridor will be 30 feet:
  - Blading of vegetation within the pipeline corridor will be allowed: maximum width of blading operations will not exceed 20 feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)
  - Clearing of brush species within the pipeline corridor will be allowed: maximum width of clearing operations will not exceed 30 feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)
  - The remaining area of the pipeline corridor (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)
8. The operator shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.
9. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this pipeline corridor and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire pipeline corridor shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted, and a 6-inch berm will be left over the ditch line to allow for settling back to grade.
10. The pipeline will be identified by signs at the point of origin and completion of the pipeline corridor and at all road crossings. At a minimum, signs will state the operator's name, BLM serial number, and the product being transported. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.
11. The operator shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the operator before maintenance begins. The operator will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the operator to construct temporary deterrence structures.
12. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes associated roads, pipeline corridor and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.
13. Escape Ramps - The operator will construct and maintain pipeline/utility trenches [that are not otherwise fenced, screened, or netted] to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

- a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them alive at least 100 yards from the trench.
- b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30-degree slope and spaced no more than 500 feet apart) shall be placed in the trench. Before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them alive at least 100 yards from the trench.

14. Special Stipulations:

**Karst:**

- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, passages, or voids are intersected by trenching, and no pipe will be laid in the trench at that point until clearance has been issued by the Authorized Officer.
- If a void is encountered, alignments may be rerouted to avoid the karst feature and lessen the potential of subsidence or collapse of karst features, buildup of toxic or combustible gas, or other possible impacts to cave and karst resources from the buried pipeline.
- Special restoration stipulations or realignment may be required at such intersections, if any.
- A leak detection plan **will be submitted to the BLM Carlsbad Field Office for approval** prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating valves and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.
- Regular monitoring is required to quickly identify leaks for their immediate and proper treatment.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

## RANGELAND MITIGATION FOR PIPELINES

### 4.5.1 Fence Requirement

Where entry is granted across a fence line, the fence must be braced and tied off on both sides of the passageway with H-braces prior to cutting. Once the work is completed, the fence will be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment operator prior to crossing any fence(s).

### 4.5.2 Cattleguards

An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at road-fence crossing(s). Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations. A gate shall be constructed on one side of the cattleguard and fastened securely to H-braces.

### 4.5.3 Livestock Watering Requirement

Structures that provide water to livestock, such as windmills, pipelines, drinking troughs, and earthen reservoirs, will be avoided by moving the proposed action.

Any damage to structures that provide water to livestock throughout the life of the well, caused by operations from the well site, must be immediately corrected by the operator. The operator must notify the BLM office (575-234-5972) and the private surface landowner or the grazing allotment operator if any damage occurs to structures that provide water to livestock.

- Livestock operators will be contacted, and adequate crossing facilities will be provided as needed to ensure livestock are not prevented from reaching water sources because of the open trench.

- Wildlife and livestock trails will remain open and passable by adding soft plugs (areas where the trench is excavated and replaced with minimal compaction) during the construction phase. Soft plugs with ramps on either side will be left at all well-defined livestock and wildlife trails along the open trench to allow passage across the trench and provide a means of escape for livestock and wildlife that may enter the trench.
- Trenches will be backfilled as soon as feasible to minimize the amount of open trench. The Operator will avoid leaving trenches open overnight to the extent possible and open trenches that cannot be backfilled immediately will have escape ramps (wooden) placed at no more than 2,500 feet intervals and sloped no more than 45 degrees.

## 5. PRODUCTION (POST DRILLING)

### 5.1 WELL STRUCTURES & FACILITIES

#### 5.1.1 Placement of Production Facilities

Production facilities must be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

#### 5.1.2 Exclosure Netting (Open-top Tanks)

Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

#### 5.1.3. Chemical and Fuel Secondary Containment and Exclosure Screening

The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

#### 5.1.4. Open-Vent Exhaust Stack Exclosures

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

### 5.1.5. Containment Structures

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

## 6. RECLAMATION

Stipulations required by the Authorized Officer on specific actions may differ from the following general guidelines

### 6.1 ROAD AND SITE RECLAMATION

Any roads constructed during the life of the well will have the caliche removed or linear burial. If contaminants are indicated then testing will be required for chlorides and applicable contaminate anomalies for final disposal determination (disposed of in a manner approved by the Authorized Officer within Federal, State and Local statutes, regulations, and ordinances) and seeded to the specifications in sections 6.5 and 6.6.

### 6.2 EROSION CONTROL

Install erosion control berms, windrows, and hummocks. Windrows must be level and constructed perpendicular to down-slope drainage; steeper slopes will require greater windrow density. Topsoil between windrows must be ripped to a depth of at least 12", unless bedrock is encountered. Any large boulders pulled up during ripping must be deep-buried on location. Ripping must be perpendicular to down-slope. The surface must be left rough in order to catch and contain rainfall on-site. Any trenches resulting from erosion cause by run-off shall be addressed immediately.

### 6.3 INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations must undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators must work with BLM surface protection specialists ([BLM\\_NM\\_CFO\\_Construction\\_Reclamation@blm.gov](mailto:BLM_NM_CFO_Construction_Reclamation@blm.gov)) to devise the best strategies to reduce the size of the location. Interim reclamation must allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche and any other surface material is required. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided in section 6.6.

Upon completion of interim reclamation, the operator shall submit a Sundry Notice, Subsequent Report of Reclamation (Form 3160-5).

## 6.4 FINAL ABANDONMENT & RECLAMATION

Prior to surface abandonment, the operator shall submit a Notice of Intent Sundry Notice and reclamation plan.

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding will be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM. After earthwork and seeding is completed, the operator is required to submit a Sundry Notice, Subsequent Report of Reclamation.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (BLM\_NM\_CFO\_Construction\_Reclamation@blm.gov).

## 6.5 SEEDING TECHNIQUES

Seeds shall be hydro-seeded, mechanically drilled, or broadcast, with the broadcast-seeded area raked, ripped or dragged to aid in covering the seed. The seed mixture shall be evenly and uniformly planted over the disturbed area.

## 6.6 SOIL SPECIFIC SEED MIXTURE

The lessee/permittee shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)\* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

Seed land application will be accomplished by mechanical planting using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area. Smaller/heavier seeds tend to drop the bottom of the drill and are planted first; the operator shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory BLM or Soil Conservation

District stand is established as determined by the Authorized Officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding or until several months of precipitation have occurred, enabling a full four months of growth, with one or more seed generations being established.

**Seed Mixture 2, for Sandy Site**

Species to be planted in pounds of pure live seed\* per acre:

<u>Species</u>	<u>lb/acre</u>
Sand dropseed (Sporobolus cryptandrus)	1.0
Sand love grass (Eragrostis trichodes)	1.0
Plains bristlegrass (Setaria macrostachya)	2.0

\*Pounds of pure live seed:

Pounds of seed  $\times$  percent purity  $\times$  percent germination = pounds pure live seed

**PECOS DISTRICT**  
**DRILLING CONDITIONS OF APPROVAL**

<b>OPERATOR'S NAME:</b>	EOG Resources, Inc.
<b>WELL NAME &amp; NO.:</b>	Ross Draw 17 Fed Com 516H
<b>LOCATION:</b>	Section 17, T.26S., R.31E.
<b>COUNTY:</b>	Eddy County

COA

<b>H2S</b>	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input checked="" type="radio"/> R-111-P
Cave/Karst Potential	<input checked="" type="radio"/> Low	<input type="radio"/> Medium	<input checked="" type="radio"/> High
Cave/Karst Potential	<input type="radio"/> Critical		
Variance	<input type="radio"/> None	<input checked="" type="radio"/> Flex Hose	<input type="radio"/> Other
Wellhead	<input type="radio"/> Conventional	<input checked="" type="radio"/> Multibowl	<input type="radio"/> Both
Wellhead Variance	<input type="radio"/> Diverter		
Other	<input type="checkbox"/> 4 String	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP
Other	<input checked="" type="checkbox"/> Fluid Filled	<input type="checkbox"/> Pilot Hole	<input type="checkbox"/> Open Annulus
Cementing	<input checked="" type="checkbox"/> Contingency Cement Squeeze	<input type="checkbox"/> EchoMeter	<input checked="" type="checkbox"/> Primary Cement Squeeze
Special Requirements	<input type="checkbox"/> Water Disposal	<input checked="" type="checkbox"/> COM	<input type="checkbox"/> Unit
Special Requirements	<input type="checkbox"/> Batch Sundry		
Special Requirements Variance	<input checked="" type="checkbox"/> Break Testing	<input checked="" type="checkbox"/> Offline Cementing	<input checked="" type="checkbox"/> Casing Clearance

**A. HYDROGEN SULFIDE**

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated AT SPUD. As a result, the Hydrogen Sulfide area must meet 43 CFR part 3170 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

## B. CASING

### **Primary Casing Design:**

1. The **10-3/4** inch surface casing shall be set at approximately **1124** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface. The surface hole shall be **13** inch in diameter.
  - 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 **8-5/8** inch intermediate casing is:
  - Cement to surface. If cement does not circulate see B.1.a, c-d above.  
**Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**
  - ❖ 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 **6 X 5-1/2** inch production casing is:
  - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

**Operator has also stated they may run 6 inch casing or 5-1/2 inch casing the entire length of the production string.**

### **Casing Alternative Design A:**

1. The **13-3/8** inch surface casing shall be set at approximately **2030** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface. The surface hole shall be **16** inch in diameter.
  - 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.

**Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.**

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
  - Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**
    - ❖ 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 **5-1/2** inch production casing is:
  - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

**Operator has proposed to pump down 9-5/8" X 5-1/2" annulus after primary cementing stage. Operator must run Echo-meter to verify Cement Slurry/Fluid top in the annulus Or operator shall run a CBL from TD of the 5-1/2" casing to surface after the second stage BH to verify TOC.**

**Submit results to the BLM. No displacement fluid/wash out shall be utilized at the top of the cement slurry between second stage BH and top out. Operator must run one CBL per Well Pad.**

**If cement does not reach surface, the next casing string must come to surface.**

**Operator must use a limited flush fluid volume of 1 bbl following backside cementing procedures.**

**Casing Alternative Design B:**

1. The **10-3/4** inch surface casing shall be set at approximately **2030** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface. The surface hole shall be **13-1/2** inch in diameter.
  - 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.

**Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.**

2. The minimum required fill of cement behind the **8-5/8** inch intermediate casing is:
  - Cement to surface. If cement does not circulate see B.1.a, c-d above.  
**Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**
  - ❖ 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 **5-1/2** inch production casing is:

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

**Operator has proposed to pump down 8-5/8" X 5-1/2" annulus after primary cementing stage. Operator must run Echo-meter to verify Cement Slurry/Fluid top in the annulus Or operator shall run a CBL from TD of the 5-1/2" casing to surface after the second stage BH to verify TOC.**

**Submit results to the BLM. No displacement fluid/wash out shall be utilized at the top of the cement slurry between second stage BH and top out. Operator must run one CBL per Well Pad.**

**If cement does not reach surface, the next casing string must come to surface.**

**Operator must use a limited flush fluid volume of 1 bbl following backside cementing procedures.**

**Casing Alternative Design C:**

1. The **13-3/8** inch surface casing shall be set at approximately **2030** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface. The surface hole shall be **16** inch in diameter.
  - 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.

**Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.**

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

- Cement to surface. If cement does not circulate see B.1.a, c-d above.  
**Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**

❖ 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 **6** inch production casing is:

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

**Operator has proposed to pump down 9-5/8" X 6 " annulus after primary cementing stage. Operator must run Echo-meter to verify Cement Slurry/Fluid top in the annulus Or operator shall run a CBL from TD of the 6" casing to surface after the second stage BH to verify TOC.**

**Submit results to the BLM. No displacement fluid/wash out shall be utilized at the top of the cement slurry between second stage BH and top out. Operator must run one CBL per Well Pad.**

**If cement does not reach surface, the next casing string must come to surface.**

**Operator must use a limited flush fluid volume of 1 bbl following backside cementing procedures.**

#### **Casing Alternative Design D:**

1. The **13-3/8** inch surface casing shall be set at approximately **2030** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface. The surface hole shall be **16** inch in diameter.
  - 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.

**Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.**

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

- Cement to surface. If cement does not circulate see B.1.a, c-d above.  
**Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**

❖ 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 **6 X 5-1/2** inch production casing is:

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

**Operator has proposed to pump down 9-5/8" X 6 " annulus after primary cementing stage. Operator must run Echo-meter to verify Cement Slurry/Fluid top in the annulus Or operator shall run a CBL from TD of the 6" casing to surface after the second stage BH to verify TOC.**

**Submit results to the BLM. No displacement fluid/wash out shall be utilized at the top of the cement slurry between second stage BH and top out. Operator must run one CBL per Well Pad.**

**If cement does not reach surface, the next casing string must come to surface.**

**Operator must use a limited flush fluid volume of 1 bbl following backside cementing procedures.**

## **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. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the **Surface** casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **10,000 (10M) psi**. **Variance is approved to use a 5000 (5M) Annular which shall be tested to 3500 (70% Working Pressure) psi.**
  - 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.

#### **D. SPECIAL REQUIREMENT (S)**

##### **Communitization Agreement**

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- The operator will submit an as-drilled survey well plat of the well completion, but are not limited to, those specified in Onshore Order 1 and 2.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

**BOPE Break Testing Variance**

- BOPE Break Testing is ONLY permitted for 5M BOPE or less. (**Annular preventer must be tested to a minimum of 70% of BOPE working pressure and shall be higher than the MASP**)
- BOPE Break Testing is NOT permitted to drilling the production hole section.
- Variance only pertains to the intermediate hole-sections and no deeper than the Bone Springs formation.
- While in transfer between wells, the BOPE shall be secured by the hydraulic carrier or cradle.
- Any well control event while drilling require notification to the BLM Petroleum Engineer (**575-706-2779**) prior to the commencement of any BOPE Break Testing operations.
- A full BOPE test is required prior to drilling the first deep intermediate hole section. If any subsequent hole interval is deeper than the first, a full BOPE test will be required. (200' TVD tolerance between intermediate shoes is allowable).
- The BLM is to be contacted (575-361-2822 Eddy County) 4 hours prior to BOPE tests.
- As a minimum, a full BOPE test shall be performed at 21-day intervals.
- In the event any repairs or replacement of the BOPE is required, the BOPE shall test as per Onshore Oil and Gas Order No. 2.
- If in the event break testing is not utilized, then a full BOPE test would be conducted.

**Casing Clearance:**

Operator casing variance is approved for the utilization of

- Annular clearance to meet or exceed 0.422" between intermediate casing ID and production casing coupling only on the first 500' overlap between both casing strings.

-Annular clearance less than 0.422" is acceptable for the production open hole section.

Operator shall clean up cycles until wellbore is clear of cuttings and any large debris, ensure cutting sizes are adequate "coffee ground or less" before cementing.

**Offline Cementing:**

Contact the BLM prior to the commencement of any offline cementing procedure.

## 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)

Eddy County

**EMAIL** or call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM

88220,

**[BLM\\_NM\\_CFO\\_DrillingNotifications@BLM.GOV](mailto:BLM_NM_CFO_DrillingNotifications@BLM.GOV)**

(575) 361-2822

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
    - i. Notify the BLM when moving in and removing the Spudder Rig.
    - ii. Notify the BLM when moving in the 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    - iii. BOP/BOPE test to be conducted per **43 CFR 3172** as soon as 2<sup>nd</sup> 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. For intervals in which cement to surface is required, cement to surface should be verified with a visual check and density or pH check to differentiate cement from spacer and drilling mud. The results should be documented in the driller's log and daily reports.

## 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 of both lead and tail cement, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. The casing integrity 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 integrity 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-Q 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 **43 CFR 3172**.
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:
  - i. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - ii. 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.
  - iii. Manufacturer representative shall install the test plug for the initial BOP test.
  - iv. Whenever any seal subject to test pressure is broken, all the tests in **43 CFR 3172.6(b)(9)** must be followed.
  - v. 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.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - i. 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 cement), 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).
  - ii. 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 cement plug. The BOPE test can be initiated after bumping the cement plug with the casing valve open. (only applies to single stage cement jobs, prior to the cement setting up.)
  - iii. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer and can be initiated immediately with the casing valve open. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to **43 CFR 3172** with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for 8 hours or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
  - iv. 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.
  - v. The results of the test shall be reported to the appropriate BLM office.

- vi. 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.
- vii. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- viii. 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 **43 CFR 3172**.

### **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.

**JAM 3/12/2025**



U.S. Department of the Interior  
BUREAU OF LAND MANAGEMENT

# Operator Certification Data Report

11/05/2025

## Operator

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

**NAME:** SHEA BAILEY**Signed on:** 09/26/2024**Title:** Regulatory Contractor**Street Address:** 5509 CHAMPIONS BLVD**City:** MIDLAND**State:** TX**Zip:** 79707**Phone:** (432)214-9797**Email address:** SHEA\_BAILEY@EOGRESOURCES.COM

## Field

**Representative Name:****Street Address:****City:****State:****Zip:****Phone:****Email address:**



APD ID: 10400101263

Submission Date: 09/27/2024

Highlighted data  
reflects the most  
recent changes  
[Show Final Text](#)

Operator Name: EOG RESOURCES INCORPORATED

Well Name: ROSS DRAW 17 FED COM

Well Number: 516H

Well Type: OIL WELL

Well Work Type: Drill

## Section 1 - General

APD ID: 10400101263 Tie to previous NOS? Submission Date: 09/27/2024

BLM Office: Carlsbad User: SHEA BAILEY Title: Regulatory Contractor

Federal/Indian APD: FED Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM59060 Lease Acres:

Surface access agreement in place? Allotted? Reservation:

Agreement in place? NO Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? N

Permitting Agent? NO APD Operator: EOG RESOURCES INCORPORATED

Operator letter of

## Operator Info

Operator Organization Name: EOG RESOURCES INCORPORATED

Operator Address: 600 17TH STREET, SUITE 1000 N

Zip: 80202

Operator PO Box:

Operator City: DENVER State: CO

Operator Phone: (303)262-9894

Operator Internet Address:

## Section 2 - Well Information

Well in Master Development Plan? NO

Master Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Well Name: ROSS DRAW 17 FED COM

Well Number: 516H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: JENNINGS;

Pool Name: BONE SPRING,  
WEST

**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H**Is the proposed well in an area containing other mineral resources?** NATURAL GAS,OIL**Is the proposed well in a Helium production area?** N **Use Existing Well Pad?** N **New surface disturbance?****Type of Well Pad:** MULTIPLE WELL**Multiple Well Pad Name:** ROSS DRAW 17 FED COM**Number:** 509H, 516H, 523H, 760H**Well Class:** HORIZONTAL**Number of Legs:** 1**Well Work Type:** Drill**Well Type:** OIL WELL**Describe Well Type:****Well sub-Type:** INFILL**Describe sub-type:****Distance to town:****Distance to nearest well:** 33 FT**Distance to lease line:** 100 FT**Reservoir well spacing assigned acres Measurement:** 960 Acres**Well plat:** ROSS\_DRAW\_17\_FED\_COM\_516H\_PLAT\_S\_20240926080446.pdf**Well work start Date:** 06/01/2025**Duration:** 25 DAYS

### Section 3 - Well Location Table

**Survey Type:** RECTANGULAR**Describe Survey Type:****Datum:** NAD83**Vertical Datum:** NAVD88**Survey number:****Reference Datum:** KELLY BUSHING

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twp	Range	Section	Aliquot/Lot/Ttract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this
SHL Leg #1	262	FNL	245	FEL	26S	31E	17	Tract G	32.04288 1	-103.7997 75	EDD Y	NEW MEXICO	NEW MEXICO	F	NMMN 59060	324 7			N
KOP Leg #1	261	FNL	238	FEL	26S	31E	17	Tract G	32.04290 2	-103.7995 38	EDD Y	NEW MEXICO	NEW MEXICO	F	NMMN 59060	-661 9	986 6	986 6	Y
PPP Leg #1-1	256	FNL	238	FEL	26S	31E	17	Tract G	32.04303 9	-103.7995 38	EDD Y	NEW MEXICO	NEW MEXICO	F	NMMN 59060	-683 1	100 87	100 78	Y

**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVd	Will this well produce from this
EXIT Leg #1	100	FNL	2384	FEL	26S	31E	8	Tract B	32.064454	-103.799489	EDD Y	NEW MEXICO	NEW MEXICO	F	NMMN 0438001	-7096	17980	10343	Y
BHL Leg #1	100	FNL	2384	FEL	26S	31E	8	Tract B	32.064454	-103.799489	EDD Y	NEW MEXICO	NEW MEXICO	F	NMMN 0438001	-7096	17980	10343	Y

C-102		State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION		Revised July 9, 2024	
Submit Electronically Via OCD Permitting		Submittal Type:	<input checked="" type="checkbox"/> Initial Submittal <input type="checkbox"/> Amended Report <input type="checkbox"/> As Drilled		
Property Name and Well Number			ROSS DRAW 17 FED COM 516H		

## WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number <b>30-015-57526</b>	Pool Code <b>97860</b>	Pool Name <b>Jennings; Bone Spring, West</b>
Property Code <b>329860</b>	Property Name <b>ROSS DRAW 17 FED COM</b>	Well Number <b>516H</b>
OGRID No. <b>7377</b>	Operator Name <b>EOG RESOURCES, INC.</b>	Ground Level Elevation <b>3247'</b>
Surface Owner: <input type="checkbox"/> State <input type="checkbox"/> Fee <input type="checkbox"/> Tribal <input checked="" type="checkbox"/> Federal		Mineral Owner: <input type="checkbox"/> State <input checked="" type="checkbox"/> Fee <input type="checkbox"/> Tribal <input checked="" type="checkbox"/> Federal

## Surface Location

UL or Lot No. <b>G</b>	Section <b>17</b>	Township <b>26 S</b>	Range <b>31 E</b>	Lot	Feet from the N/S <b>2621 FNL</b>	Feet from the E/W <b>2458 FEL</b>	Latitude <b>N 32.042881°</b>	Longitude <b>W 103.799775°</b>	County <b>EDDY</b>
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## Bottom Hole Location If Different From Surface

UL or Lot No. <b>B</b>	Section <b>8</b>	Township <b>26 S</b>	Range <b>31 E</b>	Lot	Feet from the N/S <b>100 FNL</b>	Feet from the E/W <b>2384 FEL</b>	Latitude <b>N 32.064454°</b>	Longitude <b>W 103.799489°</b>	County <b>EDDY</b>
Dedicated Acres <b>960</b>	Infill or Defining Well <b>INFILL</b>	Defining Well API <b>PENDING</b>				Overlapping Spacing Unit (Y/N) <b>YES</b>	Consolidated Code <b>C</b>		

Order Numbers	<b>PENDING COM AGREEMENT</b>		Well Setbacks are under Common Ownership: <input type="checkbox"/> Yes <input type="checkbox"/> No						
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## Kick Off Point (KOP)

UL or lot no. <b>G</b>	Section <b>17</b>	Township <b>26 S</b>	Range <b>31 E</b>	Lot	Feet from the N/S <b>2613 FNL</b>	Feet from the E/W <b>2384 FEL</b>	Latitude <b>N 32.042902°</b>	Longitude <b>W 103.799538°</b>	County <b>EDDY</b>
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## First Take Point (FTP)

UL or lot no. <b>G</b>	Section <b>17</b>	Township <b>26 S</b>	Range <b>31 E</b>	Lot	Feet from the N/S <b>2563 FNL</b>	Feet from the E/W <b>2384 FEL</b>	Latitude <b>N 32.043039°</b>	Longitude <b>W 103.799538°</b>	County <b>EDDY</b>
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## Last Take Point (LTP)

UL or lot no. <b>B</b>	Section <b>8</b>	Township <b>26 S</b>	Range <b>31 E</b>	Lot	Feet from the N/S <b>100 FNL</b>	Feet from the E/W <b>2384 FEL</b>	Latitude <b>N 32.064454°</b>	Longitude <b>W 103.799489°</b>	County <b>EDDY</b>
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Unitized Area or Area of Uniform Interest <b>COM AGREEMENT</b>	Spacing Unity Type <input checked="" type="checkbox"/> Horizontal <input type="checkbox"/> Vertical	Ground Floor Elevation <b>3272'</b>
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OPERATOR CERTIFICATION					SURVEYORS CERTIFICATION				
<p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and, if the well is a vertical or directional well, 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 a working interest or unleased mineral interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p>If this well is a horizontal well, I further certify that this organization has received the consent of at least one lessee or owner of a working interest or unleased mineral interest in each tract (in the target pool or formation) in which any part of the well's completed interval will be located or obtained a compulsory pooling order from the division.</p>					 <p>Mitchell L. McDonald New Mexico Professional Surveyor 29821 08/15/2024</p>				
<p><b>Shea Bailey</b> Signature Shea Bailey Print Name sbailey1@eogresources.com E-mail Address</p>					<p><b>9/19/24</b> Date MITCHELL L. MCDONALD, N.M. P.L.S. Signature and Seal of Professional Surveyor 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 and correct to the best of my belief.</p>				

<p>Certificate Number <b>29821</b></p>		Date of Survey <b>JUNE 20, 2024</b>
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Note: 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.





APD ID: 10400101263

Submission Date: 09/27/2024

Highlighted data  
reflects the most  
recent changes

Operator Name: EOG RESOURCES INCORPORATED

Well Name: ROSS DRAW 17 FED COM

Well Number: 516H

Well Type: OIL WELL

Well Work Type: Drill

[Show Final Text](#)

## Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical	Measured Depth	Lithologies	Mineral Resources	Producing Formation
16192157	PERMIAN	3247	0	0	ALLUVIUM	NONE	N
16192158	RUSTLER	2239	1008	1008	ANHYDRITE	NONE	N
16192159	TOP SALT	1886	1361	1361	SALT	NONE	N
16192160	BASE OF SALT	-174	3421	3421	SALT	NONE	N
16192163	BELL CANYON	-728	3975	3975	SANDSTONE	NATURAL GAS, OIL	N
16192164	CHERRY CANYON	-1647	4894	4894	SANDSTONE	NATURAL GAS, OIL	N
16192165	BRUSHY CANYON	-2907	6154	6154	SANDSTONE	NATURAL GAS, OIL	N
16192166	BONE SPRING LIME	-4620	7867	7867	LIMESTONE	NATURAL GAS, OIL	N
16192167	AVALON SAND	-4751	7998	7998	SANDSTONE	NATURAL GAS, OIL	N
16192168	BONE SPRING 1ST	-5602	8849	8849	SANDSTONE	NATURAL GAS, OIL	Y
16192169	BONE SPRING 2ND	-6263	9510	9510	SANDSTONE	NATURAL GAS, OIL	Y
16192171	BONE SPRING 3RD	-7524	10771	10771	SANDSTONE	NATURAL GAS, OIL	Y

## Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M

Rating Depth: 10343

**Equipment:** The minimum blowout preventer equipment (BOPE) shown in Exhibit #1 will consist of a single ram, mud cross and double ram-type (10,000 psi WP) preventer and an annular preventer (5,000 psi WP). Both units will be hydraulically operated and the ram-type will be equipped with blind rams on bottom and drill pipe rams on top. EOG will utilize wing unions on BOPE connections that can be isolated from wellbore pressure through means of a choke. All wing unions will be rated to a pressure that meets or exceeds the pressure rating of the BOPE system. A multi-bowl wellhead system will be utilized. After running the 13-3/8 surface casing, a 13-3/8 BOP/BOPE system with a minimum working pressure of 10,000 psi will be installed on

**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H

the wellhead system and will be pressure tested to 250 psi low followed by a 10,000 psi pressure test. This pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The minimum working pressure of the BOP and related BOPE required for drilling below the surface casing shoe shall be 10,000 psi. The multi-bowl wellhead will be installed by vendors representative(s). A copy of the installation instructions for the Cactus Multi-Bowl WH system has been sent to the NM BLM office in Carlsbad, NM. The wellhead will be installed by a third party welder while being monitored by WH vendors representative. All BOP equipment will be tested utilizing a conventional test plug. Not a cup or Jpacker type. EOG Resources reserves the option to conduct BOPE testing during wait on cement periods provided a test plug is utilized. A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi. Casing strings will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1,500 psi, whichever is greater.

#### Requesting Variance? YES

**Variance request:** SEE ATTACHED VARINCE LIST FOR FULL LIST OF REQUESTS 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. Variance is requested to use a co-flex line between the BOP and choke manifold (instead of using a 4" OD steel line). Variance is requested to use a 5,000 psi annular BOP with the 10,000 psi BOP stack. 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" Variance is requested to waive the centralizer requirements for the 8-5/8" casing in the 9-7/8" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 9-7/8" 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.

**Testing Procedure:** Pipe rams and blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. A hydraulically operated choke will be installed prior to drilling out of the intermediate casing shoe. EOG will include the Echo-meter verified fluid top and the volume of displacement fluid above the cement slurry in the annulus in all post-drill sundries on wells utilizing this cement program. EOG will report to the BLM the volume of fluid (limited to 5 bbls) used to flush intermediate casing valves following backside cementing procedures.

#### Choke Diagram Attachment:

10\_M\_Choke\_Manifold\_20211227095328.pdf

Gates\_Co\_Flex\_Hose\_Test\_Chart\_and\_Certifications\_20250212113019.pdf

#### BOP Diagram Attachment:

EOG\_BLM\_Variance\_3a\_b\_\_\_BOP\_Break\_test\_and\_Offline\_Intermediate\_Cement\_8.15.2023\_20240910081727.pdf

EOG\_BLM\_Variance\_5a\_\_\_Alternate\_Shallow\_Casing\_Designs\_20240229084408.pdf

Operator Name: EOG RESOURCES INCORPORATED

Well Name: ROSS DRAW 17 FED COM

Well Number: 516H

10\_M\_Choke\_Manifold\_20211227095328.pdf

Gates\_Co\_Flex\_Hose\_Test\_Chart\_and\_Certifications\_20250212113019.pdf

EOG\_Cameron\_3\_String\_13in\_10M\_MNDS\_20240910081806.PDF

EOG\_BLM\_Variance\_3c\_\_Shallow\_Target\_Production\_Offline\_Bradenhead\_Cement\_8.9.2024\_V2\_20240910081727.pdf

Wellhead\_3\_string\_10.750x8.625x5.500\_SDT\_3141\_20240910081832.pdf

Wellhead\_3\_string\_10.750x8.625x6.000\_SDT\_3141\_20240910081833.pdf

Blanket\_Casing\_Design\_\_Ross\_Draw\_17\_Fed\_Com\_SHALLOW\_9.6.2024\_20240918130923.pdf

EOG\_BLM\_Variance\_1c\_\_10M\_Annular\_Variance\_\_3\_String\_Large\_surface\_hole\_20230227071046.pdf

10\_M\_BOP\_Diagram\_13.625\_in\_20230227071101.pdf

EOG\_BLM\_Variance\_4a\_\_Salt\_Section\_Annular\_Clearance\_11.8.2022\_20230307144721.pdf

Ross\_Draw\_17\_Fed\_Com\_516H\_Variances\_20240926080809.pdf

### Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	13	10.75	NEW	API	N	0	1124	0	1124	3247	2123	1124	J-55	40.5	ST&C	1.125	1.25	BUOY	1.6	BUOY	1.6
2	INTERMEDIATE	9.875	8.625	NEW	API	N	0	3522	0	3521	3411	-274	3522	J-55	32	OTHER - BTC-SC	1.125	1.25	BUOY	1.6	BUOY	1.6
3	INTERMEDIATE	7.875	6.0	NEW	API	N	0	9766	0	9766	3340	-6519	9766	P-110	24.5	OTHER - VAM SPRINT TC	1.125	1.25	BUOY	1.6	BUOY	1.6
4	PRODUCTIVE	6.75	5.5	NEW	API	N	9766	17980	9766	10343	-6519	-7096	8214	P-110	20	OTHER - VAM SPRINT SF	1.125	1.25	BUOY	1.6	BUOY	1.6

### Casing Attachments

**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H**Casing Attachments****Casing ID:** 1      **String**      SURFACE**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**

Ross\_Draw\_17\_Fed\_Com\_516H\_Permit\_Info\_20240926080851.pdf

**Casing ID:** 2      **String**      INTERMEDIATE**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**

8.625in\_32ppf\_J55\_BTC\_SC\_20240926080931.pdf

**Casing ID:** 3      **String**      INTERMEDIATE**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**

6.000in\_24.50ppf\_CDS\_P110EC\_VAM\_SPRINT\_TC\_20240926080840.pdf

Operator Name: EOG RESOURCES INCORPORATED

Well Name: ROSS DRAW 17 FED COM

Well Number: 516H

## Casing Attachments

Casing ID: 4 String PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

5.500in\_20.00ppf\_P110EC\_SPRINT\_SF\_20240926080917.pdf

## Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	930	260	1.73	13.5	484.4	25	Class C	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello- Flake (TOC @ Surface)
SURFACE	Tail		930	1130	120	1.34	14.8	160.8	25	Class C	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 930')
INTERMEDIATE	Lead		0	2817	220	2.22	12.7	488.4	25	Class C	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
INTERMEDIATE	Tail		2817	3530	100	1.32	14.8	145.2	25	Class C	Tail: Class C + 10% NaCl + 3% MagOx (TOC @2817')
PRODUCTION	Lead		0	6160	1000	1.32	14.8	1320	25	CLASS H	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ Surface)
PRODUCTION	Tail		6160	17980	1400	1.52	13.2	2128	25	CLASS H	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 +

Operator Name: EOG RESOURCES INCORPORATED

Well Name: ROSS DRAW 17 FED COM

Well Number: 516H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
											0.3% NRT-241 (TOC @ 6160)

## Section 5 - Circulating Medium

**Mud System Type:** Closed

**Will an air or gas system be Used?** NO

**Description of the equipment for the circulating system in accordance with 43 CFR 3172:**

**Diagram of the equipment for the circulating system in accordance with 43 CFR 3172:**

**Describe what will be on location to control well or mitigate other conditions:** (A) A kelly cock will be kept in the drill string at all times. (B) A full opening drill pipe-stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times. (C) H2S monitoring and detection equipment will be utilized from surface casing point to TD.

**Describe the mud monitoring system utilized:** The highest mud weight needed to balance formation is expected to be 11.5 ppg. In order to maintain hole stability, mud weights up to 14.0 ppg may be utilized. An electronic pit volume totalizer (PVT) will be utilized on the circulating system, to monitor pit volume, flow rate, pump pressure and stroke rate. Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept at the wellsite at all times.

## Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	1130	WATER-BASED MUD	8.6	8.8							
3530	1034 3	OIL-BASED MUD	8.8	9.5							
1130	3320	SALT SATURATED	9	10.5							

**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H

## Section 6 - Test, Logging, Coring

**List of production tests including testing procedures, equipment and safety measures:**

Open-hole logs are not planned for this well.

GRCC will be run in cased hole during completions phase of operations.

**List of open and cased hole logs run in the well:**

DIRECTIONAL SURVEY,

**Coring operation description for the well:**

None

## Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 4841**Anticipated Surface Pressure:** 2565**Anticipated Bottom Hole Temperature(F):** 173**Anticipated abnormal pressures, temperatures, or potential geologic hazards?** NO**Describe:****Contingency Plans geohazards description:****Contingency Plans geohazards****Hydrogen Sulfide drilling operations plan required?** YES**Hydrogen sulfide drilling operations**

[Ross\\_Draw\\_17\\_Fed\\_Com\\_516H\\_H2S\\_Plan\\_Summary\\_20240926081109.pdf](Ross_Draw_17_Fed_Com_516H_H2S_Plan_Summary_20240926081109.pdf)

## Section 8 - Other Information

**Proposed horizontal/directional/multi-lateral plan submission:**

[Ross\\_Draw\\_17\\_Fed\\_Com\\_516H\\_Wall\\_Plot\\_20240926081127.pdf](Ross_Draw_17_Fed_Com_516H_Wall_Plot_20240926081127.pdf)

[Ross\\_Draw\\_17\\_Fed\\_Com\\_516H\\_Planning\\_Report\\_20240926081127.pdf](Ross_Draw_17_Fed_Com_516H_Planning_Report_20240926081127.pdf)

**Other proposed operations facets description:**

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

EOG Resources requests the option to contract a Surface Rig to drill, set surface casing, and Cement on the subject well. After WOC 8 hours or 500 psi compressive strength (whichever is greater), the Surface Rig will move off so the wellhead can be installed. A welder will cut the casing to the proper height and weld on the wellhead (both A and B sections). The weld will be tested to 1,000 psi. All valves will be closed and a wellhead cap will be installed (diagram attached). If the timing between rigs is such that EOG Resources would not be able to preset the surface, the Primary Rig will MIRU and drill the well in its entirety per the APD.

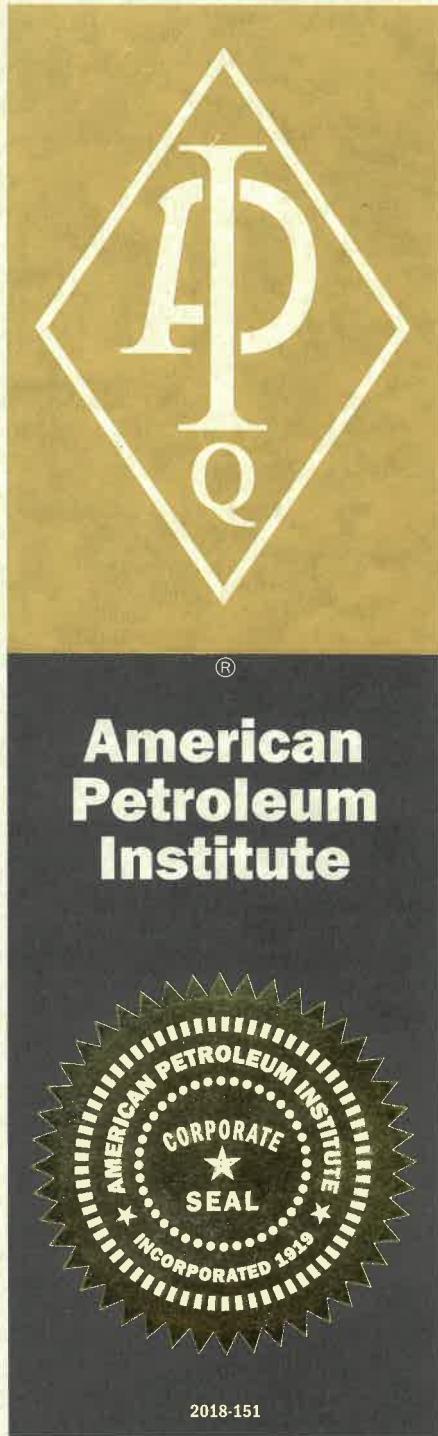
**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H**Other proposed operations facets attachment:**

10.750in\_40.5ppf\_J55\_STC\_20230227072935.pdf  
10\_M\_BOP\_Diagram\_13.625\_in\_20230227072935.pdf  
10\_M\_Choke\_Manifold\_20230227072936.pdf  
8.625in\_32ppf\_J55\_BTC\_SC\_20230227072935.pdf  
8.625in\_32ppf\_P110EC\_BTC\_SC\_20230227072935.pdf  
EOG\_Cameron\_3\_String\_13in\_10M\_MNDS\_20230227072935.PDF  
Wellhead\_3\_string\_10.750x8.625x5.500\_SDT\_3141\_20230227072935.pdf  
BLM\_Waste\_Management\_Plan\_Eddy\_County\_20240910082607.pdf  
Blanket\_Casing\_Design\_Ross\_Draw\_17\_Fed\_Com\_SHALLOW\_9.6.2024\_20240918131524.pdf  
Ross\_Draw\_17\_Fed\_Com\_516H\_Permit\_Info\_20240926081144.pdf  
Ross\_Draw\_17\_Fed\_Com\_516H\_Variances\_20240926081144.pdf  
Ross\_Draw\_17\_Fed\_Com\_516H\_Rig\_Layout\_20240926081144.pdf

**Other Variance request(s)?:** Y**Other Variance attachment:**

10M\_BOP\_Diagram\_13.625in\_20230208150436.pdf  
10\_M\_Choke\_Manifold\_20211227132831.pdf  
EOG\_BLM\_Variance\_1c\_10M\_Annular\_Variance\_3\_String\_Large\_surface\_hole\_20230227073050.pdf  
EOG\_BLM\_Variance\_5a\_Alternate\_Shallow\_Casing\_Designs\_20240229084904.pdf  
EOG\_Cameron\_3\_String\_13in\_10M\_MNDS\_20230227073051.PDF  
EOG\_BLM\_10M\_Annular\_Variance\_9.625\_in\_20230113071033.pdf  
EOG\_BLM\_Variance\_3a\_b\_BOP\_Break\_test\_and\_Offline\_Intermediate\_Cement\_8.15.2023\_20240910082722.pdf  
EOG\_BLM\_Variance\_3c\_Shallow\_Target\_Production\_Offline\_Bradenhead\_Cement\_8.9.2024\_V2\_20240910082722.pdf  
EOG\_BLM\_Variance\_4a\_Salt\_Section\_Annular\_Clearance\_11.8.2022\_20240910082738.pdf  
Gates\_Co\_Flex\_Hose\_Test\_Chart\_and\_Certifications\_20250212113049.pdf





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License Number: 7K-0519

ORIGINAL

The American Petroleum Institute hereby grants to

**GATES ENGINEERING AND SERVICES**  
**7603 Prairie Oak Drive, Suite 190**  
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QMS Exclusions: No Exclusions Identified as Applicable

Effective Date: OCTOBER 24, 2024

Expiration Date: DECEMBER 18, 2027

To verify the authenticity of this license, go to [www.api.org/compositelist](http://www.api.org/compositelist).

Senior Vice President of Global Industry Services

*Anchal Liddar*

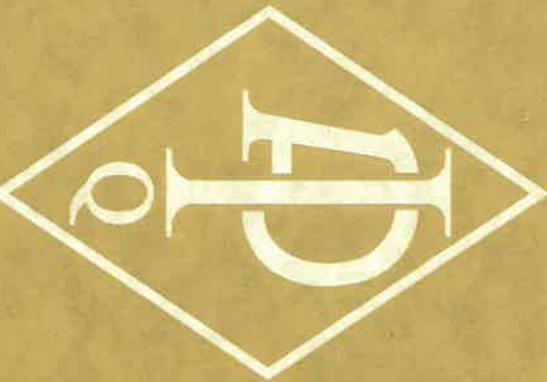
# Certificate of Authority to use the Official API Monogram

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The scope of this license includes the following: Flexible Choke and Kill Lines at FSL 0, FSL 1, FSL 2, FSL 3

QMS Exclusions: No Exclusions Identified as Applicable

**Effective Date:** OCTOBER 24, 2024  
**Expiration Date:** DECEMBER 18, 2027



American  
Petroleum  
Institute

**REGISTRATION NO. Q1-3650**

# **Certificate of Registration**

The American Petroleum Institute certifies that the quality management system of

**GATES ENGINEERING AND SERVICES**  
7603 Prairie Oak Drive, Suite 190  
Houston, TX  
United States

has been assessed by the American Petroleum Institute and found to be in conformance with the following:

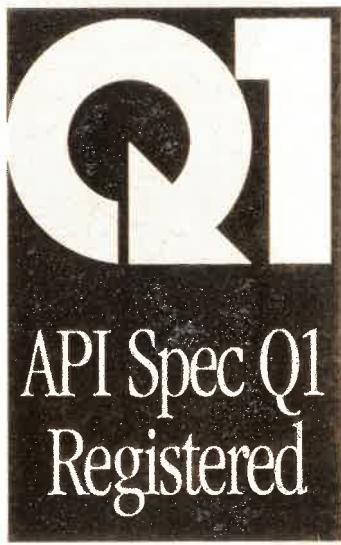
## **API Spec Q1, 9th Edition**

The scope of this registration and the approved quality management system applies to the

**Assembly and Pressure Test of High Pressure Mud and Cement Hoses,  
Flexible Choke and Kill Lines and General Rubber Hydraulic Hose Assemblies**

API approves the organization's justification for excluding

**No Exclusions Identified as Applicable**



**Effective Date:** OCTOBER 24, 2024  
**Expiration Date:** DECEMBER 18, 2027  
**Registered Since:** DECEMBER 18, 2018

**Senior Vice President of Global Industry Services**

This certificate is valid for the period specified herein. The registered organization must continually meet all requirements of API Spec Q1, *Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry*, and the requirements of the Registration Agreement. Registration is maintained and regularly monitored through annual full system audits. This certificate has been issued from API offices located at 200 Massachusetts Avenue, NW Suite 1100, Washington, DC 20001-5571, U.S.A. It is the property of API and must be returned upon request. **To verify the authenticity of this certificate, go to [www.api.org/compositelist](http://www.api.org/compositelist).**

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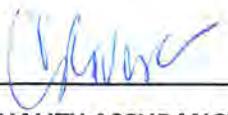
**GATES ENGINEERING & SERVICES NORTH AMERICA**  
**7603 Prairie Oak Dr. Suite 190**  
**Houston, TX. 77086**

**PHONE: +1 (281) 602-4100**  
**FAX: +1 (281) 602-4147**  
**EMAIL: gesna.quality@gates.com**  
**WEB: gates.com/oilandgas**

## **CERTIFICATE OF CONFORMANCE**

This is to verify that all Parts and/or Materials included in this shipment have been manufactured and/or processed in Conformance with applicable drawings and specifications, and that Records of Required Tests are on file and subject to examination. The following items were purchased via **Gates Engineering & Services North America** facilities in Houston, TX, USA. This hose assembly was designed and manufactured to meet requirements of API Spec 16C, 3<sup>rd</sup> Edition.

**CUSTOMER:** HELMERICH & PAYNE INTERNATIONAL DRILLING CO.  
**CUSTOMER P.O.#:** 740399823 (TAG WITH H&P I.D # 88076545 &H&P P.O. # 740399823 (UK S/O 34557))  
**CUSTOMER P/N:** 3.035.016C4116FX-FLTSSA  
**PART DESCRIPTION:** 3" X 35 FT GATES API 16C CHOKE & KILL FSL 3 TEMP B HOSE ASSEMBLY WITH STAINLESS STEEL ARMOR C/W 4 1/16" 10K H2S SUITED FLOAT X FLOAT FLANGES WITH BX 155 RING GROOVE SUPPLIED WITH SAFETY CLAMPS/LIFT EYE CLAMPS  
**SALES ORDER #:** 525112  
**QUANTITY:** 1  
**SERIAL #:** SN 139321 HOSE BATCH 139244

**SIGNATURE:**   
**TITLE:** QUALITY ASSURANCE  
**DATE:** 2/10/2023

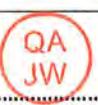
Gates Engineering & Services UK Ltd		CERTIFICATE OF CONFORMITY	
Doc. Ref.	Form-056		
Revision	4		

Gates SO No. 34557	<b>Customer Name &amp; Address:</b> Gates Engineering & Services NA Inc Accounts payable 7N GESNA 1144 Fifteenth Street, Suite 1400 Denver, CO 80202 USA
Customer PO No: 1803964 / 1	
Description: 3" 10K API 16C CHOKE & KILL HOSE ASSEMBLY X 35FT OAL (QTY 5)	

*This is to certify that the components listed below have been supplied in accordance with API 16C & the above referenced order number. The assemblies listed below have been manufactured and tested in the UK.*

#### SPECIFICATION

ITEM	DESCRIPTION	BATCH NUMBER	QTY
1	3" 10K API 16C CHOKE & KILL HOSE ASSEMBLY X 35FT OAL PART NO: HA34539-001 END A: 4.1/16" 10K API SPEC 6A TYPE FLANGE WITH BX155 RING GROOVE END B: 4.1/16" 10K API SPEC 17D SV SWIVEL FLANGE WITH BX155 RING GROOVE EACH END HAS AN INCONEL 625 INLAID RING GROOVE HOSE METALLIC PARTS MEET NACE-MR-0175 LATEST EDITION REQUIREMENTS WORKING PRESSURE: 10,000 PSI TEST PRESSURE: 15,000 PSI STANDARD: API 16C FSL3 MONOGRAMMED, 3RD EDITION EXTERNAL PROTECTION: STAINLESS STEEL ARMOUR INCLUDED FIRE RATED: API 16C STANDARD SECTION B.12.4 (704° FOR 30 MINS) H2S SERVICE SUITABLE TEMPERATURE CLASS B(-25 TO 100°C) HIGH TEMPERATURE EXPOSURE / SURVIVAL @ 177°C (INTERNAL IN A KICK SITUATION) SAFETY EQUIPMENT: INCLUDED 2 X HOSE SAFETY CLAMPS 2 X 3.6T SHACKLES 2 X 10MM OD X 6FT PCP COATED CHAINS  HOSE ASSEMBLY WORKS ORDERS NUMBERS:  139051 139052 139053 139054 139321	139062 139063 139064 139065 139244	5
	SAFETY/LIFTER CLAMP 195MM 1.7T PART NO: HCC108	MYB59483	10
	SAFETY CHAIN 10MM C/S PCP 6FT PART NO: CHC001	ACU59481	10

Accepted by.....  *J. W. Wilson* 06 DEC 2022  
for and on behalf of Gates Engineering & Services UK Ltd

Gates Engineering & Services UK Ltd		PRESSURE TEST CERTIFICATE	
Doc. Ref.	Form-051		
Revision	9		

			Certificate No:
<input type="checkbox"/> BURST	<input checked="" type="checkbox"/> HYDROSTATIC	<input type="checkbox"/> CYCLIC	PTC-139321

Product:	CK03F	Hose WO/Batch:	139244
Assembly WO:	139321	Length:	35FT
SO No:	34557	Date:	25/11/22
Customer:	Gates Engineering & Services NA Inc	Customer Reference:	PO 1803964/ 1

Inner Diameter:	3	Inch			
Working Pressure:	10000	Psi	690	bar	
Test Pressure:	15000	Psi	1034	bar	
Burst Pressure:	22500	Psi	1551	bar	

Hose Description:		3" 10K API 16C CHOKE & KILL HOSE ASSEMBLY X 35FT OAL END A: 4.1/16" 10K API SPEC 6A TYPE FLANGE WITH BX155 RING GROOVE END B: 4.1/16" 10K API SPEC 17D SV SWIVEL FLANGE WITH BX155 RING GROOVE			
Item No	Qty	Part Code			Customer Tag No (if applicable)
1	1	HA34539-001			N/A

Details of Test:	Pressure tested with water at ambient temperature for a minimum of 60 minutes at test pressure <b>1034 BAR</b>  Pressure Transducer S/N: 131203 (CH1) Chart Recorder S/N: S5VB14523 Calibration Certificate No: IKMCERTU823
Results:	Pressure Loss: <b>8.43 BAR</b>  Acceptance Criteria: Pressure loss not to exceed 500 PSI (34.47 BAR)

GESUK Ltd	Third Party
 J.W.W. 06 DEC 2022	

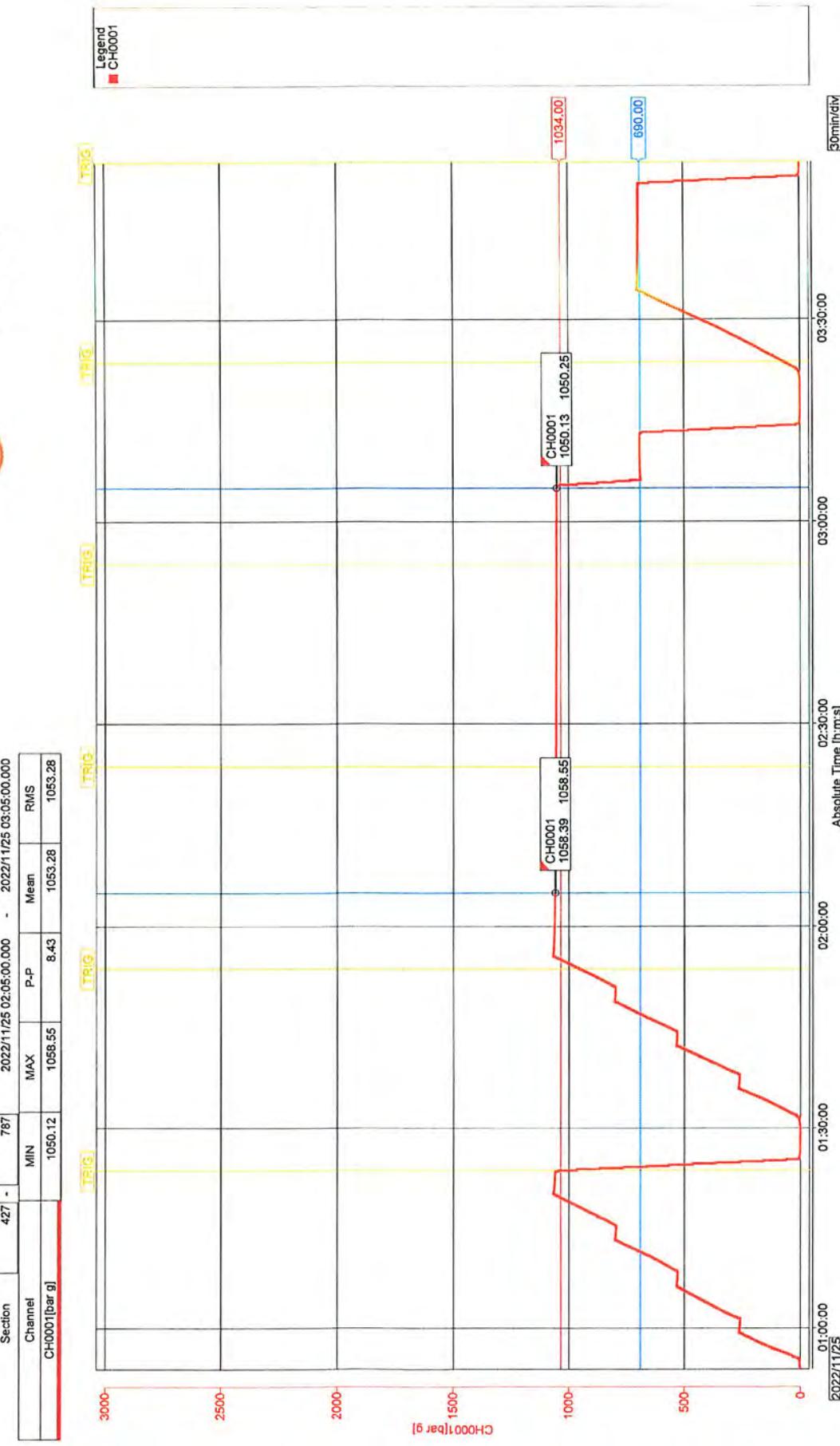
File Message	CH1 139321
Device Type	GX20
Serial No.	55V/B14523
Print Groups	GROUP 1
Print Range	2022/11/25 00:00

Start Time  
Stop Time

2022/11/25 00:53:50.000 (UTC+08:00)  
2022/11/25 03:53:20.000 (UTC+08:00)

66 DEC 2022

QA  
JW

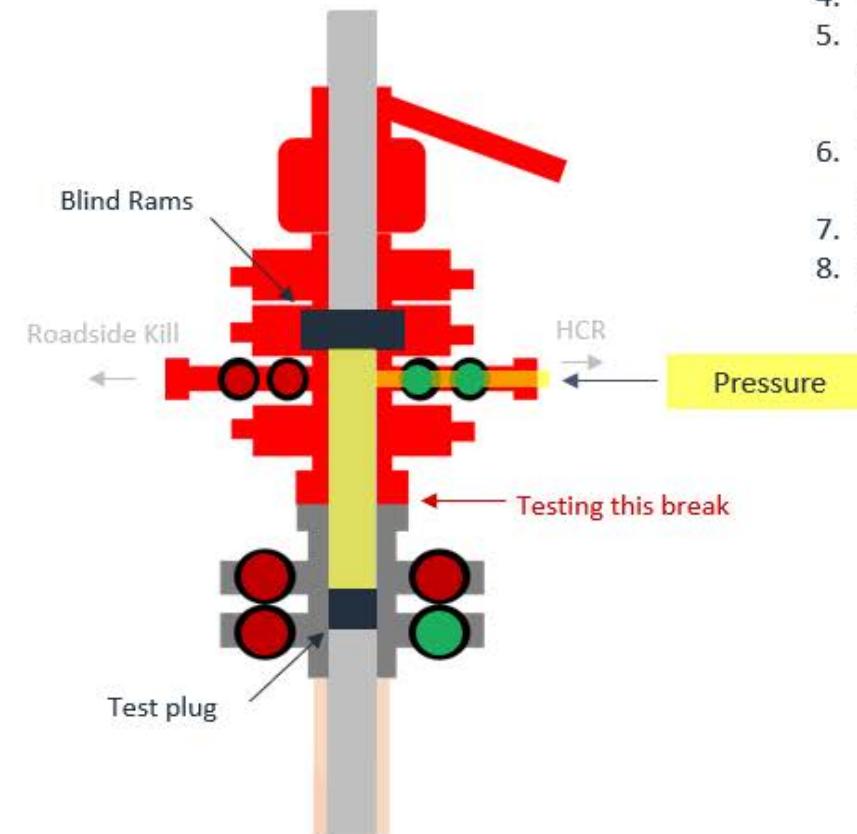
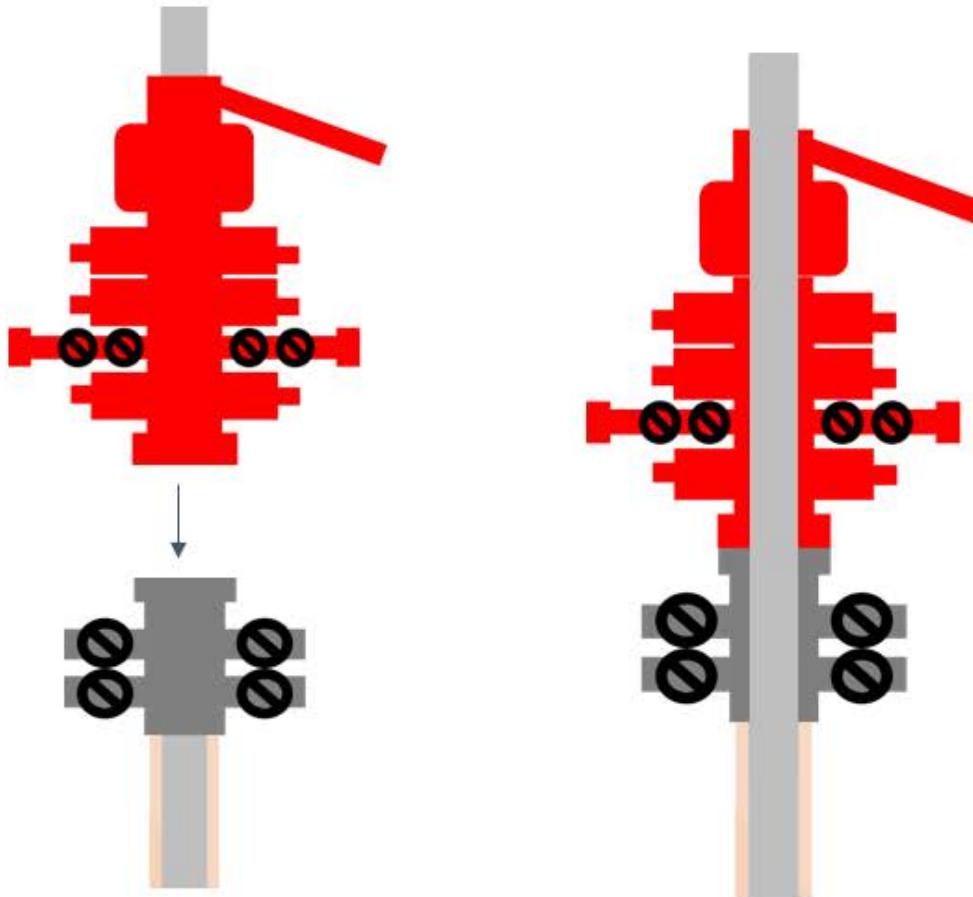


**Break-test BOP & Offline Cementing:**

EOG Resources Inc. (EOG) respectfully requests a variance from the minimum standards for well control equipment testing of ECFR Title 43 Part 3172.6(b)(9)(iv) 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.
- This test will be conducted for 5M rated hole intervals only.
- Each rig requesting the break-test variance is capable of picking up the BOP without damaging components using winches, following API Standard 53, Well Control Equipment Systems for Drilling Wells (Fifth edition, December 2018, Annex C. Table C.4) which recognizes break testing as an acceptable practice.
- Function tests will be performed on the following BOP elements:
  - Annular à during each full BOPE test
  - Upper Pipe Rams à On trip ins where FIT required
  - Blind Rams à Every trip
  - Lower Pipe Rams à during each full BOPE test
- 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.

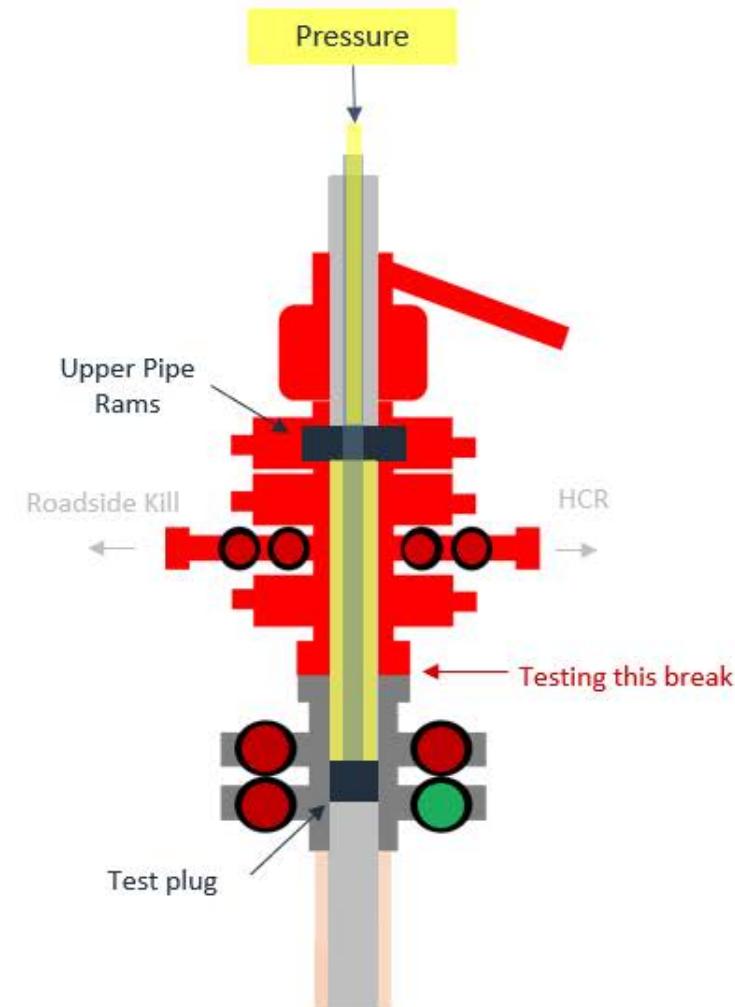
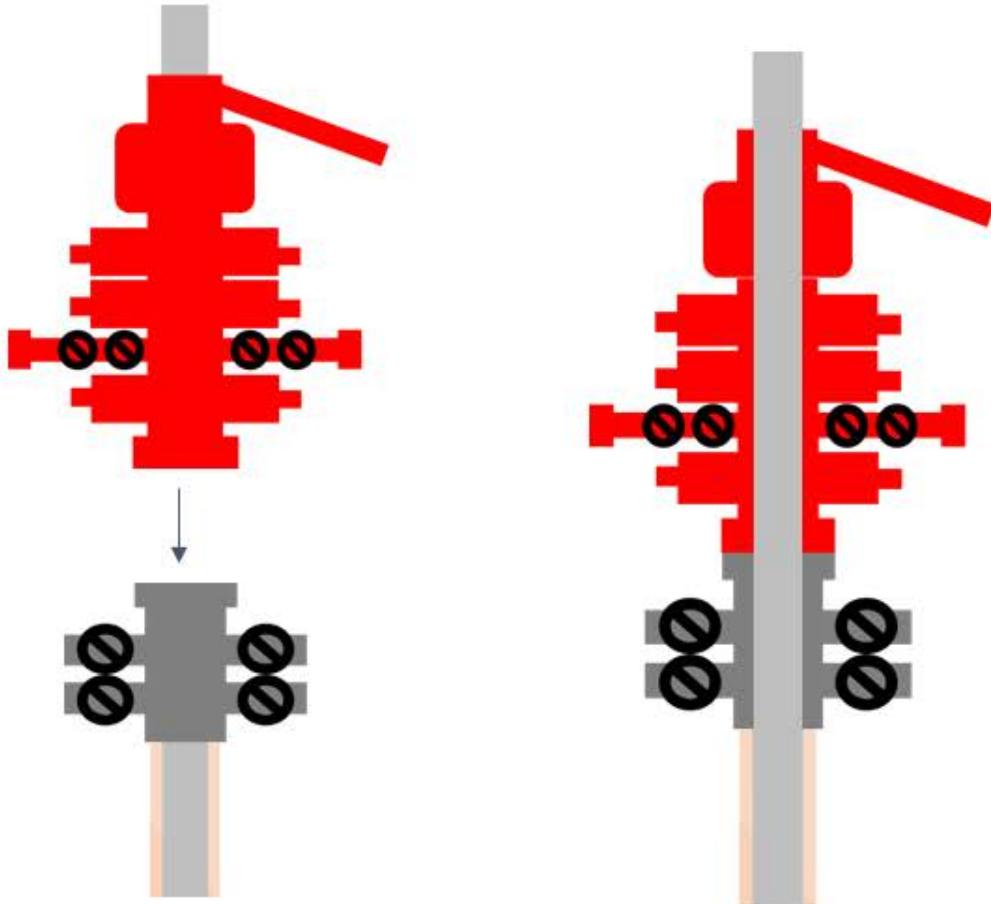
# Break Test Diagram (HCR valve)



## Steps

1. Set plug in wellhead (lower barrier)
2. Close Blind Rams (upper barrier)
3. Close roadside kill
4. Open HCR (pressure application)
5. Open wellhead valves below test plug to ensure if leak past test plug, pressure won't be applied to wellbore
6. Tie BOP testers high pressure line to main choke manifold crown valve
7. Pressure up to test break
8. Bleed test pressure from BOP testing unit

# Break Test Diagram (Test Joint)



## Steps

1. Set plug in with test joint wellhead (lower barrier)
2. Close Upper Pipe Rams (upper barrier)
3. Close roadside kill
4. Close HCR
5. Open wellhead valves below test plug to ensure if leak past test plug, pressure won't be applied to wellbore
6. Tie BOP testers high pressure line to top of test joint
7. Pressure up to test break
8. Bleed test pressure from BOP testing unit



## 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 nipped 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 nipped 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.



## 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



Figure 1: Cameron TA Plug and Offline Adapter Schematic

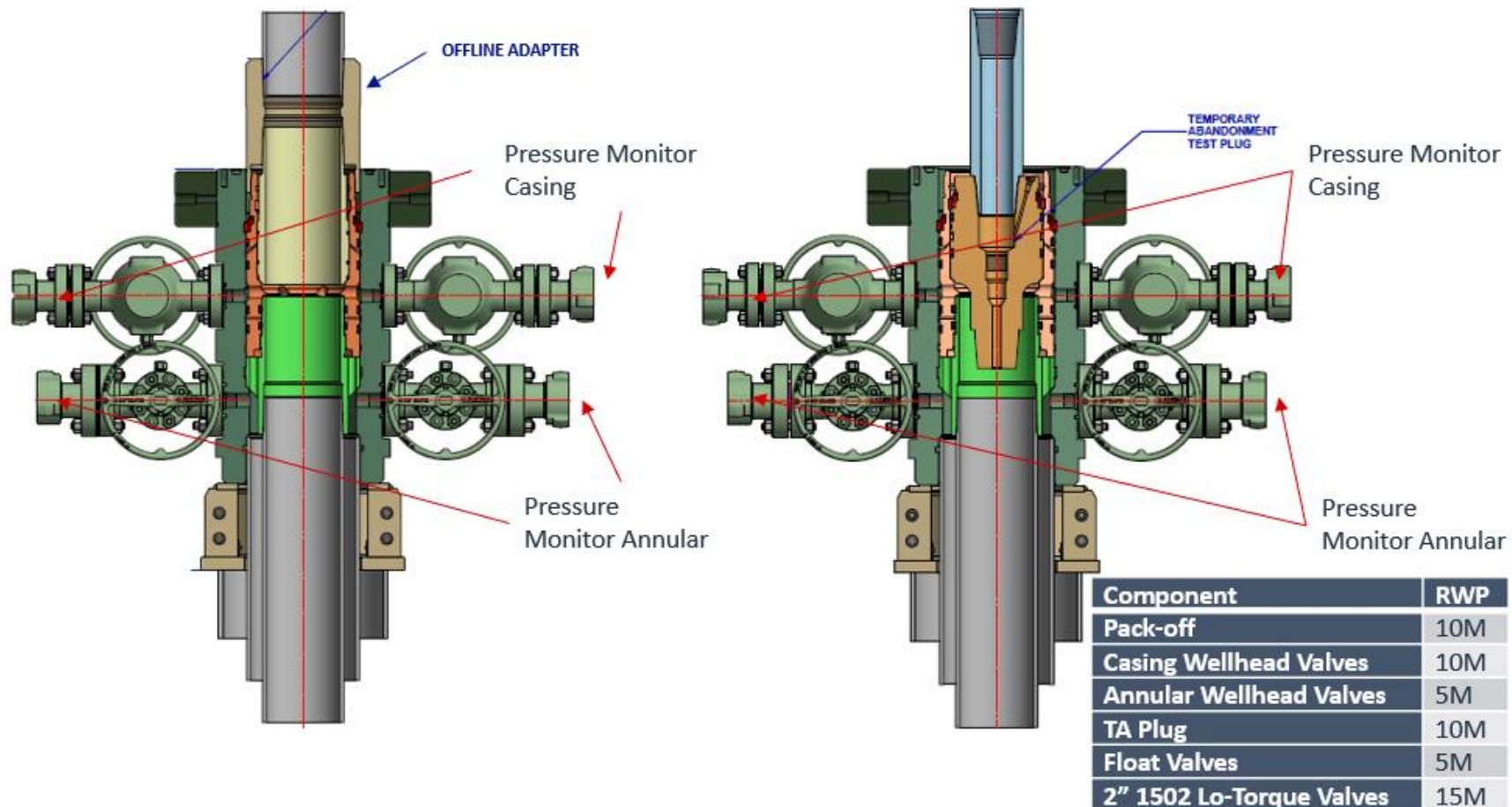
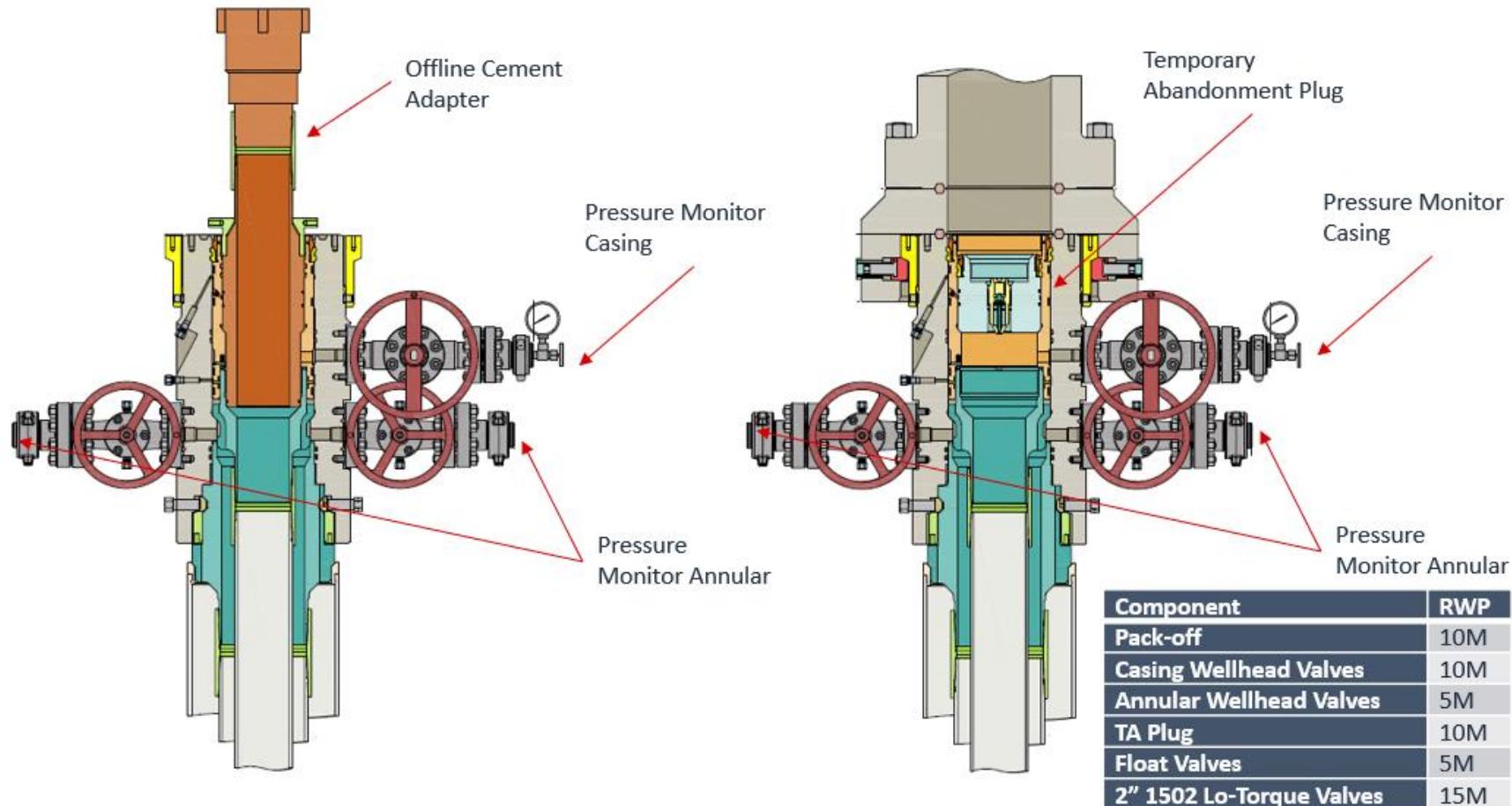
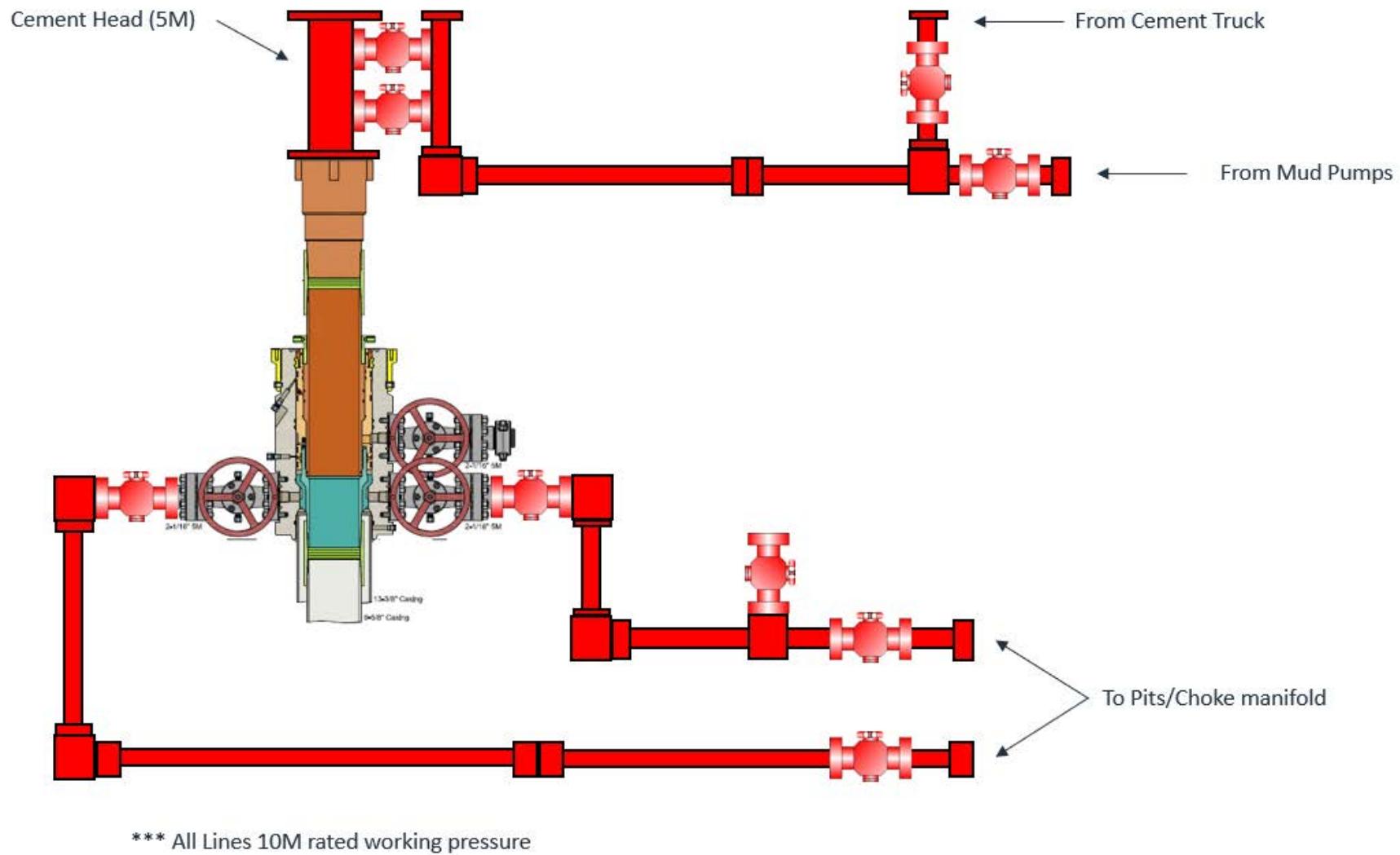
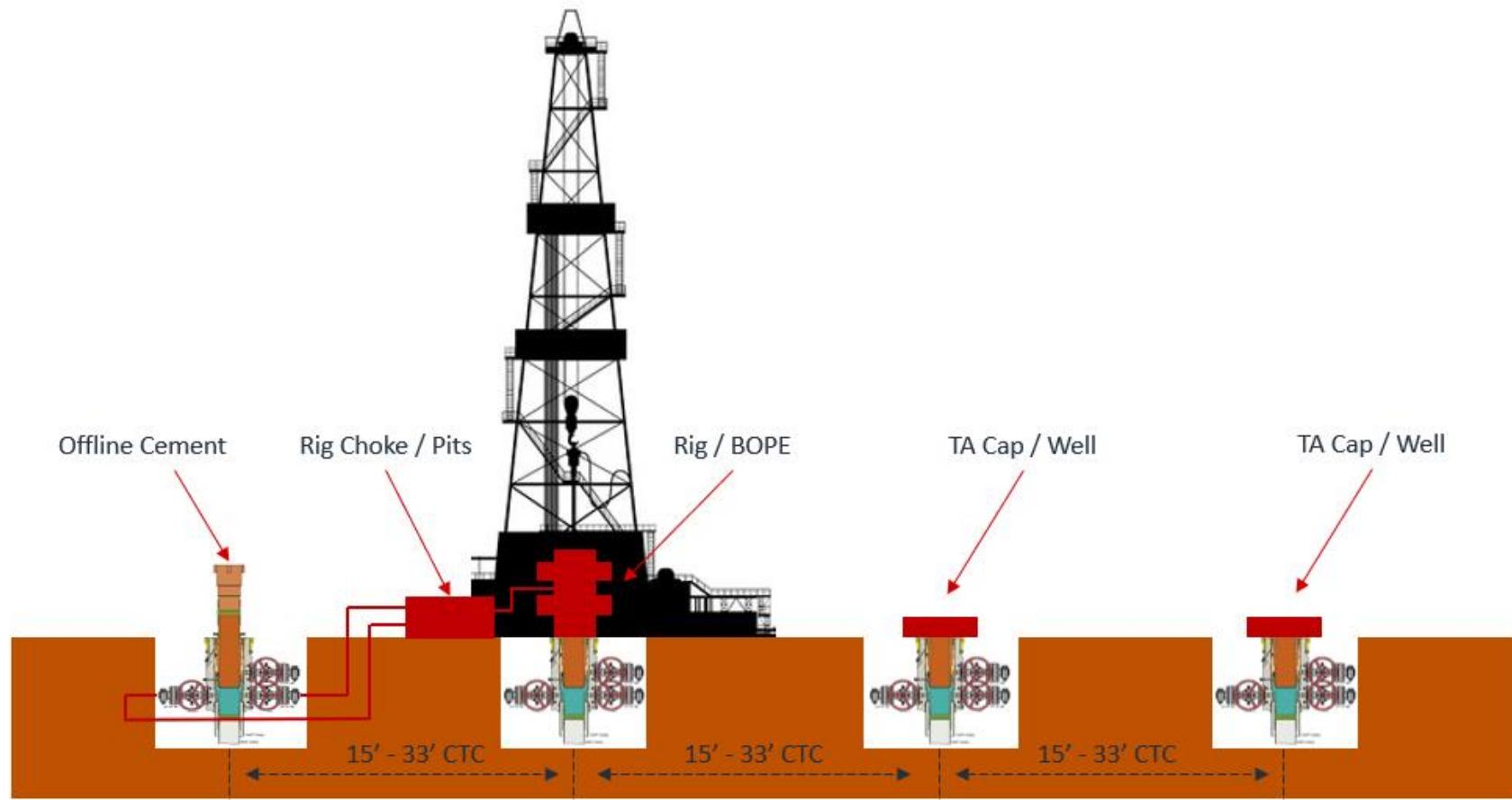




Figure 2: Cactus TA Plug and Offline Adapter Schematic



**Figure 3: Back Yard Rig Up**

**Figure 4: Rig Placement Diagram**



## EOG BLANKET CASING DESIGN VARIANCE

EOG respectfully requests the drill plans in the attached document 'EOG Alternate Casing Designs – BLM APPROVED' be added to the COA's for this well. These designs have been approved by the BLM down to the TVDs listed below and will allow EOG to run alternate casing designs for this well if necessary.

The designs and associated details listed are the "worst case scenario" boundaries for design safety factors. Location and lithology have NOT been accounted for in these designs. The specific well details will be based on the APD/Sundry package and the information listed in the COA.

The mud program will not change from the original design for this well. Summary of the mud programs for both shallow and deep targets are listed at the end of this document. If the target is changing, a sundry will be filed to update the casing design and mud/cement programs.

Cement volumes listed in this document are for reference only. The cement volumes for the specific well will be adjusted to ensure cement tops meet BLM requirements as listed in the COA and to allow bradenhead cementing when applicable.

This blanket document only applies to wells with three string designs outside of Potash and Capitan Reef boundaries.

Shallow Design Boundary Conditions				
	Deepest MD (ft)	Deepest TVD (ft)	Max Inc (deg)	Max DLS (°/100usft)
Surface	2030	2030	0	0
Intermediate	7793	5650	40	8
Production	28578	11225	90	25



### Shallow Design A

#### 1. CASING PROGRAM

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
16"	0	2,030	0	2,030	13-3/8"	54.5#	J-55	STC
11"	0	7,793	0	5,650	9-5/8"	40#	J-55	LTC
6-3/4"	0	28,578	0	11,225	5-1/2"	20#	P110-EC	DWC/C IS MS

Hole will be full during casing run for well control and tensile SF factor. Casing will be kept at least half full during run for this design to meet BLM collapse SF requirement. External pressure will be reviewed prior to conducting casing pressure tests to ensure that 70% of the yield is not exceeded.

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 Title 43 CFR Part 3170 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.

#### 2. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
2,030' 13-3/8"	570	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	160	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 1830')
7,793' 9-5/8"	770	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	250	14.8	1.32	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 6238')
28,578' 5-1/2"	410	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 7300')
	1110	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 @ 12730')

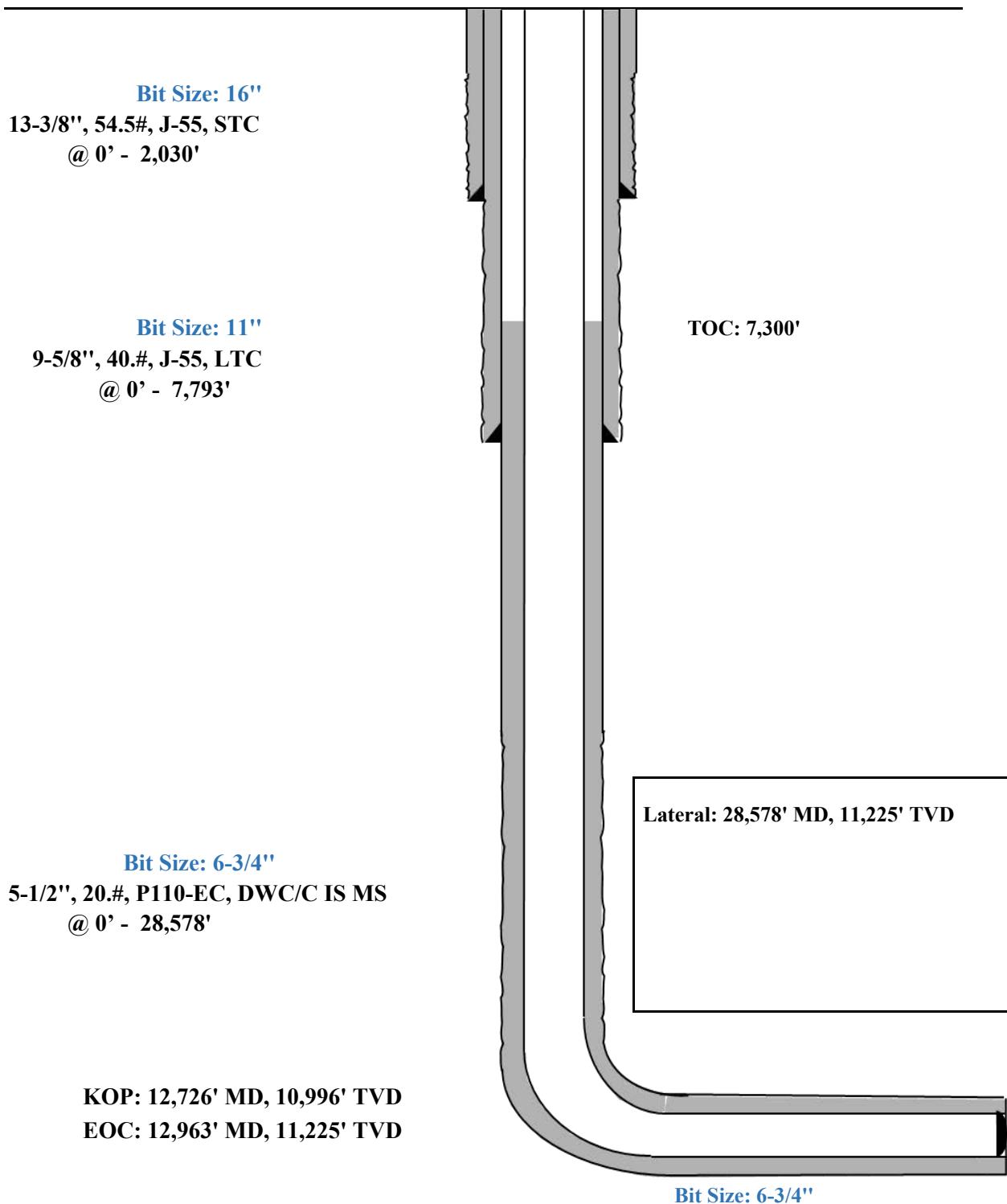


## Shallow Design A

Proposed Wellbore

KB: 3558'

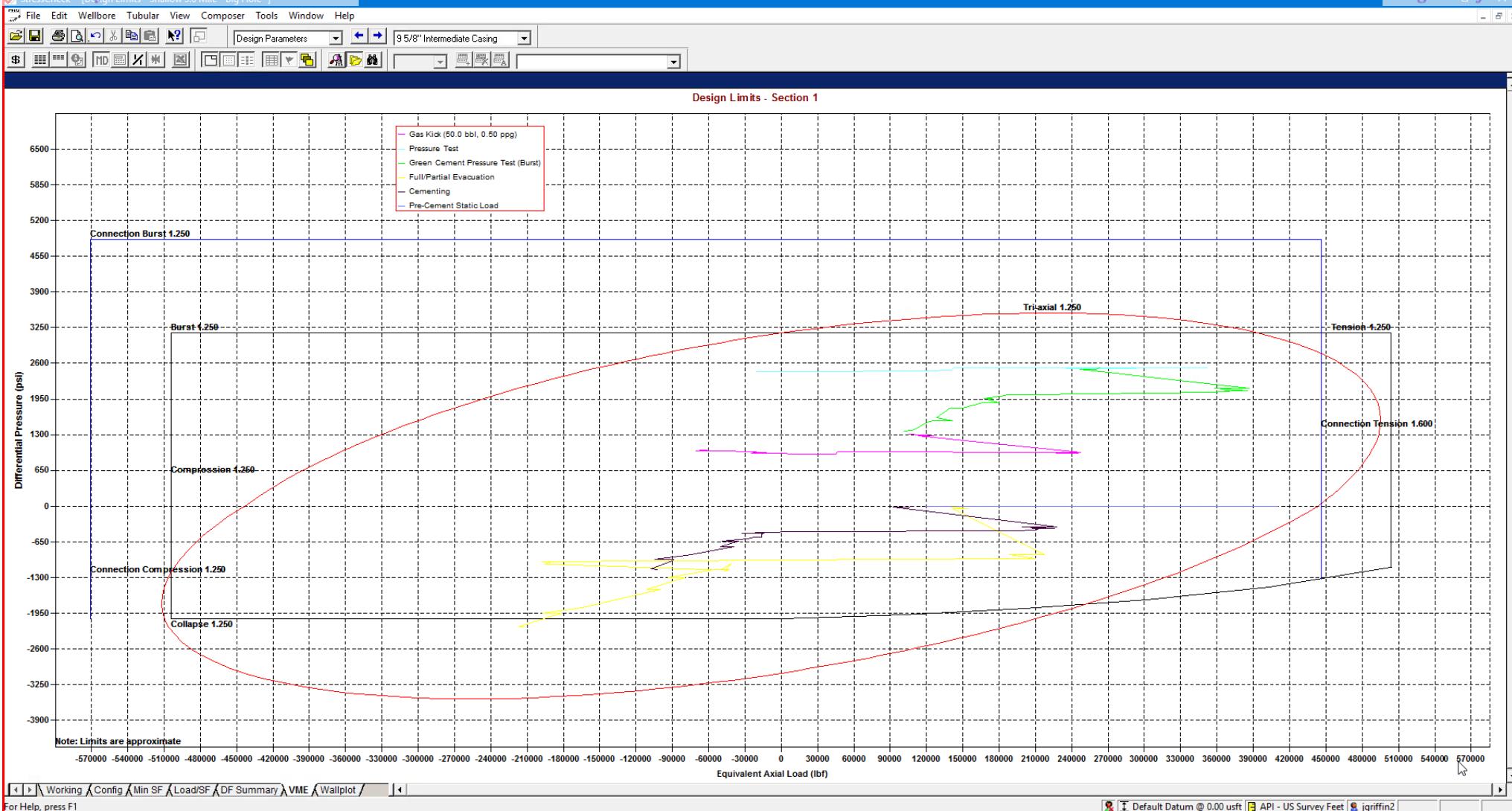
GL: 3533'



	Depth (MD) (usft)	Axial Force (lbf)		Equivalent Axial Load (lbf)	Bending Stress at OD (psi)	Absolute Safety Factor				Temperature (°F)	Pressure (psi)		Add'l Pickup To Prevent Buck. (lbf)	Buckled Length (usft)
		Apparent (w/Bending)	Actual (w/o Bending)			Triaxial	Burst	Collapse (V)	Axial		Internal	External		
1	0	252987	228954	253140	2098.2	1.69	1.58	N/A	2.82 F	70.00	2500.00	0.00	N/A	N/A
2	100	247735	223702	248466	2098.2	1.69	1.58	N/A	2.88 F	71.10	2543.63	43.63		
3	100	234996	223701	235716	986.2	1.71	1.58	N/A	3.04 F	71.10	2543.64	43.64		
4	1700	341565	139667	352253	17627.2	1.53	1.57	N/A	2.09 F	88.70	3241.64	741.64		
5	1700	312979	139666	323488	15131.5	1.58	1.57	N/A	2.28 F	88.70	3241.65	741.65		
6	1850	336881	132027	348440	17885.2	1.51	1.57	N/A	2.12 F	90.29	3305.05	805.05		
7	1850	318549	132027	329984	16284.8	1.54	1.57	N/A	2.24 F	90.29	3305.06	805.06		
8	1950	320468	127243	332475	16869.9	1.52	1.57	N/A	2.23 F	91.30	3344.87	844.87		
9	1950	312802	127243	324756	16200.7	1.53	1.57	N/A	2.28 F	91.30	3344.87	844.87		
10	2050	307858	122773	320295	16159.3	1.52	1.57	N/A	2.32 F	92.23	3381.89	881.89		
11	2050	303560	122772	315965	15784.1	1.53	1.57	N/A	2.35 F	92.23	3381.89	881.89		
12	2300	151294	112633	163658	3375.4	1.71	1.57	N/A	4.72 F	94.35	3466.13	966.13		
13	2300	132741	112633	144956	1755.6	1.72	1.57	N/A	5.38 F	94.35	3466.14	966.14		
14	2370	129966	109858	142452	1755.6	1.72	1.57	N/A	5.49 F	94.94	3489.28	989.28		
15	2370	127909	107800	140922	1755.6	1.75	1.60	N/A	5.58 F	94.94	3489.29	1036.40		
16	2700	105515	94232	119785	985.1	1.75	1.60	N/A	6.77 F	97.73	3599.97	1152.35		
17	2700	111680	94231	126006	1523.4	1.75	1.60	N/A	6.39 F	97.73	3599.97	1152.35		
18	3100	110766	77783	126839	2879.6	1.71	1.60	N/A	6.44 F	101.11	3734.23	1293.00		
19	3100	97392	77783	113331	1712.1	1.73	1.60	N/A	7.33 F	101.11	3734.23	1293.01		
20	3700	71565	53303	89806	1594.4	1.70	1.61	N/A	9.97 F	106.15	3934.24	1502.54		
21	3700	60887	53302	79004	662.3	1.71	1.61	N/A	11.72 F	106.16	3934.25	1502.55		
22	4650	346711	14219	56495	1785.6	1.64	1.61	N/A	20.59 F	114.20	4253.37	1836.86		
23	4900	44595	4828	67626	3472.0	1.59	1.61	N/A	16.01 F	116.32	4337.37	1924.87		
24	4900	28975	4828	51775	2108.2	1.62	1.61	N/A	24.64 F	116.32	4337.38	1924.87		
25	5029	22103	34	45340	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.40	1969.94		
26	5029	22102	33	45339	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.41	1969.95		
27	5600	-45329	-21341	-20805	2094.3	1.57	1.62	N/A	(13.67)	122.23	4572.11	2170.78		
28	5650	-40465	-23210	-15657	1506.5	1.58	1.62	N/A	(15.31)	122.66	4588.87	2188.34		
29		F	Conn Fracture											
30		( )	Compression											
31		(V)	Vector Collapse Safety Factor											
32														
33														

## 9-5/8" Intermediate Casing Pressure Test:

Internal Profile based off Surface Pressure + Hydrostatic: 4589 psi  
 External Profile based off Pore Pressure: 2188 psi



StressCheck - [String Summary - Shallow 3.0 Mile - Big Hole \*]

File Edit Wellbore Tubular View Composer Tools Window Help

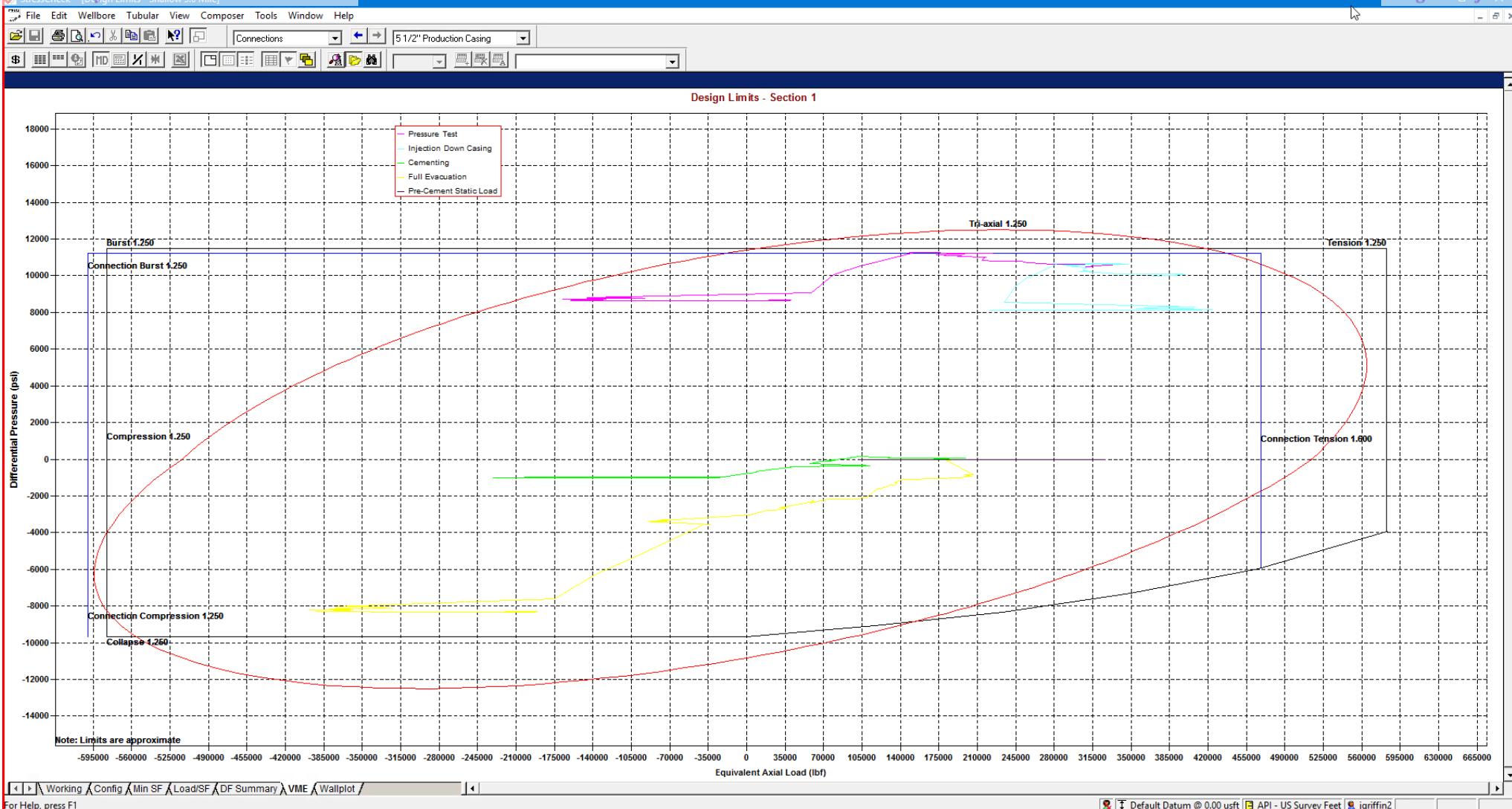
Working \ Config \ Min SF \ Load/SF \ DF Summary \ VME \ Wallplot \

For Help, press F1

Default Datum @ 0.00 usft API - US Survey Feet jgriffin2

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Intermediate Casing	9 5/8", 40.000 ppf, J-55	BTC, J-55	0.0-5650.0	8.750 A	1.57	1.59	1.80 F	1.35	98,141
2										Total = 98,141
3										
4	F Conn Fracture									
5	A Alternate Drift									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 9-5/8" 40# Intermediate Casing. Passes all Burst, Collapse and Tensile design criteria.



StressCheck - [String Summary - Shallow 3.0 Mile]

File Edit Wellbore Tubular View Composer Tools Window Help

Connections 5 1/2" Production Casing

String Summary

String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
					Burst	Collapse (V)	Axial	Triaxial	
1 Production Casing	5 1/2", 20.000 pfp, P110 ICY	BTC, P110 ICY	0.0-28578.0	4.653	1.27	1.47	1.90 F	1.35	446,902
2									Total = 446,902
3									
4 F Conn Fracture									
5 ( ) Compression									
6 (V) Vector Collapse Safety Factor									
7									

\*Modelling done with 5-1/2" 20# Production Casing with a 125ksi Control Yield. Passes all Burst, Collapse and Tensile design criteria.



## Shallow Design B

### 1. CASING PROGRAM

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
13-1/2"	0	2,030	0	2,030	10-3/4"	40.5#	J-55	STC
9-7/8"	0	7,793	0	5,650	8-5/8"	32#	J-55	BTC-SC
6-3/4"	0	28,578	0	11,225	5-1/2"	20#	P110-EC	DWC/C IS MS

Hole will be full during casing run for well control and tensile SF factor. Casing will be kept at least half full during run for this design to meet BLM collapse SF requirement. External pressure will be reviewed prior to conducting casing pressure tests to ensure that 70% of the yield is not exceeded.

Variance is requested to waive the centralizer requirements for the 8-5/8" casing in the 9-7/8" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 9-7/8" 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 Title 43 CFR Part 3170 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.

### 2. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
2,030' 10-3/4"	530	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	140	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 1830')
7,793' 8-5/8"	460	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	210	14.8	1.32	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 6238')
28,578' 5-1/2"	400	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 7300')
	1110	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 @ 12730')

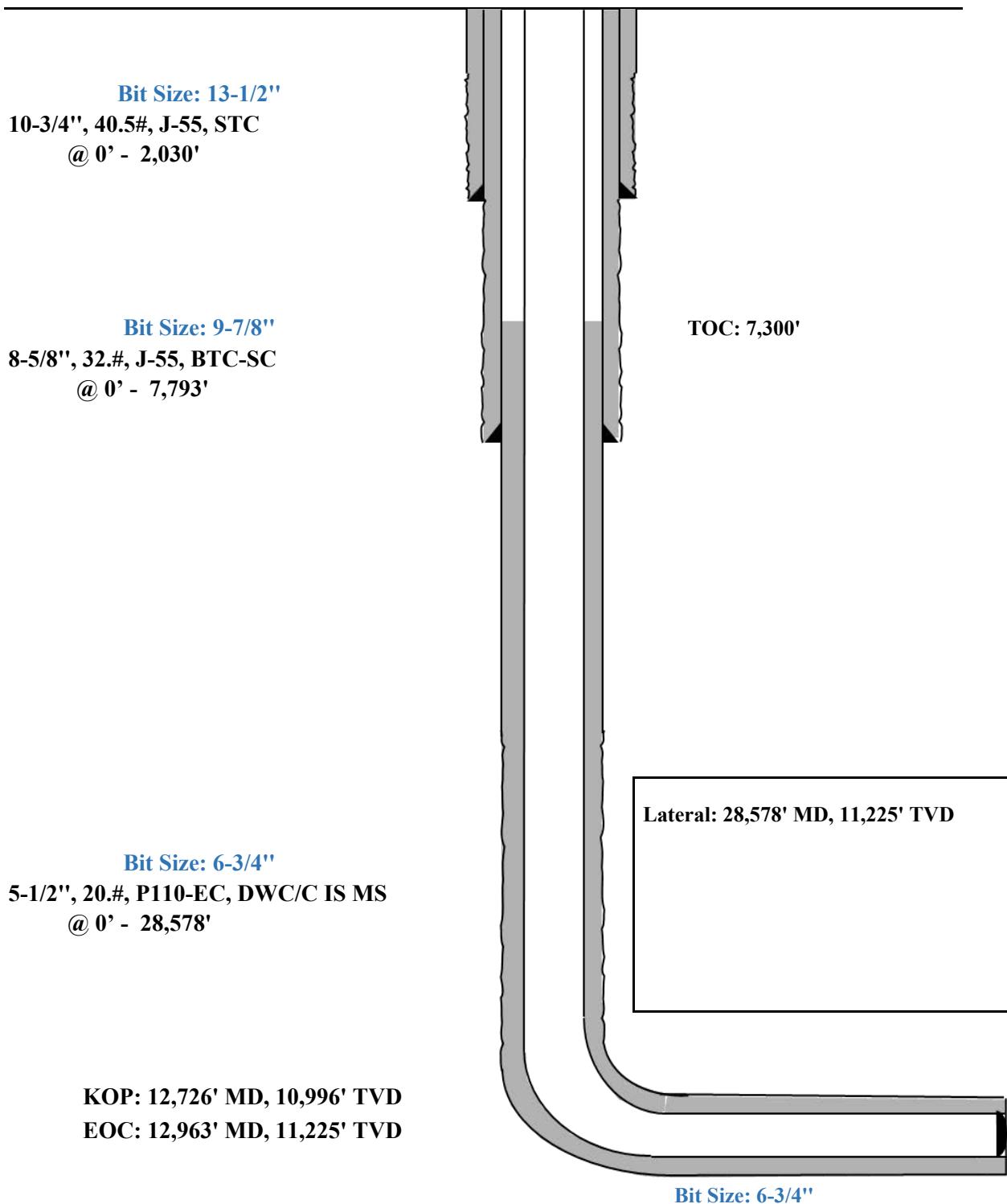


## Shallow Design B

Proposed Wellbore

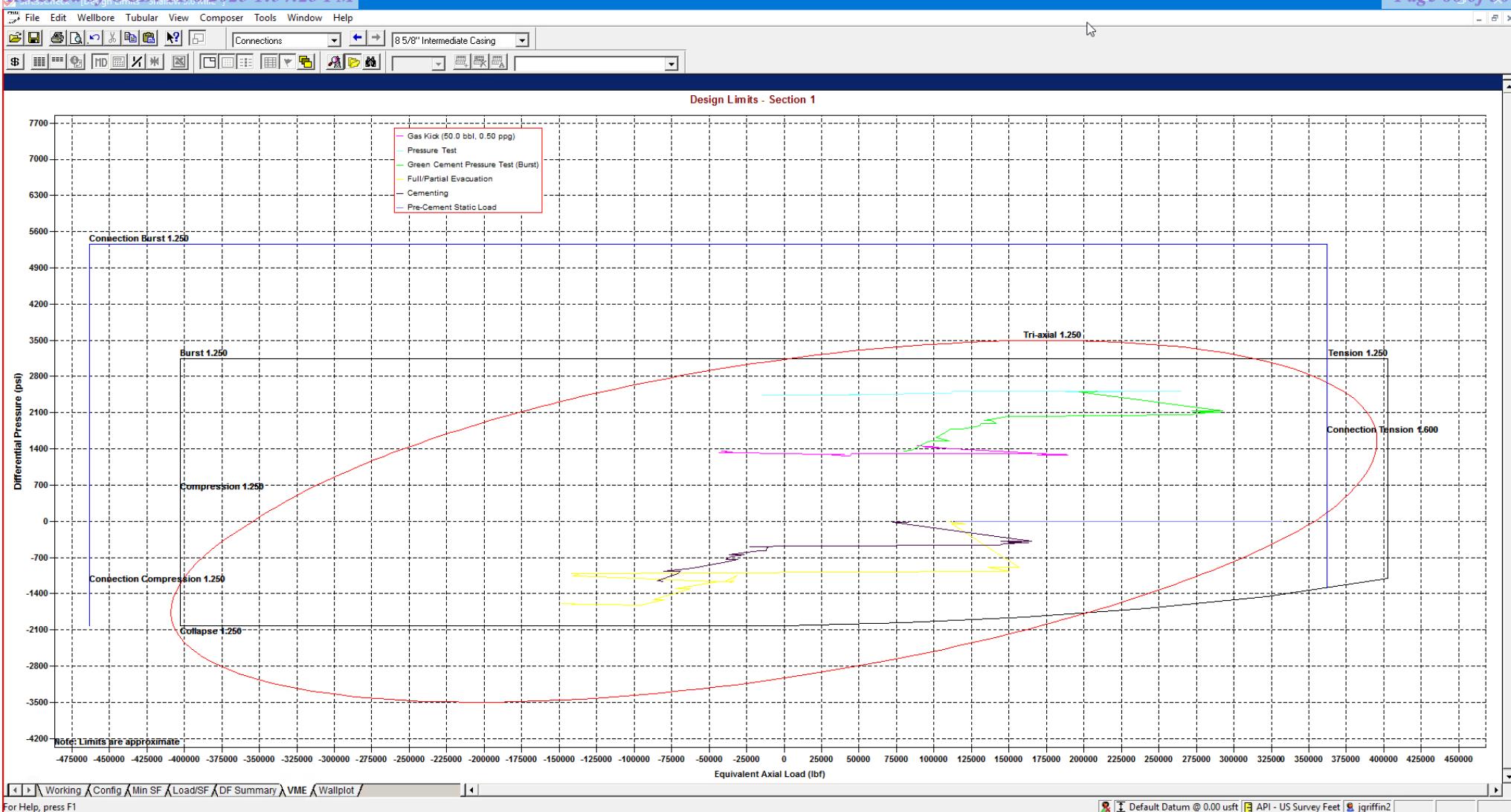
KB: 3558'

GL: 3533'



Triaxial Results														
	Depth (MD) (usft)	Axial Force (lbf)		Equivalent Axial Load (lbf)	Bending Stress at OD (psi)	Absolute Safety Factor				Temperature (°F)	Pressure (psi)		Addtl Pickup To Prevent Buckl. (lbf)	Buckled Length (usft)
		Apparent (w/Bending)	Actual (w/o Bending)			Triaxial	Burst	Collapse (V)	Axial		Internal	External		
1	0	200426	183224	200546	1880.2	1.68	1.57	N/A	2.89 F	70.00	2500.00	0.00	N/A	N/A
2	100	196229	179028	196812	1880.2	1.69	1.57	N/A	2.95 F	71.10	2543.63	43.63		
3	100	187111	179027	187686	883.7	1.70	1.57	N/A	3.10 F	71.10	2543.64	43.64		
4	1700	256401	111891	264835	15795.8	1.56	1.56	N/A	2.26 F	88.70	3241.64	741.64		
5	1700	235940	111891	244247	13559.4	1.60	1.56	N/A	2.45 F	88.70	3241.65	741.65		
6	1850	252413	105788	261533	16027.0	1.54	1.56	N/A	2.29 F	90.29	3305.05	805.05		
7	1850	239292	105787	248323	14592.9	1.56	1.56	N/A	2.42 F	90.29	3305.06	805.06		
8	1950	240267	101966	249748	15117.2	1.54	1.56	N/A	2.41 F	91.30	3344.87	844.87		
9	1950	234781	101965	244223	14517.5	1.56	1.56	N/A	2.47 F	91.30	3344.87	844.87		
10	2050	230871	98395	240694	14480.4	1.55	1.56	N/A	2.51 F	92.23	3381.89	881.89		
11	2050	227794	98394	237594	14144.2	1.55	1.56	N/A	2.54 F	92.23	3381.89	881.89		
12	2300	117966	90294	127818	3024.7	1.70	1.56	N/A	4.91 F	94.35	3466.13	966.13		
13	2300	104686	90293	114432	1573.2	1.71	1.56	N/A	5.53 F	94.35	3466.14	966.14		
14	2370	102469	88077	112431	1573.2	1.71	1.56	N/A	5.65 F	94.94	3489.28	989.28		
15	2370	100817	86424	111200	1573.2	1.75	1.59	N/A	5.75 F	94.94	3489.29	1036.40		
16	2700	83660	75583	95052	882.8	1.74	1.59	N/A	6.92 F	97.73	3599.97	1152.35		
17	2700	88072	75583	99504	1365.1	1.74	1.59	N/A	6.58 F	97.73	3599.97	1152.35		
18	3100	86049	62442	98863	2580.4	1.71	1.59	N/A	6.73 F	101.11	3734.23	1293.00		
19	3100	76477	62441	89195	1534.2	1.72	1.59	N/A	7.57 F	101.11	3734.23	1293.01		
20	3700	55953	42882	70509	1428.8	1.69	1.60	N/A	10.35 F	106.15	3934.24	1502.54		
21	3700	48311	42881	62778	593.5	1.71	1.60	N/A	11.99 F	106.16	3934.25	1502.55		
22	4000	41458	33043	56865	919.9	1.69	1.60	N/A	13.97 F	108.69	4034.82	1607.91		
23	4650	26293	11655	43706	1600.1	1.63	1.60	N/A	22.03 F	114.20	4253.37	1836.86		
24	4900	32619	4156	50970	3111.2	1.59	1.60	N/A	17.76 F	116.32	4337.37	1924.87		
25	4900	21439	4155	39625	1889.2	1.61	1.60	N/A	27.02 F	116.32	4337.38	1924.87		
26	5039	15822	26	34389	1726.6	1.61	1.61	N/A	36.61 F	117.49	4383.77	1973.48		
27	5039	15822	26	34388	1726.6	1.61	1.61	N/A	36.61 F	117.49	4383.78	1973.49		
28	5600	-33912	-16743	-14286	1876.7	1.57	1.61	N/A	(14.60)	122.23	4572.11	2170.78		
29	5650	-30585	-18235	-10742	1350.0	1.58	1.61	N/A	(16.18)	122.66	4588.87	2188.34		
30														
31		F	Conn Fracture											
32		()	Compression											
33		(V)	Vector Collapse Safety Factor											
34														

8-5/8" Intermediate Casing Pressure Test:  
 Internal Profile based off Surface Pressure + Hydrostatic: 4589 psi  
 External Profile based off Pore Pressure: 2188 psi

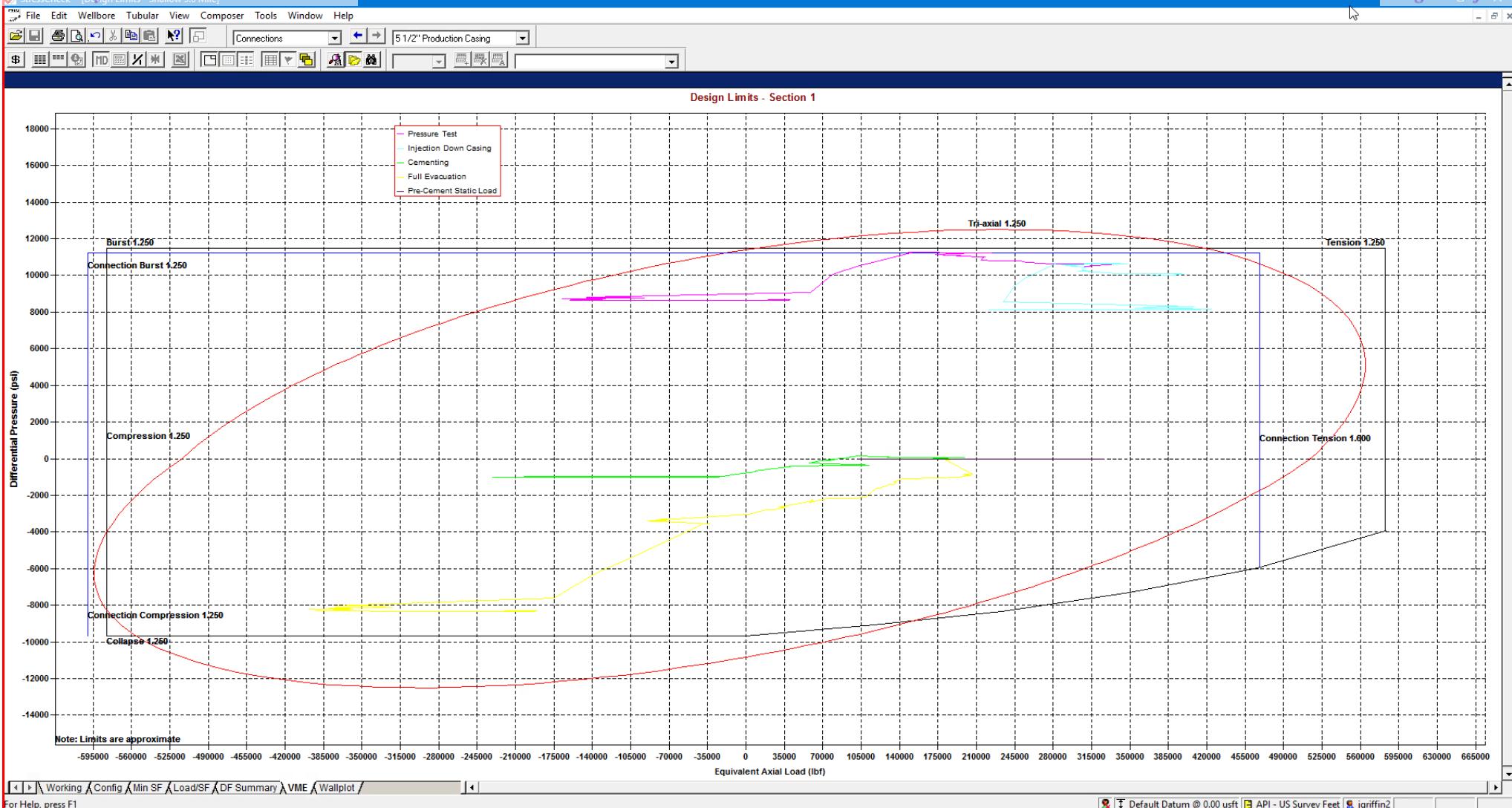


StressCheck - [String Summary - Shallow 3.0 Mile \*]

String Summary

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Intermediate Casing	8 5/8", 32.000 ppf, J-55	BTC, J-55	0.0-5650.0	7.875 A	1.56	1.57	1.81 F	1.34	80,117
2										Total = 80,117
3										
4	F Conn Fracture									
5	A Alternate Drift									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 8-5/8" 32# Intermediate Casing. Passes all Burst, Collapse and Tensile design criteria.



StressCheck - [String Summary - Shallow 3.0 Mile]

String Summary

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Production Casing	5 1/2", 20.000 pfp, P110 ICY	BTC, P110 ICY	0.0-28578.0	4.653	1.27	1.47	1.90 F	1.35	446,902
2										Total = 446,902
3										
4	F Conn Fracture									
5	( ) Compression									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 5-1/2" 20# Production Casing with a 125ksi Control Yield. Passes all Burst, Collapse and Tensile design criteria.



### Shallow Design C

#### 1. CASING PROGRAM

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
16"	0	2,030	0	2,030	13-3/8"	54.5#	J-55	STC
11"	0	7,793	0	5,650	9-5/8"	40#	J-55	LTC
7-7/8"	0	28,578	0	11,225	6"	24.5#	P110-EC	VAM Sprint-SF

Hole will be full during casing run for well control and tensile SF factor. Casing will be kept at least half full during run for this design to meet BLM collapse SF requirement. External pressure will be reviewed prior to conducting casing pressure tests to ensure that 70% of the yield is not exceeded.

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 6" casing in the 7-7/8" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 7-7/8" 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 Title 43 CFR Part 3170 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.

#### 2. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
2,030' 13-3/8"	570	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	160	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 1830')
7,793' 9-5/8"	770	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	250	14.8	1.32	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 6238')
28,578' 6"	650	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 7300')
	1870	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 @ 12730')

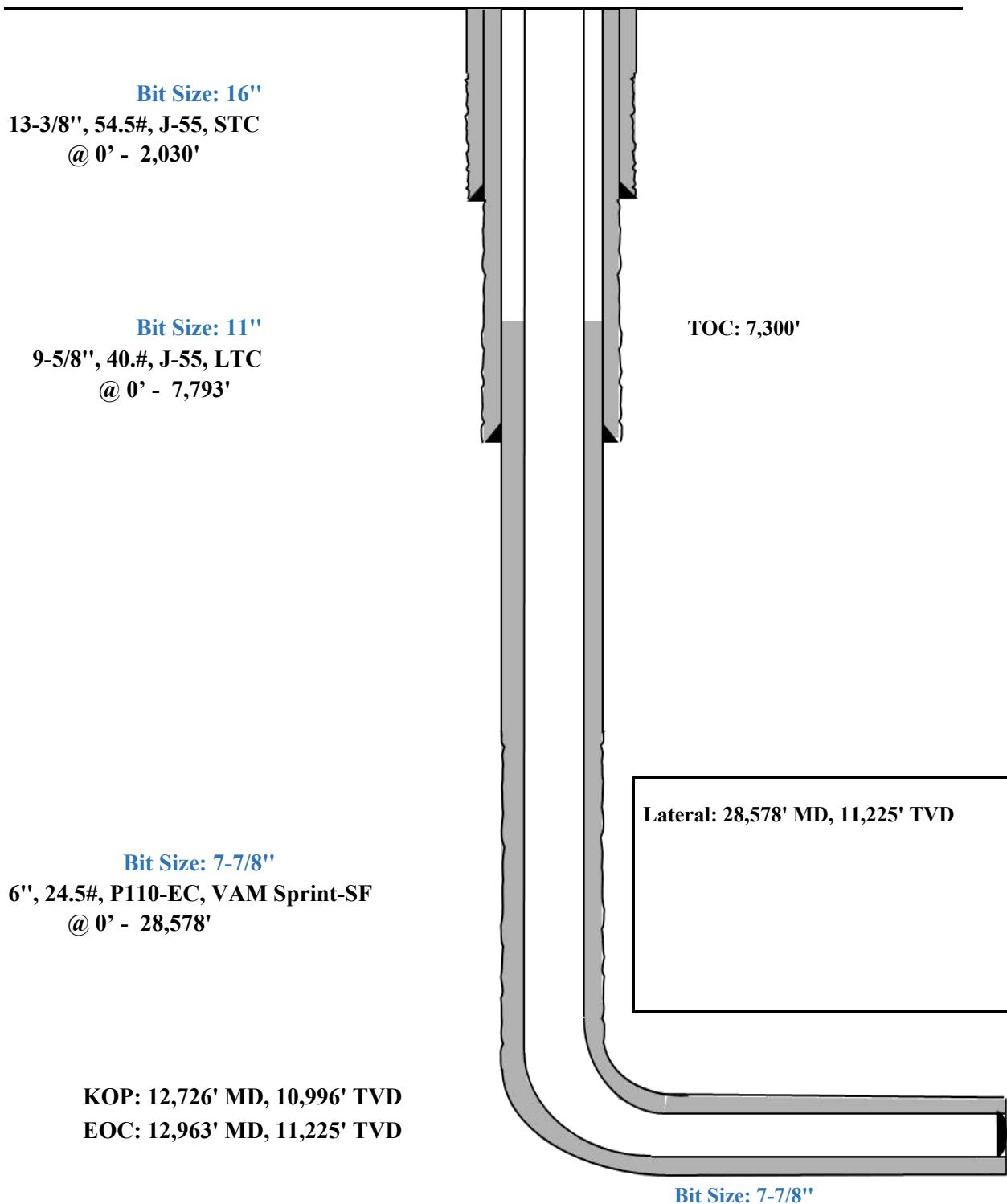


## Shallow Design C

Proposed Wellbore

KB: 3558'

GL: 3533'

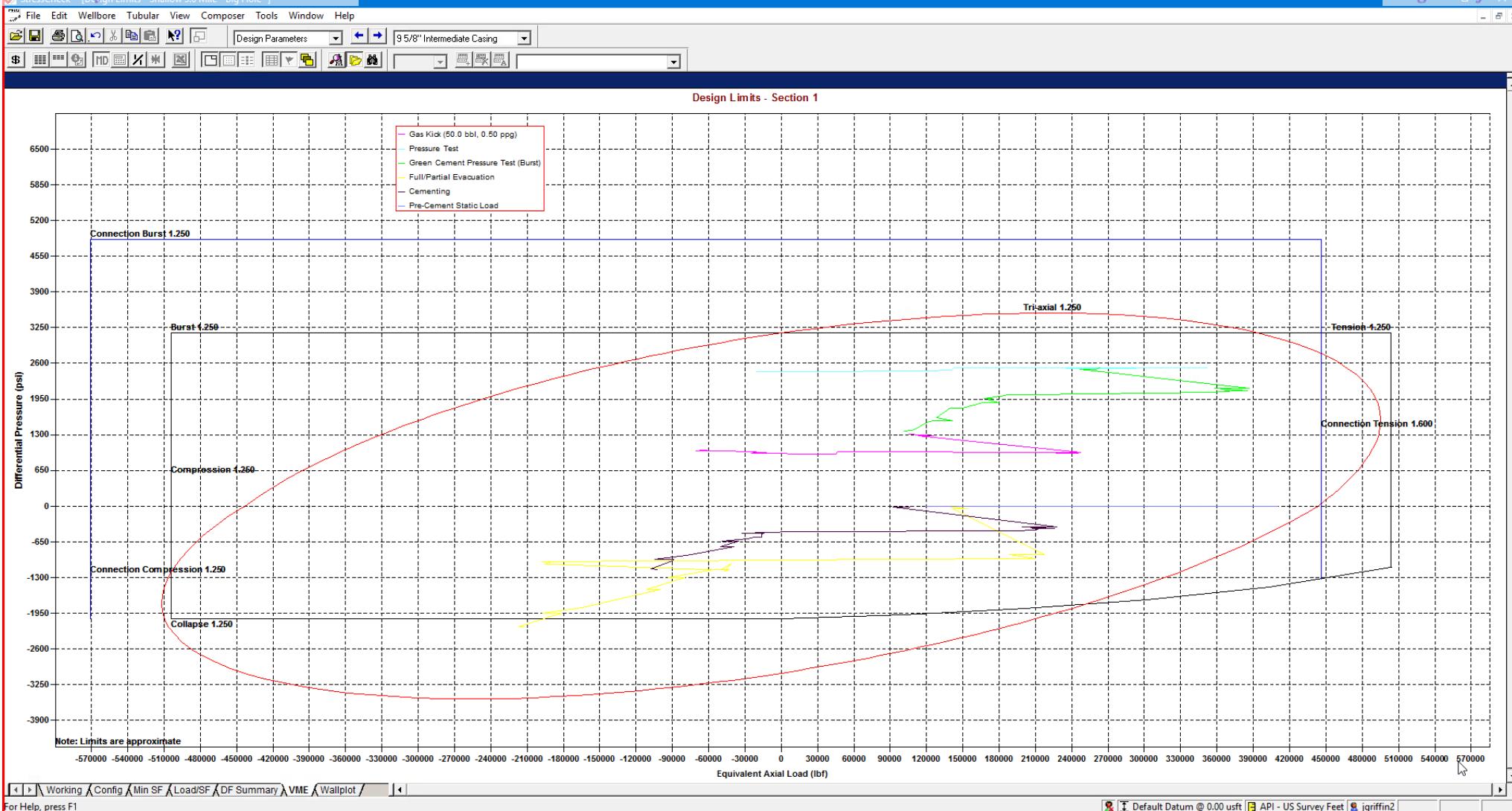


	Depth (MD) (usft)	Axial Force (lbf)		Equivalent Axial Load (lbf)	Bending Stress at OD (psi)	Absolute Safety Factor				Temperature (°F)	Pressure (psi)		Add'l Pickup To Prevent Buck. (lbf)	Buckled Length (usft)
		Apparent (w/Bending)	Actual (w/o Bending)			Triaxial	Burst	Collapse (V)	Axial		Internal	External		
1	0	252987	228954	253140	2098.2	1.69	1.58	N/A	2.82 F	70.00	2500.00	0.00	N/A	N/A
2	100	247375	223702	248466	2098.2	1.69	1.58	N/A	2.88 F	71.10	2543.63	43.63		
3	100	234996	223701	235716	986.2	1.71	1.58	N/A	3.04 F	71.10	2543.64	43.64		
4	1700	341565	139667	352253	17627.2	1.53	1.57	N/A	2.09 F	88.70	3241.64	741.64		
5	1700	312979	139666	323488	15131.5	1.58	1.57	N/A	2.28 F	88.70	3241.65	741.65		
6	1850	336881	132027	348440	17885.2	1.51	1.57	N/A	2.12 F	90.29	3305.05	805.05		
7	1850	318549	132027	329984	16284.8	1.54	1.57	N/A	2.24 F	90.29	3305.06	805.06		
8	1950	320468	127243	332475	16869.9	1.52	1.57	N/A	2.23 F	91.30	3344.87	844.87		
9	1950	312802	127243	324756	16200.7	1.53	1.57	N/A	2.28 F	91.30	3344.87	844.87		
10	2050	307858	122773	320295	16159.3	1.52	1.57	N/A	2.32 F	92.23	3381.89	881.89		
11	2050	303560	122772	315965	15784.1	1.53	1.57	N/A	2.35 F	92.23	3381.89	881.89		
12	2300	151294	112633	163658	3375.4	1.71	1.57	N/A	4.72 F	94.35	3466.13	966.13		
13	2300	132741	112633	144956	1755.6	1.72	1.57	N/A	5.38 F	94.35	3466.14	966.14		
14	2370	129966	109858	142452	1755.6	1.72	1.57	N/A	5.49 F	94.94	3489.28	989.28		
15	2370	127909	107800	140922	1755.6	1.75	1.60	N/A	5.58 F	94.94	3489.29	1036.40		
16	2700	105515	94232	119785	985.1	1.75	1.60	N/A	6.77 F	97.73	3599.97	1152.35		
17	2700	111680	94231	126006	1523.4	1.75	1.60	N/A	6.39 F	97.73	3599.97	1152.35		
18	3100	110766	77783	126839	2879.6	1.71	1.60	N/A	6.44 F	101.11	3734.23	1293.00		
19	3100	97392	77783	113331	1712.1	1.73	1.60	N/A	7.33 F	101.11	3734.23	1293.01		
20	3700	71565	53303	89806	1594.4	1.70	1.61	N/A	9.97 F	106.15	3934.24	1502.54		
21	3700	60887	53302	79004	662.3	1.71	1.61	N/A	11.72 F	106.16	3934.25	1502.55		
22	4650	346711	14219	56495	1785.6	1.64	1.61	N/A	20.59 F	114.20	4253.37	1836.86		
23	4900	44595	4828	67626	3472.0	1.59	1.61	N/A	16.01 F	116.32	4337.37	1924.87		
24	4900	28975	4828	51775	2108.2	1.62	1.61	N/A	24.64 F	116.32	4337.38	1924.87		
25	5029	22103	34	45340	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.40	1969.94		
26	5029	22102	33	45339	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.41	1969.95		
27	5600	-45329	-21341	-20805	2094.3	1.57	1.62	N/A	(13.67)	122.23	4572.11	2170.78		
28	5650	-40465	-23210	-15657	1506.5	1.58	1.62	N/A	(15.31)	122.66	4588.87	2188.34		
29		F	Conn Fracture											
30		( )	Compression											
31		(V)	Vector Collapse Safety Factor											
32														
33														

9-5/8" Intermediate Casing Pressure Test:

Internal Profile based off Surface Pressure + Hydrostatic: 4589 psi

External Profile based off Pore Pressure: 2188 psi

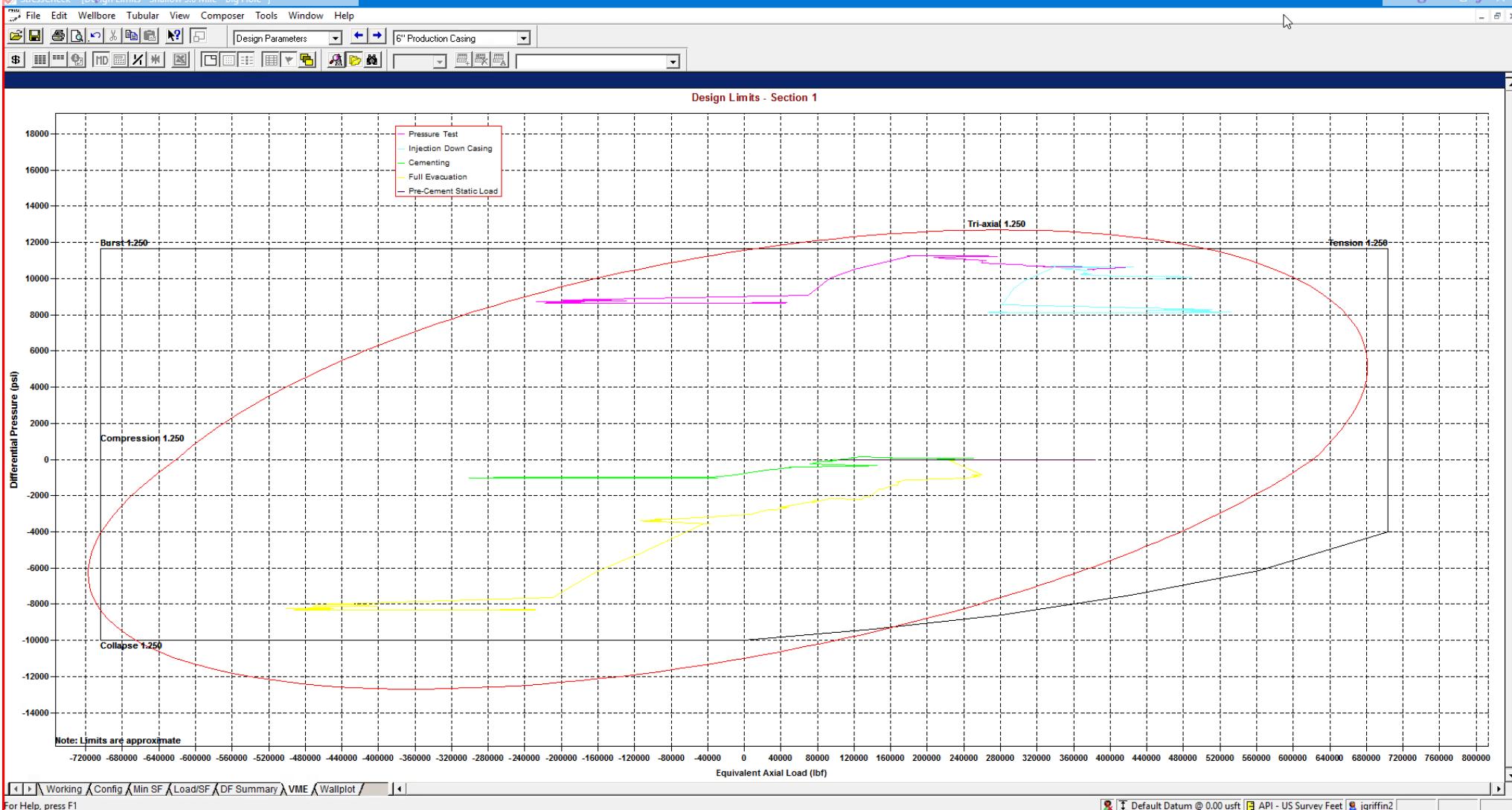


StressCheck - [String Summary - Shallow 3.0 Mile - Big Hole \*]

String Summary

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Intermediate Casing	9 5/8", 40.000 ppf, J-55	BTC, J-55	0.0-5650.0	8.750 A	1.57	1.59	1.80 F	1.35	98,141
2										Total = 98,141
3										
4	F Conn Fracture									
5	A Alternate Drift									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 9-5/8" 40# Intermediate Casing. Passes all Burst, Collapse and Tensile design criteria.



StressCheck - [String Summary - Shallow 3.0 Mile - Big Hole \*]

String Summary

String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
					Burst	Collapse (V)	Axial	Triaxial	
1 Production Casing	6", 24.500 pfp, P110 ICY	BTC, P110 ICY	0.0-28578.0	5.075	1.29	1.52	(1.75)	1.37	541,493
2									Total = 541,493
3									
4 ( ) Compression									
5 (V) Vector Collapse Safety Factor									
6									

\*Modelling done with 6" Production Casing with a 125ksi Control Yield. Passes all Burst, Collapse and Tensile design criteria.



### Shallow Design D

#### 4. CASING PROGRAM

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
16"	0	2,030	0	2,030	13-3/8"	54.5#	J-55	STC
11"	0	7,793	0	5,650	9-5/8"	40#	J-55	LTC
7-7/8"	0	12,626	0	10,896	6"	22.3#	P110-EC	DWC/C IS
6-3/4"	12,626	28,578	10,896	11,225	5-1/2"	20#	P110-EC	DWC/C IS MS

Hole will be full during casing run for well control and tensile SF factor. Casing will be kept at least half full during run for this design to meet BLM collapse SF requirement. External pressure will be reviewed prior to conducting casing pressure tests to ensure that 70% of the yield is not exceeded.

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 6" and 5-1/2" casings in the 7-7/8" and 6-3/4" hole sizes. An expansion additive will be utilized in the cement slurry for the entire length of the 7-7/8" and 6-3/4" hole intervals 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 Title 43 CFR Part 3170 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.

#### 5. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
2,030' 13-3/8"	570	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	160	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 1830')
7,793' 9-5/8"	770	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	250	14.8	1.32	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 6238')
28,578' 6"	650	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 7300')
	1870	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 @ 12730')

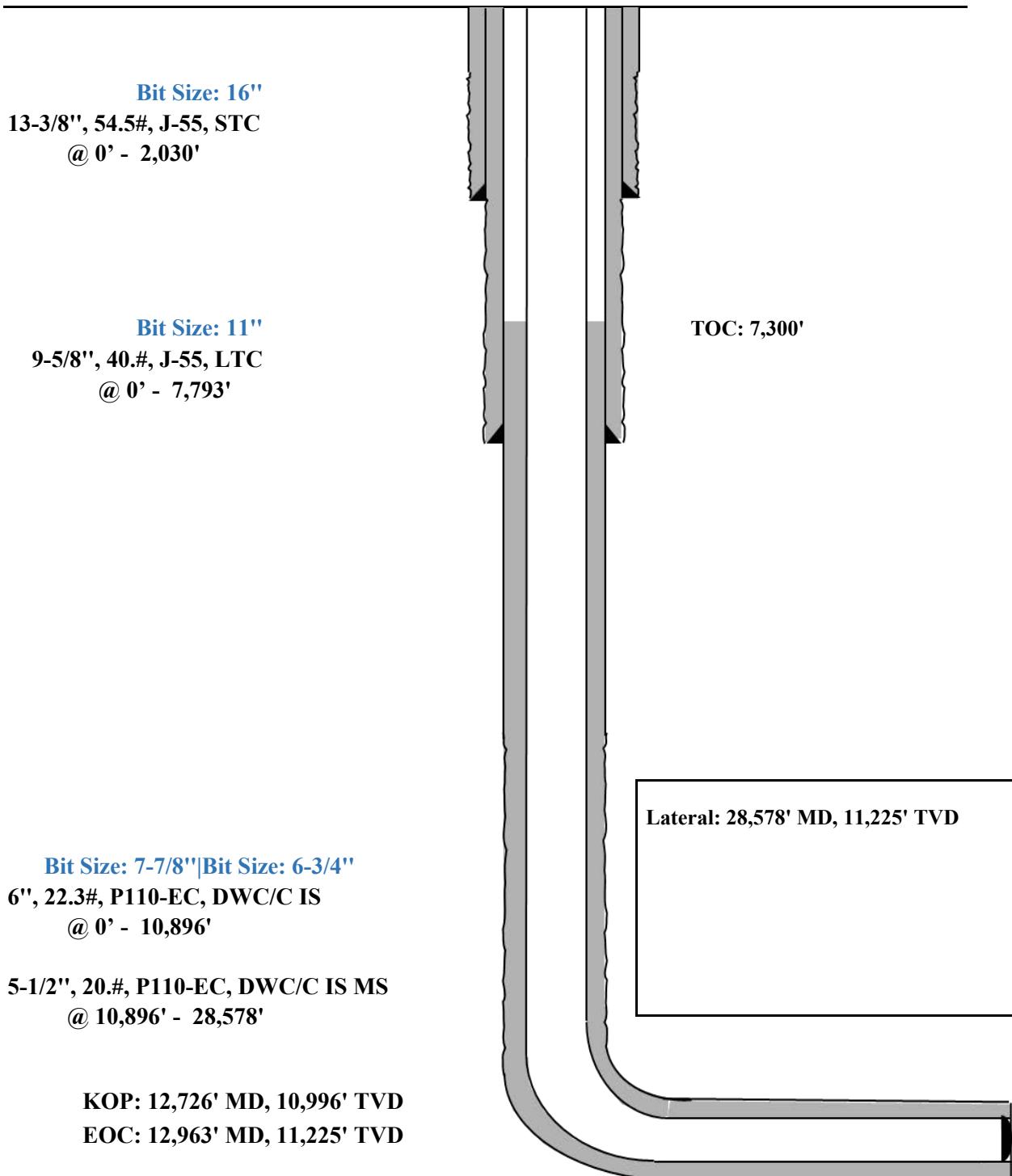


## Shallow Design D

Proposed Wellbore

KB: 3558'

GL: 3533'

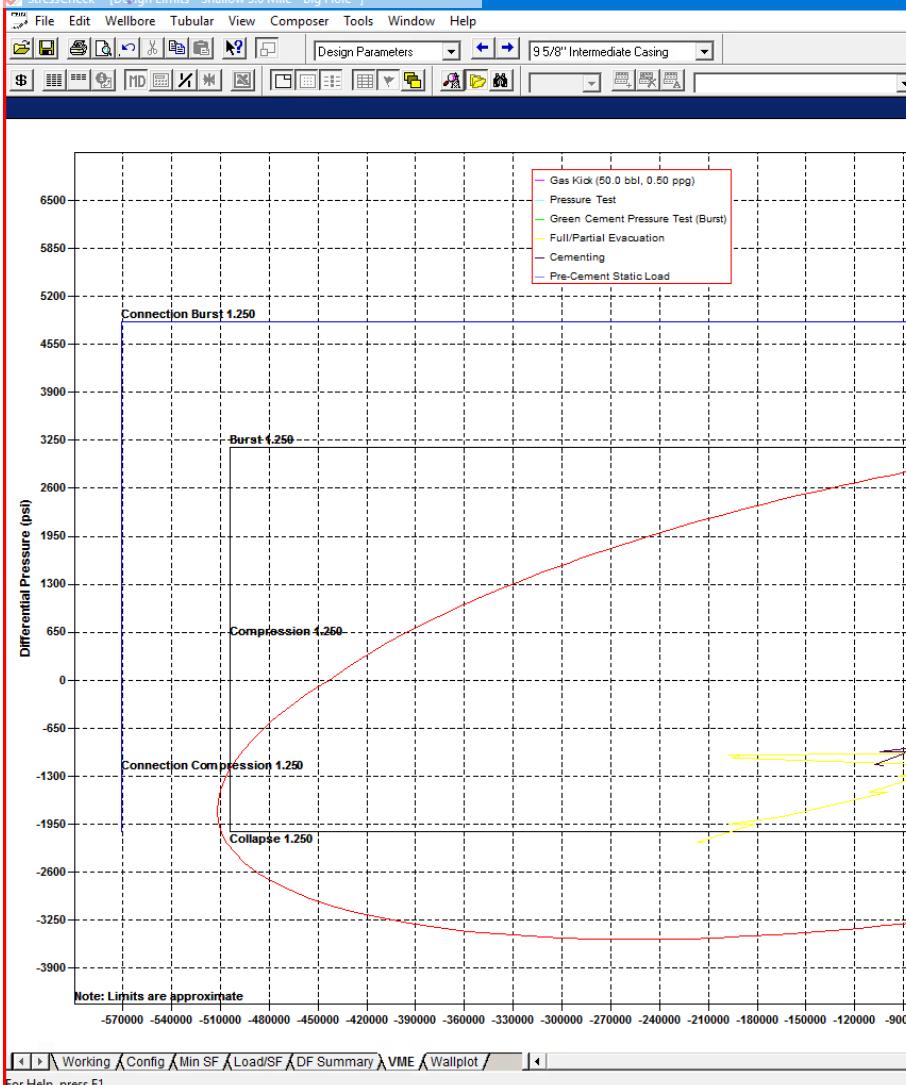


9 5/8" Intermediate Casing Pressure Test														
Triaxial Results														
	Depth (MD) (usft)	Axial Force (lbf)		Equivalent Axial Load (lbf)	Bending Stress at OD (psi)	Absolute Safety Factor				Temperature (°F)	Pressure (psi)		Add'l Pickup To Prevent Buck. (lbf)	Buckled Length (usft)
		Apparent (w/Bending)	Actual (w/o Bending)			Triaxial	Burst	Collapse (V)	Axial		Internal	External		
1	0	252987	228954	253140	2098.2	1.69	1.58	N/A	2.82 F	70.00	2500.00	0.00	N/A	N/A
2	100	247735	223702	248466	2098.2	1.69	1.58	N/A	2.88 F	71.10	2543.63	43.63		
3	100	234996	223701	235716	986.2	1.71	1.58	N/A	3.04 F	71.10	2543.64	43.64		
4	1700	341565	139667	352253	17627.2	1.53	1.57	N/A	2.09 F	88.70	3241.64	741.64		
5	1700	312979	139666	323488	15131.5	1.58	1.57	N/A	2.28 F	88.70	3241.65	741.65		
6	1850	336881	132027	348440	17885.2	1.51	1.57	N/A	2.12 F	90.29	3305.05	805.05		
7	1850	318549	132027	329984	16284.8	1.54	1.57	N/A	2.24 F	90.29	3305.06	805.06		
8	1950	320468	127243	332475	16869.9	1.52	1.57	N/A	2.23 F	91.30	3344.87	844.87		
9	1950	312802	127243	324756	16200.7	1.53	1.57	N/A	2.28 F	91.30	3344.87	844.87		
10	2050	307858	122773	320295	16159.3	1.52	1.57	N/A	2.32 F	92.23	3381.89	881.89		
11	2050	303560	122772	315965	15784.1	1.53	1.57	N/A	2.35 F	92.23	3381.89	881.89		
12	2300	151294	112633	163658	3375.4	1.71	1.57	N/A	4.72 F	94.35	3466.13	966.13		
13	2300	132741	112633	144956	1755.6	1.72	1.57	N/A	5.38 F	94.35	3466.14	966.14		
14	2370	129966	109858	142452	1755.6	1.72	1.57	N/A	5.49 F	94.94	3489.28	989.28		
15	2370	1277909	107800	140922	1755.6	1.75	1.60	N/A	5.58 F	94.94	3489.29	1036.40		
16	2700	105515	94232	119785	985.1	1.75	1.60	N/A	6.77 F	97.73	3599.97	1152.35		
17	2700	111680	94231	126006	1523.4	1.75	1.60	N/A	6.39 F	97.73	3599.97	1152.35		
18	3100	110766	77783	126839	2879.6	1.71	1.60	N/A	6.44 F	101.11	3734.23	1293.00		
19	3100	97392	77783	113331	1712.1	1.73	1.60	N/A	7.33 F	101.11	3734.23	1293.01		
20	3700	71565	53303	89806	1594.4	1.70	1.61	N/A	9.97 F	106.15	3934.24	1502.54		
21	3700	60887	53302	79004	662.3	1.71	1.61	N/A	11.72 F	106.16	3934.25	1502.55		
22	4650	34671	14219	56495	1785.6	1.64	1.61	N/A	20.59 F	114.20	4253.37	1836.86		
23	4900	44595	4828	67626	3472.0	1.59	1.61	N/A	16.01 F	116.32	4337.37	1924.87		
24	4900	28975	4828	51775	2108.2	1.62	1.61	N/A	24.64 F	116.32	4337.38	1924.87		
25	5029	22103	34	45340	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.40	1969.94		
26	5029	22102	33	45339	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.41	1969.95		
27	5600	-45329	-21341	-20805	2094.3	1.57	1.62	N/A	(13.67)	122.23	4572.11	2170.78		
28	5650	-40465	-23210	-15657	1506.5	1.58	1.62	N/A	(15.31)	122.66	4588.87	2188.34		
29														
30		F	Conn Fracture											
31		( )	Compression											
32		(V)	Vector Collapse Safety Factor											
33														

## 9-5/8" Intermediate Casing Pressure Test:

Internal Profile based off Surface Pressure + Hydrostatic: 4589 psi

External Profile based off Pore Pressure: 2188 psi

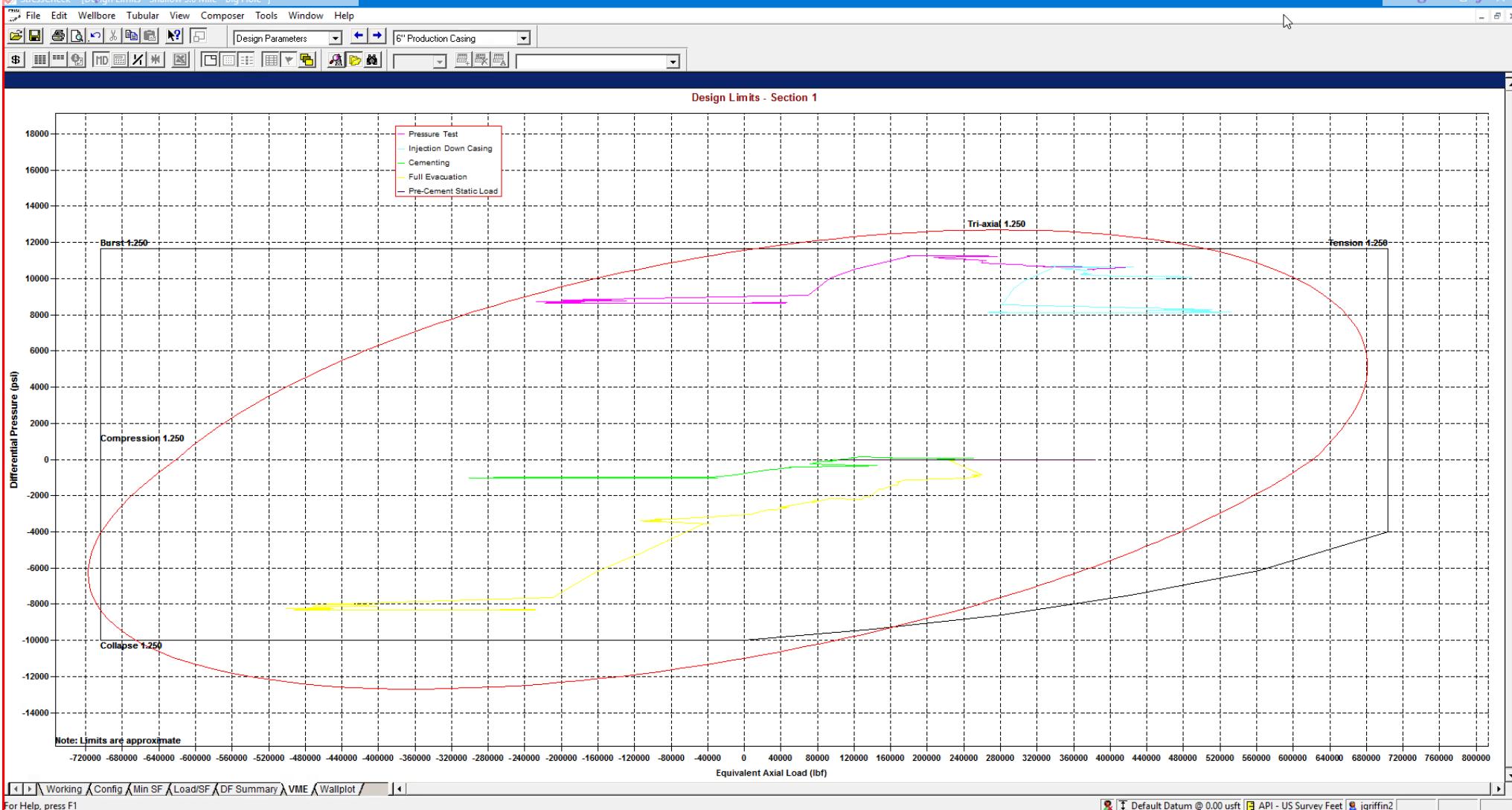


StressCheck - [String Summary - Shallow 3.0 Mile - Big Hole \*]

String Summary

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Intermediate Casing	9 5/8", 40.000 ppf, J-55	BTC, J-55	0.0-5650.0	8.750 A	1.57	1.59	1.80 F	1.35	98,141
2										Total = 98,141
3										
4	F Conn Fracture									
5	A Alternate Drift									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 9-5/8" 40# Intermediate Casing. Passes all Burst, Collapse and Tensile design criteria.

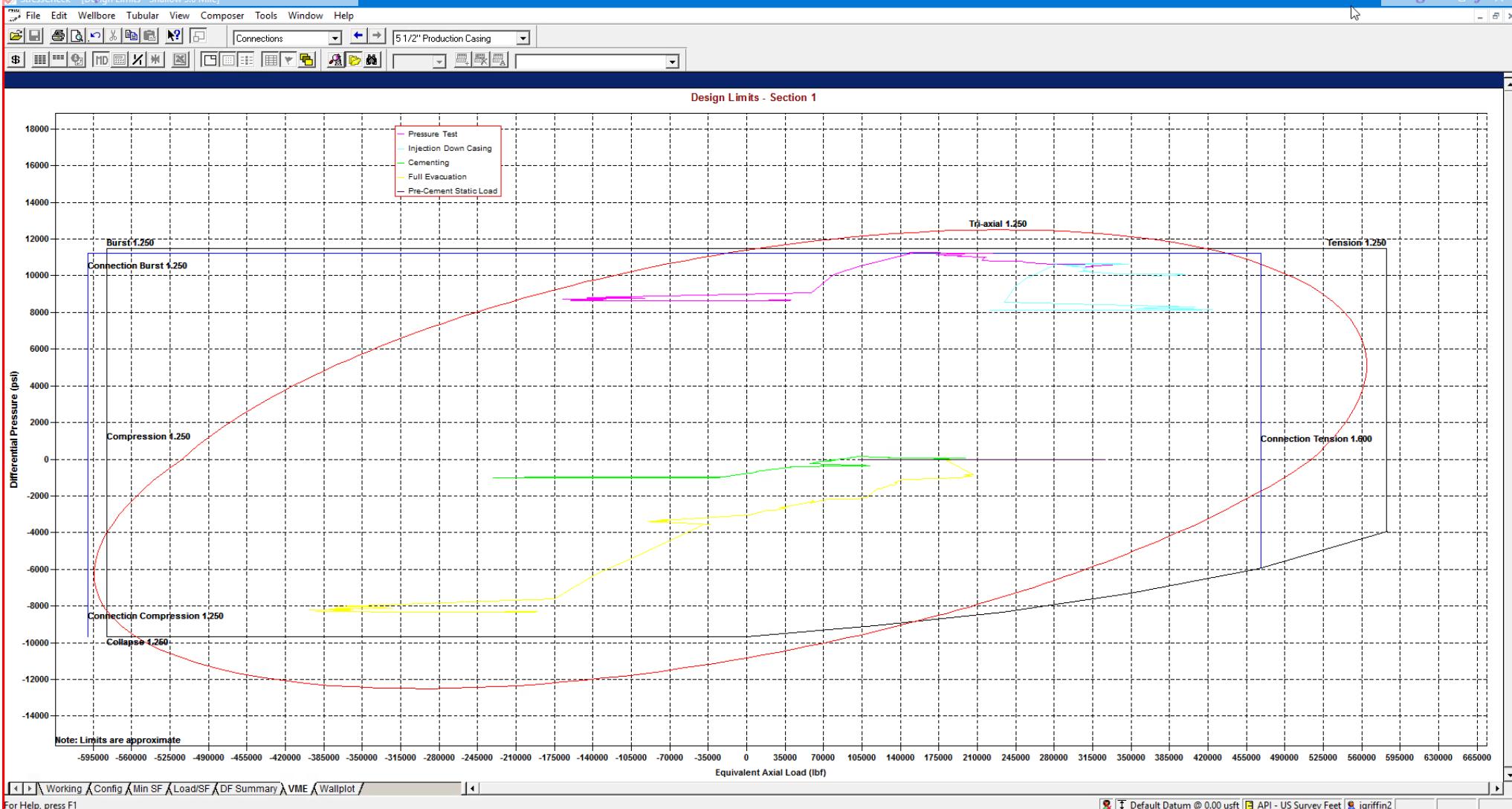


StressCheck - [String Summary - Shallow 3.0 Mile - Big Hole \*]

String Summary

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Production Casing	6", 24.500 pfp, P110 ICY	BTC, P110 ICY	0.0-28578.0	5.075	1.29	1.52	(1.75)	1.37	541,493
2										Total = 541,493
3										
4	( ) Compression									
5	(V) Vector Collapse Safety Factor									
6										

\*Modelling done with 6" Production Casing with a 125ksi Control Yield. Passes all Burst, Collapse and Tensile design criteria.



StressCheck - [String Summary - Shallow 3.0 Mile]

String Summary

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Production Casing	5 1/2", 20.000 pfp, P110 ICY	BTC, P110 ICY	0.0-28578.0	4.653	1.27	1.47	1.90 F	1.35	446,902
2										Total = 446,902
3										
4	F Conn Fracture									
5	( ) Compression									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 5-1/2" 20# Production Casing with a 125ksi Control Yield. Passes all Burst, Collapse and Tensile design criteria.



### MUD PROGRAM:

During this procedure we plan to use a Closed-Loop System and haul contents to the required disposal. The applicable depths and properties of the drilling fluid systems are as follows:

Measured Depth	Type	Weight (ppg)	Viscosity	Water Loss
0 – 2,030'	Fresh - Gel	8.6-8.8	28-34	N/c
2,030' – 7,793'	Brine	9-10.5	28-34	N/c
5,450' – 28,578' Lateral	Oil Base	8.8-9.5	58-68	N/c - 6

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

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

### CEMENTING ADDITIVES:

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

Cement integrity tests will be performed immediately following plug bump.

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.

[New Search »](#)[« Back to Previous List](#)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

[New Search »](#)[« Back to Previous List](#)USC  Metric

6/8/2015 10:23:27 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		9.625	10.625	10.625	10.625	in.
Wall Thickness		0.395	--	--	--	in.
Inside Diameter		8.835	8.835	8.835	8.835	in.
Standard Drift		8.679	8.679	8.679	8.679	in.
Alternate Drift		8.750	8.750	8.750	8.750	in.
Nominal Linear Weight, T&C		40.00	--	--	--	lbs/ft
Plain End Weight		38.97	--	--	--	lbs/ft
Performance		Pipe	BTC	LTC	STC	
Minimum Collapse Pressure		2,570	2,570	2,570	2,570	psi
Minimum Internal Yield Pressure		3,950	3,950	3,950	3,950	psi
Minimum Pipe Body Yield Strength		630.00	--	--	--	1000 lbs
Joint Strength		--	714	520	452	1000 lbs
Reference Length		--	11,898	8,665	7,529	ft
Make-Up Data		Pipe	BTC	LTC	STC	
Make-Up Loss		--	4.81	4.75	3.38	in.
Minimum Make-Up Torque		--	--	3,900	3,390	ft-lbs
Maximum Make-Up Torque		--	--	6,500	5,650	ft-lbs



## Connection Data Sheet

OD (in.)	WEIGHT (lbs./ft.)	WALL (in.)	GRADE	API DRIFT (in.)	RBW%	CONNECTION
5.500	Nominal: 20.00	0.361	VST P110EC	4.653	87.5	DWC/C-IS MS
	Plain End: 19.83					

PIPE PROPERTIES			CONNECTION PROPERTIES		
Outside Diameter	5.500	in.	Connection Type	Semi-Premium T&C	
Inside Diameter	4.778	in.	Connection O.D. (nom)	6.115	in.
Nominal Area	5.828	sq.in.	Connection I.D. (nom)	4.778	in.
Grade Type	API 5CT		Make-Up Loss	4.125	in.
Min. Yield Strength	125	ksi	Coupling Length	9.250	in.
Max. Yield Strength	140	ksi	Critical Cross Section	5.828	sq.in.
Min. Tensile Strength	135	ksi	Tension Efficiency	100.0%	of pipe
Yield Strength	729	kib	Compression Efficiency	100.0%	of pipe
Ultimate Strength	787	kib	Internal Pressure Efficiency	100.0%	of pipe
Min. Internal Yield	14,360	psi	External Pressure Efficiency	100.0%	of pipe
Collapse	12,090	psi			

CONNECTION PERFORMANCES			FIELD END TORQUE VALUES		
Yield Strength	729	kib	Min. Make-up torque	16,100	ft.lb
Parting Load	787	kib	Opti. Make-up torque	17,350	ft.lb
Compression Rating	729	kib	Max. Make-up torque	18,600	ft.lb
Min. Internal Yield	14,360	psi	Min. Shoulder Torque	1,610	ft.lb
External Pressure	12,090	psi	Max. Shoulder Torque	12,880	ft.lb
Maximum Uniaxial Bend Rating	104.2	°/100 ft	Min. Delta Turn	-	Turns
Reference String Length w 1.4 Design Factor	26,040	ft	Max. Delta Turn	0.200	Turns

Need Help? Contact: [tech.support@vam-usa.com](mailto:tech.support@vam-usa.com)

Reference Drawing: 8136PP Rev.01 & 8136BP Rev.01

Date: 12/03/2019

Time: 06:19:27 PM

For detailed information on performance properties, refer to DWC Connection Data Notes on following page(s).

Connection specifications within the control of VAM USA were correct as of the date printed. Specifications are subject to change without notice. Certain connection specifications are dependent on the mechanical properties of the pipe. Mechanical properties of mill proprietary pipe grades were obtained from mill publications and are subject to change. Properties of mill proprietary grades should be confirmed with the mill. Users are advised to obtain current connection specifications and verify pipe mechanical properties for each application.

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Tech Support Email: [tech.support@vam-usa.com](mailto:tech.support@vam-usa.com)

**DWC Connection Data Sheet Notes:**

1. DWC connections are available with a seal ring (SR) option.
2. All standard DWC/C connections are interchangeable for a given pipe OD. DWC connections are interchangeable with DWC/C-SR connections of the same OD and wall.
3. Connection performance properties are based on nominal pipe body and connection dimensions.
4. DWC connection internal and external pressure resistance is calculated using the API rating for buttress connections. API Internal pressure resistance is calculated from formulas 31, 32, and 35 in the API Bulletin 5C3.
5. DWC joint strength is the minimum pipe body yield strength multiplied by the connection critical area.
6. API joint strength is for reference only. It is calculated from formulas 42 and 43 in the API Bulletin 5C3.
7. Bending efficiency is equal to the compression efficiency.
8. The torque values listed are recommended. The actual torque required may be affected by field conditions such as temperature, thread compound, speed of make-up, weather conditions, etc.
9. Connection yield torque is not to be exceeded.
10. Reference string length is calculated by dividing the joint strength by both the nominal weight in air and a design factor (DF) of 1.4. These values are offered for reference only and do not include load factors such as bending, buoyancy, temperature, load dynamics, etc.
11. DWC connections will accommodate API standard drift diameters.
12. DWC/C family of connections are compatible with API Buttress BTC connections. Please contact [tech.support@vam-usa.com](mailto:tech.support@vam-usa.com) for details on connection ratings and make-up.



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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
Released to Imaging: 12/8/2025 12:55:55 PM		Page 28 of 32		--	--	5,250
Maximum Make-Up Torque		--	--	--	--	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 <sup>2</sup>
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 Internal Pressure:	3,930 psi	Min:	2,793
STC Joint Strength:	372 kips	Opti:	3,724
		Max:	4,655
LTC Performance		LTC Torque (ft-lbs)	
LTC Internal Pressure:	3,930 psi	Min:	3,130
LTC Joint Strength:	417 kips	Opti:	4,174
		Max:	5,217
SC-BTC Performance - Cplg OD = 9.125"		BTC Torque (ft-lbs)	
BTC Internal Pressure:	3,930 psi	follow API guidelines regarding positional make up	
BTC Joint Strength:	503 kips		

\*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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Issued on: 10 Feb. 2021 by Wesley Ott



OD 6 in.	Weight (lb/ft) Nominal: 24.50 Plain End: 23.95	Wall Th. 0.400 in.	Grade P110EC	API Drift: 5.075 in.	Connection <b>VAM® SPRINT-SF</b>
-------------	--	-----------------------	-----------------	-------------------------	-------------------------------------

PIPE PROPERTIES		
Nominal OD	6.000	in.
Nominal ID	5.200	in.
Nominal Cross Section Area	7.037	sqin.
Grade Type	High Yield	
Min. Yield Strength	125	ksi
Max. Yield Strength	140	ksi
Min. Ultimate Tensile Strength	135	ksi

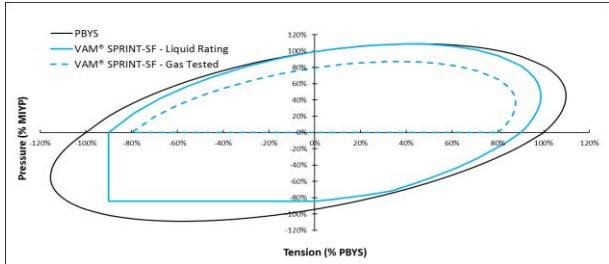
CONNECTION PROPERTIES		
Connection Type	Integral Semi-Flush	
Connection OD (nom):	6.277	in.
Connection ID (nom):	5.146	in.
Make-Up Loss	5.386	in.
Critical Cross Section	6.417	sqin.
Tension Efficiency	91.0	% of pipe
Compression Efficiency	91.0	% of pipe
Internal Pressure Efficiency	100	% of pipe
External Pressure Efficiency	100	% of pipe

CONNECTION PERFORMANCES		
Tensile Yield Strength	801	kib
Compression Resistance	801	kib
Internal Yield Pressure	14,580	psi
Collapse Resistance	12,500	psi
Max. Structural Bending	83	°/100ft
Max. Bending with ISO/API Sealability	30	°/100ft

TORQUE VALUES		
Min. Make-up torque	21,750	ft.lb
Opt. Make-up torque	24,250	ft.lb
Max. Make-up torque	26,750	ft.lb
Max. Torque with Sealability (MTS)	53,000	ft.lb

\* 87.5% RBW

VAM® SPRINT-SF is a semi-flush connection innovatively designed for extreme shale applications. Its high tension rating and ultra high torque capacity make it ideal to run a fill string length as production casing in shale wells with extended horizontal sections and tight clearance requirements.



Do you need help on this product? - Remember no one knows VAM® like VAM®

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**Connection Data Sheet**

OD (in.)	WEIGHT (lbs./ft.)	WALL (in.)	GRADE	API DRIFT (in.)	RBW%	CONNECTION
6.000	Nominal: 22.30 Plain End: 21.70	0.360	VST P110EC	5.155	92.5	DWC/C-IS

**PIPE PROPERTIES**

Nominal OD	6.000	in.
Nominal ID	5.280	in.
Nominal Area	6.379	sq.in.
Grade Type	API 5CT	
Min. Yield Strength	125	ksi
Max. Yield Strength	140	ksi
Min. Tensile Strength	135	ksi
Yield Strength	797	klb
Ultimate Strength	861	klb
Min. Internal Yield Pressure	13,880	psi
Collapse Pressure	9,800	psi

**CONNECTION PROPERTIES**

Connection Type	Semi-Premium T&C
Connection OD (nom)	6.650 in.
Connection ID (nom)	5.280 in.
Make-Up Loss	4.313 in.
Coupling Length	9.625 in.
Critical Cross Section	6.379 sq.in.
Tension Efficiency	100.0% of pipe
Compression Efficiency	100.0% of pipe
Internal Pressure Efficiency	100.0% of pipe
External Pressure Efficiency	100.0% of pipe

**CONNECTION PERFORMANCES**

Yield Strength	797	klb
Parting Load	861	klb
Compression Rating	797	klb
Min. Internal Yield	13,880	psi
External Pressure	9,800	psi
Maximum Uniaxial Bend Rating	47.7	%/100 ft
Reference String Length w 1.4 Design Factor	25,530	ft.

**FIELD END TORQUE VALUES**

Min. Make-up torque	17,000	ft.lb
Opti. Make-up torque	18,250	ft.lb
Max. Make-up torque	19,500	ft.lb
Min. Shoulder Torque	1,700	ft.lb
Max. Shoulder Torque	13,600	ft.lb
Min. Delta Turn	-	Turns
Max. Delta Turn	0.200	Turns
Maximum Operational Torque	24,200	ft.lb
Maximum Torsional Value (MTV)	26,620	ft.lb

Need Help? Contact: [tech.support@vam-usa.com](mailto:tech.support@vam-usa.com)

Reference Drawing: 8135PP Rev.02 &amp; 8135BP Rev.02

Date: 07/30/2020

Time: 07:50:47 PM

For detailed information on performance properties, refer to DWC Connection Data Notes on following page(s).

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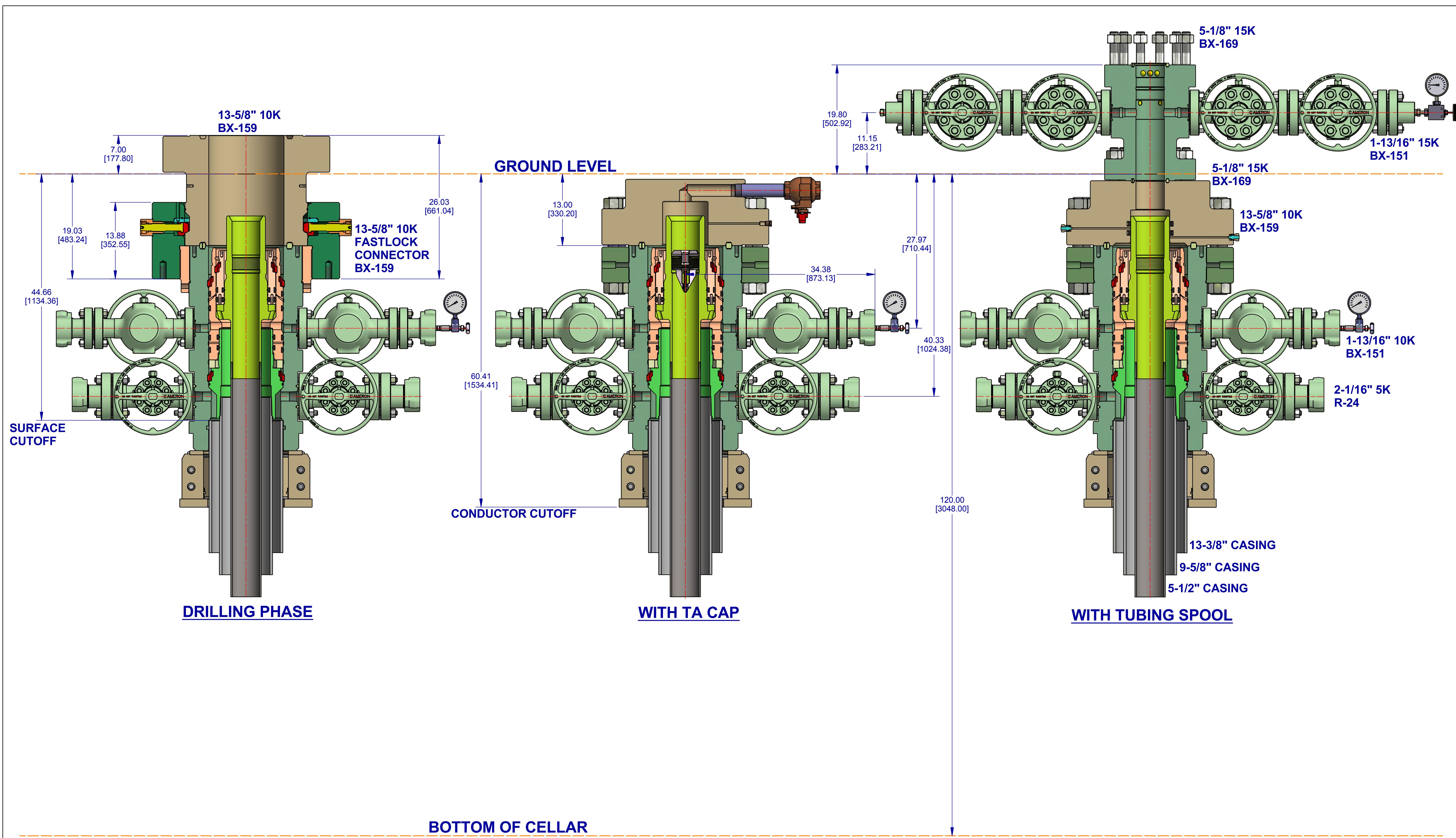
**DWC Connection Data Sheet Notes:**

1. DWC connections are available with a seal ring (SR) option.
2. All standard DWC/C connections are interchangeable for a given pipe OD. DWC connections are interchangeable with DWC/C-SR connections of the same OD and wall.
3. Connection performance properties are based on nominal pipe body and connection dimensions.
4. DWC connection internal and external pressure resistance is calculated using the API rating for buttress connections. API Internal pressure resistance is calculated from formulas 31, 32, and 35 in the API Bulletin 5C3.
5. DWC joint strength is the minimum pipe body yield strength multiplied by the connection critical area.
6. API joint strength is for reference only. It is calculated from formulas 42 and 43 in the API Bulletin 5C3.
7. Bending efficiency is equal to the compression efficiency.
8. The torque values listed are recommended. The actual torque required may be affected by field conditions such as temperature, thread compound, speed of make-up, weather conditions, etc.
9. Connection yield torque is not to be exceeded.
10. Reference string length is calculated by dividing the joint strength by both the nominal weight in air and a design factor (DF) of 1.4. These values are offered for reference only and do not include load factors such as bending, buoyancy, temperature, load dynamics, etc.
11. DWC connections will accommodate API standard drift diameters.
12. DWC/C family of connections are compatible with API Buttress BTC connections. Please contact [tech.support@vam-usa.com](mailto:tech.support@vam-usa.com) for details on connection ratings and make-up.

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CONFIDENTIAL									
DESIGNED IN INCHES		MACHINING TOLERANCES UNLESS OTHERWISE SPECIFIED		DO NOT SCALE		CAMERON		SURFACE SYSTEMS	
DIMENSIONAL UNITS		INCHES [MILLIMETERS]							
THIRD ANGLE		X [0.1]	ANGLES	DRAWN BY:	KEN REED	DATE:	6 Nov 18		
		± [ ]	± [ ]	CHECKED BY:	PA	DATE:	6 Nov 18		
		XX [0.X]		APPROVED BY:	APPROVER NAME	DATE:	6 Nov 18		
		± [ ]	RA						
		XXX [0.XX]	ALL MACHINED SURFACES	ESTIMATED WEIGHT:	8147.2 LBS	INITIAL USE BM:	3695.5 KG	EWR:650353762	
		± [ ]							

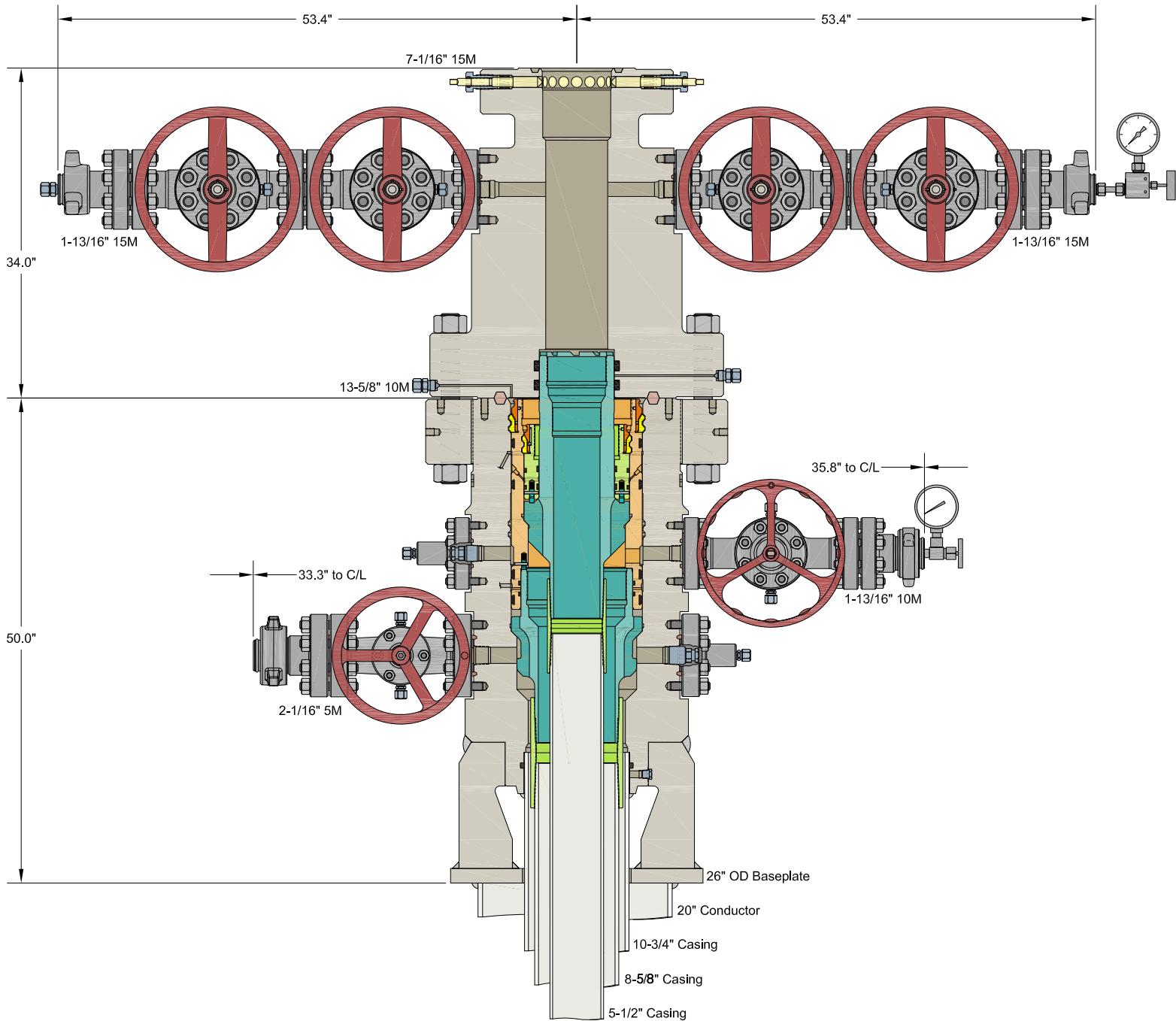
EOG RESOURCES, INC  
13-5/8" 10K MN-DS WELLHEAD  
13-3/8" X 9-5/8" X 5-1/2"

SD-052491-19-07

**Shallow Target Offline Bradenhead:**

EOG Resources Inc. (EOG) respectfully requests a variance from the minimum standards to allow for offline bradenhead cementing of the production string after primary cementing operations have been completed. The primary cement job will be pumped conventionally (online) to top of the Brushy Canyon and will cover the target production intervals, and after production pack-off is set and tested, bradenhead will be pumped through casing valves between the production and intermediate casings (offline). For the bradenhead stage of production cementing, the barriers remain the same for offline cementing compared to performing it online.

The bradenhead will be the primary option for production cementing. EOG also requests to have the conventional option in place to accommodate for logistical or wellbore conditions. The tie back requirements will be met if the cement is pumped conventionally, and cement volumes will be adjusted accordingly. TOC will be verified by CBL.



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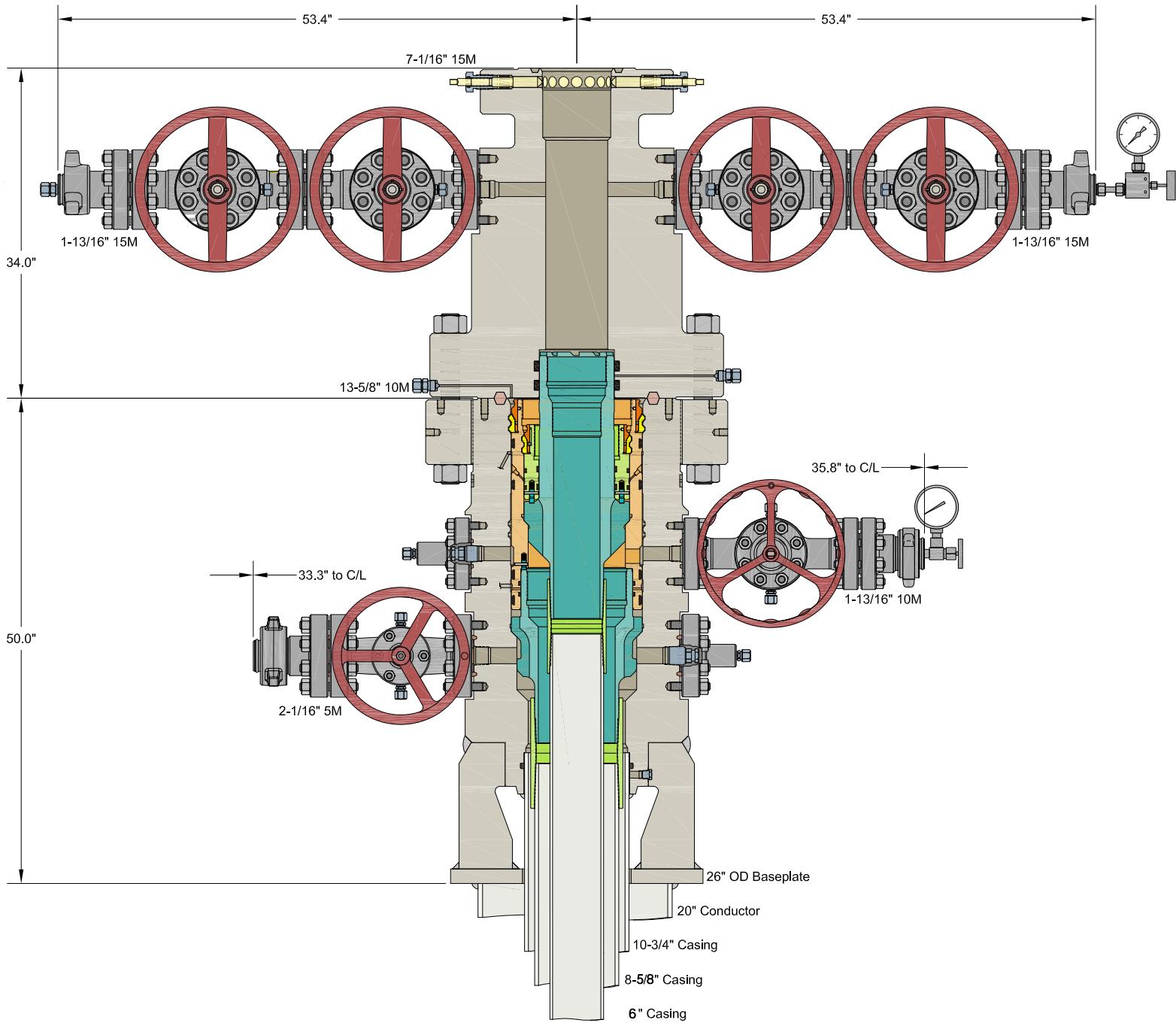
ALL DIMENSIONS APPROXIMATE

## CACTUS WELLHEAD LLC

10-3/4" x 8-5/8" x 5-1/2" MBU-3T-SF-SOW Wellhead System  
With 8-5/8" & 5-1/2" Pin Bottom Mandrel Casing Hangers  
And 13-5/8" 10M x 7-1/16" 15M CTH-DBLHPS Tubing Head

## EOG RESOURCES

DRAWN	DLE	14APR21
APPRV		
DRAWING NO.		SDT-3141



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## CACTUS WELLHEAD LLC

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## EOG RESOURCES

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APPRV		
DRAWING NO.		SDT-3141



### EOG Batch Casing

**Pad Name:** Ross Draw 17 Fed Com SHALLOW

SHL: Section 17, Township 26-S, Range 31-E, EDDY County, NM

EOG requests for the below wells to be approved for all designs listed in the Blanket Casing Design ('EOG BLM Variance 5a - Alternate Shallow Casing Designs.pdf' OR 'EOG BLM Variance 5b - Alternate Deep Casing Designs.pdf') document. The MDs and TVDs for all intervals are within the boundary conditions. The max inclination and DLS are also within the boundary conditions. The directional plans for the wells are attached separately.

Well Name	API #	Surface		Intermediate		Production	
		MD	TVD	MD	TVD	MD	TVD
Ross Draw 17 Fed Com #110H	30-025-*****	1,124	1,124	3,754	3,521	16,171	8,330
Ross Draw 17 Fed Com #111H	30-025-*****	1,124	1,124	3,572	3,521	16,018	8,330
Ross Draw 17 Fed Com #209H	30-025-*****	1,124	1,124	3,557	3,521	16,070	8,400
Ross Draw 17 Fed Com #210H	30-025-*****	1,124	1,124	3,836	3,521	16,303	8,400
Ross Draw 17 Fed Com #211H	30-025-*****	1,124	1,124	3,535	3,521	16,053	8,400
Ross Draw 17 Fed Com #506H	30-025-*****	1,124	1,124	3,542	3,521	17,231	9,575
Ross Draw 17 Fed Com #507H	30-025-*****	1,124	1,124	3,528	3,521	17,219	9,575
Ross Draw 17 Fed Com #508H	30-025-*****	1,124	1,124	3,571	3,521	17,260	9,575
Ross Draw 17 Fed Com #509H	30-025-*****	1,124	1,124	3,522	3,521	17,213	9,575
Ross Draw 17 Fed Com #510H	30-025-*****	1,124	1,124	3,527	3,521	17,219	9,575
Ross Draw 17 Fed Com #511H	30-025-*****	1,124	1,124	3,531	3,521	17,223	9,575
Ross Draw 17 Fed Com #512H	30-025-*****	1,124	1,124	3,544	3,521	17,236	9,575
Ross Draw 17 Fed Com #513H	30-025-*****	1,124	1,124	3,577	3,521	17,267	9,575
Ross Draw 17 Fed Com #514H	30-025-*****	1,124	1,124	3,529	3,521	17,987	10,343
Ross Draw 17 Fed Com #515H	30-025-*****	1,124	1,124	3,531	3,521	17,990	10,343
Ross Draw 17 Fed Com #516H	30-025-*****	1,124	1,124	3,522	3,521	17,980	10,343
Ross Draw 17 Fed Com #517H	30-025-*****	1,124	1,124	3,530	3,521	17,990	10,343
Ross Draw 17 Fed Com #518H	30-025-*****	1,124	1,124	3,582	3,521	18,040	10,343
Ross Draw 17 Fed Com #521H	30-025-*****	1,124	1,124	3,539	3,521	18,155	10,502
Ross Draw 17 Fed Com #522H	30-025-*****	1,124	1,124	3,539	3,521	18,155	10,502
Ross Draw 17 Fed Com #523H	30-025-*****	1,124	1,124	3,537	3,521	18,155	10,502
Ross Draw 17 Fed Com #524H	30-025-*****	1,124	1,124	3,560	3,521	18,177	10,502
Ross Draw 17 Fed Com #525H	30-025-*****	1,124	1,124	3,541	3,521	18,161	10,502



## EOG Batch Casing

### Variances

EOG requests the additional variance(s) in the attached document(s):

- EOG BLM Variance 2a - Intermediate Bradenhead Cement
- EOG BLM Variance 3a\_b - BOP Break-test and Offline Intermediate Cement
- EOG BLM Variance 4a - Salt Section Annular Clearance
- EOG BLM Variance 5a - Alternate Shallow Casing Designs



## EOG Batch Casing

### GEOLOGIC NAME OF SURFACE FORMATION:

Permian

### ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:

Rustler	1,008'
Tamarisk Anhydrite	1,099'
Top of Salt	1,361'
Base of Salt	3,421'
Lamar	3,721'
Bell Canyon	3,975'
Cherry Canyon	4,894'
Brushy Canyon	6,154'
Bone Spring Lime	7,867'
Leonard (Avalon) Shale	7,998'
1st Bone Spring Sand	8,849'
2nd Bone Spring Shale	9,100'
2nd Bone Spring Sand	9,510'
3rd Bone Spring Carb	10,010'
3rd Bone Spring Sand	10,771'
Wolfcamp	11,164'

### ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:

Upper Permian Sands	0- 400'	Fresh Water
Bell Canyon	3,975'	Oil
Cherry Canyon	4,894'	Oil
Brushy Canyon	6,154'	Oil
Leonard (Avalon) Shale	7,998'	Oil
1st Bone Spring Sand	8,849'	Oil
2nd Bone Spring Shale	9,100'	Oil
2nd Bone Spring Sand	9,510'	Oil

No other Formations are expected to give up oil, gas or fresh water in measurable quantities. Surface fresh water sands will be protected by setting surface casing at 1,130' and circulating cement back to surface.

## 10,000 PSI BOP Annular Variance Request (EOG Variance 1c)

EOG Resources request a variance to use a 5000 psi annular BOP with a 10,000 psi BOP stack. The component and compatibility tables along with the general well control plans demonstrate how the 5000 psi annular BOP will be protected from pressures that exceed its rated working pressure (RWP). The pressure at which the control of the wellbore is transferred from the annular preventer to another available preventer will not exceed 3500 psi (70% of the RWP of the 5000 psi annular BOP).

### 1. Component and Preventer Compatibility Tables

The tables below outlines the tubulars and the compatible preventers in use. This table, combined with the drilling fluid, documents that two barriers to flow will be maintained at all times.

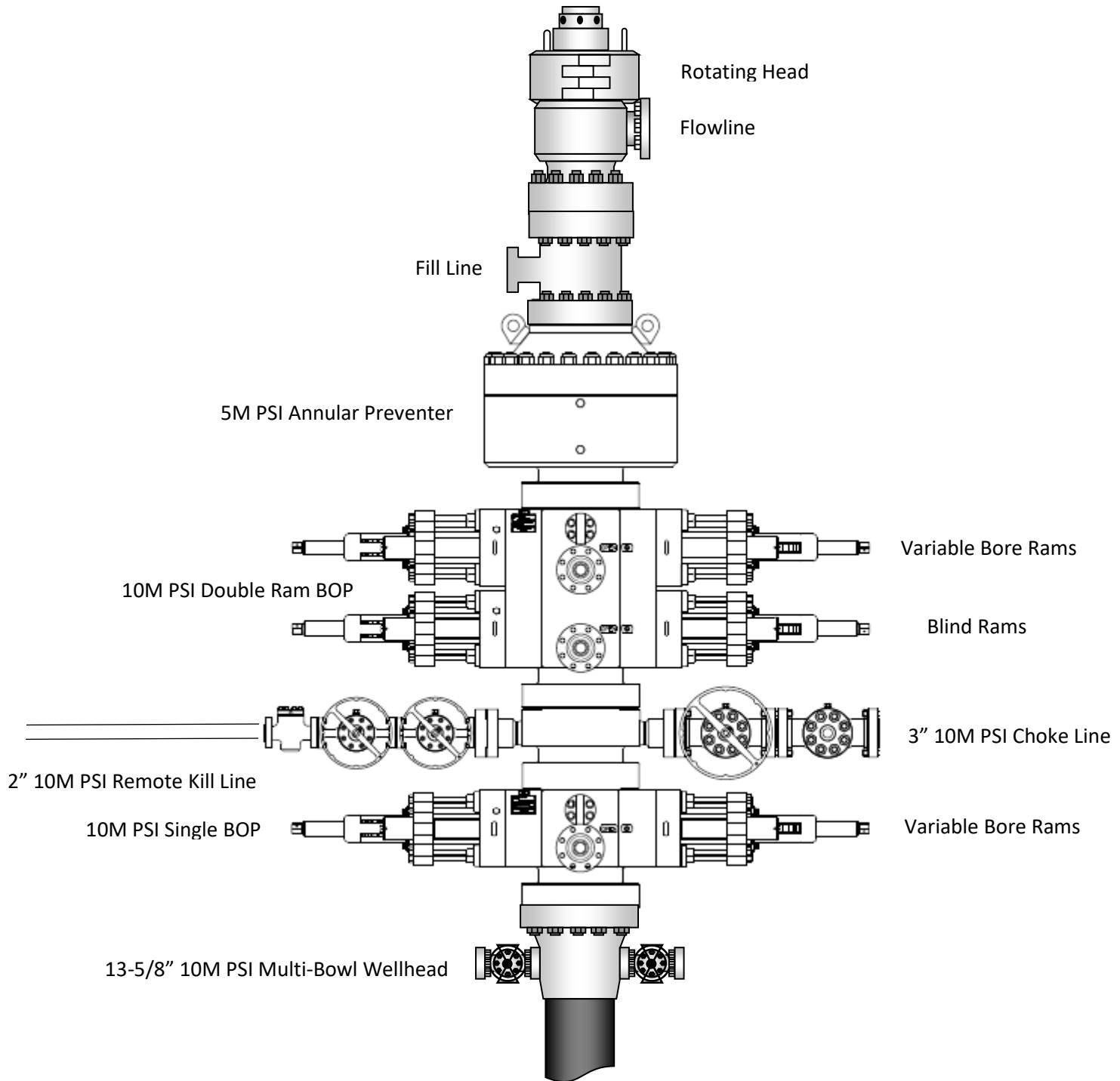
<b>12-1/4" Intermediate Hole Section</b> <b>10M psi requirement</b>					
<b>Component</b>	<b>OD</b>	<b>Primary Preventer</b>	<b>RWP</b>	<b>Alternate Preventer(s)</b>	<b>RWP</b>
Drillpipe	5.000" or 4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
HWDP	5.000" or 4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
Jars	6.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
DCs and MWD tools	6.500" – 8.000"	Annular	5M	-	-
Mud Motor	8.000" – 9.625"	Annular	5M	-	-
1 <sup>st</sup> Intermediate casing	9.625"	Annular	5M	-	-
Open-hole	-	Blind Rams	10M	-	-

<b>8-3/4" Production Hole Section</b> <b>10M psi requirement</b>					
<b>Component</b>	<b>OD</b>	<b>Primary Preventer</b>	<b>RWP</b>	<b>Alternate Preventer(s)</b>	<b>RWP</b>
Drillpipe	5.000" or 4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
HWDP	5.000" or 4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
Jars	6.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
DCs and MWD tools	6.500" – 8.000"	Annular	5M	-	-
Mud Motor	6.750" – 8.000"	Annular	5M	-	-
2 <sup>nd</sup> Intermediate casing	7.625"	Annular	5M	-	-
Open-hole	-	Blind Rams	10M	-	-

VBR = Variable Bore Ram

## EOG Resources

### 13-5/8" 10M PSI BOP Stack



## 2. Well Control Procedures

Below are the minimal high-level tasks prescribed to assure a proper shut-in while drilling, tripping, running casing, pipe out of the hole (open hole), and moving the BHA through the BOPs. At least one well control drill will be performed weekly per crew to demonstrate compliance with the procedure and well control plan. The well control drill will be recorded in the daily drilling log. The type of drill will be determined by the ongoing operations, but reasonable attempts will be made to vary the type of drill conducted (pit, trip, open hole, choke, etc.). This well control plan will be available for review by rig personnel in the EOG Resources drilling supervisor's office on location, and on the rig floor. All BOP equipment will be tested as per Onshore O&G Order No. 2 with the exception of the 5000 psi annular which will be tested to 100% of its RWP.

### General Procedure While Drilling

1. Sound alarm (alert crew)
2. Space out drill string
3. Shut down pumps (stop pumps and rotary)
4. Shut-in Well (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
  - a. SIDPP and SICP
  - b. Pit gain
  - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach 70% or greater of the RWP of the annular preventer, confirm spacing and close the upper variable bore rams.

### General Procedure While Tripping

1. Sound alarm (alert crew)
2. Stab full opening safety valve and close
3. Space out drill string
4. Shut-in (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
  - a. SIDPP and SICP
  - b. Pit gain
  - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach 70% or greater of the RWP of the annular preventer, confirm spacing and close the upper variable bore rams.

### General Procedure While Running Production Casing

1. Sound alarm (alert crew)
2. Stab crossover and full opening safety valve and close
3. Space out string
4. Shut-in (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
  - a. SIDPP and SICP
  - b. Pit gain
  - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach 70% or greater of the RWP of the annular preventer, confirm spacing and close the upper variable bore rams.

### General Procedure With No Pipe In Hole (Open Hole)

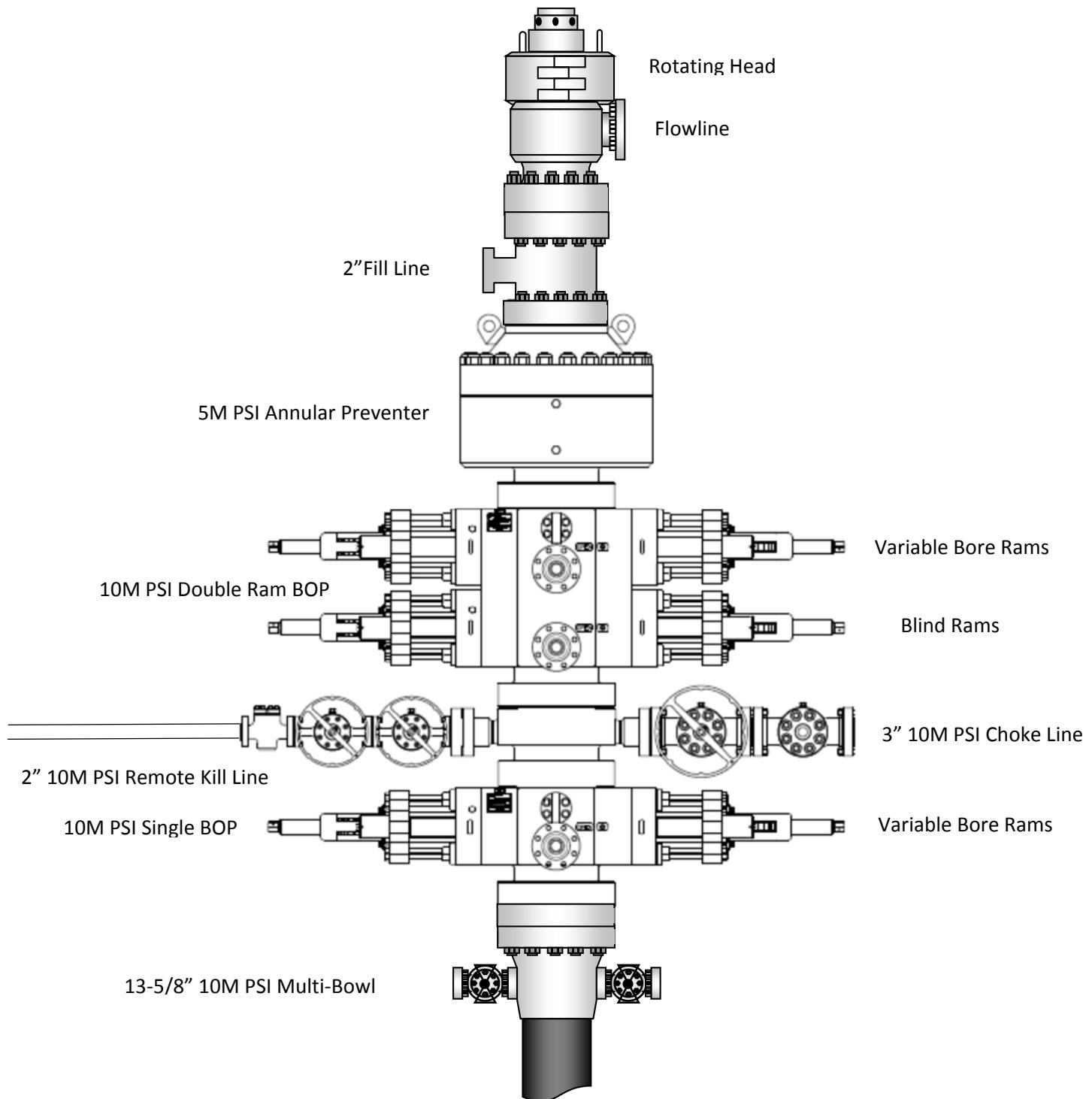
1. Sound alarm (alert crew)
2. Shut-in with blind rams. (HCR and choke will already be in the closed position.)
3. Confirm shut-in
4. Notify toolpusher/company representative
5. Read and record the following:
  - a. SICP
  - b. Pit gain
  - c. Time
6. Regroup and identify forward plan

### General Procedures While Pulling BHA thru Stack

1. PRIOR to pulling last joint of drillpipe thru the stack.
  - a. Perform flowcheck, if flowing:
  - b. Sound alarm (alert crew)
  - c. Stab full opening safety valve and close
  - d. Space out drill string with tool joint just beneath the upper variable bore rams.
  - e. Shut-in using upper variable bore rams. (HCR and choke will already be in the closed position.)
  - f. Confirm shut-in
  - g. Notify toolpusher/company representative
  - h. Read and record the following:
    - i. SIDPP and SICP
    - ii. Pit gain
    - iii. Time
  - i. Regroup and identify forward plan

2. With BHA in the stack and compatible ram preventer and pipe combo immediately available.
  - a. Sound alarm (alert crew)
  - b. Stab crossover and full opening safety valve and close
  - c. Space out drill string with upset just beneath the upper variable bore rams.
  - d. Shut-in using upper variable bore rams. (HCR and choke will already be in the closed position.)
  - e. Confirm shut-in
  - f. Notify toolpusher/company representative
  - g. Read and record the following:
    - i. SIDPP and SICP
    - ii. Pit gain
    - iii. Time
  - h. Regroup and identify forward plan
3. With BHA in the stack and NO compatible ram preventer and pipe combo immediately available.
  - a. Sound alarm (alert crew)
  - b. If possible to pick up high enough, pull string clear of the stack and follow "Open Hole" scenario.
  - c. If impossible to pick up high enough to pull the string clear of the stack:
  - d. Stab crossover, make up one joint/stand of drillpipe, and full opening safety valve and close
  - e. Space out drill string with tooljoint just beneath the upper variable bore ram.
  - f. Shut-in using upper variable bore ram. (HCR and choke will already be in the closed position.)
  - g. Confirm shut-in
  - h. Notify toolpusher/company representative
  - i. Read and record the following:
    - i. SIDPP and SICP
    - ii. Pit gain
    - iii. Time
  - j. Regroup and identify forward plan

Exhibit 1  
EOG Resources  
13-5/8" 10M PSI BOP Stack





# **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

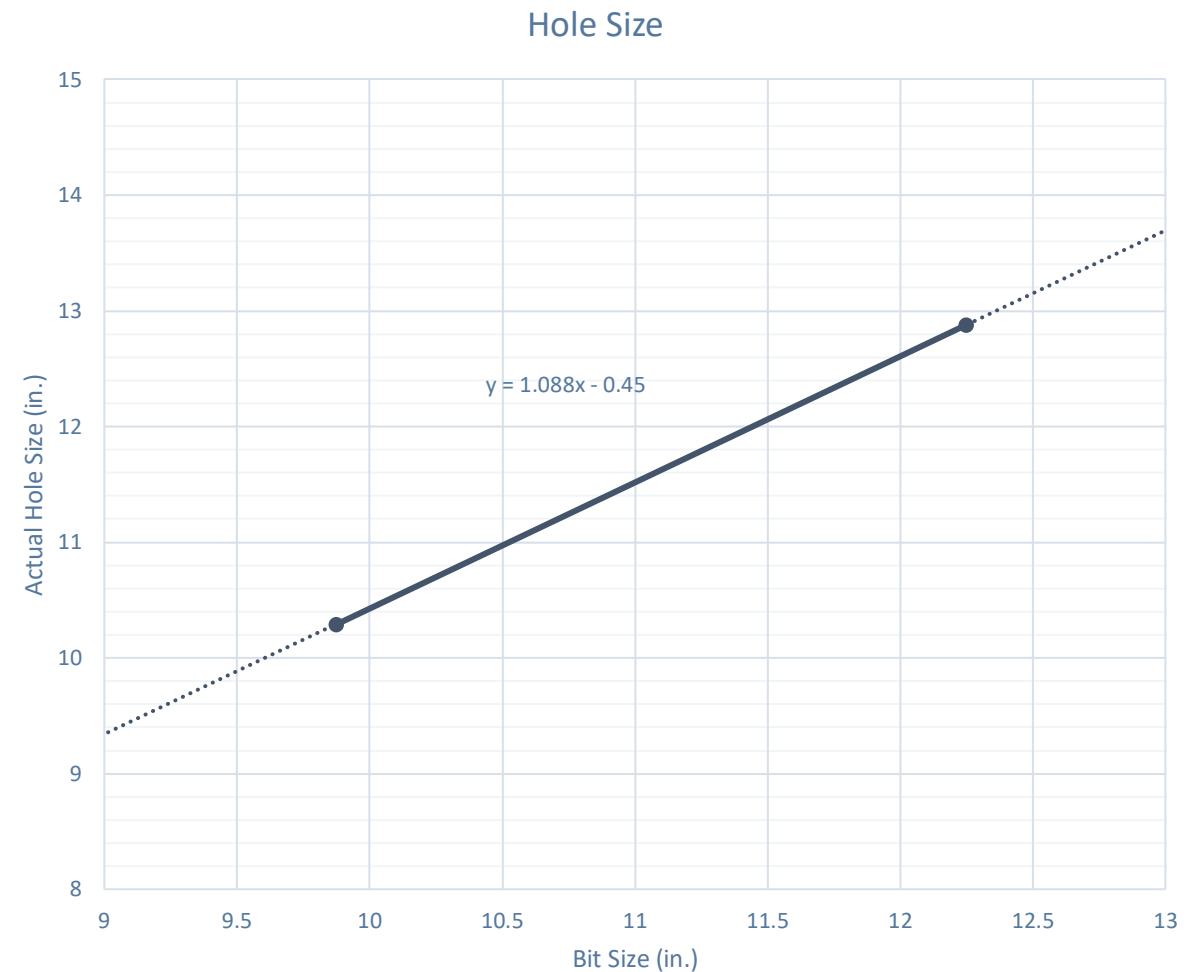
# Volumetric Hole Size Calculation

## 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

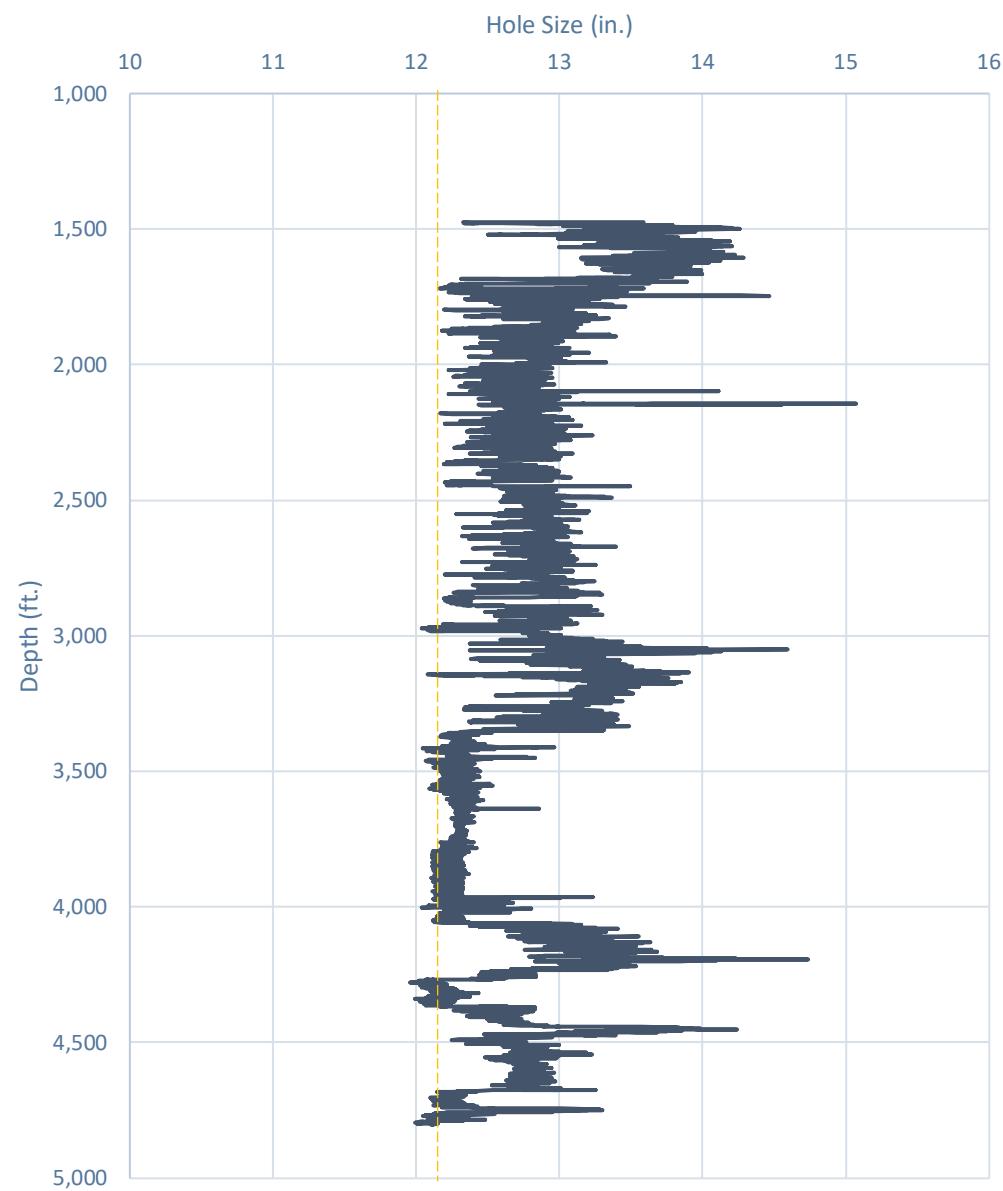


# Caliper Hole Size (12.25")

## 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

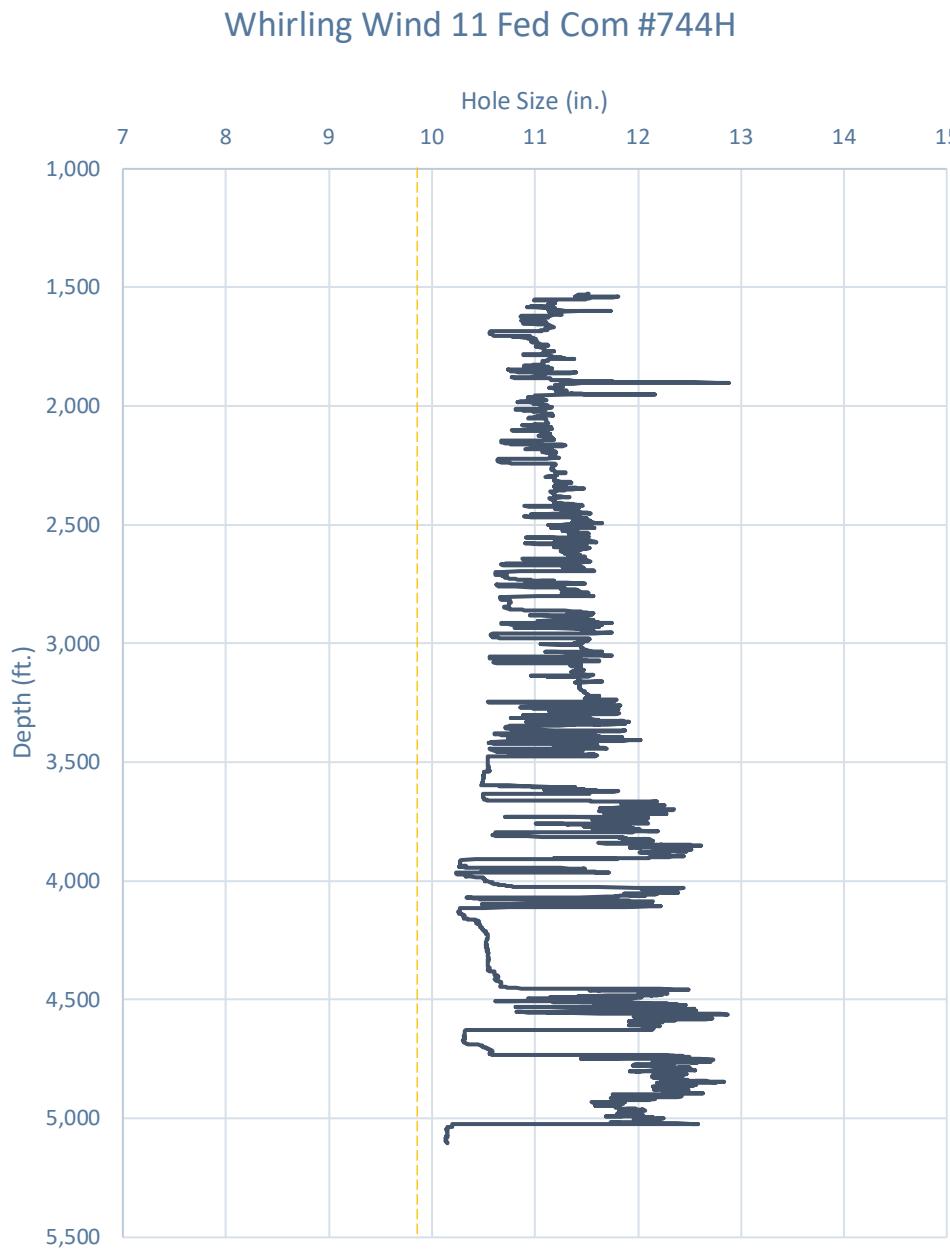
Modelo 10 Fed Com #501H



# 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



# Design A

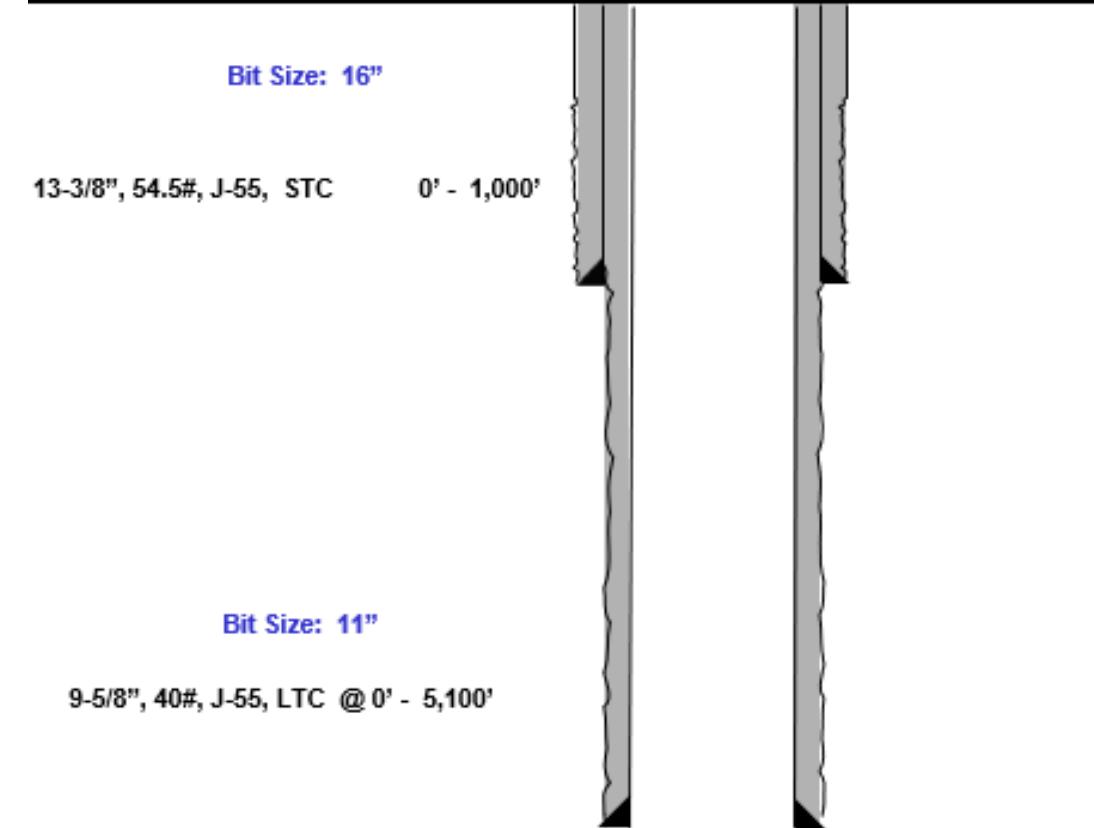
## Proposed 11" Hole with 9.625" 40# J55/HCK55 LTC Casing

- 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

$$= \frac{10.295 - 8.625}{2}$$

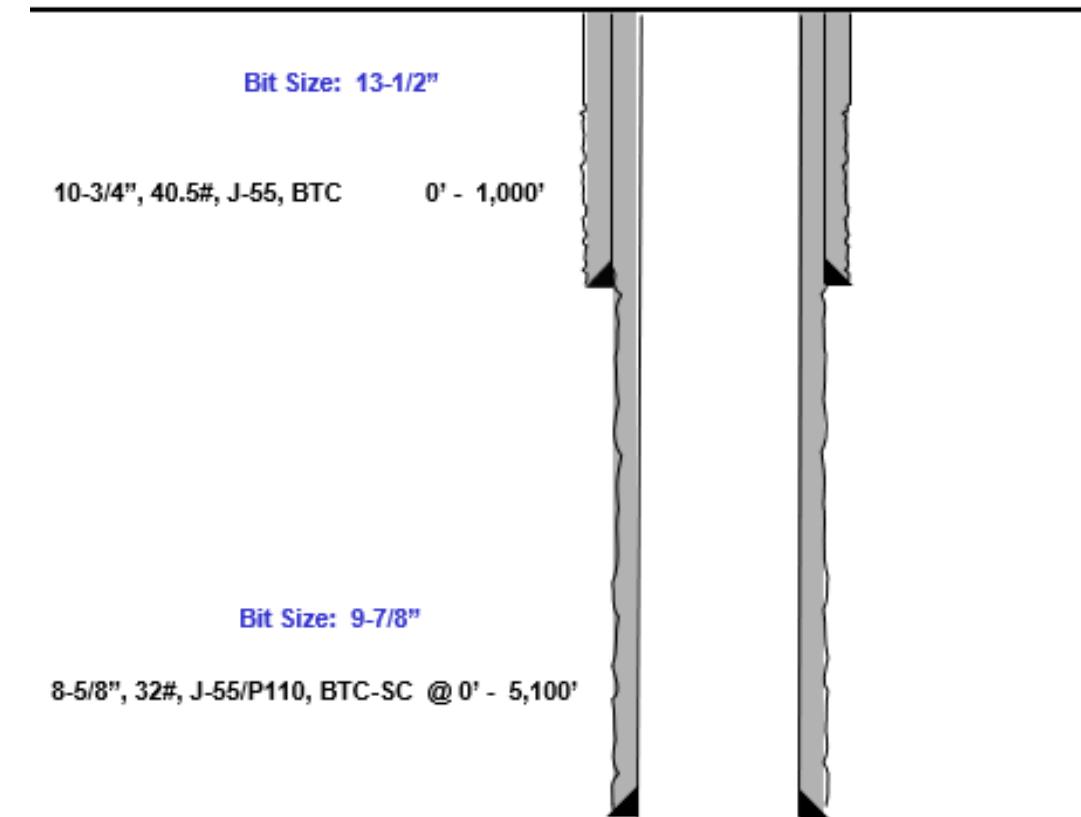
- 0.585" Clearance to coupling OD

$$= \frac{10.295 - 9.125}{2}$$

- Previous Shoe – 10.75" 40.5# J55 STC

- 0.4625" Clearance to coupling OD (~1,200' overlap)

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





# Index

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# 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	in <sup>2</sup>			

### 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 »

« Back to Previous List

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

**VALLOUREC STAR 8.625 32# J55 S S2L2 DA 7.875 WO# SLN# PO# MADE IN USA FT LB**

**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)	
<b>Pipe</b>	
Minimum Yield Strength:	55 ksi
Maximum Yield Strength:	80 ksi
Minimum Tensile Strength:	75 ksi
<b>Coupling</b>	
Minimum Yield Strength:	55 ksi
Maximum Yield Strength:	80 ksi
Minimum Tensile Strength:	75 ksi

Pipe Body Data (PE)	
<b>Geometry</b>	
Nominal ID:	7.92 inch
Nominal Area:	9.149 in <sup>2</sup>
*Special/Alt. Drift:	7.875 inch
<b>Performance</b>	
Pipe Body Yield Strength:	503 kips
Collapse Resistance:	2,530 psi
Internal Yield Pressure: (API Historical)	3,930 psi

API Connection Data	
Coupling OD: 9.625"	
<b>STC Performance</b>	
STC Internal Pressure:	3,930 psi
STC Joint Strength:	372 kips
<b>LTC Performance</b>	
LTC Internal Pressure:	3,930 psi
LTC Joint Strength:	417 kips
<b>SC-BTC Performance - Cplg OD = 9.125"</b>	
BTC Internal Pressure:	3,930 psi
BTC Joint Strength:	503 kips

API Connection Torque	
<b>STC Torque (ft-lbs)</b>	
Min:	2,793
Opti:	3,724
Max:	4,655
<b>LTC Torque (ft-lbs)</b>	
Min:	3,130
Opti:	4,174
Max:	5,217
<b>BTC Torque (ft-lbs)</b>	
follow API guidelines regarding positional make up	

\*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

**Ross Draw 17 Fed Com 516H API #: 30-025-\*\*\*\*\* Variances**

EOG respectfully requests the below variances to be applied to the above well:

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

- Variance is also requested to waive the centralizer requirements for the production casing in the production hole. An expansion additive will be utilized, in the cement slurry, for the entire length of the production interval to maximize cement bond and zonal isolation.

- Bradenhead will be the primary option for production cementing. EOG also requests to have the conventional option in place to accommodate for logistical or wellbore conditions. The tie back requirements will be met if the cement is pumped conventionally, and cement volumes will be adjusted accordingly. TOC will be verified by CBL.

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

- Variance is requested to use a 5,000 psi annular BOP with the 10,000 psi BOP stack.

- EOG Resources requests the option to contract a Surface Rig to drill, set surface casing, and Cement on the subject well. After WOC 8 hours or 500 psi compressive strength (whichever is greater), the Surface Rig will move off so the wellhead can be installed. A welder will cut the casing to the proper height and weld on the wellhead (both "A" and "B" sections). The weld will be tested to 1,500 psi. All valves will be closed and a wellhead cap will be installed (diagram attached). If the timing between rigs is such that EOG Resources would not be able to preset the surface, the Primary Rig will MIRU and drill the well in its entirety per the APD.

EOG requests the additional variance(s) in the attached document(s):

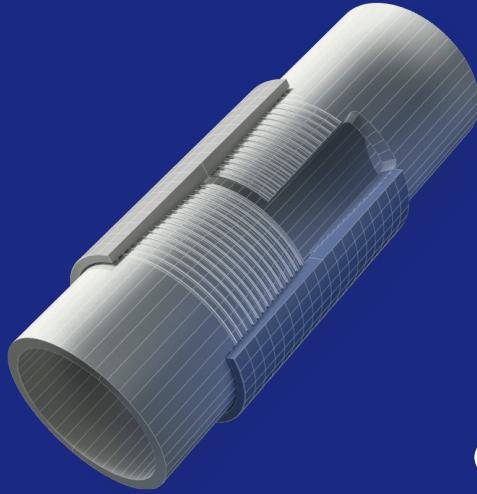
- EOG BLM Variance 2a - Inermediate Bradenhead Cement
- EOG BLM Variance 3a\_b - BOP Break-test and Offline Intermediate Cement
- EOG BLM Variance 3c - Shallow Target Production Offline Bradenhead Cement
- EOG BLM Variance 4a - Salt Section Annular Clearance
- EOG BLM Variance 5a - Alternate Shallow Casing Designs



## CONNECTION DATA SHEET

OD: **6.000 in.** Grade: **P110 EC**  
 Weight: **24.50 lb/ft** Drift: **5.075 in. (API)**  
 Wall Th.: **0.400 in.**

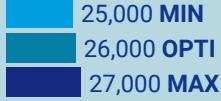
### VAM® SPRINT-TC



T&C

#### Field Torque Values

##### Make-up Torque (ft-lb)



##### Torque with Sealability (ft-lb)



##### Locked Flank Torque (ft-lb)



(2) MTS: Maximum Torque with Sealability.  
 Note: Thread compound must be applied as a thin even layer

#### PIPE BODY PROPERTIES

Nominal OD	6.000	in.
Nominal ID	5.200	in.
Nominal Wall Thickness	0.400	in.
Minimum Wall Thickness	87.5	%
Nominal Weight (API)	24.50	lb/ft
Plain End Weight	23.95	lb/ft
Drift	5.075	in.
Grade Type	High Yield	
Minimum Yield Strength	125	ksi
Maximum Yield Strength	140	ksi
Minimum Ultimate Tensile Strength	135	ksi
Pipe Body Yield Strength	880	kib
Internal Yield Pressure	14,580	psi
Collapse Pressure	12,500	psi

#### CONNECTION PROPERTIES

Connection Type	Semi-Premium Threaded & Coupled	
Nominal Connection OD	6.525	in.
Nominal Connection ID	5.267	in.
Make-up Loss	4.283	in.
Coupling Length	8.831	in.
Tension Efficiency	100	% Pipe Body
Compression Efficiency	100	% Pipe Body
Internal Pressure Efficiency	100	% Pipe Body
External Pressure Efficiency	100	% Pipe Body

#### JOINT PERFORMANCES

Tension Strength	880	kib
Compression Strength	880	kib
Internal Pressure Resistance	14,580	psi
External Pressure Resistance	12,500	psi
Maximum Bending, Structural	95	%/100 ft
Maximum Bending, with Sealability(1)	30	%/100 ft
Maximum Load on Coupling Face	373	kib

(1) Sealability rating demonstrated as per API RP 5C5 / ISO 13679



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## Ross Draw 17 Fed Com 516H

### 1. GEOLOGIC NAME OF SURFACE FORMATION:

Permian

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

Rustler	1,008'
Tamarisk Anhydrite	1,099'
Top of Salt	1,361'
Base of Salt	3,421'
Lamar	3,721'
Bell Canyon	3,975'
Cherry Canyon	4,894'
Brushy Canyon	6,154'
Bone Spring Lime	7,867'
Leonard (Avalon) Shale	7,998'
1st Bone Spring Sand	8,849'
2nd Bone Spring Shale	9,100'
2nd Bone Spring Sand	9,510'
3rd Bone Spring Carb	10,010'
3rd Bone Spring Sand	10,771'
Wolfcamp	11,164'
TD	10,343'

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

Upper Permian Sands	0- 400'	Fresh Water
Bell Canyon	3,975'	Oil
Cherry Canyon	4,894'	Oil
Brushy Canyon	6,154'	Oil
Leonard (Avalon) Shale	7,998'	Oil
1st Bone Spring Sand	8,849'	Oil
2nd Bone Spring Shale	9,100'	Oil
2nd Bone Spring Sand	9,510'	Oil

No other Formations are expected to give up oil, gas or fresh water in measurable quantities. Surface fresh water sands will be protected by setting 10-3/4" casing at 1,130' and circulating cement back to surface.



## Ross Draw 17 Fed Com 516H

## 4. CASING PROGRAM

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
13"	0	1,124	0	1,124	10-3/4"	40.5#	J-55	STC
9-7/8"	0	3,522	0	3,521	8-5/8"	32#	J-55	BTC-SC
7-7/8"	0	9,766	0	9,766	6"	24.5#	P110-EC	VAM Sprint-TC
6-3/4"	9,766	17,980	9,766	10,343	5-1/2"	20#	P110-EC	VAM Sprint SF

\*\*For highlighted rows above, variance is requested to run entire string of either 6" or 5-1/2" casing string above due to availability.

Hole will be full during casing run for well control and tensile SF factor. Casing will be kept at least half full during run for this design to meet BLM collapse SF requirement. External pressure will be reviewed prior to conducting casing pressure tests to ensure that 70% of the yield is not exceeded.

Variance is requested to waive the centralizer requirements for the 8-5/8" casing in the 9-7/8" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 9-7/8" hole interval to maximize cement bond and zonal isolation.

Variance is also requested to waive any centralizer requirements for the 6" and 5-1/2" casings in the 7-7/8" and 6-3/4" hole sizes. An expansion additive will be utilized in the cement slurry for the entire length of the 7-7/8" and 6-3/4" hole intervals 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 Title 43 CFR Part 3170 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.

## 5. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
1,130' 10-3/4"	260	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	120	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 930')
3,530' 8-5/8"	220	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	100	14.8	1.32	Tail: Class C + 10% NaCL + 3% MagOx (TOC @ 2817')
17,980' 6"	1000	14.8	1.32	Bradenhead squeeze: Class C + 3% Salt + 1% PreMag-M + 6% Bentonite Gel (TOC @ surface)
	1400	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 @ 6160')



## Ross Draw 17 Fed Com 516H

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

Cement integrity tests will be performed immediately following plug bump.

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.

EOG requests variance from minimum standards to pump a two stage cement job on the 6" and 5-1/2" production casing strings with the first stage being pumped conventionally with the calculated top of cement at the Brushy Canyon (6,154') and the second stage performed as a 1000 sack bradenhead squeeze with planned cement from the Brushy Canyon to surface. If necessary, a top out consisting of 400 sacks of Class C cement + 3% Salt + 1% PreMag-M + 6% Bentonite Gel (1.32 yld, 14.8 ppg) will be executed as a contingency. Top will be verified by Echo-meter.

Bradenhead will be the primary option for production cementing. EOG also requests to have the conventional option in place to accommodate for logistical or wellbore conditions. The tie back requirements will be met if the cement is pumped conventionally, and cement volumes will be adjusted accordingly. TOC will be verified by CBL.



## Ross Draw 17 Fed Com 516H

### 6. MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL:

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

The minimum blowout preventer equipment (BOPE) shown in Exhibit #1 will consist of a single ram, mud cross and double ram-type (10,000 psi WP) preventer and an annular preventer (5,000-psi WP). Both units will be hydraulically operated and the ram-type will be equipped with blind rams on bottom and drill pipe rams on top. All BOPE will be tested in accordance with Onshore Oil & Gas order No. 2.

EOG will utilize wing unions on BOPE connections that can be isolated from wellbore pressure through means of a choke. All wing unions will be rated to a pressure that meets or exceeds the pressure rating of the BOPE system.

Variance is requested to use a 5,000 psi annular BOP with the 10,000 psi BOP stack.

Before drilling out of the surface casing, the ram-type BOP and accessory equipment will be tested to 10,000/ 250 psig and the annular preventer to 5,000/ 250 psig.

Pipe rams and blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

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

### 7. TYPES AND CHARACTERISTICS OF THE PROPOSED MUD SYSTEM:

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

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

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0 – 1,130'	Fresh - Gel	8.6-8.8	28-34	N/c
1,130' – 3,320'	Brine	9-10.5	28-34	N/c
3,530' – 17,980' Lateral	Oil Base	8.8-9.5	58-68	N/c - 6

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

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

**Ross Draw 17 Fed Com 516H****8. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT:**

- (A) A kelly cock will be kept in the drill string at all times.
- (B) A full opening drill pipe-stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times.
- (C) H2S monitoring and detection equipment will be utilized from surface casing point to TD.

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

- (A) Open-hole logs are not planned for this well.
- (B) GR-CCL will be run in cased hole during completions phase of operations.

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

The estimated bottom-hole temperature (BHT) at TD is 173 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 4,841 psig and a maximum anticipated surface pressure of 2,565 psig (based on 9.0 ppg MW). No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported or are known to exist at this depth in this area. Severe loss circulation is expected from 6,154' to intermediate casing point.

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

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

EOG Resources requests the option to contract a Surface Rig to drill, set surface casing, and Cement on the subject well. After WOC 8 hours or 500 psi compressive strength (whichever is greater), the Surface Rig will move off so the wellhead can be installed. A welder will cut the casing to the proper height and weld on the wellhead (both "A" and "B" sections). The weld will be tested to 1,500 psi. All valves will be closed and a wellhead cap will be installed (diagram attached). If the timing between rigs is such that EOG Resources would not be able to preset the surface, the Primary Rig will MIRU and drill the well in its entirety per the APD.

**Ross Draw 17 Fed Com 516H****12. WELLHEAD:**

A multi-bowl wellhead system will be utilized.

After running the surface casing, a BOP/BOPE system with a minimum working pressure of 10,000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 10,000 psi pressure test. This pressure test will be repeated at least every 30 days, as per Title 43 CFR Part 3170.

The minimum working pressure of the BOP and related BOPE required for drilling below the surface casing shoe shall be 10,000 psi.

The multi-bowl wellhead will be installed by vendor's representative(s). A copy of the installation instructions for the Cactus Multi-Bowl WH system has been sent to the NM BLM office in Carlsbad, NM.

The wellhead will be installed by a third party welder while being monitored by WH vendor's representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. EOG Resources reserves the option to conduct BOPE testing during wait on cement periods provided a test plug is utilized.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

Casing strings will be tested as per Title 43 CFR Part 3170 to at least 0.22 psi/ft or 1,500 psi, whichever is greater.

**13. VARIANCE REQUESTS:**

EOG requests the additional variance(s) in the attached document(s):

- EOG BLM Variance 3a\_b - BOP Break-test and Offline Intermediate Cement
- EOG BLM Variance 4a - Salt Section Annular Clearance
- EOG BLM Variance 5a - Alternate Shallow Casing Designs

**EOG resources**  
**Ross Draw 17 Fed Com 516H****14. TUBING REQUIREMENTS:**

EOG respectively requests an exception to the following NMOCD rule:

- 19.15.16.10 Casing AND TUBING REQUIREMENTS:

J (3): "The operator shall set tubing as near the bottom as practical and tubing perforations shall not be more than 250 feet above top of pay zone."

With horizontal flowing and gas lifted wells an end of tubing depth placed at or slightly above KOP is a conservative way to ensure the tubing stays clean from debris, plugging, and allows for fewer well interventions post offset completion. The deeper the tubulars are run into the curve, the higher the probability is that the tubing will become stuck in sand and or well debris as the well produces over time. An additional consideration for EOT placement during artificial lift installations is avoiding the high dog leg severity and inclinations found in the curve section of the wellbore to help improve reliability and performance. Dog leg severity and inclinations tend not to hamper gas lifted or flowing wells, but they do effect other forms of artificial lift like rod pump or ESP (electric submersible pump). Keeping the EOT above KOP is an industry best practice for those respective forms of artificial lift.



## Ross Draw 17 Fed Com 516H

2621' FNL  
2458' FEL  
Section 17  
T-26-S, R-31-E

**Proposed Wellbore**  
API: 30-025-\*\*\*\*\*

KB: 3272'  
GL: 3247'

**Bit Size: 13"**  
**10-3/4", 40.5#, J-55, STC**  
**@ 0' - 1,124'**

**Bit Size: 9-7/8"**  
**8-5/8", 32.#, J-55, BTC-SC**  
**@ 0' - 3,522'**

**Bit Size: 7-7/8" | Bit Size: 6-3/4"**  
**6", 24.5#, P110-EC, VAM Sprint-TC**  
**@ 0' - 9,766'**

**5-1/2", 20.#, P110-EC, VAM Sprint SF**  
**@ 9,766' - 17,980'**

**KOP: 9,866' MD, 9,866' TVD**  
**EOC: 10,616' MD, 10,343' TVD**

If production Bradenhead is performed, TOC will be at surface

TOC @ 3,022', if performed conventionally.

Lateral: 17,980' MD, 10,343' TVD  
Upper Most Perf:  
2563' FNL & 2384' FEL Sec. 17  
Lower Most Perf:  
100' FNL & 2384' FEL Sec. 8  
BH Location: 100' FNL & 2384' FEL Sec. 8, T-26-S, R-31-E

Issued on: 08 Jul. 2020 by Wesley Ott



OD 5 1/2 in.	Weight 20.00 lb/ft	Wall Th. 0.361 in.	Grade P110EC	API Drift: 4.653 in.	Connection VAM® SPRINT-SF
-----------------	-----------------------	-----------------------	-----------------	-------------------------	------------------------------

PIPE PROPERTIES	
Nominal OD	5.500 in.
Nominal ID	4.778 in.
Nominal Cross Section Area	5.828 sqin.
Grade Type	High Yield
Min. Yield Strength	125 ksi
Max. Yield Strength	140 ksi
Min. Ultimate Tensile Strength	135 ksi

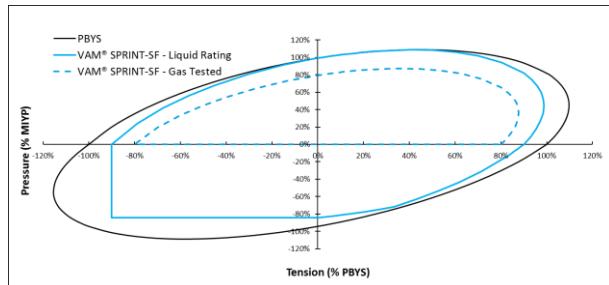
CONNECTION PROPERTIES	
Connection Type	Semi-Premium Integral Semi-Flush
Connection OD (nom):	5.783 in.
Connection ID (nom):	4.717 in.
Make-Up Loss	5.965 in.
Critical Cross Section	5.244 sqin.
Tension Efficiency	90.0 % of pipe
Compression Efficiency	90.0 % of pipe
Internal Pressure Efficiency	100 % of pipe
External Pressure Efficiency	100 % of pipe

CONNECTION PERFORMANCES	
Tensile Yield Strength	656 klb
Compression Resistance	656 klb
Internal Yield Pressure	14,360 psi
Collapse Resistance	12,080 psi
Max. Structural Bending	89 °/100ft
Max. Bending with ISO/API Sealability	30 °/100ft

TORQUE VALUES		
Min. Make-up torque	20,000	ft.lb
Opt. Make-up torque	22,500	ft.lb
Max. Make-up torque	25,000	ft.lb
Max. Torque with Sealability (MTS)	40,000	ft.lb

\* 87.5% RBW

**VAM® SPRINT-SF** is a semi-flush connection innovatively designed for extreme shale applications. Its high tension rating and ultra high torque capacity make it ideal to run a full string length as production casing in shale wells with extended horizontal sections and tight clearance requirements.



Do you need help on this product? - Remember no one knows VAM® like VAM®

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usa@vamfieldservice.com  
mexico@vamfieldservice.com  
brazil@vamfieldservice.com

uk@vamfieldservice.com  
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nigeria@vamfieldservice.com  
angola@vamfieldservice.com

china@vamfieldservice.com  
baku@vamfieldservice.com  
singapore@vamfieldservice.com  
australia@vamfieldservice.com

Over 140 VAM® Specialists available worldwide 24/7 for Rig Site Assistance





## 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 <sup>2</sup>
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 Internal Pressure:	3,930 psi	Min:	2,793
STC Joint Strength:	372 kips	Opti:	3,724
		Max:	4,655
LTC Performance		LTC Torque (ft-lbs)	
LTC Internal Pressure:	3,930 psi	Min:	3,130
LTC Joint Strength:	417 kips	Opti:	4,174
		Max:	5,217
SC-BTC Performance - Cplg OD = 9.125"		BTC Torque (ft-lbs)	
BTC Internal Pressure:	3,930 psi	follow API guidelines regarding positional make up	
BTC Joint Strength:	503 kips		

\*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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Ross Draw 17 Fed Com #516H

## Hydrogen Sulfide Plan Summary

**A. All personnel shall receive proper H2S training in accordance with Onshore Order III.C.3.a.**

**B. Briefing Area: two perpendicular areas will be designated by signs and readily accessible.**

**C. Required Emergency Equipment:**

■ **Well control equipment**

- a. Flare line 150' from wellhead to be ignited by flare gun.
- b. Choke manifold with a remotely operated choke.
- c. Mud/gas separator

■ **Protective equipment for essential personnel:**

- a. Breathing Apparatus:
  - i. Rescue Packs (SCBA) — 1 unit shall be placed at each breathing area, 2 shall be stored in the safety trailer.
  - ii. Work/Escape packs —4 packs shall be stored on the rig floor with sufficient air hose not to restrict work activity.
  - iii. Emergency Escape Packs —4 packs shall be stored in the doghouse for emergency evacuation.
- b. Auxiliary Rescue Equipment:
  - i. Stretcher
  - ii. Two OSHA full body harness
  - iii. 100 ft 5/8 inch OSHA approved rope
  - iv. 1-20# class ABC fire extinguisher

■ **H2S Detection and Monitoring Equipment:**

The stationary detector with three sensors will be placed in the upper dog house if equipped, set to visually alarm @ 10 ppm and audible @ 14 ppm. Calibrate a minimum of every 30 days or as needed. The sensors will be placed in the following places: Rig floor / Bell nipple / End of flow line or where well bore fluid is being discharged. (Gas sample tubes will be stored in the safety trailer)

■ **Visual Warning System:**

- a. One color code condition sign will be placed at the entrance to the site reflecting the possible conditions at the site.
- b. A colored condition flag will be on display, reflecting the current condition at the site at the time.
- c. Two wind socks will be placed in strategic locations, visible from all angles.



Ross Draw 17 Fed Com #516H

■ **Mud Program:**

The mud program has been designed to minimize the volume of H<sub>2</sub>S circulated to surface. The operator will have the necessary mud products to minimize hazards while drilling in H<sub>2</sub>S bearing zones.

■ **Metallurgy:**

All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H<sub>2</sub>S service.

■ **Communication:**

Communication will be via cell phones and land lines where available.



Ross Draw 17 Fed Com #516H

## Emergency Assistance Telephone List

<b>PUBLIC SAFETY:</b>	<b>911 or</b>
<b>Lea County Sheriff's Department</b>	(575) 396-3611
Corey Helton	
<b>Fire Department</b>	
Carlsbad	(575) 885-3125
Artesia	(575) 746-5050
<b>Hospitals</b>	
Carlsbad	(575) 887-4121
Artesia	(575) 748-3333
Hobbs	(575) 392-1979
<b>Dept. of Public Safety/Carlsbad</b>	(575) 748-9718
<b>Highway Department</b>	(575) 885-3281
<b>U.S. Department of Labor</b>	(575) 887-1174
<b>Bureau of Land Management - Hobbs (Lea Co)</b>	(575) 393-3612
PET On Call - Hobbs	(575) 706-2779
<b>Bureau of Land Management - Carlsbad (Eddy Co)</b>	(575) 234-5972
PET On Call - Carlsbad	(575) 706-2779
<b>New Mexico Oil Conservation Division - Artesia</b>	(575) 748-1283
Inspection Group South - Gilbert Gordero	(575) 626-0830
<b>EOG Resources, Inc.</b>	
EOG Midland	(432) 686-3600
<b>Company Drilling Consultants:</b>	
Jett Dueitt	(432) 230-4840
Blake Burney	
<b>Drilling Engineers</b>	
Stephen Davis	(432) 235-9789
Matt Day	(210) 296-4456
<b>Drilling Managers</b>	
Branden Keener	(210) 294-3729
<b>Drilling Superintendents</b>	
Lance Hardy	(432) 215-8152
Ryan Reynolds	(432) 215-5978
Steve Kelly	(210) 416-7894
<b>H&amp;P Drilling</b>	
H&P Drilling	(432) 563-5757
<b>Nabors Drilling</b>	
Nabors Drilling	(432) 363-8180
<b>Patterson UTI</b>	
Patterson UTI	(432) 561-9382
<b>EOG Safety</b>	
Brian Chandler (HSE Manager)	(817) 239-0251

## Eddy County, NM (NAD 83 NME)

Ross Draw 17 Fed Com #516H

### Plan #0.1 RT



Azimuths to Grid North  
True North: -0.28°  
Magnetic North: 5.97°

Magnetic Field  
Strength: 47029.6nT  
Dip Angle: 59.59°  
Date: 9/4/2024  
Model: IGRF2020

To convert a Magnetic Direction to a Grid Direction, Add 5.97°  
To convert a Magnetic Direction to a True Direction, Add 6.26° East  
To convert a True Direction to a Grid Direction, Subtract 0.28°

#### PROJECT DETAILS: Eddy 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: #516H

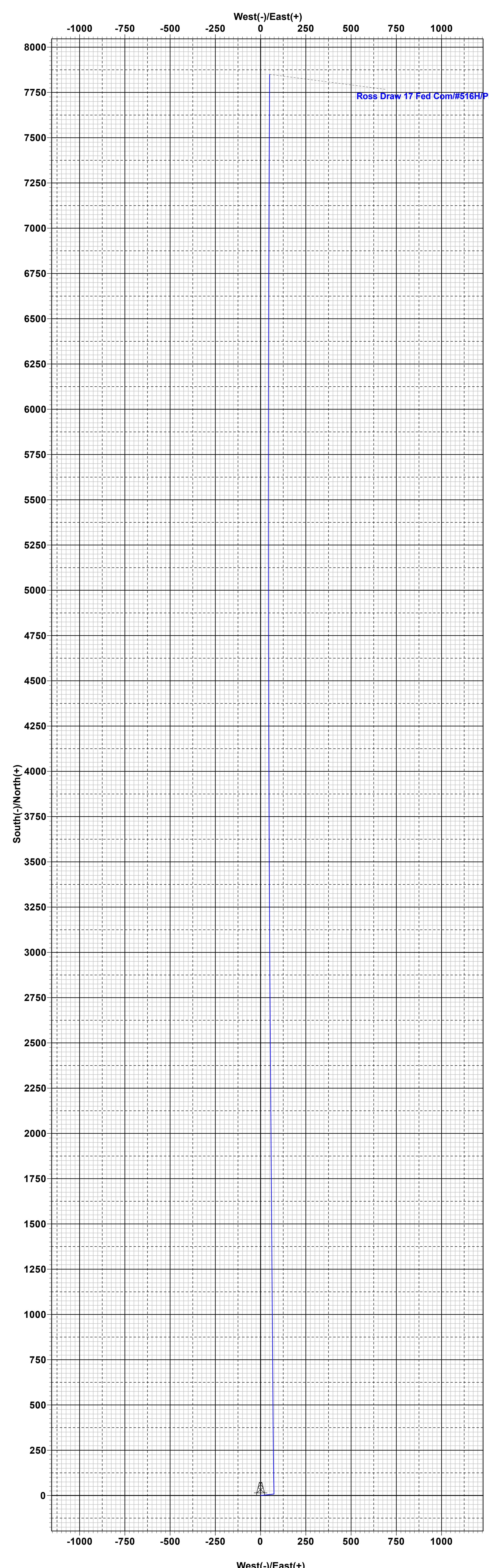
3247.0  
kb = 26' @ 3273.0usft  
Northing 379747.00      Easting 706658.00      Latitude 32° 2' 34.374 N      Longitude 103° 47' 59.193 W

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1275.0	0.00	0.00	1275.0	0.0	0.0	0.00	0.00	0.0	
3	1319.1	0.88	83.83	1319.1	0.0	0.3	2.00	83.83	0.0	
4	6110.5	0.88	83.83	6109.9	8.0	73.7	0.00	0.00	8.4	
5	6154.6	0.00	0.00	6154.0	8.0	74.0	2.00	180.00	8.5	
6	9866.1	0.00	0.00	9865.5	8.0	74.0	0.00	0.00	8.5	KOP(Ross Draw 17 Fed Com #516H)
7	10086.5	26.47	358.85	10078.2	58.0	73.0	12.01	358.85	58.5	FTP(Ross Draw 17 Fed Com #516H)
8	10615.9	90.00	359.59	10342.9	485.4	68.3	12.00	0.82	485.8	Fed Perf 1(Ross Draw 17 Fed Com #516H)
9	12752.3	90.00	359.59	10343.0	2621.7	53.0	0.00	0.00	2622.0	PBHL(Ross Draw 17 Fed Com #516H)
10	17980.4	90.00	0.34	10343.0	7849.7	50.0	0.01	89.40	7849.9	

CASING DETAILS	
No casing data is available	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)					
Name	TVD	+N/S	+E/W	Northing	Easting
KOP(Ross Draw 17 Fed Com #516H)	9865.5	8.0	74.0	379755.00	706732.00
FTP(Ross Draw 17 Fed Com #516H)	10078.2	58.0	73.0	379805.00	706731.00
Fed Perf 1(Ross Draw 17 Fed Com #516H)	10343.0	2621.7	53.0	382368.00	706711.00
PBHL(Ross Draw 17 Fed Com #516H)	10343.0	7849.7	50.0	387595.00	706708.00



Ross Draw 17 Fed Com #516H/Plan #0.1 RT



## Midland

Eddy County, NM (NAD 83 NME)  
Ross Draw 17 Fed Com  
#516H

OH

Plan: Plan #0.1 RT

## Standard Planning Report

04 September, 2024



## Planning Report

Database:	PEDMB	Local Co-ordinate Reference:	Well #516H
Company:	Midland	TVD Reference:	kb = 26' @ 3273.0usft
Project:	Eddy County, NM (NAD 83 NME)	MD Reference:	kb = 26' @ 3273.0usft
Site:	Ross Draw 17 Fed Com	North Reference:	Grid
Well:	#516H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

Project	Eddy 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		Using geodetic scale factor

Site	Ross Draw 17 Fed Com				
Site Position:		Northing:	379,813.00 usft	Latitude:	32° 2' 34.952 N
From:	Map	Easting:	708,193.00 usft	Longitude:	103° 47' 41.355 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "		

Well	#516H				
Well Position	+N/S	0.0 usft	Northing:	379,747.00 usft	Latitude: 32° 2' 34.374 N
	+E/W	0.0 usft	Easting:	706,658.00 usft	Longitude: 103° 47' 59.193 W
Position Uncertainty	0.0 usft		Wellhead Elevation:	usft	Ground Level: 3,247.0 usft
Grid Convergence:	0.28 °				

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	9/4/2024	6.26	59.59	47,029.60303137

Design	Plan #0.1 RT				
<b>Audit Notes:</b>					
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	0.37

Plan Survey Tool Program	Date	9/4/2024		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.0	17,980.4 Plan #0.1 RT (OH)	EOG MWD+IFR1 MWD + IFR1	



## Planning Report

<b>Database:</b> <b>Company:</b> <b>Project:</b> <b>Site:</b> <b>Well:</b> <b>Wellbore:</b> <b>Design:</b>	PEDMB Midland Eddy County, NM (NAD 83 NME) Ross Draw 17 Fed Com #516H OH Plan #0.1 RT	<b>Local Co-ordinate Reference:</b> <b>TVD Reference:</b> <b>MD Reference:</b> <b>North Reference:</b> <b>Survey Calculation Method:</b>	Well #516H kb = 26' @ 3273.0usft kb = 26' @ 3273.0usft Grid Minimum Curvature
--	---	--	---

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	0.00
1,275.0	0.00	0.00	1,275.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00
1,319.1	0.88	83.83	1,319.1	0.0	0.3	2.00	2.00	0.00	83.83	
6,110.5	0.88	83.83	6,109.9	8.0	73.7	0.00	0.00	0.00	0.00	
6,154.6	0.00	0.00	6,154.0	8.0	74.0	2.00	-2.00	0.00	180.00	
9,866.1	0.00	0.00	9,865.5	8.0	74.0	0.00	0.00	0.00	0.00	KOP(Ross Draw 17 F
10,086.5	26.47	358.85	10,078.2	58.0	73.0	12.01	12.01	-0.52	358.85	FTP(Ross Draw 17 F
10,615.9	90.00	359.59	10,342.9	485.4	68.3	12.00	12.00	0.14	0.82	
12,752.3	90.00	359.59	10,343.0	2,621.7	53.0	0.00	0.00	0.00	0.00	Fed Perf 1(Ross Draw
17,980.4	90.00	0.34	10,343.0	7,849.7	50.0	0.01	0.00	0.01	89.40	PBHL(Ross Draw 17



## Planning Report

<b>Database:</b> PEDMB	<b>Local Co-ordinate Reference:</b>	Well #516H
<b>Company:</b> Midland	<b>TVD Reference:</b>	kb = 26' @ 3273.0usft
<b>Project:</b> Eddy County, NM (NAD 83 NME)	<b>MD Reference:</b>	kb = 26' @ 3273.0usft
<b>Site:</b> Ross Draw 17 Fed Com	<b>North Reference:</b>	Grid
<b>Well:</b> #516H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b> OH		
<b>Design:</b> Plan #0.1 RT		

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
1,275.0	0.00	0.00	1,275.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.50	83.83	1,300.0	0.0	0.1	0.0	2.00	2.00	0.00
1,319.1	0.88	83.83	1,319.1	0.0	0.3	0.0	2.00	2.00	0.00
1,400.0	0.88	83.83	1,400.0	0.2	1.6	0.2	0.00	0.00	0.00
1,500.0	0.88	83.83	1,500.0	0.3	3.1	0.4	0.00	0.00	0.00
1,600.0	0.88	83.83	1,600.0	0.5	4.6	0.5	0.00	0.00	0.00
1,700.0	0.88	83.83	1,700.0	0.7	6.2	0.7	0.00	0.00	0.00
1,800.0	0.88	83.83	1,799.9	0.8	7.7	0.9	0.00	0.00	0.00
1,900.0	0.88	83.83	1,899.9	1.0	9.2	1.1	0.00	0.00	0.00
2,000.0	0.88	83.83	1,999.9	1.2	10.8	1.2	0.00	0.00	0.00
2,100.0	0.88	83.83	2,099.9	1.3	12.3	1.4	0.00	0.00	0.00
2,200.0	0.88	83.83	2,199.9	1.5	13.8	1.6	0.00	0.00	0.00
2,300.0	0.88	83.83	2,299.9	1.7	15.4	1.8	0.00	0.00	0.00
2,400.0	0.88	83.83	2,399.9	1.8	16.9	1.9	0.00	0.00	0.00
2,500.0	0.88	83.83	2,499.9	2.0	18.4	2.1	0.00	0.00	0.00
2,600.0	0.88	83.83	2,599.8	2.2	19.9	2.3	0.00	0.00	0.00
2,700.0	0.88	83.83	2,699.8	2.3	21.5	2.5	0.00	0.00	0.00
2,800.0	0.88	83.83	2,799.8	2.5	23.0	2.6	0.00	0.00	0.00
2,900.0	0.88	83.83	2,899.8	2.7	24.5	2.8	0.00	0.00	0.00
3,000.0	0.88	83.83	2,999.8	2.8	26.1	3.0	0.00	0.00	0.00
3,100.0	0.88	83.83	3,099.8	3.0	27.6	3.2	0.00	0.00	0.00
3,200.0	0.88	83.83	3,199.8	3.1	29.1	3.3	0.00	0.00	0.00
3,300.0	0.88	83.83	3,299.8	3.3	30.7	3.5	0.00	0.00	0.00
3,400.0	0.88	83.83	3,399.8	3.5	32.2	3.7	0.00	0.00	0.00
3,500.0	0.88	83.83	3,499.7	3.6	33.7	3.9	0.00	0.00	0.00
3,600.0	0.88	83.83	3,599.7	3.8	35.3	4.0	0.00	0.00	0.00
3,700.0	0.88	83.83	3,699.7	4.0	36.8	4.2	0.00	0.00	0.00
3,800.0	0.88	83.83	3,799.7	4.1	38.3	4.4	0.00	0.00	0.00
3,900.0	0.88	83.83	3,899.7	4.3	39.8	4.6	0.00	0.00	0.00
4,000.0	0.88	83.83	3,999.7	4.5	41.4	4.7	0.00	0.00	0.00
4,100.0	0.88	83.83	4,099.7	4.6	42.9	4.9	0.00	0.00	0.00
4,200.0	0.88	83.83	4,199.7	4.8	44.4	5.1	0.00	0.00	0.00
4,300.0	0.88	83.83	4,299.6	5.0	46.0	5.3	0.00	0.00	0.00
4,400.0	0.88	83.83	4,399.6	5.1	47.5	5.4	0.00	0.00	0.00
4,500.0	0.88	83.83	4,499.6	5.3	49.0	5.6	0.00	0.00	0.00
4,600.0	0.88	83.83	4,599.6	5.5	50.6	5.8	0.00	0.00	0.00
4,700.0	0.88	83.83	4,699.6	5.6	52.1	6.0	0.00	0.00	0.00
4,800.0	0.88	83.83	4,799.6	5.8	53.6	6.1	0.00	0.00	0.00
4,900.0	0.88	83.83	4,899.6	6.0	55.2	6.3	0.00	0.00	0.00
5,000.0	0.88	83.83	4,999.6	6.1	56.7	6.5	0.00	0.00	0.00
5,100.0	0.88	83.83	5,099.5	6.3	58.2	6.7	0.00	0.00	0.00



## Planning Report

Database:	PEDMB	Local Co-ordinate Reference:	Well #516H
Company:	Midland	TVD Reference:	kb = 26' @ 3273.0usft
Project:	Eddy County, NM (NAD 83 NME)	MD Reference:	kb = 26' @ 3273.0usft
Site:	Ross Draw 17 Fed Com	North Reference:	Grid
Well:	#516H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

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)	
5,200.0	0.88	83.83	5,199.5	6.5	59.7	6.8	0.00	0.00	0.00	0.00
5,300.0	0.88	83.83	5,299.5	6.6	61.3	7.0	0.00	0.00	0.00	0.00
5,400.0	0.88	83.83	5,399.5	6.8	62.8	7.2	0.00	0.00	0.00	0.00
5,500.0	0.88	83.83	5,499.5	7.0	64.3	7.4	0.00	0.00	0.00	0.00
5,600.0	0.88	83.83	5,599.5	7.1	65.9	7.5	0.00	0.00	0.00	0.00
5,700.0	0.88	83.83	5,699.5	7.3	67.4	7.7	0.00	0.00	0.00	0.00
5,800.0	0.88	83.83	5,799.5	7.5	68.9	7.9	0.00	0.00	0.00	0.00
5,900.0	0.88	83.83	5,899.5	7.6	70.5	8.1	0.00	0.00	0.00	0.00
6,000.0	0.88	83.83	5,999.4	7.8	72.0	8.2	0.00	0.00	0.00	0.00
6,100.0	0.88	83.83	6,099.4	7.9	73.5	8.4	0.00	0.00	0.00	0.00
6,110.5	0.88	83.83	6,109.9	8.0	73.7	8.4	0.00	0.00	0.00	0.00
6,154.6	0.00	0.00	6,154.0	8.0	74.0	8.5	2.00	-2.00	0.00	
6,200.0	0.00	0.00	6,199.4	8.0	74.0	8.5	0.00	0.00	0.00	
6,300.0	0.00	0.00	6,299.4	8.0	74.0	8.5	0.00	0.00	0.00	
6,400.0	0.00	0.00	6,399.4	8.0	74.0	8.5	0.00	0.00	0.00	
6,500.0	0.00	0.00	6,499.4	8.0	74.0	8.5	0.00	0.00	0.00	
6,600.0	0.00	0.00	6,599.4	8.0	74.0	8.5	0.00	0.00	0.00	
6,700.0	0.00	0.00	6,699.4	8.0	74.0	8.5	0.00	0.00	0.00	
6,800.0	0.00	0.00	6,799.4	8.0	74.0	8.5	0.00	0.00	0.00	
6,900.0	0.00	0.00	6,899.4	8.0	74.0	8.5	0.00	0.00	0.00	
7,000.0	0.00	0.00	6,999.4	8.0	74.0	8.5	0.00	0.00	0.00	
7,100.0	0.00	0.00	7,099.4	8.0	74.0	8.5	0.00	0.00	0.00	
7,200.0	0.00	0.00	7,199.4	8.0	74.0	8.5	0.00	0.00	0.00	
7,300.0	0.00	0.00	7,299.4	8.0	74.0	8.5	0.00	0.00	0.00	
7,400.0	0.00	0.00	7,399.4	8.0	74.0	8.5	0.00	0.00	0.00	
7,500.0	0.00	0.00	7,499.4	8.0	74.0	8.5	0.00	0.00	0.00	
7,600.0	0.00	0.00	7,599.4	8.0	74.0	8.5	0.00	0.00	0.00	
7,700.0	0.00	0.00	7,699.4	8.0	74.0	8.5	0.00	0.00	0.00	
7,800.0	0.00	0.00	7,799.4	8.0	74.0	8.5	0.00	0.00	0.00	
7,900.0	0.00	0.00	7,899.4	8.0	74.0	8.5	0.00	0.00	0.00	
8,000.0	0.00	0.00	7,999.4	8.0	74.0	8.5	0.00	0.00	0.00	
8,100.0	0.00	0.00	8,099.4	8.0	74.0	8.5	0.00	0.00	0.00	
8,200.0	0.00	0.00	8,199.4	8.0	74.0	8.5	0.00	0.00	0.00	
8,300.0	0.00	0.00	8,299.4	8.0	74.0	8.5	0.00	0.00	0.00	
8,400.0	0.00	0.00	8,399.4	8.0	74.0	8.5	0.00	0.00	0.00	
8,500.0	0.00	0.00	8,499.4	8.0	74.0	8.5	0.00	0.00	0.00	
8,600.0	0.00	0.00	8,599.4	8.0	74.0	8.5	0.00	0.00	0.00	
8,700.0	0.00	0.00	8,699.4	8.0	74.0	8.5	0.00	0.00	0.00	
8,800.0	0.00	0.00	8,799.4	8.0	74.0	8.5	0.00	0.00	0.00	
8,900.0	0.00	0.00	8,899.4	8.0	74.0	8.5	0.00	0.00	0.00	
9,000.0	0.00	0.00	8,999.4	8.0	74.0	8.5	0.00	0.00	0.00	
9,100.0	0.00	0.00	9,099.4	8.0	74.0	8.5	0.00	0.00	0.00	
9,200.0	0.00	0.00	9,199.4	8.0	74.0	8.5	0.00	0.00	0.00	
9,300.0	0.00	0.00	9,299.4	8.0	74.0	8.5	0.00	0.00	0.00	
9,400.0	0.00	0.00	9,399.4	8.0	74.0	8.5	0.00	0.00	0.00	
9,500.0	0.00	0.00	9,499.4	8.0	74.0	8.5	0.00	0.00	0.00	
9,600.0	0.00	0.00	9,599.4	8.0	74.0	8.5	0.00	0.00	0.00	
9,700.0	0.00	0.00	9,699.4	8.0	74.0	8.5	0.00	0.00	0.00	
9,800.0	0.00	0.00	9,799.4	8.0	74.0	8.5	0.00	0.00	0.00	
9,866.1	0.00	0.00	9,865.5	8.0	74.0	8.5	0.00	0.00	0.00	
9,875.0	1.07	358.85	9,874.4	8.1	74.0	8.6	12.01	12.01	0.00	
9,900.0	4.07	358.85	9,899.4	9.2	74.0	9.7	12.01	12.01	0.00	
9,925.0	7.08	358.85	9,924.3	11.6	74.0	12.1	12.01	12.01	0.00	
9,950.0	10.08	358.85	9,949.0	15.4	73.9	15.8	12.01	12.01	0.00	



## Planning Report

Database:	PEDMB	Local Co-ordinate Reference:	Well #516H
Company:	Midland	TVD Reference:	kb = 26' @ 3273.0usft
Project:	Eddy County, NM (NAD 83 NME)	MD Reference:	kb = 26' @ 3273.0usft
Site:	Ross Draw 17 Fed Com	North Reference:	Grid
Well:	#516H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

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)
9,975.0	13.08	358.85	9,973.5	20.4	73.8	20.8	12.01	12.01	0.00
10,000.0	16.08	358.85	9,997.7	26.7	73.7	27.1	12.01	12.01	0.00
10,025.0	19.08	358.85	10,021.5	34.2	73.5	34.7	12.01	12.01	0.00
10,050.0	22.08	358.85	10,044.9	43.0	73.3	43.5	12.01	12.01	0.00
10,075.0	25.09	358.85	10,067.8	53.0	73.1	53.5	12.01	12.01	0.00
10,086.5	26.47	358.85	10,078.2	58.0	73.0	58.5	12.01	12.01	0.00
10,100.0	28.09	358.90	10,090.2	64.2	72.9	64.7	12.00	12.00	0.37
10,125.0	31.09	358.98	10,111.9	76.5	72.7	77.0	12.00	12.00	0.32
10,150.0	34.09	359.05	10,133.0	90.0	72.4	90.5	12.00	12.00	0.27
10,175.0	37.09	359.11	10,153.3	104.5	72.2	105.0	12.00	12.00	0.23
10,200.0	40.09	359.15	10,172.8	120.1	72.0	120.6	12.00	12.00	0.20
10,225.0	43.09	359.20	10,191.5	136.7	71.7	137.2	12.00	12.00	0.17
10,250.0	46.09	359.24	10,209.3	154.3	71.5	154.7	12.00	12.00	0.16
10,275.0	49.09	359.27	10,226.2	172.7	71.3	173.2	12.00	12.00	0.14
10,300.0	52.09	359.30	10,242.1	192.0	71.0	192.5	12.00	12.00	0.13
10,325.0	55.09	359.33	10,256.9	212.1	70.8	212.6	12.00	12.00	0.12
10,350.0	58.09	359.36	10,270.7	233.0	70.5	233.4	12.00	12.00	0.11
10,375.0	61.09	359.39	10,283.3	254.6	70.3	255.0	12.00	12.00	0.10
10,400.0	64.09	359.41	10,294.8	276.7	70.1	277.2	12.00	12.00	0.10
10,425.0	67.08	359.44	10,305.2	299.5	69.8	299.9	12.00	12.00	0.09
10,450.0	70.08	359.46	10,314.3	322.8	69.6	323.2	12.00	12.00	0.09
10,475.0	73.08	359.48	10,322.2	346.5	69.4	346.9	12.00	12.00	0.09
10,500.0	76.08	359.50	10,328.8	370.6	69.2	371.0	12.00	12.00	0.08
10,525.0	79.08	359.52	10,334.2	395.0	69.0	395.4	12.00	12.00	0.08
10,550.0	82.08	359.54	10,338.3	419.7	68.8	420.1	12.00	12.00	0.08
10,575.0	85.08	359.56	10,341.1	444.5	68.6	444.9	12.00	12.00	0.08
10,600.0	88.08	359.58	10,342.6	469.5	68.4	469.9	12.00	12.00	0.08
10,615.9	90.00	359.59	10,342.9	485.4	68.3	485.8	12.00	12.00	0.08
10,700.0	90.00	359.59	10,342.9	569.4	67.7	569.9	0.00	0.00	0.00
10,800.0	90.00	359.59	10,342.9	669.4	67.0	669.9	0.00	0.00	0.00
10,900.0	90.00	359.59	10,342.9	769.4	66.2	769.9	0.00	0.00	0.00
11,000.0	90.00	359.59	10,342.9	869.4	65.5	869.8	0.00	0.00	0.00
11,100.0	90.00	359.59	10,342.9	969.4	64.8	969.8	0.00	0.00	0.00
11,200.0	90.00	359.59	10,342.9	1,069.4	64.1	1,069.8	0.00	0.00	0.00
11,300.0	90.00	359.59	10,342.9	1,169.4	63.4	1,169.8	0.00	0.00	0.00
11,400.0	90.00	359.59	10,342.9	1,269.4	62.7	1,269.8	0.00	0.00	0.00
11,500.0	90.00	359.59	10,342.9	1,369.4	62.0	1,369.8	0.00	0.00	0.00
11,600.0	90.00	359.59	10,342.9	1,469.4	61.2	1,469.8	0.00	0.00	0.00
11,700.0	90.00	359.59	10,342.9	1,569.4	60.5	1,569.8	0.00	0.00	0.00
11,800.0	90.00	359.59	10,342.9	1,669.4	59.8	1,669.8	0.00	0.00	0.00
11,900.0	90.00	359.59	10,342.9	1,769.4	59.1	1,769.8	0.00	0.00	0.00
12,000.0	90.00	359.59	10,342.9	1,869.4	58.4	1,869.8	0.00	0.00	0.00
12,100.0	90.00	359.59	10,343.0	1,969.4	57.7	1,969.7	0.00	0.00	0.00
12,200.0	90.00	359.59	10,343.0	2,069.4	57.0	2,069.7	0.00	0.00	0.00
12,300.0	90.00	359.59	10,343.0	2,169.4	56.2	2,169.7	0.00	0.00	0.00
12,400.0	90.00	359.59	10,343.0	2,269.4	55.5	2,269.7	0.00	0.00	0.00
12,500.0	90.00	359.59	10,343.0	2,369.4	54.8	2,369.7	0.00	0.00	0.00
12,600.0	90.00	359.59	10,343.0	2,469.4	54.1	2,469.7	0.00	0.00	0.00
12,700.0	90.00	359.59	10,343.0	2,569.4	53.4	2,569.7	0.00	0.00	0.00
12,752.3	90.00	359.59	10,343.0	2,621.7	53.0	2,622.0	0.00	0.00	0.00
12,800.0	90.00	359.60	10,343.0	2,669.4	52.7	2,669.7	0.01	0.00	0.01
12,900.0	90.00	359.61	10,343.0	2,769.4	52.0	2,769.7	0.01	0.00	0.01
13,000.0	90.00	359.63	10,343.0	2,869.4	51.3	2,869.7	0.01	0.00	0.01
13,100.0	90.00	359.64	10,343.0	2,969.4	50.7	2,969.7	0.01	0.00	0.01



## Planning Report

<b>Database:</b> PEDMB	<b>Local Co-ordinate Reference:</b>	Well #516H
<b>Company:</b> Midland	<b>TVD Reference:</b>	kb = 26' @ 3273.0usft
<b>Project:</b> Eddy County, NM (NAD 83 NME)	<b>MD Reference:</b>	kb = 26' @ 3273.0usft
<b>Site:</b> Ross Draw 17 Fed Com	<b>North Reference:</b>	Grid
<b>Well:</b> #516H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b> OH		
<b>Design:</b> Plan #0.1 RT		

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)
13,200.0	90.00	359.66	10,343.0	3,069.4	50.1	3,069.6	0.01	0.00	0.01
13,300.0	90.00	359.67	10,343.0	3,169.4	49.5	3,169.6	0.01	0.00	0.01
13,400.0	90.00	359.68	10,343.0	3,269.4	48.9	3,269.6	0.01	0.00	0.01
13,500.0	90.00	359.70	10,343.0	3,369.4	48.4	3,369.6	0.01	0.00	0.01
13,600.0	90.00	359.71	10,343.0	3,469.4	47.9	3,469.6	0.01	0.00	0.01
13,700.0	90.00	359.73	10,343.1	3,569.4	47.4	3,569.6	0.01	0.00	0.01
13,800.0	90.00	359.74	10,343.1	3,669.4	46.9	3,669.6	0.01	0.00	0.01
13,900.0	90.00	359.76	10,343.1	3,769.4	46.5	3,769.6	0.01	0.00	0.01
14,000.0	90.00	359.77	10,343.1	3,869.4	46.1	3,869.6	0.01	0.00	0.01
14,100.0	90.00	359.78	10,343.1	3,969.4	45.7	3,969.6	0.01	0.00	0.01
14,200.0	90.00	359.80	10,343.1	4,069.4	45.3	4,069.6	0.01	0.00	0.01
14,300.0	90.00	359.81	10,343.1	4,169.4	45.0	4,169.6	0.01	0.00	0.01
14,400.0	90.00	359.83	10,343.1	4,269.4	44.7	4,269.6	0.01	0.00	0.01
14,500.0	90.00	359.84	10,343.1	4,369.4	44.4	4,369.6	0.01	0.00	0.01
14,600.0	90.00	359.86	10,343.1	4,469.4	44.1	4,469.6	0.01	0.00	0.01
14,700.0	90.00	359.87	10,343.1	4,569.4	43.9	4,569.6	0.01	0.00	0.01
14,800.0	90.00	359.89	10,343.1	4,669.4	43.7	4,669.6	0.01	0.00	0.01
14,900.0	90.00	359.90	10,343.1	4,769.4	43.5	4,769.6	0.01	0.00	0.01
15,000.0	90.00	359.91	10,343.1	4,869.4	43.3	4,869.5	0.01	0.00	0.01
15,100.0	90.00	359.93	10,343.1	4,969.4	43.2	4,969.5	0.01	0.00	0.01
15,200.0	90.00	359.94	10,343.1	5,069.4	43.1	5,069.5	0.01	0.00	0.01
15,300.0	90.00	359.96	10,343.1	5,169.4	43.0	5,169.5	0.01	0.00	0.01
15,400.0	90.00	359.97	10,343.1	5,269.4	42.9	5,269.5	0.01	0.00	0.01
15,500.0	90.00	359.99	10,343.1	5,369.4	42.9	5,369.5	0.01	0.00	0.01
15,600.0	90.00	0.00	10,343.1	5,469.4	42.9	5,469.5	0.01	0.00	0.01
15,700.0	90.00	0.02	10,343.1	5,569.4	42.9	5,569.5	0.01	0.00	0.01
15,800.0	90.00	0.03	10,343.1	5,669.4	42.9	5,669.5	0.01	0.00	0.01
15,900.0	90.00	0.04	10,343.1	5,769.4	43.0	5,769.5	0.01	0.00	0.01
16,000.0	90.00	0.06	10,343.1	5,869.4	43.1	5,869.5	0.01	0.00	0.01
16,100.0	90.00	0.07	10,343.1	5,969.4	43.2	5,969.5	0.01	0.00	0.01
16,200.0	90.00	0.09	10,343.1	6,069.4	43.3	6,069.5	0.01	0.00	0.01
16,300.0	90.00	0.10	10,343.1	6,169.4	43.5	6,169.5	0.01	0.00	0.01
16,400.0	90.00	0.12	10,343.1	6,269.4	43.7	6,269.5	0.01	0.00	0.01
16,500.0	90.00	0.13	10,343.1	6,369.4	43.9	6,369.5	0.01	0.00	0.01
16,600.0	90.00	0.14	10,343.1	6,469.4	44.1	6,469.5	0.01	0.00	0.01
16,700.0	90.00	0.16	10,343.1	6,569.4	44.4	6,569.5	0.01	0.00	0.01
16,800.0	90.00	0.17	10,343.1	6,669.4	44.7	6,669.5	0.01	0.00	0.01
16,900.0	90.00	0.19	10,343.1	6,769.4	45.0	6,769.5	0.01	0.00	0.01
17,000.0	90.00	0.20	10,343.1	6,869.4	45.3	6,869.5	0.01	0.00	0.01
17,100.0	90.00	0.22	10,343.1	6,969.4	45.7	6,969.5	0.01	0.00	0.01
17,200.0	90.00	0.23	10,343.0	7,069.4	46.1	7,069.5	0.01	0.00	0.01
17,300.0	90.00	0.25	10,343.0	7,169.4	46.5	7,169.5	0.01	0.00	0.01
17,400.0	90.00	0.26	10,343.0	7,269.4	47.0	7,269.5	0.01	0.00	0.01
17,500.0	90.00	0.27	10,343.0	7,369.4	47.4	7,369.5	0.01	0.00	0.01
17,600.0	90.00	0.29	10,343.0	7,469.4	47.9	7,469.5	0.01	0.00	0.01
17,700.0	90.00	0.30	10,343.0	7,569.4	48.4	7,569.5	0.01	0.00	0.01
17,800.0	90.00	0.32	10,343.0	7,669.4	49.0	7,669.5	0.01	0.00	0.01
17,900.0	90.00	0.33	10,343.0	7,769.4	49.5	7,769.5	0.01	0.00	0.01
17,980.4	90.00	0.34	10,343.0	7,849.7	50.0	7,849.9	0.01	0.00	0.01



## Planning Report

<b>Database:</b> <b>Company:</b> <b>Project:</b> <b>Site:</b> <b>Well:</b> <b>Wellbore:</b> <b>Design:</b>	PEDMB Midland Eddy County, NM (NAD 83 NME) Ross Draw 17 Fed Com #516H OH Plan #0.1 RT	<b>Local Co-ordinate Reference:</b> <b>TVD Reference:</b> <b>MD Reference:</b> <b>North Reference:</b> <b>Survey Calculation Method:</b>	Well #516H kb = 26' @ 3273.0usft kb = 26' @ 3273.0usft Grid Minimum Curvature
--	---	--	---

Design Targets										
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/S (usft)	+E/W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
KOP(Ross Draw 17 Fed - plan hits target center - Point		0.00	0.00	9,865.5	8.0	74.0	379,755.00	706,732.00	32° 2' 34.450 N	103° 47' 58.333 W
FTP(Ross Draw 17 Fed - plan hits target center - Point		0.00	0.00	10,078.2	58.0	73.0	379,805.00	706,731.00	32° 2' 34.945 N	103° 47' 58.341 W
PBHL(Ross Draw 17 Fe - plan hits target center - Point		0.00	0.00	10,343.0	7,849.7	50.0	387,595.00	706,708.00	32° 3' 52.035 N	103° 47' 58.161 W
Fed Perf 1(Ross Draw 1 - plan hits target center - Point		0.00	0.00	10,343.0	2,621.7	53.0	382,368.00	706,711.00	32° 3' 0.309 N	103° 47' 58.427 W

10.750 40.50/0.350 J55

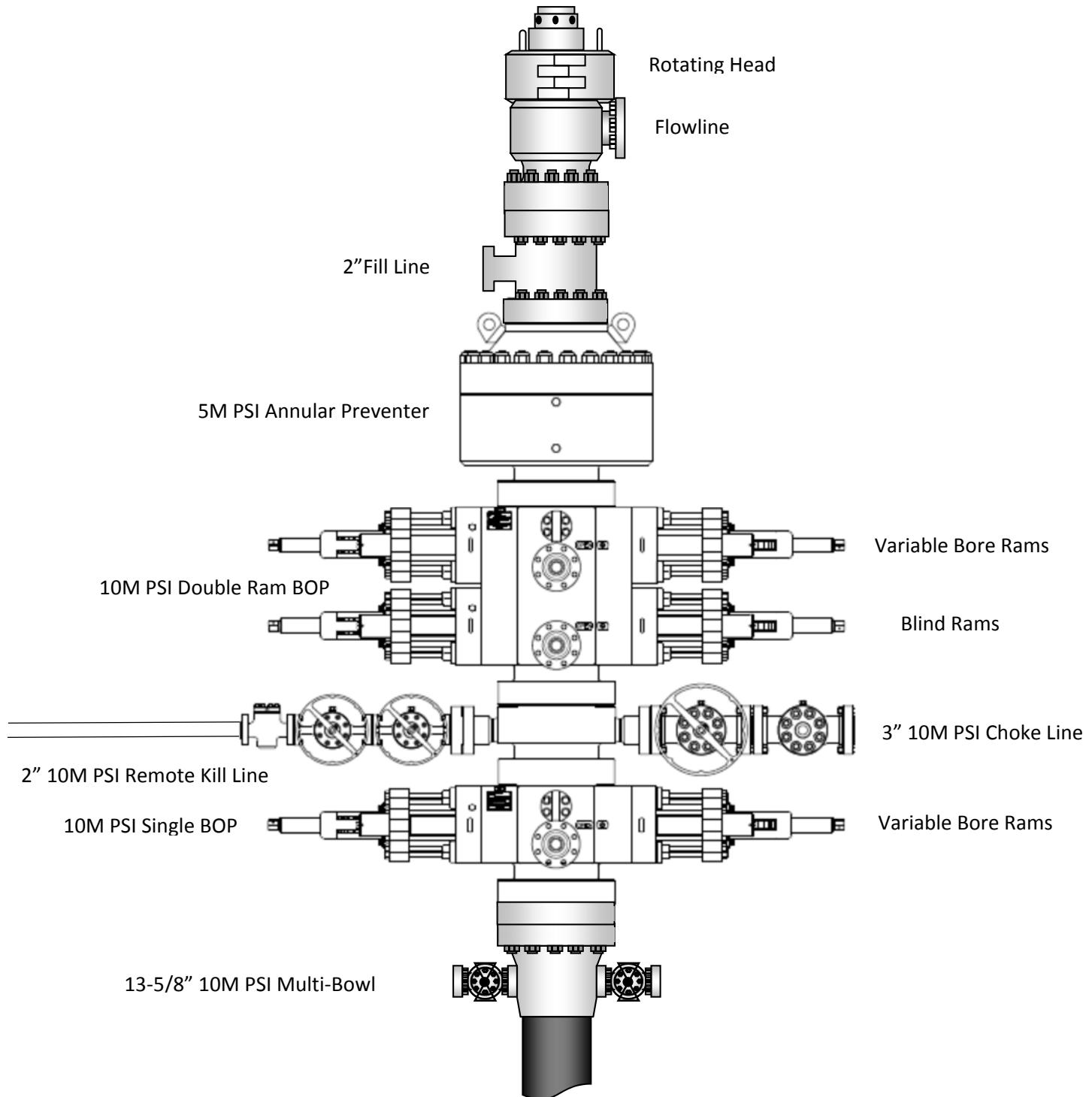
PDF

[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
Released to Imaging: 12/8/2025 12:55:55 PM		--	--	--	5,250	ft-lbs
Maximum Make-Up Torque		--	--	--	--	

Exhibit 1  
EOG Resources  
13-5/8" 10M PSI BOP Stack







## 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 <sup>2</sup>
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 Internal Pressure:	3,930 psi	Min:	2,793
STC Joint Strength:	372 kips	Opti:	3,724
STC Performance		Max:	
STC Internal Pressure:	3,930 psi	4,655	
LTC Performance		LTC Torque (ft-lbs)	
LTC Internal Pressure:	3,930 psi	Min:	3,130
LTC Joint Strength:	417 kips	Opti:	4,174
SC-BTC Performance - Cplg OD = 9.125"		Max:	
SC-BTC Internal Pressure:	3,930 psi	5,217	
BTC Internal Pressure:		BTC Torque (ft-lbs)	
BTC Internal Pressure:	3,930 psi	follow API guidelines regarding positional make up	
BTC Joint Strength:	503 kips		

\*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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## 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	P110EC	7.796	87.5

Material Properties (PE)	
Pipe	
Minimum Yield Strength:	125 ksi
Maximum Yield Strength:	140 ksi
Minimum Tensile Strength:	135 ksi
Coupling	
Minimum Yield Strength:	125 ksi
Maximum Yield Strength:	140 ksi
Minimum Tensile Strength:	135 ksi

Pipe Body Data (PE)	
Geometry	
Nominal ID:	7.92 inch
Nominal Area:	9.149 in <sup>2</sup>
*Special/Alt. Drift:	7.875 inch
Performance	
Pipe Body Yield Strength:	1,144 kips
Collapse Resistance:	4,000 psi
Internal Yield Pressure: (API Historical)	8,930 psi

**THIS SIZE/GRADE IS NOT VALIDATED BY API TO HAVE AN API CONNECTION**

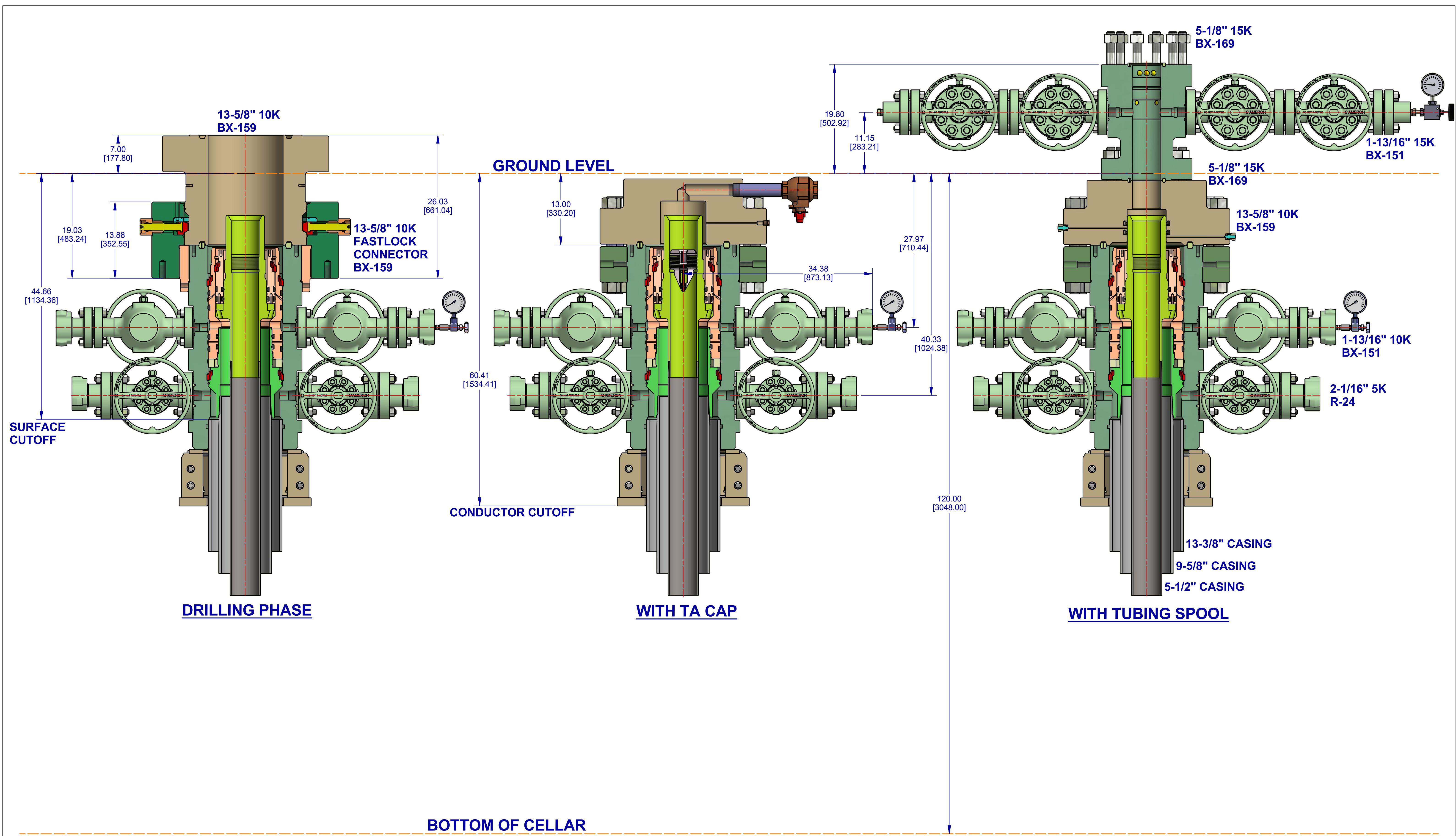
API Connection Data	
Coupling OD: 9.625"	
STC Performance	
STC Internal Pressure:	8,930 psi
STC Joint Strength:	793 kips
LTC Performance	
LTC Internal Pressure:	8,930 psi
LTC Joint Strength:	887 kips
SC-BTC Performance - Cplg OD = 9.125"	
BTC Internal Pressure:	6,340 psi
BTC Joint Strength:	1,120 kips

API Connection Torque			
STC Torque (ft-lbs)			
Min:	5,948	Opti:	7,930
Max:	9,913		
LTC Torque (ft-lbs)			
Min:	6,653	Opti:	8,870
Max:	11,088		
BTC Torque (ft-lbs)			
follow API guidelines regarding positional make up			

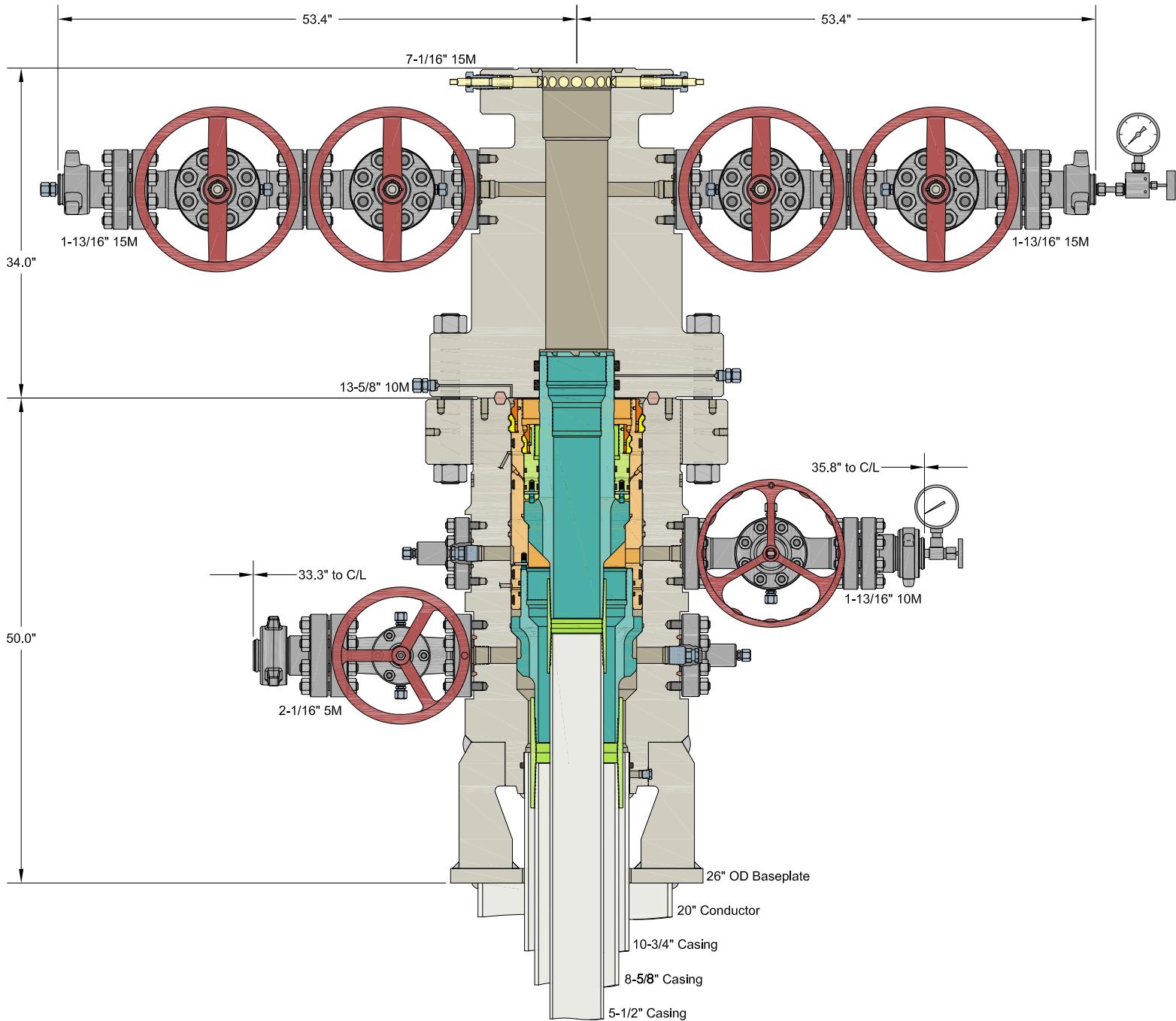
\*Alt. Drift will be used unless API Drift is specified on order.

\*\*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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CONFIDENTIAL									
DESIGNED IN INCHES		MACHINING TOLERANCES UNLESS OTHERWISE SPECIFIED		DO NOT SCALE		CAMERON		SURFACE SYSTEMS	
DIMENSIONAL UNITS		INCHES [MILLIMETERS]		X [0.1]		ANGLES		CHECKED BY: KEN REED DATE: 6 Nov 18	
MACHINED FILLET RADII: 0.15-0.60 [3.81-15.24] BREAK ALL SHARP EDGES: 0.1-0.3 [0.2-0.8] RADII OR 45°. SURFACE FINISHES: 125-250 RA. INTERPROF DRAWING PER ASME Y14.5, ASME Y14.36, AND AWS A2.4 STANDARDS. SEE BIM FOR MATERIAL AND SPECIAL REQUIREMENTS. ITEM NUMBERS NOT APPEARING ON BIM DO NOT APPLY.	THIRD ANGLE	± [ ]	± [ ]	XX [0.X]	XX [0.X]	RA [ ]	RA [ ]	APPROVED BY: PA DATE: 6 Nov 18	APPROVER NAME: EWR:650353762 DATE: 6 Nov 18
		XXX [0.XXX]	XXX [0.XXX]	✓	✓	ALL MACHINED SURFACES	ESTIMATED WEIGHT: 8147.2 LBS INITIAL USE BIM: 3695.5 KG		



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ALL DIMENSIONS APPROXIMATE

## CACTUS WELLHEAD LLC

10-3/4" x 8-5/8" x 5-1/2" MBU-3T-SF-SOW Wellhead System  
With 8-5/8" & 5-1/2" Pin Bottom Mandrel Casing Hangers  
And 13-5/8" 10M x 7-1/16" 15M CTH-DBLHPS Tubing Head

## EOG RESOURCES

DRAWN	DLE	14APR21
APPRV		
DRAWING NO.		SDT-3141

## BLM: Waste Management Plan

### Eddy County

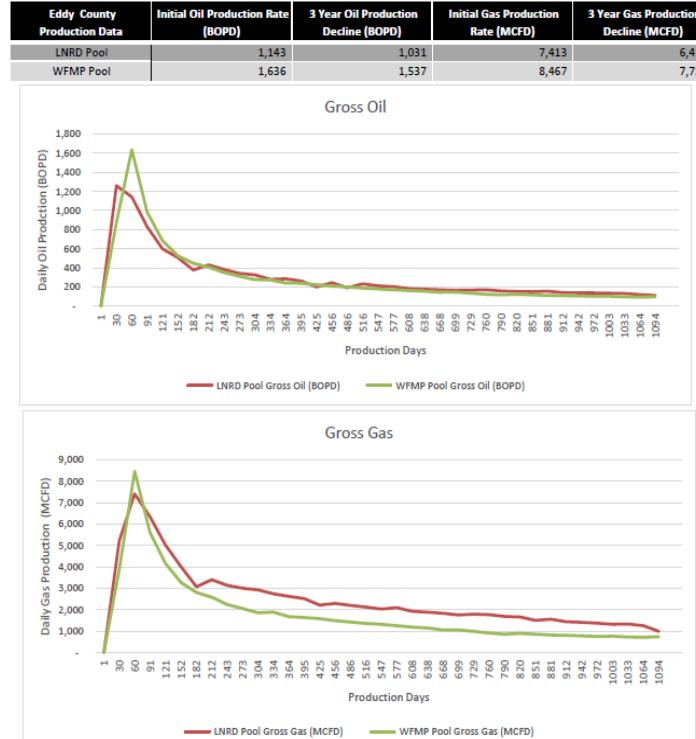
#### 43 CFR 3162.3-1(j)

##### (1) initial oil production estimates and decline

##### (2) initial gas production estimates and decline

The charts below illustrate the requested anticipated production decline over the first three years of gas and oil production.

Production Days	LNRD Pool Gross Oil (BOPD)	LNRD Pool Gross Gas (MCFD)	WFMP Pool Gross Oil (BOPD)	WFMP Pool Gross Gas (MCFD)
1	-	-	-	-
30	1,260	5,219	874	3,900
60	1,143	7,413	1,636	8,467
91	830	6,341	984	5,605
121	600	5,027	687	4,169
152	509	4,009	525	3,277
182	380	3,076	448	2,915
212	433	3,410	409	2,592
243	386	3,142	351	2,252
273	343	3,015	315	2,066
304	328	2,935	278	1,870
334	281	2,755	274	1,897
364	288	2,626	242	1,688
395	265	2,525	239	1,646
425	202	2,219	225	1,584
456	245	2,301	209	1,500
486	193	2,204	202	1,435
516	233	2,134	190	1,370
547	213	2,032	182	1,324
577	203	2,101	173	1,255
608	185	1,934	163	1,201
638	179	1,891	156	1,150
668	172	1,843	145	1,065
699	166	1,759	147	1,069
729	169	1,800	137	995
760	171	1,775	125	925
790	159	1,691	118	873
820	155	1,669	123	900
851	152	1,515	118	864
881	157	1,562	113	829
912	143	1,449	110	816
942	139	1,417	107	792
972	139	1,374	103	762
1003	136	1,334	104	776
1033	132	1,344	97	731
1064	121	1,266	96	726
1094	112	1,000	99	747



##### (3) certification that the operator has an executed gas sales contract to sell 100 percent of the produced oil-well gas

In accordance with the requirements set forth in 43 CFR subpart 3178, we hereby certify that we have entered into sales contracts to sell 100% of the produced oil-well gas, less the gas anticipated for use on-lease pursuant to 43 CFR Subpart 3178.

##### (4) any other information demonstrating the operator's plans to avoid the waste of gas.

In an effort to avoid the waste of gas production, EOG Resources utilizes the following equipment/procedures as part of its facilities and operations:

- Instrument Air Compressors
- Wellhead Autochokes
- iSense Continuous Leak Detection
- Tank Vapor Capture
- Audio, Visual, & Olfactory (AVO) Inspections
- Optical Gas Imaging (OGI) Inspections
- High- & Low-Pressure Gas Capture Tracking
- Vapor Recovery Unit Monitoring



### EOG Batch Casing

**Pad Name:** Ross Draw 17 Fed Com SHALLOW

SHL: Section 17, Township 26-S, Range 31-E, EDDY County, NM

EOG requests for the below wells to be approved for all designs listed in the Blanket Casing Design ('EOG BLM Variance 5a - Alternate Shallow Casing Designs.pdf' OR 'EOG BLM Variance 5b - Alternate Deep Casing Designs.pdf') document. The MDs and TVDs for all intervals are within the boundary conditions. The max inclination and DLS are also within the boundary conditions. The directional plans for the wells are attached separately.

Well Name	API #	Surface		Intermediate		Production	
		MD	TVD	MD	TVD	MD	TVD
Ross Draw 17 Fed Com #110H	30-025-*****	1,124	1,124	3,754	3,521	16,171	8,330
Ross Draw 17 Fed Com #111H	30-025-*****	1,124	1,124	3,572	3,521	16,018	8,330
Ross Draw 17 Fed Com #209H	30-025-*****	1,124	1,124	3,557	3,521	16,070	8,400
Ross Draw 17 Fed Com #210H	30-025-*****	1,124	1,124	3,836	3,521	16,303	8,400
Ross Draw 17 Fed Com #211H	30-025-*****	1,124	1,124	3,535	3,521	16,053	8,400
Ross Draw 17 Fed Com #506H	30-025-*****	1,124	1,124	3,542	3,521	17,231	9,575
Ross Draw 17 Fed Com #507H	30-025-*****	1,124	1,124	3,528	3,521	17,219	9,575
Ross Draw 17 Fed Com #508H	30-025-*****	1,124	1,124	3,571	3,521	17,260	9,575
Ross Draw 17 Fed Com #509H	30-025-*****	1,124	1,124	3,522	3,521	17,213	9,575
Ross Draw 17 Fed Com #510H	30-025-*****	1,124	1,124	3,527	3,521	17,219	9,575
Ross Draw 17 Fed Com #511H	30-025-*****	1,124	1,124	3,531	3,521	17,223	9,575
Ross Draw 17 Fed Com #512H	30-025-*****	1,124	1,124	3,544	3,521	17,236	9,575
Ross Draw 17 Fed Com #513H	30-025-*****	1,124	1,124	3,577	3,521	17,267	9,575
Ross Draw 17 Fed Com #514H	30-025-*****	1,124	1,124	3,529	3,521	17,987	10,343
Ross Draw 17 Fed Com #515H	30-025-*****	1,124	1,124	3,531	3,521	17,990	10,343
Ross Draw 17 Fed Com #516H	30-025-*****	1,124	1,124	3,522	3,521	17,980	10,343
Ross Draw 17 Fed Com #517H	30-025-*****	1,124	1,124	3,530	3,521	17,990	10,343
Ross Draw 17 Fed Com #518H	30-025-*****	1,124	1,124	3,582	3,521	18,040	10,343
Ross Draw 17 Fed Com #521H	30-025-*****	1,124	1,124	3,539	3,521	18,155	10,502
Ross Draw 17 Fed Com #522H	30-025-*****	1,124	1,124	3,539	3,521	18,155	10,502
Ross Draw 17 Fed Com #523H	30-025-*****	1,124	1,124	3,537	3,521	18,155	10,502
Ross Draw 17 Fed Com #524H	30-025-*****	1,124	1,124	3,560	3,521	18,177	10,502
Ross Draw 17 Fed Com #525H	30-025-*****	1,124	1,124	3,541	3,521	18,161	10,502



## EOG Batch Casing

### Variances

EOG requests the additional variance(s) in the attached document(s):

- EOG BLM Variance 2a - Intermediate Bradenhead Cement
- EOG BLM Variance 3a\_b - BOP Break-test and Offline Intermediate Cement
- EOG BLM Variance 4a - Salt Section Annular Clearance
- EOG BLM Variance 5a - Alternate Shallow Casing Designs



## EOG Batch Casing

### GEOLOGIC NAME OF SURFACE FORMATION:

Permian

### ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:

Rustler	1,008'
Tamarisk Anhydrite	1,099'
Top of Salt	1,361'
Base of Salt	3,421'
Lamar	3,721'
Bell Canyon	3,975'
Cherry Canyon	4,894'
Brushy Canyon	6,154'
Bone Spring Lime	7,867'
Leonard (Avalon) Shale	7,998'
1st Bone Spring Sand	8,849'
2nd Bone Spring Shale	9,100'
2nd Bone Spring Sand	9,510'
3rd Bone Spring Carb	10,010'
3rd Bone Spring Sand	10,771'
Wolfcamp	11,164'

### ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:

Upper Permian Sands	0- 400'	Fresh Water
Bell Canyon	3,975'	Oil
Cherry Canyon	4,894'	Oil
Brushy Canyon	6,154'	Oil
Leonard (Avalon) Shale	7,998'	Oil
1st Bone Spring Sand	8,849'	Oil
2nd Bone Spring Shale	9,100'	Oil
2nd Bone Spring Sand	9,510'	Oil

No other Formations are expected to give up oil, gas or fresh water in measurable quantities. Surface fresh water sands will be protected by setting surface casing at 1,130' and circulating cement back to surface.



## Ross Draw 17 Fed Com 516H

### 1. GEOLOGIC NAME OF SURFACE FORMATION:

Permian

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

Rustler	1,008'
Tamarisk Anhydrite	1,099'
Top of Salt	1,361'
Base of Salt	3,421'
Lamar	3,721'
Bell Canyon	3,975'
Cherry Canyon	4,894'
Brushy Canyon	6,154'
Bone Spring Lime	7,867'
Leonard (Avalon) Shale	7,998'
1st Bone Spring Sand	8,849'
2nd Bone Spring Shale	9,100'
2nd Bone Spring Sand	9,510'
3rd Bone Spring Carb	10,010'
3rd Bone Spring Sand	10,771'
Wolfcamp	11,164'
TD	10,343'

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

Upper Permian Sands	0- 400'	Fresh Water
Bell Canyon	3,975'	Oil
Cherry Canyon	4,894'	Oil
Brushy Canyon	6,154'	Oil
Leonard (Avalon) Shale	7,998'	Oil
1st Bone Spring Sand	8,849'	Oil
2nd Bone Spring Shale	9,100'	Oil
2nd Bone Spring Sand	9,510'	Oil

No other Formations are expected to give up oil, gas or fresh water in measurable quantities. Surface fresh water sands will be protected by setting 10-3/4" casing at 1,130' and circulating cement back to surface.



## Ross Draw 17 Fed Com 516H

## 4. CASING PROGRAM

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
13"	0	1,124	0	1,124	10-3/4"	40.5#	J-55	STC
9-7/8"	0	3,522	0	3,521	8-5/8"	32#	J-55	BTC-SC
7-7/8"	0	9,766	0	9,766	6"	24.5#	P110-EC	VAM Sprint-TC
6-3/4"	9,766	17,980	9,766	10,343	5-1/2"	20#	P110-EC	VAM Sprint SF

\*\*For highlighted rows above, variance is requested to run entire string of either 6" or 5-1/2" casing string above due to availability.

Hole will be full during casing run for well control and tensile SF factor. Casing will be kept at least half full during run for this design to meet BLM collapse SF requirement. External pressure will be reviewed prior to conducting casing pressure tests to ensure that 70% of the yield is not exceeded.

Variance is requested to waive the centralizer requirements for the 8-5/8" casing in the 9-7/8" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 9-7/8" hole interval to maximize cement bond and zonal isolation.

Variance is also requested to waive any centralizer requirements for the 6" and 5-1/2" casings in the 7-7/8" and 6-3/4" hole sizes. An expansion additive will be utilized in the cement slurry for the entire length of the 7-7/8" and 6-3/4" hole intervals 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 Title 43 CFR Part 3170 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.

## 5. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
1,130' 10-3/4"	260	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	120	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 930')
3,530' 8-5/8"	220	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	100	14.8	1.32	Tail: Class C + 10% NaCL + 3% MagOx (TOC @ 2817')
17,980' 6"	1000	14.8	1.32	Bradenhead squeeze: Class C + 3% Salt + 1% PreMag-M + 6% Bentonite Gel (TOC @ surface)
	1400	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 @ 6160')



## Ross Draw 17 Fed Com 516H

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

Cement integrity tests will be performed immediately following plug bump.

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.

EOG requests variance from minimum standards to pump a two stage cement job on the 6" and 5-1/2" production casing strings with the first stage being pumped conventionally with the calculated top of cement at the Brushy Canyon (6,154') and the second stage performed as a 1000 sack bradenhead squeeze with planned cement from the Brushy Canyon to surface. If necessary, a top out consisting of 400 sacks of Class C cement + 3% Salt + 1% PreMag-M + 6% Bentonite Gel (1.32 yld, 14.8 ppg) will be executed as a contingency. Top will be verified by Echo-meter.

Bradenhead will be the primary option for production cementing. EOG also requests to have the conventional option in place to accommodate for logistical or wellbore conditions. The tie back requirements will be met if the cement is pumped conventionally, and cement volumes will be adjusted accordingly. TOC will be verified by CBL.



## Ross Draw 17 Fed Com 516H

### 6. MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL:

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

The minimum blowout preventer equipment (BOPE) shown in Exhibit #1 will consist of a single ram, mud cross and double ram-type (10,000 psi WP) preventer and an annular preventer (5,000-psi WP). Both units will be hydraulically operated and the ram-type will be equipped with blind rams on bottom and drill pipe rams on top. All BOPE will be tested in accordance with Onshore Oil & Gas order No. 2.

EOG will utilize wing unions on BOPE connections that can be isolated from wellbore pressure through means of a choke. All wing unions will be rated to a pressure that meets or exceeds the pressure rating of the BOPE system.

Variance is requested to use a 5,000 psi annular BOP with the 10,000 psi BOP stack.

Before drilling out of the surface casing, the ram-type BOP and accessory equipment will be tested to 10,000/ 250 psig and the annular preventer to 5,000/ 250 psig.

Pipe rams and blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

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

### 7. TYPES AND CHARACTERISTICS OF THE PROPOSED MUD SYSTEM:

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

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

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0 – 1,130'	Fresh - Gel	8.6-8.8	28-34	N/c
1,130' – 3,320'	Brine	9-10.5	28-34	N/c
3,530' – 17,980' Lateral	Oil Base	8.8-9.5	58-68	N/c - 6

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

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

**Ross Draw 17 Fed Com 516H****8. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT:**

- (A) A kelly cock will be kept in the drill string at all times.
- (B) A full opening drill pipe-stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times.
- (C) H2S monitoring and detection equipment will be utilized from surface casing point to TD.

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

- (A) Open-hole logs are not planned for this well.
- (B) GR-CCL will be run in cased hole during completions phase of operations.

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

The estimated bottom-hole temperature (BHT) at TD is 173 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 4,841 psig and a maximum anticipated surface pressure of 2,565 psig (based on 9.0 ppg MW). No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported or are known to exist at this depth in this area. Severe loss circulation is expected from 6,154' to intermediate casing point.

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

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

EOG Resources requests the option to contract a Surface Rig to drill, set surface casing, and Cement on the subject well. After WOC 8 hours or 500 psi compressive strength (whichever is greater), the Surface Rig will move off so the wellhead can be installed. A welder will cut the casing to the proper height and weld on the wellhead (both "A" and "B" sections). The weld will be tested to 1,500 psi. All valves will be closed and a wellhead cap will be installed (diagram attached). If the timing between rigs is such that EOG Resources would not be able to preset the surface, the Primary Rig will MIRU and drill the well in its entirety per the APD.

**Ross Draw 17 Fed Com 516H****12. WELLHEAD:**

A multi-bowl wellhead system will be utilized.

After running the surface casing, a BOP/BOPE system with a minimum working pressure of 10,000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 10,000 psi pressure test. This pressure test will be repeated at least every 30 days, as per Title 43 CFR Part 3170.

The minimum working pressure of the BOP and related BOPE required for drilling below the surface casing shoe shall be 10,000 psi.

The multi-bowl wellhead will be installed by vendor's representative(s). A copy of the installation instructions for the Cactus Multi-Bowl WH system has been sent to the NM BLM office in Carlsbad, NM.

The wellhead will be installed by a third party welder while being monitored by WH vendor's representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. EOG Resources reserves the option to conduct BOPE testing during wait on cement periods provided a test plug is utilized.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

Casing strings will be tested as per Title 43 CFR Part 3170 to at least 0.22 psi/ft or 1,500 psi, whichever is greater.

**13. VARIANCE REQUESTS:**

EOG requests the additional variance(s) in the attached document(s):

- EOG BLM Variance 3a\_b - BOP Break-test and Offline Intermediate Cement
- EOG BLM Variance 4a - Salt Section Annular Clearance
- EOG BLM Variance 5a - Alternate Shallow Casing Designs

**eog resources**  
Ross Draw 17 Fed Com 516H**14. TUBING REQUIREMENTS:**

EOG respectively requests an exception to the following NMOCD rule:

- 19.15.16.10 Casing AND TUBING REQUIREMENTS:

J (3): "The operator shall set tubing as near the bottom as practical and tubing perforations shall not be more than 250 feet above top of pay zone."

With horizontal flowing and gas lifted wells an end of tubing depth placed at or slightly above KOP is a conservative way to ensure the tubing stays clean from debris, plugging, and allows for fewer well interventions post offset completion. The deeper the tubulars are run into the curve, the higher the probability is that the tubing will become stuck in sand and or well debris as the well produces over time. An additional consideration for EOT placement during artificial lift installations is avoiding the high dog leg severity and inclinations found in the curve section of the wellbore to help improve reliability and performance. Dog leg severity and inclinations tend not to hamper gas lifted or flowing wells, but they do effect other forms of artificial lift like rod pump or ESP (electric submersible pump). Keeping the EOT above KOP is an industry best practice for those respective forms of artificial lift.



## Ross Draw 17 Fed Com 516H

2621' FNL  
2458' FEL  
Section 17  
T-26-S, R-31-E

**Proposed Wellbore**  
API: 30-025-\*\*\*\*\*

KB: 3272'  
GL: 3247'

**Bit Size: 13"**  
**10-3/4", 40.5#, J-55, STC**  
**@ 0' - 1,124'**

**Bit Size: 9-7/8"**  
**8-5/8", 32.#, J-55, BTC-SC**  
**@ 0' - 3,522'**

**Bit Size: 7-7/8" | Bit Size: 6-3/4"**  
**6", 24.5#, P110-EC, VAM Sprint-TC**  
**@ 0' - 9,766'**

**5-1/2", 20.#, P110-EC, VAM Sprint SF**  
**@ 9,766' - 17,980'**

**KOP: 9,866' MD, 9,866' TVD**  
**EOC: 10,616' MD, 10,343' TVD**

If production Bradenhead is performed, TOC will be at surface  
TOC @ 3,022', if performed conventionally.

Lateral: 17,980' MD, 10,343' TVD  
Upper Most Perf:  
2563' FNL & 2384' FEL Sec. 17  
Lower Most Perf:  
100' FNL & 2384' FEL Sec. 8  
BH Location: 100' FNL & 2384' FEL Sec. 8, T-26-S, R-31-E

**Ross Draw 17 Fed Com 516H API #: 30-025-\*\*\*\*\* Variances**

EOG respectfully requests the below variances to be applied to the above well:

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

- Variance is also requested to waive the centralizer requirements for the production casing in the production hole. An expansion additive will be utilized, in the cement slurry, for the entire length of the production interval to maximize cement bond and zonal isolation.

- Bradenhead will be the primary option for production cementing. EOG also requests to have the conventional option in place to accommodate for logistical or wellbore conditions. The tie back requirements will be met if the cement is pumped conventionally, and cement volumes will be adjusted accordingly. TOC will be verified by CBL.

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

- Variance is requested to use a 5,000 psi annular BOP with the 10,000 psi BOP stack.

- EOG Resources requests the option to contract a Surface Rig to drill, set surface casing, and Cement on the subject well. After WOC 8 hours or 500 psi compressive strength (whichever is greater), the Surface Rig will move off so the wellhead can be installed. A welder will cut the casing to the proper height and weld on the wellhead (both "A" and "B" sections). The weld will be tested to 1,500 psi. All valves will be closed and a wellhead cap will be installed (diagram attached). If the timing between rigs is such that EOG Resources would not be able to preset the surface, the Primary Rig will MIRU and drill the well in its entirety per the APD.

EOG requests the additional variance(s) in the attached document(s):

- EOG BLM Variance 2a - Inermediate Bradenhead Cement
- EOG BLM Variance 3a\_b - BOP Break-test and Offline Intermediate Cement
- EOG BLM Variance 3c - Shallow Target Production Offline Bradenhead Cement
- EOG BLM Variance 4a - Salt Section Annular Clearance
- EOG BLM Variance 5a - Alternate Shallow Casing Designs

Exhibit 4  
EOG Resources  
Ross Draw 17 Fed Com #516H

Well Site Diagram

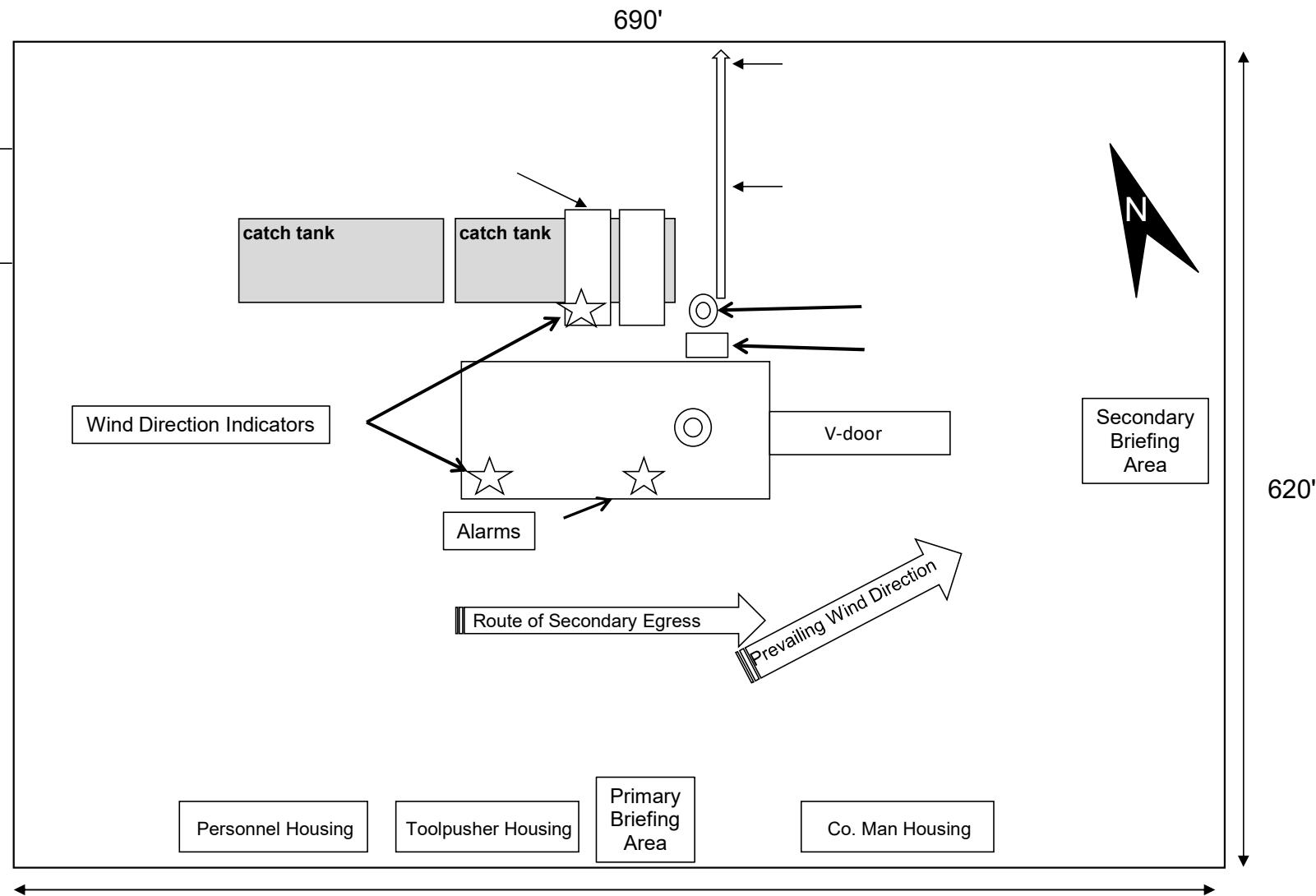
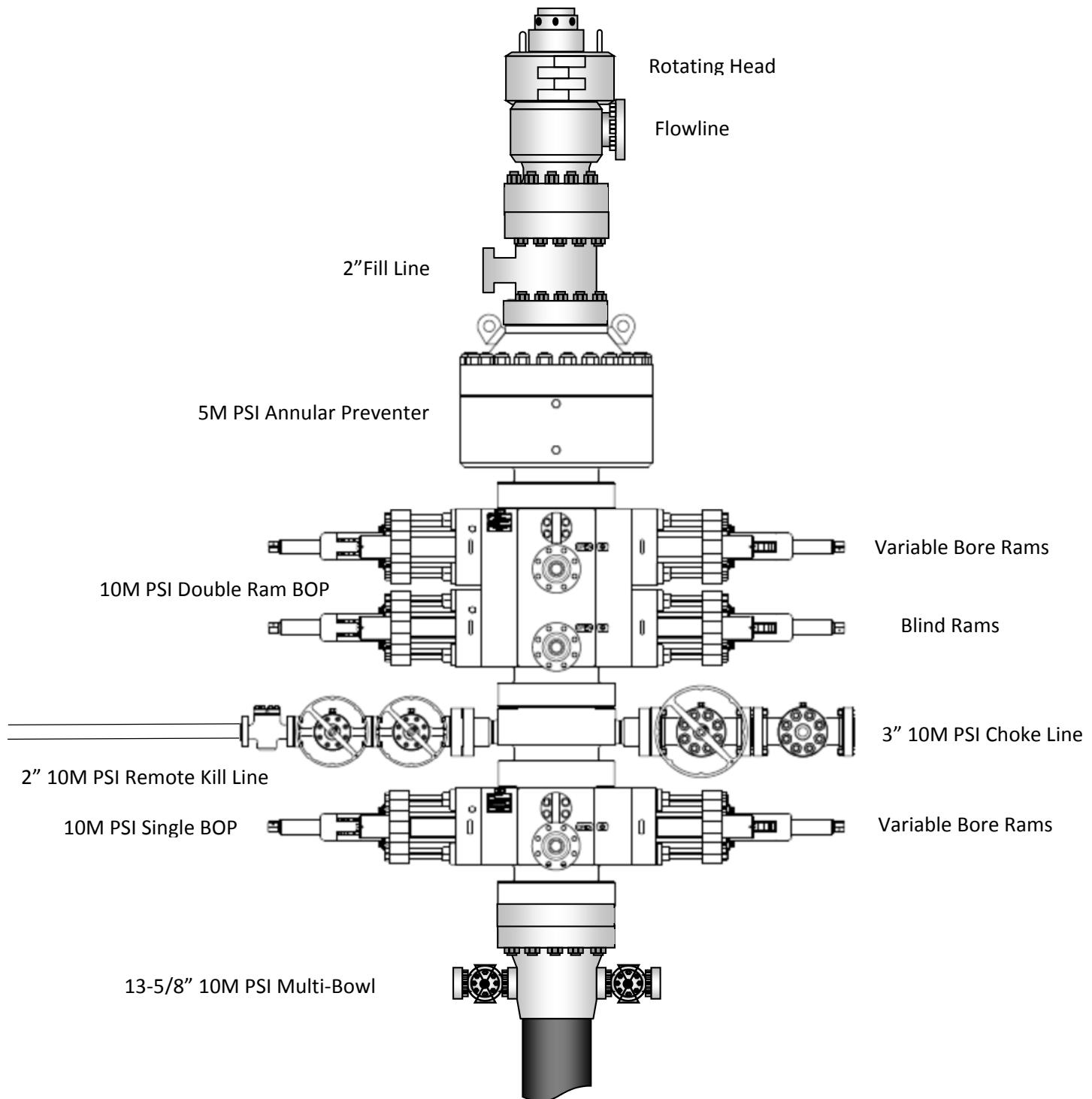


Exhibit 1  
EOG Resources  
13-5/8" 10M PSI BOP Stack





## 10,000 PSI BOP Annular Variance Request (EOG Variance 1c)

EOG Resources request a variance to use a 5000 psi annular BOP with a 10,000 psi BOP stack. The component and compatibility tables along with the general well control plans demonstrate how the 5000 psi annular BOP will be protected from pressures that exceed its rated working pressure (RWP). The pressure at which the control of the wellbore is transferred from the annular preventer to another available preventer will not exceed 3500 psi (70% of the RWP of the 5000 psi annular BOP).

### 1. Component and Preventer Compatibility Tables

The tables below outlines the tubulars and the compatible preventers in use. This table, combined with the drilling fluid, documents that two barriers to flow will be maintained at all times.

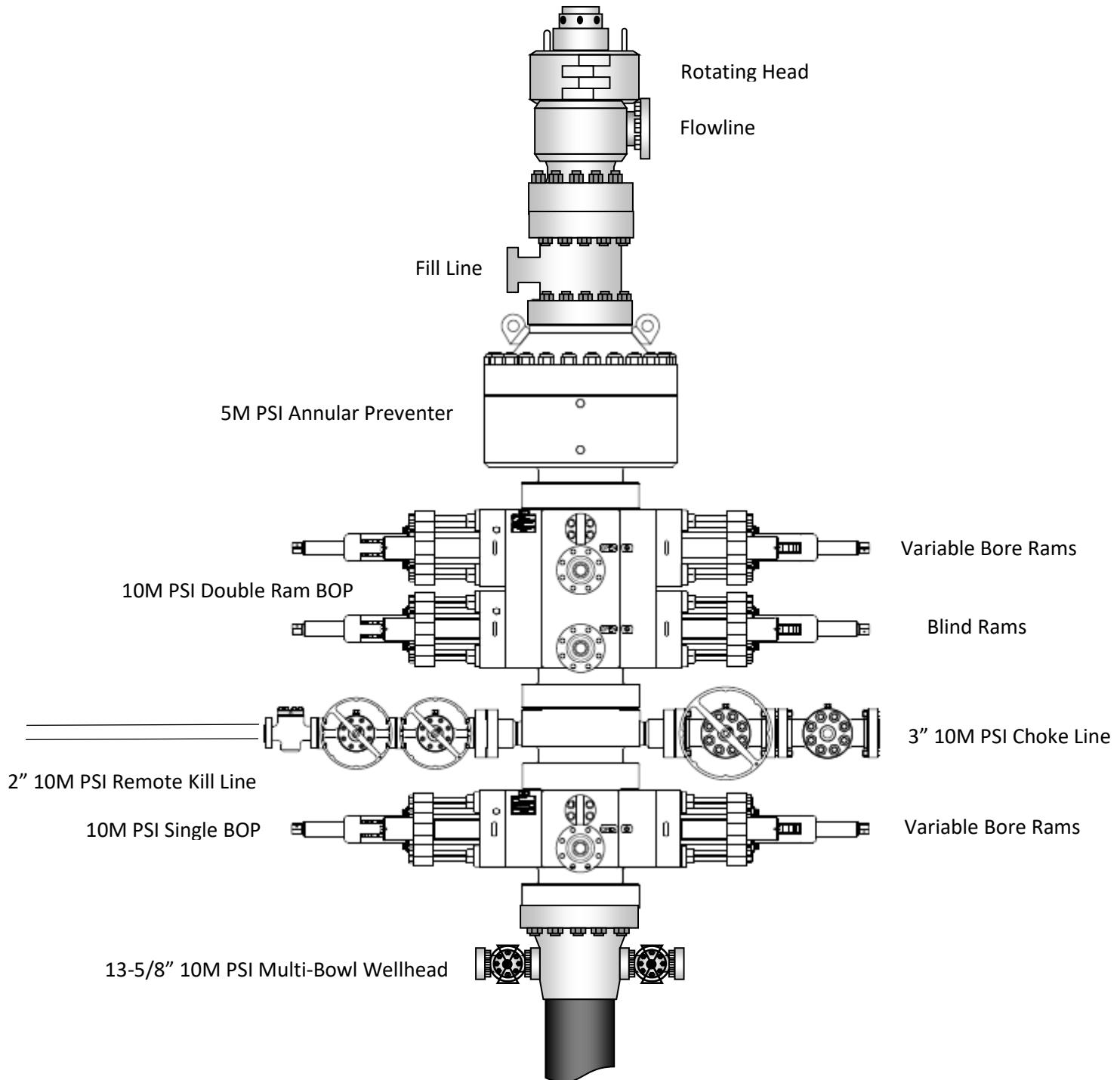
<b>12-1/4" Intermediate Hole Section</b> <b>10M psi requirement</b>					
<b>Component</b>	<b>OD</b>	<b>Primary Preventer</b>	<b>RWP</b>	<b>Alternate Preventer(s)</b>	<b>RWP</b>
Drillpipe	5.000" or 4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
HWDP	5.000" or 4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
Jars	6.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
DCs and MWD tools	6.500" – 8.000"	Annular	5M	-	-
Mud Motor	8.000" – 9.625"	Annular	5M	-	-
1 <sup>st</sup> Intermediate casing	9.625"	Annular	5M	-	-
Open-hole	-	Blind Rams	10M	-	-

<b>8-3/4" Production Hole Section</b> <b>10M psi requirement</b>					
<b>Component</b>	<b>OD</b>	<b>Primary Preventer</b>	<b>RWP</b>	<b>Alternate Preventer(s)</b>	<b>RWP</b>
Drillpipe	5.000" or 4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
HWDP	5.000" or 4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
Jars	6.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
DCs and MWD tools	6.500" – 8.000"	Annular	5M	-	-
Mud Motor	6.750" – 8.000"	Annular	5M	-	-
2 <sup>nd</sup> Intermediate casing	7.625"	Annular	5M	-	-
Open-hole	-	Blind Rams	10M	-	-

VBR = Variable Bore Ram

## EOG Resources

### 13-5/8" 10M PSI BOP Stack



## 2. Well Control Procedures

Below are the minimal high-level tasks prescribed to assure a proper shut-in while drilling, tripping, running casing, pipe out of the hole (open hole), and moving the BHA through the BOPs. At least one well control drill will be performed weekly per crew to demonstrate compliance with the procedure and well control plan. The well control drill will be recorded in the daily drilling log. The type of drill will be determined by the ongoing operations, but reasonable attempts will be made to vary the type of drill conducted (pit, trip, open hole, choke, etc.). This well control plan will be available for review by rig personnel in the EOG Resources drilling supervisor's office on location, and on the rig floor. All BOP equipment will be tested as per Onshore O&G Order No. 2 with the exception of the 5000 psi annular which will be tested to 100% of its RWP.

### General Procedure While Drilling

1. Sound alarm (alert crew)
2. Space out drill string
3. Shut down pumps (stop pumps and rotary)
4. Shut-in Well (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
  - a. SIDPP and SICP
  - b. Pit gain
  - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach 70% or greater of the RWP of the annular preventer, confirm spacing and close the upper variable bore rams.

### General Procedure While Tripping

1. Sound alarm (alert crew)
2. Stab full opening safety valve and close
3. Space out drill string
4. Shut-in (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
  - a. SIDPP and SICP
  - b. Pit gain
  - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach 70% or greater of the RWP of the annular preventer, confirm spacing and close the upper variable bore rams.

### General Procedure While Running Production Casing

1. Sound alarm (alert crew)
2. Stab crossover and full opening safety valve and close
3. Space out string
4. Shut-in (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
  - a. SIDPP and SICP
  - b. Pit gain
  - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach 70% or greater of the RWP of the annular preventer, confirm spacing and close the upper variable bore rams.

### General Procedure With No Pipe In Hole (Open Hole)

1. Sound alarm (alert crew)
2. Shut-in with blind rams. (HCR and choke will already be in the closed position.)
3. Confirm shut-in
4. Notify toolpusher/company representative
5. Read and record the following:
  - a. SICP
  - b. Pit gain
  - c. Time
6. Regroup and identify forward plan

### General Procedures While Pulling BHA thru Stack

1. PRIOR to pulling last joint of drillpipe thru the stack.
  - a. Perform flowcheck, if flowing:
  - b. Sound alarm (alert crew)
  - c. Stab full opening safety valve and close
  - d. Space out drill string with tool joint just beneath the upper variable bore rams.
  - e. Shut-in using upper variable bore rams. (HCR and choke will already be in the closed position.)
  - f. Confirm shut-in
  - g. Notify toolpusher/company representative
  - h. Read and record the following:
    - i. SIDPP and SICP
    - ii. Pit gain
    - iii. Time
  - i. Regroup and identify forward plan

2. With BHA in the stack and compatible ram preventer and pipe combo immediately available.
  - a. Sound alarm (alert crew)
  - b. Stab crossover and full opening safety valve and close
  - c. Space out drill string with upset just beneath the upper variable bore rams.
  - d. Shut-in using upper variable bore rams. (HCR and choke will already be in the closed position.)
  - e. Confirm shut-in
  - f. Notify toolpusher/company representative
  - g. Read and record the following:
    - i. SIDPP and SICP
    - ii. Pit gain
    - iii. Time
  - h. Regroup and identify forward plan
3. With BHA in the stack and NO compatible ram preventer and pipe combo immediately available.
  - a. Sound alarm (alert crew)
  - b. If possible to pick up high enough, pull string clear of the stack and follow "Open Hole" scenario.
  - c. If impossible to pick up high enough to pull the string clear of the stack:
  - d. Stab crossover, make up one joint/stand of drillpipe, and full opening safety valve and close
  - e. Space out drill string with tooljoint just beneath the upper variable bore ram.
  - f. Shut-in using upper variable bore ram. (HCR and choke will already be in the closed position.)
  - g. Confirm shut-in
  - h. Notify toolpusher/company representative
  - i. Read and record the following:
    - i. SIDPP and SICP
    - ii. Pit gain
    - iii. Time
  - j. Regroup and identify forward plan



## EOG BLANKET CASING DESIGN VARIANCE

EOG respectfully requests the drill plans in the attached document 'EOG Alternate Casing Designs – BLM APPROVED' be added to the COA's for this well. These designs have been approved by the BLM down to the TVDs listed below and will allow EOG to run alternate casing designs for this well if necessary.

The designs and associated details listed are the "worst case scenario" boundaries for design safety factors. Location and lithology have NOT been accounted for in these designs. The specific well details will be based on the APD/Sundry package and the information listed in the COA.

The mud program will not change from the original design for this well. Summary of the mud programs for both shallow and deep targets are listed at the end of this document. If the target is changing, a sundry will be filed to update the casing design and mud/cement programs.

Cement volumes listed in this document are for reference only. The cement volumes for the specific well will be adjusted to ensure cement tops meet BLM requirements as listed in the COA and to allow bradenhead cementing when applicable.

This blanket document only applies to wells with three string designs outside of Potash and Capitan Reef boundaries.

Shallow Design Boundary Conditions				
	Deepest MD (ft)	Deepest TVD (ft)	Max Inc (deg)	Max DLS (°/100usft)
Surface	2030	2030	0	0
Intermediate	7793	5650	40	8
Production	28578	11225	90	25



### Shallow Design A

#### 1. CASING PROGRAM

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
16"	0	2,030	0	2,030	13-3/8"	54.5#	J-55	STC
11"	0	7,793	0	5,650	9-5/8"	40#	J-55	LTC
6-3/4"	0	28,578	0	11,225	5-1/2"	20#	P110-EC	DWC/C IS MS

Hole will be full during casing run for well control and tensile SF factor. Casing will be kept at least half full during run for this design to meet BLM collapse SF requirement. External pressure will be reviewed prior to conducting casing pressure tests to ensure that 70% of the yield is not exceeded.

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 Title 43 CFR Part 3170 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.

#### 2. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
2,030' 13-3/8"	570	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	160	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 1830')
7,793' 9-5/8"	770	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	250	14.8	1.32	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 6238')
28,578' 5-1/2"	410	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 7300')
	1110	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 @ 12730')

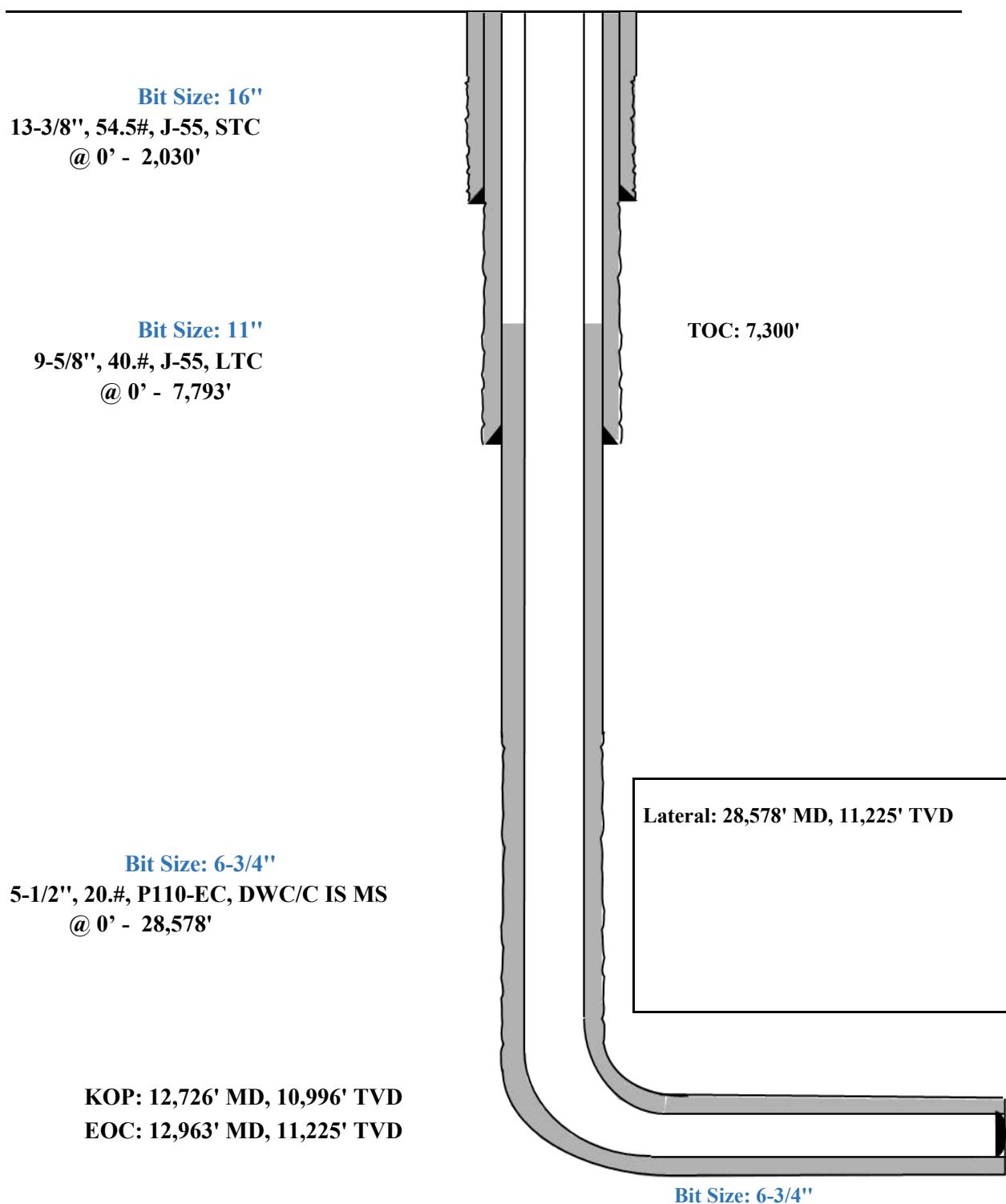


## Shallow Design A

Proposed Wellbore

KB: 3558'

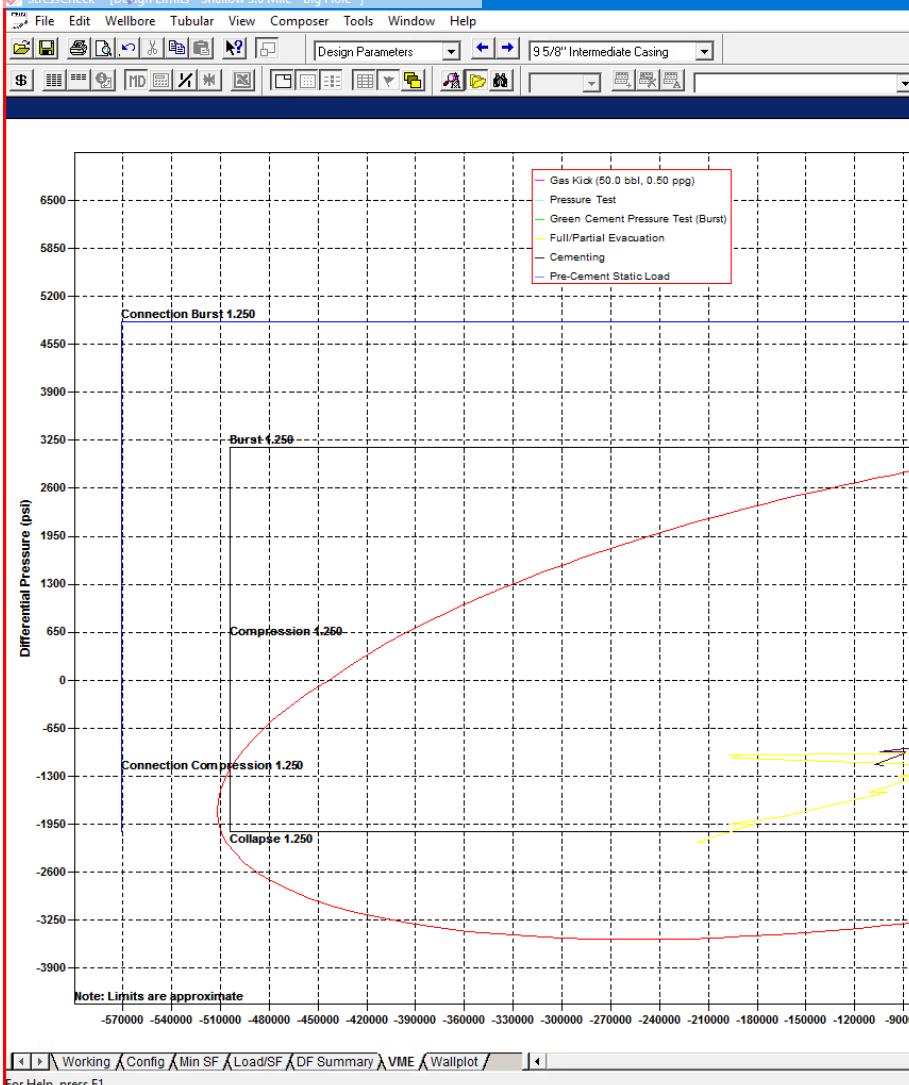
GL: 3533'



	Depth (MD) (usft)	Axial Force (lbf)		Equivalent Axial Load (lbf)	Bending Stress at OD (psi)	Absolute Safety Factor				Temperature (°F)	Pressure (psi)		Add'l Pickup To Prevent Buck. (lbf)	Buckled Length (usft)
		Apparent (w/Bending)	Actual (w/o Bending)			Triaxial	Burst	Collapse (V)	Axial		Internal	External		
1	0	252987	228954	253140	2098.2	1.69	1.58	N/A	2.82 F	70.00	2500.00	0.00	N/A	N/A
2	100	247735	223702	248466	2098.2	1.69	1.58	N/A	2.88 F	71.10	2543.63	43.63		
3	100	234996	223701	235716	986.2	1.71	1.58	N/A	3.04 F	71.10	2543.64	43.64		
4	1700	341565	139667	352253	17627.2	1.53	1.57	N/A	2.09 F	88.70	3241.64	741.64		
5	1700	312979	139666	323488	15131.5	1.58	1.57	N/A	2.28 F	88.70	3241.65	741.65		
6	1850	336881	132027	348440	17885.2	1.51	1.57	N/A	2.12 F	90.29	3305.05	805.05		
7	1850	318549	132027	329984	16284.8	1.54	1.57	N/A	2.24 F	90.29	3305.06	805.06		
8	1950	320468	127243	332475	16869.9	1.52	1.57	N/A	2.23 F	91.30	3344.87	844.87		
9	1950	312802	127243	324756	16200.7	1.53	1.57	N/A	2.28 F	91.30	3344.87	844.87		
10	2050	307858	122773	320295	16159.3	1.52	1.57	N/A	2.32 F	92.23	3381.89	881.89		
11	2050	303560	122772	315965	15784.1	1.53	1.57	N/A	2.35 F	92.23	3381.89	881.89		
12	2300	151294	112633	163658	3375.4	1.71	1.57	N/A	4.72 F	94.35	3466.13	966.13		
13	2300	132741	112633	144956	1755.6	1.72	1.57	N/A	5.38 F	94.35	3466.14	966.14		
14	2370	129966	109858	142452	1755.6	1.72	1.57	N/A	5.49 F	94.94	3489.28	989.28		
15	2370	127909	107800	140922	1755.6	1.75	1.60	N/A	5.58 F	94.94	3489.29	1036.40		
16	2700	105515	94232	119785	985.1	1.75	1.60	N/A	6.77 F	97.73	3599.97	1152.35		
17	2700	111680	94231	126006	1523.4	1.75	1.60	N/A	6.39 F	97.73	3599.97	1152.35		
18	3100	110766	77783	126839	2879.6	1.71	1.60	N/A	6.44 F	101.11	3734.23	1293.00		
19	3100	97392	77783	113331	1712.1	1.73	1.60	N/A	7.33 F	101.11	3734.23	1293.01		
20	3700	71565	53303	89806	1594.4	1.70	1.61	N/A	9.97 F	106.15	3934.24	1502.54		
21	3700	60887	53302	79004	662.3	1.71	1.61	N/A	11.72 F	106.16	3934.25	1502.55		
22	4650	346711	14219	56495	1785.6	1.64	1.61	N/A	20.59 F	114.20	4253.37	1836.86		
23	4900	44595	4828	67626	3472.0	1.59	1.61	N/A	16.01 F	116.32	4337.37	1924.87		
24	4900	28975	4828	51775	2108.2	1.62	1.61	N/A	24.64 F	116.32	4337.38	1924.87		
25	5029	22103	34	45340	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.40	1969.94		
26	5029	22102	33	45339	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.41	1969.95		
27	5600	-45329	-21341	-20805	2094.3	1.57	1.62	N/A	(13.67)	122.23	4572.11	2170.78		
28	5650	-40465	-23210	-15657	1506.5	1.58	1.62	N/A	(15.31)	122.66	4588.87	2188.34		
29		F	Conn Fracture											
30		( )	Compression											
31		(V)	Vector Collapse Safety Factor											
32														
33														

## 9-5/8" Intermediate Casing Pressure Test:

Internal Profile based off Surface Pressure + Hydrostatic: 4589 psi  
 External Profile based off Pore Pressure: 2188 psi



StressCheck - [String Summary - Shallow 3.0 Mile - Big Hole \*]

File Edit Wellbore Tubular View Composer Tools Window Help

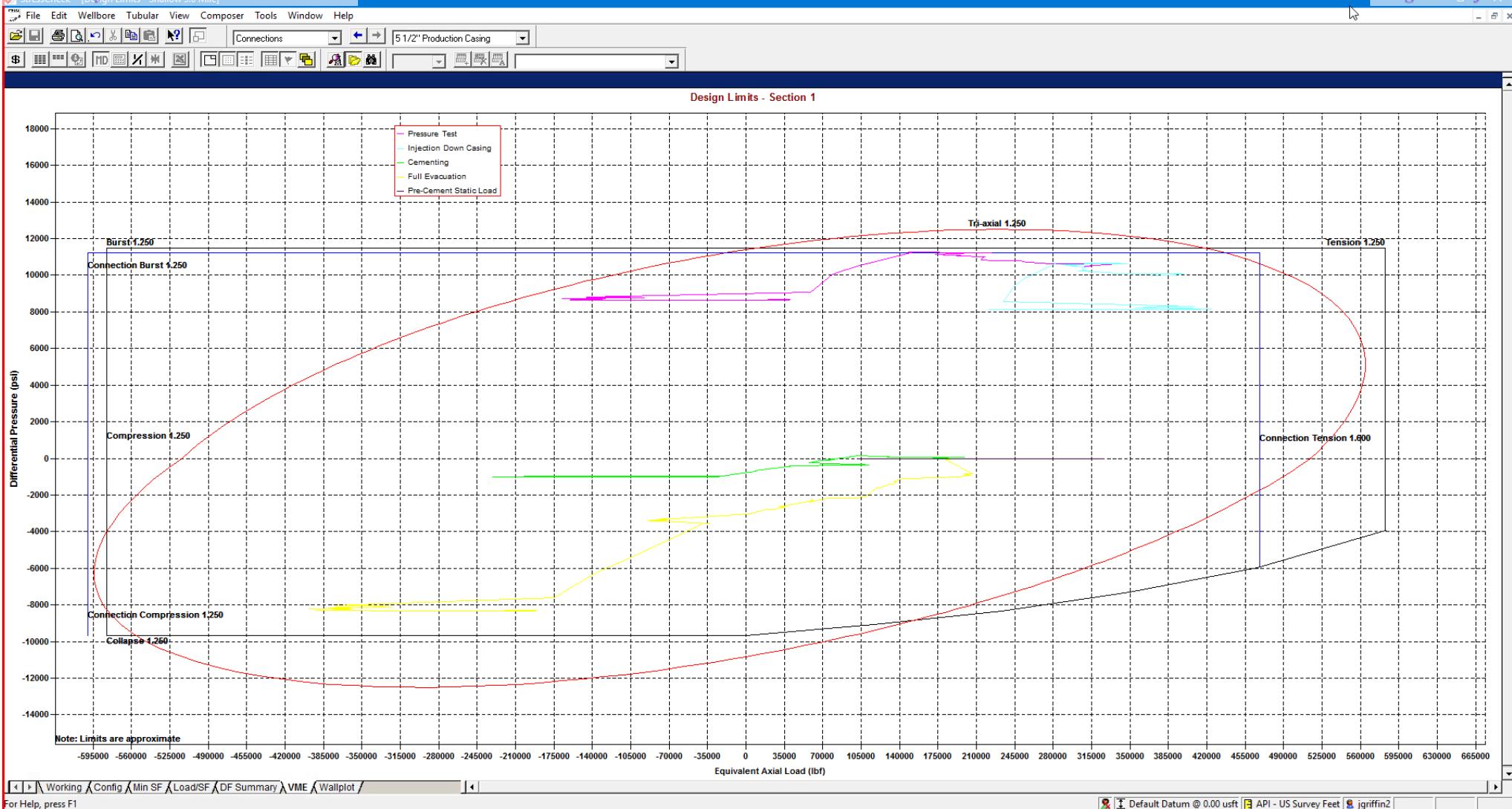
Working \ Config \ Min SF \ Load/SF \ DF Summary \ VME \ Wallplot \

For Help, press F1

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	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Intermediate Casing	9 5/8", 40.000 ppf, J-55	BTC, J-55	0.0-5650.0	8.750 A	1.57	1.59	1.80 F	1.35	98,141
2										Total = 98,141
3										
4	F Conn Fracture									
5	A Alternate Drift									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 9-5/8" 40# Intermediate Casing. Passes all Burst, Collapse and Tensile design criteria.



StressCheck - [String Summary - Shallow 3.0 Mile]

String Summary

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Production Casing	5 1/2", 20.000 ppf, P110 ICY	BTC, P110 ICY	0.0-28578.0	4.653	1.27	1.47	1.90 F	1.35	446,902
2										Total = 446,902
3										
4	F Conn Fracture									
5	( ) Compression									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 5-1/2" 20# Production Casing with a 125ksi Control Yield. Passes all Burst, Collapse and Tensile design criteria.



## Shallow Design B

### 1. CASING PROGRAM

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
13-1/2"	0	2,030	0	2,030	10-3/4"	40.5#	J-55	STC
9-7/8"	0	7,793	0	5,650	8-5/8"	32#	J-55	BTC-SC
6-3/4"	0	28,578	0	11,225	5-1/2"	20#	P110-EC	DWC/C IS MS

Hole will be full during casing run for well control and tensile SF factor. Casing will be kept at least half full during run for this design to meet BLM collapse SF requirement. External pressure will be reviewed prior to conducting casing pressure tests to ensure that 70% of the yield is not exceeded.

Variance is requested to waive the centralizer requirements for the 8-5/8" casing in the 9-7/8" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 9-7/8" 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 Title 43 CFR Part 3170 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.

### 2. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
2,030' 10-3/4"	530	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	140	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 1830')
7,793' 8-5/8"	460	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	210	14.8	1.32	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 6238')
28,578' 5-1/2"	400	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 7300')
	1110	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 @ 12730')

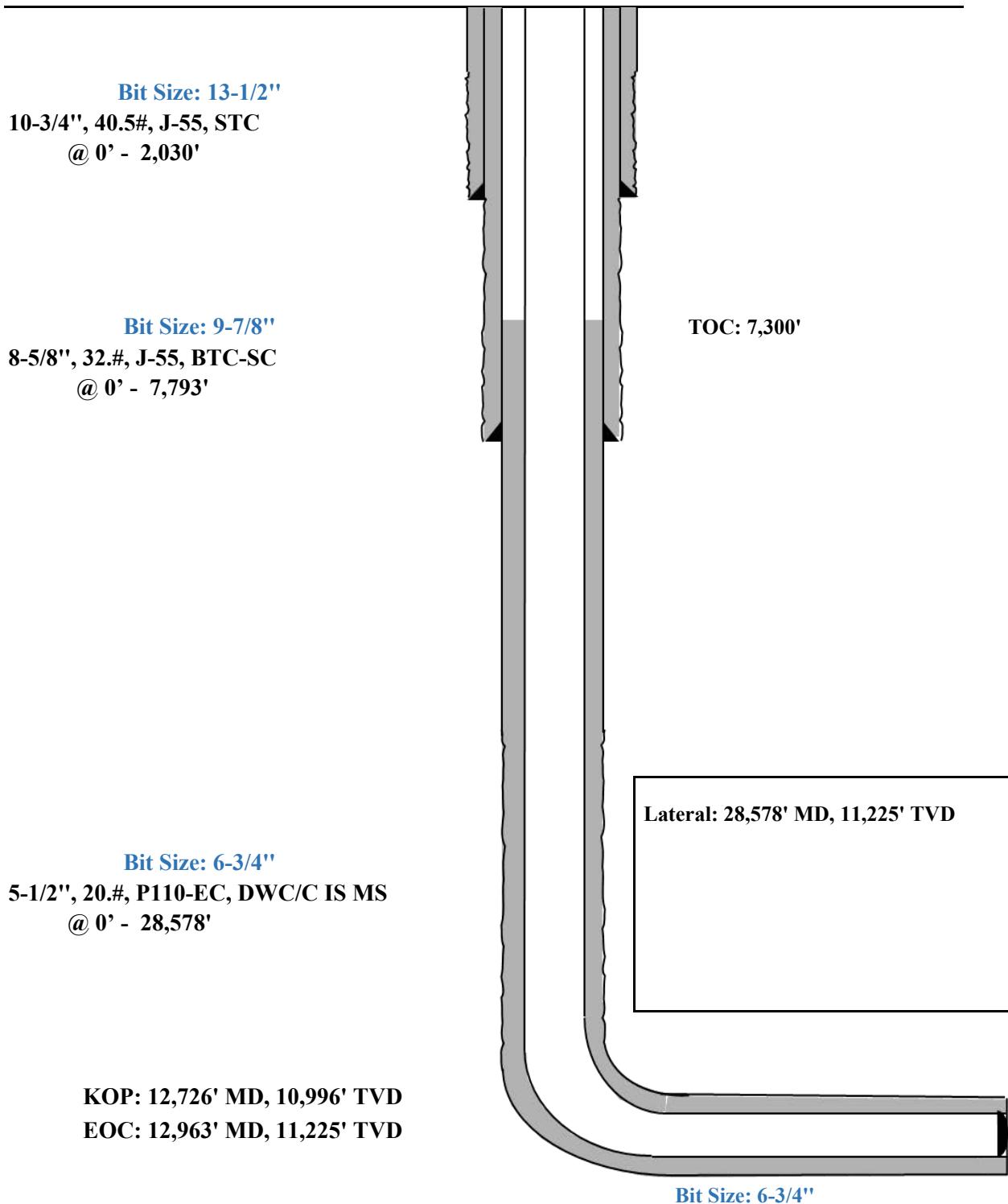


## Shallow Design B

Proposed Wellbore

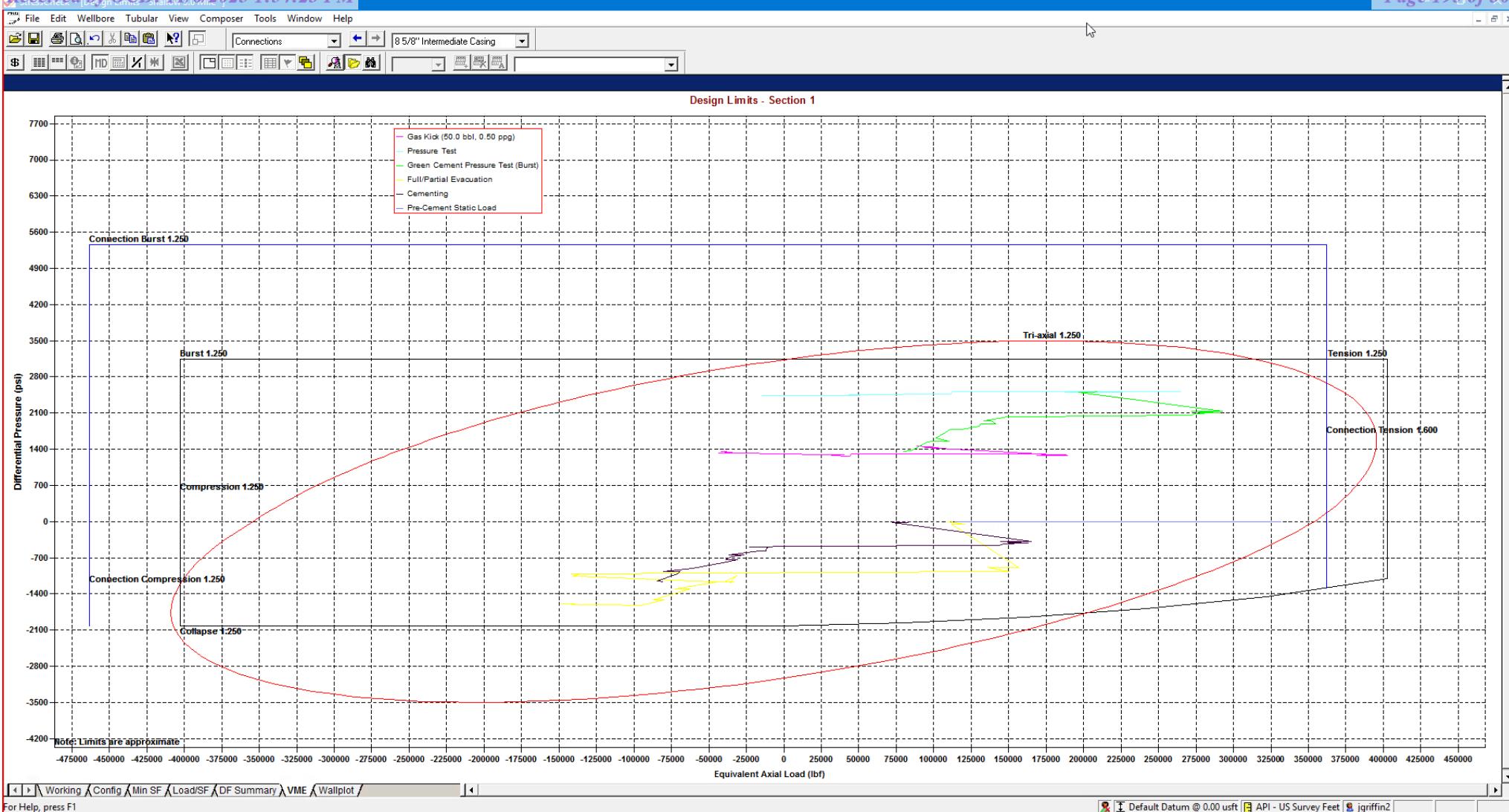
KB: 3558'

GL: 3533'



Triaxial Results														
	Depth (MD) (usft)	Axial Force (lbf)		Equivalent Axial Load (lbf)	Bending Stress at OD (psi)	Absolute Safety Factor				Temperature (°F)	Pressure (psi)		Addtl Pickup To Prevent Buckl. (lbf)	Buckled Length (usft)
		Apparent (w/Bending)	Actual (w/o Bending)			Triaxial	Burst	Collapse (V)	Axial		Internal	External		
1	0	200426	183224	200546	1880.2	1.68	1.57	N/A	2.89 F	70.00	2500.00	0.00	N/A	N/A
2	100	196229	179028	196812	1880.2	1.69	1.57	N/A	2.95 F	71.10	2543.63	43.63		
3	100	187111	179027	187686	883.7	1.70	1.57	N/A	3.10 F	71.10	2543.64	43.64		
4	1700	256401	111891	264835	15795.8	1.56	1.56	N/A	2.26 F	88.70	3241.64	741.64		
5	1700	235940	111891	244247	13559.4	1.60	1.56	N/A	2.45 F	88.70	3241.65	741.65		
6	1850	252413	105788	261533	16027.0	1.54	1.56	N/A	2.29 F	90.29	3305.05	805.05		
7	1850	239292	105787	248323	14592.9	1.56	1.56	N/A	2.42 F	90.29	3305.06	805.06		
8	1950	240267	101966	249748	15117.2	1.54	1.56	N/A	2.41 F	91.30	3344.87	844.87		
9	1950	234781	101965	244223	14517.5	1.56	1.56	N/A	2.47 F	91.30	3344.87	844.87		
10	2050	230871	98395	240694	14480.4	1.55	1.56	N/A	2.51 F	92.23	3381.89	881.89		
11	2050	227794	98394	237594	14144.2	1.55	1.56	N/A	2.54 F	92.23	3381.89	881.89		
12	2300	117966	90294	127818	3024.7	1.70	1.56	N/A	4.91 F	94.35	3466.13	966.13		
13	2300	104686	90293	114432	1573.2	1.71	1.56	N/A	5.53 F	94.35	3466.14	966.14		
14	2370	102469	88077	112431	1573.2	1.71	1.56	N/A	5.65 F	94.94	3489.28	989.28		
15	2370	100817	86424	111200	1573.2	1.75	1.59	N/A	5.75 F	94.94	3489.29	1036.40		
16	2700	83660	75583	95052	882.8	1.74	1.59	N/A	6.92 F	97.73	3599.97	1152.35		
17	2700	88072	75583	99504	1365.1	1.74	1.59	N/A	6.58 F	97.73	3599.97	1152.35		
18	3100	86049	62442	98863	2580.4	1.71	1.59	N/A	6.73 F	101.11	3734.23	1293.00		
19	3100	76477	62441	89195	1534.2	1.72	1.59	N/A	7.57 F	101.11	3734.23	1293.01		
20	3700	55953	42882	70509	1428.8	1.69	1.60	N/A	10.35 F	106.15	3934.24	1502.54		
21	3700	48311	42881	62778	593.5	1.71	1.60	N/A	11.99 F	106.16	3934.25	1502.55		
22	4000	41458	33043	56865	919.9	1.69	1.60	N/A	13.97 F	108.69	4034.82	1607.91		
23	4650	26293	11655	43706	1600.1	1.63	1.60	N/A	22.03 F	114.20	4253.37	1836.86		
24	4900	32619	4156	50970	3111.2	1.59	1.60	N/A	17.76 F	116.32	4337.37	1924.87		
25	4900	21439	4155	39625	1889.2	1.61	1.60	N/A	27.02 F	116.32	4337.38	1924.87		
26	5039	15822	26	34389	1726.6	1.61	1.61	N/A	36.61 F	117.49	4383.77	1973.48		
27	5039	15822	26	34388	1726.6	1.61	1.61	N/A	36.61 F	117.49	4383.78	1973.49		
28	5600	-33912	-16743	-14286	1876.7	1.57	1.61	N/A	(14.60)	122.23	4572.11	2170.78		
29	5650	-30585	-18235	-10742	1350.0	1.58	1.61	N/A	(16.18)	122.66	4588.87	2188.34		
30														
31		F	Conn Fracture											
32		()	Compression											
33		(V)	Vector Collapse Safety Factor											
34														

8-5/8" Intermediate Casing Pressure Test:  
 Internal Profile based off Surface Pressure + Hydrostatic: 4589 psi  
 External Profile based off Pore Pressure: 2188 psi



StressCheck - [String Summary - Shallow 3.0 Mile \*]

String

OD/Weight/Grade

Connection

MD Interval (usft)

Drift Dia. (")

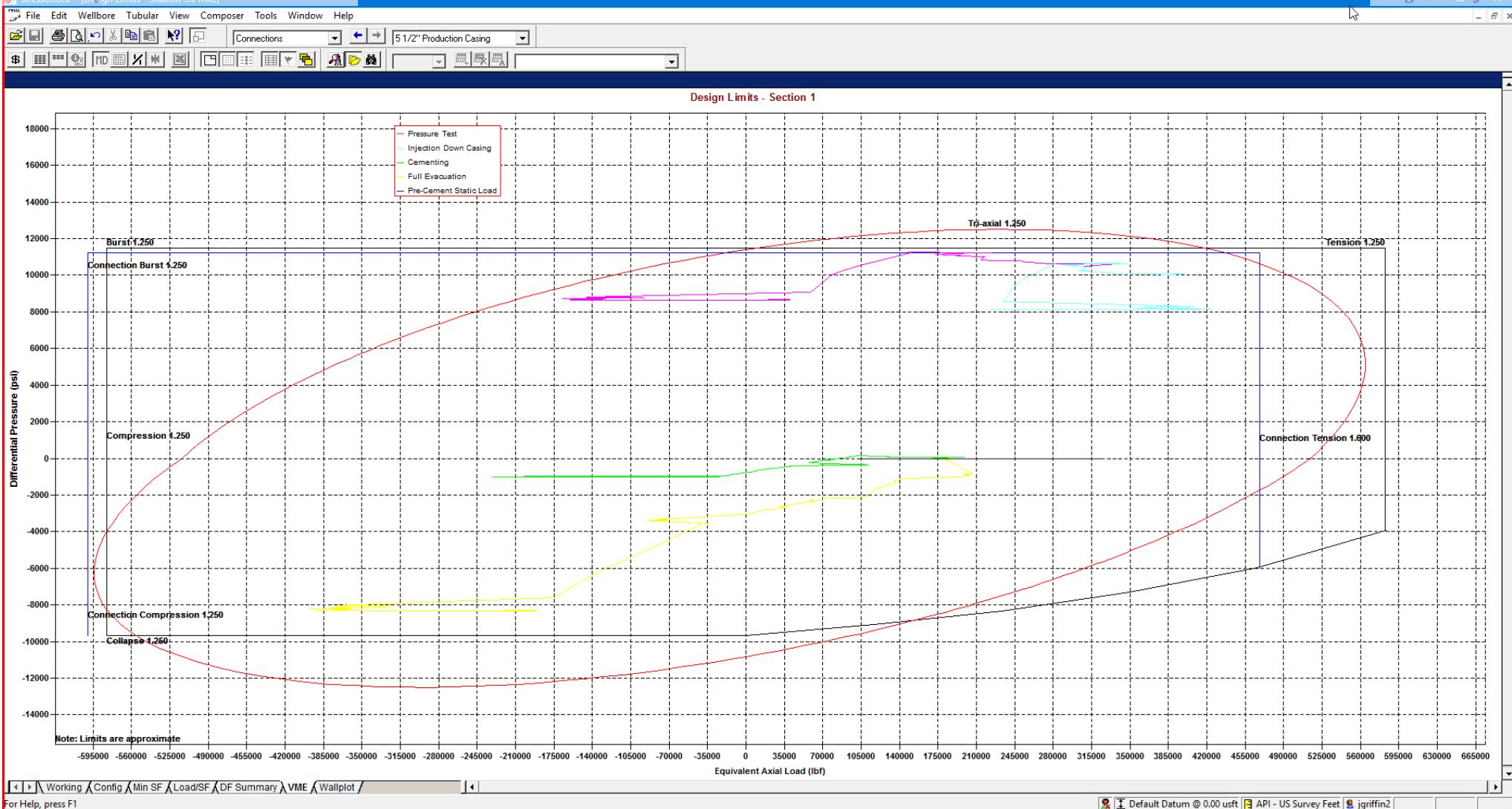
Minimum Safety Factor (Abs)

Design Cost (\$)

String Summary

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Intermediate Casing	8 5/8", 32.000 ppf, J-55	BTC, J-55	0.0-5650.0	7.875 A	1.56	1.57	1.81 F	1.34	80,117
2										Total = 80,117
3										
4	F Conn Fracture									
5	A Alternate Drift									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 8-5/8" 32# Intermediate Casing. Passes all Burst, Collapse and Tensile design criteria.



StressCheck - [String Summary - Shallow 3.0 Mile]

String Summary

String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
					Burst	Collapse (V)	Axial	Triaxial	
1 Production Casing	5 1/2", 20.000 pfp, P110 ICY	BTC, P110 ICY	0.0-28578.0	4.653	1.27	1.47	1.90 F	1.35	446,902
2									Total = 446,902
3									
4 F Conn Fracture									
5 ( ) Compression									
6 (V) Vector Collapse Safety Factor									
7									

\*Modelling done with 5-1/2" 20# Production Casing with a 125ksi Control Yield. Passes all Burst, Collapse and Tensile design criteria.



### Shallow Design C

#### 1. CASING PROGRAM

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
16"	0	2,030	0	2,030	13-3/8"	54.5#	J-55	STC
11"	0	7,793	0	5,650	9-5/8"	40#	J-55	LTC
7-7/8"	0	28,578	0	11,225	6"	24.5#	P110-EC	VAM Sprint-SF

Hole will be full during casing run for well control and tensile SF factor. Casing will be kept at least half full during run for this design to meet BLM collapse SF requirement. External pressure will be reviewed prior to conducting casing pressure tests to ensure that 70% of the yield is not exceeded.

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 6" casing in the 7-7/8" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 7-7/8" 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 Title 43 CFR Part 3170 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.

#### 2. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
2,030' 13-3/8"	570	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	160	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 1830')
7,793' 9-5/8"	770	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	250	14.8	1.32	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 6238')
28,578' 6"	650	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 7300')
	1870	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 @ 12730')

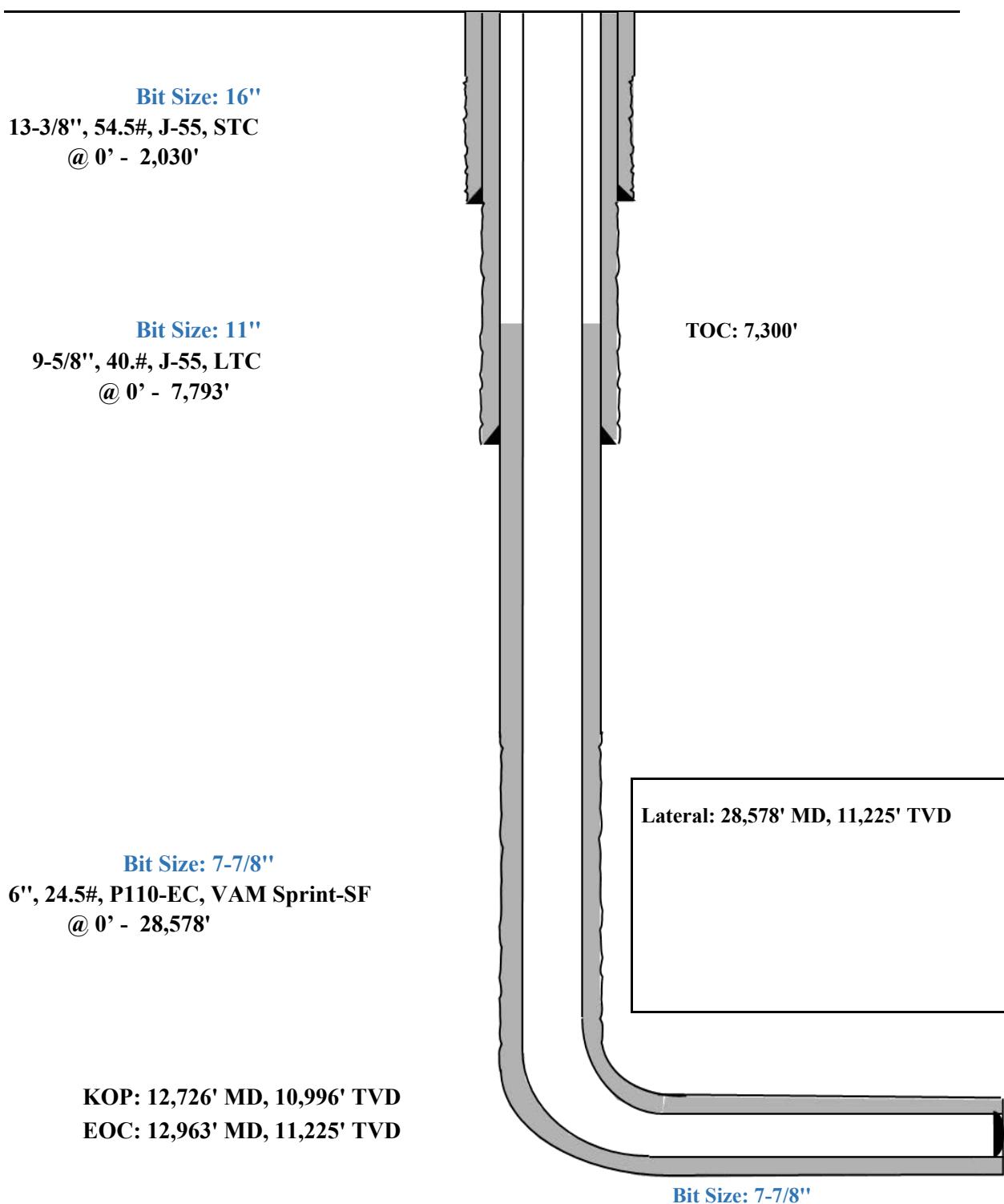


## Shallow Design C

Proposed Wellbore

KB: 3558'

GL: 3533'



	Depth (MD) (usft)	Axial Force (lbf)		Equivalent Axial Load (lbf)	Bending Stress at OD (psi)	Absolute Safety Factor				Temperature (°F)	Pressure (psi)		Add'l Pickup To Prevent Buck. (lbf)	Buckled Length (usft)
		Apparent (w/Bending)	Actual (w/o Bending)			Triaxial	Burst	Collapse (V)	Axial		Internal	External		
1	0	252987	228954	253140	2098.2	1.69	1.58	N/A	2.82 F	70.00	2500.00	0.00	N/A	N/A
2	100	247375	223702	248466	2098.2	1.69	1.58	N/A	2.88 F	71.10	2543.63	43.63		
3	100	234996	223701	235716	986.2	1.71	1.58	N/A	3.04 F	71.10	2543.64	43.64		
4	1700	341565	139667	352253	17627.2	1.53	1.57	N/A	2.09 F	88.70	3241.64	741.64		
5	1700	312979	139666	323488	15131.5	1.58	1.57	N/A	2.28 F	88.70	3241.65	741.65		
6	1850	336881	132027	348440	17885.2	1.51	1.57	N/A	2.12 F	90.29	3305.05	805.05		
7	1850	318549	132027	329984	16284.8	1.54	1.57	N/A	2.24 F	90.29	3305.06	805.06		
8	1950	320468	127243	332475	16869.9	1.52	1.57	N/A	2.23 F	91.30	3344.87	844.87		
9	1950	312802	127243	324756	16200.7	1.53	1.57	N/A	2.28 F	91.30	3344.87	844.87		
10	2050	307858	122773	320295	16159.3	1.52	1.57	N/A	2.32 F	92.23	3381.89	881.89		
11	2050	303560	122772	315965	15784.1	1.53	1.57	N/A	2.35 F	92.23	3381.89	881.89		
12	2300	151294	112633	163658	3375.4	1.71	1.57	N/A	4.72 F	94.35	3466.13	966.13		
13	2300	132741	112633	144956	1755.6	1.72	1.57	N/A	5.38 F	94.35	3466.14	966.14		
14	2370	129966	109858	142452	1755.6	1.72	1.57	N/A	5.49 F	94.94	3489.28	989.28		
15	2370	127909	107800	140922	1755.6	1.75	1.60	N/A	5.58 F	94.94	3489.29	1036.40		
16	2700	105515	94232	119785	985.1	1.75	1.60	N/A	6.77 F	97.73	3599.97	1152.35		
17	2700	111680	94231	126006	1523.4	1.75	1.60	N/A	6.39 F	97.73	3599.97	1152.35		
18	3100	110766	77783	126839	2879.6	1.71	1.60	N/A	6.44 F	101.11	3734.23	1293.00		
19	3100	97392	77783	113331	1712.1	1.73	1.60	N/A	7.33 F	101.11	3734.23	1293.01		
20	3700	71565	53303	89806	1594.4	1.70	1.61	N/A	9.97 F	106.15	3934.24	1502.54		
21	3700	60887	53302	79004	662.3	1.71	1.61	N/A	11.72 F	106.16	3934.25	1502.55		
22	4650	346711	14219	56495	1785.6	1.64	1.61	N/A	20.59 F	114.20	4253.37	1836.86		
23	4900	44595	4828	67626	3472.0	1.59	1.61	N/A	16.01 F	116.32	4337.37	1924.87		
24	4900	28975	4828	51775	2108.2	1.62	1.61	N/A	24.64 F	116.32	4337.38	1924.87		
25	5029	22103	34	45340	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.40	1969.94		
26	5029	22102	33	45339	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.41	1969.95		
27	5600	-45329	-21341	-20805	2094.3	1.57	1.62	N/A	(13.67)	122.23	4572.11	2170.78		
28	5650	-40465	-23210	-15657	1506.5	1.58	1.62	N/A	(15.31)	122.66	4588.87	2188.34		
29		F	Conn Fracture											
30		( )	Compression											
31		(V)	Vector Collapse Safety Factor											
32														
33														

Working \ Config \ Min SF \ Load/SF \ DF Summary \ VME \ Wallplot /

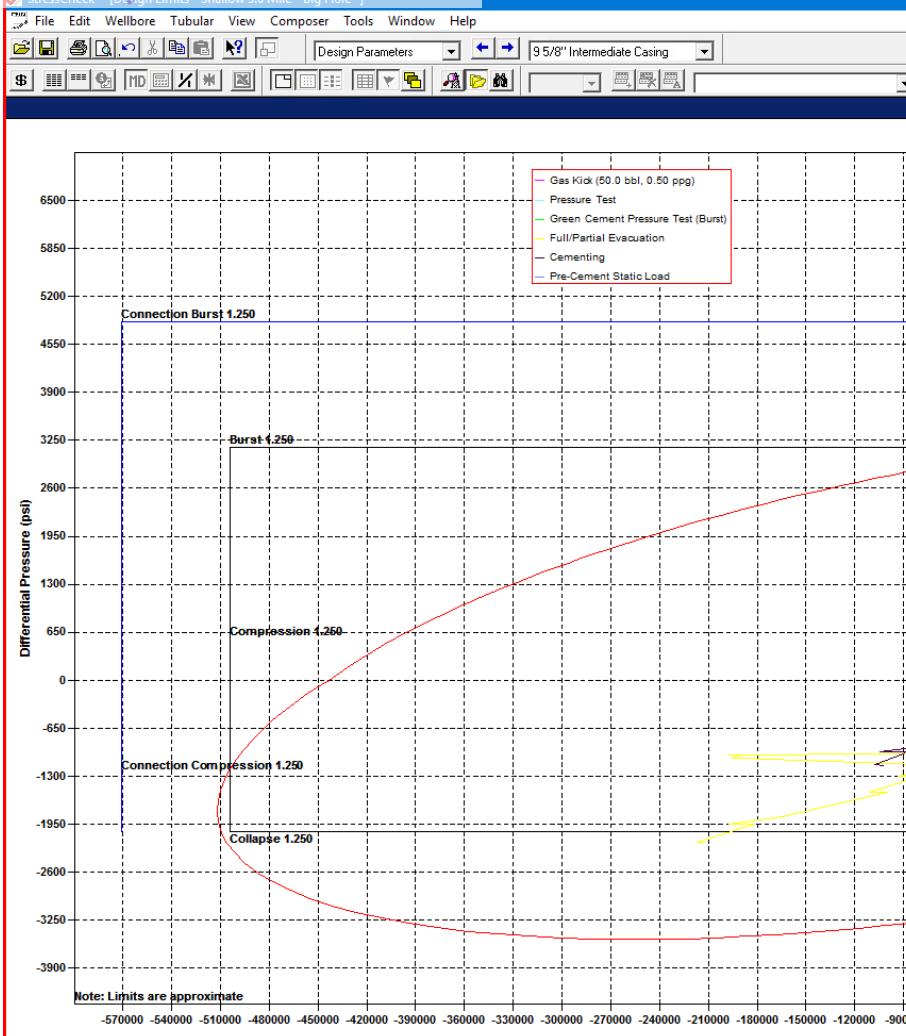
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9-5/8" Intermediate Casing Pressure Test:

Internal Profile based off Surface Pressure + Hydrostatic: 4589 psi

External Profile based off Pore Pressure: 2188 psi



Working \ Config \ Min SF \ Load/SF \ DF Summary \ VME \ Wallplot \

For Help, press F1

Default Datum @ 0.00 usft API - US Survey Feet jgriffin2

StressCheck - [String Summary - Shallow 3.0 Mile - Big Hole \*]

File Edit Wellbore Tubular View Composer Tools Window Help



String Summary

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Intermediate Casing	9 5/8", 40,000 pcf, J-55	BTC, J-55	0.0-5650.0	8.750 A	1.57	1.59	1.80 F	1.35	98,141
2										Total = 98,141
3										
4	F Conn Fracture									
5	A Alternate Drift									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 9-5/8" 40# Intermediate Casing. Passes all Burst, Collapse and Tensile design criteria.



StressCheck - [String Summary - Shallow 3.0 Mile - Big Hole \*]

String Summary

String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
					Burst	Collapse (V)	Axial	Triaxial	
1 Production Casing	6", 24.500 pfp, P110 ICY	BTC, P110 ICY	0.0-28578.0	5.075	1.29	1.52	(1.75)	1.37	541,493
2									Total = 541,493
3									
4 ( ) Compression									
5 (V) Vector Collapse Safety Factor									
6									

\*Modelling done with 6" Production Casing with a 125ksi Control Yield. Passes all Burst, Collapse and Tensile design criteria.



### Shallow Design D

#### 4. CASING PROGRAM

Hole Size	Interval MD		Interval TVD		Csg OD	Weight	Grade	Conn
	From (ft)	To (ft)	From (ft)	To (ft)				
16"	0	2,030	0	2,030	13-3/8"	54.5#	J-55	STC
11"	0	7,793	0	5,650	9-5/8"	40#	J-55	LTC
7-7/8"	0	12,626	0	10,896	6"	22.3#	P110-EC	DWC/C IS
6-3/4"	12,626	28,578	10,896	11,225	5-1/2"	20#	P110-EC	DWC/C IS MS

Hole will be full during casing run for well control and tensile SF factor. Casing will be kept at least half full during run for this design to meet BLM collapse SF requirement. External pressure will be reviewed prior to conducting casing pressure tests to ensure that 70% of the yield is not exceeded.

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 6" and 5-1/2" casings in the 7-7/8" and 6-3/4" hole sizes. An expansion additive will be utilized in the cement slurry for the entire length of the 7-7/8" and 6-3/4" hole intervals 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 Title 43 CFR Part 3170 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.

#### 5. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
2,030' 13-3/8"	570	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	160	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 1830')
7,793' 9-5/8"	770	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	250	14.8	1.32	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 6238')
28,578' 6"	650	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 7300')
	1870	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 @ 12730')

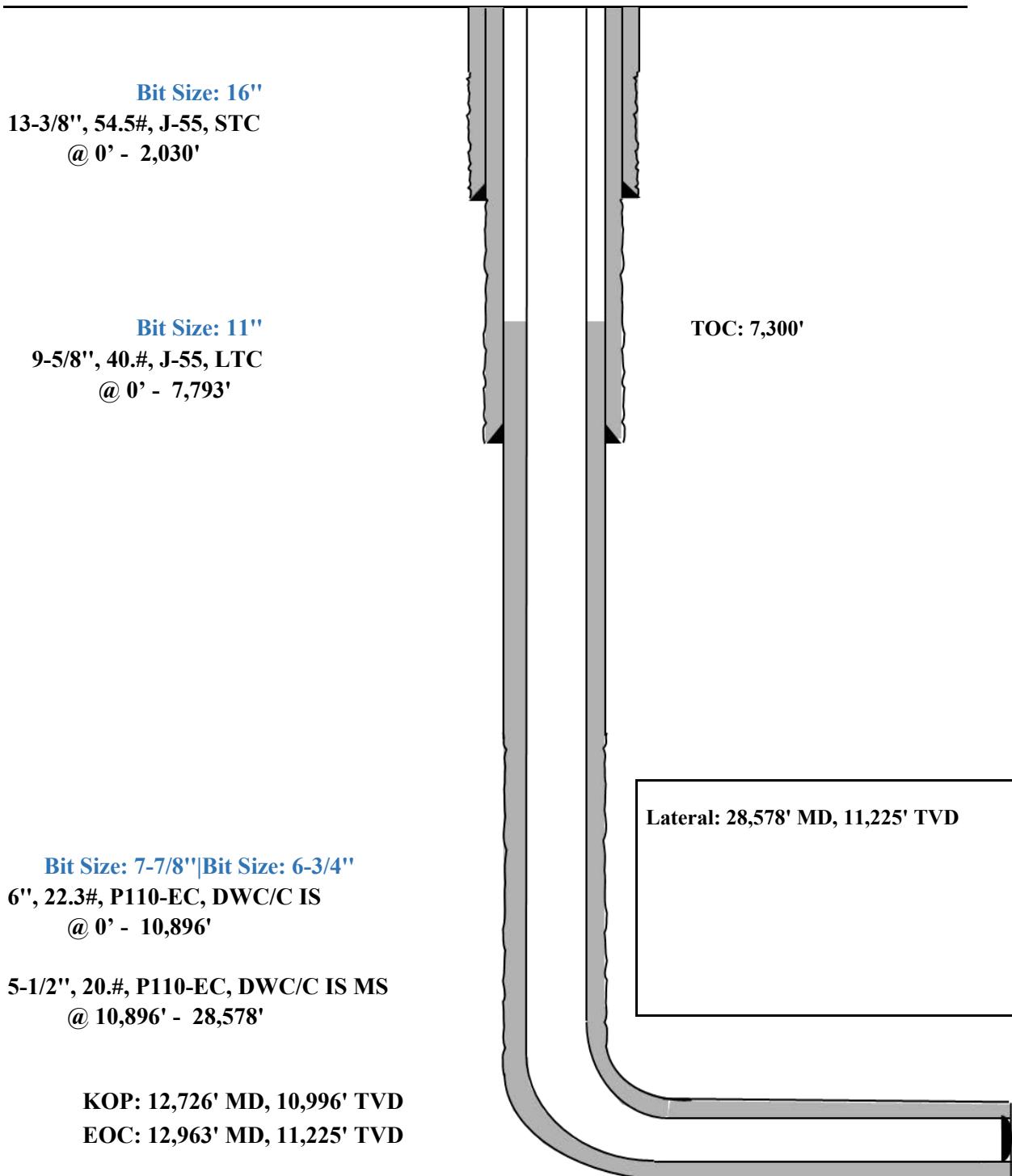


## Shallow Design D

Proposed Wellbore

KB: 3558'

GL: 3533'

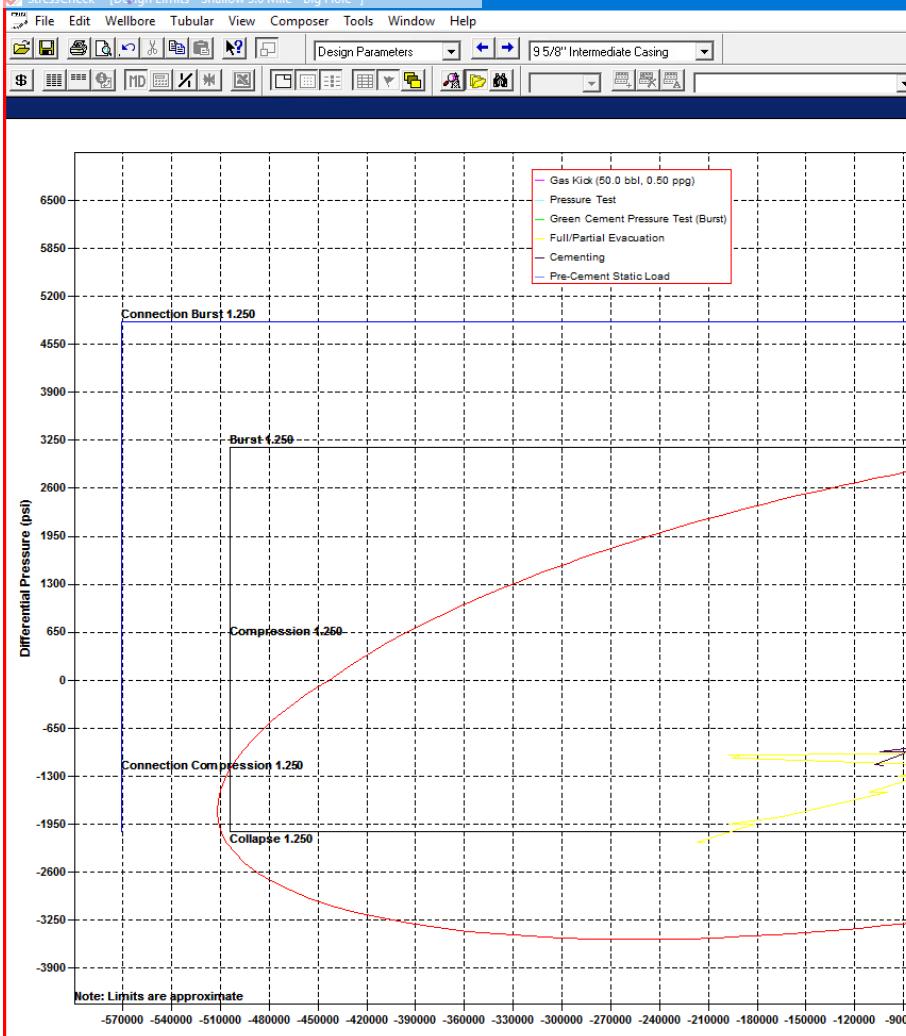


9 5/8" Intermediate Casing Pressure Test														
Triaxial Results														
	Depth (MD) (usft)	Axial Force (lbf)		Equivalent Axial Load (lbf)	Bending Stress at OD (psi)	Absolute Safety Factor				Temperature (°F)	Pressure (psi)		Add'l Pickup To Prevent Buck. (lbf)	Buckled Length (usft)
		Apparent (w/Bending)	Actual (w/o Bending)			Triaxial	Burst	Collapse (V)	Axial		Internal	External		
1	0	252987	228954	253140	2098.2	1.69	1.58	N/A	2.82 F	70.00	2500.00	0.00	N/A	N/A
2	100	247735	223702	248466	2098.2	1.69	1.58	N/A	2.88 F	71.10	2543.63	43.63		
3	100	234996	223701	235716	986.2	1.71	1.58	N/A	3.04 F	71.10	2543.64	43.64		
4	1700	341565	139667	352253	17627.2	1.53	1.57	N/A	2.09 F	88.70	3241.64	741.64		
5	1700	312979	139666	323488	15131.5	1.58	1.57	N/A	2.28 F	88.70	3241.65	741.65		
6	1850	336881	132027	348440	17885.2	1.51	1.57	N/A	2.12 F	90.29	3305.05	805.05		
7	1850	318549	132027	329984	16284.8	1.54	1.57	N/A	2.24 F	90.29	3305.06	805.06		
8	1950	320468	127243	332475	16869.9	1.52	1.57	N/A	2.23 F	91.30	3344.87	844.87		
9	1950	312802	127243	324756	16200.7	1.53	1.57	N/A	2.28 F	91.30	3344.87	844.87		
10	2050	307858	122773	320295	16159.3	1.52	1.57	N/A	2.32 F	92.23	3381.89	881.89		
11	2050	303560	122772	315965	15784.1	1.53	1.57	N/A	2.35 F	92.23	3381.89	881.89		
12	2300	151294	112633	163658	3375.4	1.71	1.57	N/A	4.72 F	94.35	3466.13	966.13		
13	2300	132741	112633	144956	1755.6	1.72	1.57	N/A	5.38 F	94.35	3466.14	966.14		
14	2370	129966	109858	142452	1755.6	1.72	1.57	N/A	5.49 F	94.94	3489.28	989.28		
15	2370	1277909	107800	140922	1755.6	1.75	1.60	N/A	5.58 F	94.94	3489.29	1036.40		
16	2700	105515	94232	119785	985.1	1.75	1.60	N/A	6.77 F	97.73	3599.97	1152.35		
17	2700	111680	94231	126006	1523.4	1.75	1.60	N/A	6.39 F	97.73	3599.97	1152.35		
18	3100	110766	77783	126839	2879.6	1.71	1.60	N/A	6.44 F	101.11	3734.23	1293.00		
19	3100	97392	77783	113331	1712.1	1.73	1.60	N/A	7.33 F	101.11	3734.23	1293.01		
20	3700	71565	53303	89806	1594.4	1.70	1.61	N/A	9.97 F	106.15	3934.24	1502.54		
21	3700	60887	53302	79004	662.3	1.71	1.61	N/A	11.72 F	106.16	3934.25	1502.55		
22	4650	34671	14219	56495	1785.6	1.64	1.61	N/A	20.59 F	114.20	4253.37	1836.86		
23	4900	44595	4828	67626	3472.0	1.59	1.61	N/A	16.01 F	116.32	4337.37	1924.87		
24	4900	28975	4828	51775	2108.2	1.62	1.61	N/A	24.64 F	116.32	4337.38	1924.87		
25	5029	22103	34	45340	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.40	1969.94		
26	5029	22102	33	45339	1926.8	1.61	1.61	N/A	32.30 F	117.40	4380.41	1969.95		
27	5600	-45329	-21341	-20805	2094.3	1.57	1.62	N/A	(13.67)	122.23	4572.11	2170.78		
28	5650	-40465	-23210	-15657	1506.5	1.58	1.62	N/A	(15.31)	122.66	4588.87	2188.34		
29														
30		F	Conn Fracture											
31		( )	Compression											
32		(V)	Vector Collapse Safety Factor											
33														

## 9-5/8" Intermediate Casing Pressure Test:

Internal Profile based off Surface Pressure + Hydrostatic: 4589 psi

External Profile based off Pore Pressure: 2188 psi



Working \ Config \ Min SF \ Load/SF \ DF Summary \ VME \ Wallplot \

For Help, press F1

Default Datum @ 0.00 usft API - US Survey Feet jgriffin2

StressCheck - [String Summary - Shallow 3.0 Mile - Big Hole \*]

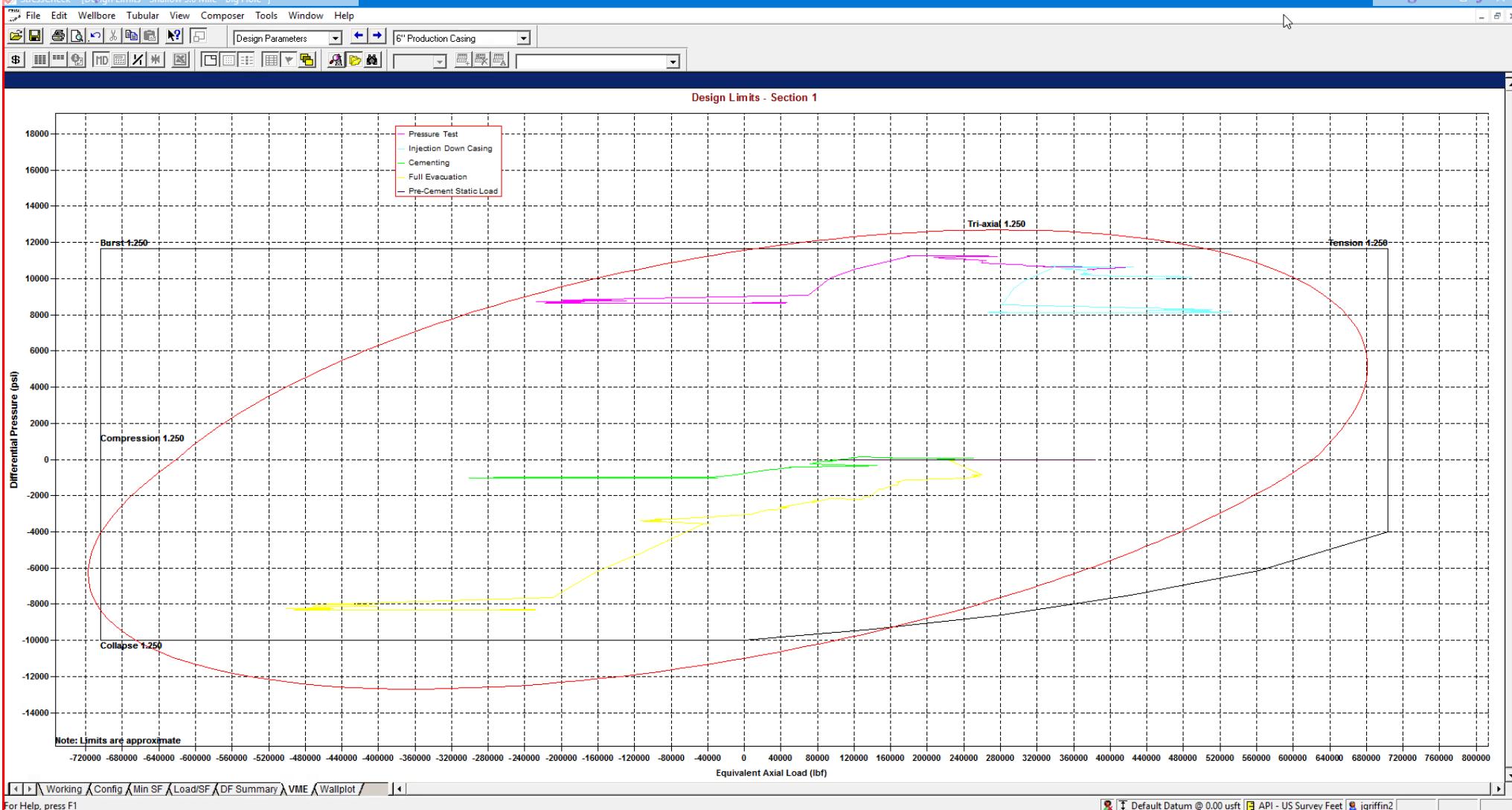
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String Summary

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Intermediate Casing	9 5/8", 40.000 ppf, J-55	BTC, J-55	0.0-5650.0	8.750 A	1.57	1.59	1.80 F	1.35	98,141
2										Total = 98,141
3										
4	F Conn Fracture									
5	A Alternate Drift									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 9-5/8" 40# Intermediate Casing. Passes all Burst, Collapse and Tensile design criteria.

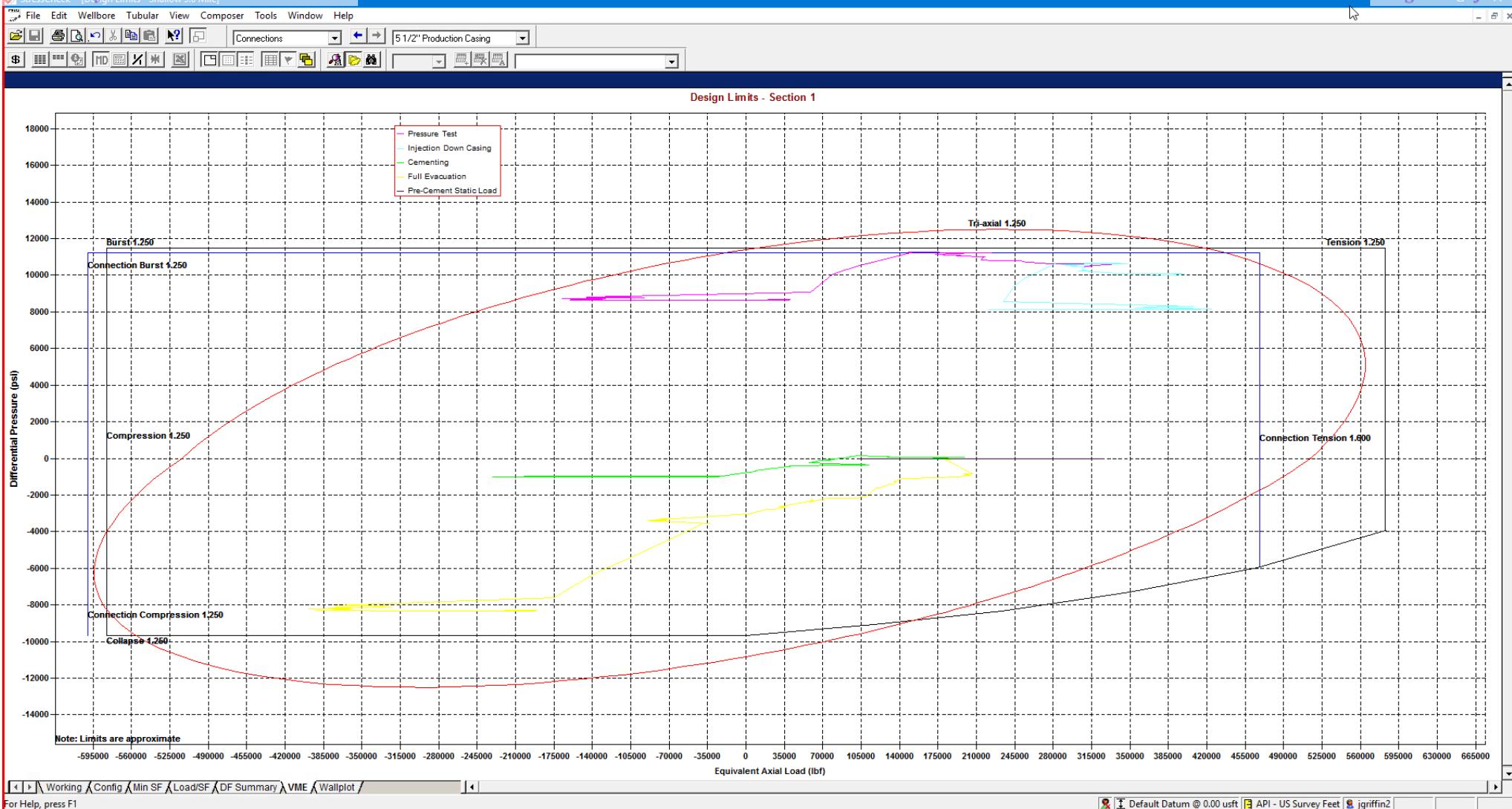


StressCheck - [String Summary - Shallow 3.0 Mile - Big Hole \*]

String Summary

String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
					Burst	Collapse (V)	Axial	Triaxial	
1 Production Casing	6", 24.500 pfp, P110 ICY	BTC, P110 ICY	0.0-28578.0	5.075	1.29	1.52	(1.75)	1.37	541,493
2									Total = 541,493
3									
4 ( ) Compression									
5 (V) Vector Collapse Safety Factor									
6									

\*Modelling done with 6" Production Casing with a 125ksi Control Yield. Passes all Burst, Collapse and Tensile design criteria.



StressCheck - [String Summary - Shallow 3.0 Mile]

String Summary

	String	OD/Weight/Grade	Connection	MD Interval (usft)	Drift Dia. (")	Minimum Safety Factor (Abs)				Design Cost (\$)
						Burst	Collapse (V)	Axial	Triaxial	
1	Production Casing	5 1/2", 20.000 ppf, P110 ICY	BTC, P110 ICY	0.0-28578.0	4.653	1.27	1.47	1.90 F	1.35	446,902
2										Total = 446,902
3										
4	F Conn Fracture									
5	( ) Compression									
6	(V) Vector Collapse Safety Factor									
7										

\*Modelling done with 5-1/2" 20# Production Casing with a 125ksi Control Yield. Passes all Burst, Collapse and Tensile design criteria.



### MUD PROGRAM:

During this procedure we plan to use a Closed-Loop System and haul contents to the required disposal. The applicable depths and properties of the drilling fluid systems are as follows:

Measured Depth	Type	Weight (ppg)	Viscosity	Water Loss
0 – 2,030'	Fresh - Gel	8.6-8.8	28-34	N/c
2,030' – 7,793'	Brine	9-10.5	28-34	N/c
5,450' – 28,578' Lateral	Oil Base	8.8-9.5	58-68	N/c - 6

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

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

### CEMENTING ADDITIVES:

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

Cement integrity tests will be performed immediately following plug bump.

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.

[New Search »](#)[« Back to Previous List](#)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

[New Search »](#)[« Back to Previous List](#)USC  Metric

6/8/2015 10:23:27 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		9.625	10.625	10.625	10.625	in.
Wall Thickness		0.395	--	--	--	in.
Inside Diameter		8.835	8.835	8.835	8.835	in.
Standard Drift		8.679	8.679	8.679	8.679	in.
Alternate Drift		8.750	8.750	8.750	8.750	in.
Nominal Linear Weight, T&C		40.00	--	--	--	lbs/ft
Plain End Weight		38.97	--	--	--	lbs/ft
Performance		Pipe	BTC	LTC	STC	
Minimum Collapse Pressure		2,570	2,570	2,570	2,570	psi
Minimum Internal Yield Pressure		3,950	3,950	3,950	3,950	psi
Minimum Pipe Body Yield Strength		630.00	--	--	--	1000 lbs
Joint Strength		--	714	520	452	1000 lbs
Reference Length		--	11,898	8,665	7,529	ft
Make-Up Data		Pipe	BTC	LTC	STC	
Make-Up Loss		--	4.81	4.75	3.38	in.
Minimum Make-Up Torque		--	--	3,900	3,390	ft-lbs
Maximum Make-Up Torque		--	--	6,500	5,650	ft-lbs



## Connection Data Sheet

OD (in.)	WEIGHT (lbs./ft.)	WALL (in.)	GRADE	API DRIFT (in.)	RBW%	CONNECTION
5.500	Nominal: 20.00	0.361	VST P110EC	4.653	87.5	DWC/C-IS MS
	Plain End: 19.83					

PIPE PROPERTIES			CONNECTION PROPERTIES		
Outside Diameter	5.500	in.	Connection Type	Semi-Premium T&C	
Inside Diameter	4.778	in.	Connection O.D. (nom)	6.115	in.
Nominal Area	5.828	sq.in.	Connection I.D. (nom)	4.778	in.
Grade Type	API 5CT		Make-Up Loss	4.125	in.
Min. Yield Strength	125	ksi	Coupling Length	9.250	in.
Max. Yield Strength	140	ksi	Critical Cross Section	5.828	sq.in.
Min. Tensile Strength	135	ksi	Tension Efficiency	100.0%	of pipe
Yield Strength	729	kib	Compression Efficiency	100.0%	of pipe
Ultimate Strength	787	kib	Internal Pressure Efficiency	100.0%	of pipe
Min. Internal Yield	14,360	psi	External Pressure Efficiency	100.0%	of pipe
Collapse	12,090	psi			

CONNECTION PERFORMANCES			FIELD END TORQUE VALUES		
Yield Strength	729	kib	Min. Make-up torque	16,100	ft.lb
Parting Load	787	kib	Opti. Make-up torque	17,350	ft.lb
Compression Rating	729	kib	Max. Make-up torque	18,600	ft.lb
Min. Internal Yield	14,360	psi	Min. Shoulder Torque	1,610	ft.lb
External Pressure	12,090	psi	Max. Shoulder Torque	12,880	ft.lb
Maximum Uniaxial Bend Rating	104.2	°/100 ft	Min. Delta Turn	-	Turns
Reference String Length w 1.4 Design Factor	26,040	ft	Max. Delta Turn	0.200	Turns

Need Help? Contact: [tech.support@vam-usa.com](mailto:tech.support@vam-usa.com)

Reference Drawing: 8136PP Rev.01 & 8136BP Rev.01

Date: 12/03/2019

Time: 06:19:27 PM

For detailed information on performance properties, refer to DWC Connection Data Notes on following page(s).

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**DWC Connection Data Sheet Notes:**

1. DWC connections are available with a seal ring (SR) option.
2. All standard DWC/C connections are interchangeable for a given pipe OD. DWC connections are interchangeable with DWC/C-SR connections of the same OD and wall.
3. Connection performance properties are based on nominal pipe body and connection dimensions.
4. DWC connection internal and external pressure resistance is calculated using the API rating for buttress connections. API Internal pressure resistance is calculated from formulas 31, 32, and 35 in the API Bulletin 5C3.
5. DWC joint strength is the minimum pipe body yield strength multiplied by the connection critical area.
6. API joint strength is for reference only. It is calculated from formulas 42 and 43 in the API Bulletin 5C3.
7. Bending efficiency is equal to the compression efficiency.
8. The torque values listed are recommended. The actual torque required may be affected by field conditions such as temperature, thread compound, speed of make-up, weather conditions, etc.
9. Connection yield torque is not to be exceeded.
10. Reference string length is calculated by dividing the joint strength by both the nominal weight in air and a design factor (DF) of 1.4. These values are offered for reference only and do not include load factors such as bending, buoyancy, temperature, load dynamics, etc.
11. DWC connections will accommodate API standard drift diameters.
12. DWC/C family of connections are compatible with API Buttress BTC connections. Please contact [tech.support@vam-usa.com](mailto:tech.support@vam-usa.com) for details on connection ratings and make-up.



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10.750 40.50/0.350 J55

PDF

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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
Released to Imaging: 12/8/2025 12:55:55 PM		Page 28 of 32		--	--	5,250
Maximum Make-Up Torque		--	--	--	--	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 <sup>2</sup>
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 Internal Pressure:	3,930 psi	Min:	2,793
STC Joint Strength:	372 kips	Opti:	3,724
		Max:	4,655
LTC Performance		LTC Torque (ft-lbs)	
LTC Internal Pressure:	3,930 psi	Min:	3,130
LTC Joint Strength:	417 kips	Opti:	4,174
		Max:	5,217
SC-BTC Performance - Cplg OD = 9.125"		BTC Torque (ft-lbs)	
BTC Internal Pressure:	3,930 psi	follow API guidelines regarding positional make up	
BTC Joint Strength:	503 kips		

\*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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Issued on: 10 Feb. 2021 by Wesley Ott



OD 6 in.	Weight (lb/ft) Nominal: 24.50 Plain End: 23.95	Wall Th. 0.400 in.	Grade P110EC	API Drift: 5.075 in.	Connection <b>VAM® SPRINT-SF</b>
-------------	--	-----------------------	-----------------	-------------------------	-------------------------------------

PIPE PROPERTIES		
Nominal OD	6.000	in.
Nominal ID	5.200	in.
Nominal Cross Section Area	7.037	sqin.
Grade Type	High Yield	
Min. Yield Strength	125	ksi
Max. Yield Strength	140	ksi
Min. Ultimate Tensile Strength	135	ksi

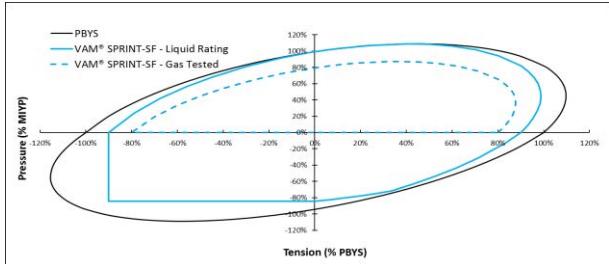
CONNECTION PROPERTIES		
Connection Type	Integral Semi-Flush	
Connection OD (nom):	6.277	in.
Connection ID (nom):	5.146	in.
Make-Up Loss	5.386	in.
Critical Cross Section	6.417	sqin.
Tension Efficiency	91.0	% of pipe
Compression Efficiency	91.0	% of pipe
Internal Pressure Efficiency	100	% of pipe
External Pressure Efficiency	100	% of pipe

CONNECTION PERFORMANCES		
Tensile Yield Strength	801	kib
Compression Resistance	801	kib
Internal Yield Pressure	14,580	psi
Collapse Resistance	12,500	psi
Max. Structural Bending	83	°/100ft
Max. Bending with ISO/API Sealability	30	°/100ft

TORQUE VALUES		
Min. Make-up torque	21,750	ft.lb
Opt. Make-up torque	24,250	ft.lb
Max. Make-up torque	26,750	ft.lb
Max. Torque with Sealability (MTS)	53,000	ft.lb

\* 87.5% RBW

VAM® SPRINT-SF is a semi-flush connection innovatively designed for extreme shale applications. Its high tension rating and ultra high torque capacity make it ideal to run a fill string length as production casing in shale wells with extended horizontal sections and tight clearance requirements.



Do you need help on this product? - Remember no one knows VAM® like VAM®

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Over 140 VAM® Specialists available worldwide 24/7 for Rig Site Assistance



**Connection Data Sheet**

OD (in.)	WEIGHT (lbs./ft.)	WALL (in.)	GRADE	API DRIFT (in.)	RBW%	CONNECTION
6.000	Nominal: 22.30 Plain End: 21.70	0.360	VST P110EC	5.155	92.5	DWC/C-IS

**PIPE PROPERTIES**

Nominal OD	6.000	in.
Nominal ID	5.280	in.
Nominal Area	6.379	sq.in.
Grade Type	API 5CT	
Min. Yield Strength	125	ksi
Max. Yield Strength	140	ksi
Min. Tensile Strength	135	ksi
Yield Strength	797	kib
Ultimate Strength	861	kib
Min. Internal Yield Pressure	13,880	psi
Collapse Pressure	9,800	psi

**CONNECTION PROPERTIES**

Connection Type	Semi-Premium T&C
Connection OD (nom)	6.650 in.
Connection ID (nom)	5.280 in.
Make-Up Loss	4.313 in.
Coupling Length	9.625 in.
Critical Cross Section	6.379 sq.in.
Tension Efficiency	100.0% of pipe
Compression Efficiency	100.0% of pipe
Internal Pressure Efficiency	100.0% of pipe
External Pressure Efficiency	100.0% of pipe

**CONNECTION PERFORMANCES**

Yield Strength	797	kib
Parting Load	861	kib
Compression Rating	797	kib
Min. Internal Yield	13,880	psi
External Pressure	9,800	psi
Maximum Uniaxial Bend Rating	47.7	%/100 ft
Reference String Length w 1.4 Design Factor	25,530	ft.

**FIELD END TORQUE VALUES**

Min. Make-up torque	17,000	ft.lb
Opti. Make-up torque	18,250	ft.lb
Max. Make-up torque	19,500	ft.lb
Min. Shoulder Torque	1,700	ft.lb
Max. Shoulder Torque	13,600	ft.lb
Min. Delta Turn	-	Turns
Max. Delta Turn	0.200	Turns
Maximum Operational Torque	24,200	ft.lb
Maximum Torsional Value (MTV)	26,620	ft.lb

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Reference Drawing: 8135PP Rev.02 &amp; 8135BP Rev.02

Date: 07/30/2020

Time: 07:50:47 PM

For detailed information on performance properties, refer to DWC Connection Data Notes on following page(s).

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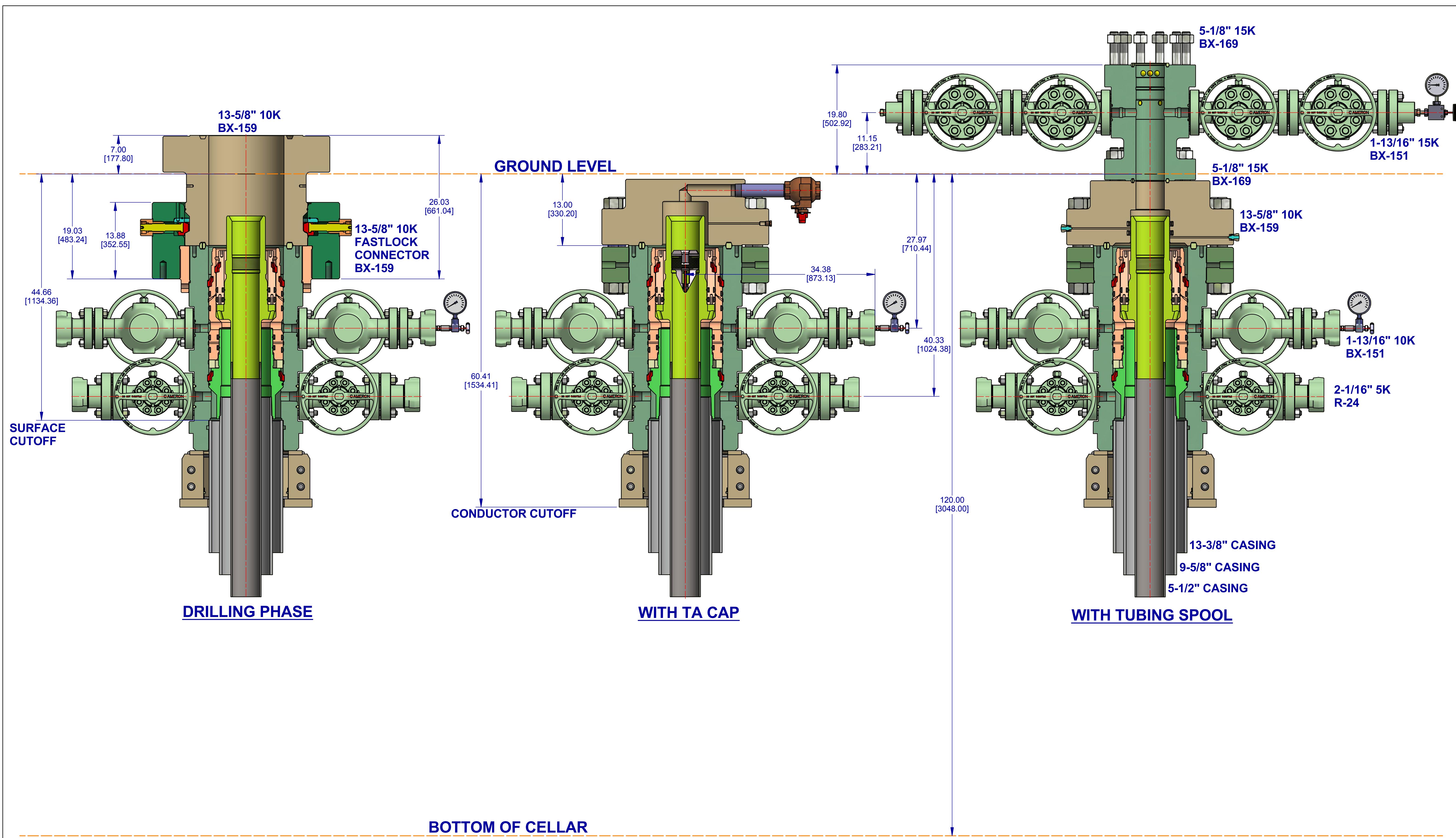
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DESIGNED IN INCHES		MACHINING TOLERANCES UNLESS OTHERWISE SPECIFIED		DO NOT SCALE		CAMERON		SURFACE SYSTEMS	
DIMENSIONAL UNITS		INCHES [MILLIMETERS]							
X [0.1]	± [ ]	XX [0.X]	± [ ]	X [0.1]	± [ ]	PA	APPROVED BY: KEN REED	DATE: 6 Nov 18	
XX [0.X]	± [ ]	XXX [0.XX]	± [ ]	XX [0.1]	± [ ]	PA	APPROVED BY: PA	DATE: 6 Nov 18	
						✓ RA	APPROVER NAME: PA	DATE: 6 Nov 18	
						✓ RA	APPROVER NAME: PA	DATE: 6 Nov 18	
MACHINED FILLET RADII: 0.15-0.60 [0.38-1.27]. BREAK ALL SHARP EDGES. 0.1-0.3 [0.2-0.8] RADII OR 45°. SURFACE FINISHES: 125-250 RA. INTERPROF DRAWING PER ASME Y14.5, ASME Y14.36, AND AWS A2.4 STANDARDS. SEE BIM FOR MATERIAL AND SPECIAL REQUIREMENTS. ITEM NUMBERS NOT APPEARING ON BIM DO NOT APPLY.		ALL ESTIMATED WEIGHT: 8147.2 LBS INITIAL USE BIM: 3695.5 KG EWR: 650353762		SURFACE TREATMENT		DO NOT SCALE		CAMERON	

## 10,000 PSI BOP Annular Variance Request

EOG Resources request a variance to use a 5000 psi annular BOP with a 10,000 psi BOP stack. The component and compatibility tables along with the general well control plans demonstrate how the 5000 psi annular BOP will be protected from pressures that exceed its rated working pressure (RWP). The pressure at which the control of the wellbore is transferred from the annular preventer to another available preventer will not exceed 3500 psi (70% of the RWP of the 5000 psi annular BOP).

### 1. Component and Preventer Compatibility Tables

The tables below outlines the tubulars and the compatible preventers in use. This table, combined with the drilling fluid, documents that two barriers to flow will be maintained at all times.

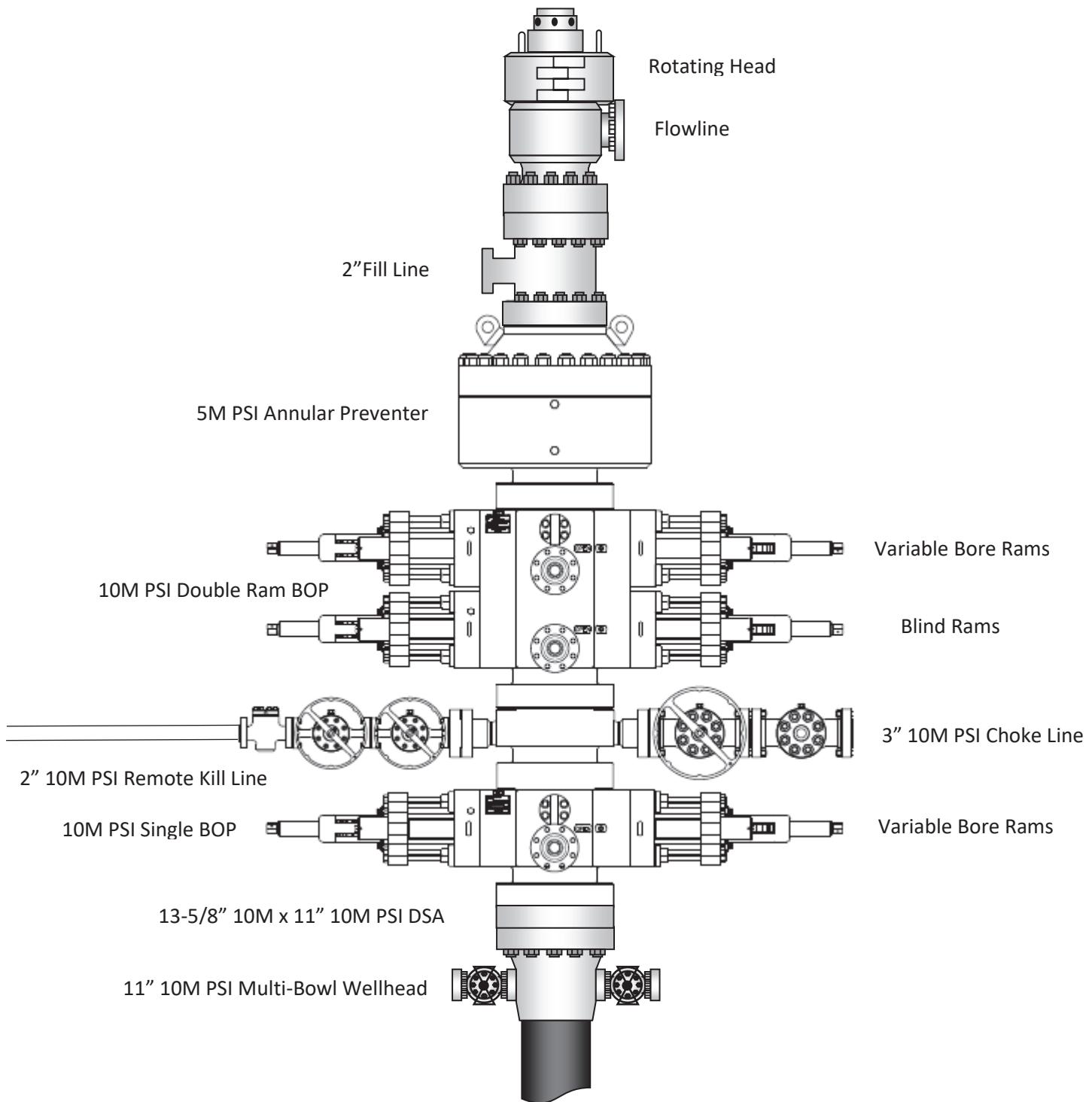
9-7/8" & 8-3/4" Intermediate Hole Section 10M psi requirement					
Component	OD	Primary Preventer	RWP	Alternate Preventer(s)	RWP
Drillpipe	4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
HWDP	4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
Jars	4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
DCs and MWD tools	6.500 – 8.000"	Annular	5M	-	-
Mud Motor	6.750 – 8.000"	Annular	5M	-	-
Intermediate casing	7.625"	Annular	5M	-	-
Open-hole	-	Blind Rams	10M	-	-

6-3/4" Production Hole Section 10M psi requirement					
Component	OD	Primary Preventer	RWP	Alternate Preventer(s)	RWP
Drillpipe	4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
HWDP	4.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
DCs and MWD tools	4.750 – 5.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
Mud Motor	4.750 – 5.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
Mud Motor	5.500 – 5.750"	Annular	5M	-	-
Production casing	5.500"	Annular	5M	Upper 3.5 - 5.5" VBR Lower 3.5 - 5.5" VBR	10M 10M
Open-hole	-	Blind Rams	10M	-	-

VBR = Variable Bore Ram

## EOG Resources

### 11" 10M PSI BOP Stack



## 2. Well Control Procedures

Below are the minimal high-level tasks prescribed to assure a proper shut-in while drilling, tripping, running casing, pipe out of the hole (open hole), and moving the BHA through the BOPs. At least one well control drill will be performed weekly per crew to demonstrate compliance with the procedure and well control plan. The well control drill will be recorded in the daily drilling log. The type of drill will be determined by the ongoing operations, but reasonable attempts will be made to vary the type of drill conducted (pit, trip, open hole, choke, etc.). This well control plan will be available for review by rig personnel in the EOG Resources drilling supervisor's office on location, and on the rig floor. All BOP equipment will be tested as per Onshore O&G Order No. 2 with the exception of the 5000 psi annular which will be tested to 100% of its RWP.

### General Procedure While Drilling

1. Sound alarm (alert crew)
2. Space out drill string
3. Shut down pumps (stop pumps and rotary)
4. Shut-in Well (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
  - a. SIDPP and SICP
  - b. Pit gain
  - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach 70% or greater of the RWP of the annular preventer, confirm spacing and close the upper variable bore rams.

### General Procedure While Tripping

1. Sound alarm (alert crew)
2. Stab full opening safety valve and close
3. Space out drill string
4. Shut-in (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
  - a. SIDPP and SICP
  - b. Pit gain
  - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach 70% or greater of the RWP of the annular preventer, confirm spacing and close the upper variable bore rams.

### General Procedure While Running Production Casing

1. Sound alarm (alert crew)
2. Stab crossover and full opening safety valve and close
3. Space out string

4. Shut-in (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
  - a. SIDPP and SICP
  - b. Pit gain
  - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach 70% or greater of the RWP of the annular preventer, confirm spacing and close the upper variable bore rams.

#### General Procedure With No Pipe In Hole (Open Hole)

1. Sound alarm (alert crew)
2. Shut-in with blind rams. (HCR and choke will already be in the closed position.)
3. Confirm shut-in
4. Notify toolpusher/company representative
5. Read and record the following:
  - a. SICP
  - b. Pit gain
  - c. Time
6. Regroup and identify forward plan

#### General Procedures While Pulling BHA thru Stack

1. PRIOR to pulling last joint of drillpipe thru the stack.
  - a. Perform flowcheck, if flowing:
  - b. Sound alarm (alert crew)
  - c. Stab full opening safety valve and close
  - d. Space out drill string with tool joint just beneath the upper variable bore rams.
  - e. Shut-in using upper variable bore rams. (HCR and choke will already be in the closed position.)
  - f. Confirm shut-in
  - g. Notify toolpusher/company representative
  - h. Read and record the following:
    - i. SIDPP and SICP
    - ii. Pit gain
    - iii. Time
  - i. Regroup and identify forward plan
2. With BHA in the stack and compatible ram preventer and pipe combo immediately available.
  - a. Sound alarm (alert crew)
  - b. Stab crossover and full opening safety valve and close
  - c. Space out drill string with upset just beneath the upper variable bore rams.
  - d. Shut-in using upper variable bore rams. (HCR and choke will already be in the closed position.)
  - e. Confirm shut-in
  - f. Notify toolpusher/company representative
  - g. Read and record the following:
    - i. SIDPP and SICP

- ii. Pit gain
  - iii. Time
- h. Regroup and identify forward plan

3. With BHA in the stack and NO compatible ram preventer and pipe combo immediately available.

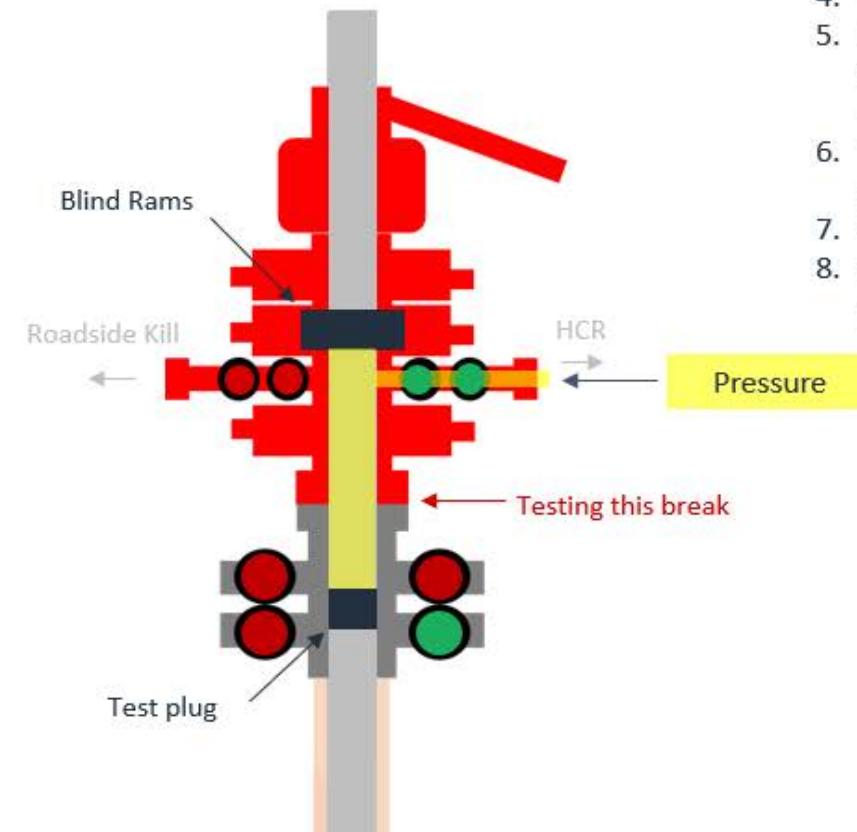
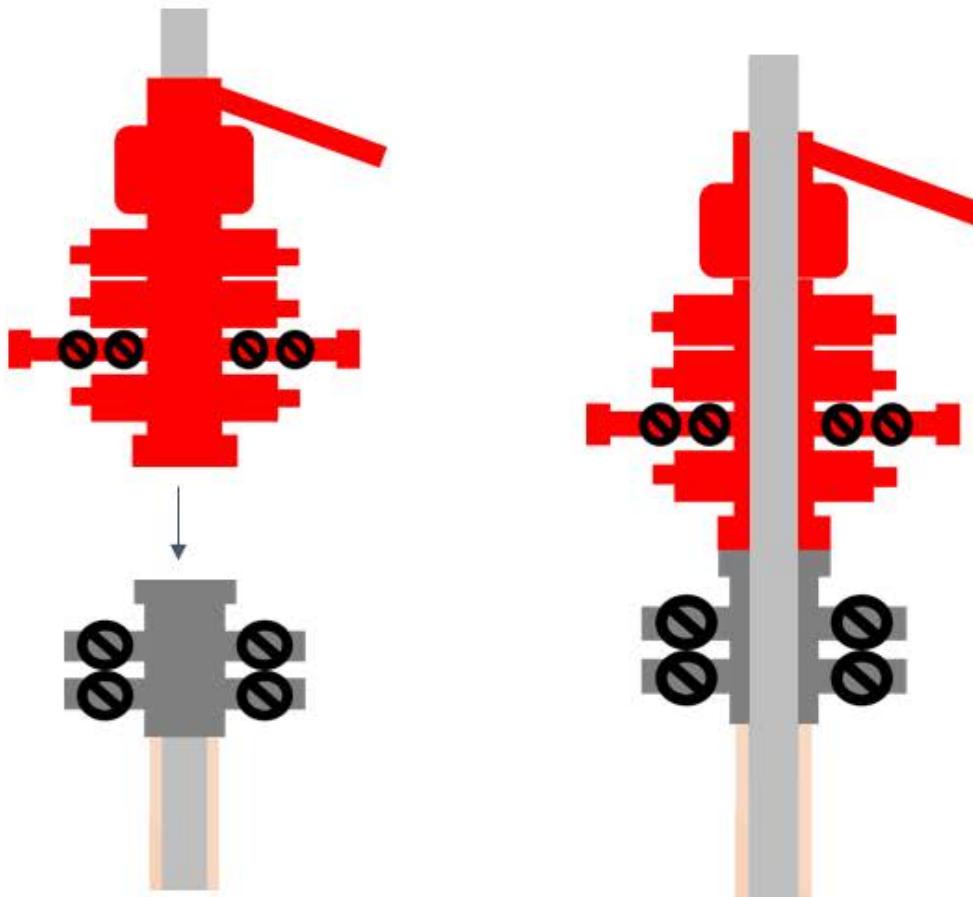
- a. Sound alarm (alert crew)
- b. If possible to pick up high enough, pull string clear of the stack and follow "Open Hole" scenario.
- c. If impossible to pick up high enough to pull the string clear of the stack:
- d. Stab crossover, make up one joint/stand of drillpipe, and full opening safety valve and close
- e. Space out drill string with tooljoint just beneath the upper variable bore ram.
- f. Shut-in using upper variable bore ram. (HCR and choke will already be in the closed position.)
- g. Confirm shut-in
- h. Notify toolpusher/company representative
- i. Read and record the following:
  - i. SIDPP and SICP
  - ii. Pit gain
  - iii. Time
- j. Regroup and identify forward plan

**Break-test BOP & Offline Cementing:**

EOG Resources Inc. (EOG) respectfully requests a variance from the minimum standards for well control equipment testing of ECFR Title 43 Part 3172.6(b)(9)(iv) 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.
- This test will be conducted for 5M rated hole intervals only.
- Each rig requesting the break-test variance is capable of picking up the BOP without damaging components using winches, following API Standard 53, Well Control Equipment Systems for Drilling Wells (Fifth edition, December 2018, Annex C. Table C.4) which recognizes break testing as an acceptable practice.
- Function tests will be performed on the following BOP elements:
  - Annular à during each full BOPE test
  - Upper Pipe Rams à On trip ins where FIT required
  - Blind Rams à Every trip
  - Lower Pipe Rams à during each full BOPE test
- 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.

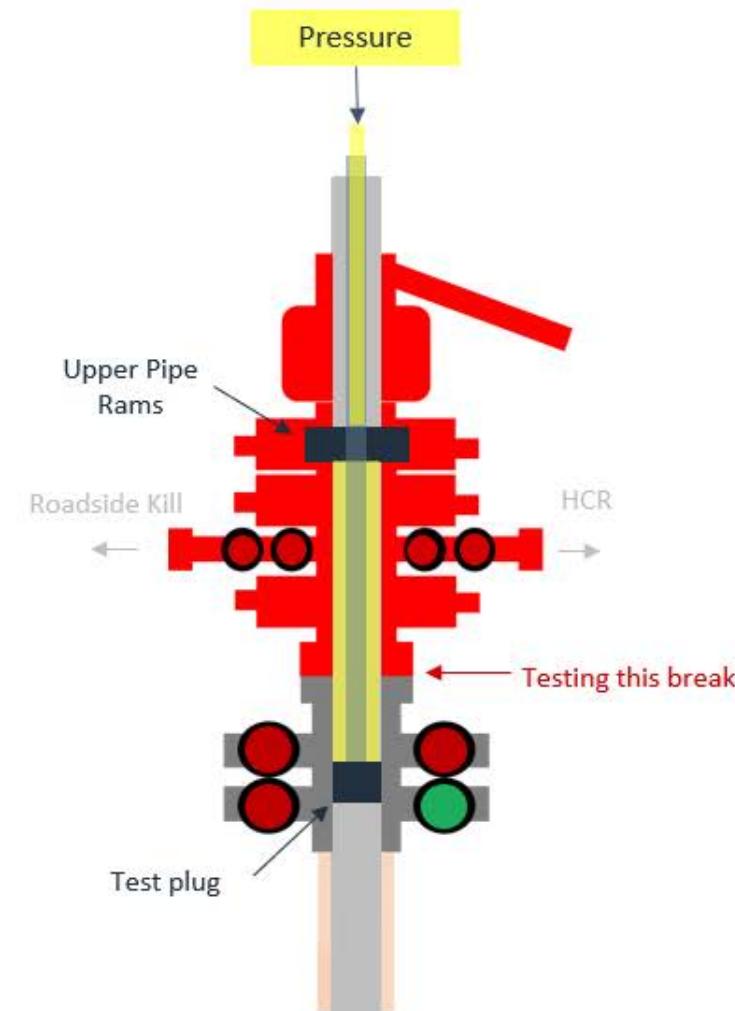
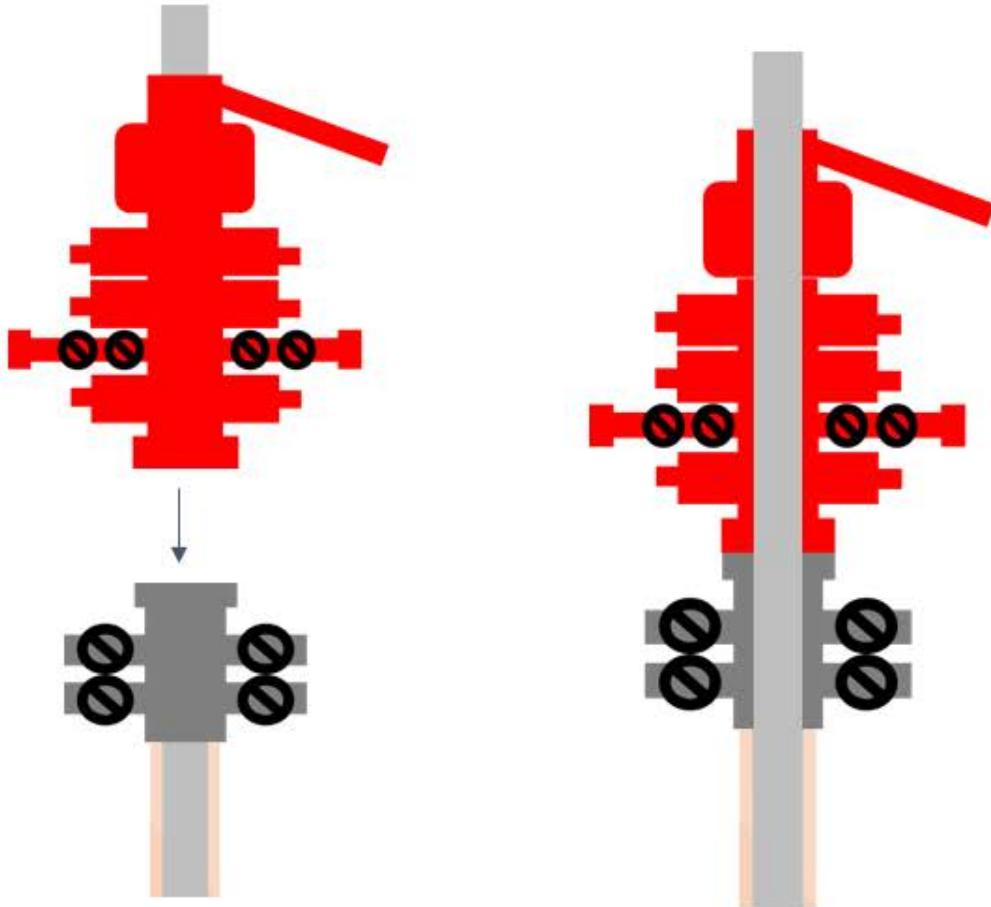
# Break Test Diagram (HCR valve)



## Steps

1. Set plug in wellhead (lower barrier)
2. Close Blind Rams (upper barrier)
3. Close roadside kill
4. Open HCR (pressure application)
5. Open wellhead valves below test plug to ensure if leak past test plug, pressure won't be applied to wellbore
6. Tie BOP testers high pressure line to main choke manifold crown valve
7. Pressure up to test break
8. Bleed test pressure from BOP testing unit

# Break Test Diagram (Test Joint)



## Steps

1. Set plug in with test joint wellhead (lower barrier)
2. Close Upper Pipe Rams (upper barrier)
3. Close roadside kill
4. Close HCR
5. Open wellhead valves below test plug to ensure if leak past test plug, pressure won't be applied to wellbore
6. Tie BOP testers high pressure line to top of test joint
7. Pressure up to test break
8. Bleed test pressure from BOP testing unit



## 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.



## 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



Figure 1: Cameron TA Plug and Offline Adapter Schematic

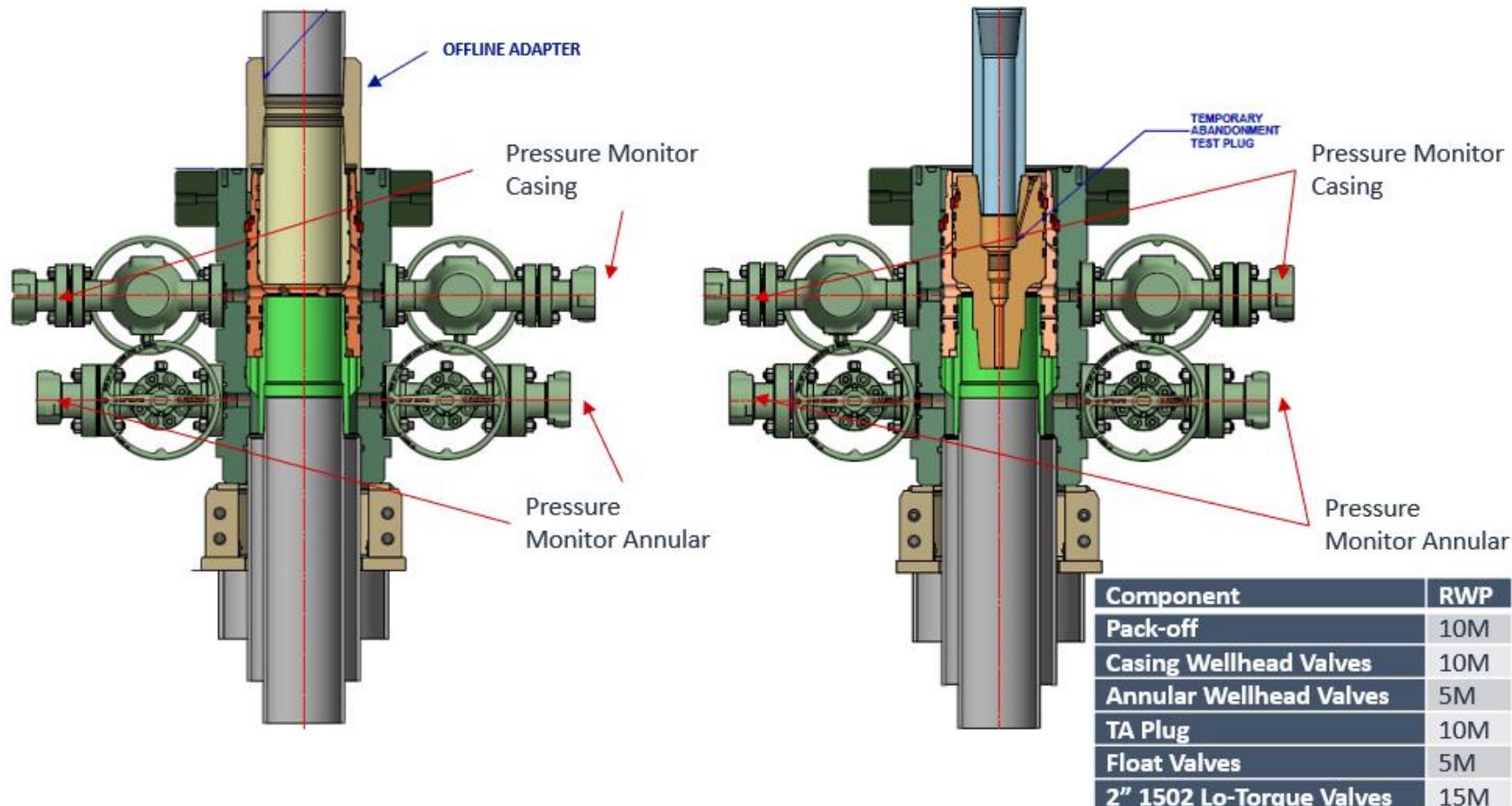
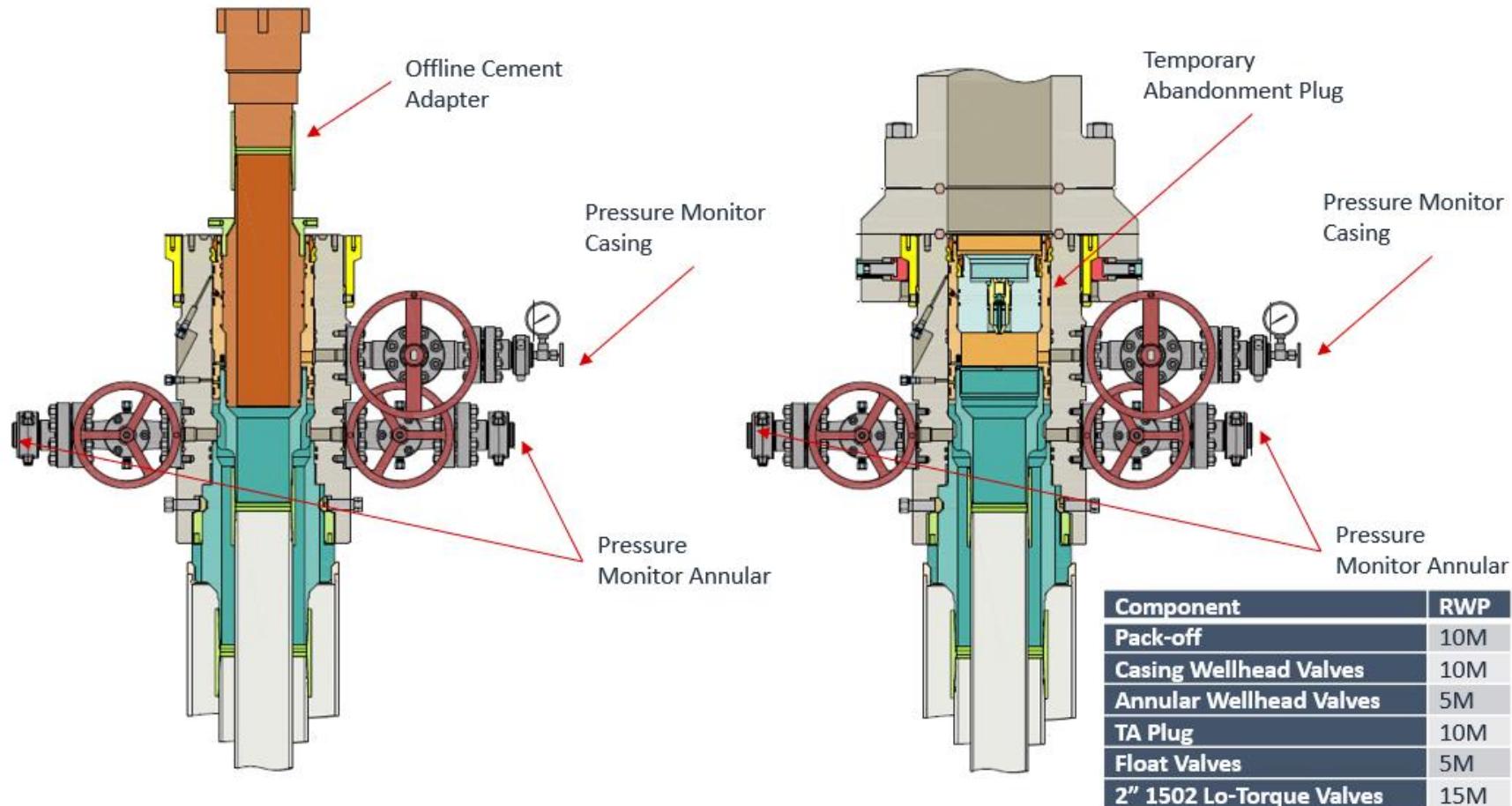
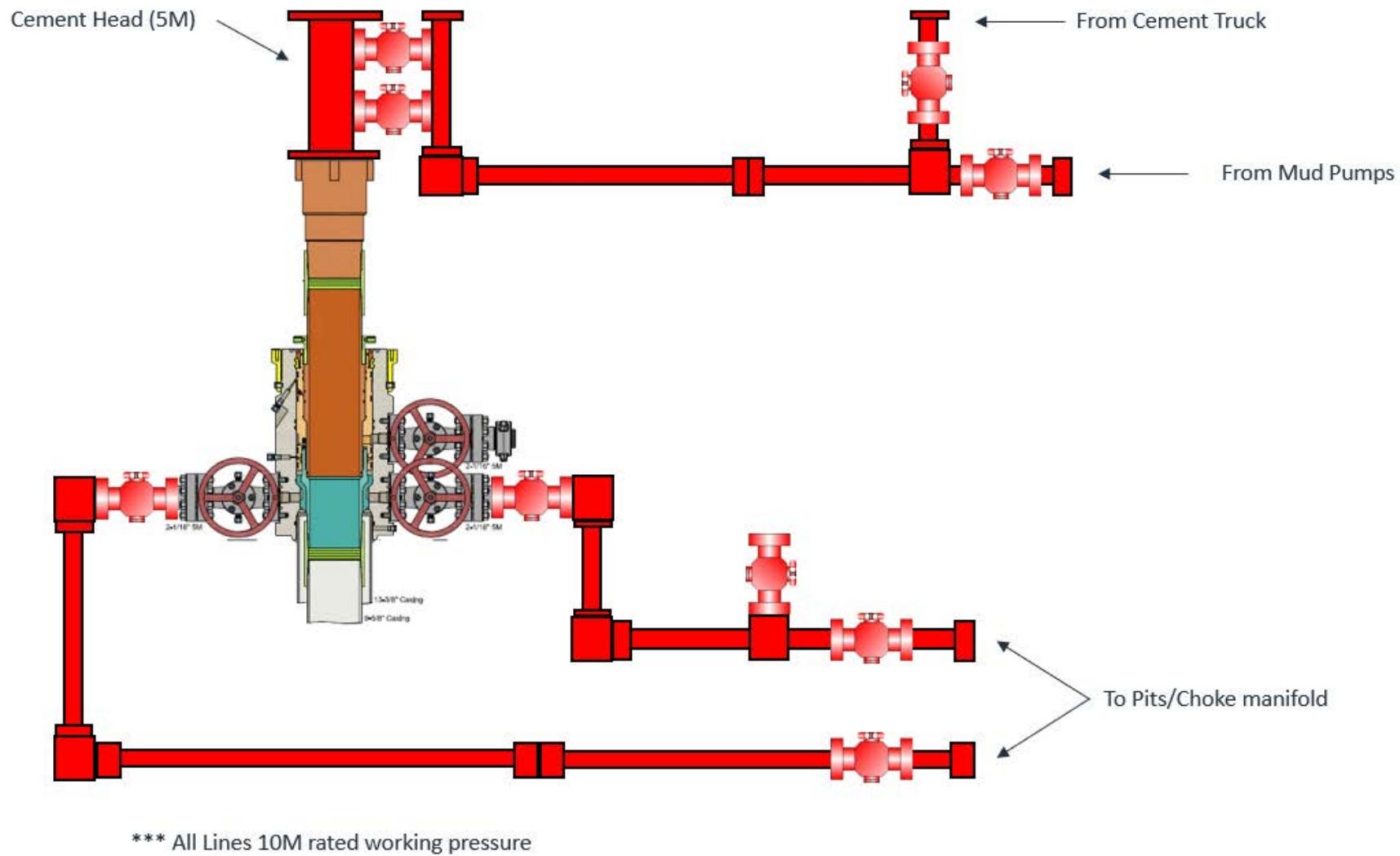
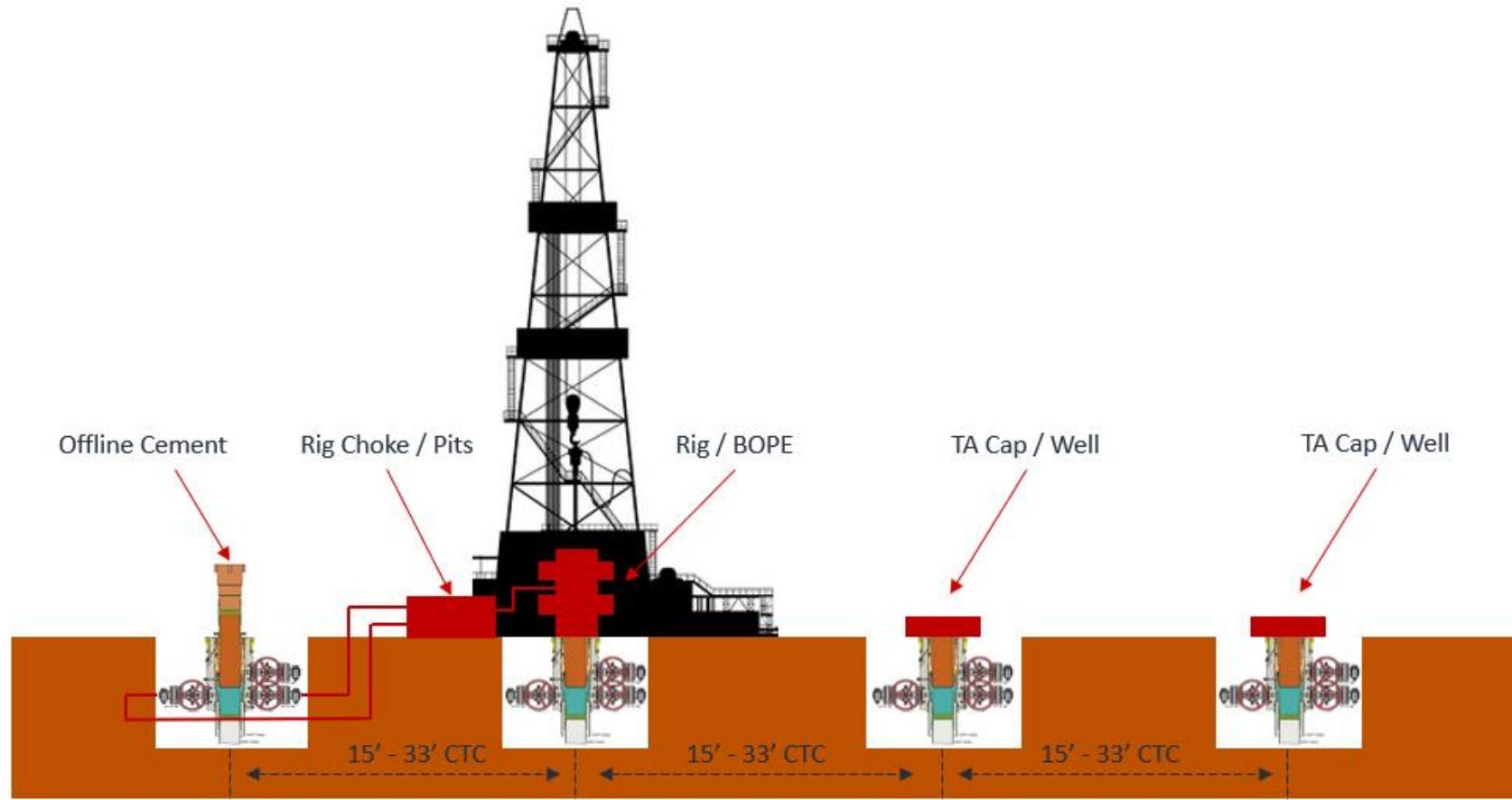




Figure 2: Cactus TA Plug and Offline Adapter Schematic



**Figure 3: Back Yard Rig Up**

**Figure 4: Rig Placement Diagram**

**Shallow Target Offline Bradenhead:**

EOG Resources Inc. (EOG) respectfully requests a variance from the minimum standards to allow for offline bradenhead cementing of the production string after primary cementing operations have been completed. The primary cement job will be pumped conventionally (online) to top of the Brushy Canyon and will cover the target production intervals, and after production pack-off is set and tested, bradenhead will be pumped through casing valves between the production and intermediate casings (offline). For the bradenhead stage of production cementing, the barriers remain the same for offline cementing compared to performing it online.

The bradenhead will be the primary option for production cementing. EOG also requests to have the conventional option in place to accommodate for logistical or wellbore conditions. The tie back requirements will be met if the cement is pumped conventionally, and cement volumes will be adjusted accordingly. TOC will be verified by CBL.



# **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

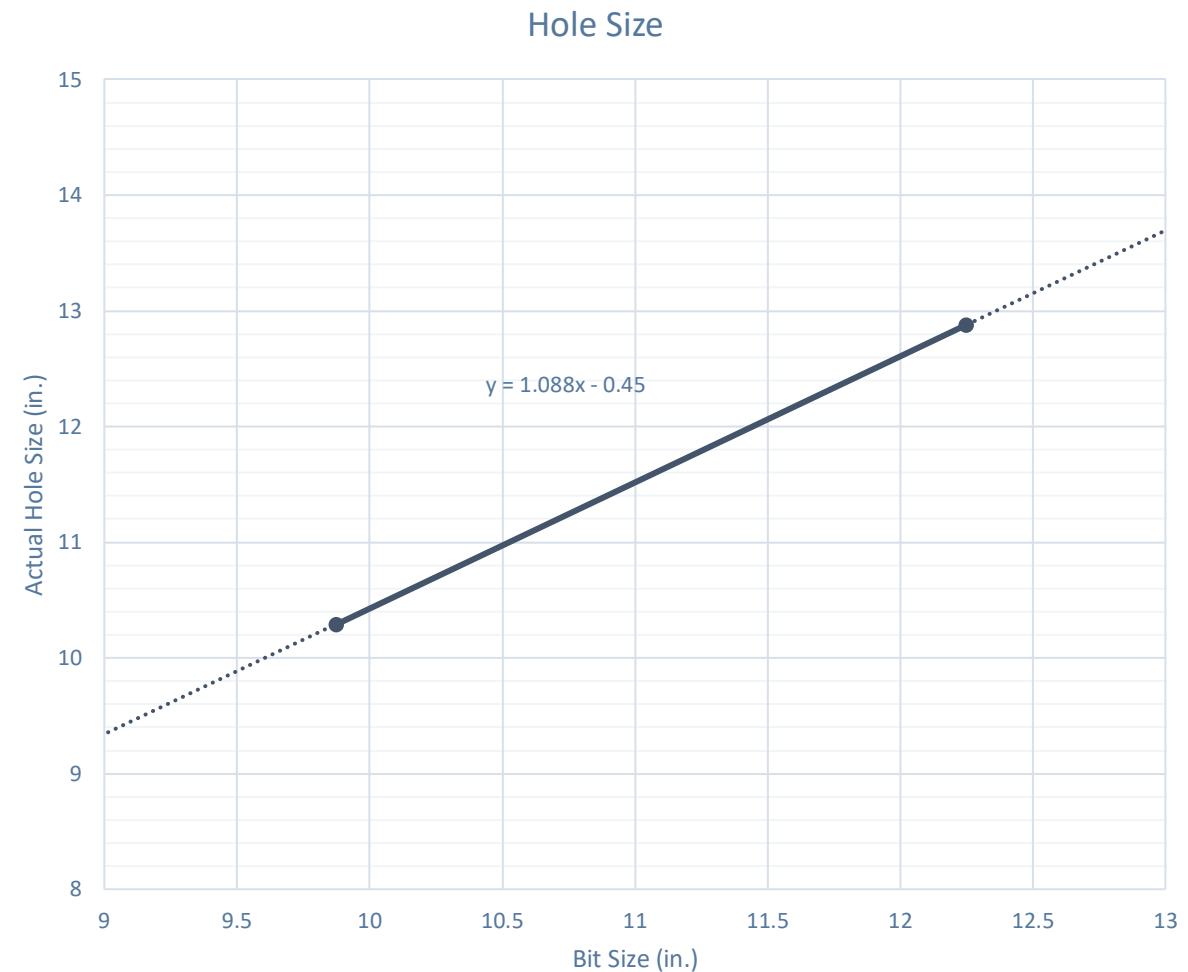
# Volumetric Hole Size Calculation

## 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

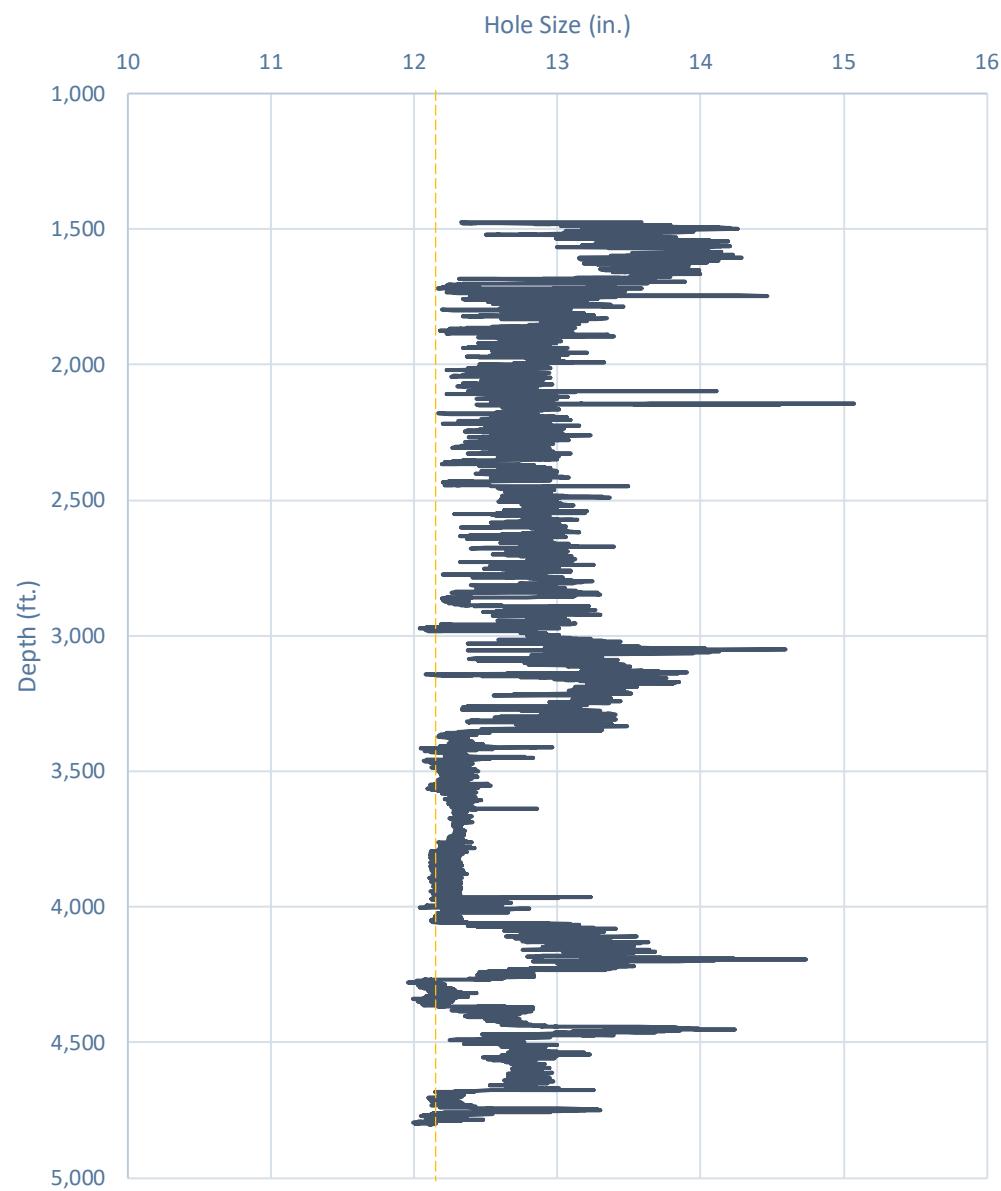


# Caliper Hole Size (12.25")

## 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

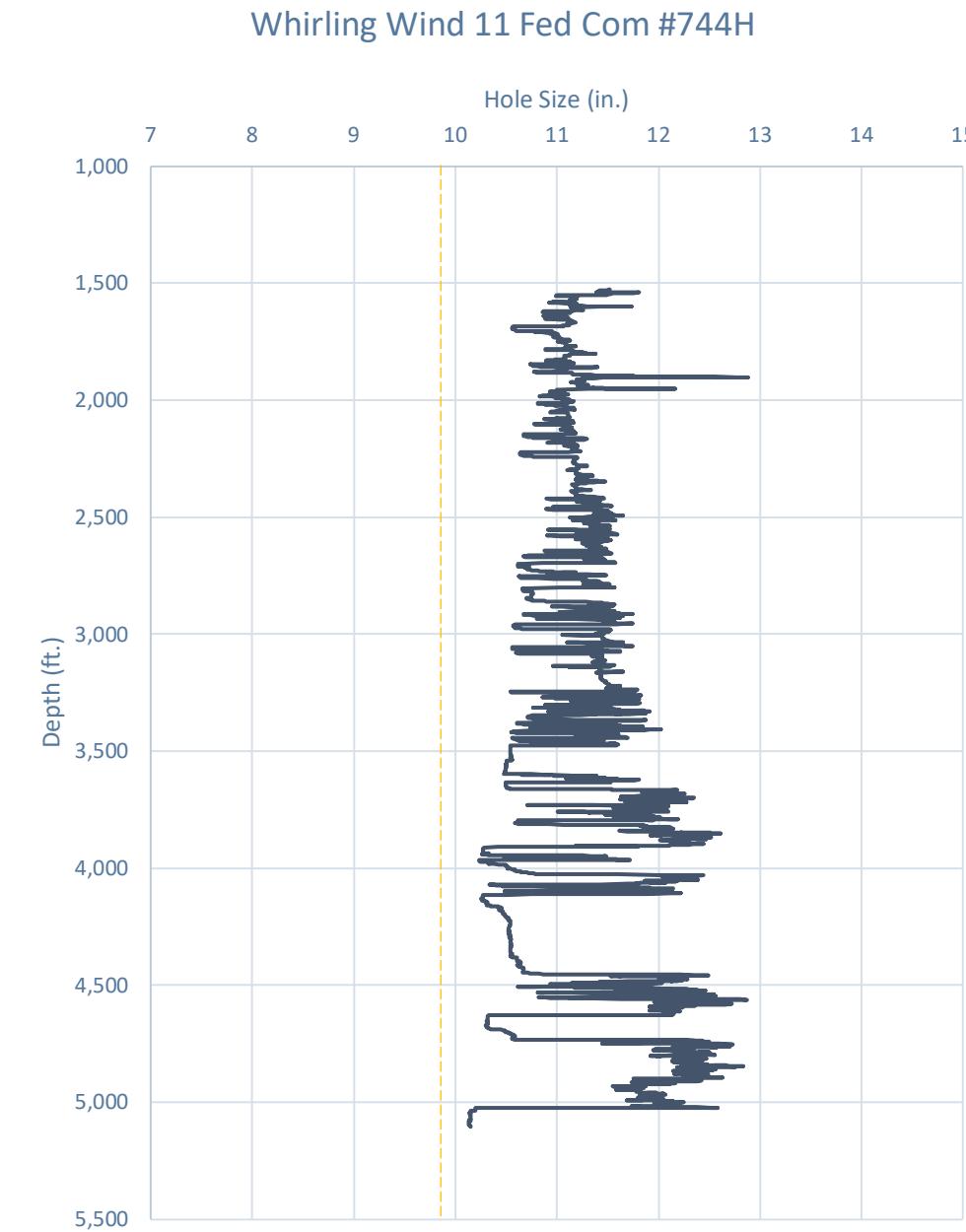
Modelo 10 Fed Com #501H



# 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



# Design A

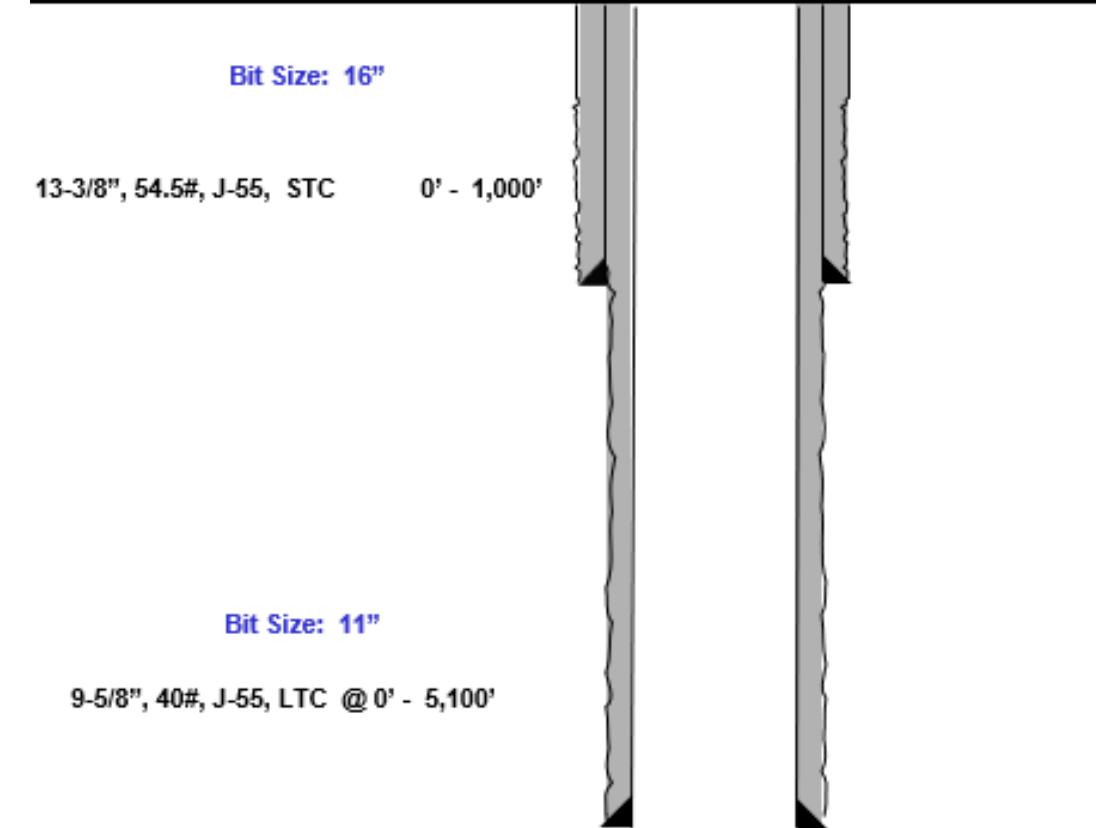
## Proposed 11" Hole with 9.625" 40# J55/HCK55 LTC Casing

- 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

$$= \frac{10.295 - 8.625}{2}$$

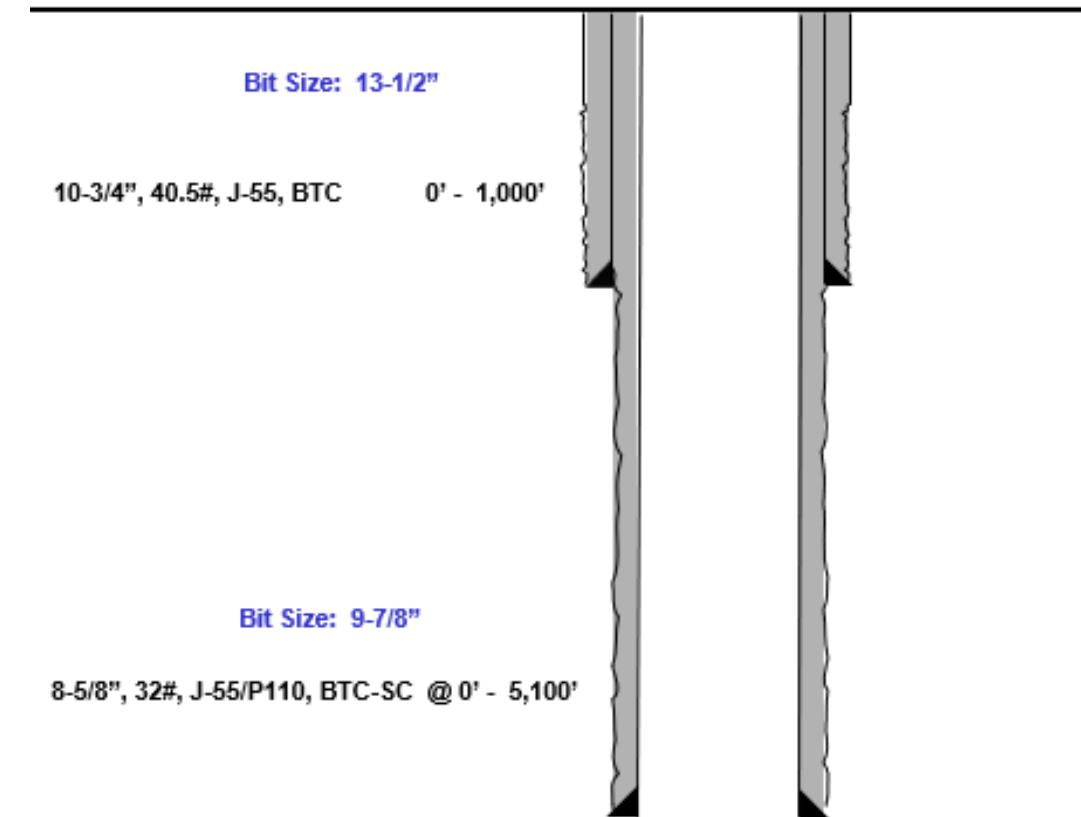
- 0.585" Clearance to coupling OD

$$= \frac{10.295 - 9.125}{2}$$

- Previous Shoe – 10.75" 40.5# J55 STC

- 0.4625" Clearance to coupling OD (~1,200' overlap)

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





# Index

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# 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	in <sup>2</sup>			

### 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

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USC  Metric

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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

**VALLOUREC STAR 8.625 32# J55 S S2L2 DA 7.875 WO# SLN# PO# MADE IN USA FT LB**

**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)	
<b>Pipe</b>	
Minimum Yield Strength:	55 ksi
Maximum Yield Strength:	80 ksi
Minimum Tensile Strength:	75 ksi
<b>Coupling</b>	
Minimum Yield Strength:	55 ksi
Maximum Yield Strength:	80 ksi
Minimum Tensile Strength:	75 ksi

Pipe Body Data (PE)	
<b>Geometry</b>	
Nominal ID:	7.92 inch
Nominal Area:	9.149 in <sup>2</sup>
*Special/Alt. Drift:	7.875 inch
<b>Performance</b>	
Pipe Body Yield Strength:	503 kips
Collapse Resistance:	2,530 psi
Internal Yield Pressure: (API Historical)	3,930 psi

API Connection Data	
Coupling OD: 9.625"	
<b>STC Performance</b>	
STC Internal Pressure:	3,930 psi
STC Joint Strength:	372 kips
<b>LTC Performance</b>	
LTC Internal Pressure:	3,930 psi
LTC Joint Strength:	417 kips
<b>SC-BTC Performance - Cplg OD = 9.125"</b>	
BTC Internal Pressure:	3,930 psi
BTC Joint Strength:	503 kips

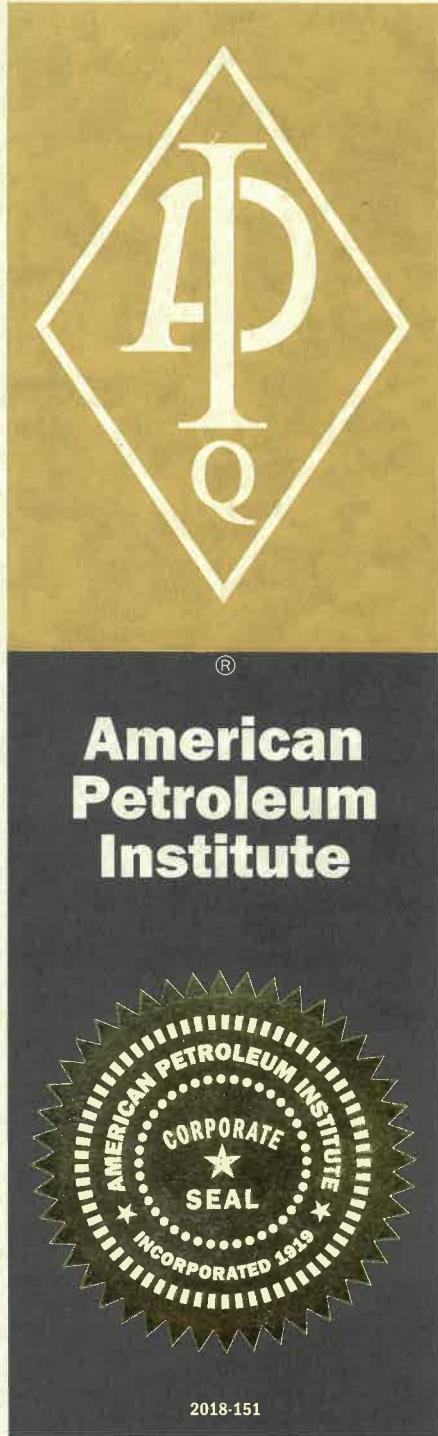
API Connection Torque	
<b>STC Torque (ft-lbs)</b>	
Min:	2,793
Opti:	3,724
Max:	4,655
<b>LTC Torque (ft-lbs)</b>	
Min:	3,130
Opti:	4,174
Max:	5,217
<b>BTC Torque (ft-lbs)</b>	
follow API guidelines regarding positional make up	

\*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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Effective Date: OCTOBER 24, 2024

Expiration Date: DECEMBER 18, 2027

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Senior Vice President of Global Industry Services

*Anchal Liddar*

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Institute

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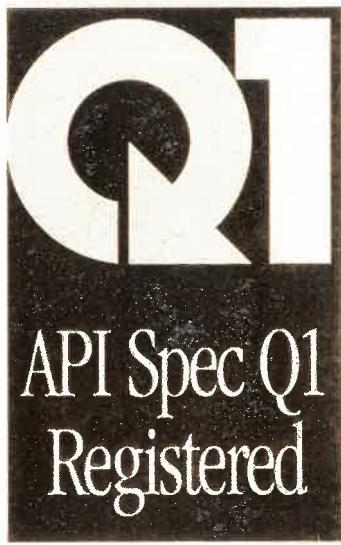
## **API Spec Q1, 9th Edition**

The scope of this registration and the approved quality management system applies to the

**Assembly and Pressure Test of High Pressure Mud and Cement Hoses,  
Flexible Choke and Kill Lines and General Rubber Hydraulic Hose Assemblies**

API approves the organization's justification for excluding

**No Exclusions Identified as Applicable**



**Effective Date:** OCTOBER 24, 2024  
**Expiration Date:** DECEMBER 18, 2027  
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**Senior Vice President of Global Industry Services**

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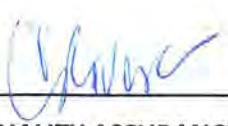
**GATES ENGINEERING & SERVICES NORTH AMERICA**  
**7603 Prairie Oak Dr. Suite 190**  
**Houston, TX. 77086**

**PHONE: +1 (281) 602-4100**  
**FAX: +1 (281) 602-4147**  
**EMAIL: gesna.quality@gates.com**  
**WEB: gates.com/oilandgas**

## **CERTIFICATE OF CONFORMANCE**

This is to verify that all Parts and/or Materials included in this shipment have been manufactured and/or processed in Conformance with applicable drawings and specifications, and that Records of Required Tests are on file and subject to examination. The following items were purchased via **Gates Engineering & Services North America** facilities in Houston, TX, USA. This hose assembly was designed and manufactured to meet requirements of API Spec 16C, 3<sup>rd</sup> Edition.

**CUSTOMER:** HELMERICH & PAYNE INTERNATIONAL DRILLING CO.  
**CUSTOMER P.O.#:** 740399823 (TAG WITH H&P I.D # 88076545 &H&P P.O. # 740399823 (UK S/O 34557))  
**CUSTOMER P/N:** 3.035.016C4116FX-FLTSSA  
**PART DESCRIPTION:** 3" X 35 FT GATES API 16C CHOKE & KILL FSL 3 TEMP B HOSE ASSEMBLY WITH STAINLESS STEEL ARMOR C/W 4 1/16" 10K H2S SUITED FLOAT X FLOAT FLANGES WITH BX 155 RING GROOVE SUPPLIED WITH SAFETY CLAMPS/LIFT EYE CLAMPS  
**SALES ORDER #:** 525112  
**QUANTITY:** 1  
**SERIAL #:** SN 139321 HOSE BATCH 139244

**SIGNATURE:**   
**TITLE:** QUALITY ASSURANCE  
**DATE:** 2/10/2023

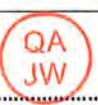
Gates Engineering & Services UK Ltd		CERTIFICATE OF CONFORMITY	
Doc. Ref.	Form-056		
Revision	4		

Gates SO No. 34557	<b>Customer Name &amp; Address:</b> Gates Engineering & Services NA Inc Accounts payable 7N GESNA 1144 Fifteenth Street, Suite 1400 Denver, CO 80202 USA
Customer PO No: 1803964 / 1	
Description: 3" 10K API 16C CHOKE & KILL HOSE ASSEMBLY X 35FT OAL (QTY 5)	

*This is to certify that the components listed below have been supplied in accordance with API 16C & the above referenced order number. The assemblies listed below have been manufactured and tested in the UK.*

**SPECIFICATION**

ITEM	DESCRIPTION	BATCH NUMBER	QTY
1	3" 10K API 16C CHOKE & KILL HOSE ASSEMBLY X 35FT OAL PART NO: HA34539-001 END A: 4.1/16" 10K API SPEC 6A TYPE FLANGE WITH BX155 RING GROOVE END B: 4.1/16" 10K API SPEC 17D SV SWIVEL FLANGE WITH BX155 RING GROOVE EACH END HAS AN INCONEL 625 INLAID RING GROOVE HOSE METALLIC PARTS MEET NACE-MR-0175 LATEST EDITION REQUIREMENTS WORKING PRESSURE: 10,000 PSI TEST PRESSURE: 15,000 PSI STANDARD: API 16C FSL3 MONOGRAMMED, 3RD EDITION EXTERNAL PROTECTION: STAINLESS STEEL ARMOUR INCLUDED FIRE RATED: API 16C STANDARD SECTION B.12.4 (704° FOR 30 MINS) H2S SERVICE SUITABLE TEMPERATURE CLASS B(-25 TO 100°C) HIGH TEMPERATURE EXPOSURE / SURVIVAL @ 177°C (INTERNAL IN A KICK SITUATION) SAFETY EQUIPMENT: INCLUDED 2 X HOSE SAFETY CLAMPS 2 X 3.6T SHACKLES 2 X 10MM OD X 6FT PCP COATED CHAINS  HOSE ASSEMBLY WORKS ORDERS NUMBERS:  139051 139052 139053 139054 139321	139062 139063 139064 139065 139244	5
	SAFETY/LIFTER CLAMP 195MM 1.7T PART NO: HCC108	MYB59483	10
	SAFETY CHAIN 10MM C/S PCP 6FT PART NO: CHC001	ACU59481	10

Accepted by.....  *J. W. Wilson* 06 DEC 2022 for and on behalf of Gates Engineering & Services UK Ltd

Gates Engineering & Services UK Ltd		PRESSURE TEST CERTIFICATE	
Doc. Ref.	Form-051		
Revision	9		

			Certificate No:
<input type="checkbox"/> BURST	<input checked="" type="checkbox"/> HYDROSTATIC	<input type="checkbox"/> CYCLIC	PTC-139321

Product:	CK03F	Hose WO/Batch:	139244
Assembly WO:	139321	Length:	35FT
SO No:	34557	Date:	25/11/22
Customer:	Gates Engineering & Services NA Inc	Customer Reference:	PO 1803964/ 1

Inner Diameter:	3	Inch			
Working Pressure:	10000	Psi	690	bar	
Test Pressure:	15000	Psi	1034	bar	
Burst Pressure:	22500	Psi	1551	bar	

Hose Description:		3" 10K API 16C CHOKE & KILL HOSE ASSEMBLY X 35FT OAL END A: 4.1/16" 10K API SPEC 6A TYPE FLANGE WITH BX155 RING GROOVE END B: 4.1/16" 10K API SPEC 17D SV SWIVEL FLANGE WITH BX155 RING GROOVE			
Item No	Qty	Part Code			Customer Tag No (if applicable)
1	1	HA34539-001			N/A

Details of Test:	Pressure tested with water at ambient temperature for a minimum of <b>60</b> minutes at test pressure <b>1034 BAR</b>  Pressure Transducer S/N: 131203 (CH1) Chart Recorder S/N: S5VB14523 Calibration Certificate No: IKMCERTU823
Results:	Pressure Loss: <b>8.43 BAR</b>  Acceptance Criteria: Pressure loss not to exceed <b>500 PSI (34.47 BAR)</b>

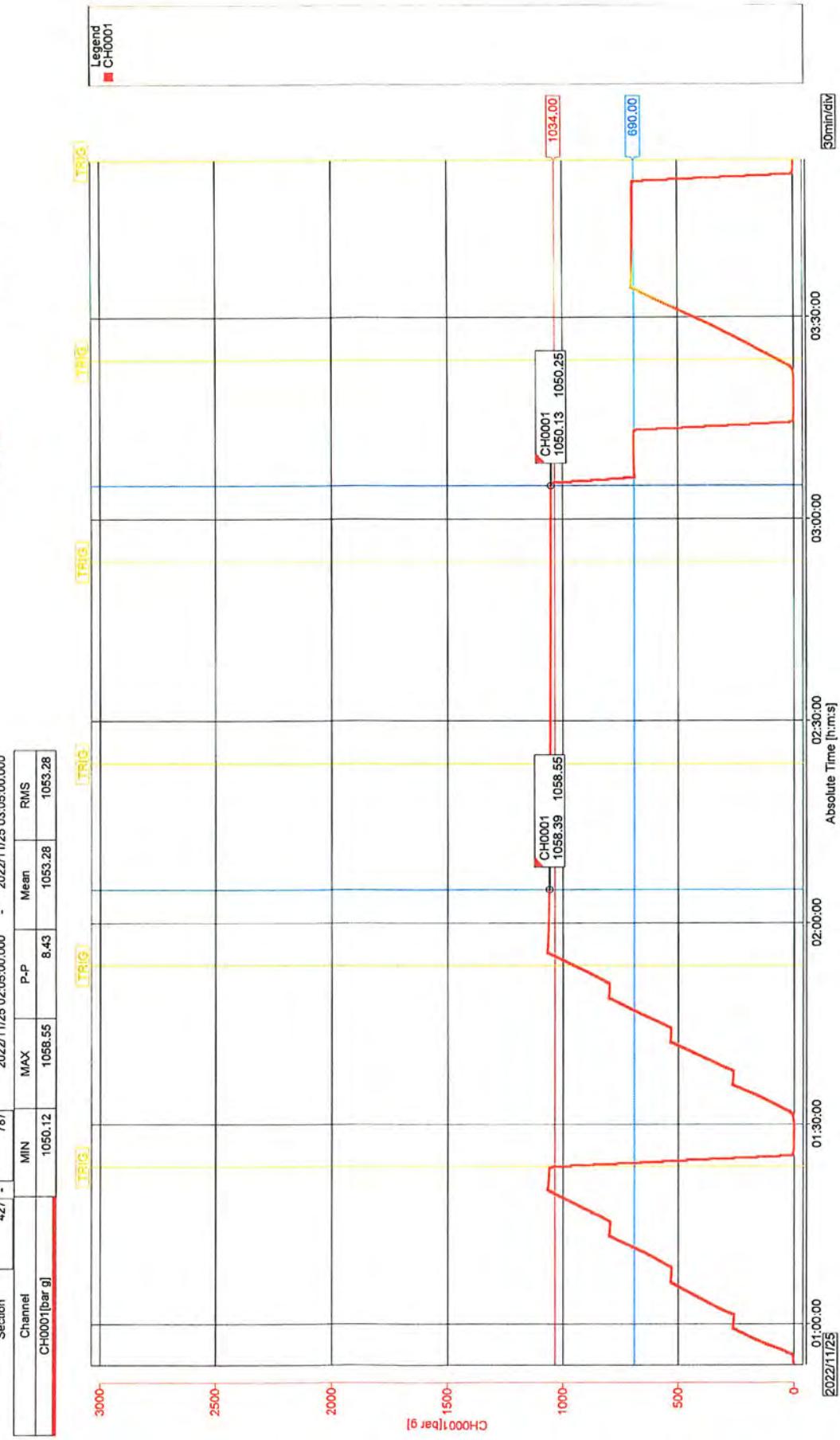
GESUK Ltd	Third Party
 J.W.W. 06 DEC 2022	

File Message	CH1 139321
Device Type	GX20
Serial No.	55V/B14523
Print Groups	GROUP 1
Print Range	2022/11/25 00:00

Start Time  
Stop Time

： 2022/11/25 00:53:50.000 (UTC+08:00)  
： 2022/11/25 03:53:20.000 (UTC+08:00)

66 DEC 2022





**Operator Name:** EOG RESOURCES INCORPORATED

**Well Name:** ROSS DRAW 17 FED COM

**Well Number:** 516H

weather requirements as needed. Construction will include ditching, draining, crowning and capping or sloping and dipping the roadbed as necessary to provide a well-constructed and safe road. We plan to water twice a year.

**New road access plan or profile prepared?** N

**New road access plan**

**Access road engineering design?** N

**Access road engineering design**

**Turnout?** N

**Access surfacing type:** OTHER

**Access topsoil source:** OFFSITE

**Access surfacing type description:** 6" of compacted caliche

**Access onsite topsoil source depth:**

**Offsite topsoil source description:** See attached SUPO

**Onsite topsoil removal process:**

**Access other construction information:**

**Access miscellaneous information:**

**Number of access turnouts:**

**Access turnout map:**

#### Drainage Control

**New road drainage crossing:** CULVERT

**Drainage Control comments:** N/A

**Road Drainage Control Structures (DCS) description:** N/A

**Road Drainage Control Structures (DCS) attachment:**

#### Access Additional Attachments

### Section 3 - Location of Existing Wells

**Existing Wells Map?** YES

**Existing Well map Attachment:**

3\_Ross\_Draw\_17\_Fed\_Com\_Radius\_516H\_20240926081213.pdf

### Section 4 - Location of Existing and/or Proposed Production Facilities

**Submit or defer a Proposed Production Facilities plan?** SUBMIT

**Production Facilities description:** SECTION 17, TOWNSHIP 26S, RANGE 31E, N.M.P.M

**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H**Production Facilities map:**

EP\_ROSS\_DRAW\_17\_FED\_COM\_PAD\_A\_FL\_CORRIDOR\_R1\_20240918131736.pdf

EP\_ROSS\_DRAW\_17\_FED\_COM\_PAD\_B\_FL\_CORRIDOR\_R1\_20240918131736.pdf

EP\_ROSS\_DRAW\_17\_FED\_COM\_PAD\_C\_FL\_CORRIDOR\_R1\_20240918131736.pdf

EP\_ROSS\_DRAW\_17\_FED\_COM\_PAD\_D\_FL\_CORRIDOR\_R1\_20240918131736.pdf

EP\_ROSS\_DRAW\_17\_FED\_COM\_PAD\_E\_FL\_CORRIDOR\_R1\_20240918131737.pdf

**Section 5 - Location and Types of Water Supply****Water Source Table****Water source type:** RECYCLED**Water source use type:** OTHER

**Describe use type:** The source and location of the water location will be drilled using a combination of water mud program. (i) Water will be obtained from commercial water to the location by trucks using existing and proposed roads attached. (ii) Water may be supplied from frac ponds and temporary above-ground surface lines as shown on the map. 4-inch polyethylene or layflat lines and up to six 12-inch lines. Water. Freshwater is defined as containing less than 1000 mg/L (TDS), exhibiting no petroleum sheen when standing, and no mechanical processes that expose it to heavy metals or salts. To utilize up to six 4-inch polyethylene or layflat lines and transport treated produced water is defined as the reconditioning of water to a reusable form and may include mechanical and chemical processes. Water Pit, Loving County, TX EOG Ross Draw Pit, Section 14, New Mexico Temporary surface lines would originate from locations in the surrounding area of the proposed action on the ground with minimal disturbance. Temporary surface lines will be located at least 100 feet from the edge of the existing disturbance (i.e., edge of a road, or two-track road, or other man-made addition to the landscape). A mechanism will be used. All vehicle equipment will remain in the same location. Map or maps showing the locations of the temporary surface lines will be included in the Environmental Assessment. An electronic file (e.g., KMZ file) shall be submitted with the Environmental Assessment.

**Source latitude:****Source longitude:****Source datum:****City:****Water source permit type:** WATER RIGHT**Water source transport method:** PIPELINE

TRUCKING

**Source land ownership:** FEDERAL

**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H**Source transportation land ownership:** FEDERAL**Water source volume (barrels):** 1**Source volume (acre-feet):** 0.00012889**Source volume (gal):** 42**Water source and transportation**

Ripple\_and\_Ross\_Draw\_Fed\_Com\_Water\_Map\_20240918131853.pdf

**Water source comments:** see SUPO**New water well?** N**New Water Well Info****Well latitude:****Well Longitude:****Well datum:****Well target aquifer:****Est. depth to top of aquifer(ft):****Est thickness of aquifer:****Aquifer comments:****Aquifer documentation:****Well depth (ft):****Well casing type:****Well casing outside diameter (in.):****Well casing inside diameter (in.):****New water well casing?****Used casing source:****Drilling method:****Drill material:****Grout material:****Grout depth:****Casing length (ft.):****Casing top depth (ft.):****Well Production type:****Completion Method:****Water well additional information:****State appropriation permit:****Additional information attachment:****Section 6 - Construction Materials****Using any construction materials:** YES

**Construction Materials description:** Caliche will be supplied from pits, as shown on the attached caliche source map. Caliche utilized for the drilling pad will be obtained either from an existing approved mineral pit or by benching into a hill, which will allow the pad to be level with existing caliche from the cut or extracted by Flipping the sound location. A mineral material permit will be obtained from BLM before excavating any caliche on Federal Lands. The amount will vary for each pad. The procedure for Flipping a healthy location is as follows: \* -An adequate amount of topsoil/root zone (usually the top 6 inches of soil) will be stripped from the proposed healthy location and stockpiled along the side of the sound location as depicted on the OK site diagram/survey plat. -An area within the proposed well site dimensions will be used to excavate the caliche. Subsoil will be removed and stockpiled within the surveyed well pad dimensions. -Once caliche/surfacing mineral is found, the mineral material will be excavated and stockpiled within the approved drilling pad dimensions. -Then, the subsoil will be pushed back into the excavated hole, and the caliche will be spread accordingly across the entire healthy pad and road (if available). -Neither caliche nor subsoil will be stockpiled outside the healthy pad dimensions. Topsoil will be stockpiled along the edge of the pad as depicted in the

**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H

Well Site Layout or survey plat. \* If no caliche is found onsite, caliche will be hauled in from a BLM-approved caliche pit or other established mineral pit. A BLM mineral material permit will be acquired before obtaining mineral material from BLM pits or federal land.

**Construction Materials source location**

Ripple\_and\_Ross\_Draw\_Fed\_Com\_Caliche\_Map\_20240918131926.pdf

## Section 7 - Methods for Handling

**Waste type:** GARBAGE**Waste content description:** trash generated by onsite personnel**Amount of waste:** 1 pounds**Waste disposal frequency :** Weekly

**Safe containment description:** Trash dumpsters are utilized to contain garbage onsite. Dumpsters are maintained by a third party vendor. All trash is hauled to Lee County landfill.

**Safe containmant attachment:****Waste disposal type:** OTHER**Disposal location ownership:** OTHER**Disposal type description:** Lee County Landfill**Disposal location description:** Lee County Landfill**Waste type:** SEWAGE**Waste content description:** Human grey water waste**Amount of waste:** 1 barrels**Waste disposal frequency :** Weekly

&lt;style isBold="true"&gt;Safe containment description:&lt;/style&gt; Human waste managed by third-party vendors. ROW construction waste contained in on-site portable toilets maintained by third party vendor. During drilling activities waste is managed by third party vendor utilizing onsite aerobic (treatment) wastewater management. Liquids treated through the aerobic system are transferred to via water line to CTBs for reuse by EOG. All solid waste remaining after treatment process are pumped into an enclosed waste transfer truck at the time of rig down and taken to one of the following disposal facilities by the third party vendor: Qual Run Services LLC (a Licensed Waste Management Service Facility in Reeves County, Texas) or ReUse OilField Services (a Licensed Waste Management Facility in Mentone, TX)

**Safe containmant attachment:****Waste disposal type:** HAUL TO COMMERCIAL**Disposal location ownership:** COMMERCIAL

FACILITY

**Disposal type description:**

&lt;style isBold="true"&gt;Disposal location description:&lt;/style&gt; Human waste managed by third-party vendors. ROW construction waste contained in on-site portable toilets maintained by third party vendor. During drilling activities waste is managed by third party vendor utilizing onsite aerobic (treatment) wastewater management. Liquids treated through the aerobic system are transferred to via water line to CTBs for reuse by EOG. All solid waste remaining after treatment process are pumped into an enclosed waste transfer truck at the time of rig down and taken to one of the following disposal facilities by the third party vendor: Qual Run Services LLC (a Licensed Waste Management Service Facility in Reeves County, Texas) or ReUse OilField Services (a Licensed Waste Management Facility in Mentone, TX)

**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H**Waste type:** DRILLING

**Waste content description:** Drilling fluids and produced oil and water from the well during drilling and completion operations will be stored onsite in frac tanks and disposed of at the time of rig down. Primary disposal location for EOGs NM operations is the North Delaware Basin Disposal facility in Jal, New Mexico which is a privately owned commercial facility. Some EOG locations within New Mexico may require transportation of cuttings to other licensed commercial disposal facilities based on geographic location.

**Amount of waste:** 0 barrels**Waste disposal frequency :** Daily**Safe containment description:** STEEL TANKS**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL **Disposal location ownership:** COMMERCIAL FACILITY

**Disposal type description:****Disposal location description:** TRUCKED TO NMOCD APPROVED DISPOSAL FACILITY

### Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit? NO

Reserve pit length (ft.) Reserve pit width (ft.)

Reserve pit depth (ft.) Reserve pit volume (cu. yd.)

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

### Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? Y

**Description of cuttings location** EOG utilizes a Closed Loop System, cuttings leave the rig and enter low/highwall cuttings bin. Cuttings are then transferred to trucks for transportation to a State of New Mexico approved disposal facility. Primary disposal location for EOGs NM operations is the North Delaware Basin Disposal Facility in Jal, New Mexico which is a privately owned commercial facility. Some EOG locations within New Mexico may require transportation of cuttings to other licensed commercial disposal facilities based on geographic location.

Cuttings area length (ft.) Cuttings area width (ft.)

Cuttings area depth (ft.) Cuttings area volume (cu. yd.)

Is at least 50% of the cuttings area in cut?

Cuttings area liner

Cuttings area liner specifications and installation description

**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H

## Section 8 - Ancillary

**Are you requesting any Ancillary Facilities?:** N**Ancillary Facilities****Comments:**

## Section 9 - Well Site

**Well Site Layout Diagram:**

6\_Ross\_Draw\_17\_Fed\_Com\_Padsite\_516H\_2\_20240926081258.pdf

Ross\_Draw\_17\_Fed\_Com\_516H\_Rig\_Layout\_20240926081258.pdf

4\_Ross\_Draw\_17\_Fed\_Com\_WLE\_516H\_20240926081258.pdf

5\_Ross\_Draw\_17\_Fed\_Com\_Padsite\_516H\_1\_20240926081258.pdf

**Comments:** Exhibit 2A-Wellsite, Exhibit 2B-Padsite, Exhibit 4-Rig Layout

## Section 10 - Plans for Surface

**Type of disturbance:** New Surface Disturbance**Multiple Well Pad Name:** ROSS DRAW 17 FED COM**Multiple Well Pad Number:** 509H, 516H, 523H, 760H**Recontouring**

7\_Ross\_Draw\_17\_Fed\_Com\_Reclamation\_Diagram\_516H\_20240926081312.pdf

**Drainage/Erosion control construction:** Proper erosion control methods will be used on the area to control erosion, runoff, and siltation of the surrounding area.**Drainage/Erosion control reclamation:** The interim reclamation will be monitored periodically to ensure that vegetation has reestablished and that erosion is controlled.**Well pad proposed disturbance (acres):** 0**Well pad interim reclamation (acres):** 0 **Well pad long term disturbance (acres):** 0**Road proposed disturbance (acres):** 0 **Road interim reclamation (acres):** 0 **Road long term disturbance (acres):** 0**Powerline proposed disturbance (acres):** 0**Powerline interim reclamation (acres):** 0 **Powerline long term disturbance (acres):** 0**Pipeline proposed disturbance (acres):** 0**Pipeline interim reclamation (acres):** 0 **Pipeline long term disturbance (acres):** 0**Other proposed disturbance (acres):** 0 **Other interim reclamation (acres):** 0**Other long term disturbance (acres):** 0**Total proposed disturbance:** 0**Total interim reclamation:** 0**Total long term disturbance:** 0**Disturbance Comments:** All Interim and Final reclamation must be within 6 months. Interim must be within 6 months of completion and final within 6 months of abandonment plugging. Dual pad operations may alter timing.**Reconstruction method:** In areas planned for interim reclamation, all the surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads. Areas planned for interim reclamation will be recontoured to the original contour if feasible, or if not feasible, to an

**Operator Name:** EOG RESOURCES INCORPORATED**Well Name:** ROSS DRAW 17 FED COM**Well Number:** 516H

interim contour that blends with the surrounding topography as much as possible. Where applicable, the fill material of the well pad will be backfilled into the cut to bring the area back to the original contour. The interim cut and fill slopes prior to reseeding will not be steeper than a 3:1 ratio, unless the adjacent native topography is steeper. Note: Constructed slopes may be much steeper during drilling, but will be recontoured to the above ratios during interim reclamation.

**Topsoil redistribution:** Topsoil will be evenly respread and aggressively revegetated over the entire disturbed area not needed for all-weather operations including cuts and fills. To seed the area, the proper BLM seed mixture, free of noxious weeds, will be used. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.

**Soil treatment:** Re-seed according to BLM standards. All reclaimed areas will be monitored periodically to ensure that revegetation occurs, that the area is not redisturbed, and that erosion is controlled.

**Existing Vegetation at the well pad:** Grass, forbs, and small woody vegetation, such as mesquite will be excavated as the topsoil is removed. Large woody vegetation will be stripped and stored separately and respreads evenly on the site following topsoil respreading. Topsoil depth is defined as the top layer of soil that contains 80% of the roots. In areas to be heavily disturbed, the top 6 inches of soil material, will be stripped and stockpiled on the perimeter of the well location and along the perimeter of the access road to control run-on and run-off, to keep topsoil viable, and to make redistribution of topsoil more efficient during interim reclamation. Stockpiled topsoil should include vegetative material. Topsoil will be clearly segregated and stored separately from subsoils.

#### **Existing Vegetation at the well pad**

**Existing Vegetation Community at the road:** All disturbed areas, including roads, pipelines, pads, will be recontoured to the contour existing prior to the initial construction or a contour that blends indistinguishably with the surrounding landscape. Topsoil that was spread over the interim reclamation areas will be stockpiled prior to recontouring. The topsoil will be redistributed evenly over the entire disturbed site to ensure successful revegetation.

#### **Existing Vegetation Community at the road**

**Existing Vegetation Community at the pipeline:** All disturbed areas, including roads, pipelines, pads, will be recontoured to the contour existing prior to the initial construction or a contour that blends indistinguishably with the surrounding landscape. Topsoil that was spread over the interim reclamation areas will be stockpiled prior to recontouring. The topsoil will be redistributed evenly over the entire disturbed site to ensure successful revegetation.

#### **Existing Vegetation Community at the pipeline**

**Existing Vegetation Community at other disturbances:** All disturbed areas, including roads, pipelines, pads, will be recontoured to the contour existing prior to the initial construction or a contour that blends indistinguishably with the surrounding landscape. Topsoil that was spread over the interim reclamation areas will be stockpiled prior to recontouring. The topsoil will be redistributed evenly over the entire disturbed site to ensure successful revegetation.

#### **Existing Vegetation Community at other disturbances**

**Non native seed used?** N

**Non native seed description:**

**Seedling transplant description:**

**Will seedlings be transplanted for this project?** N

**Seedling transplant description attachment:**

**Will seed be harvested for use in site reclamation?** N

**Operator Name:** EOG RESOURCES INCORPORATED

**Well Name:** ROSS DRAW 17 FED COM

**Well Number:** 516H

**Seed harvest description:**

**Seed harvest description attachment:**

**Seed**

**Seed Table**

**Seed Summary**

**Total pounds/Acre:**

<b>Seed Type</b>	<b>Pounds/Acre</b>
------------------	--------------------

**Seed reclamation**

**Operator Contact/Responsible Official**

**First Name:**

**Last Name:**

**Phone:**

**Email:**

**Seedbed prep:**

**Seed BMP:**

**Seed method:**

**Existing invasive species?** N

**Existing invasive species treatment description:**

**Existing invasive species treatment**

**Weed treatment plan description:** All reclaimed areas will be monitored periodically to ensure that revegetation occurs, that the area is not redisturbed, erosion is controlled, and free of noxious weeds. Weeds will be treated if found.

**Weed treatment plan**

**Monitoring plan description:** Reclamation will be completed within 6 months of well plugging. All reclaimed areas will be monitored periodically to ensure that revegetation occurs, that the area is not redisturbed, erosion is controlled, and free of noxious weeds.

**Monitoring plan**

**Success standards:** N/A

**Pit closure description:** N/A

**Pit closure attachment:**

**Section 11 - Surface**

**Operator Name:** EOG RESOURCES INCORPORATED

**Well Name:** ROSS DRAW 17 FED COM

**Well Number:** 516H

**Disturbance type:** WELL PAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

## Section 12 - Other

**Right of Way needed?** N

**Use APD as ROW?**

**ROW Type(s):**

**ROW**

**SUPO Additional Information:** \*\*\*An onsite meeting was conducted on 7/3/2024\*\*\* We plan to use (6) 12-inch lay flat hoses to transport water and (6) 4-inch polylines or lay flat for drilling and frac operations. The well will be produced using a gas lift as the artificial lift method. Produced water will be transported via pipeline to the EOG-produced water gathering system. Produced Water Gathering Sale Line: N/A Gas Gathering Sale Line: N/A Localized Gas Lift: N/A Crude Oil Gathering Sale Line: N/A Overhead Electric Line: N/A Central Tank Battery 400 ft. x 600 ft: N/A Monoline: N/A

**Use a previously conducted onsite?** N

**Previous Onsite information:**

**Other SUPO**

**Operator Name:** EOG RESOURCES INCORPORATED

**Well Name:** ROSS DRAW 17 FED COM

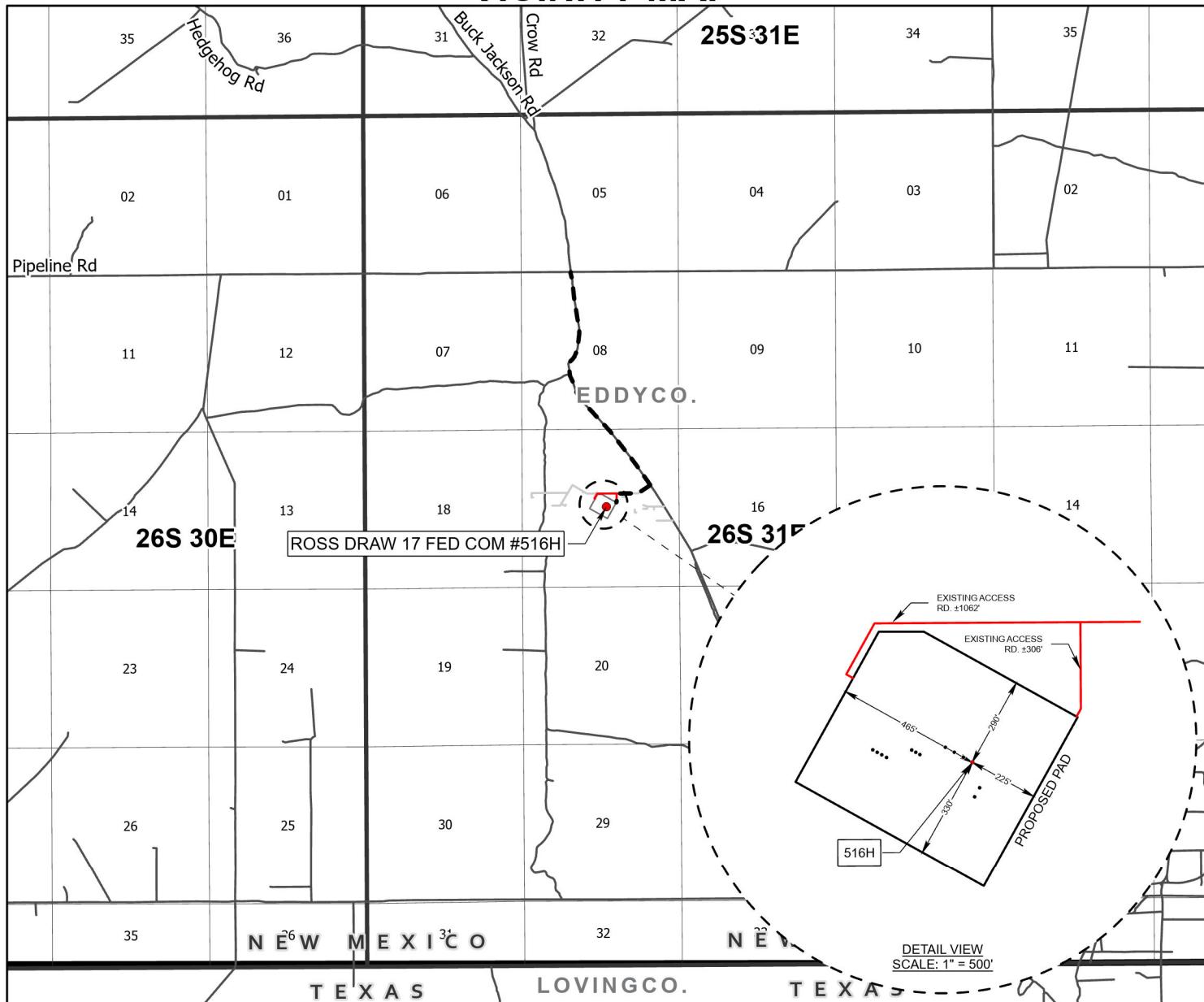
**Well Number:** 516H

1\_Ross\_Draw\_17\_Fed\_Com\_Location\_516H\_20240926081334.pdf

SUPO\_ROSS\_DRAW\_17\_FED\_COM\_516H\_20240926081339.pdf

# EXHIBIT 2

## VICINITY MAP



LEASE NAME & WELL NO.: ROSS DRAW 17 FED COM #516H  
 LATITUDE: N 32.042881 LONG: W 103.799775 ELEVATION: 3247'

SECTION: 17 TWP: 26S RGE: 31E SURVEY: N.M.P.M.  
 COUNTY: EDDY STATE: NM

DESCRIPTION: 2621' FNL & 2458' FEL

**DISTANCE & DIRECTION:**

FROM THE INTERSECTION OF PIPELINE ROAD AND BUCK JACKSON ROAD,  
 TRAVEL SOUTH ON BUCK JACKSON ROAD FOR ±1.56 MILES;  
 THENCE SOUTHWEST (RIGHT) ON AN EXISTING ACCESS ROAD ± 1220 FEET;  
 THENCE SOUTH (LEFT) ON AN EXISTING ACCESS ROAD ±306 FEET TO THE EDGE OF THE PAD.  
 (PROPOSED ACCESS ROAD LENGTH = ±0')

- Proposed Well
- Driving Directions
- Existing Access Road
- Existing Roads
- Existing Pad
- Road
- Section
- Township
- County



JOB No.: EOG\_B240086

NOTE:  
 ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE  
 FOLLOWING COORDINATE SYSTEM: NAD83 NEW MEXICO STATE PLANE, EAST ZONE, U.S. SURVEY FEET

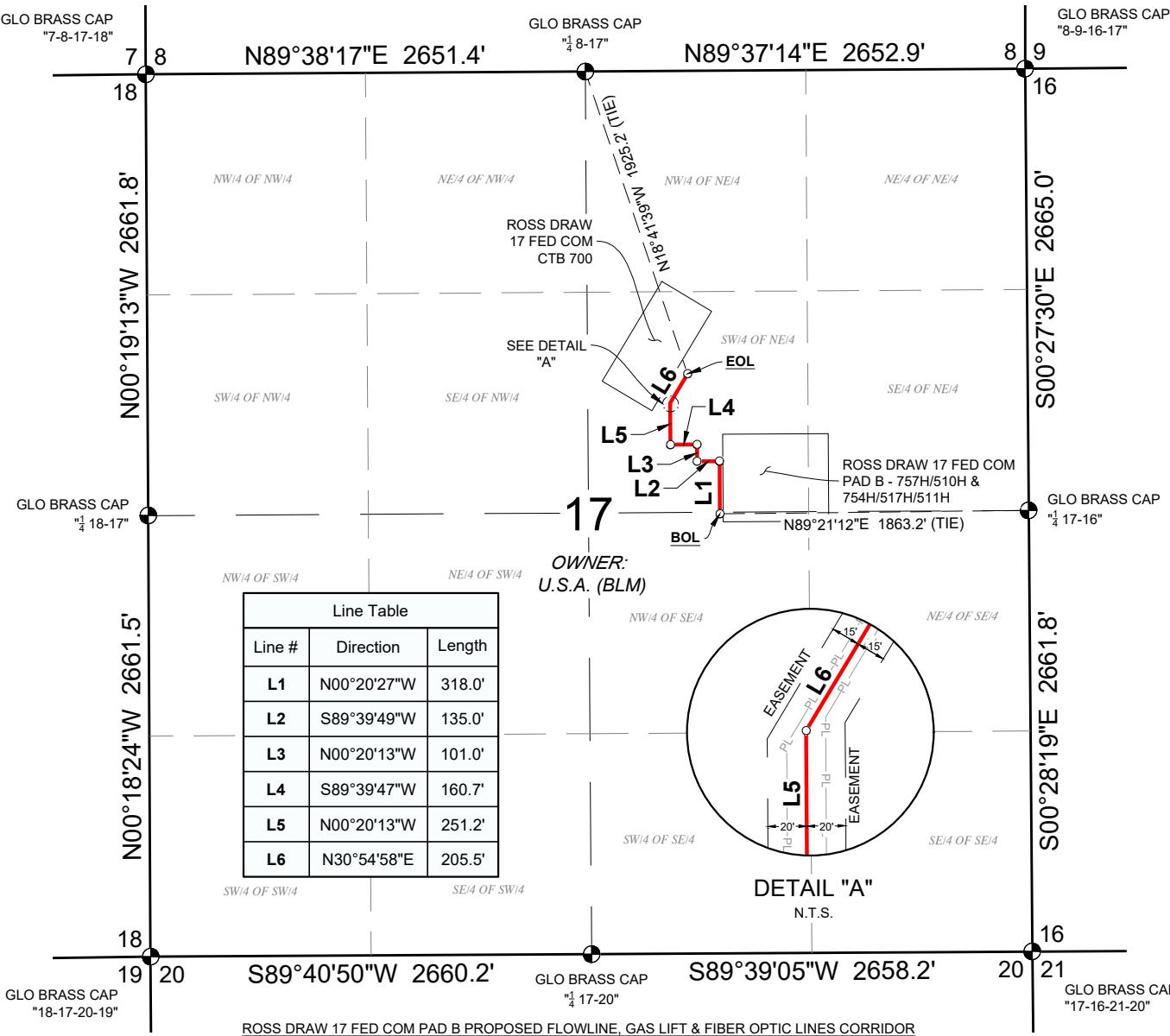
DISCLAIMER:  
 THIS PLOT DOES NOT REPRESENT A MONUMENTED LAND SURVEY AND SHOULD NOT BE RELIED UPON  
 TO DETERMINE BOUNDARY LINES, PROPERTY OWNERSHIP OR OTHER PROPERTY INTERESTS.

Released to Imaging 12/8/2025 12:33:53 PM

N

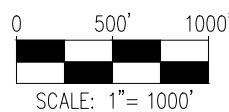
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SCALE: 1"=1 MI.

SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICO

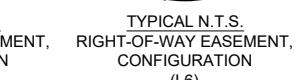
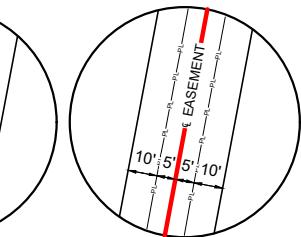
## LEGEND

- BOL** BEGINNING OF LINE
- EOL** END OF LINE
- PROPOSED CENTERLINE OF EASEMENT
- PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES
- POINT FOR BEGIN/END OR ANGLE POINT
- FOUND MONUMENT AS SHOWN



## NOTES:

- BEARINGS, COORDINATES, AND DISTANCES SHOWN HEREON ARE BASED ON THE NEW MEXICO STATE PLANE COORDINATE SYSTEM, EAST ZONE, NAD 83-2011 (EPOCH 2010) FRAMEWORK, AS DERIVED BY OPUS SOLUTION. THE ELEVATIONS SHOWN HEREON AREA BASED ON NAVD 88.
- LAND OWNERSHIP INFORMATION REFLECTED HEREON WAS PROVIDED BY CLIENT AND/OR OBTAINED FROM PUBLIC DOMAIN DATA, NO INDEPENDENT OWNERSHIP SEARCH WAS PERFORMED BY ASCENT



I, MITCHELL L. McDONALD, NEW MEXICO PROFESSIONAL SURVEYOR NO. 29821, DO HEREBY CERTIFY THAT THIS EASEMENT PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND I FURTHER CERTIFY THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT AND THAT THIS INSTRUMENT IS AN EASEMENT PLAT OF A PROPOSED EASEMENT.

Mitchell L. McDonald, N.M. P.L.S.

SURVEY DATE: 06/29/2024  
JOB NO.: B24.EOG.0086  
SHEET: 1 OF 1

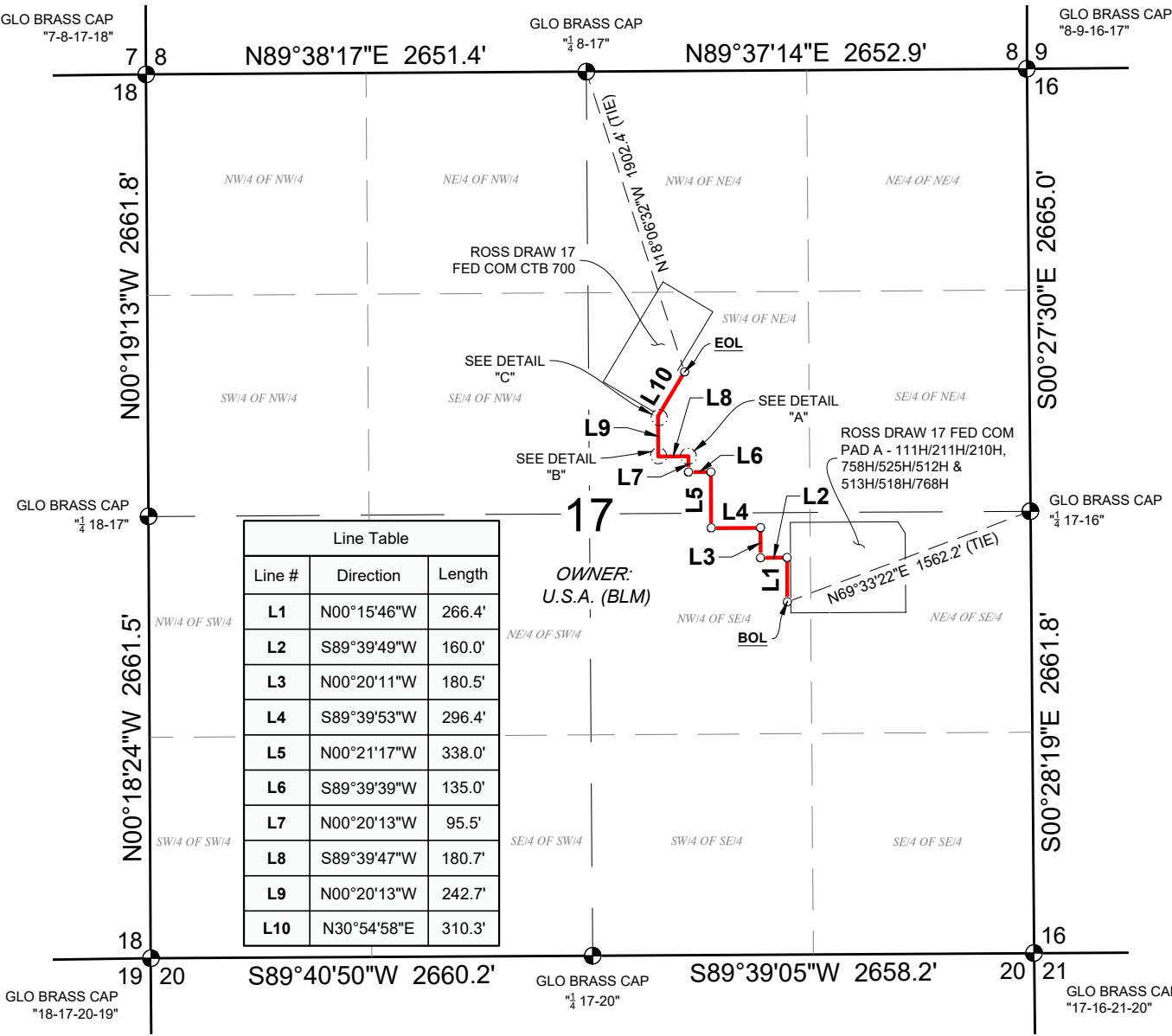
No.29821

DRAFTED BY: JC  
CHECKED BY: KS  
REV: 1

**eog resources**  
ROSS DRAW 17 FED COM PAD B PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



PETROLEUM FIELD SERVICES, LLC  
DBA: ASCENT GEOMATICS SOLUTIONS  
8620 WOLFF CT.  
WESTMINSTER, CO 80031  
OFFICE: (303) 928-7128

SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICO

## LEGEND

BOL BEGINNING OF LINE

EOL END OF LINE

PROPOSED CENTERLINE OF EASEMENT

PROPOSED FLOWLINE, GAS LIFT &amp; FIBER OPTIC LINES

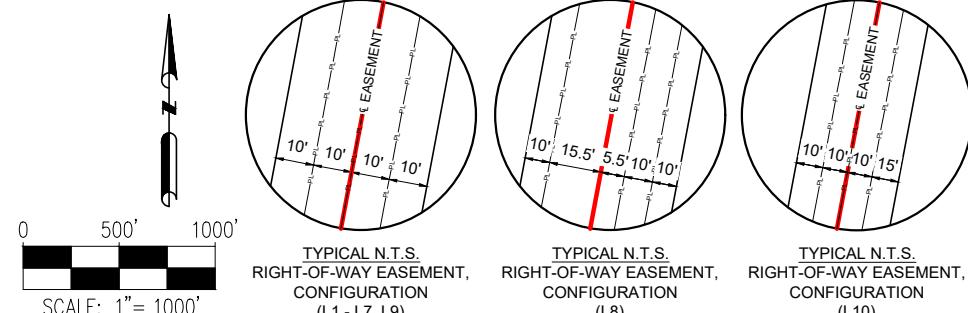
POINT FOR BEGIN/END OR ANGLE POINT

FOUND MONUMENT AS SHOWN

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\*SEE SHEET 2 OF 2 FOR DETAIL VIEWS &amp; CENTERLINE DESCRIPTION.



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SURVEY DATE: 06/29/2024  
JOB NO.: B24.EOG.0086  
SHEET: 1 OF 2

No.29821

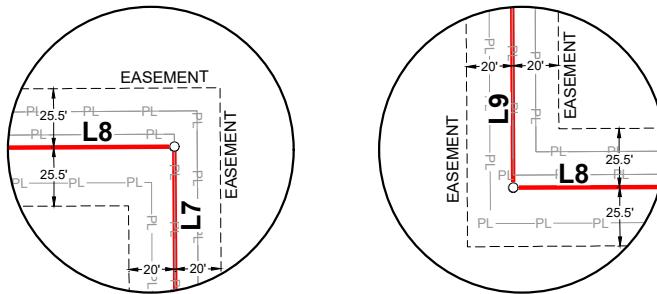
DRAFTED BY: JC  
CHECKED BY: KS  
REV: 1

**eoq resources**  
ROSS DRAW 17 FED COM PAD A PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



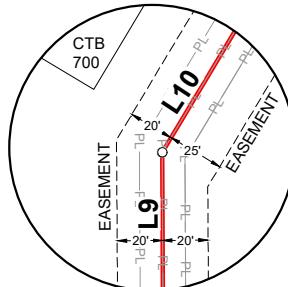
PETROLEUM FIELD SERVICES, LLC  
DBA: ASCENT GEOMATICS SOLUTIONS  
8620 WOLFF CT.  
WESTMINSTER, CO 80031  
OFFICE: (303) 928-7128

**SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICO**



**DETAIL "A"**  
N.T.S.

**DETAIL "B"**  
N.T.S.



**DETAIL "C"**  
N.T.S.

**ROSS DRAW 17 FED COM PAD A PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES CORRIDOR  
CENTERLINE DESCRIPTION**

A STRIP OF LAND VARIABLE IN WIDTH AND 2205.5 FEET, 133.7 RODS OR 0.4 MILES IN LENGTH, SITUATED IN SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING OF VARIABLE WIDTHS ON EACH SIDE OF THE CENTERLINE SHOWN HEREON AND THE DETAIL VIEWS.

\*SEE SHEET 1 OF 2 FOR ADDITIONAL INFORMATION.

**LEGEND**

**BOL** BEGINNING OF LINE

**EOL** END OF LINE

**—** PROPOSED CENTERLINE OF EASEMENT

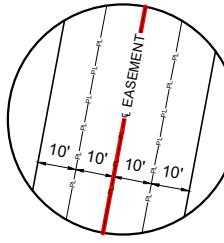
**—** PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES

**○** POINT FOR BEGIN/END OR ANGLE POINT

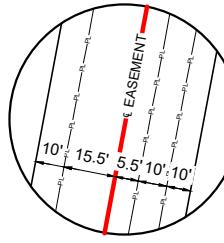


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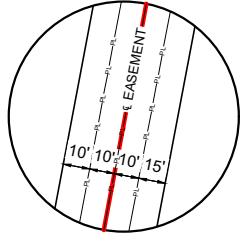
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**TYPICAL N.T.S.  
RIGHT-OF-WAY EASEMENT,  
CONFIGURATION  
(L7, L9)**



**TYPICAL N.T.S.  
RIGHT-OF-WAY EASEMENT,  
CONFIGURATION  
(L8)**



**TYPICAL N.T.S.  
RIGHT-OF-WAY EASEMENT,  
CONFIGURATION  
(L10)**



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**Mitchell L. McDonald**, N.M. P.L.S.

SURVEY DATE: 06/29/2024  
JOB NO.: B24.EOG.0086  
SHEET: 2 OF 2

**No.29821**

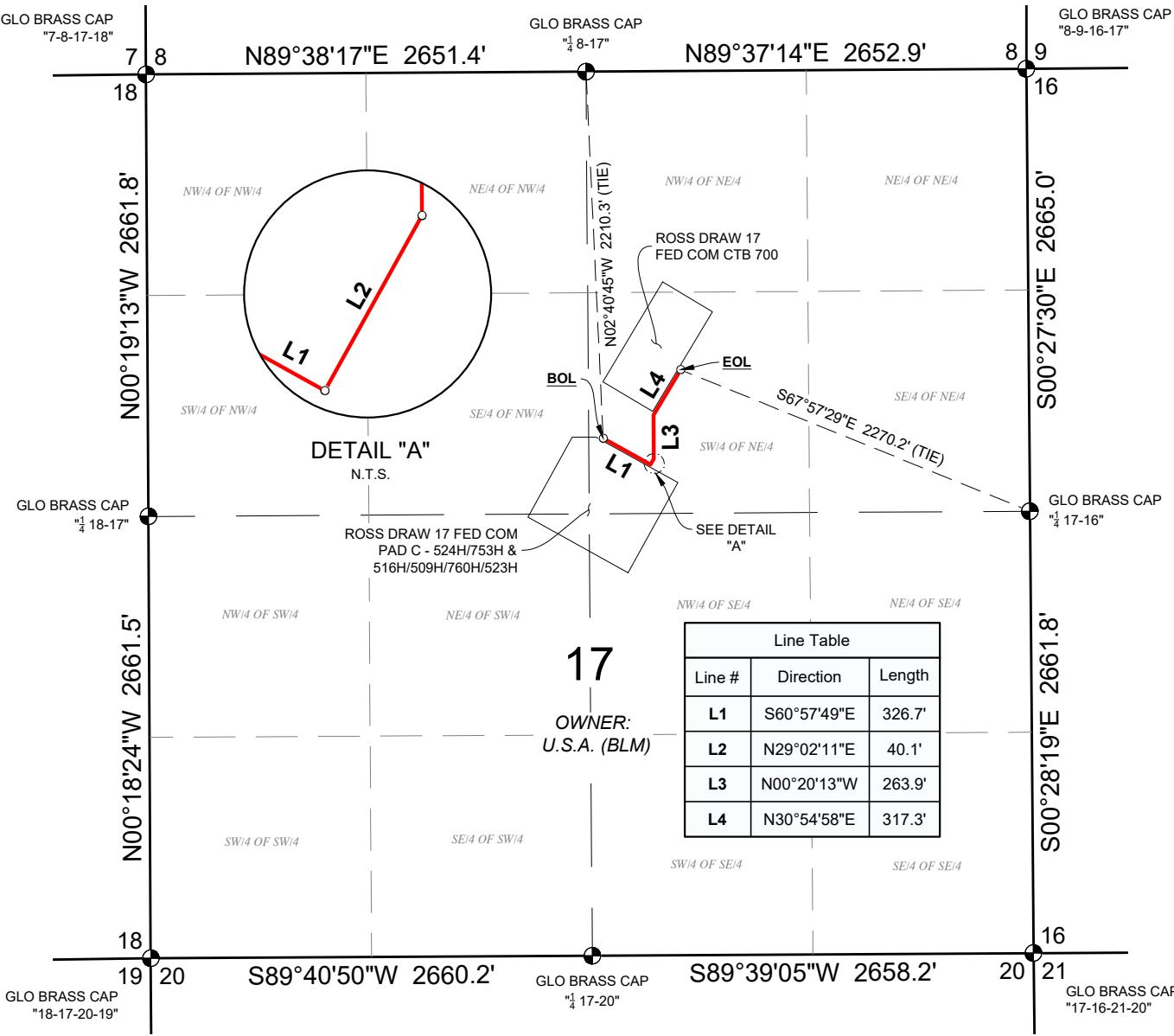
DRAFTED BY: JC  
CHECKED BY: KS  
REV: 1

**eog resources**

**ROSS DRAW 17 FED COM PAD A PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO**



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WESTMINSTER, CO 80031  
OFFICE: (303) 928-7128

SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICOROSS DRAW 17 FED COM PAD C PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES CORRIDOR  
CENTERLINE DESCRIPTION

A STRIP OF LAND 30 FEET IN WIDTH AND 948.0 FEET, 57.5 RODS OR 0.2 MILES IN LENGTH, SITUATED IN SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15 FEET ON EACH SIDE OF THE CENTERLINE SHOWN HEREON.

## LEGEND

BOL BEGINNING OF LINE

EOL END OF LINE

— PROPOSED CENTERLINE OF EASEMENT

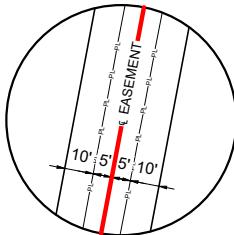
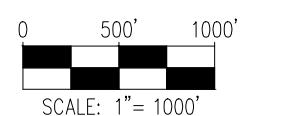
— PROPOSED FLOWLINE, GAS LIFT &amp; FIBER OPTIC LINES

○ POINT FOR BEGIN/END OR ANGLE POINT

● FOUND MONUMENT AS SHOWN

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SURVEY DATE: 06/29/2024  
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SHEET: 1 OF 1

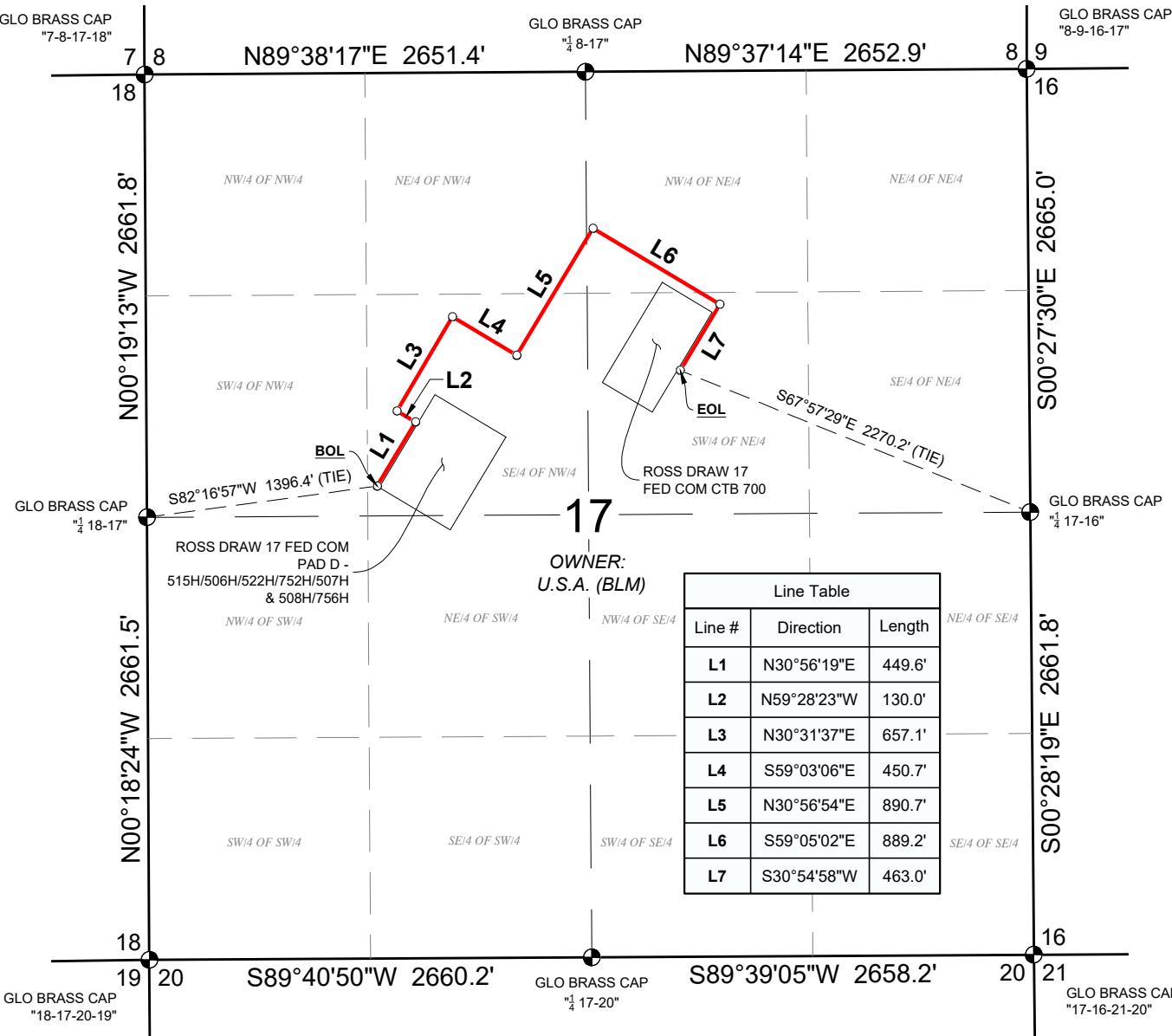
No.29821

DRAFTED BY: JC  
CHECKED BY: KS  
REV: 1

**eoq resources**  
ROSS DRAW 17 FED COM PAD C PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



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SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICOROSS DRAW 17 FED COM PAD D PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES CORRIDOR  
CENTERLINE DESCRIPTION

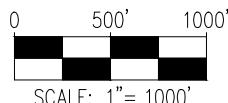
A STRIP OF LAND 30 FEET IN WIDTH AND 3930.3 FEET, 238.2 RODS OR 0.7 MILES IN LENGTH, SITUATED IN SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15 FEET ON EACH SIDE OF THE CENTERLINE SHOWN HEREON.

## LEGEND

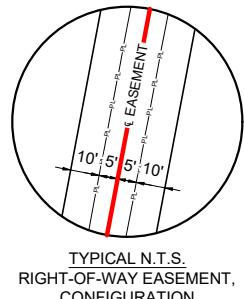
- BOL** BEGINNING OF LINE
- EOL** END OF LINE
- PROPOSED CENTERLINE OF EASEMENT
- PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES
- POINT FOR BEGIN/END OR ANGLE POINT
- FOUND MONUMENT AS SHOWN

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SCALE: 1" = 1000'



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SURVEY DATE: 06/29/2024  
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SHEET: 1 OF 1

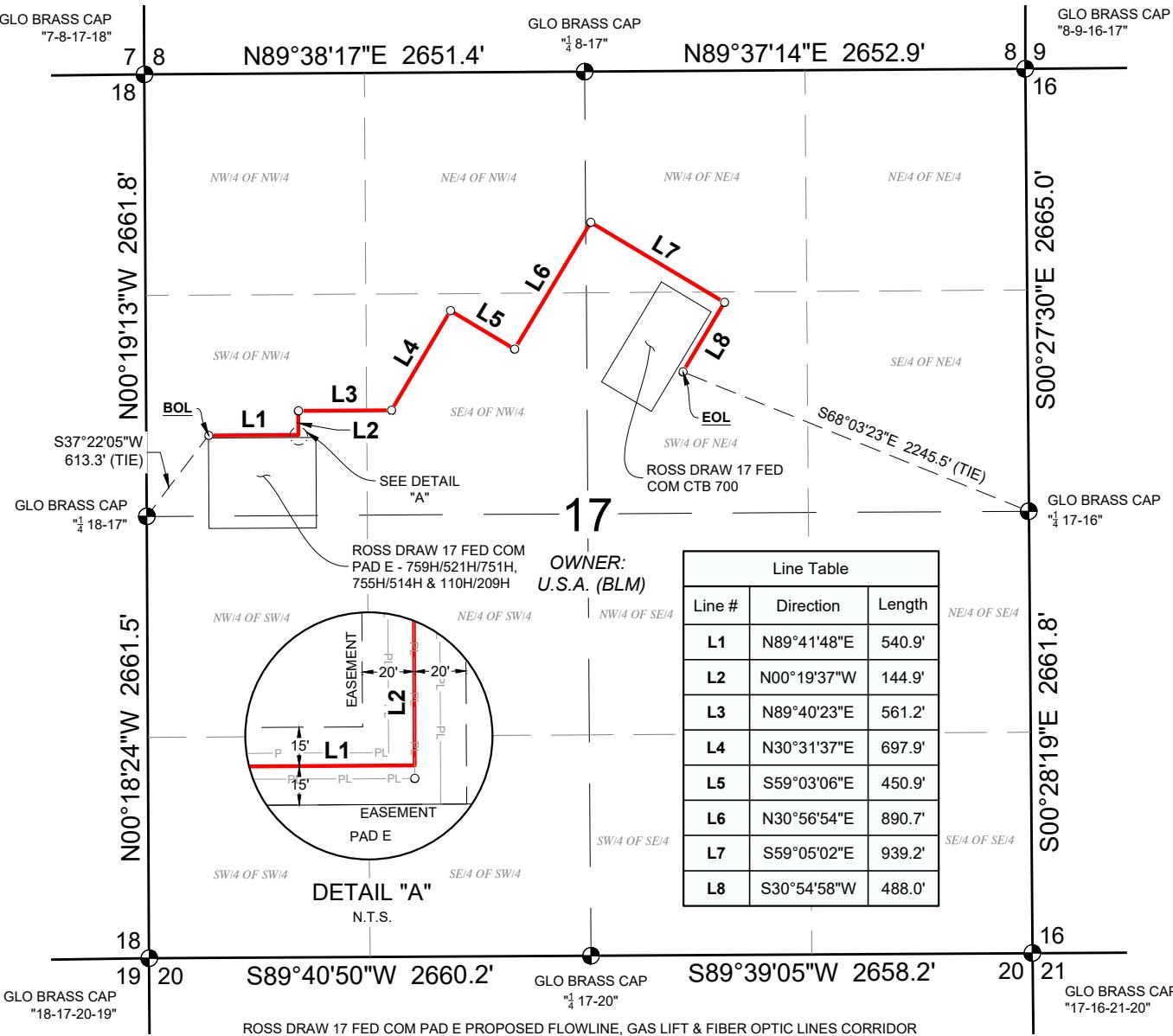
No.29821

DRAFTED BY: JC  
CHECKED BY: KS  
REV: 1

**eoq resources**  
ROSS DRAW 17 FED COM PAD D PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



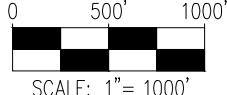
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OFFICE: (303) 928-7128

SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICOROSS DRAW 17 FED COM PAD E PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES CORRIDOR  
CENTERLINE DESCRIPTION

A STRIP OF LAND VARIABLE IN WIDTH AND 4713.7 FEET, 285.7 RODS OR 0.9 MILES IN LENGTH, SITUATED IN SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING OF VARIABLE WIDTH ON EACH SIDE OF THE CENTERLINE SHOWN HEREON AND THE DETAIL VIEWS.

**LEGEND**

- BOL** BEGINNING OF LINE
- EOL** END OF LINE
- PROPOSED CENTERLINE OF EASEMENT
- PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES
- POINT FOR BEGIN/END OR ANGLE POINT
- FOUND MONUMENT AS SHOWN



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**MITCHELL L. McDONALD, N.M. P.L.S.**

SURVEY DATE: 06/29/2024  
JOB NO.: B24.EOG.0086  
SHEET: 1 OF 1

**No.29821**

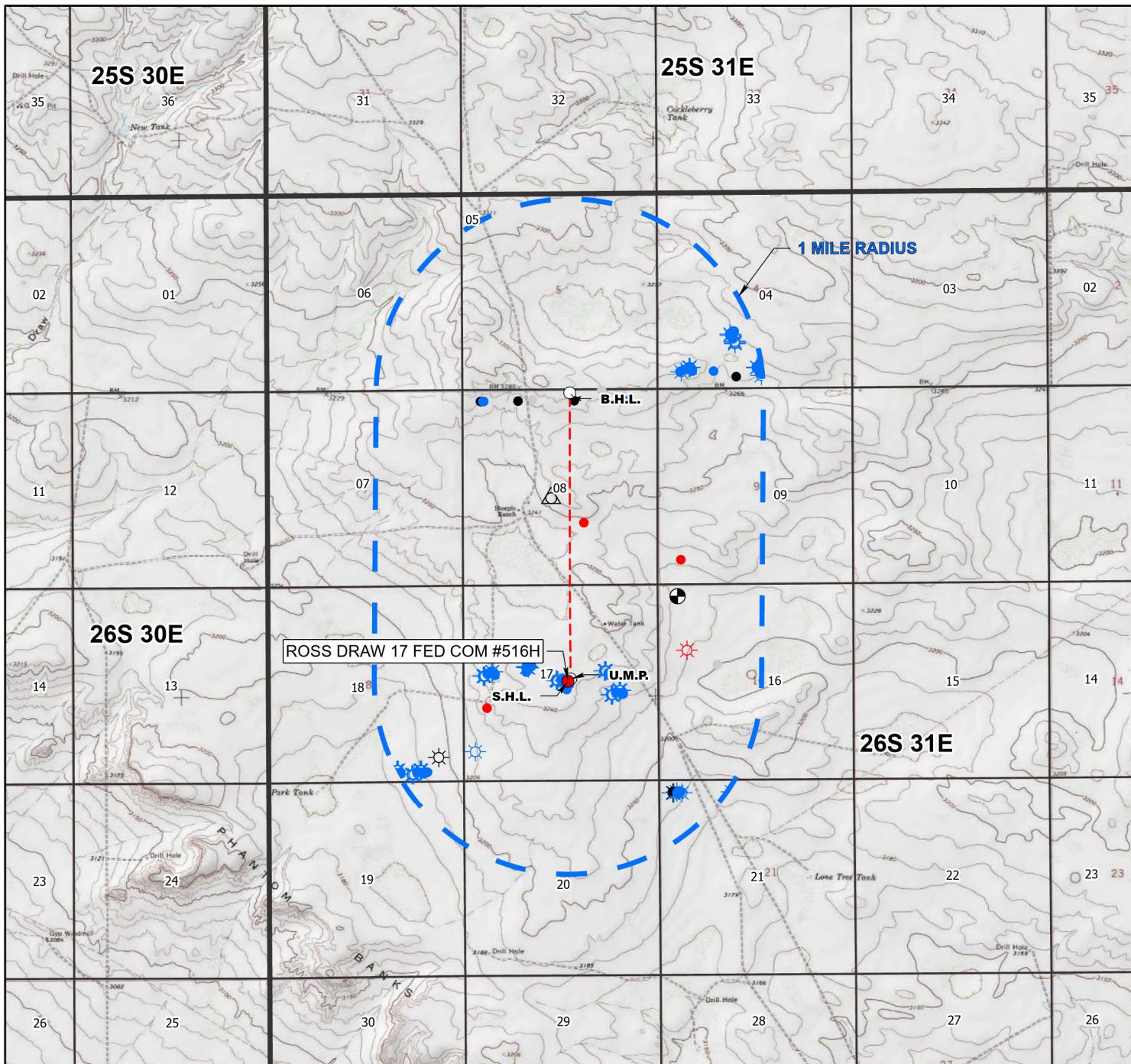
DRAFTED BY: JC  
CHECKED BY: KS  
REV: 1

**eog resources**  
ROSS DRAW 17 FED COM PAD E PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



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OFFICE: (303) 928-7128

**EXHIBIT 3**  
**1 MILE RADIUS BUFFER MAP**



LEASE NAME & WELL NO.: ROSS DRAW 17 FED COM #516H  
LATITUDE: N 32.042881 LONG: W 103.799775 ELEVATION: 3247'

SECTION: 17 TWP: 26S RGE: 31E SURVEY: N.M.P.M.  
COUNTY: EDDY STATE: NM

DESCRIPTION: 2621' FNL & 2458' FEL

- S.H.L.
- UMP; LMP; BHL
- Bore Line
- ⌚ Miscellaneous
- ☀ Gas, Active
- ☀ Gas, Cancelled
- ☀ Gas, New
- Oil, Active
- Oil, Cancelled
- Oil, New
- Oil, Plugged
- ▲ Salt Water Injection, Active
- Section
- Township



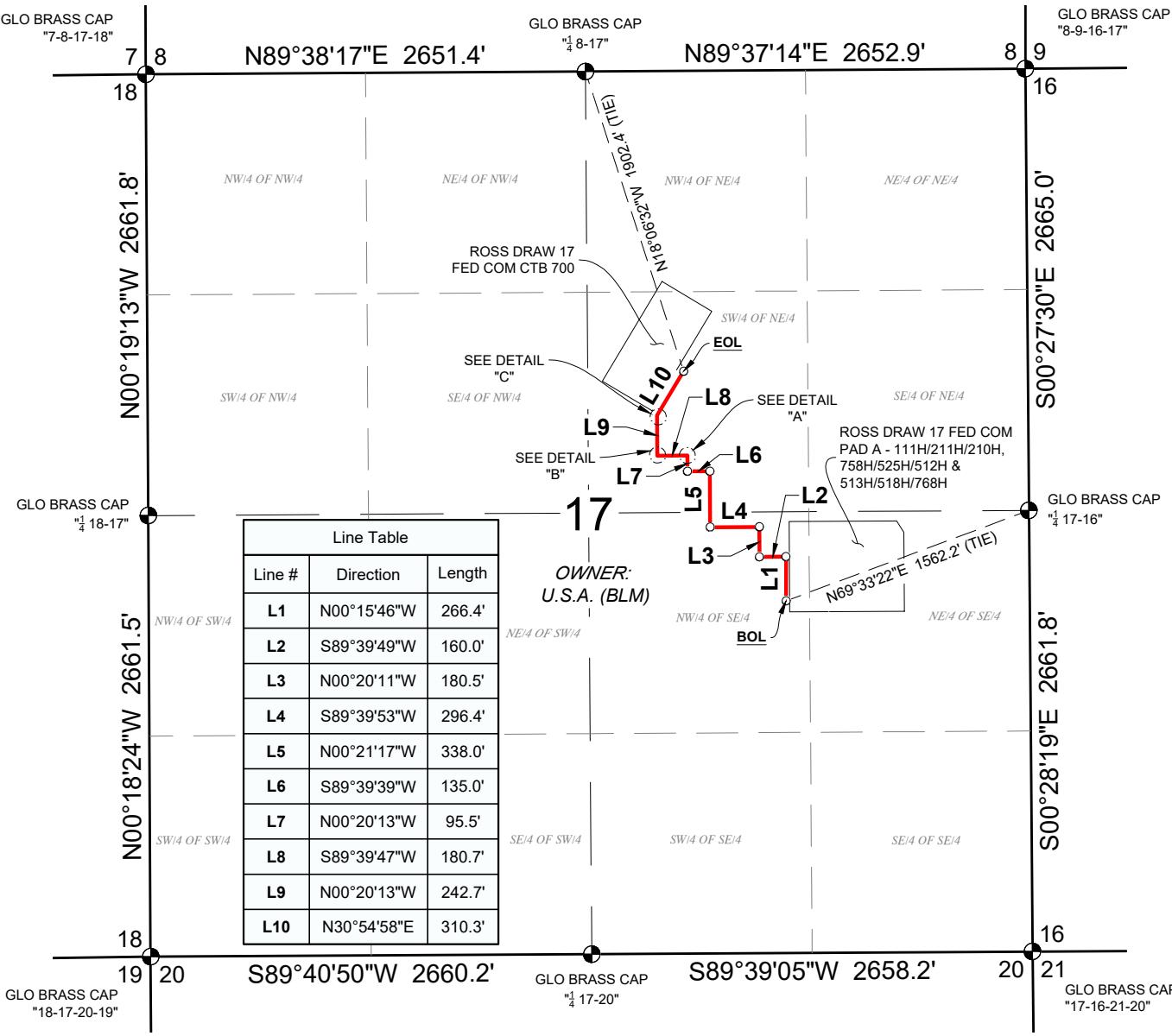
JOB No.: EOG\_B240086

NOTE:  
ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE  
FOLLOWING COORDINATE SYSTEM: NAD83 NEW MEXICO STATE PLANE, EAST ZONE, U.S. SURVEY FEET

**DISCLAIMER:**  
THIS PLOT DOES NOT REPRESENT A MONUMENTED LAND SURVEY AND SHOULD NOT BE RELIED UPON  
TO DETERMINE BOUNDARY LINES, PROPERTY OWNERSHIP OR OTHER PROPERTY INTERESTS.  
*Released to Imaging: 12/20/2025 12:55:35 PM*



**ASCENT**  
GEOMATICS SOLUTIONS  
8620 WOLFF COURT  
WESTMINSTER, CO 80031  
OFFICE: (303) 928-7128  
[WWW.ASCENTGEOMATICS.COM](http://WWW.ASCENTGEOMATICS.COM)

SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICO

## LEGEND

BOL BEGINNING OF LINE

EOL END OF LINE

PROPOSED CENTERLINE OF EASEMENT

PROPOSED FLOWLINE, GAS LIFT &amp; FIBER OPTIC LINES

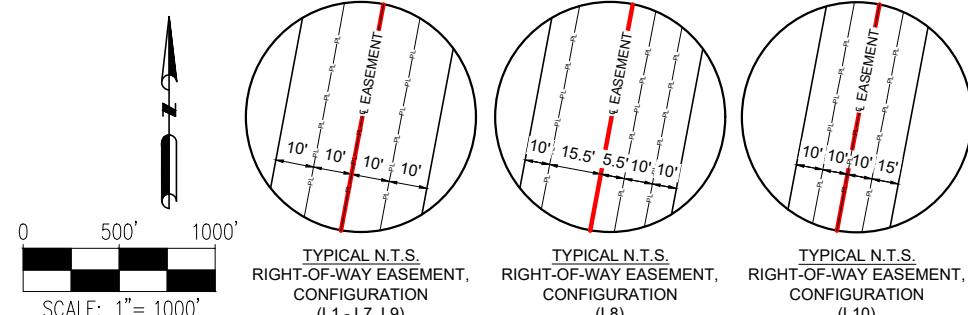
POINT FOR BEGIN/END OR ANGLE POINT

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\*SEE SHEET 2 OF 2 FOR DETAIL VIEWS &amp; CENTERLINE DESCRIPTION.



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SURVEY DATE: 06/29/2024  
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SHEET: 1 OF 2

No.29821

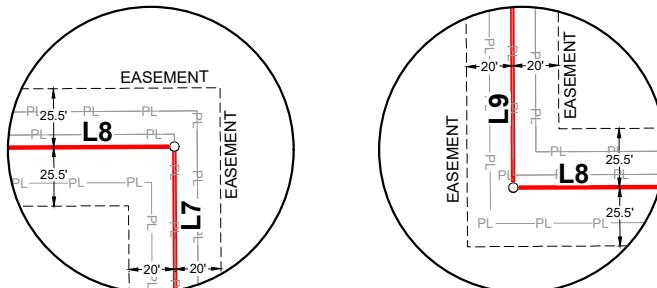
DRAFTED BY: JC  
CHECKED BY: KS  
REV: 1

  
ROSS DRAW 17 FED COM PAD A PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



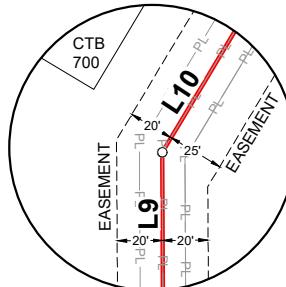
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**SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICO**



**DETAIL "A"**  
N.T.S.

**DETAIL "B"**  
N.T.S.



**DETAIL "C"**  
N.T.S.

**ROSS DRAW 17 FED COM PAD A PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES CORRIDOR  
CENTERLINE DESCRIPTION**

A STRIP OF LAND VARIABLE IN WIDTH AND 2205.5 FEET, 133.7 RODS OR 0.4 MILES IN LENGTH, SITUATED IN SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING OF VARIABLE WIDTHS ON EACH SIDE OF THE CENTERLINE SHOWN HEREON AND THE DETAIL VIEWS.

\*SEE SHEET 1 OF 2 FOR ADDITIONAL INFORMATION.

**LEGEND**

**BOL** BEGINNING OF LINE

**EOL** END OF LINE

**—** PROPOSED CENTERLINE OF EASEMENT

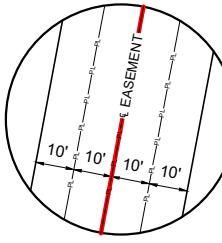
**—** PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES

**○** POINT FOR BEGIN/END OR ANGLE POINT

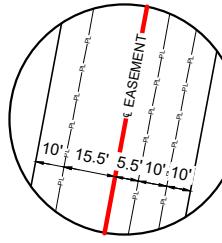


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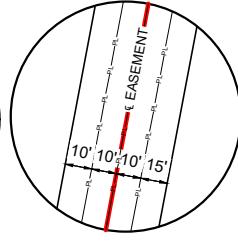
- BEARINGS, COORDINATES, AND DISTANCES SHOWN HEREON ARE BASED ON THE NEW MEXICO STATE PLANE COORDINATE SYSTEM, EAST ZONE, NAD 83-2011 (EPOCH 2010) FRAMEWORK, AS DERIVED BY OPUS SOLUTION. THE ELEVATIONS SHOWN HEREON AREA BASED ON NAVD 88.
- LAND OWNERSHIP INFORMATION REFLECTED HEREON WAS PROVIDED BY CLIENT AND/OR OBTAINED FROM PUBLIC DOMAIN DATA, NO INDEPENDENT OWNERSHIP SEARCH WAS PERFORMED BY ASCENT



**TYPICAL N.T.S.  
RIGHT-OF-WAY EASEMENT,  
CONFIGURATION  
(L7, L9)**



**TYPICAL N.T.S.  
RIGHT-OF-WAY EASEMENT,  
CONFIGURATION  
(L8)**



**TYPICAL N.T.S.  
RIGHT-OF-WAY EASEMENT,  
CONFIGURATION  
(L10)**



I, MITCHELL L. McDONALD, NEW MEXICO PROFESSIONAL SURVEYOR NO. 29821, DO HEREBY CERTIFY THAT THIS EASEMENT PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND I FURTHER CERTIFY THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT AND THAT THIS INSTRUMENT IS AN EASEMENT PLAT OF A PROPOSED EASEMENT.

**MITCHELL L. McDONALD, N.M. P.L.S.**

SURVEY DATE: 06/29/2024  
JOB NO.: B24.EOG.0086  
SHEET: 2 OF 2

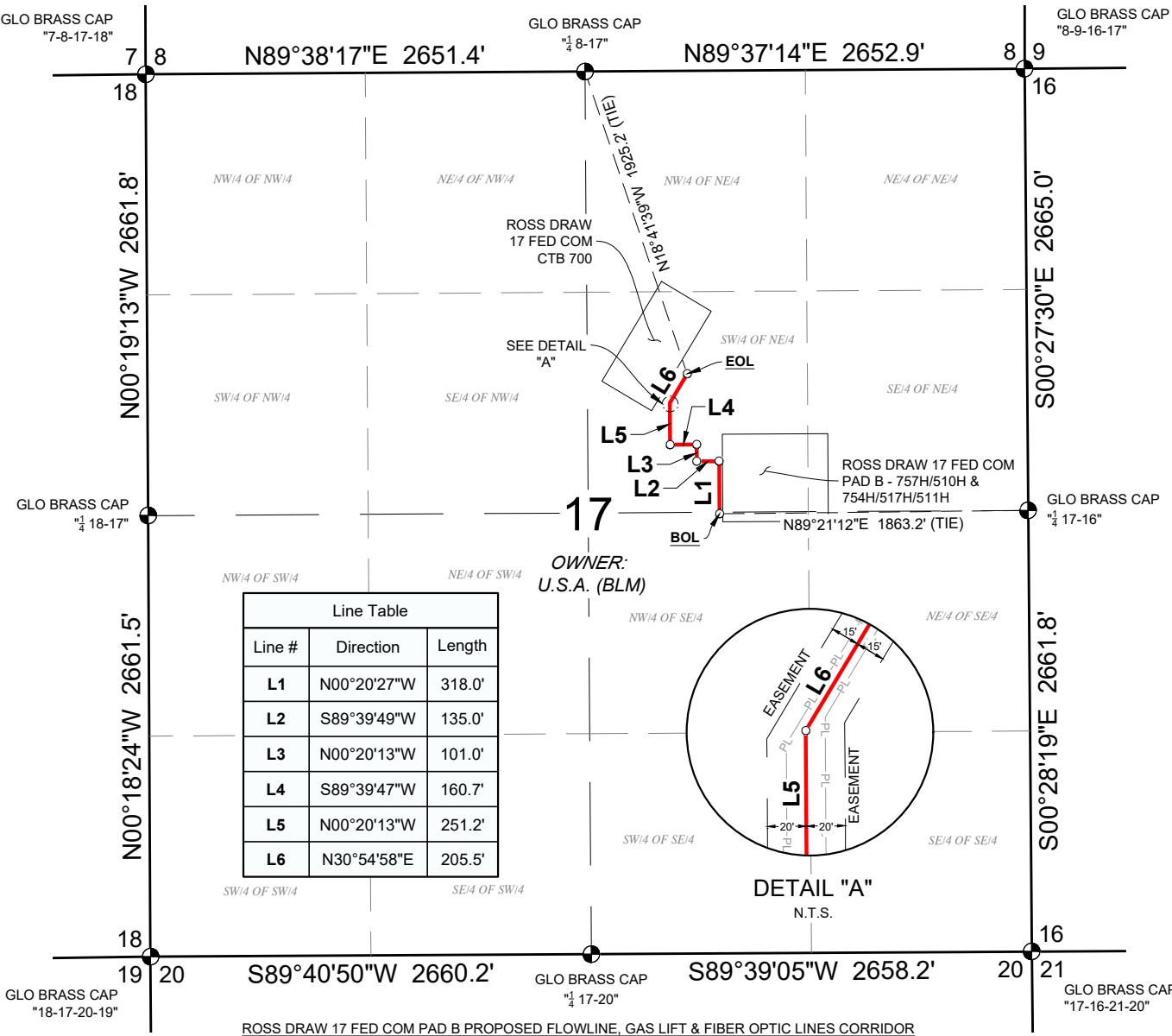
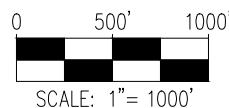
**No.29821**

DRAFTED BY: JC  
CHECKED BY: KS  
REV: 1

**eoq resources**  
ROSS DRAW 17 FED COM PAD A PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



PETROLEUM FIELD SERVICES, LLC  
DBA: ASCENT GEOMATICS SOLUTIONS  
8620 WOLFF CT.  
WESTMINSTER, CO 80031  
OFFICE: (303) 928-7128

SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICO**LEGEND****BOL** BEGINNING OF LINE**EOL** END OF LINE**—** PROPOSED CENTERLINE OF EASEMENT**—** PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES**○** POINT FOR BEGIN/END OR ANGLE POINT**●** FOUND MONUMENT AS SHOWN

## NOTES:

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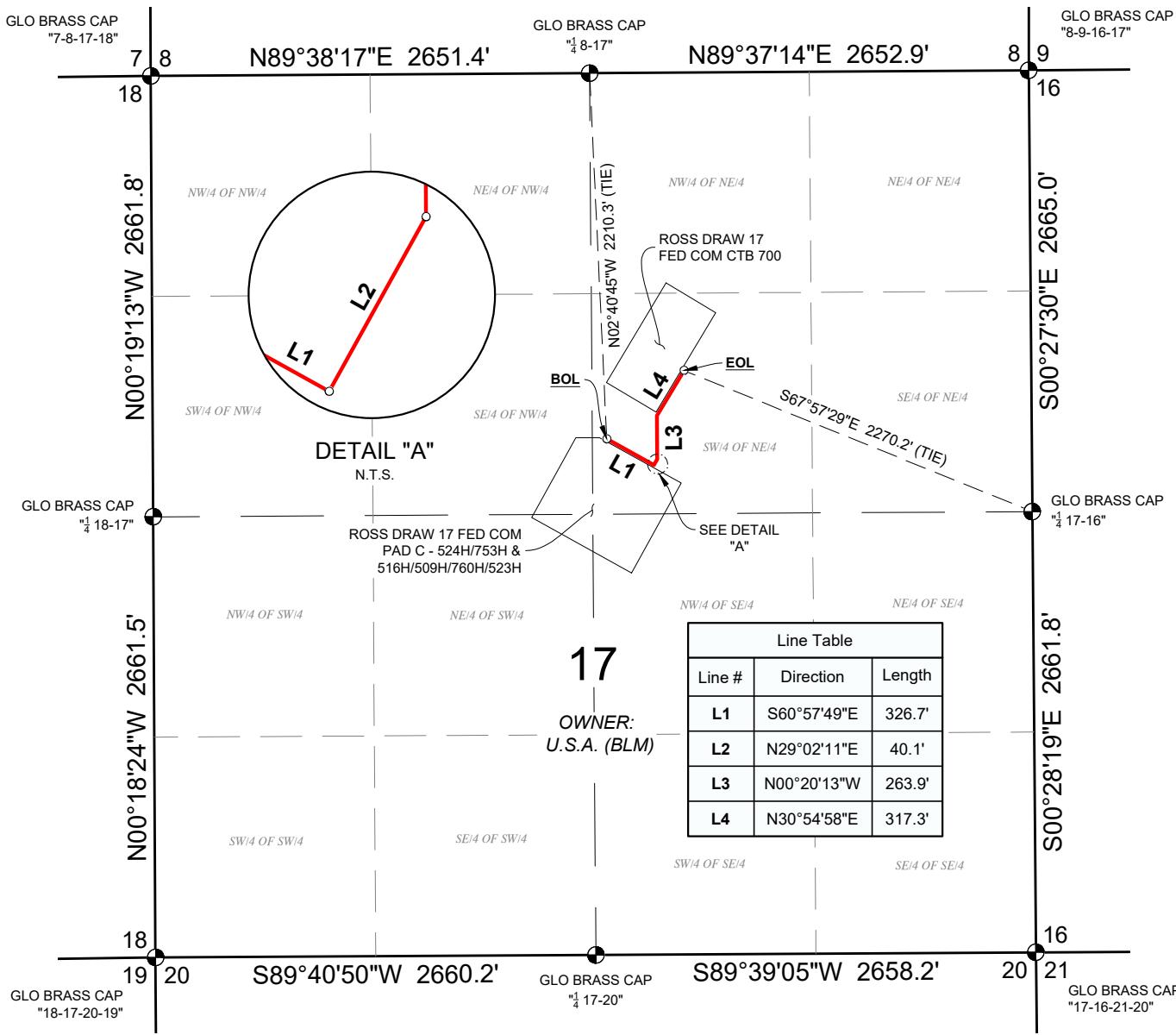
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**Mitchell L. McDonald, N.M. P.L.S.**SURVEY DATE: 06/29/2024  
JOB NO.: B24.EOG.0086  
SHEET: 1 OF 1**No.29821**DRAFTED BY: JC  
CHECKED BY: KS  
REV: 1

**ROSS DRAW 17 FED COM PAD B PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR**  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



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8620 WOLFF CT.  
WESTMINSTER, CO 80031  
OFFICE: (303) 928-7128

SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICOROSS DRAW 17 FED COM PAD C PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES CORRIDOR  
CENTERLINE DESCRIPTION

A STRIP OF LAND 30 FEET IN WIDTH AND 948.0 FEET, 57.5 RODS OR 0.2 MILES IN LENGTH, SITUATED IN SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15 FEET ON EACH SIDE OF THE CENTERLINE SHOWN HEREON.

## LEGEND

BOL BEGINNING OF LINE

EOL END OF LINE

— PROPOSED CENTERLINE OF EASEMENT

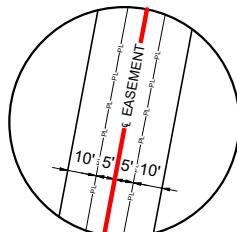
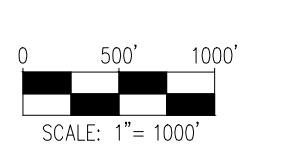
— PROPOSED FLOWLINE, GAS LIFT &amp; FIBER OPTIC LINES

○ POINT FOR BEGIN/END OR ANGLE POINT

● FOUND MONUMENT AS SHOWN

## NOTES:

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TYPICAL N.T.S.  
RIGHT-OF-WAY EASEMENT,  
CONFIGURATION

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MITCHELL L. McDONALD, N.M. P.L.S.

SURVEY DATE: 06/29/2024  
JOB NO.: B24.EOG.0086  
SHEET: 1 OF 1

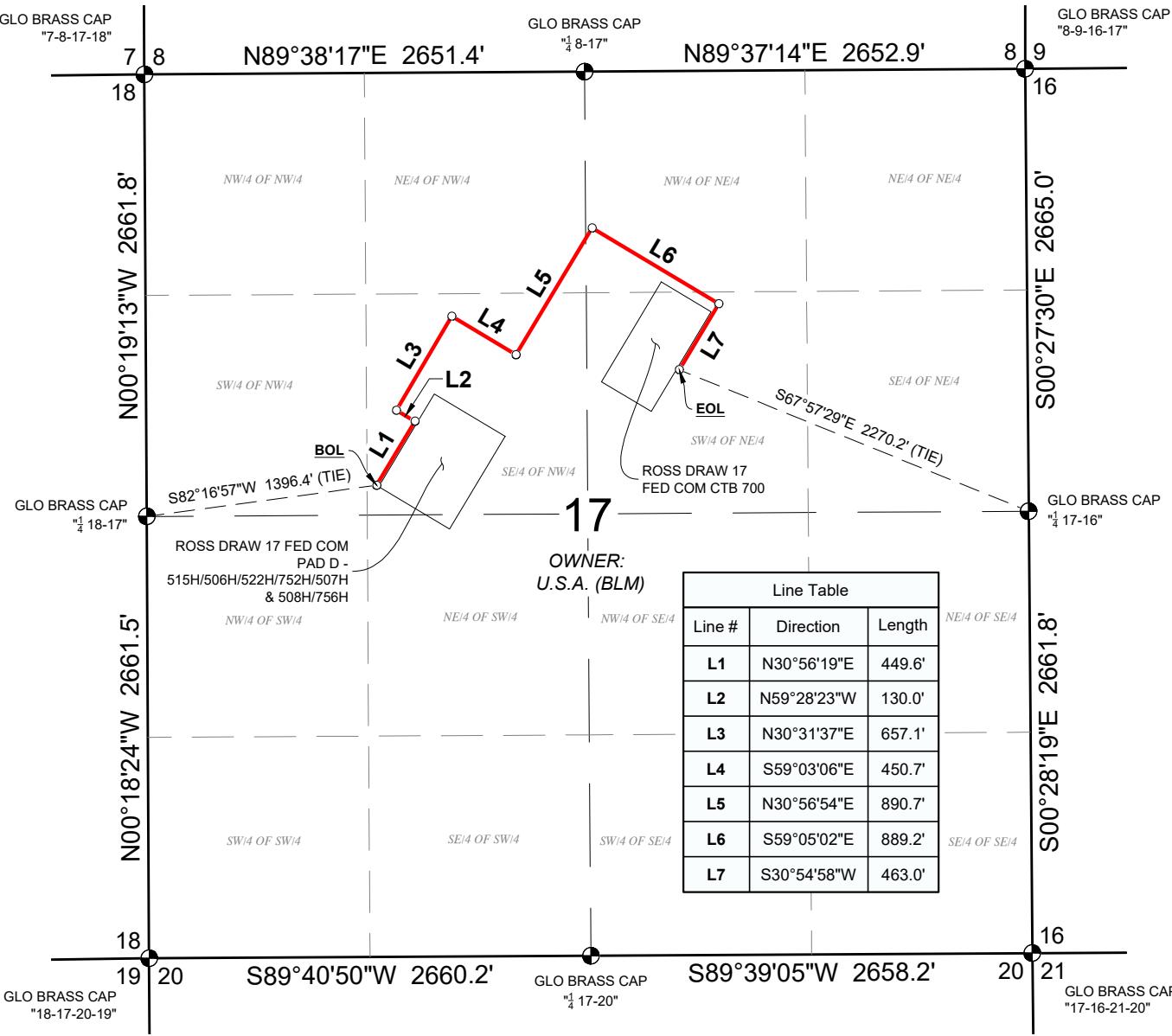
No.29821

DRAFTED BY: JC  
CHECKED BY: KS  
REV: 1

ROSS DRAW 17 FED COM PAD C PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



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SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICOROSS DRAW 17 FED COM PAD D PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES CORRIDOR  
CENTERLINE DESCRIPTION

A STRIP OF LAND 30 FEET IN WIDTH AND 3930.3 FEET, 238.2 RODS OR 0.7 MILES IN LENGTH, SITUATED IN SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15 FEET ON EACH SIDE OF THE CENTERLINE SHOWN HEREON.

## LEGEND

BOL BEGINNING OF LINE

EOL END OF LINE

— PROPOSED CENTERLINE OF EASEMENT

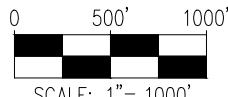
— PROPOSED FLOWLINE, GAS LIFT &amp; FIBER OPTIC LINES

○ POINT FOR BEGIN/END OR ANGLE POINT

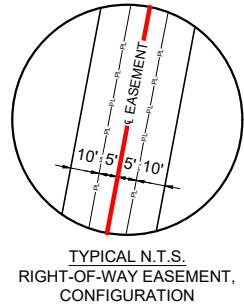
● FOUND MONUMENT AS SHOWN

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SCALE: 1" = 1000'

TYPICAL N.T.S.  
RIGHT-OF-WAY EASEMENT,  
CONFIGURATION

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MITCHELL L. McDONALD, N.M. P.L.S.

SURVEY DATE: 06/29/2024  
JOB NO.: B24.EOG.0086  
SHEET: 1 OF 1

No.29821

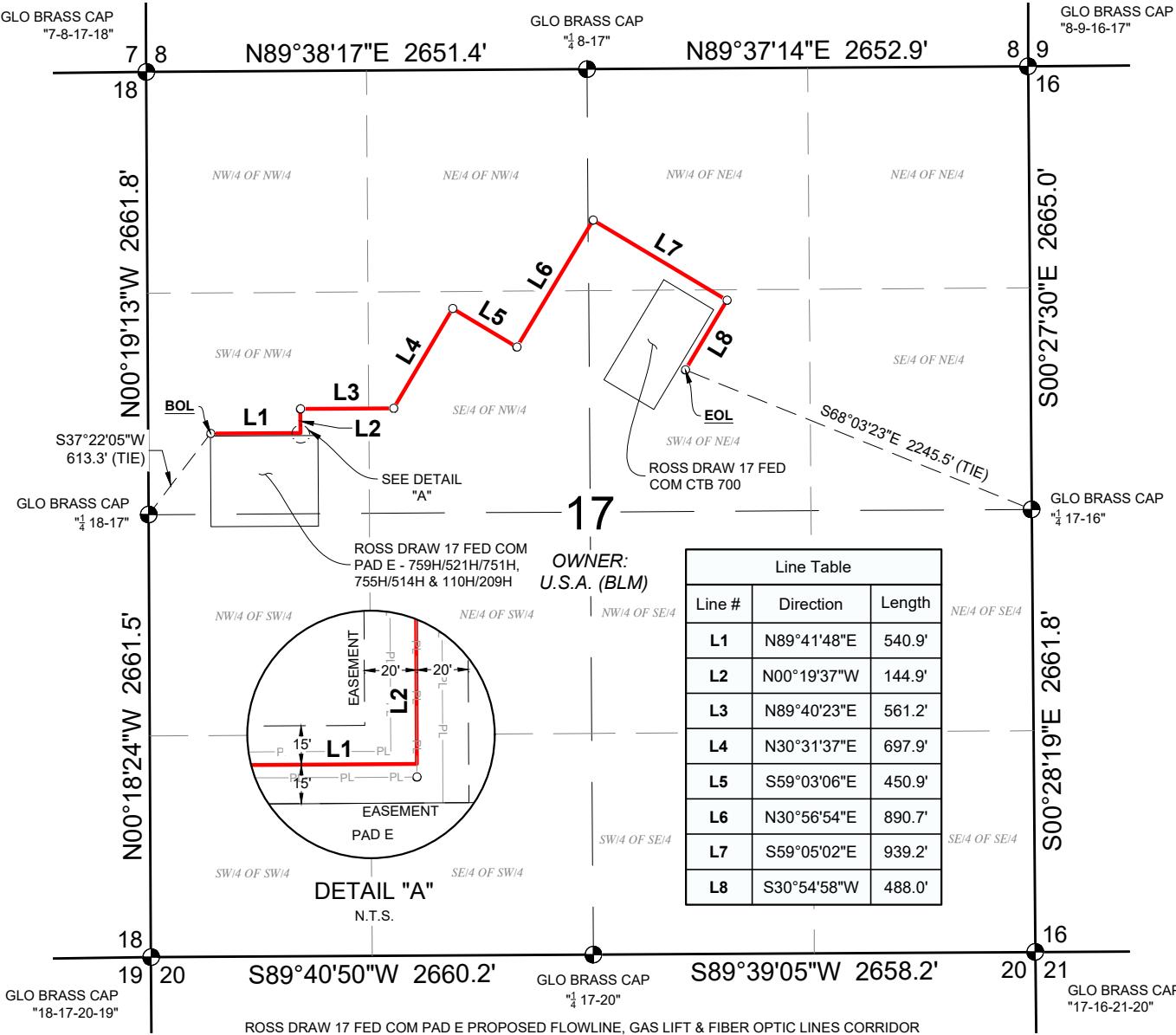
DRAFTED BY: JC  
CHECKED BY: KS  
REV: 1

**eoq resources**  
ROSS DRAW 17 FED COM PAD D PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



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SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICO



## LEGEND

## BOL BEGINNING OF LINE

**EOL** END OF LINE

— PROPOSED CENTERLINE OF EASEMENT

— PROPOSED FLOWLINE, GAS LIFT & FIBER OPTIC LINES

### POINT FOR BEGIN/END OR ANGLE POINT

FOUND MONUMENT AS SHOWN

## NOTES:

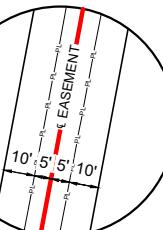
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0      500'      1000'

SCALE: 1 = 1000



TYPICAL N.T.S.  
RIGHT-OF-WAY EASEMENT  
CONFIGURATION  
(L1)



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Mitchell McDonald NM PLS

**No 29821**

SURVEY DATE: 06/29/2024  
JOB NO.: B24.EOG.0086

DRAFTED BY: JC  
CHECKED BY: KS  
REVIEWED BY:

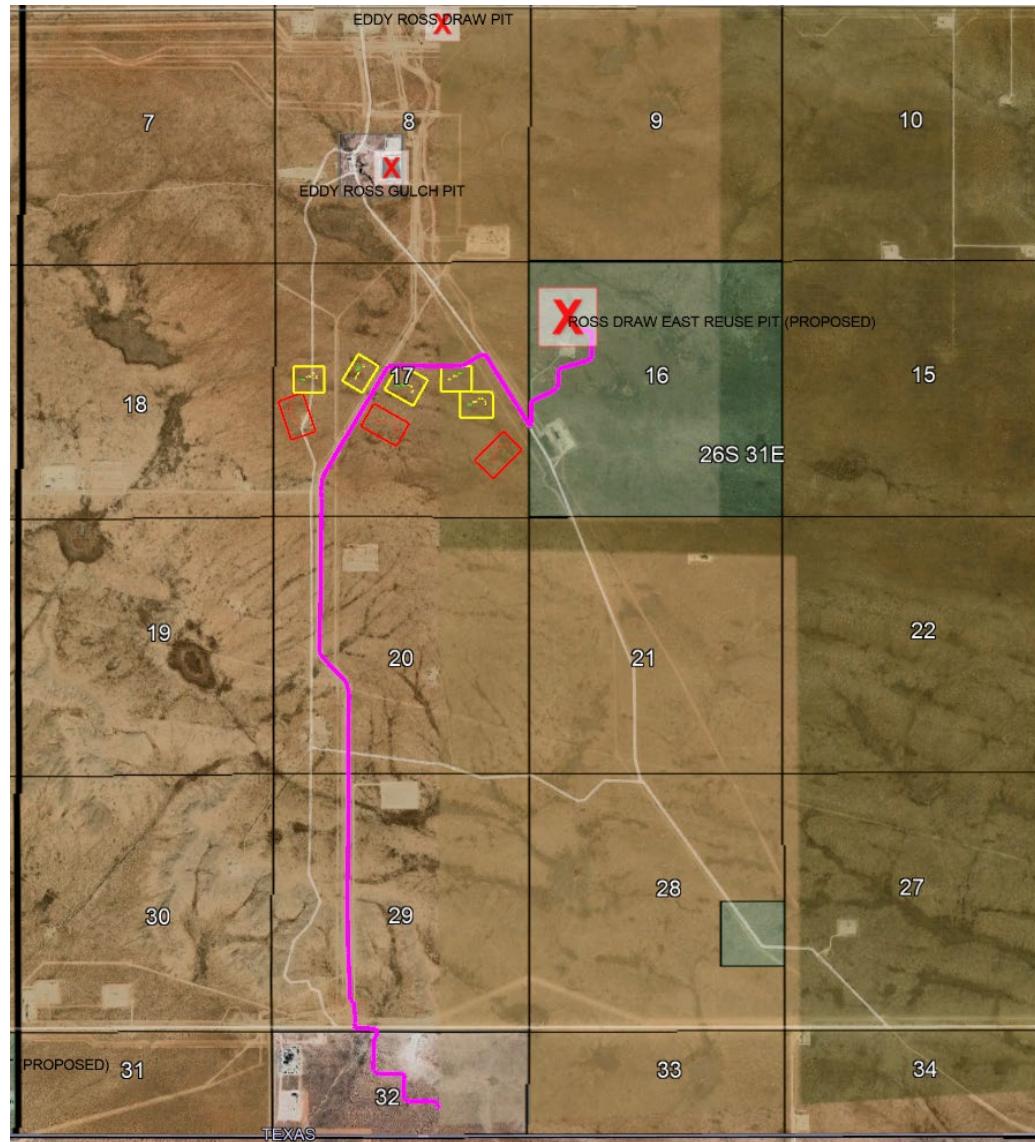
 **eog resources**

**ROSS DRAW 17 FED COM PAD E PROPOSED FLOWLINE,  
GAS LIFT & FIBER OPTIC LINES CORRIDOR  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO**

 ASCENT

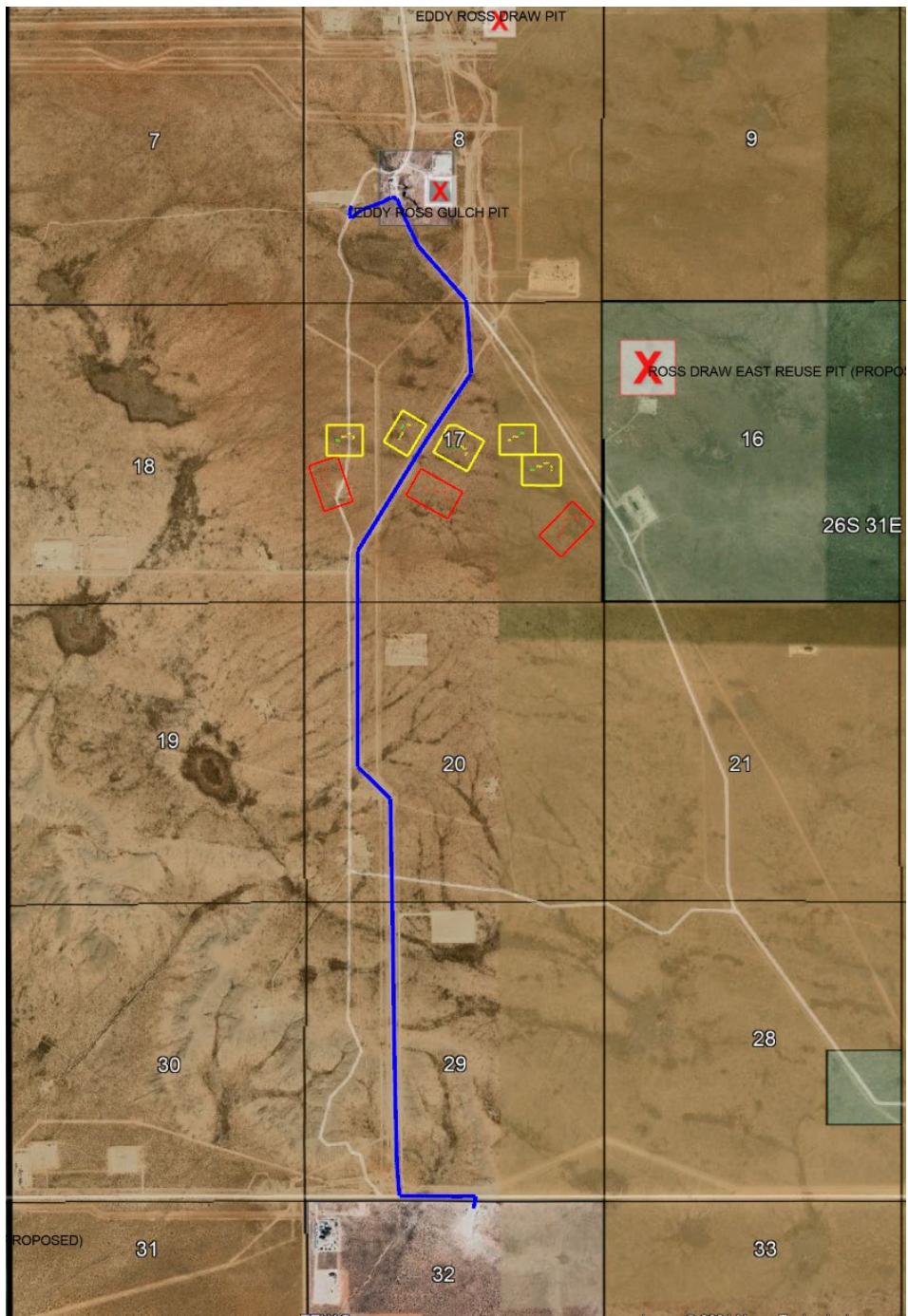
PETROLEUM FIELD SERVICES, LLC  
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8620 WOLFF CT.  
WESTMINSTER, CO 80031  
OFFICE: (303) 928-7128

## Ross Draw 17 Fed Com and Ripple 32 Fed Com Water Map



Water Pit Option 1 is in Section 16, Township 26S, Range 31E. The plan is to lay six (12") above-ground flat lines following existing disturbances from the Ross Draw Pit to the locations. The Line would leave the pit crossing Sections 17, 20, 29, 32 Township 26S, Range 31E, for approx. 3.5 miles. Access to the pit take CR1 to pipeline road go west 7 miles head south on our lease 2.5 miles to the Ross Draw Pit.

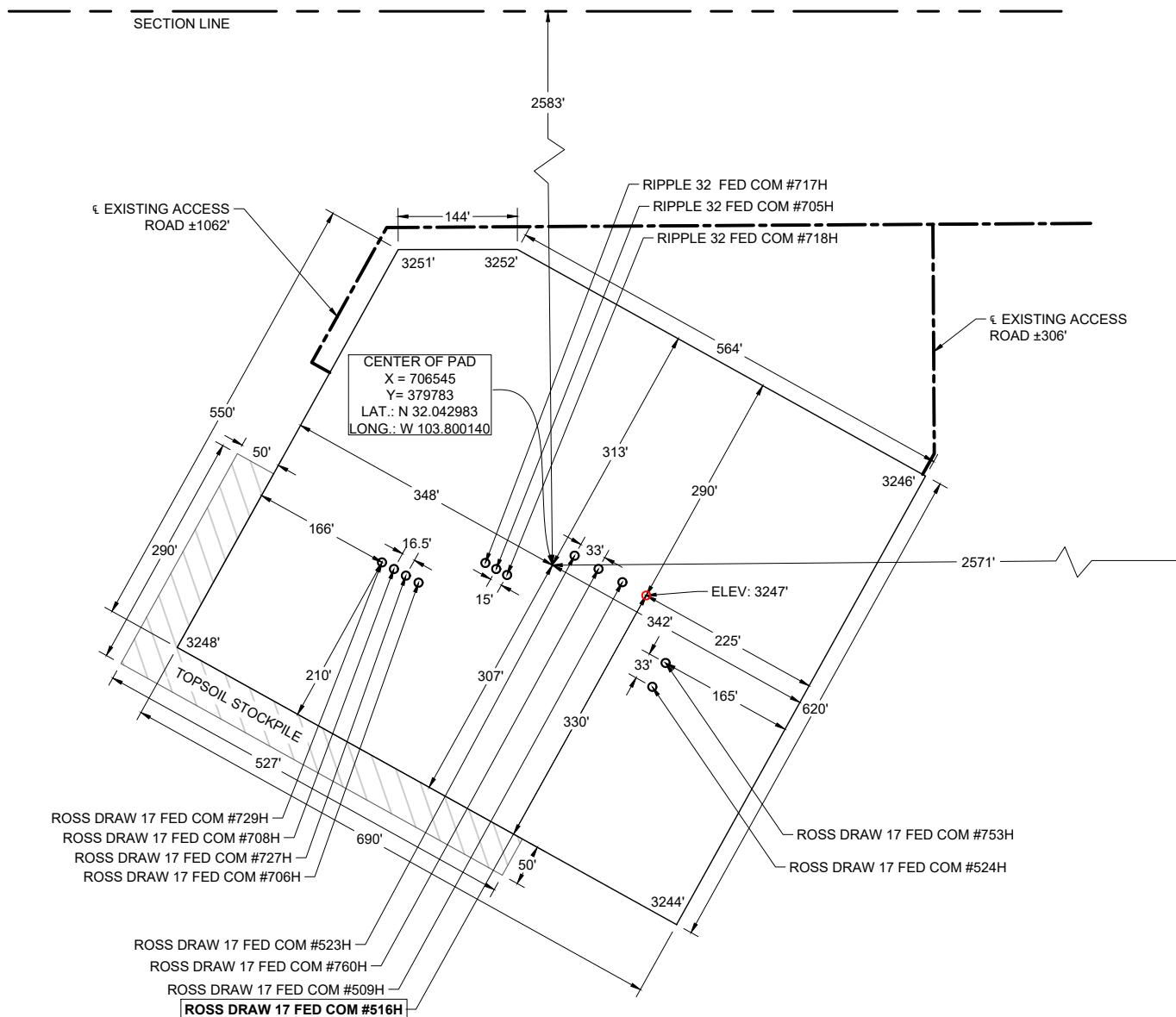
## Ross Draw and Ripple Caliche Map



Caliche will come from Section 8 and 32 Pit in T26S R31E. We can access the pits off Pipeline Road and go south 2 miles to the Section 8 pit, then keep traveling south 3.8 miles, and you will get to the Section 32 pit. Please see the attached map.

# EXHIBIT 2B

## PAD LAYOUT



LEASE NAME & WELL NO.: ROSS DRAW 17 FED COM #516H  
 LATITUDE: N 32.042881° LONG: W 103.799775° ELEVATION: 3247'

SECTION: 17 TWP: 26 S RGE: 31 E SURVEY: N.M.P.M.  
 COUNTY: EDDY STATE: NM

DESCRIPTION: CENTER OF PAD IS 2583' FNL & 2571' FEL

### LEGEND

— - - - -	= PROPOSED ACCESS ROAD
— - - - -	= SECTION LINE



JOB No.: EOG\_B240086

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE FOLLOWING COORDINATE SYSTEM: NAD83 NEW MEXICO STATE PLANE, EAST ZONE, U.S. SURVEY FEET.

DISCLAIMER:  
 THIS PLOT DOES NOT REPRESENT A MONUMENTED LAND SURVEY AND SHOULD NOT BE RELIED UPON TO DETERMINE BOUNDARY LINES, PROPERTY OWNERSHIP OR OTHER PROPERTY INTERESTS.

SHEET 2 OF 2

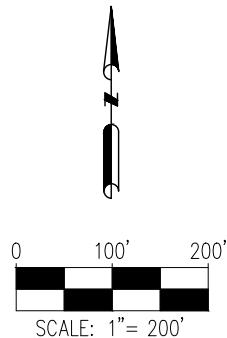
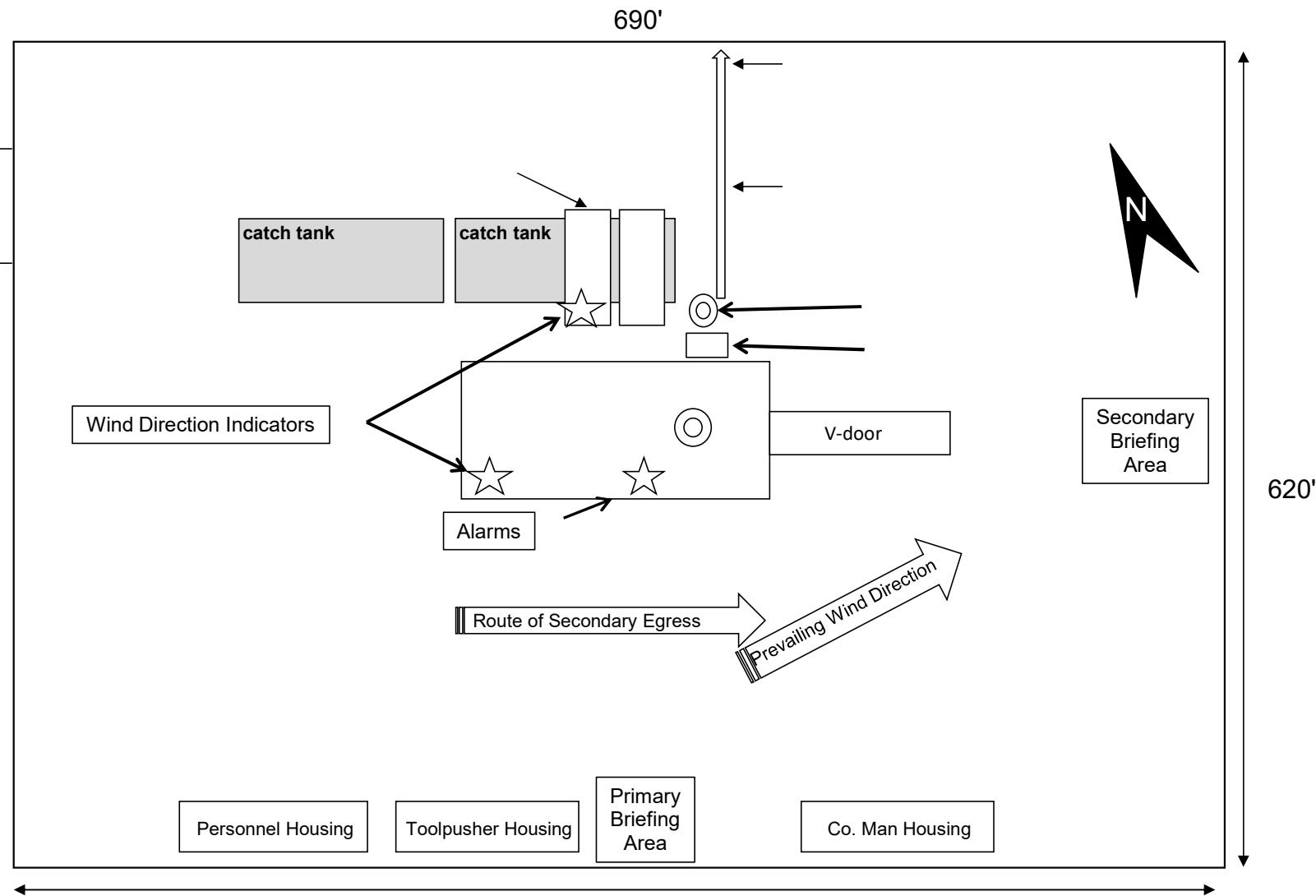


Exhibit 4  
EOG Resources  
Ross Draw 17 Fed Com #516H

Well Site Diagram



# EXHIBIT 2A

## WELL LOCATION EXHIBIT

**SURFACE LOCATION**

NEW MEXICO EAST

NAD 1983

X=706658' Y=379747'

LAT=N32.042881°

LONG=W103.799775°

NAD 1927

X=665472' Y=379689'

LAT=N32.042756°

LONG=W103.799300°

2621' FNL 2458' FEL

**KOP LOCATION**

NEW MEXICO EAST

NAD 1983

X=706732' Y=379755'

LAT=N32.042902°

LONG=W103.799538°

NAD 1927

X=665545' Y=379697'

LAT=N32.042777°

LONG=W103.799062°

2613' FNL 2384' FEL

**FIRST TAKE POINT**

NEW MEXICO EAST

NAD 1983

X=706731' Y=379805'

LAT=N32.043039°

LONG=W103.799538°

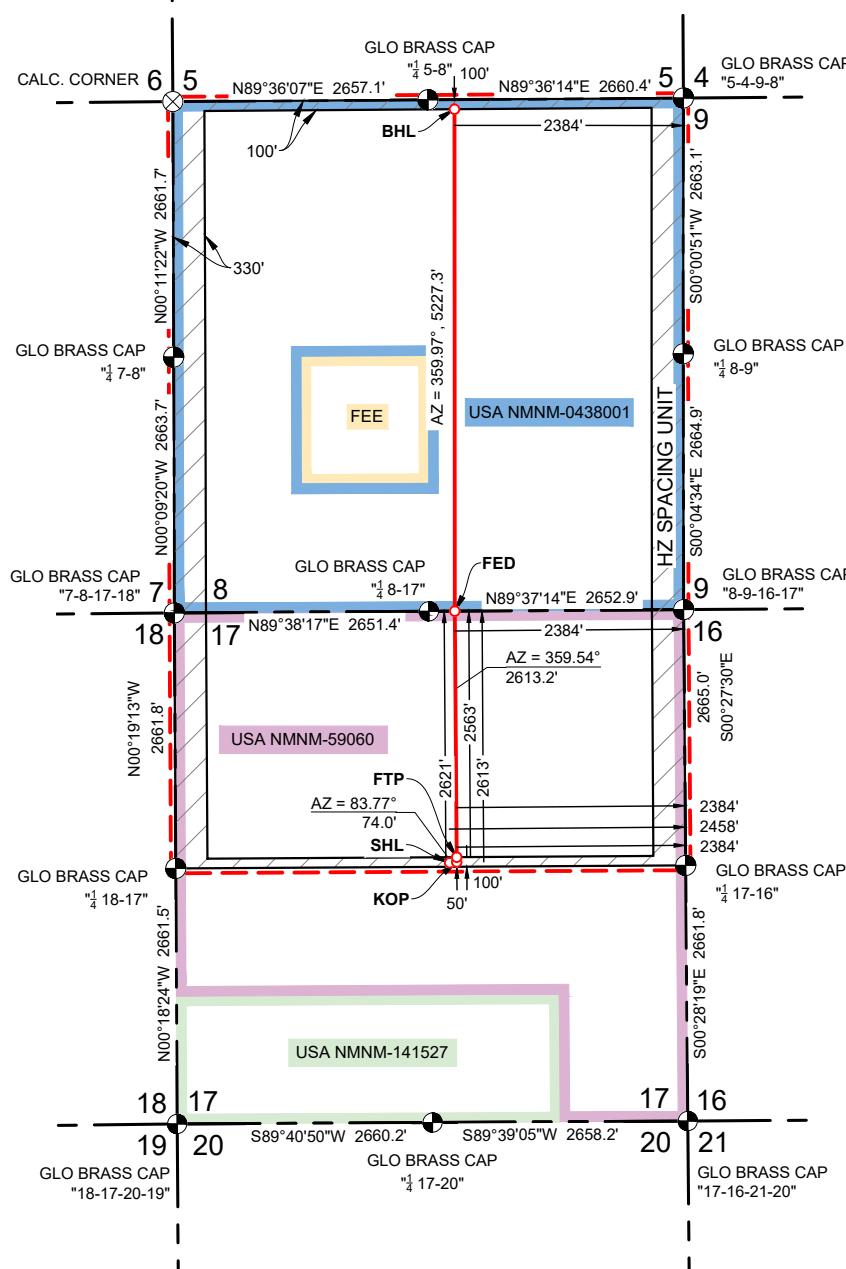
NAD 1927

X=665545' Y=379747'

LAT=N32.042914°

LONG=W103.799063°

2563' FNL 2384' FEL



LEASE NAME & WELL NO.: ROSS DRAW 17 FED COM #516H  
LATITUDE: N 32.042881° LONG: W 103.799775° ELEVATION: 3247'

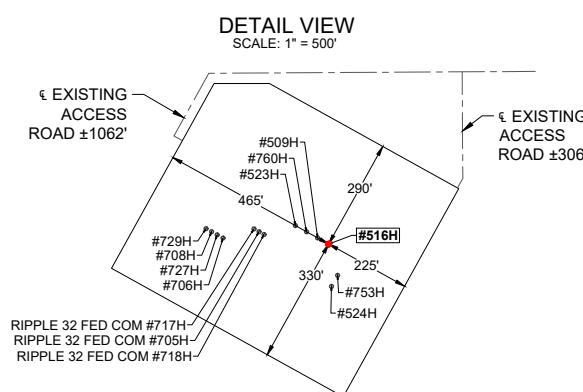
SECTION: 17 TWP: 26 S RGE: 31 E SURVEY: N.M.P.M.  
COUNTY: EDDY STATE: NM

DESCRIPTION: 2621' FNL & 2458' FEL

**DISTANCE & DIRECTION:**

FROM THE INTERSECTION OF PIPELINE ROAD AND BUCK JACKSON ROAD, TRAVEL SOUTH ON BUCK JACKSON ROAD FOR ±1.56 MILES; THENCE SOUTHWEST (RIGHT) ON AN EXISTING ACCESS ROAD ±1220 FEET; THENCE SOUTH (LEFT) ON AN EXISTING ACCESS ROAD ±306 FEET TO THE EDGE OF THE PAD.

(PROPOSED ACCESS ROAD LENGTH = ±0')



  
JOB No.: EOG\_B240086

NOTE:  
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ARE GRID BASED UPON THE FOLLOWING COORDINATE SYSTEM: NAD83 NEW  
MEXICO STATE PLANE, EAST ZONE, U.S. SURVEY FEET.

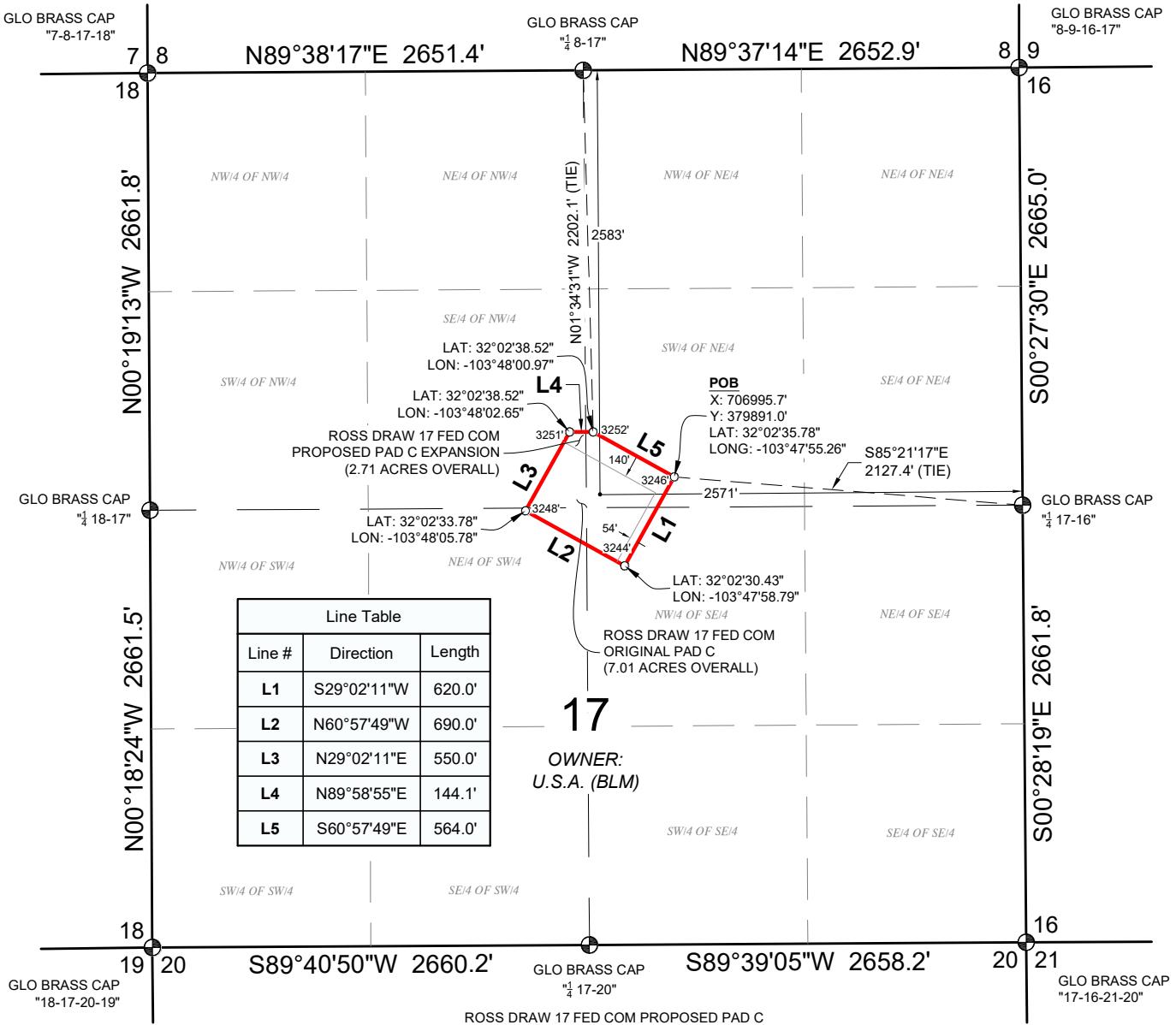
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Ralph B. Chustz, Jr.  
NEW MEXICO  
26264  
07/03/2024  
*Ralph B. Chustz, Jr.*

RALPH B. CHUSTZ, JR., N.M. P.L.S. No. 24246

  
ASCENT  
GEOMATICS SOLUTIONS  
8620 WOLFF CT.  
WESTMINSTER, CO 80031  
OFFICE: (303) 928-7128  
WWW.ASCENTGEOMATICS.COM

SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST,  
EDDY COUNTY, NEW MEXICO



**PAD DESCRIPTION**

A PROPOSED PAD SITUATED IN THE CENTER OF SECTION 17, TOWNSHIP 26 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

**BEGINNING AT A POINT, FROM WHICH A GLO BRASS CAP FOUND AND ACCEPTED AS THE EAST QUARTER CORNER OF SAID SECTION 17 BEARS S85°21'17"E, 2127.4 FEET, SAID POINT BEING THE EAST CORNER HEREOF;**

**THENCE** THE FOLLOWING FIVE (5) COURSES AND DISTANCES:

S29°02'11"W, 620.0 FEET;

N60°57'49"W, 690.0 FEET;

N29°02'11"E, 550.0 FEET;

N89°58'55"E, 144.1 FEET;

S60°57'49"E, 564.0 FEET TO THE POINT OF BEGINNING, CONTAINING 9.72 ACRES

## NOTES

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— PROPOSED PAD C

#### — EXISTING EDGE OF PAD C

○ POINT FOR BEGIN/END OR ANGLE POINT

• FOUND MONUMENT AS SHOWN



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**MITCHELL L. MCDONALD, N.M. P.L.S.**  
SURVEY DATE: 06/20/2024  
JOB NO.: B24.EOG.0086  
SHEET: 1 OF 2

**No.29821**  
DRAFTED BY: RH  
CHECKED BY: JB  
REV: 0

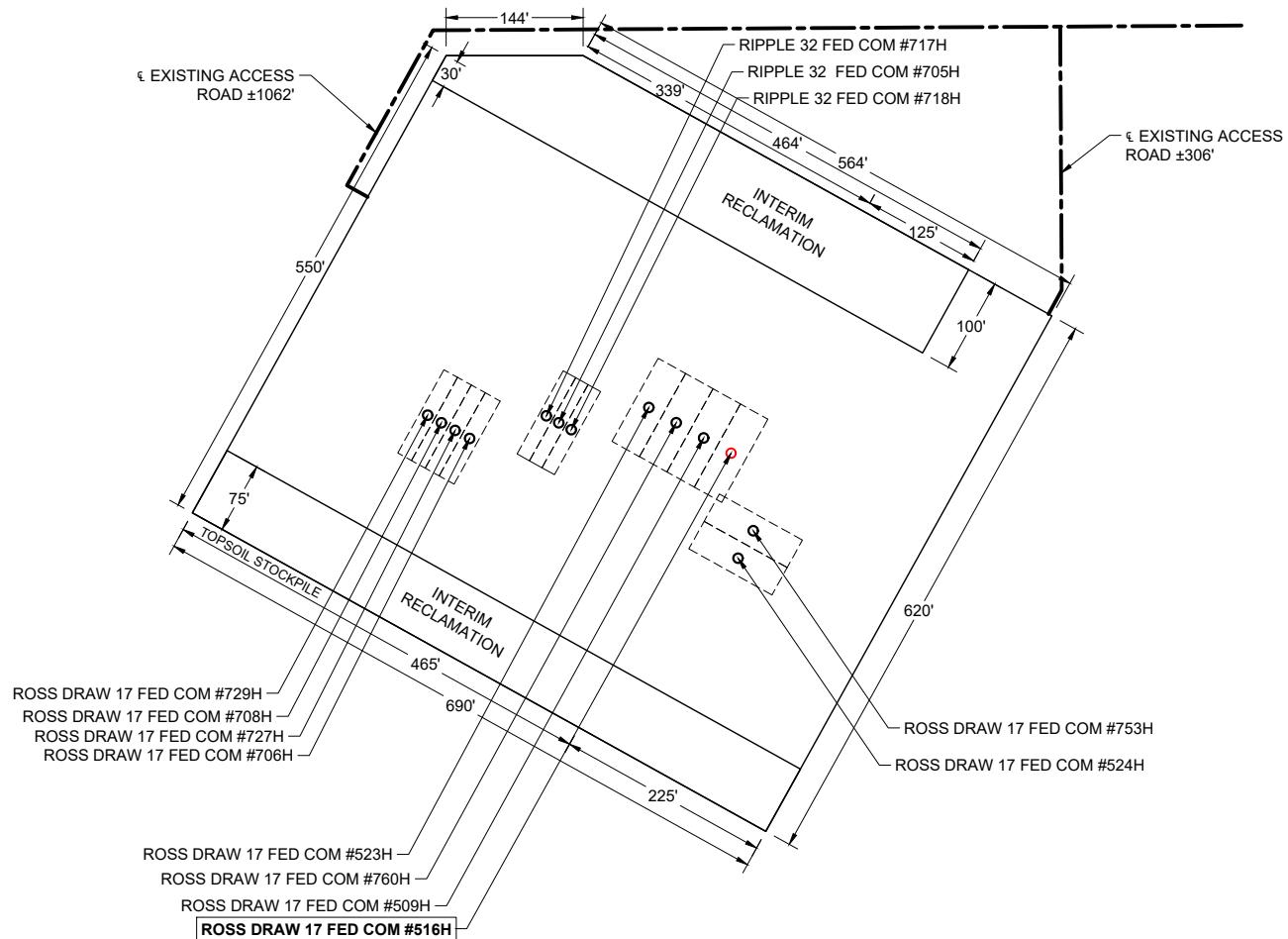


**ROSS DRAW 17 FED COM PROPOSED PAD C**  
SEC. 17, T-26-S, R-31-E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO

PETROLEUM FIELD SERVICES, LLC  
DBA: ASCENT GEOMATICS SOLUTIONS  
8620 WOLFF CT.  
WESTMINSTER, CO 80031  
OFFICE: (303) 928-7128

# EXHIBIT 2C

## RECLAMATION DIAGRAM



LEASE NAME & WELL NO.: ROSS DRAW 17 FED COM #516H  
 LATITUDE: N 32.042881° LONG: W 103.799775° ELEVATION: 3247'

SECTION: 17 TWP: 26 S RGE: 31 E SURVEY: N.M.P.M.  
 COUNTY: EDDY STATE: NM

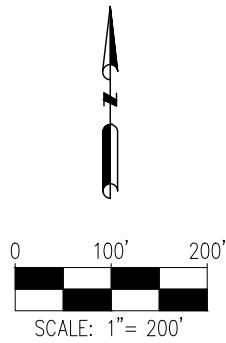
DESCRIPTION: CENTER OF PAD IS 2583' FNL & 2571' FEL



JOB No.: EOG\_B240086

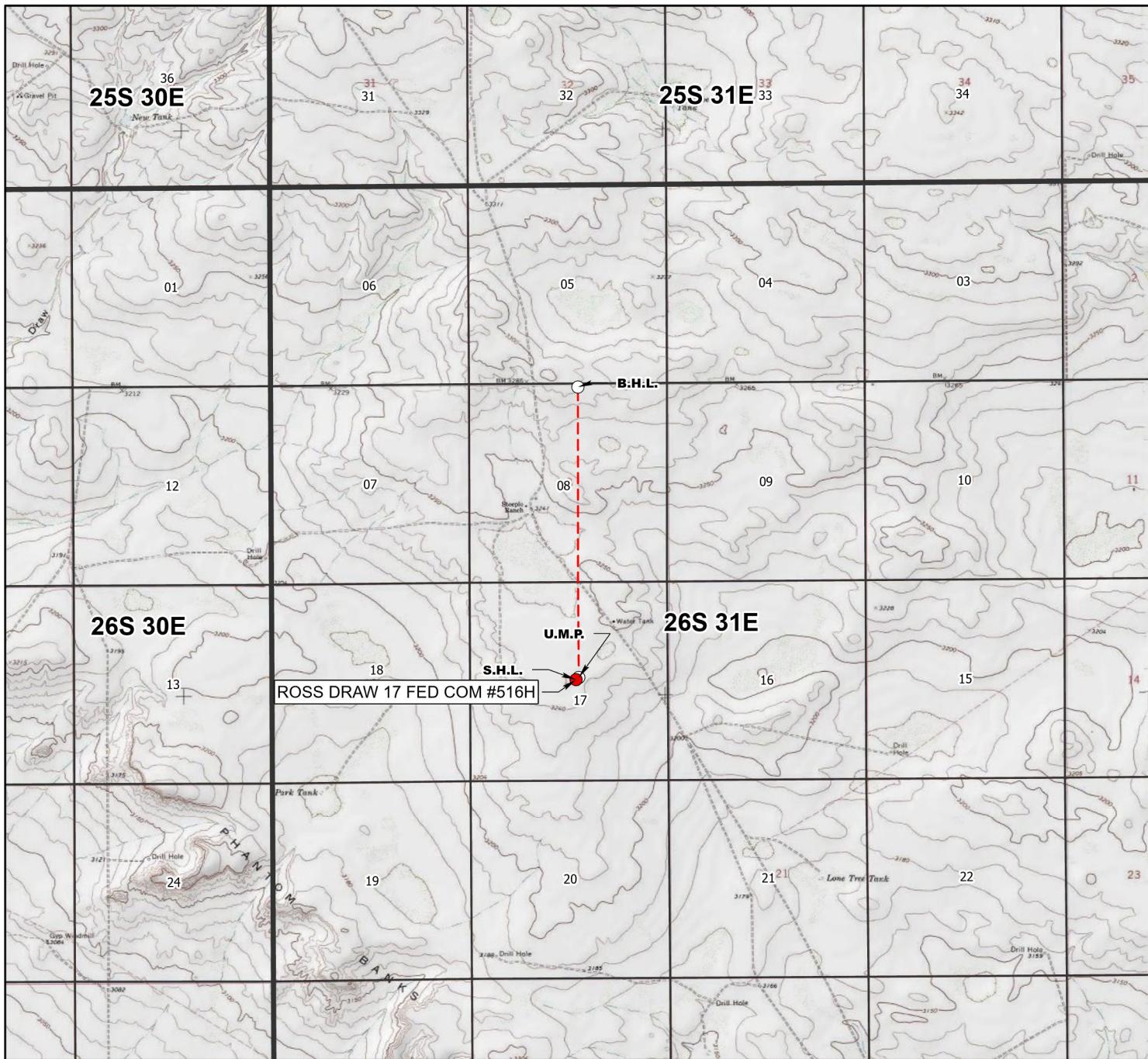
ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE FOLLOWING COORDINATE SYSTEM: NAD83 NEW MEXICO STATE PLANE, EAST ZONE, U.S. SURVEY FEET.

DISCLAIMER:  
 THIS PLOT DOES NOT REPRESENT A MONUMENTED LAND SURVEY AND SHOULD NOT BE RELIED UPON TO DETERMINE BOUNDARY LINES, PROPERTY OWNERSHIP OR OTHER PROPERTY INTERESTS.



# EXHIBIT 1

## LOCATION & ELEVATION VERIFICATION MAP



LEASE NAME & WELL NO.: ROSS DRAW 17 FED COM #516H  
 LATITUDE: N 32.042881 LONG: W 103.799775 ELEVATION: 3247'

SECTION: 17 TWP: 26S RGE: 31E SURVEY: N.M.P.M.  
 COUNTY: EDDY STATE: NM

DESCRIPTION: 2621' FNL & 2458' FEL

- S.H.L.
- U.M.P.; L.M.P.; B.H.L.
- Bore Line
- Section
- Township



JOB No.: EOG\_B240086

NOTE:  
 ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE  
 FOLLOWING COORDINATE SYSTEM: NAD83 NEW MEXICO STATE PLANE, EAST ZONE, U.S. SURVEY FEET

DISCLAIMER:  
 THIS PLOT DOES NOT REPRESENT A MONUMENTED LAND SURVEY AND SHOULD NOT BE RELIED UPON  
 TO DETERMINE BOUNDARY LINES, PROPERTY OWNERSHIP OR OTHER PROPERTY INTERESTS.

Released to Imaging 12/8/2025 12:53:53 PM

N

0 2,000 4,000

SCALE: 1"=4,000'

EOG Resources, Inc.  
ROSS DRAW 17 FED COM 516H

SHL: 2621 FSL & 2458 FEL, Section: 8, T.26S., R.31E.  
BHL: 100 FNL & 2384 FEL, Section: 8, T.26S., R.31E.

# Surface Use Plan of Operations

## Introduction

The following surface use plan of operations will be followed and carried out once the APD is approved. No other disturbance will be created other than what was submitted in this surface use plan. If any other surface disturbance is needed after the APD is approved, a BLM approved sundry notice or right of way application will be acquired prior to any new surface disturbance.

Before any surface disturbance is created, stakes or flagging will be installed to mark boundaries of permitted areas of disturbance, including soils storage areas. As necessary, slope, grade, and other construction control stakes will be placed to ensure construction in accordance with the surface use plan. All boundary markers will be maintained in place until final construction cleanup is completed. If disturbance boundary markers are disturbed or knocked down, they will be replaced before construction proceeds.

If terms and conditions are attached to the approved APD and amend any of the proposed actions in this surface use plan, we will adhere to the terms and conditions.

## 1. Existing Roads

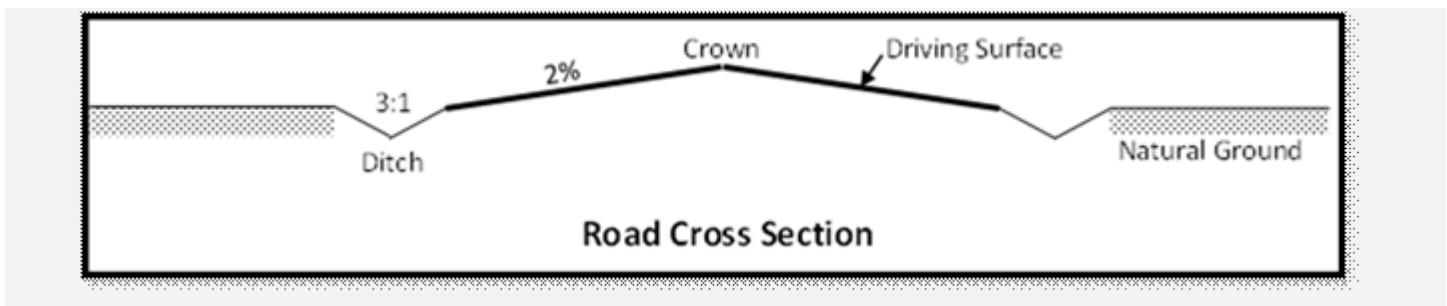
- a. The existing access road route to the proposed project is depicted on ROSS DRAW 17 FED COM 516H VICINITY. Improvements to the driving surface will be done where necessary. No new surface disturbance will be done, unless otherwise noted in the New or Reconstructed Access Roads section of this surface use plan..
- b. The existing access road route to the proposed project does not cross lease or unit boundaries, so a BLM right-of-way grant will not be acquired for this proposed road route.
- c. The operator will improve or maintain existing roads in a condition the same as or better than before operations begin. The operator will repair pot holes, clear ditches, repair the crown, etc. All existing structures on the entire access route such as cattleguards, other range improvement projects, culverts, etc. will be properly repaired or replaced if they are damaged or have deteriorated beyond practical use.
- d. We will prevent and abate fugitive dust as needed, whether created by vehicular traffic, equipment operations, or wind events. BLM written approval will be acquired before application of surfactants, binding agents, or other dust suppression chemicals on roadways.

## 2. New or Reconstructed Access Roads

- a. An access road will be needed for this proposed project. See the survey plat for the location of the access road.
- b. The length of access road needed to be constructed for this proposed project is about 99 feet.
- c. The maximum driving width of the access road will be 30 feet. The maximum width of surface disturbance when constructing the access road will not exceed 25 feet. All areas outside of the driving surface will be revegetated.
- d. The access road will be constructed with 6 inches of compacted CALICHE.
- e. When the road travels on fairly level ground, the road will be crowned and ditched with a 2% slope from the tip of the road crown to the edge of the driving surface. The ditches will be 3 feet wide with 3:1 slopes. See Road Cross Section diagram below.

EOG Resources, Inc.  
ROSS DRAW 17 FED COM 516H

SHL: 2621 FSL & 2458 FEL, Section: 8, T.26S., R.31E.  
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- f. The access road will be constructed with a ditch on each side of the road.
- g. The maximum grade for the access road will be 6 percent.
- h. No turnouts will be constructed on the proposed access road.
- i. No cattleguards will be installed for this proposed access road.
- j. No BLM right-of-way grant is needed for the construction of this access road.
- k. An appropriately sized culvert will be installed where drainages cross the access road. The culvert(s) will be no less than 18 inches in diameter and covered with no less than 12 inches of surfacing material. Each culvert will be marked with reflectors attached to T-Posts on both sides of the road. The uphill and downhill opening of the culvert will have rip-rap (cobble stone) extending 3 feet out and 12 inches deep to slow water flow entering and exiting the culvert. Standards in the BLM Gold Book will be used. The culvert will be maintained in its original condition throughout the life of the road. See survey plat for location of culvert(s).
- l. No low water crossings will be constructed for the access road.
- m. Since the access road is on level ground, no lead-off ditches will be constructed for the proposed access road.
- n. Newly constructed or reconstructed roads, on surface under the jurisdiction of the Bureau of Land Management, will be constructed as outlined in the BLM "Gold Book" and to meet the standards of the anticipated traffic flow and all anticipated weather requirements as needed. Construction will include ditching, draining, crowning and capping or sloping and dipping the roadbed as necessary to provide a well-constructed and safe road.

### 3. Location of Existing Wells

- a. ROSS DRAW 17 FED COM 516H RADIUS of the APD depicts all known wells within a one mile radius of the proposed well.
- b. There is no other information regarding wells within a one mile radius.

### 4. Location of Existing and/or Proposed Production Facilities SEE ELECTRICAL ATTACHMENT

- a. All permanent, lasting more than 6 months, above ground structures including but not limited to pumpjacks, storage tanks, barrels, pipeline risers, meter housing, etc. that are not subject to safety requirements will be painted a non-reflective paint color, Shale Green, from the BLM Standard Environmental Colors chart, unless another color is required in the APD Conditions of Approval.
- b. If any type of production facilities are located on the well pad, they will be strategically placed to allow for maximum interim reclamation, recontouring, and revegetation of the well location.
- c. Production from the proposed well will be transported to the production facility named ROSS DRAW 17 FED COM CTB. The location of the facility is as follows: SECTION 17, TOWNSHIP 26S, RANGE 31E.

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ROSS DRAW 17 FED COM 516H

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d. A pipeline to transport production will be installed from the proposed well to the existing production facility.

- i. We plan to install a 6 inch buried FLEXPIPE/FLEXSTEEL pipeline from the proposed well to the offsite production facility. The proposed length of the pipeline will be 948 feet. The working pressure of the pipeline will be about 1440 psi. A 30 feet wide work area will be needed to install the buried pipeline. In areas where blading is allowed, topsoil will be stockpiled and separated from the excavated trench mineral material. Final reclamation procedures will match the procedures in Plans for Surface Reclamation. When the excavated soil is backfilled, it will be compacted to prevent subsidence. No berm over the pipeline will be evident.
- ii. ROSS DRAW 17 FED COM INFRASTRUCTURE MAP depicts the proposed production pipeline route from the well to the existing production facility.
- iii. The proposed pipeline does not cross lease boundaries, so a right of way grant will not need to be acquired from the BLM.

**If any plans change regarding the production facility or other infrastructure (pipeline, electric line, etc.), we will submit a sundry notice or right of way (if applicable) prior to installation or construction.**

#### Electric Line(s)

- a. No electric line will be applied for with this APD.

### 5. Location and Types of Water

a. The source and location of the water supply are as follows: The source and location of the water supply are as follows: This location will be drilled using a combination of water mud systems as outlined in the drilling program (i) Water will be obtained from commercial water stations in the area and hauled to the location by trucks using existing and proposed roads as depicted on the road map attached (ii) Water may be supplied from frac ponds and transported to the location by temporary above ground surface lines\_ as shown on the map EOG plans to utilize up to six 4 inch polyethylene or lay flat lines and up to six 12 inch lay flat lines to transport fresh water Freshwater contains less than 10\_000 mg\_I Total Dissolved Solids (TDS)\_ exhibits no petroleum sheen when standing\_ and has not previously been used in mechanical processes that expose it to heavy metals or other potential toxins

EOG plans to utilize up to six 10 inch lay flat lines and up to six 12 inch lay flat lines to transport treated produced water\_ defined as reconditioning produced water to a reusable form and may include mechanical and chemical processes

TPLT Freshwater Pit\_ Section 3\_ Blk 55 1\_ T&P RR Co Survey\_ Reeves Co\_ Texas

EOG Ross Draw Reuse Pit\_ Section 16\_ T26S\_ R31E\_ Eddy Co\_ New Mexico

Temporary surface lines would originate from a single or multiple water source locations in the surrounding area of the proposed action and be temporarily laid above ground with minimal disturbance

Temporary surface line(s) shall be laid no more than 10 feet from the existing disturbance's edge (ie\_ bar\_borrow ditch\_ road surface\_ two track road\_ or other man made addition to the landscape) A push off arm or another mechanism will be used All vehicle equipment will remain within the existing disturbance

Maps or maps showing the locations of the temporary surface lines will be provided with the APD and included in the environmental assessment An electronic map file (shape file or KMZ file) shall be submitted with the Environmental Assessment.

- b. ROSS DRAW 17 FED COMK WATER AND CALICHE MAP depicts the proposed route for a 12 inch LAYFLAT temporary (<90 days) water pipeline supplying water for drilling operations.

### 6. Construction Material

- a. Caliche will be supplied from pits, as shown on the attached caliche source map.

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EOG Resources, Inc.

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Caliche utilized for the drilling pad will be obtained either from an existing approved mineral pit or by benching into a hill, which will allow the pad to be level with existing caliche from the cut or extracted by "Flipping" the sound location. A mineral material permit will be obtained from BLM before excavating any caliche on Federal Lands. The amount will vary for each pad. The procedure for "Flipping" a healthy location is as follows:

\*

-An adequate amount of topsoil/root zone (usually the top 6 inches of soil) will be stripped from the proposed healthy location and stockpiled along the side of the sound location as depicted on the OK site diagram/survey plat.

-An area within the proposed well site dimensions will be used to excavate the caliche.

Subsoil will be removed and stockpiled within the surveyed well pad dimensions.

-Once caliche/surfacing mineral is found, the mineral material will be excavated and stockpiled within the approved drilling pad dimensions.

-Then, the subsoil will be pushed back into the excavated hole, and the caliche will be spread accordingly across the entire healthy pad and road (if available).

-Neither caliche nor subsoil will be stockpiled outside the healthy pad dimensions. Topsoil will be stockpiled along the edge of the pad as depicted in the Well Site Layout or survey plat.

\*

If no caliche is found onsite, caliche will be hauled in from a BLM-approved caliche pit or other established mineral pit. A BLM mineral material permit will be acquired before obtaining mineral material from BLM pits or federal land.

## 7. Methods for Handling Waste SEE SECTION SEVEN ATTACHMENT

- a. Drilling fluids and produced oil and water from the well during drilling and completion operations will be stored safely and disposed of properly in an NMOCD approved disposal facility.
- b. Garbage and trash produced during drilling and completion operations will be collected in a trash container and disposed of properly at a state approved disposal facility. All trash on and around the well site will be collected for disposal.
- c. Human waste and grey water will be properly contained and disposed of properly at a state approved disposal facility.
- d. After drilling and completion operations, trash, chemicals, salts, frac sand and other waste material will be removed and disposed of properly at a state approved disposal facility.
- e. The well will be drilled utilizing a closed loop system. Drill cutting will be properly disposed of into steel tanks and taken to an NMOCD approved disposal facility.

## 8. Ancillary Facilities

- a. No ancillary facilities will be needed for this proposed project.

## 9. Well Site Layout

- a. The following information is presented in the well site survey plat or diagram:
  - i. reasonable scale (near 1":50')
  - ii. well pad dimensions
  - iii. well pad orientation

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ROSS DRAW 17 FED COM 516H

SHL: 2621 FSL & 2458 FEL, Section: 8, T.26S., R.31E.  
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- iv. drilling rig components
- v. proposed access road
- vi. elevations of all points
- vii. topsoil stockpile
- viii. reserve pit location/dimensions if applicable
- ix. other disturbances needed (flare pit, stinger, frac farm pad, etc.)
- x. existing structures within the 600' x 600' archaeological surveyed area (pipelines, electric lines, well pads, etc)

b. The proposed drilling pad was staked and surveyed by a professional surveyor. The attached survey plat of the well site depicts the drilling pad layout as staked.

c. A title of a well site diagram is ROSS DRAW 17 FED COM 516H RIG LAYOUT. This diagram depicts the RIG LAYOUT.

d. Topsoil Salvaging

- i. Grass, forbs, and small woody vegetation, such as mesquite will be excavated as the topsoil is removed. Large woody vegetation will be stripped and stored separately and respread evenly on the site following topsoil respreading. Topsoil depth is defined as the top layer of soil that contains 80% of the roots. In areas to be heavily disturbed, the top 6 inches of soil material, will be stripped and stockpiled on the perimeter of the well location and along the perimeter of the access road to control run-on and run-off, to keep topsoil viable, and to make redistribution of topsoil more efficient during interim reclamation. Stockpiled topsoil should include vegetative material. Topsoil will be clearly segregated and stored separately from subsoils. Contaminated soil will not be stockpiled, but properly treated and handled prior to topsoil salvaging.

## 10. Plans for Surface Reclamation

### Reclamation Objectives

- i. The objective of interim reclamation is to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; and minimize habitat and forage loss, visual impact, and weed infestation, during the life of the well or facilities.
- ii. The long-term objective of final reclamation is to return the land to a condition similar to what existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, actions will be taken to ensure standards are met for site stability, visual quality, hydrological functioning, and vegetative productivity.
- iii. The BLM will be notified at least 3 days prior to commencement of any reclamation procedures.
- iv. If circumstances allow, interim reclamation and/or final reclamation actions will be completed no later than 6 months from when the final well on the location has been completed or plugged. We will gain written permission from the BLM if more time is needed.
- v. Interim reclamation will be performed on the well site after the well is drilled and completed. ROSS DRAW 17 FED COM 516H RECLAMATION depicts the location and dimensions of the planned interim reclamation for the well site.

### Interim Reclamation Procedures (If performed)

1. Within 30 days of well completion, the well location and surrounding areas will be cleared of, and maintained free of, all materials, trash, and equipment not required for production.

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EOG Resources, Inc.

ROSS DRAW 17 FED COM 516H

SHL: 2621 FSL & 2458 FEL, Section: 8, T.26S., R.31E.

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2. In areas planned for interim reclamation, all the surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads.
3. The areas planned for interim reclamation will then be recontoured to the original contour if feasible, or if not feasible, to an interim contour that blends with the surrounding topography as much as possible. Where applicable, the fill material of the well pad will be backfilled into the cut to bring the area back to the original contour. The interim cut and fill slopes prior to re-seeding will not be steeper than a 3:1 ratio, unless the adjacent native topography is steeper. Note: Constructed slopes may be much steeper during drilling, but will be recontoured to the above ratios during interim reclamation.
4. Topsoil will be evenly respread and aggressively revegetated over the entire disturbed area not needed for all-weather operations including cuts & fills. To seed the area, the proper BLM seed mixture, free of noxious weeds, will be used. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.
5. Proper erosion control methods will be used on the area to control erosion, runoff and siltation of the surrounding area.
6. The interim reclamation will be monitored periodically to ensure that vegetation has reestablished and that erosion is controlled.

#### **Final Reclamation (well pad, buried pipelines, etc.)**

1. Prior to final reclamation procedures, the well pad, road, and surrounding area will be cleared of material, trash, and equipment.
2. All surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads.
3. All disturbed areas, including roads, pipelines, pads, production facilities, and interim reclaimed areas will be recontoured to the contour existing prior to initial construction or a contour that blends indistinguishably with the surrounding landscape. Topsoil that was spread over the interim reclamation areas will be stockpiled prior to recontouring. The topsoil will be redistributed evenly over the entire disturbed site to ensure successful revegetation.
4. After all the disturbed areas have been properly prepared, the areas will be seeded with the proper BLM seed mixture, free of noxious weeds. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.
5. Proper erosion control methods will be used on the entire area to control erosion, runoff and siltation of the surrounding area.
6. All unused equipment and structures including pipelines, electric line poles, tanks, etc. that serviced the well will be removed.
7. All reclaimed areas will be monitored periodically to ensure that revegetation occurs, that the area is not redisturbed, and that erosion is controlled.

## **11. Surface Ownership**

- a. The surface ownership of the proposed project is FEDERAL.

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ROSS DRAW 17 FED COM 516H

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## 12. Other Information

a. \*\*\*An onsite meeting was conducted on 7/3/2024\*\*\*

We plan to use (6) 12-inch lay flat hoses to transport water and (6) 4-inch polylines or lay flat for drilling and frac operations.

The well will be produced using a gas lift as the artificial lift method.

Produced water will be transported via pipeline to the EOG-produced water gathering system.

Produced Water Gathering Sale Line: N/A

Gas Gathering Sale Line: N/A

Localized Gas Lift: N/A

Crude Oil Gathering Sale Line: N/A

Overhead Electric Line: N/A

Central Tank Battery 400 ft. x 600 ft: N/A

Monoline: N/A

## 13. Maps and Diagrams

ROSS DRAW 17 FED COM 516H VICINITY - Existing Road

ROSS DRAW 17 FED COM 516H RADIUS - Wells Within One Mile

ROSS DRAW 17 FED COM INFRASTRUCTURE MAP - Production Pipeline

ROSS DRAW 17 FED COM WATER AND CALICHE MAP - Drilling Water Pipeline

ROSS DRAW 17 FED COM 516H RIG LAYOUT - Well Site Diagram

ROSS DRAW 17 FED COM 516H RECLAMATION - Interim Reclamation

EOG Resources, Inc.

## Surface Use Plan of Operations Section 7 Methods for Handling Waste Attachment

Human waste managed by third-party vendors. ROW construction waste contained in on-site portable toilets maintained by third party vendor. During drilling activities waste is managed by third party vendor utilizing onsite aerobic (treatment) wastewater management. Liquids treated through the aerobic system are transferred to via water line to CTBs for reuse by EOG. All solid waste remaining after treatment process are pumped into an enclosed waste transfer truck at the time of rig down and taken to one of the following disposal facilities by the third-party vendor: Qual Run Services LLC (a Licensed Waste Management Service Facility in Reeves County, Texas) or ReUse OilField Services (a Licensed Waste Management Facility in Mentone, TX)

Trash dumpsters are utilized to contain garbage onsite. Dumpsters are maintained by a third-party vendor. All trash is hauled to Lee County, NM landfill.

EOG utilizes a Closed Loop System, cuttings leave the rig and enter low/highwall cuttings bin. Cuttings are then transferred to trucks for transportation to a State of New Mexico approved disposal facility. Primary disposal location for EOG's NM operations is the North Delaware Basin Disposal Facility in Jal, New Mexico which is a privately owned commercial facility. Some EOG locations within New Mexico may require transportation of cuttings to other licensed commercial disposal facilities based on geographic location.

Drilling fluids and produced oil and water from the well during drilling and completion operations will be stored onsite in frac tanks and disposed of at the time of rig down. Primary disposal location for EOG's NM operations is the North Delaware Basin Disposal facility in Jal, New Mexico which is a privately owned commercial facility. Some EOG locations within New Mexico may require transportation of cuttings to other licensed commercial disposal facilities based on geographic location.

## OVERHEAD ELECTRIC LINE ATTACHMENT

### Electric Line(s)

- a. We plan to install an overhead electric line for the proposed well. The proposed length of the electric line will be 94 feet. Overhead Electric Line depicts the location of the proposed electric line route. The electric line will be constructed to provide protection from raptor electrocution.
- b. The proposed electric line does not cross lease boundaries, so a right of way grant will not need to be acquired from the BLM.



**APD ID:** 10400101263

**Submission Date:** 09/27/2024

**Operator Name:** EOG RESOURCES INCORPORATED

**Well Name:** ROSS DRAW 17 FED COM

**Well Number:** 516H

**Well Type:** OIL WELL

**Well Work Type:** Drill

## Section 1 - General

Would you like to address long-term produced water disposal? NO

## Section 2 - Lined

Would you like to utilize Lined Pit PWD options? N

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Other PWD Surface Owner Description:

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit

Pit liner description:

Pit liner manufacturers

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule

Lined pit reclamation description:

Lined pit reclamation

Leak detection system description:

Leak detection system



**Operator Name:** EOG RESOURCES INCORPORATED

**Well Name:** ROSS DRAW 17 FED COM

**Well Number:** 516H

**State**

**Unlined Produced Water Pit Estimated**

**Unlined pit: do you have a reclamation bond for the pit?**

**Is the reclamation bond a rider under the BLM bond?**

**Unlined pit bond number:**

**Unlined pit bond amount:**

**Additional bond information**

#### **Section 4 -**

**Would you like to utilize Injection PWD options? N**

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Other PWD Surface Owner Description:**

**Injection PWD discharge volume (bbl/day):**

**Injection well mineral owner:**

**Injection well type:**

**Injection well number:**

**Injection well name:**

**Assigned injection well API number?**

**Injection well API number:**

**Injection well new surface disturbance (acres):**

**Minerals protection information:**

**Mineral protection**

**Underground Injection Control (UIC) Permit?**

**UIC Permit**

#### **Section 5 - Surface**

**Would you like to utilize Surface Discharge PWD options? N**

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Other PWD Surface Owner Description :**

**Surface discharge PWD discharge volume (bbl/day):**

**Surface Discharge NPDES Permit?**

**Surface Discharge NPDES Permit attachment:**

**Surface Discharge site facilities information:**

**Surface discharge site facilities map:**

**Operator Name:** EOG RESOURCES INCORPORATED

**Well Name:** ROSS DRAW 17 FED COM

**Well Number:** 516H

## Section 6 -

Would you like to utilize Other PWD options? N

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

PWD Surface Owner Description:

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type

Have other regulatory requirements been met?

Other regulatory requirements



U.S. Department of the Interior  
BUREAU OF LAND MANAGEMENT

**Bond Info Data**

11/05/2025

**APD ID:** 10400101263

**Submission Date:** 09/27/2024

Highlighted data  
reflects the most  
recent changes  
[Show Final Text](#)

**Operator Name:** EOG RESOURCES INCORPORATED

**Well Number:** 516H

**Well Name:** ROSS DRAW 17 FED COM

**Well Work Type:** Drill

**Well Type:** OIL WELL

## Bond

**Federal/Indian APD:** FED

**BLM Bond number:** NM2308

**BIA Bond number:**

**Do you have a reclamation bond?** NO

**Is the reclamation bond a rider under the BLM bond?**

**Is the reclamation bond BLM or Forest Service?**

**BLM reclamation bond number:**

**Forest Service reclamation bond number:**

**Forest Service reclamation bond attachment:**

**Reclamation bond amount:**

**Reclamation bond rider amount:**

**Additional reclamation bond information attachment:**

State of New Mexico  
Energy, Minerals and Natural Resources Department

Submit Electronically  
Via E-permitting

Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

## NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

### Section 1 – Plan Description Effective May 25, 2021

**I. Operator:** EOG Resources, Inc. **OGRID:** 7377 **Date:** 11/5/2025

**II. Type:**  Original  Amendment due to  19.15.27.9.D(6)(a) NMAC  19.15.27.9.D(6)(b) NMAC  Other.

If Other, please describe: \_\_\_\_\_

**III. Well(s):** Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
ROSS DRAW 17 FED COM 516H		G-17-26S-31E	2621' FNL & 2458' FEL	+/- 1000	+/- 3500	+/- 3000

**IV. Central Delivery Point Name:** Ross Draw 17 Fed Com CTB [See 19.15.27.9(D)(1) NMAC]

**V. Anticipated Schedule:** Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
ROSS DRAW 17 FED COM 516H		1/1/26	1/15/26	3/01/26	4/01/26	5/01/26

**VI. Separation Equipment:**  Attach a complete description of how Operator will size separation equipment to optimize gas capture.

**VII. Operational Practices:**  Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

**VIII. Best Management Practices:**  Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

**Section 2 – Enhanced Plan**  
**EFFECTIVE APRIL 1, 2022**

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

**IX. Anticipated Natural Gas Production:**

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

**X. Natural Gas Gathering System (NGGS):**

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

**XI. Map.**  Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

**XII. Line Capacity.** The natural gas gathering system  will  will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

**XIII. Line Pressure.** Operator  does  does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

Attach Operator's plan to manage production in response to the increased line pressure.

**XIV. Confidentiality:**  Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

## Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system.

*If Operator checks this box, Operator will select one of the following:*

**Well Shut-In.**  Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

**Venting and Flaring Plan.**  Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- (a) power generation on lease;
- (b) power generation for grid;
- (c) compression on lease;
- (d) liquids removal on lease;
- (e) reinjection for underground storage;
- (f) reinjection for temporary storage;
- (g) reinjection for enhanced oil recovery;
- (h) fuel cell production; and
- (i) other alternative beneficial uses approved by the division.

## Section 4 - Notices

1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature: *Star L Harrell*

Printed Name: Star L Harrell

Title: Regulatory Advisor

E-mail Address: Star\_Harrell@eogresources.com

Date: 11/5/2025

Phone: (432) 848-9161

**OIL CONSERVATION DIVISION**  
**(Only applicable when submitted as a standalone form)**

Approved By:

Title:

Approval Date:

Conditions of Approval:

**Natural Gas Management Plan****Items VI-VIII****VI. Separation Equipment: Attach a complete description of how Operator will size separation equipment to optimize gas capture.**

- Separation equipment will be sized to provide adequate separation for anticipated rates.
- Adequate separation relates to retention time for Liquid – Liquid separation and velocity for Gas-Liquid separation.
- Collection systems are appropriately sized to handle facility production rates on all (3) phases.
- Ancillary equipment and metering is selected to be serviced without flow interruptions or the need to release gas from the well.

**VII. Operational Practices: Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F 19.15.27.8 NMAC.****Drilling Operations**

- All flare stacks will be properly sized. The flare stacks will be located at a minimum 100' from the nearest surface hole location on the pad.
- All natural gas produced during drilling operations will be flared, unless there is an equipment malfunction and/or to avoid risk of an immediate and substantial adverse impact on safety and the environment, at which point the gas will be vented.

**Completions/Recompletions Operations**

- New wells will not be flowed back until they are connected to a properly sized gathering system.
- The facility will be built/sized for maximum anticipated flowrates and pressures to minimize waste.
- For flowback operations, multiple stages of separation will be used as well as excess VRU and blowers to make sure waste is minimized off the storage tanks and facility.
- During initial flowback, the well stream will be routed to separation equipment.
- At an existing facility, when necessary, post separation natural gas will be flared until it meets pipeline specifications, at which point it will be turned into a collection system.
- At a new facility, post separation natural gas will be vented until storage tanks can safely function, at which point it will be flared until it meets pipeline spec.

**Production Operations**

- Weekly AVOs will be performed on all facilities.
- All flares will be equipped with auto-ignition systems and continuous pilot operations.
- After a well is stabilized from liquid unloading, the well will be turned back into the collection system.
- All plunger lift systems will be optimized to limit the amount of waste.
- All tanks will have automatic gauging equipment installed.
- Leaking thief hatches found during AVOs will be cleaned and properly re-sealed.

**Performance Standards**

- Production equipment will be designed to handle maximum anticipated rates and pressure.
- All flared gas will be combusted in a flare stack that is properly sized and designed to ensure proper combustion.
- Weekly AVOs will be performed on all wells and facilities that produce more than 60 Mcfd.

**Measurement & Estimation**

- All volume that is flared and vented that is not measured will be estimated.
- All measurement equipment for flared volumes will conform to API 14.10.
- No meter bypasses will be installed.

- When metering is not practical due to low pressure/low rate, the vented or flared volume will be estimated.

**VIII. Best Management Practices: Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.**

- During downhole well maintenance, EOG will use best management practices to vent as minimally as possible.
- Prior to the commencement of any maintenance, the tank or vessel will be isolated from the rest of the facilities.
- All valves upstream of the equipment will be closed and isolated.
- After equipment has been isolated, the equipment will be blown down to as low a pressure as possible into the collection system.
- If the equipment being maintained cannot be relieved into the collection system, it shall be released to a tank where the vapor can either be captured or combusted if possible.
- After downhole well maintenance, natural gas will be flared until it reaches pipeline specification.

Sante Fe Main Office  
Phone: (505) 476-3441

General Information  
Phone: (505) 629-6116

Online Phone Directory  
<https://www.emnrd.nm.gov/ocd/contact-us>

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

ACKNOWLEDGMENTS

Action 524000

**ACKNOWLEDGMENTS**

Operator: EOG RESOURCES INC 5509 Champions Drive Midland, TX 79706	OGRID: 7377
	Action Number: 524000
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

**ACKNOWLEDGMENTS**

<input checked="" type="checkbox"/>	I hereby certify that no additives containing PFAS chemicals will be added to the completion or recompletion of this well.
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## State of New Mexico

### Energy, Minerals and Natural Resources Oil Conservation Division 1220 S. St Francis Dr. Santa Fe, NM 87505

CONDITIONS

Action 524000

#### CONDITIONS

Operator: EOG RESOURCES INC 5509 Champions Drive Midland, TX 79706	OGRID: 7377
	Action Number: 524000
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

#### CONDITIONS

Created By	Condition	Condition Date
sharrell1	Cement is required to circulate on both surface and intermediate1 strings of casing.	11/6/2025
sharrell1	If cement does not circulate on any string, a Cement Bond Log (CBL) is required for that string of casing.	11/6/2025
ward.rikala	Notify the OCD 24 hours prior to casing & cement.	12/8/2025
ward.rikala	File As Drilled C-102 and a directional Survey with C-104 completion packet.	12/8/2025
ward.rikala	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string.	12/8/2025
ward.rikala	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.	12/8/2025