Form 3160-5 (June 2019)

UNITED STATES DEPARTMENT OF THE INTERIOR

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 202

DEF	AKTMENT OF THE INTERIOR			p. 2021
BURI	EAU OF LAND MANAGEMENT	5. Lease Serial No.	NMNM118726	
Do not use this t	IOTICES AND REPORTS ON W form for proposals to drill or to Use Form 3160-3 (APD) for suc	o re-enter an	6. If Indian, Allottee	or Tribe Name
SUBMIT IN T	TRIPLICATE - Other instructions on pag	ne 2	7. If Unit of CA/Agre	eement, Name and/or No.
1. Type of Well			0 W-11 N 1 N	
Oil Well Gas W	<u> </u>		8. Well Name and No	ANTIETAM 9 FED COM/109H
2. Name of Operator EOG RESOURO	CES INCORPORATED		9. API Well No.	30-025-52245
3a. Address 1111 BAGBY SKY LOB	BY 2, HOUSTON, TX 770 3b. Phone No. (713) 651-70		10. Field and Pool or RED HILLS/UPPE	Exploratory Area ER BONE SPRING SHALE
4. Location of Well (Footage, Sec., T.,R SEC 9/T25S/R33E/NMP	C.,M., or Survey Description)		11. Country or Parish LEA/NM	ı, State
12. CHE	CK THE APPROPRIATE BOX(ES) TO INI	DICATE NATURE C	F NOTICE, REPORT OR OT	HER DATA
TYPE OF SUBMISSION		ТҮРЕ	OF ACTION	
Notice of Intent	Acidize Deep	pen [Production (Start/Resume)	Water Shut-Off
Notice of Intent	Alter Casing Hydr	aulic Fracturing	Reclamation	Well Integrity
Subsequent Report		Construction	Recomplete	Other
Final Abandonment Notice		and Abandon Back	Temporarily Abandon Water Disposal	
is ready for final inspection.) Antietam 9 Fed Com 309H (Fr EOG respectfully requests an Change name from Antietam 9 Change BHL from T-25-S, R-3		is well to reflect the		the operator has determined that the site
	true and correct. Name (Printed/Typed)	Regulatory S	Specialist	
STAR HARRELL / Ph: (432) 848-9	101	Title		
Signature (Electronic Submission	on)	Date	11/30/2	2023
	THE SPACE FOR FED	ERAL OR STA	TE OFICE USE	
Approved by				
KEITH P IMMATTY / Ph: (575) 988	3-4722 / Approved	Title ENGIN	EEK	12/21/2023 Date
	hed. Approval of this notice does not warran equitable title to those rights in the subject le duct operations thereon.		SBAD	
			1 2110 11	C.1. TI ': 10:

Title 18 U.S.C Section 1001 and Title 43 U.S.C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

GENERAL INSTRUCTIONS

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

SPECIFIC INSTRUCTIONS

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

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

NOTICES

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

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

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

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

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

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

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

Response to this request is mandatory.

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

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

Additional Information

Location of Well

 $0. \ SHL: TR\ D\ /\ 786\ FNL\ /\ 1285\ FWL\ /\ TWSP: 25S\ /\ RANGE: 33E\ /\ SECTION: 9\ /\ LAT: 32.1501973\ /\ LONG: -103.5815924\ (\ TVD: 0\ feet,\ MD: 0\ feet\)$ $PPP: TR\ D\ /\ 100\ FNL\ /\ 1260\ FWL\ /\ TWSP: 25S\ /\ RANGE: 33E\ /\ SECTION: 9\ /\ LAT: 32.1520826\ /\ LONG: -103.5816722\ (\ TVD: 9135\ feet,\ MD: 9180\ feet\)$ $BHL: TR\ E\ /\ 2540\ FNL\ /\ 1260\ FWL\ /\ TWSP: 25S\ /\ RANGE: 33E\ /\ SECTION: 16\ /\ LAT: 32.1308622\ /\ LONG: -103.5816858\ (\ TVD: 9400\ feet,\ MD: 17002\ feet\)$

DISTRICT I
1625 N. Freuch Dr., Hobbs, NM 88240
Phone: (573) 939-6161 Fax: (575) 939-072
DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (573) 748-1285 Fax: (575) 748-9720
DISTRICT III
1000 Rio Bracon Rd., Artes, NM 87410
Phone: (503) 334-437 Fax: (505) 334-437
DISTRICT III
1205 S. S. Francis Dr., Santa Fe, NM 87505
Phone: (504) 744-540 Fax: (505) 345-5407

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

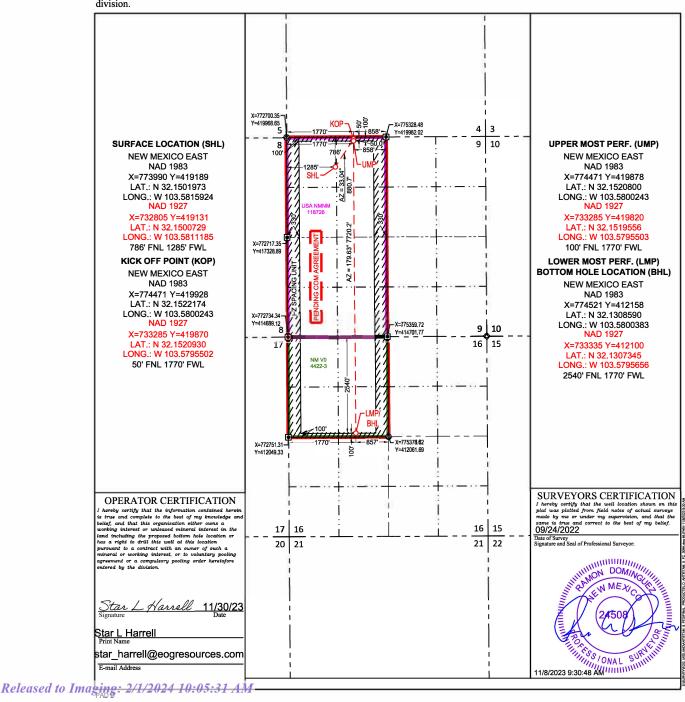
Form C-102 Revised August 1, 2011 Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number Pool Code				Pool Code		Pool Name				
3	30-025-52245 96392 DRA			DRAPER MI	ILL:BONE	SPRING	,			
Property C	ode				Property Nar	ne		Well Number		
31713	1			A	NTIETAM 9	ED COM		30	9H	
OGRID N	lo.				Operator Na	me		Elevation	on	
7377	•			E	OG RESOUR	CES, INC.		34	29'	
					Surface Loc	ation		15.		
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County	
D	9	25-S	33-E	(=)	786'	NORTH	WEST	LEA		
			Bott	om Hole	Location If D	fferent From Surfa	ce			
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County	
F	16	25-S	33-E		2540'	640' NORTH 1770' WEST LEA				
Dedicated Acres	Joint or	Infill	Consolidated Co	de Ord	Order No.					
480.00	-			PENDING COM AGREEMENT						

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the





Revised Permit Information 11/02/2023:

Well Name: Antietam 9 Fed Com 309H

Location: SHL: 786' FNL & 1285' FWL, Section 9, T-25-S, R-33-E, Lea Co., N.M.

BHL: 2540' FNL & 1770' FWL, Section 16, T-25-S, R-33-E, Lea Co., N.M.

Casing Program A:

Hole	Interv	al MD	Interval TVD		Csg			
Size	From (ft)	To (ft)	From (ft)	To (ft)	OD Weight		Grade	Conn
16"	0	1,270	0	1,270	13-3/8"	54.5#	J - 55	STC
11"	0	5,098	0	5,050	9-5/8"	40#	J - 55	LTC
6-3/4"	0	17,727	0	10,114	5-1/2"	17#	HCP-110	LTC

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

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

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

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

Cementing Program:

r	mung 110g	7		
Depth	No. Sacks	Wt.	Yld Ft3/sk	Slurry Description
1,270'	340	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 @ 1,070')
5,050' 9-5/8"	490	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 @ 4,040')
17,727' 5-1/2"	290	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 4,550')
	570	13.2	1.52	Tail: Class H + 5% NEX-020 + 0.2% NAC-102 + 0.15% NAS-725 + 0.5% NFL-549 + 0.2% NFP-703 + 1% NBE-737 + 0.3% NRT-241 (TOC @ 9690')



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

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

Mud Program:

Depth (TVD)	Type	Weight (ppg)	Viscosity	Water Loss
0 – 1,270'	Fresh - Gel	8.6-8.8	28-34	N/c
1,270' – 5,050'	Brine	8.6-8.8	28-34	N/c
5,050' – 17,727'	Oil Base	8.8-9.5	58-68	N/c - 6



TUBING REQUIREMENTS

EOG respectively requests an exception to the following NMOCD rule:

• 19.15.16.10 Casing AND TUBING RQUIREMENTS: 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.



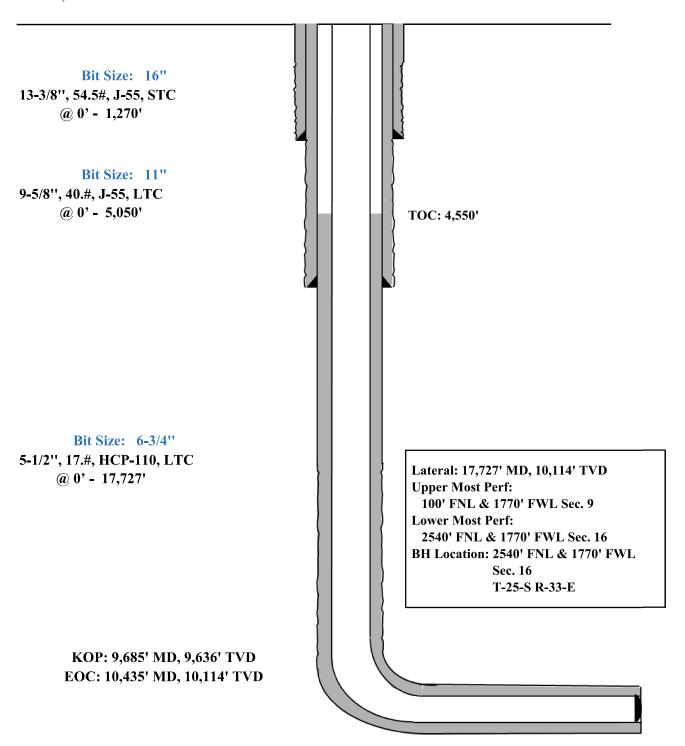
786' FNL Revised Wellbore A:

KB: 3454' GL: 3429'

1285' FWL Section 9

T-25-S, R-33-E

API: 30-025-52245





Revised Permit Information 11/02/2023:

Well Name: Antietam 9 Fed Com 309H

Location: SHL: 786' FNL & 1285' FWL, Section 9, T-25-S, R-33-E, Lea Co., N.M.

BHL: 2540' FNL & 1770' FWL, Section 16, T-25-S, R-33-E, Lea Co., N.M.

Casing Program B:

Hole	Interv	Interval MD Inter		al TVD	Csg			
Size	From (ft)	To (ft)	From (ft)	To (ft)	OD	Weight	Grade	Conn
13-1/2"	0	1,270	0	1,270	10-3/4"	40.5#	J-55	STC
9-7/8"	0	5,098	0	5,050	8-5/8"	32#	J-55	BTC-SC
6-3/4"	0	17,727	0	10,114	5-1/2"	17#	HCP-110	LTC

Cementing Program:

Cementing 110gram.								
Depth	No. Sacks	Wt.	Yld Ft3/sk	Slurry Description				
1,270' 10-3/4"	410	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello- Flake (TOC @ Surface)				
	110	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 1,070')				
5,050' 8-5/8"	400	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)				
	640	14.8	1.32	Tail: Class C + 10% NaCL + 3% MagOx (TOC @ 4,040')				
17,727 ['] 5-1/2"	480	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 4,550')				
	800	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 @ 9690')				



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:

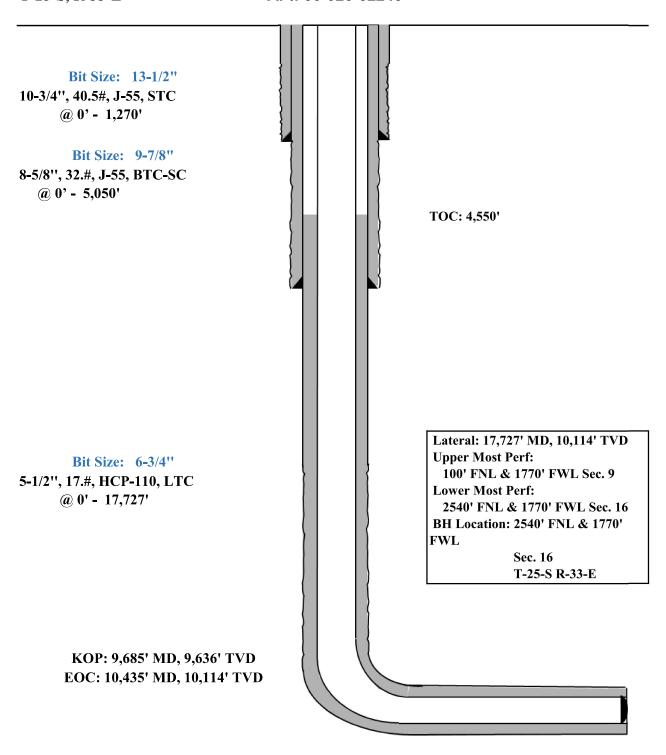
- The variance is not applicable within the Potash Boundaries or Capitan Reef areas.
- Operator takes responsibility to get casing to set point in the event that the clearance causes stuck pipe issues.



786' Revised Wellbore B: KB: 3454' 1285' GL: 3429'

Section 9

T-25-S, R-33-E API: 30-025-52245





GEOLOGIC NAME OF SURFACE FORMATION:

Permian

ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:

1,162'
1,244'
1,532'
4,949'
5,105'
5,133'
6,156'
9,001'
9,197'
9,246'
10,107'
10,349'
10,114'

ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:

MATED DEPTHS OF ANTICIPATED	FRESH WA	ATER, OIL O
Upper Permian Sands	0-400'	Fresh Water
Bell Canyon	5,133'	Oil
Cherry Canyon	6,156'	Oil
Brushy Canyon	9,001'	Oil
Leonard (Avalon) Shale	9,246'	Oil
1st Bone Spring Sand	10,107'	Oil
2nd Bone Spring Shale	10,349'	Oil



Midland

Lea County, NM (NAD 83 NME) Antietam 9 Fed Com #309H

OH

Plan: Plan #0.2

Standard Planning Report

08 November, 2023



Planning Report

Database: PEDM Company: Midlan

Company: Midland
Project: Lea County, NM (NAD 83 NME)

Site: Antietam 9 Fed Com Well: #309H

Wellbore: OH
Design: Plan #0.2

Local Co-ordinate Reference:

TVD Reference:
MD Reference:
North Reference:

Survey Calculation Method:

Well #309H

kb = 26' @ 3455.0usft kb = 26' @ 3455.0usft

Grid

Minimum Curvature

Project Lea County, NM (NAD 83 NME)

Map System:US State Plane 1983Geo Datum:North American Datum 1983

Map Zone: North American Datum 198
New Mexico Eastern Zone

System Datum: Mean Sea Level

Site Antietam 9 Fed Com

 Site Position:
 Northing:
 419,815.00 usft
 Latitude:
 32° 9′ 6.852 N

 From:
 Map
 Easting:
 774,698.00 usft
 Longitude:
 103° 34′ 45.452 W

Position Uncertainty: 0.0 usft Slot Radius: 13-3/16 "

Well #309H

 Well Position
 +N/-S
 0.0 usft
 Northing:
 419,189.00 usft
 Latitude:
 32° 9′ 0.707 N

 +E/-W
 0.0 usft
 Easting:
 773,990.00 usft
 Longitude:
 103° 34′ 53.738 W

Position Uncertainty

0.0 usft

Wellhead Elevation:

usft

Ground Level:

3,429.0 usft

Grid Convergence: 0.40 $^{\circ}$

Wellbore OH

 Magnetics
 Model Name
 Sample Date
 Declination (°)
 Dip Angle (nT)
 Field Strength (nT)

 IGRF2020
 11/7/2022
 6.38
 59.78
 47,303.60982204

Design Plan #0.2

Audit Notes:

Version:Phase:PLANTie On Depth:0.0

 Vertical Section:
 Depth From (TVD) (usft)
 +N/-S +E/-W (usft)
 Direction (usft)

 0.0
 0.0
 0.0
 175.68

Plan Survey Tool Program Date 11/8/2023

Depth From Depth To

(usft) (usft) Survey (Wellbore) Tool Name Remarks

1 0.0 17,727.5 Plan #0.2 (OH) EOG MWD+IFR1

MWD + IFR1

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,717.7	6.35	33.06	1,717.0	14.7	9.6	2.00	2.00	0.00	33.06	
9,367.1	6.35	33.06	9,319.5	724.3	471.4	0.00	0.00	0.00	0.00	
9,684.8	0.00	0.00	9,636.5	739.0	481.0	2.00	-2.00	0.00	180.00	KOP(Antietam 9 Fed
9,905.2	26.46	180.00	9,849.2	689.0	481.0	12.00	12.00	81.65	180.00	FTP(Antietam 9 Fed (
10,434.8	90.00	179.62	10,113.9	261.5	482.9	12.00	12.00	-0.07	-0.42	
17,727.5	90.00	179.62	10,114.0	-7,031.0	531.0	0.00	0.00	0.00	0.00	PBHL(Antietam 9 Fed

Planning Report

Database: PEDM Company: Midland

Project: Lea County, NM (NAD 83 NME)

Site: Antietam 9 Fed Com

 Well:
 #309H

 Wellbore:
 OH

 Design:
 Plan #0.2

Local Co-ordinate Reference:

TVD Reference:
MD Reference:
North Reference:

Survey Calculation Method:

Well #309H

kb = 26' @ 3455.0usft kb = 26' @ 3455.0usft

Grid

Depth (usft)	ign:	Plan #0.2						
Measured Depth Inclination Azimuth Vertical Depth (usft) (u	nned Survey							
100.0 0.00 0.00 100.0 0.00 0.00 0.0 0.0	Measured Depth		Depth +N/-		Section	Rate	Rate	Turn Rate (°/100usft)
200.0 0.00 0.00 200.0 0.0 0.0 0.0 0.0 0.	0.0				0.0		0.00	0.00
300.0 0.00 0.00 400.0 0.0 0.0 0.0 0.0 0.0	100.0	0.00 0.00	100.0	0.0 0.0	0.0	0.00	0.00	0.00
400.0	200.0	0.00 0.00	200.0	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 0.0 0.0 0.00 0.	300.0	0.00 0.00	300.0	0.0 0.0	0.0	0.00	0.00	0.00
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1,000.0	800.0	0.00 0.00	800.0	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 0.0 0.0 0.00 0.0	900.0	0.00 0.00	900.0	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 0.0 0.0 0.00 0.0	1 000 0	0.00 0.00	1 000 0	0.0	0.0	0.00	0.00	0.00
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3,400.0 6.35 33.06 3,389.0 170.8 111.2 -161.9 0.00 0.00 3,500.0 6.35 33.06 3,488.4 180.1 117.2 -170.7 0.00 0.00 3,600.0 6.35 33.06 3,587.8 189.3 123.2 -179.5 0.00 0.00 3,700.0 6.35 33.06 3,687.2 198.6 129.3 -188.3 0.00 0.00 3,800.0 6.35 33.06 3,786.6 207.9 135.3 -197.1 0.00 0.00 3,900.0 6.35 33.06 3,885.9 217.2 141.3 -205.9 0.00 0.00 4,000.0 6.35 33.06 3,985.3 226.4 147.4 -214.7 0.00 0.00 4,100.0 6.35 33.06 4,084.7 235.7 153.4 -223.5 0.00 0.00 4,200.0 6.35 33.06 4,184.1 245.0 159.5 -232.3 0.00 0.00 4,300.0 6.35 33.06 4,283.5 254.3 165.5	·							0.00
3,500.0 6.35 33.06 3,488.4 180.1 117.2 -170.7 0.00 0.00 3,600.0 6.35 33.06 3,587.8 189.3 123.2 -179.5 0.00 0.00 3,700.0 6.35 33.06 3,687.2 198.6 129.3 -188.3 0.00 0.00 3,800.0 6.35 33.06 3,786.6 207.9 135.3 -197.1 0.00 0.00 3,900.0 6.35 33.06 3,885.9 217.2 141.3 -205.9 0.00 0.00 4,000.0 6.35 33.06 3,985.3 226.4 147.4 -214.7 0.00 0.00 4,100.0 6.35 33.06 4,084.7 235.7 153.4 -223.5 0.00 0.00 4,200.0 6.35 33.06 4,184.1 245.0 159.5 -232.3 0.00 0.00 4,300.0 6.35 33.06 4,283.5 254.3 165.5 -241.1 0.00 0.00 4,400.0 6.35 33.06 4,382.9 263.5 171.5	3,300.0	6.35 33.06	3,289.6	161.5 105.1	-153.1	0.00	0.00	0.00
3,600.0 6.35 33.06 3,587.8 189.3 123.2 -179.5 0.00 0.00 3,700.0 6.35 33.06 3,687.2 198.6 129.3 -188.3 0.00 0.00 3,800.0 6.35 33.06 3,786.6 207.9 135.3 -197.1 0.00 0.00 3,900.0 6.35 33.06 3,885.9 217.2 141.3 -205.9 0.00 0.00 4,000.0 6.35 33.06 3,985.3 226.4 147.4 -214.7 0.00 0.00 4,100.0 6.35 33.06 4,084.7 235.7 153.4 -223.5 0.00 0.00 4,200.0 6.35 33.06 4,184.1 245.0 159.5 -232.3 0.00 0.00 4,300.0 6.35 33.06 4,283.5 254.3 165.5 -241.1 0.00 0.00 4,400.0 6.35 33.06 4,382.9 263.5 171.5 -249.9 0.00 0.00	·							0.00
3,700.0 6.35 33.06 3,687.2 198.6 129.3 -188.3 0.00 0.00 3,800.0 6.35 33.06 3,786.6 207.9 135.3 -197.1 0.00 0.00 3,900.0 6.35 33.06 3,885.9 217.2 141.3 -205.9 0.00 0.00 4,000.0 6.35 33.06 3,985.3 226.4 147.4 -214.7 0.00 0.00 4,100.0 6.35 33.06 4,084.7 235.7 153.4 -223.5 0.00 0.00 4,200.0 6.35 33.06 4,184.1 245.0 159.5 -232.3 0.00 0.00 4,300.0 6.35 33.06 4,283.5 254.3 165.5 -241.1 0.00 0.00 4,400.0 6.35 33.06 4,382.9 263.5 171.5 -249.9 0.00 0.00	·							0.00
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3,900.0 6.35 33.06 3,885.9 217.2 141.3 -205.9 0.00 0.00 4,000.0 6.35 33.06 3,985.3 226.4 147.4 -214.7 0.00 0.00 4,100.0 6.35 33.06 4,084.7 235.7 153.4 -223.5 0.00 0.00 4,200.0 6.35 33.06 4,184.1 245.0 159.5 -232.3 0.00 0.00 4,300.0 6.35 33.06 4,283.5 254.3 165.5 -241.1 0.00 0.00 4,400.0 6.35 33.06 4,382.9 263.5 171.5 -249.9 0.00 0.00								0.00
4,000.0 6.35 33.06 3,985.3 226.4 147.4 -214.7 0.00 0.00 4,100.0 6.35 33.06 4,084.7 235.7 153.4 -223.5 0.00 0.00 4,200.0 6.35 33.06 4,184.1 245.0 159.5 -232.3 0.00 0.00 4,300.0 6.35 33.06 4,283.5 254.3 165.5 -241.1 0.00 0.00 4,400.0 6.35 33.06 4,382.9 263.5 171.5 -249.9 0.00 0.00		6.35 33.06	3,786.6	207.9 135.3	-197.1	0.00		0.00
4,100.0 6.35 33.06 4,084.7 235.7 153.4 -223.5 0.00 0.00 4,200.0 6.35 33.06 4,184.1 245.0 159.5 -232.3 0.00 0.00 4,300.0 6.35 33.06 4,283.5 254.3 165.5 -241.1 0.00 0.00 4,400.0 6.35 33.06 4,382.9 263.5 171.5 -249.9 0.00 0.00	3,900.0			217.2 141.3	-205.9	0.00	0.00	0.00
4,200.0 6.35 33.06 4,184.1 245.0 159.5 -232.3 0.00 0.00 4,300.0 6.35 33.06 4,283.5 254.3 165.5 -241.1 0.00 0.00 4,400.0 6.35 33.06 4,382.9 263.5 171.5 -249.9 0.00 0.00								0.00
4,300.0 6.35 33.06 4,283.5 254.3 165.5 -241.1 0.00 0.00 4,400.0 6.35 33.06 4,382.9 263.5 171.5 -249.9 0.00 0.00								0.00
4,400.0 6.35 33.06 4,382.9 263.5 171.5 -249.9 0.00 0.00								0.00
	4,300.0	6.35 33.06	4,283.5	254.3 165.5	-241.1	0.00	0.00	0.00
4 500 0 6 35 33 06 4 482 3 272 8 177 6 -258 7 0.00 0.00	4,400.0	6.35 33.06	4,382.9	263.5 171.5	-249.9	0.00	0.00	0.00
	4,500.0	6.35 33.06		272.8 177.6	-258.7	0.00	0.00	0.00
								0.00
								0.00
4,800.0 6.35 33.06 4,780.4 300.6 195.7 -285.1 0.00 0.00	4,800.0	6.35 33.06	4,780.4	300.6 195.7	-285.1	0.00	0.00	0.00
4,900.0 6.35 33.06 4,879.8 309.9 201.7 -293.8 0.00 0.00	4,900.0	6.35 33.06	4,879.8	309.9 201.7	-293.8	0.00	0.00	0.00
								0.00
							0.00	0.00
5,200.0 6.35 33.06 5,178.0 337.7 219.8 -320.2 0.00 0.00	5,200.0	6.35 33.06	5,178.0	337.7 219.8	-320.2	0.00	0.00	0.00

Planning Report

Database: PEDM Company: Midland

Project: Lea County, NM (NAD 83 NME)

Site: Antietam 9 Fed Com

 Well:
 #309H

 Wellbore:
 OH

 Design:
 Plan #0.2

Local Co-ordinate Reference:

TVD Reference:
MD Reference:
North Reference:

Survey Calculation Method:

Well #309H

kb = 26' @ 3455.0usft kb = 26' @ 3455.0usft

Grid

sign:	Plan #0.2								
anned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,300.0	6.35	33.06	5,277.3	347.0	225.9	-329.0	0.00	0.00	0.00
5,400.0	6.35	33.06	5,376.7	356.3	231.9	-337.8	0.00	0.00	0.00
5,500.0	6.35	33.06	5,476.1	365.6	237.9	-346.6	0.00	0.00	0.00
5,600.0	6.35	33.06	5,575.5	374.8	244.0	-355.4	0.00	0.00	0.00
5,700.0	6.35	33.06	5,674.9	384.1	250.0	-364.2	0.00	0.00	0.00
5,800.0	6.35	33.06	5,774.3	393.4	256.1	-373.0	0.00	0.00	0.00
5,900.0	6.35	33.06	5,873.7	402.7	262.1	-381.8	0.00	0.00	0.00
6,000.0	6.35	33.06	5,973.0	411.9	268.1	-390.6	0.00	0.00	0.00
6,100.0	6.35	33.06	6,072.4	421.2	274.2	-399.4	0.00	0.00	0.00
6,200.0	6.35	33.06	6,171.8	430.5	280.2	-408.2	0.00	0.00	0.00
6,300.0	6.35	33.06	6,271.2	439.8	286.2	-417.0	0.00	0.00	0.00
6,400.0	6.35	33.06	6,370.6	449.0	292.3	-425.8	0.00	0.00	0.00
6,500.0	6.35	33.06	6,470.0	458.3	298.3	-434.6	0.00	0.00	0.00
6,600.0	6.35	33.06	6,569.4	467.6	304.3	-434.0 -443.3	0.00	0.00	0.00
6,700.0	6.35	33.06	6,668.7	476.9	310.4	-443.3 -452.1	0.00	0.00	0.00
6,800.0	6.35	33.06	6,768.1	486.1	316.4	-460.9	0.00	0.00	0.00
6,900.0	6.35	33.06	6,867.5	495.4	322.5	469.7	0.00	0.00	0.00
7,000.0	6.35	33.06	6,867.5	495.4 504.7	322.5 328.5	478.5	0.00	0.00	0.00
7,000.0 7,100.0	6.35	33.06	7,066.3	504.7 514.0	326.5 334.5	476.5 487.3	0.00	0.00	0.00
7,100.0	6.35	33.06	7,066.3 7.165.7	514.0	334.5 340.6	4 67.3 - 496.1	0.00	0.00	0.00
7,300.0	6.35	33.06	7,165.7	532.5	346.6	-504.9	0.00	0.00	0.00
·			•						
7,400.0	6.35	33.06	7,364.4	541.8	352.6	-513.7	0.00	0.00	0.00
7,500.0	6.35	33.06	7,463.8	551.1	358.7	-522.5	0.00	0.00	0.00
7,600.0	6.35	33.06	7,563.2	560.3	364.7	-531.3	0.00	0.00	0.00
7,700.0	6.35	33.06	7,662.6	569.6	370.8	-540.1	0.00	0.00	0.00
7,800.0	6.35	33.06	7,762.0	578.9	376.8	-548.9	0.00	0.00	0.00
7,900.0	6.35	33.06	7,861.4	588.2	382.8	-557.7	0.00	0.00	0.00
8,000.0	6.35	33.06	7,960.8	597.4	388.9	-566.5	0.00	0.00	0.00
8,100.0	6.35	33.06	8,060.1	606.7	394.9	-575.3	0.00	0.00	0.00
8,200.0	6.35	33.06	8,159.5	616.0	400.9	-584.1	0.00	0.00	0.00
8,300.0	6.35	33.06	8,258.9	625.3	407.0	-592.9	0.00	0.00	0.00
8,400.0	6.35	33.06	8,358.3	634.6	413.0	-601.6	0.00	0.00	0.00
8,500.0	6.35	33.06	8,457.7	643.8	419.1	-610.4	0.00	0.00	0.00
8,600.0	6.35	33.06	8,557.1	653.1	425.1	-619.2	0.00	0.00	0.00
8,700.0	6.35	33.06	8,656.5	662.4	431.1	-628.0	0.00	0.00	0.00
8,800.0	6.35	33.06	8,755.8	671.7	437.2	-636.8	0.00	0.00	0.00
8,900.0	6.35	33.06	8,855.2	680.9	443.2	-645.6	0.00	0.00	0.00
9,000.0	6.35	33.06	8,954.6	690.2	449.2	-654.4	0.00	0.00	0.00
9,100.0	6.35	33.06	9,054.0	699.5	455.3	-663.2	0.00	0.00	0.00
9,200.0	6.35	33.06	9,153.4	708.8	461.3	-672.0	0.00	0.00	0.00
9,300.0	6.35	33.06	9,252.8	718.0	467.3	-680.8	0.00	0.00	0.00
9,367.1	6.35	33.06	9,319.5	724.3	471.4	-686.7	0.00	0.00	0.00
9,400.0	5.70	33.06	9,352.2	727.1	473.3	-689.4	2.00	-2.00	0.00
9,500.0	3.70	33.06	9,451.8	734.0	477.8	-695.9	2.00	-2.00	0.00
9,600.0	1.70	33.06	9,551.7	737.9	480.3	-699.7	2.00	-2.00	0.00
9,684.8	0.00	0.00	9,636.5	739.0	481.0	-700.7	2.00	-2.00	0.00
9,700.0	1.83	180.00	9,651.7	738.8	481.0	-700.4	12.00	12.00	0.00
9,725.0	4.83	180.00	9,676.7	737.3	481.0	-700.4 -699.0	12.00	12.00	0.00
9,750.0	7.83	180.00	9,701.5	737.3 734.6	481.0	-696.2	12.00	12.00	0.00
9,750.0	10.83	180.00	9,726.2	734.6	481.0	-696.2 -692.2	12.00	12.00	0.00
9,800.0	13.83	180.00	9,750.6	730.3 725.2	481.0	-686.9	12.00	12.00	0.00
9,825.0 9,850.0	16.83 19.83	180.00 180.00	9,774.7 9,798.4	718.6 710.7	481.0 481.0	-680.3 -672.5	12.00 12.00	12.00 12.00	0.00 0.00
9,830.0	22.83	180.00	9,796.4 9,821.7	710.7 701.6	481.0	-672.5 -663.4	12.00	12.00	0.00

Planning Report

Database: PEDM Company: Midland

Project: Lea County, NM (NAD 83 NME)

Site: Antietam 9 Fed Com

 Well:
 #309H

 Wellbore:
 OH

 Design:
 Plan #0.2

Local Co-ordinate Reference:

TVD Reference:
MD Reference:
North Reference:

Survey Calculation Method:

Well #309H

kb = 26' @ 3455.0usft kb = 26' @ 3455.0usft

Grid

esign:	Plan #0.2								
lanned 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)
9,900.0	25.83	180.00	9,844.5	691.3	481.0	-653.1	12.00	12.00	0.00
9,905.2	26.46	180.00	9,849.2	689.0	481.0	-650.8	12.00	12.00	0.00
9,925.0	28.83	179.96	9,866.7	679.8	481.0	-641.7	12.00	12.00	-0.18
9,950.0	31.83	179.93	9,888.3	667.2	481.0	-629.1	12.00	12.00	-0.15
9,975.0	34.83	179.89	9,909.2	653.5	481.0	-615.4	12.00	12.00	-0.13
10,000.0	37.83	179.86	9,929.3	638.7	481.1	-600.6	12.00	12.00	-0.11
10,025.0	40.83	179.84	9,948.6	622.8	481.1	-584.8	12.00	12.00	-0.10
10,050.0	43.83	179.82	9,967.1	606.0	481.2	-568.0	12.00	12.00	-0.09
10,075.0	46.83	179.80	9,984.7	588.2	481.2	-550.3	12.00	12.00	- 0.08
10,100.0	49.83	179.78	10,001.3	569.5	481.3	-531.7 540.0	12.00	12.00	-0.07
10,125.0 10,150.0	52.83 55.83	179.76 179.75	10,016.9 10,031.5	550.0 529.7	481.4 481.5	-512.2 -492.0	12.00 12.00	12.00 12.00	-0.06 -0.06
10,175.0	58.83	179.74	10,045.0	508.7	481.5	-471.0	12.00	12.00	-0.06
10,200.0	61.83	179.72	10,057.4	487.0	481.6 481.8	-449.3	12.00	12.00	-0.05
10,225.0 10,250.0	64.83 67.83	179.71 179.70	10,068.6 10,078.6	464.6 441.7	481.8 481.9	-427.0 -404.2	12.00 12.00	12.00 12.00	-0.05 -0.05
10,275.0	70.83	179.70	10,076.6	441.7	481.9 482.0	-404.2 -380.9	12.00	12.00	-0.05 -0.04
			,						
10,300.0	73.83	179.68	10,095.1	394.5	482.1	-357.1	12.00	12.00	-0.04
10,325.0	76.83	179.67	10,101.4	370.3	482.3	-333.0	12.00	12.00	-0.04
10,350.0 10,375.0	79.83 82.83	179.66 179.65	10,106.4 10,110.2	345.9 321.2	482.4 482.6	-308.6 -283.9	12.00 12.00	12.00 12.00	-0.04 -0.04
10,400.0	85.83	179.64	10,112.7	296.3	482.7	-259.1	12.00	12.00	-0.04
10,425.0	88.83	179.63	10,113.8	271.3	482.9	-234.2	12.00	12.00	-0.04
10,434.8	90.00	179.62	10,113.9	261.5	482.9	-224.4	12.00	12.00	-0.04
10,500.0	90.00	179.62	10,113.9	196.3	483.4	-159.4	0.00	0.00	0.00
10,600.0	90.00	179.62	10,113.9	96.3	484.0	-59.6	0.00	0.00	0.00
10,700.0	90.00	179.62	10,113.9	-3.7	484.7	40.2	0.00	0.00	0.00
10,800.0	90.00	179.62	10,113.9	-103.7	485.4	139.9	0.00	0.00	0.00
10,900.0	90.00	179.62	10,113.9	-203.7	486.0	239.7	0.00	0.00	0.00
11,000.0	90.00	179.62	10,113.9	-303.7	486.7	339.5	0.00	0.00	0.00
11,100.0	90.00	179.62	10,113.9	-403.7	487.3	439.2	0.00	0.00	0.00
11,200.0	90.00	179.62	10,114.0	-503.7	488.0	539.0	0.00	0.00	0.00
11,300.0	90.00	179.62	10,114.0	-603.7	488.6	638.8	0.00	0.00	0.00
11,400.0	90.00	179.62	10,114.0	-703.7	489.3	738.5	0.00	0.00	0.00
11,500.0	90.00	179.62	10,114.0	-803.7	490.0	838.3	0.00	0.00	0.00
11,600.0	90.00	179.62	10,114.0	-903.7 1.003.7	490.6	938.0	0.00	0.00	0.00
11,700.0	90.00	179.62	10,114.0	-1,003.7	491.3	1,037.8	0.00	0.00	0.00
11,800.0	90.00	179.62	10,114.0	-1,103.7	491.9	1,137.6	0.00	0.00	0.00
11,900.0	90.00	179.62	10,114.0	-1,203.7	492.6	1,237.3	0.00	0.00	0.00
12,000.0	90.00	179.62	10,114.0	-1,303.7	493.3	1,337.1	0.00	0.00	0.00
12,100.0 12,200.0	90.00 90.00	179.62 179.62	10,114.0 10,114.0	-1,403.7 -1,503.6	493.9 494.6	1,436.9 1,536.6	0.00 0.00	0.00 0.00	0,00 0.00
12,300.0	90.00	179.62	10,114.0	-1,603.6	495.2	1,636.4	0.00	0.00	0.00
12,400.0	90.00	179.62	10,114.0	-1,703.6	495.9	1,736.2	0.00	0.00	0.00
12,500.0	90.00	179.62	10,114.0	-1,803.6	496.6	1,835.9	0.00	0.00	0.00
12,600.0 12,700.0	90.00 90.00	179.62 179.62	10,114.0 10,114.0	-1,903.6 -2,003.6	497.2 497.9	1,935.7 2,035.4	0.00 0.00	0.00 0.00	0.00 0.00
12,800.0	90.00	179.62	10,114.0	-2,103.6	498.5	2,135.2	0.00	0.00	0.00
12,900.0	90.00	179.62	10,114.0	-2,203.6	499.2	2,235.0	0.00	0.00	0.00
13,000.0 13,100.0	90.00 90.00	179.62 179.62	10,114.0 10,114.0	-2,303.6 -2,403.6	499.9 500.5	2,334.7 2,434.5	0.00 0.00	0.00 0.00	0.00 0.00
13,100.0	90.00	179.62	10,114.0	-2,403.6 -2,503.6	500.5 501.2	2,434.5 2,534.3	0.00	0.00	0.00
13,300.0	90.00	179.62	10,114.0	-2,603.6	501.8	2,634.0	0.00	0.00	0.00
13,400.0	90.00	179.62	10,114.0	-2,703.6	502.5	2,733.8	0.00	0.00	0.00



Planning Report

Database: PEDM Company: Midland

Project: Lea County, NM (NAD 83 NME)

Site: Antietam 9 Fed Com

 Well:
 #309H

 Wellbore:
 OH

 Design:
 Plan #0.2

Local Co-ordinate Reference:

TVD Reference:
MD Reference:
North Reference:

Survey Calculation Method:

Well #309H

kb = 26' @ 3455.0usft kb = 26' @ 3455.0usft

Grid

anned 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)
13,500.0	90.00	179.62	10,114.0	-2,803.6	503.1	2,833.6	0.00	0.00	0.00
13,600.0	90.00	179.62	10,114.0	-2,903.6	503.8	2,933.3	0.00	0.00	0.00
13,700.0	90.00	179.62	10,114.0	-3,003.6	504.5	3,033.1	0.00	0.00	0.00
			·						
13,800.0 13,900.0	90.00 90.00	179.62 179.62	10,114.0 10.114.0	-3,103.6 -3,203.6	505.1 505.8	3,132.8 3,232.6	0.00 0.00	0.00 0.00	0.00 0.00
14,000.0	90.00	179.62	10,114.0	-3,203.6 -3,303.6	506.4	3,332.4	0.00	0.00	0.00
14,100.0	90.00	179.62	10,114.0	-3,403.6	507.1	3,432.1	0.00	0.00	0.00
14,200.0	90.00	179.62	10,114.0	-3,503.6	507.8	3,531.9	0.00	0.00	0.00
•				,		•			
14,300.0	90.00	179.62	10,114.0	- 3,603.6	508.4	3,631.7	0.00	0.00	0.00
14,400.0	90.00	179.62	10,114.0	-3,703.6	509.1	3,731.4	0.00	0.00	0.00
14,500.0	90.00	179.62	10,114.0	-3,803.6	509.7	3,831.2	0.00	0.00	0.00
14,600.0	90.00	179.62	10,114.0	-3,903.6	510.4	3,930.9	0.00	0.00	0.00
14,700.0	90.00	179.62	10,114.0	-4,003.6	511.1	4,030.7	0.00	0.00	0.00
14,800.0	90.00	179.62	10,114.0	-4,103.6	511.7	4,130.5	0.00	0.00	0.00
14,900.0	90.00	179.62	10,114.0	-4,203.6	512.4	4,230.2	0.00	0.00	0.00
15,000.0	90.00	179.62	10,114.0	-4,303.6	513.0	4,330.0	0.00	0.00	0.00
15,100.0	90.00	179.62	10,114.0	-4,403.6	513.7	4,429.8	0.00	0.00	0.00
15,200.0	90.00	179.62	10,114.0	-4,503.6	514.3	4,529.5	0.00	0.00	0.00
15,300.0	90.00	179.62	10,114.0	-4,603.6	515.0	4,629.3	0.00	0.00	0.00
15,400.0	90.00	179.62	10,114.0	-4,703.6	515.7	4,729.1	0.00	0.00	0.00
15,500.0	90.00	179.62	10,114.0	-4,803.6	516.3	4,828.8	0.00	0.00	0.00
15,600.0	90.00	179.62	10,114.0	-4,903.6	517.0	4,928.6	0.00	0.00	0.00
15,700.0	90.00	179.62	10,114.0	-5,003.6	517.6	5,028.3	0.00	0.00	0.00
15,800.0	90.00	179.62	10,114.0	-5,103,6	518.3	5,128.1	0.00	0.00	0.00
15,900.0	90.00	179.62	10,114.0	-5,203.6	519.0	5,227.9	0.00	0.00	0.00
16,000.0	90.00	179.62	10,114.0	-5,303.6	519.6	5,327.6	0.00	0.00	0.00
16,100.0	90.00	179.62	10,114.0	-5,403.6	520.3	5,427.4	0.00	0.00	0.00
16,200.0	90.00	179.62	10,114.0	-5,503.6	520.9	5,527.2	0.00	0.00	0.00
			10.114.0						
16,300.0 16,400.0	90.00 90.00	179.62 179.62	10,114.0	-5,603.6 -5,703.6	521.6	5,626.9 5,726.7	0.00	0.00 0.00	0.00 0.00
16,500.0	90.00	179.62	10,114.0	-5,703.6 -5,803.6	522.3 522.9	5,726.7 5,826.5	0.00 0.00	0.00	0.00
16,600.0	90.00	179.62	10,114.0	-5,603.6 -5,903.6	522.9 523.6	5,926.2	0.00	0.00	0.00
16,700.0	90.00	179.62	10,114.0	-6,003.6	524.2	6,026.0	0.00	0.00	0.00
16,800.0	90.00	179.62	10,114.0	-6,103.5	524.9	6,125.7	0.00	0.00	0.00
16,900.0	90.00	179.62	10,114.0	-6,203.5	525.5	6,225.5	0.00	0.00	0.00
17,000.0 17,100.0	90.00	179.62 179.62	10,114.0 10,114.0	-6,303.5	526.2	6,325.3	0.00 0.00	0.00 0.00	0.00
17,100.0 17,200.0	90.00 90.00	179.62 179.62	10,114.0	-6,403.5 -6,503.5	526.9 527.5	6,425.0 6,524.8	0.00	0.00	0.00 0.00
17,300.0	90.00	179.62	10,114.0	-6,603.5	528.2	6,624.6	0.00	0.00	0.00
17,400.0	90.00	179.62	10,114.0	-6,703.5	528.8	6,724.3	0.00	0.00	0.00
17,500.0	90.00	179,62	10,114.0	-6,803.5	529.5	6,824.1	0.00	0.00	0.00
17,600.0	90.00	179.62	10,114.0	-6,903.5	530.2	6,923.9	0.00	0.00	0.00
17,700.0	90.00	179.62	10,114.0	-7,003.5	530.8	7,023.6	0.00	0.00	0.00
17,727.5	90.00	179.62	10,114.0	-7,031.0	531.0	7,051.0	0.00	0.00	0.00



Planning Report

Database: PEDM

Company: Midland

Project: Lea County, NM (NAD 83 NME)

Site: Antietam 9 Fed Com

 Well:
 #309H

 Wellbore:
 OH

 Design:
 Plan #0.2

Local Co-ordinate Reference:

TVD Reference:
MD Reference:
North Reference:

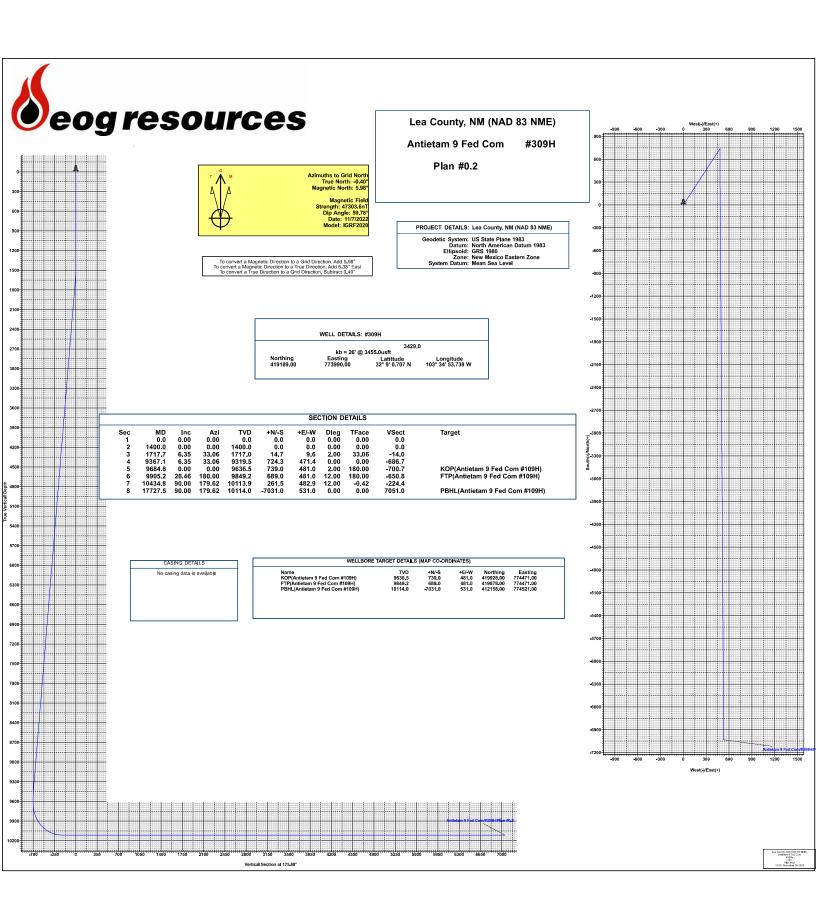
Survey Calculation Method:

Well #309H

kb = 26' @ 3455.0usft kb = 26' @ 3455.0usft

Grid

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
KOP(Antietam 9 Fed Co - plan hits target cen - Point	0.00 ter	0.00	9,636.5	739.0	481.0	419,928.00	774,471.00	32° 9′ 7.986 N	103° 34' 48.083 W
FTP(Antietam 9 Fed Cor - plan hits target cen - Point		0.01	9,849.2	689.0	481.0	419,878.00	774,471.00	32° 9′ 7.491 N	103° 34' 48.087 W
PBHL(Antietam 9 Fed C - plan hits target cen - Point		0.00	10,114.0	-7,031.0	531.0	412,158.00	774,521.00	32° 7' 51.096 N	103° 34' 48.134 W



PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

ALL PREVIOUS COAs STILL APPLY

COA

H2S	○ Yes	● No	
Potash	None	© Secretary	© R-111-P
Cave/Karst Potential	• Low	Medium	○ High
Cave/Karst Potential	Critical		
Variance	○ None	Flex Hose	Other
Wellhead	Conventional	• Multibowl	○ Both
Other	4 String Area	Capitan Reef	□WIPP
Other	Fluid Filled	Cement Squeeze	Pilot Hole
Special Requirements	Water Disposal	☑ COM	Unit

A. CASING

Alternate Casing Design:

- 1. The 13-3/8 inch surface casing shall be set at approximately 1,270 feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8** hours or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength,

- whichever is greater.
- d. If cement falls back, remedial cementing will be done prior to drilling out that string.
- 2. The **9-5/8** inch surface casing shall be set at approximately **5,050** feet TVD. Clearance in salt interval OK based on washout data. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

Option 1 (Single Stage):

• 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 or potash.

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:
 - Cement to surface. If cement does not circulate, contact the appropriate BLM office.
 - Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
- 3. The **5-1/2** inch surface casing shall be set at approximately **17,727** feet. The minimum required fill of cement behind the **5-1/2** inch production casing is:

Option 1 (Single Stage):

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

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:
 - Cement should tie-back at least 200 feet into previous casing string.
 Operator shall provide method of verification.

Alternate Casing Design B:

- 1. The **10-3/4** inch surface casing shall be set at approximately **1,270** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8** hours or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
- 2. The **8-3/4** inch termediate casing shall be set at approximately **5,050** feet TVD. Clearance in salt interval OK based on washout data. The minimum required fill of cement behind the **8-3/4** inch intermediate casing is:

Option 1 (Single Stage):

• 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 or potash.

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:
 - Cement to surface. If cement does not circulate, contact the appropriate BLM office.
 - Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
- 3. The 5-1/2 inch production casing shall be set at approximately 17,727 feet. **. KEEP HOLE FULL FOR TENSILE SF.** The minimum required fill of cement behind the 5-1/2 inch production casing is:

BOPE Break Testing Variance (Note: For 5M BOPE or less)

- BOPE Break Testing is ONLY permitted for 5M BOPE or less.
- BOPE Break Testing is NOT permitted to drilling the production hole section.
- 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 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.
- The BLM is to be contacted (575-689-5981 Lea 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.

OFFLINE CEMENTING AND BREAK TESTING IS APPROVED FOR THE SURFACE AND INTERMEDIATE SECTIONS.

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
 Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,

(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
 - Notify the BLM when moving in and removing the Spudder Rig.
 - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
- 2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
- 3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

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

- 2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.
- 3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.
- 4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
- 5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
- 6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
- 7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
- 8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

- 1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
- 2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's

requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

- 3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
- 4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
 - e. 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.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
 - b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

- c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. The results of the test shall be reported to the appropriate BLM office.
- f. 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.
- g. 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.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

KPI - 12/21/2022

Salt Section Annular Clearance Variance Request

Daniel Moose

<u>~</u>

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

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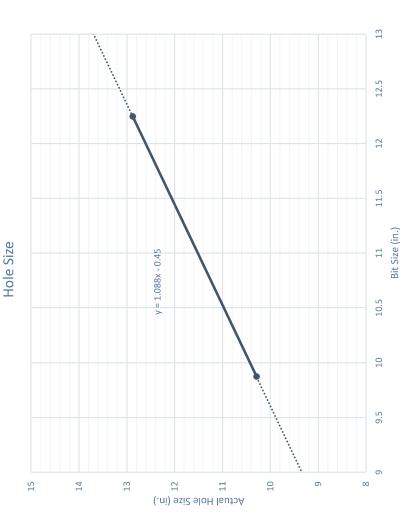
Volumetric Hole Size Calculation

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



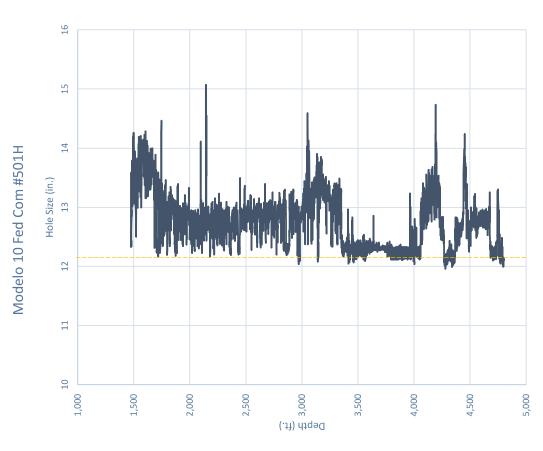


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Caliper Hole Size (12.25")

Average Hole Size

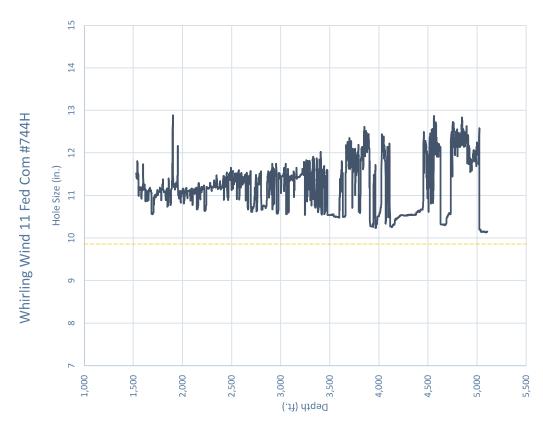
- 12.25" Bit
- 12.76" Hole
- 4.14% diameter increase
- 8.44% area increase
- 0.51" Average enlargement 0.52" Median enlargement
- Brine



Caliper Hole Size (9.875")

Average Hole Size

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



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

$$=\frac{11.52-9.625}{}$$

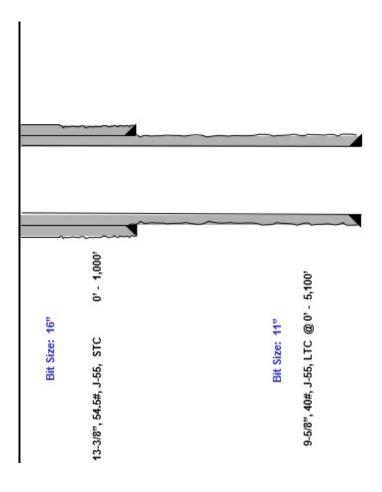
• 0.4475" Clearance to coupling OD

$$=\frac{11.52-10.625}{11.52-10.625}$$

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

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

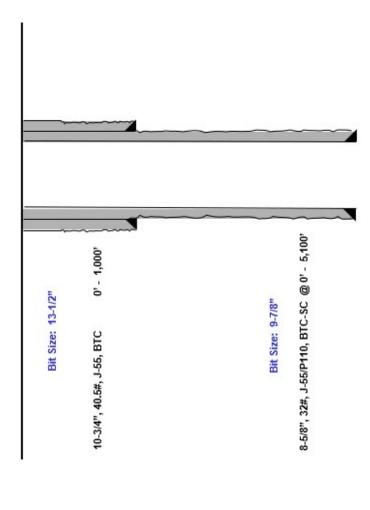
• 0.585" Clearance to coupling OD

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

Previous Shoe – 10.75" 40.5# J55 STC

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

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



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Index

Casing Spec Sheets

PERFORMANCE DATA

40.00 lbs/ft 9.625 in **Technical Data Sheet** API LTC

K55 HC

Size	9.625	E.	Minimum Yield	
Nominal Weight	40.00	lbs/ft	Minimum Tensile	
Grade	K55 HC		Yield Load	
PE Weight	38.94	lbs/ft	Tensile Load	
Wall Thickness	0.395	⊑	Min. Internal Yield Pressure	
Nominal ID	8.835	.⊑	Collapse Pressure	
Drift Diameter	8.750	ii		
Nom. Pipe Body Area	11,454	in ²		

55 95 629 1088 3,950 3600

Connection Parameters		
Connection OD	10.625	ü
Coupling Length	10,500	Ε
Threads Per Inch	8	φ
Standoff Thread Turns	3.50	turns
Make-Up Loss	4.750	.⊑
Min. Internal Yield Pressure	3,950	psi

Pipe Body and API Connections Performance Data 13.375 54.50/0.380 J55

« Back to Pre

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Mechanical Properties	Pipe	ВТС	TIC	STC	
Minimum Yield Strength	55,000	-	-	ı	psi
Maximum Yield Strength	80,000	1	1	ī	isd
Minimum Tensile Strength	75,000	1	1	1	isd
Dimensions	Pipe	ВТС	TIC	STC	
Outside Diameter	13.375	14.375	-	14.375	in.
Wall Thickness	0.380			1	in.
Inside Diameter	12.615	12.615	1	12.615	in.
Standard Drift	12.459	12.459	-	12.459	ï.
Alternate Drift		1	-	1	, ij
Nominal Linear Weight, T&C	54.50	-	-	ī	lbs/fl
Plain End Weight	52.79	L	ı	1	lbs/fl
Performance	Pipe	BTC	TIC	STC	
Minimum Collapse Pressure	1,130	1,130	1	1,130	psi
Minimum Internal Yield Pressure	2,740	2,740	1	2,740	psi
Minimum Pipe Body Yield Strength	853.00	-	-	ı	1000 lbs
Joint Strength		606		514	1000 lbs
Reference Length	-	11,125	-	6,290	ŧ
Make-Up Data	Pipe	ВТС	LTC	STC	
Make-Up Loss	1	4.81	1	3.50	ij
Minimum Make-Up Torque		1	ı	3,860	u-lbs
Maximum Make-Up Torque			ı	6,430	ft-lbs

Annular Clearance Variance

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Annular Clearance Variance

≫8

Casing Spec Sheets

Pipe Body and API Connections Performance Data 10.750 40.50/0.350 J55

PDF

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New Search »		

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Mechanical Properties	Pipe	BTC	רונכ	STC	
Minimum Yield Strength	25,000	,	1	1	isd
Maximum Yield Strength	80,000	1	,	1	isd
Minimum Tensile Strength	75,000	1	1	1	psi
Dimensions	Pipe	ВТС	IIC	STC	
Outside Diameter	10.750	11.750	1	11.750	ji.
Wall Thickness	0.350	ı	ı	ı	Ë
Inside Diameter	10.050	10.050	1	10.050	Ë
Standard Drift	9.894	9.894	ı	9.894	Ë
Alternale Drift	1	1	1	1	ď.
Nominal Linear Weight, T&C	40.50	1		1	lbs/ft
Plain End Weight	38.91	1	1	1	lbs/ft
Performance	Pipe	ВТС	TIC	STC	
Minimum Collapse Pressure	1,580	1,580		1,580	psi
Minimum Internal Yield Pressure	3,130	3,130		3,130	İsd
Minimum Pipe Body Yield Strength	629.00		1	1	1000 lbs
Joint Strength	ı	700	ı	420	1000 lbs
Reference Length	1	11,522	ı	6,915	Œ
Make-Up Data	Pipe	ВТС	TIC	STC	
Make-Up Loss	1	4.81	-	3.50	ij
Minimum Make-Up Torque	1	L	1	3,150	#-lbs
Maximum Make-Up Torque	ı	,	ı	5,250	#-lbs

vallourec	API 5CT, 10th Ed. Connection Data Sheet	in) GRADE *API DRIFT (in) RBW %	J55 7.796 87.5	Pipe Body Data (PE)	Geometry	Nominal ID: 7.92 inch	Nominal Area: 9.149 in ²	*Special/Alt. Drift: 7.875 inch	Performance	Pipe Body Yield Strength: 503 kips	Collapse Resistance: 2,530 psi	Internal Yield Pressure: 3,930 psi (API Historical)	API Connection Torque	STC Torque (ft-lbs)	Min: 2,793 Opti: 3,724 Max: 4,655		LTC Torque (ft-lbs)	Min: 3,130 Opti: 4,174 Max: 5,217	BTC Torque (ft-lbs)	follow API guidelines regarding positional make up		'Alt. Drift will be used unless API Drift is specified on order.	uit your needs, VAM® premium connections are available up to 100% of pipe body ratings.	AND COLARIA OF PROSPECTIVE CONTRACTOR OF THE STATE OF THE
		(lb/ft) WALL (in)	32.00 0.352 31.13 0.352	rties (PE)		55 ksi	80 ksi	ı: 75 ksi	ō.	55 ksi	80 ksi	ı: 75 ksi	on Data 9.625"	nance	3,930 psi	372 kips	nance	3,930 psi	417 kips Cplg OD = 9.125"	3,930 psi	503 kips	*Alt. Drift will be used unle	"If above API connections do not suit your needs, 100% of pipe b	EC OR ITS AFFILATES AT USER'S SOLE I NATIVO REPRESENTATION OF ANN KI FENCIDALY OR REPRESENTED OR TESTS. THE IN THE OFFICE OR PERSON OF THE OR TESTS OFFI PECULENTAL LOSS OR DAMAGE (INCLI.) ARISING, AND WHETHER SUCH LOSSE
		WEIGHT (Ib/ft)	Nominal: Plain End:	Material Properties (PE)	Pipe	Minimum Yield Strength:	Maximum Yield Strength:	Minimum Tensile Strength:	Coupling	Minimum Yield Strength:	Maximum Yield Strength:	Minimum Tensile Strength:	API Connection Data Coupling OD: 9.625"	STC Performance	STC Internal Pressure:	STC Joint Strength:	LTC Performance	TC Internal Pressure:	LTC Joint Strength: 417 SC-BTC Performance - Cplg OD =	BTC Internal Pressure:	BTC Joint Strength:		above API conne	IN IS PROVIDED BY VALLOURE S. IS" BASIS WITHOUT WARR, ITY, FITNESS FOR PURPOSE, A ED ON ESTINATES THAT HAN MITVE, EXEMPLARY OR CONS OFIT) HOWEVER CAUSED OR J

VALLOUREC STAR 8.625 32# J55 5 S2L2 DA 7.875 W/O# 5LN# PO# MADE IN USA FT LB



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 → during each full BOPE test
 - Upper Pipe Rams \rightarrow On trip ins where FIT required
 - Blind Rams → Every trip
 - Lower Pipe Rams → 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)

1. Set plug in wellhead (lower barrier)

- Close Blind Rams (upper barrier)
- Open HCR (pressure application)
- 4
- Tie BOP testers high pressure line to main choke manifold crown valve 9

Blind Rams

Bleed test pressure from BOP testing Pressure up to test break unit 7. 00

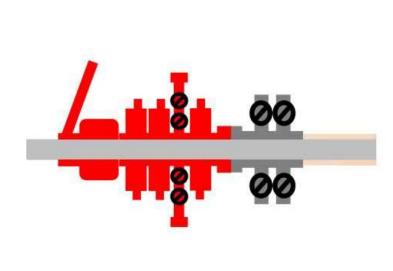
Pressure

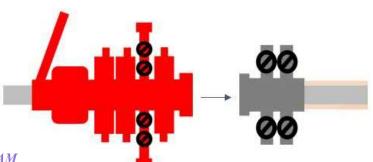
HCR

Roadside Kill

Testing this break

Test plug





to ensure if leak past test plug, pressure Open wellhead valves below test plug won't be applied to wellbore

Break Test Diagram (Test Joint)

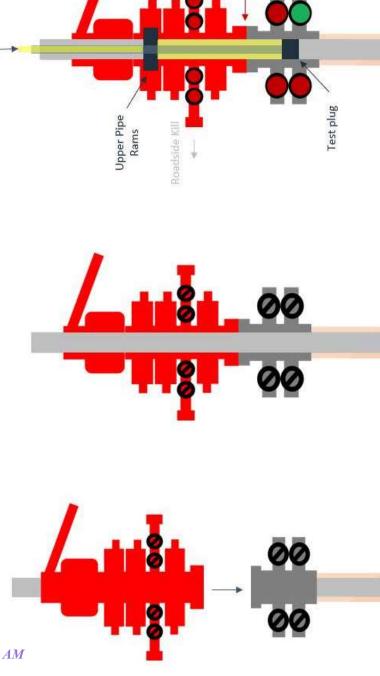
Steps Was a compared by OCD: 12/22/2023 6:03:29 AM L. Set plug in with test joint wellhead (lower barrier) (lower barrier) C. Close Upper Pipe Rams (upper barrier) 1. Set plug in with test joint wellhead Steps

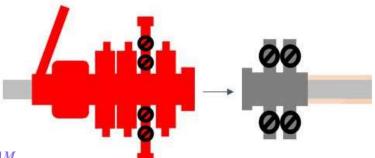
Pressure

- Close roadside kill Close HCR 3
- pressure won't be applied to wellbore Open wellhead valves below test plug Tie BOP testers high pressure line to to ensure if leak past test plug, 4 . 6
 - Pressure up to test break top of test joint



Testing this break





Offline Intermediate Cementing Procedure **eog resources**

2/24/2022

Cement Program

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

Summarized Operational Procedure for Intermediate Casing

- Run casing as per normal operations. While running casing, conduct negative pressure test and confirm integrity of the float equipment back pressure valves. **⊢**i
- Float equipment is equipped with two back pressure valves rated to a minimum of 5,000 psi
- Land production casing on mandrel hanger through BOP. 2
- a. If casing is unable to be landed with a mandrel hanger, then the casing will be cemented online.
- Break circulation and confirm no restrictions.

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- Ensure no blockage of float equipment and appropriate annular returns. a.
- Perform flow check to confirm well is static.
- Set pack-off 4
- 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.
- 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. <u>.</u>
- 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. 5.
 - Minimum 4 hrs notice.
- With the well secured and BLM notified, nipple down BOP and secure on hydraulic carrier or cradle. 6.
- Note, if any of the barriers fail to test, the BOP stack will not be nippled down until after the cement job has concluded and both lead and tail slurry have reached 500 psi.
- Skid/Walk rig off current well.
- Confirm well is static before removing TA Plug.
- Cementing operations will not proceed until well is under control. (If well is not static, notify BLM and proceed to kill) ь а.
- Casing outlet valves will provide access to both the casing ID and annulus. Rig or third party pump truck will kill well prior to
- Well control plan can be seen in Section B, Well Control Procedures.
- If need be, rig can be moved back over well and BOP nippled back up for any further remediation. ن خ

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2/24/2022

Offline Intermediate Cementing Procedure

- e. Diagram for rig positioning relative to offline cementing can be seen in Figure 4.
 - Rig up return lines to take returns from wellhead to pits and rig choke.
- 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.
 - Return line schematics can be seen in Figure 3.
- 10. Remove TA Plug from the casing.
- 11. Install offline cement tool.
- Current offline cement tool schematics can be seen in Figure 1 (Cameron) and Figure 2 (Cactus).
- 12. Rig up cement head and cementing lines.
- 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.
- Max anticipated time before circulating with cement truck is 6 hrs.
 - 14. Pump cement job as per plan.
- At plug bump, test casing to 0.22 psi/ft or 1500 psi, whichever is greater.
- 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.
- With floats holding and backside static:
- i. Remove cement head.
- If floats are leaking:

<u>ە</u>

- 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.
- If there is flow on the backside:

ن

- 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.

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2/24/2022

Example Well Control Plan Content

A. Well Control Component Table

The table below, which covers the cementing of the **5M MASP (Maximum Allowable Surface Pressure) portion of the well**, outlines the well control component rating in use. This table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the BOP nippled 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	2M
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.

2/24/2022

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Offline Intermediate Cementing Procedure

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

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

General Procedure After Cementing

- Sound alarm (alert crew)
- Shut-in Well (close valves to rig pits and open valve to rig choke line. Rig choke will already be in the closed position).
 - Confirm shut-in.
- Notify tool pusher/company representative. 4. .
 - Read and record the following:
- Pit gain ə. Þ.

SICP and AP

- Time
- Shut-in annulus valves on wellhead ن خ

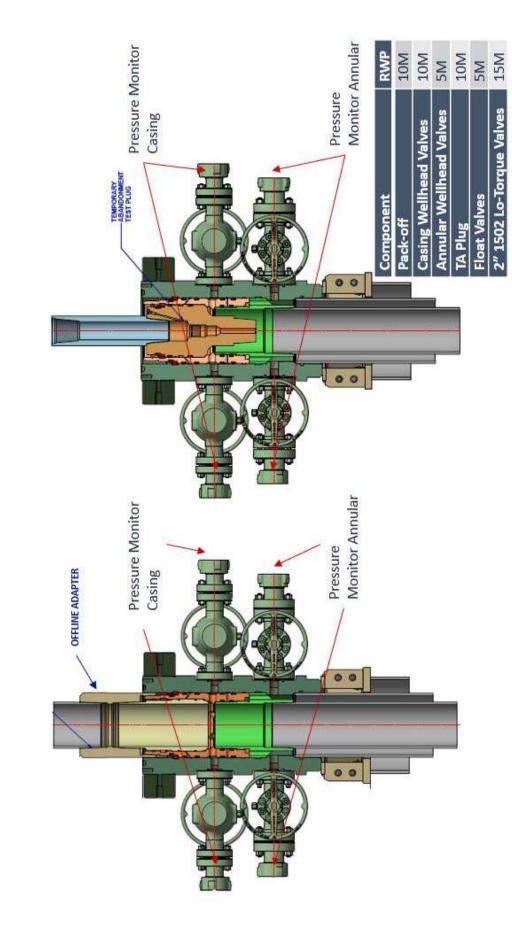


Figure 1: Cameron TA Plug and Offline Adapter Schematic

15M

2" 1502 Lo-Torque Valves

2/24/2022

Offline Intermediate Cementing Procedure **eog resources**

Monitor Annular Pressure Monitor 10M 10M 10M 5M 5M Pressure Casing Annular Wellhead Valves Casing Wellhead Valves Abandonment Plug Temporary Float Valves Component TA Plug g Monitor Annular Pressure Monitor Pressure Casing Offline Cement Adapter

Figure 2: Cactus TA Plug and Offline Adapter Schematic

2/24/2022

From Mud Pumps To Pits/Choke manifold From Cement Truck Figure 3: Back Yard Rig Up Cement Head (5M)

*** All Lines 10M rated working pressure



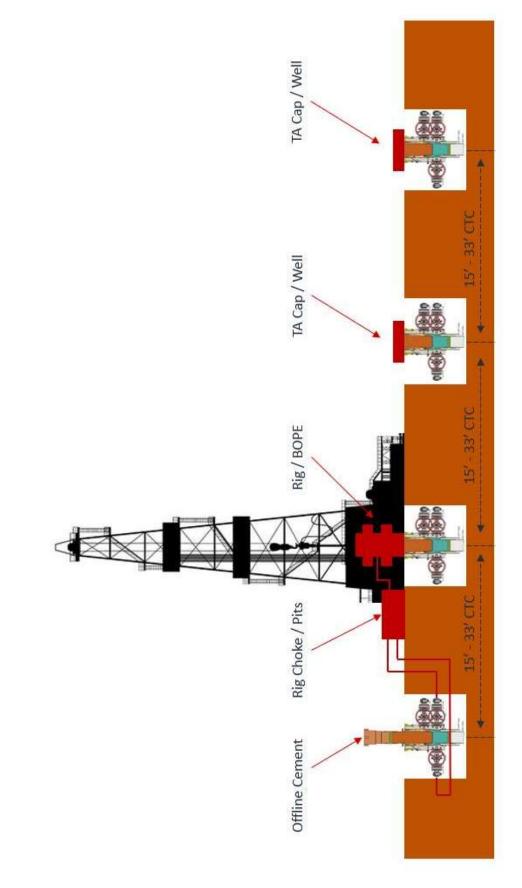


Figure 4: Rig Placement Diagram

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720 District II

811 S. First St., Artesia, NM 88210 Phone:(575) 748-1283 Fax:(575) 748-9720 District III

1000 Rio Brazos Rd., Aztec, NM 87410 Phone:(505) 334-6178 Fax:(505) 334-6170

1220 S. St Francis Dr., Santa Fe, NM 87505 Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 297221

CONDITIONS

Operator:	OGRID:
EOG RESOURCES INC	7377
5509 Champions Drive	Action Number:
Midland, TX 79706	297221
	Action Type:
	[C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By		Condition Date
pkautz	None	2/1/2024