Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☐ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☐ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☐ Single Zone ☐ Multiple Zone

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

8. Lease Name and Well No.

[325998]

2. Name of Operator

[6137]

9. API Well No.

3a. Address

3b. Phone No. *(include area code)*

10. Field and Pool, or Exploratory **[98270]**

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface

At proposed prod. zone

11. Sec., T. R. M. or Blk. and Survey or Area

14. Distance in miles and direction from nearest town or post office*

12. County or Parish

13. State

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration

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.
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).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
Title		
Approved by *(Signature)*	Name *(Printed/Typed)*	Date
Title	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.

GCP Rec 04/29/2021

NSL

REQUIRES NSL

APPROVED WITH CONDITIONS

Approval Date: 03/23/2021

(Continued on page 2)

*(Instructions on page 2)

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

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
	98270	WC-025 G-07 S253216D;UPPER WOLFCAMP

[4] Property Code	[5] Property Name	[6] Well Number
325998	MARWARI 21-16 STATE FED COM	731H

[7] OGRID No.	[8] Operator Name	[9] Elevation
	DEVON ENERGY PRODUCTION COMPANY, L.P.	3374.5

[10] Surface Location

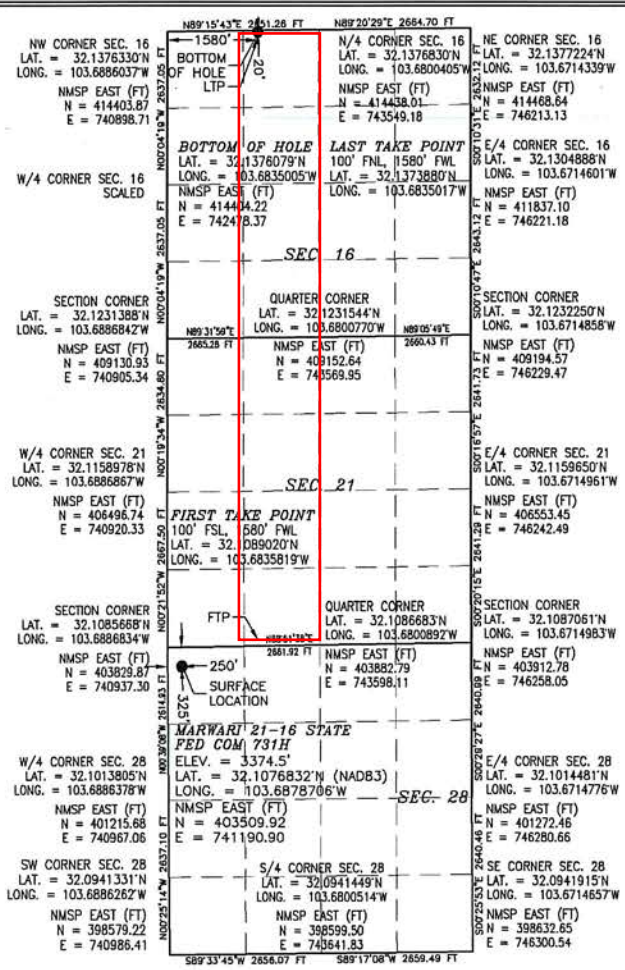
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	28	25 S	32 E		325	NORTH	250	WEST	LEA

[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	16	25 S	32 E		20	NORTH	1580	WEST	LEA

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
320			

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



[17] OPERATOR CERTIFICATION

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

Linda Good 2/19/2019
Signature Date

Linda Good
Printed Name

linda.good@dvn.com
E-mail Address

[18] SURVEYOR CERTIFICATION

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

FEBRUARY 12, 2019
Date of Survey

FILIMON F. JARAMILLO NEW MEXICO 12797 PROFESSIONAL SURVEYOR

Signature and Seal of Professional Surveyor:

Certificate Number: FILIMON F. JARAMILLO, PLS 12797

SURVEY NO. 6893A

Intent [X] As Drilled [ ]

API #

Operator Name:	Property Name:	Well Number
DEVON ENERGY PRODUCTION COMPANY, L.P.	MARWARI 21-16 STATE FED COM	731H

Kick Off Point (KOP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
D	28	25S	32E		375	NORTH	1475	WEST	LEA

Latitude	Longitude	NAD
32.107526	-103.683916	83

First Take Point (FTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
N	21	25S	32E		100	SOUTH	1580	WEST	LEA

Latitude	Longitude	NAD
32.1089020	103.6835819	83

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
C	16	25S	32E		100	NORTH	1580	WEST	LEA

Latitude	Longitude	NAD
32.1373880	103.6835017	83

Is this well the defining well for the Horizontal Spacing Unit? [ ]

Is this well an infill well? YES

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API #

Operator Name:	Property Name:	Well Number
Devon Energy Production Co., LP	Marwari 21-16 State Fed Com	712H

KZ 06/29/2018

District I
1625 N. French Dr., Hobbs, NM 88240
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1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit Original to Appropriate District Office

GAS CAPTURE PLAN

Date: 2/19/2019

☒ Original Operator & OGRID No.: Devon Energy Prod Co., LP (6137)
☐ Amended - Reason for Amendment: _____

This Gas Capture Plan outlines actions to be taken by the Devon to reduce well/production facility flaring/venting for new completion (new drill, recomplete to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Marwari 21-16 State Fed Com 731H		UNIT D, SEC 28-T25S-R32E	325 FNL 250 FWL			MARWARI 21 CTB 1

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if DCP system is in place. The gas produced from production facility is dedicated to DCP and will be connected to DCP low/high pressure gathering system located in Lea County, New Mexico. It will require 1100' of pipeline to connect the facility to low/high pressure gathering system. Devon provides (periodically) to DCP a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Devon and DCP have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at DCP Processing Plant located in Sec. 19, Twn. 19S, Rng. 32E, Lea County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on DCP system at that time. Based on current information, it is Devon's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
  - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
  - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
  - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

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

Drilling Plan Data Report
04/12/2021

APD ID: 10400039091 **Submission Date:** 02/21/2019

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: MARWARI 21-16 STATE FED COM **Well Number:** 731H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
396895	UNKNOWN	3374	0	0	ALLUVIUM	NONE	N
396896	RUSTLER	2545	829	829	ANHYDRITE	NONE	N
396897	SALADO	2182	1192	1192	SALT	NONE	N
396890	DELAWARE	-1198	4572	4572	SANDSTONE	NATURAL GAS, OIL	N
396891	BONE SPRING	-5161	8535	8535	LIMESTONE	NATURAL GAS, OIL	N
396892	BONE SPRING 1ST	-6092	9466	9466	SANDSTONE	NATURAL GAS, OIL	N
396893	BONE SPRING 2ND	-6777	10151	10151	SANDSTONE	NATURAL GAS, OIL	N
396894	BONE SPRING 3RD	-8002	11376	11376	SANDSTONE	OIL	N
396898	WOLFCAMP	-8443	11817	11817	SHALE	NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M **Rating Depth:** 12260

Equipment: BOP/BOPE will be installed per Onshore Oil & Gas Order #2 requirements prior to drilling below intermediate casing, a BOP/BOPE system with the above minimum rating will be installed on the wellhead system. BOP/BOPE will be tested by an independent service company per Onshore Oil & Gas Order #2 requirements and MASP (Maximum Anticipated Surface Pressure) calculations. If the system is upgraded, all the components installed will be functional and tested.
Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP stack to the choke manifold. See attached for specs for hydrostatic test chart.
Testing Procedure: A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.
Choke Diagram Attachment:

10M_BOPE_CHK_DR_CLS_RKL_20210204130857.pdf

Annular_Variance___Preventer_Summary_20210204130858.pdf

Marwari 21-16 State Fed Com 731H

1. Geologic Formations

TVD of target	12260	Pilot hole depth	N/A
MD at TD:	22664	Deepest expected fresh water	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone?	Hazards*
Rustler	995		
Salt	1380		
Base of Salt	4625		
Lamar	4625		
Delaware	4625		
Cherry Canyon	5580		
Brushy Canyon	7170		
1st Bone Spring Lime	8680		
Bone Spring 1st	9665		
Bone Spring 2nd	10310		
3rd Bone Spring Lime	10805		
Bone Spring 3rd	11415		
Wolfcamp	11910		

*H2S, water flows, loss of circulation, abnormal pressures, etc.

2. Casing Program (Primary Design)

Hole Size	Csg. Size	Wt (PPF)	Grade	Conn	Casing Interval		Casing Interval	
					From (MD)	To (MD)	From (TVD)	To (TVD)
17 1/2	13 3/8	48	H40	STC	0	1020	0	1020
9 7/8	8 5/8	32	P110	TLW	0	11910	0	11910
7 7/8	5 1/2	17	P110	BTC	0	22664	0	12260

• All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 IILB.1.h Must have table for continengcy casing.

3. Cementing Program (Primary Design)

Casing	# Sks	TOC	Wt. ppg	Yld (ft3/sack)	Slurry Description
Surface	777	Surf	13.2	1.44	Lead: Class C Cement + additives
Int 1	494	Surf	9	3.27	Lead: Class C Cement + additives
	465	4000' above	13.2	1.44	Tail: Class H / C + additives
Int 1 Intermediate Squeeze	As Needed	Surf	13.2	1.44	Squeeze Lead: Class C Cement + additives
	494	Surf	9	3.27	Lead: Class C Cement + additives
	465	4000' above	13.2	1.44	Tail: Class H / C + additives
Production	117	9820	9	3.27	Lead: Class H /C + additives
	1435	11820	13.2	1.44	Tail: Class H / C + additives

Casing String	% Excess
Surface	50%
Intermediate 1	30%
Intermediate 1 (Two Stage)	25%
Prod	10%

4. Pressure Control Equipment (Three String Design)

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
Int 1	13-58"	5M	Annular	X	50% of rated working pressure
			Blind Ram	X	5M
			Pipe Ram		
			Double Ram	X	
			Other*		
Production	13-5/8"	5M	Annular (5M)	X	100% of rated working pressure
			Blind Ram	X	10M
			Pipe Ram		
			Double Ram	X	
			Other*		
			Annular (5M)		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
Y	A variance is requested to run a 5 M annular on a 10M system

5. Mud Program (Three String Design)

Section	Type	Weight (ppg)
Surface	FW Gel	8.5-9
Intermediate	DBE / Cut Brine	10-10.5
Production	OBM	10-10.5

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

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing	
X	Will run GR/CNL from TD to surface (horizontal well - vertical portion of hole). Stated logs run will be in the Completion Rpeort and sbumitted to the BLM.
	No logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain.
	Coring? If yes, explain.

Additional logs planned		Interval
	Resistivity	Int. shoe to KOP
	Density	Int. shoe to KOP
X	CBL	Production casing
X	Mud log	Intermediate shoe to TD
	PEX	

7. Drilling Conditions

Condition	Specfiy what type and where?
BH pressure at deepest TVD	6694
Abnormal temperature	No

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

Hydrogren Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S plan attached.

8. Other facets of operation

Is this a walking operation? Potentially

1 If operator elects, drilling rig will batch drill the surface holes and run/cement surface casing; walking the rig to next wells on the pad.
2 The drilling rig will then batch drill the intermediate sections and run/cement intermediate casing; the wellbore will be isolated with a blind flange and pressure gauge installed for monitoring the well before walking to the next well.
3 The drilling rig will then batch drill the production hole sections on the wells with OBM, run/cement production casing, and install TA caps or tubing heads for completions.

NOTE: During batch operations the drilling rig will be moved from well to well however, it will not be removed

from the pad until all wells have production casing run/cemented.

Will be pre-setting casing? Potentially

1 Spudder rig will move in and batch drill surface hole.
   a. Rig will utilize fresh water based mud to drill surface hole to TD. Solids control will be handled entirely on a closed loop basis.,
2 After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
3 The wellhead will be installed and tested once the surface casing is cut off and the WOC time has been reached.
4 A blind flange with the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with a pressure gauge installed on the wellhead.
5 Spudder rig operations is expected to take 4-5 days per well on a multi-well pa.
6 The NMOCD will be contacted and notified 24 hours prior to commencing spudder rig operations.
7 Drilling operations will be performed with drilling rig. A that time an approved BOP stack will be nippled up and tested on the wellhead before drilling operations commences on each well.
   a. The NMOCD will be contacted / notified 24 hours before the drilling rig moves back on to the pad with the pre-set surface casing.

Attachments

X Directional Plan

_____ Other, describe

Marwari 21-16 State Fed Com 731H

1. Geologic Formations

TVD of target	12295	Pilot hole depth	N/A
MD at TD:	23077	Deepest expected fresh water	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone?	Hazards*
RUSTLER	829		
SALADO	1192		
BONE SPRING	8535		
BONE SPRING 1ST	9466		
BONE SPRING 2ND	10151		
BONE SPRING 3RD	11376		
WOLFCAMP	11817		

*H2S, water flows, loss of circulation, abnormal pressures, etc.

Marwari 21-16 State Fed Com 731H

2. Casing Program (Primary Design)

Hole Size	Casing Interval		Csg. Size	Wt (PPF)	Grade	Conn	Min SF Collapse	Min SF Burst	Min SF Tension
	From	To							
17 1/2	0	854 TVD	13 3/8	48.0	H40	STC	1.125	1.25	1.6
9 7/8	0	11817 TVD	7 5/8	29.7	P110	Flushmax III	1.125	1.25	1.6
6 3/4	0	TD	5 1/2	20.0	P110	Vam SG	1.125	1.25	1.6
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

• All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 IILB.1.h Must have table for continengcy casing.
• Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed.
• A variance is requested for collapse rating on intermediate casing. Operator will keep pipe full while running casing.

• Int casing shoe will be selected based on drilling data/gamma, setting depth with be revised accordingly if needed.

• A variance is requested to wave the centralizer requirement for the Intermediate casing and production casing.

• A variance is requested to set intermediate casing in the curve if hole conditions dictate that a higher shoe strength is required.

Casing Program (Alternative Design)

Hole Size	Casing Interval		Csg. Size	Wt (PPF)	Grade	Conn	Min SF Collapse	Min SF Burst	Min SF Tension
	From	To							
17 1/2	0	854 TVD	13 3/8	48.0	H40	STC	1.125	1.25	1.6
9 7/8	0	11817 TVD	8 5/8	32.0	P110	TLW	1.125	1.25	1.6
7 7/8	0	TD	5 1/2	17.0	P110	BTC	1.125	1.25	1.6
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

• All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 IILB.1.h Must have table for continengcy casing.
• Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed.
• A variance is requested for collapse rating on intermediate casing. Operator will keep pipe full while running casing.
• Int casing shoe will be selected based on drilling data/gamma, setting depth with be revised accordingly if needed.
• A variance is requested to wave the centralizer requirement for the Intermediate casing and production casing.
•Variance requested to drill 10.625" hole instead of 9.875" for intermediate 1, the 8.625" connection will change from TLW to BTC.
• A variance is requested to set intermediate casing in the curve if hole conditions dictate that a higher shoe strength is required.

Marwari 21-16 State Fed Com 731H

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specficition sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program (Primary Design)

Casing	# Sks	TOC	Wt. (lb/gal)	Yld (ft3/sack)	Slurry Description
Surface	657	Surf	13.2	1.44	Lead: Class C Cement + additives
Int 1	742	Surf	9	3.27	Lead: Class C Cement + additives
	783	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Int 1 Two Stage w/ DV @ TVD of Delaware	570	200' above DV	9	3.27	1st stage Lead: Class C Cement + additives
	93	500' above shoe	13.2	1.44	1st stage Tail: Class H / C + additives
	412	Surf	9	3.27	2nd stage Lead: Class C Cement + additives
	93	500' above DV	13.2	1.44	2nd stage Tail: Class H / C + additives
Int 1 Intermediate Squeeze	As Needed	Surf	9	1.44	Squeeze Lead: Class C Cement + additives
	742	Surf	9	3.27	Lead: Class C Cement + additives
	783	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Production	63	9790	9.0	3.3	Lead: Class H /C + additives
	720	11790	13.2	1.4	Tail: Class H / C + additives

If a DV tool is ran the depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Slurry weights will be adjusted based on estimated fracture gradient of the formation. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. If cement is not returned to surface during the primary cement job on the surface casing string, a planned top job will be conducted immediately after completion of the primary job.

Casing String	% Excess
Surface	50%
Intermediate 1	30%
Intermediate 1 (Two Stage)	25%
Prod	10%

Marwari 21-16 State Fed Com 731H

3. Cementing Program (Alternative Design)

Casing	# Sks	TOC	Wt. ppg	Yld (ft3/sack)	Slurry Description
Surface	657	Surf	13.2	1.44	Lead: Class C Cement + additives
Int 1	473	Surf	9	3.27	Lead: Class C Cement + additives
	465	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Int 1 Two Stage w DV @ ~4500	335	Surf	9	3.27	1st stage Lead: Class C Cement + additives
	55	500' above shoe	13.2	1.44	1st stage Tail: Class H / C + additives
	279	Surf	9	3.27	2nd stage Lead: Class C Cement + additives
	55	500' above DV	13.2	1.44	2nd stage Tail: Class H / C + additives
Int 1 Intermediate Squeeze	As Needed	Surf	13.2	1.44	Squeeze Lead: Class C Cement + additives
	473	Surf	9	3.27	Lead: Class C Cement + additives
	465	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Production	117	9790	9.0	3.3	Lead: Class H /C + additives
	1494	11790	13.2	1.4	Tail: Class H / C + additives

If a DV tool is ran the depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Slurry weights will be adjusted based on estimated fracture gradient of the formation. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. If cement is not returned to surface during the primary cement job on the surface casing string, a planned top job will be conducted immediately after completion of the primary job.

Casing String	% Excess
Surface	50%
Intermediate 1	30%
Intermediate 1 (Two Stage)	25%
Prod	10%

Marwari 21-16 State Fed Com 731H

4. Pressure Control Equipment (Three String Design)

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
Int 1	13-58"	5M	Annular	X	50% of rated working pressure
			Blind Ram	X	5M
			Pipe Ram		
			Double Ram	X	
			Other*		
Production	13-5/8"	10M	Annular (5M)	X	100% of rated working pressure
			Blind Ram	X	10M
			Pipe Ram		
			Double Ram	X	
			Other*		
			Annular (5M)		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
Y	A variance is requested to run a 5 M annular on a 10M system

5. Mud Program (Three String Design)

Section	Type	Weight (ppg)
Surface	FW Gel	8.5-9
Intermediate	DBE / Cut Brine	10-10.5
Production	OBM	10-10.5

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

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing	
X	Will run GR/CNL from TD to surface (horizontal well - vertical portion of hole). Stated logs run will be in the Completion Rpeort and sbumitted to the BLM.
	No logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain.
	Coring? If yes, explain.

Additional logs planned		Interval
	Resistivity	Int. shoe to KOP
	Density	Int. shoe to KOP
X	CBL	Production casing
X	Mud log	Intermediate shoe to TD
	PEX	

7. Drilling Conditions

Condition	Specfiy what type and where?
BH pressure at deepest TVD	6713
Abnormal temperature	No

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

Hydrogren Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S plan attached.

8. Other facets of operation

Is this a walking operation? Potentially

1 If operator elects, drilling rig will batch drill the surface holes and run/cement surface casing; walking the rig to next wells on the pad.
2 The drilling rig will then batch drill the intermediate sections and run/cement intermediate casing; the wellbore will be isolated with a blind flange and pressure gauge installed for monitoring the well before walking to the next well.
3 The drilling rig will then batch drill the production hole sections on the wells with OBM, run/cement production casing, and install TA caps or tubing heads for completions.

NOTE: During batch operations the drilling rig will be moved from well to well however, it will not be removed from the pad until all wells have production casing run/cemented.

Will be pre-setting casing? Potentially

1 Spudder rig will move in and batch drill surface hole.
    a. Rig will utilize fresh water based mud to drill surface hole to TD. Solids control will be handled entirely on a closed loop basis.,
2 After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
3 The wellhead will be installed and tested once the surface casing is cut off and the WOC time has been reached.
4 A blind flange with the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with a pressure gauge installed on the wellhead.
5 Spudder rig operations is expected to take 4-5 days per well on a multi-well pa.
6 The NMOCD will be contacted and notified 24 hours prior to commencing spudder rig operations.
7 Drilling operations will be performed with drilling rig. A that time an approved BOP stack will be nippled up and tested on the wellhead before drilling operations commences on each well.
    a. The NMOCD will be contacted / notified 24 hours before the drilling rig moves back on to the pad with the pre-set surface casing.

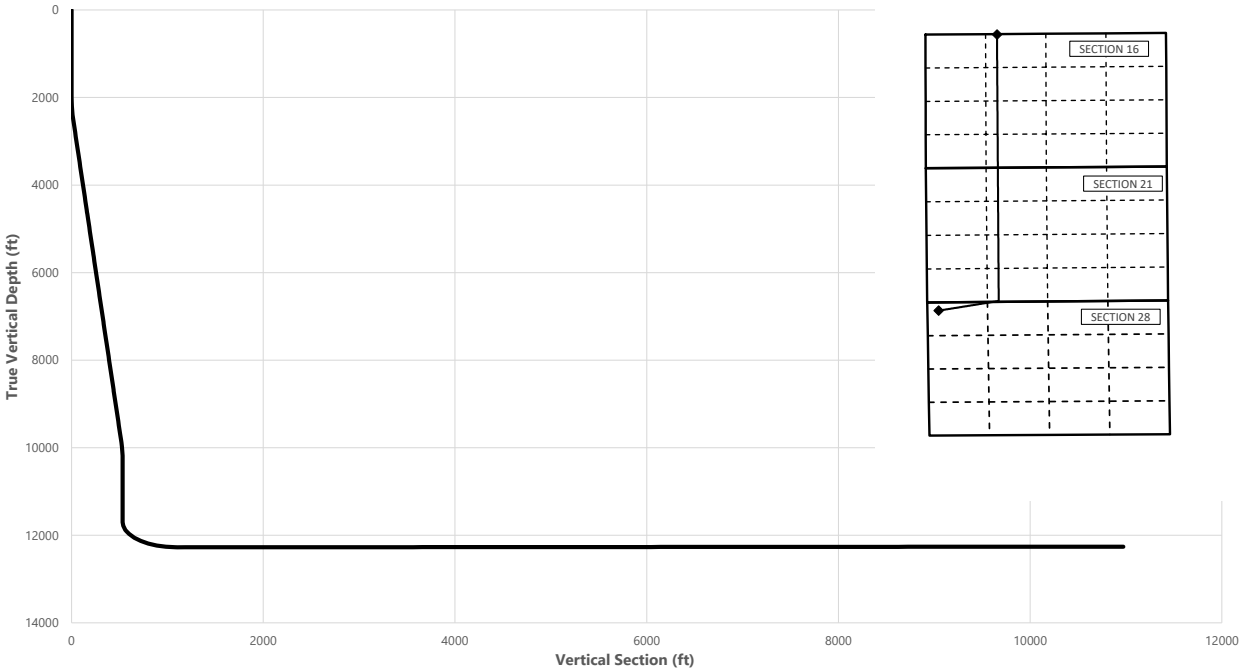
Attachments

X Directional Plan
_____ Other, describe

Well: Marwari 21-16 State Fed Com 731H
County: Lea
Wellbore: Permit Plan
Design: Permit Plan #1

Geodetic System: US State Plane 1983
Datum: North American Datum 1927
Ellipsoid: Clarke 1866
Zone: 3001 - NM East (NAD83)

MD (ft)	INC (°)	AZI (°)	TVD (ft)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL
2000.00	0.00	74.00	2000.00	0.00	0.00	0.00	0.00	Start Tangent
2500.00	10.00	74.00	2497.47	12.00	41.84	16.82	1.00	Hold Tangent
9944.34	10.00	74.00	9828.71	368.31	1284.46	516.51	0.00	Drop to Vertical
10444.34	0.00	74.00	10326.18	380.31	1326.29	533.34	2.00	Hold Vertical
11820.21	0.00	359.79	11702.04	380.31	1326.29	533.34	0.00	KOP
12721.07	90.09	359.79	12275.00	954.13	1324.19	1102.94	10.00	Landing Point
22663.69	90.09	359.79	12260.00	10896.67	1287.75	10972.50	0.00	BHL



Key Depths	MD (ft)	TVD (ft)
Rustler	0.00	0.00
Salt	1380.00	1380.00
Base of Salt	4660.36	4625.00
Lamar	4660.36	4625.00
Delaware	4660.36	4625.00
Cherry Canyon	5630.09	5580.00
Brushy Canyon	7244.62	7170.00
1st Bone Spring Lime	8777.91	8680.00
Bone Spring 1st	9778.11	9665.00
Bone Spring 2nd	10428.17	10310.00
3rd Bone Spring Lime	10923.17	10805.00
Bone Spring 3rd	11533.17	11415.00
Wolfcamp / Point of Penetration	12033.02	11910.00
EXIT	22583.69	12260.13

	MD (ft)	TVD (ft)	Lat (°)	Long (°)	Section Footages
SHL	0.00	0.00	32.1076	-103.6879	325' FNL, 250' FWL of Sec 28 in T25S, R32E
KOP	11820.21	11702.04	32.1086	-103.6837	36' FSL, 1580' FWL of Sec 21 in T25S, R32E
Point of Penetration	12033.02	11910.00	32.1089	-103.6836	100' FSL, 1580' FWL of Sec 21 in T25S, R32E
Exit	22583.69	12260.13	32.1374	-103.6835	100' FNL, 1580' FWL of Sec 16 in T25S, R32E
BHL	22663.69	12260.00	32.1375	-103.6836	20' FNL, 1580' FWL of Sec 16 in T25S, R32E

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MD (ft)	INC (°)	AZI (°)	TVD (ft)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL
100.00	0.00	74.00	100.00	0.00	0.00	0.00	0.00	
200.00	0.00	74.00	200.00	0.00	0.00	0.00	0.00	
300.00	0.00	74.00	300.00	0.00	0.00	0.00	0.00	
400.00	0.00	74.00	400.00	0.00	0.00	0.00	0.00	
500.00	0.00	74.00	500.00	0.00	0.00	0.00	0.00	
600.00	0.00	74.00	600.00	0.00	0.00	0.00	0.00	
700.00	0.00	74.00	700.00	0.00	0.00	0.00	0.00	
800.00	0.00	74.00	800.00	0.00	0.00	0.00	0.00	
900.00	0.00	74.00	900.00	0.00	0.00	0.00	0.00	
995.00	0.00	74.00	995.00	0.00	0.00	0.00	0.00	Rustler
1000.00	0.00	74.00	1000.00	0.00	0.00	0.00	0.00	
1100.00	0.00	74.00	1100.00	0.00	0.00	0.00	0.00	
1200.00	0.00	74.00	1200.00	0.00	0.00	0.00	0.00	
1300.00	0.00	74.00	1300.00	0.00	0.00	0.00	0.00	
1380.00	0.00	74.00	1380.00	0.00	0.00	0.00	0.00	Salt
1400.00	0.00	74.00	1400.00	0.00	0.00	0.00	0.00	
1500.00	0.00	74.00	1500.00	0.00	0.00	0.00	0.00	
1600.00	0.00	74.00	1600.00	0.00	0.00	0.00	0.00	
1700.00	0.00	74.00	1700.00	0.00	0.00	0.00	0.00	
1800.00	0.00	74.00	1800.00	0.00	0.00	0.00	0.00	
1900.00	0.00	74.00	1900.00	0.00	0.00	0.00	0.00	
2000.00	0.00	74.00	2000.00	0.00	0.00	0.00	0.00	Start Tangent
2100.00	2.00	74.00	2099.98	0.48	1.68	0.67	2.00	
2200.00	4.00	74.00	2199.84	1.92	6.71	2.70	2.00	
2300.00	6.00	74.00	2299.45	4.33	15.09	6.07	2.00	
2400.00	8.00	74.00	2398.70	7.68	26.80	10.78	2.00	
2500.00	10.00	74.00	2497.47	12.00	41.84	16.82	1.00	Hold Tangent
2600.00	10.00	74.00	2595.95	16.78	58.53	23.54	0.00	
2700.00	10.00	74.00	2694.43	21.57	75.22	30.25	0.00	
2800.00	10.00	74.00	2792.91	26.36	91.91	36.96	0.00	
2900.00	10.00	74.00	2891.39	31.14	108.61	43.67	0.00	
3000.00	10.00	74.00	2989.87	35.93	125.30	50.39	0.00	
3100.00	10.00	74.00	3088.35	40.71	141.99	57.10	0.00	
3200.00	10.00	74.00	3186.83	45.50	158.68	63.81	0.00	
3300.00	10.00	74.00	3285.31	50.29	175.37	70.52	0.00	
3400.00	10.00	74.00	3383.79	55.07	192.07	77.23	0.00	
3500.00	10.00	74.00	3482.27	59.86	208.76	83.95	0.00	
3600.00	10.00	74.00	3580.75	64.65	225.45	90.66	0.00	
3700.00	10.00	74.00	3679.23	69.43	242.14	97.37	0.00	
3800.00	10.00	74.00	3777.72	74.22	258.83	104.08	0.00	
3900.00	10.00	74.00	3876.20	79.01	275.53	110.80	0.00	
4000.00	10.00	74.00	3974.68	83.79	292.22	117.51	0.00	
4100.00	10.00	74.00	4073.16	88.58	308.91	124.22	0.00	
4200.00	10.00	74.00	4171.64	93.37	325.60	130.93	0.00	
4300.00	10.00	74.00	4270.12	98.15	342.29	137.65	0.00	
4400.00	10.00	74.00	4368.60	102.94	358.99	144.36	0.00	
4500.00	10.00	74.00	4467.08	107.72	375.68	151.07	0.00	
4600.00	10.00	74.00	4565.56	112.51	392.37	157.78	0.00	
4660.36	10.00	74.00	4625.00	115.40	402.45	161.83	0.00	Base of Salt, Lamar, Delaware
4700.00	10.00	74.00	4664.04	117.30	409.06	164.50	0.00	
4800.00	10.00	74.00	4762.52	122.08	425.76	171.21	0.00	
4900.00	10.00	74.00	4861.00	126.87	442.45	177.92	0.00	
5000.00	10.00	74.00	4959.48	131.66	459.14	184.63	0.00	
5100.00	10.00	74.00	5057.97	136.44	475.83	191.34	0.00	
5200.00	10.00	74.00	5156.45	141.23	492.52	198.06	0.00	
5300.00	10.00	74.00	5254.93	146.02	509.22	204.77	0.00	
5400.00	10.00	74.00	5353.41	150.80	525.91	211.48	0.00	
5500.00	10.00	74.00	5451.89	155.59	542.60	218.19	0.00	
5600.00	10.00	74.00	5550.37	160.38	559.29	224.91	0.00	
5630.09	10.00	74.00	5580.00	161.82	564.31	226.93	0.00	Cherry Canyon
5700.00	10.00	74.00	5648.85	165.16	575.98	231.62	0.00	
5800.00	10.00	74.00	5747.33	169.95	592.68	238.33	0.00	
5900.00	10.00	74.00	5845.81	174.73	609.37	245.04	0.00	
6000.00	10.00	74.00	5944.29	179.52	626.06	251.76	0.00	
6100.00	10.00	74.00	6042.77	184.31	642.75	258.47	0.00	
6200.00	10.00	74.00	6141.25	189.09	659.44	265.18	0.00	
6300.00	10.00	74.00	6239.73	193.88	676.14	271.89	0.00	
6400.00	10.00	74.00	6338.22	198.67	692.83	278.61	0.00	
6500.00	10.00	74.00	6436.70	203.45	709.52	285.32	0.00	

devon

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MD (ft)	INC (°)	AZI (°)	TVD (ft)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Comment
6600.00	10.00	74.00	6535.18	208.24	726.21	292.03	0.00	
6700.00	10.00	74.00	6633.66	213.03	742.91	298.74	0.00	
6800.00	10.00	74.00	6732.14	217.81	759.60	305.46	0.00	
6900.00	10.00	74.00	6830.62	222.60	776.29	312.17	0.00	
7000.00	10.00	74.00	6929.10	227.38	792.98	318.88	0.00	
7100.00	10.00	74.00	7027.58	232.17	809.67	325.59	0.00	
7200.00	10.00	74.00	7126.06	236.96	826.37	332.30	0.00	
7244.62	10.00	74.00	7170.00	239.09	833.81	335.30	0.00	Brushy Canyon
7300.00	10.00	74.00	7224.54	241.74	843.06	339.02	0.00	
7400.00	10.00	74.00	7323.02	246.53	859.75	345.73	0.00	
7500.00	10.00	74.00	7421.50	251.32	876.44	352.44	0.00	
7600.00	10.00	74.00	7519.99	256.10	893.13	359.15	0.00	
7700.00	10.00	74.00	7618.47	260.89	909.83	365.87	0.00	
7800.00	10.00	74.00	7716.95	265.68	926.52	372.58	0.00	
7900.00	10.00	74.00	7815.43	270.46	943.21	379.29	0.00	
8000.00	10.00	74.00	7913.91	275.25	959.90	386.00	0.00	
8100.00	10.00	74.00	8012.39	280.04	976.60	392.72	0.00	
8200.00	10.00	74.00	8110.87	284.82	993.29	399.43	0.00	
8300.00	10.00	74.00	8209.35	289.61	1009.98	406.14	0.00	
8400.00	10.00	74.00	8307.83	294.39	1026.67	412.85	0.00	
8500.00	10.00	74.00	8406.31	299.18	1043.36	419.57	0.00	
8600.00	10.00	74.00	8504.79	303.97	1060.06	426.28	0.00	
8700.00	10.00	74.00	8603.27	308.75	1076.75	432.99	0.00	
8777.91	10.00	74.00	8680.00	312.48	1089.75	438.22	0.00	1st Bone Spring Lime
8800.00	10.00	74.00	8701.75	313.54	1093.44	439.70	0.00	
8900.00	10.00	74.00	8800.24	318.33	1110.13	446.41	0.00	
9000.00	10.00	74.00	8898.72	323.11	1126.82	453.13	0.00	
9100.00	10.00	74.00	8997.20	327.90	1143.52	459.84	0.00	
9200.00	10.00	74.00	9095.68	332.69	1160.21	466.55	0.00	
9300.00	10.00	74.00	9194.16	337.47	1176.90	473.26	0.00	
9400.00	10.00	74.00	9292.64	342.26	1193.59	479.98	0.00	
9500.00	10.00	74.00	9391.12	347.04	1210.28	486.69	0.00	
9600.00	10.00	74.00	9489.60	351.83	1226.98	493.40	0.00	
9700.00	10.00	74.00	9588.08	356.62	1243.67	500.11	0.00	
9778.11	10.00	74.00	9665.00	360.36	1256.71	505.36	0.00	Bone Spring 1st
9800.00	10.00	74.00	9686.56	361.40	1260.36	506.83	0.00	
9900.00	10.00	74.00	9785.04	366.19	1277.05	513.54	0.00	
9944.34	10.00	74.00	9828.71	368.31	1284.46	516.51	0.00	Drop to Vertical
10000.00	8.89	74.00	9883.61	370.83	1293.23	520.04	2.00	
10100.00	6.89	74.00	9982.66	374.61	1306.42	525.35	2.00	
10200.00	4.89	74.00	10082.13	377.44	1316.28	529.31	2.00	
10300.00	2.89	74.00	10181.90	379.31	1322.80	531.93	2.00	
10400.00	0.89	74.00	10281.84	380.21	1325.96	533.20	2.00	
10428.17	0.32	74.00	10310.00	380.30	1326.25	533.32	2.00	Bone Spring 2nd
10444.34	0.00	74.00	10326.18	380.31	1326.29	533.34	2.00	Hold Vertical
10500.00	0.00	359.79	10381.83	380.31	1326.29	533.34	0.00	
10600.00	0.00	359.79	10481.83	380.31	1326.29	533.34	0.00	
10700.00	0.00	359.79	10581.83	380.31	1326.29	533.34	0.00	
10800.00	0.00	359.79	10681.83	380.31	1326.29	533.34	0.00	
10900.00	0.00	359.79	10781.83	380.31	1326.29	533.34	0.00	
10923.17	0.00	359.79	10805.00	380.31	1326.29	533.34	0.00	3rd Bone Spring Lime
11000.00	0.00	359.79	10881.83	380.31	1326.29	533.34	0.00	
11100.00	0.00	359.79	10981.83	380.31	1326.29	533.34	0.00	
11200.00	0.00	359.79	11081.83	380.31	1326.29	533.34	0.00	
11300.00	0.00	359.79	11181.83	380.31	1326.29	533.34	0.00	
11400.00	0.00	359.79	11281.83	380.31	1326.29	533.34	0.00	
11500.00	0.00	359.79	11381.83	380.31	1326.29	533.34	0.00	
11533.17	0.00	359.79	11415.00	380.31	1326.29	533.34	0.00	Bone Spring 3rd
11600.00	0.00	359.79	11481.83	380.31	1326.29	533.34	0.00	
11700.00	0.00	359.79	11581.83	380.31	1326.29	533.34	0.00	
11800.00	0.00	359.79	11681.83	380.31	1326.29	533.34	0.00	
11820.21	0.00	359.79	11702.04	380.31	1326.29	533.34	0.00	KOP
11900.00	7.98	359.79	11781.58	385.86	1326.27	538.84	10.00	
12000.00	17.98	359.79	11878.90	408.29	1326.19	561.11	10.00	
12033.02	21.28	359.79	11910.00	419.38	1326.15	572.12	10.00	Wolfcamp / Point of Penetration
12100.00	27.98	359.79	11970.85	447.28	1326.05	599.81	10.00	
12200.00	37.98	359.79	12054.63	501.64	1325.85	653.78	10.00	
12300.00	47.98	359.79	12127.69	569.73	1325.60	721.36	10.00	
12400.00	57.98	359.79	12187.83	649.47	1325.30	800.52	10.00	
12500.00	67.98	359.79	12233.20	738.44	1324.98	888.84	10.00	

devon

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MD (ft)	INC (°)	AZI (°)	TVD (ft)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Comment
12600.00	77.98	359.79	12262.44	833.93	1324.63	983.63	10.00	
12700.00	87.98	359.79	12274.64	933.06	1324.26	1082.03	10.00	
12721.07	90.09	359.79	12275.00	954.13	1324.19	1102.94	10.00	Landing Point
12800.00	90.09	359.79	12274.88	1033.05	1323.90	1181.29	0.00	
12900.00	90.09	359.79	12274.73	1133.05	1323.53	1280.56	0.00	
13000.00	90.09	359.79	12274.58	1233.05	1323.17	1379.82	0.00	
13100.00	90.09	359.79	12274.43	1333.05	1322.80	1479.09	0.00	
13200.00	90.09	359.79	12274.28	1433.05	1322.43	1578.35	0.00	
13300.00	90.09	359.79	12274.13	1533.05	1322.06	1677.62	0.00	
13400.00	90.09	359.79	12273.98	1633.05	1321.70	1776.88	0.00	
13500.00	90.09	359.79	12273.83	1733.05	1321.33	1876.15	0.00	
13600.00	90.09	359.79	12273.68	1833.05	1320.96	1975.41	0.00	
13700.00	90.09	359.79	12273.52	1933.05	1320.60	2074.68	0.00	
13800.00	90.09	359.79	12273.37	2033.05	1320.23	2173.94	0.00	
13900.00	90.09	359.79	12273.22	2133.05	1319.86	2273.21	0.00	
14000.00	90.09	359.79	12273.07	2233.04	1319.50	2372.47	0.00	
14100.00	90.09	359.79	12272.92	2333.04	1319.13	2471.74	0.00	
14200.00	90.09	359.79	12272.77	2433.04	1318.76	2571.00	0.00	
14300.00	90.09	359.79	12272.62	2533.04	1318.39	2670.27	0.00	
14400.00	90.09	359.79	12272.47	2633.04	1318.03	2769.53	0.00	
14500.00	90.09	359.79	12272.32	2733.04	1317.66	2868.80	0.00	
14600.00	90.09	359.79	12272.17	2833.04	1317.29	2968.06	0.00	
14700.00	90.09	359.79	12272.02	2933.04	1316.93	3067.33	0.00	
14800.00	90.09	359.79	12271.87	3033.04	1316.56	3166.59	0.00	
14900.00	90.09	359.79	12271.72	3133.04	1316.19	3265.86	0.00	
15000.00	90.09	359.79	12271.56	3233.04	1315.82	3365.12	0.00	
15100.00	90.09	359.79	12271.41	3333.04	1315.46	3464.39	0.00	
15200.00	90.09	359.79	12271.26	3433.03	1315.09	3563.65	0.00	
15300.00	90.09	359.79	12271.11	3533.03	1314.72	3662.92	0.00	
15400.00	90.09	359.79	12270.96	3633.03	1314.36	3762.18	0.00	
15500.00	90.09	359.79	12270.81	3733.03	1313.99	3861.45	0.00	
15600.00	90.09	359.79	12270.66	3833.03	1313.62	3960.71	0.00	
15700.00	90.09	359.79	12270.51	3933.03	1313.26	4059.98	0.00	
15800.00	90.09	359.79	12270.36	4033.03	1312.89	4159.24	0.00	
15900.00	90.09	359.79	12270.21	4133.03	1312.52	4258.51	0.00	
16000.00	90.09	359.79	12270.06	4233.03	1312.15	4357.77	0.00	
16100.00	90.09	359.79	12269.91	4333.03	1311.79	4457.04	0.00	
16200.00	90.09	359.79	12269.76	4433.03	1311.42	4556.30	0.00	
16300.00	90.09	359.79	12269.61	4533.03	1311.05	4655.57	0.00	
16400.00	90.09	359.79	12269.45	4633.03	1310.69	4754.83	0.00	
16500.00	90.09	359.79	12269.30	4733.02	1310.32	4854.10	0.00	
16600.00	90.09	359.79	12269.15	4833.02	1309.95	4953.36	0.00	
16700.00	90.09	359.79	12269.00	4933.02	1309.58	5052.63	0.00	
16800.00	90.09	359.79	12268.85	5033.02	1309.22	5151.89	0.00	
16900.00	90.09	359.79	12268.70	5133.02	1308.85	5251.16	0.00	
17000.00	90.09	359.79	12268.55	5233.02	1308.48	5350.42	0.00	
17100.00	90.09	359.79	12268.40	5333.02	1308.12	5449.69	0.00	
17200.00	90.09	359.79	12268.25	5433.02	1307.75	5548.95	0.00	
17300.00	90.09	359.79	12268.10	5533.02	1307.38	5648.22	0.00	
17400.00	90.09	359.79	12267.95	5633.02	1307.02	5747.48	0.00	
17500.00	90.09	359.79	12267.80	5733.02	1306.65	5846.75	0.00	
17600.00	90.09	359.79	12267.65	5833.02	1306.28	5946.01	0.00	
17700.00	90.09	359.79	12267.50	5933.02	1305.91	6045.28	0.00	
17800.00	90.09	359.79	12267.34	6033.01	1305.55	6144.54	0.00	
17900.00	90.09	359.79	12267.19	6133.01	1305.18	6243.81	0.00	
18000.00	90.09	359.79	12267.04	6233.01	1304.81	6343.07	0.00	
18100.00	90.09	359.79	12266.89	6333.01	1304.45	6442.34	0.00	
18200.00	90.09	359.79	12266.74	6433.01	1304.08	6541.60	0.00	
18300.00	90.09	359.79	12266.59	6533.01	1303.71	6640.87	0.00	
18400.00	90.09	359.79	12266.44	6633.01	1303.34	6740.13	0.00	
18500.00	90.09	359.79	12266.29	6733.01	1302.98	6839.40	0.00	
18600.00	90.09	359.79	12266.14	6833.01	1302.61	6938.66	0.00	
18700.00	90.09	359.79	12265.99	6933.01	1302.24	7037.93	0.00	
18800.00	90.09	359.79	12265.84	7033.01	1301.88	7137.19	0.00	
18900.00	90.09	359.79	12265.69	7133.01	1301.51	7236.46	0.00	
19000.00	90.09	359.79	12265.54	7233.00	1301.14	7335.72	0.00	
19100.00	90.09	359.79	12265.38	7333.00	1300.78	7434.99	0.00	
19200.00	90.09	359.79	12265.23	7433.00	1300.41	7534.25	0.00	
19300.00	90.09	359.79	12265.08	7533.00	1300.04	7633.52	0.00	
19400.00	90.09	359.79	12264.93	7633.00	1299.67	7732.78	0.00	

devon

Well: Marwari 21-16 State Fed Com 731H
County: Lea
Wellbore: Permit Plan
Design: Permit Plan #1

Geodetic System: US State Plane 1983
Datum: North American Datum 1927
Ellipsoid: Clarke 1866
Zone: 3001 - NM East (NAD83)

MD (ft)	INC (°)	AZI (°)	TVD (ft)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Comment
19500.00	90.09	359.79	12264.78	7733.00	1299.31	7832.05	0.00	
19600.00	90.09	359.79	12264.63	7833.00	1298.94	7931.31	0.00	
19700.00	90.09	359.79	12264.48	7933.00	1298.57	8030.58	0.00	
19800.00	90.09	359.79	12264.33	8033.00	1298.21	8129.84	0.00	
19900.00	90.09	359.79	12264.18	8133.00	1297.84	8229.11	0.00	
20000.00	90.09	359.79	12264.03	8233.00	1297.47	8328.37	0.00	
20100.00	90.09	359.79	12263.88	8333.00	1297.11	8427.64	0.00	
20200.00	90.09	359.79	12263.73	8433.00	1296.74	8526.90	0.00	
20300.00	90.09	359.79	12263.58	8532.99	1296.37	8626.17	0.00	
20400.00	90.09	359.79	12263.43	8632.99	1296.00	8725.43	0.00	
20500.00	90.09	359.79	12263.27	8732.99	1295.64	8824.70	0.00	
20600.00	90.09	359.79	12263.12	8832.99	1295.27	8923.96	0.00	
20700.00	90.09	359.79	12262.97	8932.99	1294.90	9023.23	0.00	
20800.00	90.09	359.79	12262.82	9032.99	1294.54	9122.49	0.00	
20900.00	90.09	359.79	12262.67	9132.99	1294.17	9221.76	0.00	
21000.00	90.09	359.79	12262.52	9232.99	1293.80	9321.03	0.00	
21100.00	90.09	359.79	12262.37	9332.99	1293.43	9420.29	0.00	
21200.00	90.09	359.79	12262.22	9432.99	1293.07	9519.56	0.00	
21300.00	90.09	359.79	12262.07	9532.99	1292.70	9618.82	0.00	
21400.00	90.09	359.79	12261.92	9632.99	1292.33	9718.09	0.00	
21500.00	90.09	359.79	12261.77	9732.99	1291.97	9817.35	0.00	
21600.00	90.09	359.79	12261.62	9832.98	1291.60	9916.62	0.00	
21700.00	90.09	359.79	12261.47	9932.98	1291.23	10015.88	0.00	
21800.00	90.09	359.79	12261.32	10032.98	1290.87	10115.15	0.00	
21900.00	90.09	359.79	12261.16	10132.98	1290.50	10214.41	0.00	
22000.00	90.09	359.79	12261.01	10232.98	1290.13	10313.68	0.00	
22100.00	90.09	359.79	12260.86	10332.98	1289.76	10412.94	0.00	
22200.00	90.09	359.79	12260.71	10432.98	1289.40	10512.21	0.00	
22300.00	90.09	359.79	12260.56	10532.98	1289.03	10611.47	0.00	
22400.00	90.09	359.79	12260.41	10632.98	1288.66	10710.74	0.00	
22500.00	90.09	359.79	12260.26	10732.98	1288.30	10810.00	0.00	
22583.69	90.09	359.79	12260.13	10816.67	1287.99	10893.08	0.00	EXIT
22600.00	90.09	359.79	12260.11	10832.98	1287.93	10909.27	0.00	
22663.69	90.09	359.79	12260.00	10896.67	1287.75	10972.50	0.00	BHL

Devon Energy Center
333 West Sheridan Avenue
Oklahoma City, Oklahoma 73102-5015

Hydrogen Sulfide (H_2S) Contingency Plan

For

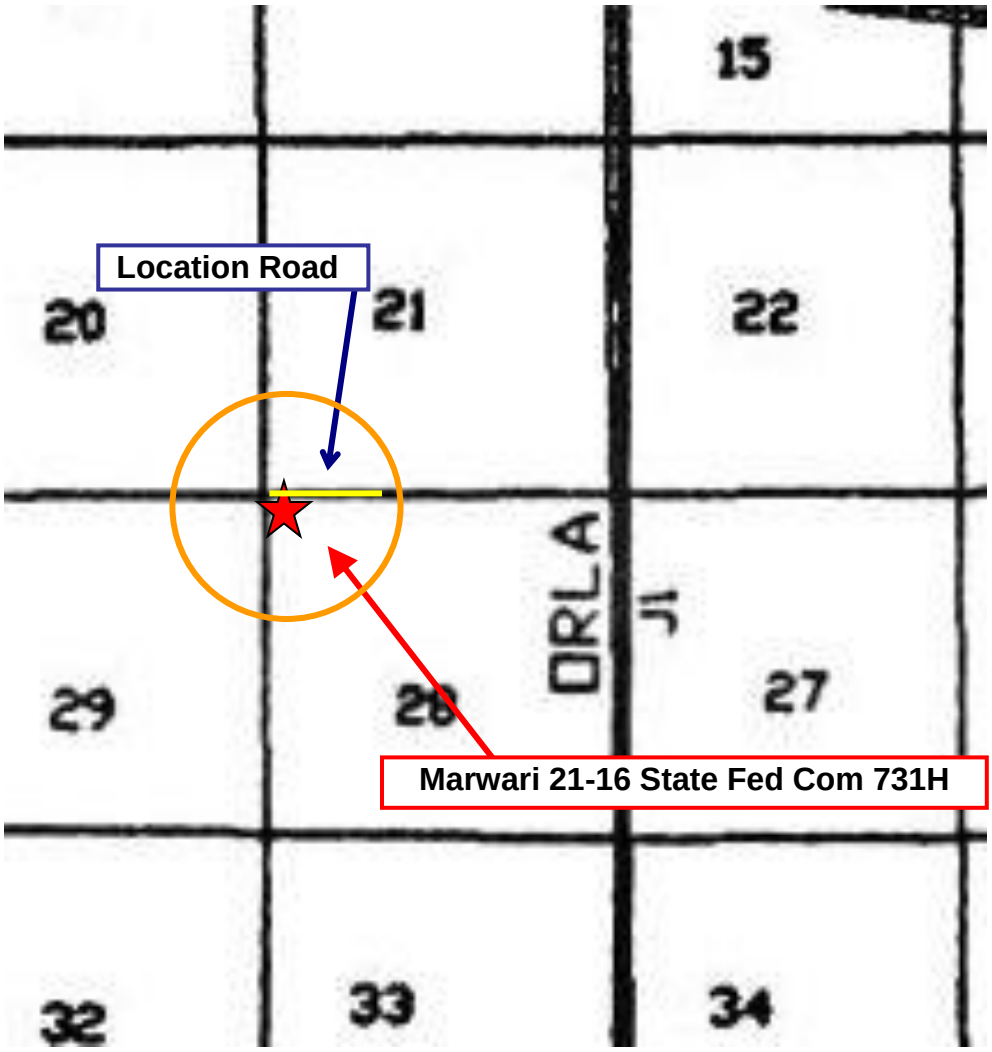
Marwari 21-16 State Fed Com 731H

Sec-28 T-25S R-32E
325’ FNL & 250’ FWL
LAT. = 32.1076832’ N (NAD83)
LONG = 103.6878706’ W

Lea County NM

Marwari 21-16 State Fed Com 731H

This is an open drilling site. H_2S monitoring equipment and emergency response equipment will be used within 500' of zones known to contain H_2S, including warning signs, wind indicators and H_2S monitor.



Assumed 100 ppm ROE = 3000' (Radius of Exposure)
100 ppm H2S concentration shall trigger activation of this plan.

Escape

Crews shall escape upwind of escaping gas in the event of an emergency release of gas. Escape can be facilitated from the location entrance road. Crews should then block the entrance to the location from the lease road so as not to allow anyone traversing into a hazardous area. The blockade should be at a safe distance outside of the ROE. There are no homes or buildings in or near the ROE.

Assumed 100 ppm ROE = 3000'

100 ppm H_2S concentration shall trigger activation of this plan.

Emergency Procedures

In the event of a release of gas containing H_2S, the first responder(s) must

- **Isolate the area and prevent entry by other persons into the 100 ppm ROE.**
- **Evacuate any public places encompassed by the 100 ppm ROE.**
- **Be equipped with H_2S monitors and air packs in order to control the release.**
- **Use the "buddy system" to ensure no injuries occur during the response**
- **Take precautions to avoid personal injury during this operation.**
- **Contact operator and/or local officials to aid in operation. See list of phone numbers attached.**
- **Have received training in the**
  - **Detection of H_2S, and**
  - **Measures for protection against the gas,**
  - **Equipment used for protection and emergency response.**

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO_2). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas

Characteristics of H_2S and SO_2

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H_2S	1.189 Air = 1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO_2	2.21 Air = 1	2 ppm	N/A	1000 ppm

Contacting Authorities

Devon Energy Corp. personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available. The following call list of essential and potential responders has been prepared for use during a release. Devon Energy Corp. Company response must be in coordination with the State of New Mexico's 'Hazardous Materials Emergency Response Plan' (HMER)

Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE (H_2S) TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

1. The hazards and characteristics of hydrogen sulfide (H_2S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H_2S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H_2S metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H_2S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H_2S zone (within 3 days or 500 feet) and weekly H_2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H_2S Drilling Operations Plan and the Public Protection Plan.

II. HYDROGEN SULFIDE TRAINING

Note: All H_2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H_2S.

1. **Well Control Equipment**

   A. Flare line

   B. Choke manifold – Remotely Operated

   C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit

   D. Auxiliary equipment may include if applicable: annular preventer and rotating head.

   E. Mud/Gas Separator

2. **Protective equipment for essential personnel:**

   30-minute SCBA units located at briefing areas, as indicated on well site diagram, with escape units available in the top doghouse. As it may be difficult to communicate audibly while wearing these units, hand signals shall be utilized.

3. **H_2S detection and monitoring equipment:**

   Portable H_2S monitors positioned on location for best coverage and response. These units have warning lights which activate when H_2S levels reach 10 ppm and audible sirens which activate at 15 ppm. Sensor locations:

   - **Bell nipple**
   - **Rig floor**
   - **Cellar**
   - **Possum Belly/Shale shaker**
   - **Choke manifold**

   Visual warning systems:

   A. Wind direction indicators as shown on well site diagram

   B. Caution/ Danger signs shall be posted on roads providing direct access to locations. Signs will be painted a high visibility yellow with black lettering of sufficient size to be reasonable distance from the immediate location. Bilingual signs will be used when appropriate.

4. **Mud program:**

   The mud program has been designed to minimize the volume of H_2S circulated to surface. Proper mud weight, safe drilling practices and the use of H_2S scavengers will minimize hazards when penetrating H_2S bearing zones.

5. **Metallurgy:**

   A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold lines, and valves shall be H_2S trim.

   B. All elastomers used for packing and seals shall be H_2S trim.

6. **Communication:**

   A. Company personnel have/use cellular telephones in the field.

   B. Land line (telephone) communications at Office

7. **Well testing:**

   A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safety and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H_2S environment will use the closed chamber method of testing.

   B. There will be no drill stem testing.

Devon Energy Corp. Company Call List		
Drilling Supervisor – Basin – Mark Kramer		405-823-4796
EHS Professional – Laura Wright		405-439-8129
Agency Call List		
Lea County (575)	**Hobbs**	
	Lea County Communication Authority	393-3981
	State Police	392-5588
	City Police	397-9265
	Sheriff's Office	393-2515
	Ambulance	**911**
	Fire Department	397-9308
	LEPC (Local Emergency Planning Committee)	393-2870
	NMOCD	393-6161
	US Bureau of Land Management	393-3612
Eddy County (575)	**Carlsbad**	
	State Police	885-3137
	City Police	885-2111
	Sheriff's Office	887-7551
	Ambulance	**911**
	Fire Department	885-3125
	LEPC (Local Emergency Planning Committee)	887-3798
	US Bureau of Land Management	887-6544
	NM Emergency Response Commission (Santa Fe)	(505) 476-9600
	24 HR	(505) 827-9126
	National Emergency Response Center	(800) 424-8802
	National Pollution Control Center: Direct	(703) 872-6000
	For Oil Spills	(800) 280-7118
	Emergency Services	
	Wild Well Control	(281) 784-4700
	Cudd Pressure Control (915) 699-0139	(915) 563-3356
	Halliburton	(575) 746-2757
	B. J. Services	(575) 746-3569
Give GPS position:	Native Air – Emergency Helicopter – Hobbs (NM and TX)	(800)642-7828
	Flight For Life - Lubbock, TX	(806) 743-9911
	Aerocare - Lubbock, TX	(806) 747-8923
	Med Flight Air Amb - Albuquerque, NM	(575) 842-4433
	Lifeguard Air Med Svc. Albuquerque, NM	(800) 222-1222
	Poison Control (24/7)	(575) 272-3115
	Oil & Gas Pipeline 24 Hour Service	(800) 364-4366
	NOAA – Website - www.nhc.noaa.gov	

Prepared in conjunction with
Dave Small

SHARP communications and consulting

devon

Commitment Runs Deep

Design Plan
Operation and Maintenance Plan
Closure Plan

SENM – Closed Loop Systems
June 2010

I. Design Plan

Devon uses MI SWACO closed loop system (CLS). The MI SWACO CLS is designed to maintain drill solids at or below 5%. The equipment is arranged to progressively remove solids from the largest to the smallest size. Drilling fluids can thus be reused and savings is realized on mud and disposal costs. Dewatering may be required with the centrifuges to insure removal of ultra fine solids.

The drilling location is constructed to allow storm water to flow to a central sump normally the cellar. This insures no contamination leaves the drilling pad in the event of a spill. Storm water is reused in the mud system or stored in a reserve fluid tank farm until it can be reused. All lubricants, oils, or chemicals are removed immediately from the ground to prevent the contamination of storm water. An oil trap is normally installed on the sump if an oil spill occurs during a storm.

A tank farm is utilized to store drilling fluids including fresh water and brine fluids. The tank farm is constructed on a 20 ml plastic lined, bermed pad to prevent the contamination of the drilling site during a spill. Fluids from other sites may be stored in these tanks for processing by the solids control equipment and reused in the mud system. At the end of the well the fluids are transported from the tank farm to an adjoining well or to the next well for the rig.

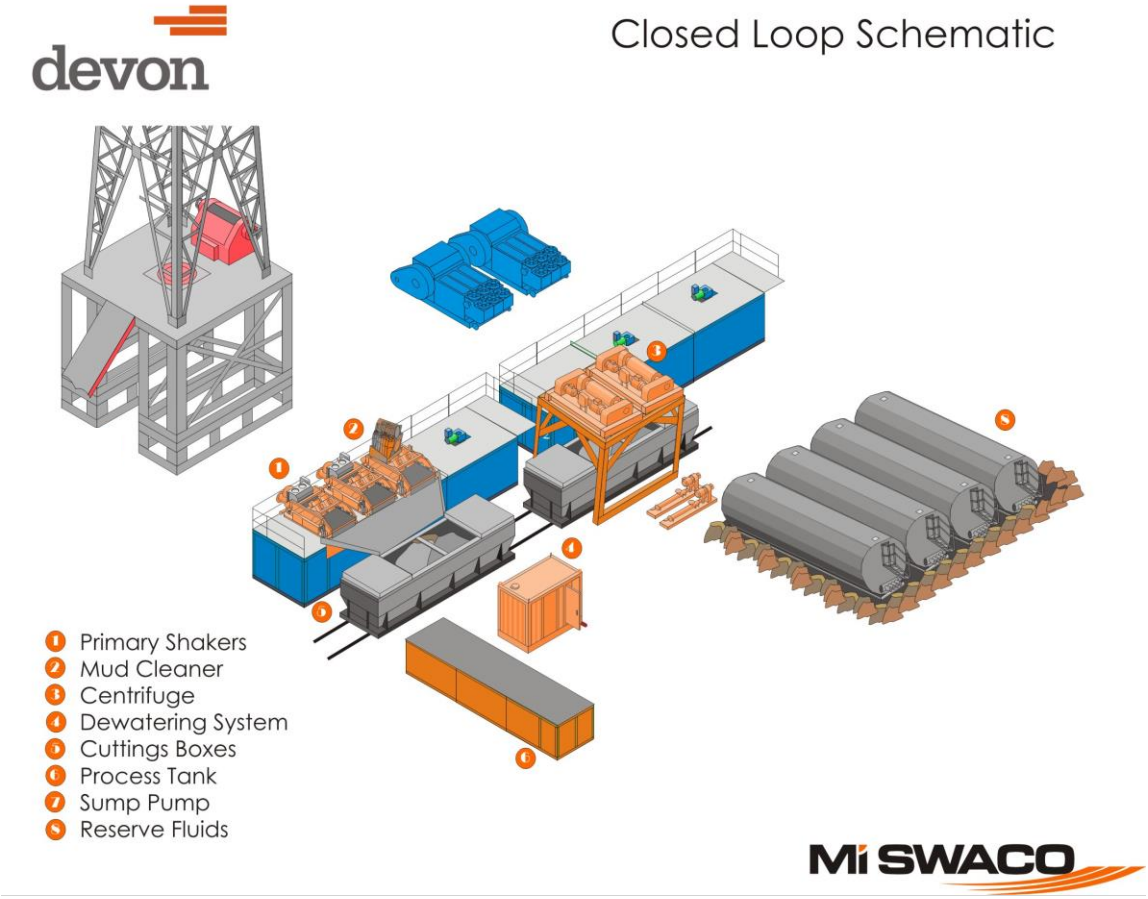
Prior to installing a closed-loop system on site, the topsoil, if present, will be stripped and stockpiled for use as the final cover or fill at the time of closure.

Signs will be posted on the fence surrounding the closed-loop system unless the closed-loop system is located on a site where there is an existing well, that is operated by Devon.

II. Operations and Maintenance Plan

Primary Shakers: The primary shakers make the first removal of drill solids from the drilling mud as it leaves the well bore. The shakers are sized to handle maximum drilling rate at optimal screen size. The shakers normally remove solids down to 74 microns.

Mud Cleaner: The Mud Cleaner cleans the fluid after it leaves the shakers. A set of hydrocyclones are sized to handle 1.25 to 1.5 times the maximum circulating rate. This ensures all the fluid is being processed to an average cut point of 25 microns. The wet discharged is dewatered on a shaker equipped with ultra fine mesh screens and generally cut at 40 microns.



Centrifuges: The centrifuges can be one or two in number depending on the well geometry or depth of well. The centrifuges are sized to maintain low gravity solids at 5% or below. They may or may not need a dewatering system to enhance the removal rates. The centrifuges can make a cut point of 8-10 microns depending on bowl speed, feed rate, solids loading and other factors.

The centrifuge system is designed to work on the active system and be flexible to process incoming fluids from other locations. This set-up is also dependant on well factors.

Dewatering System: The dewatering system is a chemical mixing and dosing system designed to enhance the solids removal of the centrifuge. Not commonly used in shallow wells. It may contain pH adjustment, coagulant mixing and dosing, and polymer mixing and dosing. Chemical flocculation binds ultra fine solids into a mass that is within the centrifuge operating design. The

dewatering system improves the centrifuge cut point to infinity or allows for the return of clear water or brine fluid. This ability allows for the ultimate control of low gravity solids.

Cuttings Boxes: Cuttings boxes are utilized to capture drill solids that are discarded from the solids control equipment. These boxes are set upon a rail system that allows for the removal and replacement of a full box of cuttings with an empty one. They are equipped with a cover that insures no product is spilled into the environment during the transportation phase.

Process Tank: (Optional) The process tank allows for the holding and process of fluids that are being transferred into the mud system. Additionally, during times of lost circulation the process tank may hold active fluids that are removed for additional treatment. It can further be used as a mixing tank during well control conditions.

Sump and Sump Pump: The sump is used to collect storm water and the pump is used to transfer this fluid to the active system or to the tank for to hold in reserve. It can also be used to collect fluids that may escape during spills. The location contains drainage ditches that allow the location fluids to drain to the sump.

Reserve Fluids (Tank Farm): A series of frac tanks are used to replace the reserve pit. These are steel tanks that are equipped with a manifold system and a transfer pump. These tanks can contain any number of fluids used during the drilling process. These can include fresh water, cut brine, and saturated salt fluid. The fluid can be from the active well or reclaimed fluid from other locations. A 20 ml liner and berm system is employed to ensure the fluids do not migrate to the environment during a spill.

If a leak develops, the appropriate division district office will be notified within 48 hours of the discovery and the leak will be addressed. Spill prevention is accomplished by maintaining pump packing, hoses, and pipe fittings to insure no leaks are occurring. During an upset condition the source of the spill is isolated and repaired as soon as it is discovered. Free liquid is removed by a diaphragm pump and returned to the mud system. Loose topsoil may be used to stabilize the spill and the contaminated soil is excavated and placed in the cuttings boxes. After the well is finished and the rig has moved, the entire location is scrapped and testing will be performed to determine if a release has occurred.

All trash is kept in a wire mesh enclosure and removed to an approved landfill when full. All spent motor oils are kept in separate containers and they are removed and sent to an approved recycling center. Any spilled lubricants, pipe

dope, or regulated chemicals are removed from soil and sent to landfills approved for these products.

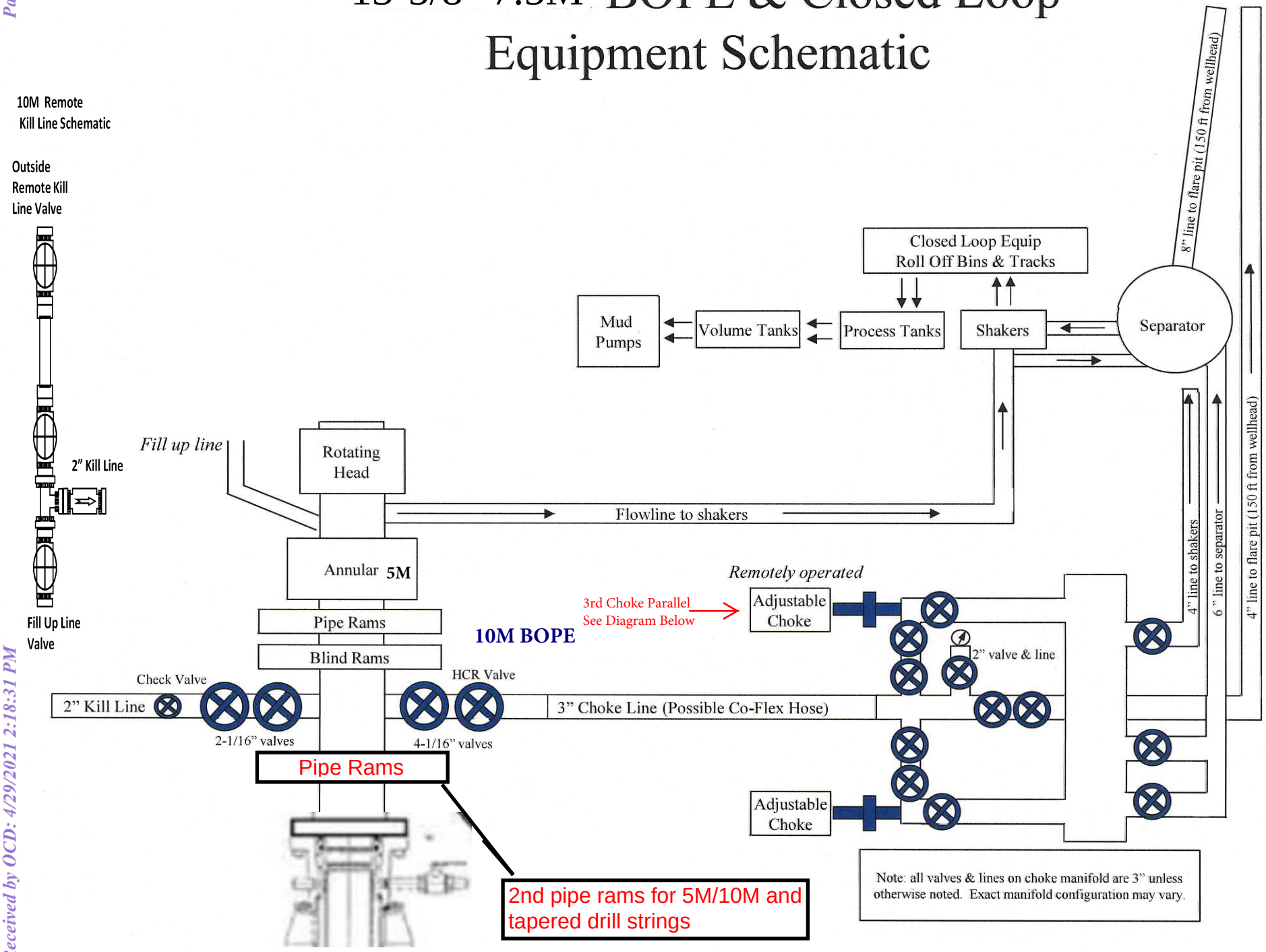
These operations are monitored by Mi Swaco service technicians. Daily logs are maintained to ensure optimal equipment operation and maintenance. Screen and chemical use is logged to maintain inventory control. Fluid properties are monitored and recorded and drilling mud volumes are accounted for in the mud storage farm. This data is kept for end of well review to insure performance goals are met. Lessons learned are logged and used to help with continuous improvement.

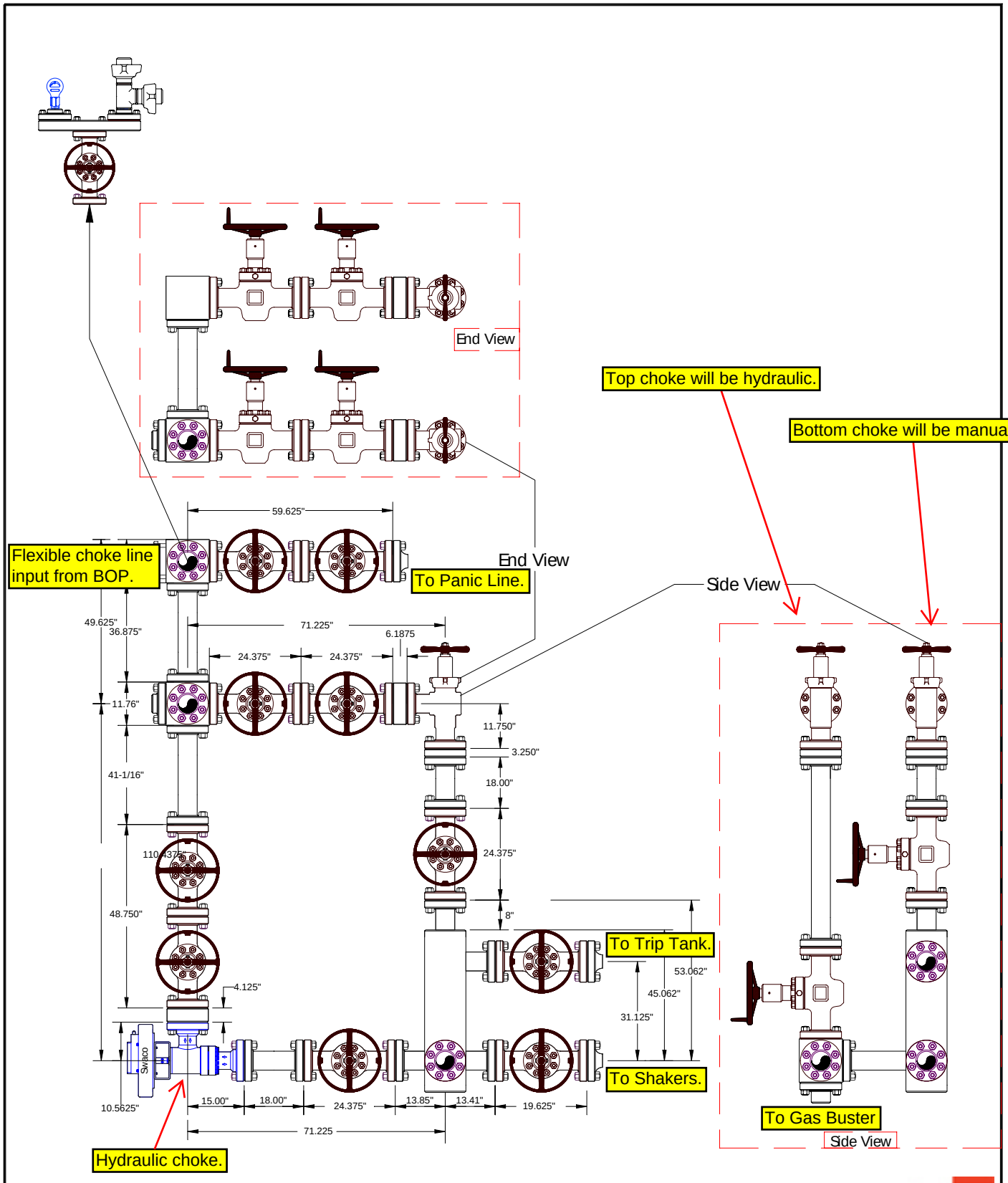
A MI SWACO field supervisor manages from 3-5 wells. They are responsible for training personnel, supervising installations, and inspecting sites for compliance of MI SWACO safety and operational policy.

III. Closure Plan

A maximum 340' X 340' caliche pad is built per well. All of the trucks and steel tanks fit on this pad. All fluid cuttings go to the steel tanks to be hauled by various trucking companies to an agency approved disposal.

13-5/8" 7.5M BOPE & Closed Loop Equipment Schematic




End View
Top choke will be hydraulic.
Bottom choke will be manual.
59.625"
Flexible choke line input from BOP.
End View
To Panic Line.
Side View
49.625"
36.875"
71.225"
6.1875
24.375"
24.375"
11.76"
11.750"
3.250"
18.00"
41-1/16"
24.375"
48.750"
8"
To Trip Tank.
53.062"
45.062"
31.125"
4.125"
To Shakers.
10.5625"
15.00"
18.00"
24.375"
13.85"
13.41"
19.625"
71.225
Hydraulic choke.
To Gas Buster
Side View
Helmerich & Payne
Flex 3 Rig w/ 3 Chokes
devon
Name: Mike Potts
Date: 6-23-2010
Working Pressure: 10M
J-5132-E

Devon Energy Annular Preventer Summary

1. Component and Preventer Compatibility Table

The table below, which covers the drilling and casing of the 10M MASP portion of the well, outlines the tubulars and the compatible preventers in use. This table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the rating of the annular preventer.

6-3/4" Production hole section, 10M requirement

Component	OD	Preventer	RWP
Drillpipe	4.5"	Fixed lower 4.5" Upper 4.5-7" VBR	10M
HWDP	4.5"	Fixed lower 4.5" Upper 4.5-7" VBR	10M
Drill collars and MWD tools	4.75"	Upper 4.5-7" VBR	10M
Mud Motor	4.75"	Upper 4.5-7" VBR	10M
Production casing	5.5"	Upper 4.5-7" VBR	10M
ALL	0-13-5/8"	Annular	5M
Open-hole	-	Blind Rams	10M

VBR = Variable Bore Ram. Compatible range listed in chart.

2. 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 drilling, tripping, running casing, pipe out of the hole (open hole), and moving the BHA through the BOPs. The pressure at which control is swapped from the annular to another compatible ram is variable, but the operator will document in the submission their operating pressure limit. The operator may chose an operating pressure less than or equal to RWP, but in no case will it exceed the RWP of the annular preventer.

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 the RWP of the annular preventer, confirm spacing and swap to the upper pipe ram.

Devon Energy Annular Preventer Summary

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 the RWP of the annular preventer, confirm spacing and swap to the upper pipe ram.

General Procedure While Running 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 the RWP of the annular preventer, confirm spacing and swap to compatible pipe ram.

General Procedure With No Pipe In Hole (Open Hole)

1. Sound alarm (alert crew)
2. Shut-in with blind rams or BSR. (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

Devon Energy Annular Preventer Summary

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 pipe ram.
    e. Shut-in using upper pipe ram. (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 compatible pipe ram.
    d. Shut-in using compatible pipe ram. (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 pipe ram.
    f. Shut-in using upper pipe 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

A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

Devon proposes using a multi-bowl wellhead assembly. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 5000 (5M) psi.

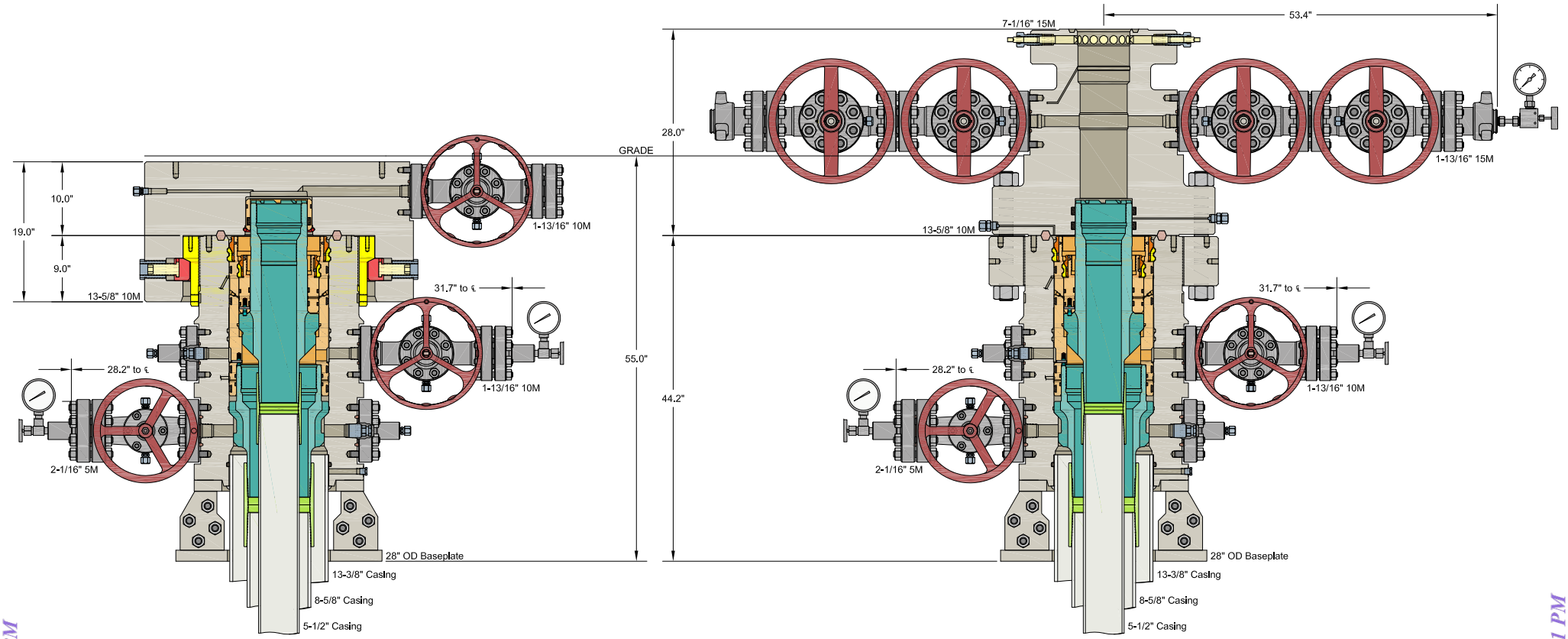
- Wellhead will be installed by wellhead representatives.
- If the welding is performed by a third party, the wellhead representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
- Wellhead representative will install the test plug for the initial BOP test.
- Wellhead company will install a solid steel body pack-off to completely isolate the lower head after cementing intermediate casing. After installation of the pack-off, the pack-off and the lower flange will be tested to 5M, as shown on the attached schematic. Everything above the pack-off will not have been altered whatsoever from the initial nipple up. Therefore the BOP components will not be retested at that time.
- If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head will be cut and top out operations will be conducted.
- Devon will pressure test all seals above and below the mandrel (but still above the casing) to full working pressure rating.
- Devon will test the casing to 0.22 psi/ft or 1500 psi, whichever is greater, as per Onshore Order #2.

After running the surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 5M will be installed on the wellhead system and will undergo a 250 psi low pressure test followed by a 5,000 psi high pressure test. The 5,000 psi high and 250 psi low test will cover testing requirements a maximum of 30 days, as per Onshore Order #2. If the well is not complete within 30 days of this BOP test, another full BOP test will be conducted, as per Onshore Order #2.

After running the intermediate casing with a mandrel hanger, the 13-5/8" BOP/BOPE system with a minimum rating of 10M will be installed and tested, with 5M annular being tested to 100% of rated working pressure.

The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. A 2" kill line and 3" choke line will be incorporated into the drilling spool below the ram BOP. In addition to the rams and annular preventer, additional BOP accessories include a kelly cock, floor safety valve, choke lines, and choke manifold rated at 10,000 psi WP.

Devon's proposed wellhead manufactures will be FMC Technologies, Cactus Wellhead, or Cameron.



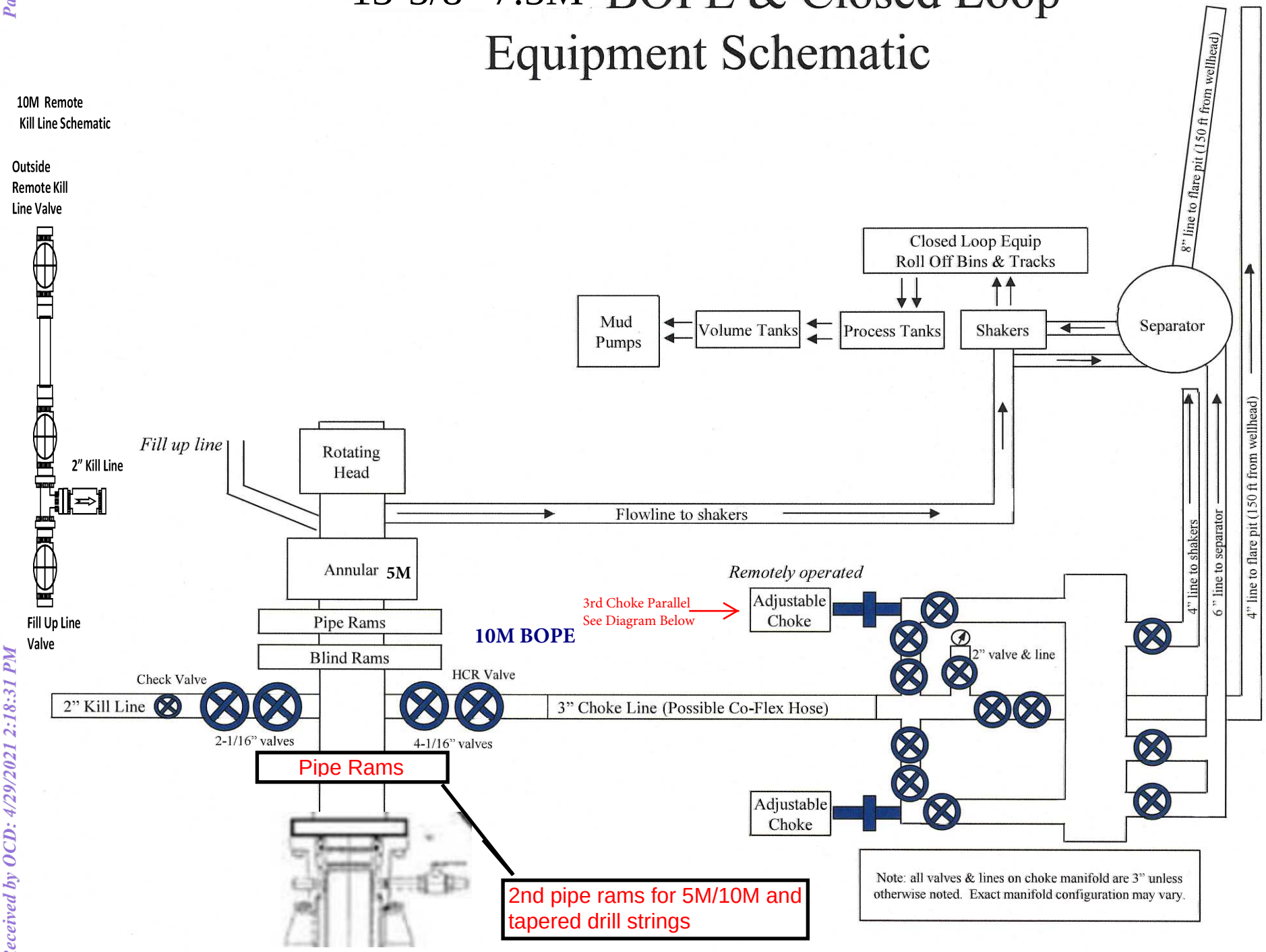
CACTUS WELLHEAD LLC

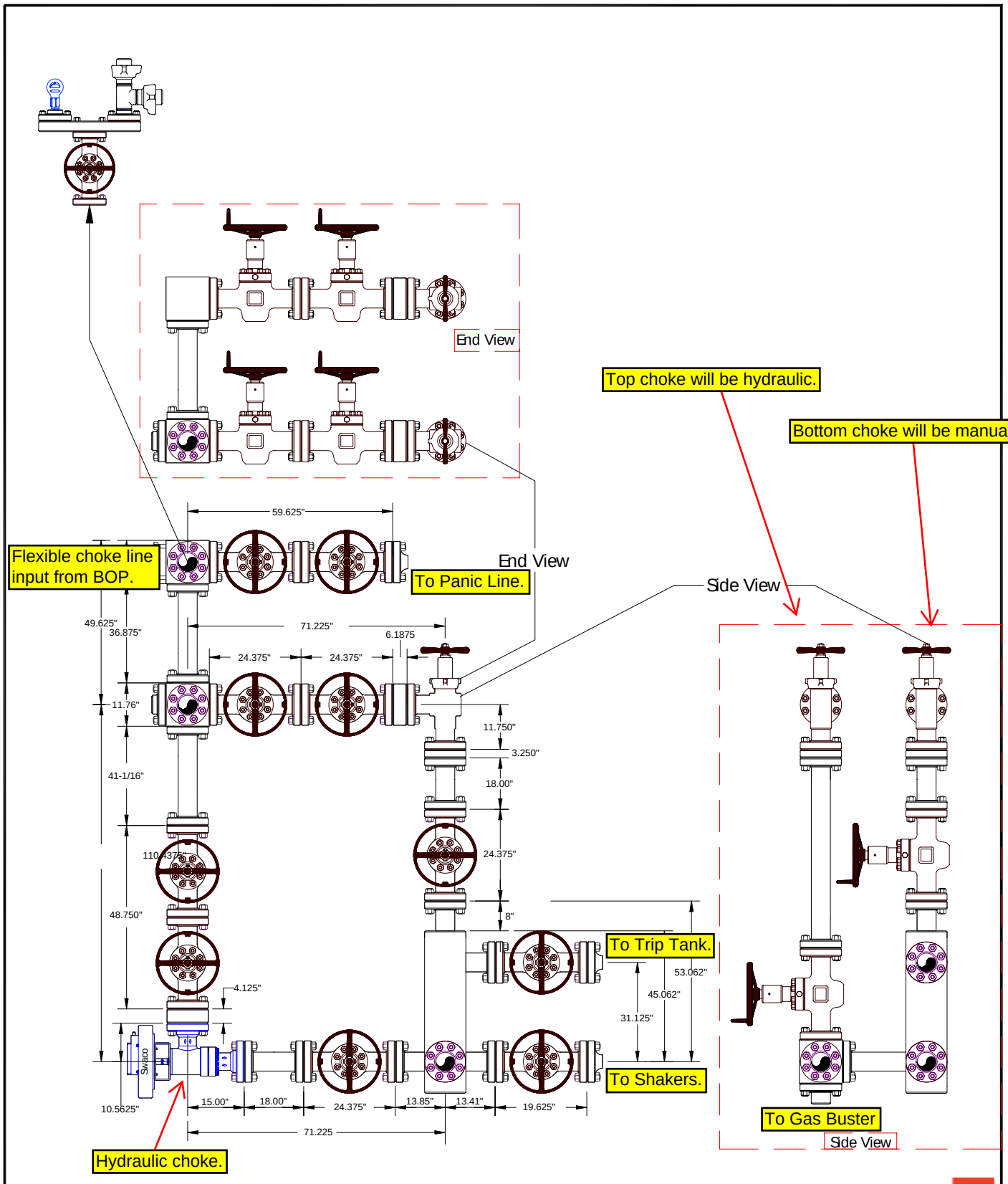
DEVON ENERGY CORPORATIO

13-3/8" x 8-5/8" x 5-1/2" 5M MBU-3T Wellhead System
With 8-5/8" & 5-1/2" Pin Down Rotating Mandrel Hangers
And 13-5/8" 10M x 7-1/16" 15M CTH-P-DBLHPS Tubing Head

DRAWN	DLE	10MAY18
APPRV		
DRAWING NO.	ODE0002309	

13-5/8" 7.5M BOPE & Closed Loop Equipment Schematic




End View
Top choke will be hydraulic.
Bottom choke will be manual.
59.625"
Flexible choke line input from BOP.
End View
To Panic Line.
Side View
49.625"
36.875"
71.225"
6.1875
24.375"
24.375"
11.76"
11.750"
3.250"
18.00"
41-1/16"
24.375"
8"
48.750"
To Trip Tank.
53.062"
45.062"
31.125"
4.125"
To Shakers.
10.5625"
15.00"
18.00"
24.375"
13.85"
13.41"
19.625"
71.225
Hydraulic choke.
To Gas Buster
Side View
Helmerich & Payne
Flex 3 Rig w/ 3 Chokes
devon
Mike Potts
Name:
6-23-2010
Date:
10M
Working Pressure:
J-5132-E

Casing Assumptions and Load Cases

Surface

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Surface Casing Burst Design		
Load Case	**External Pressure**	**Internal Pressure**
Pressure Test	Formation Pore Pressure	Max mud weight of next hole-section plus Test psi
Drill Ahead	Formation Pore Pressure	Max mud weight of next hole section
Displace to Gas	Formation Pore Pressure	Dry gas from next casing point

Surface Casing Collapse Design		
Load Case	**External Pressure**	**Internal Pressure**
Full Evacuation	Water gradient in cement, mud above TOC	None
Cementing	Wet cement weight	Water (8.33ppg)

Surface Casing Tension Design	
Load Case	**Assumptions**
Overpull	100kips
Runing in hole	3 ft/s
Service Loads	N/A

Casing Assumptions and Load Cases

Intermediate

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Intermediate Casing Burst Design		
Load Case	**External Pressure**	**Internal Pressure**
Pressure Test	Formation Pore Pressure	Max mud weight of next hole-section plus Test psi
Drill Ahead	Formation Pore Pressure	Max mud weight of next hole section
Fracture @ Shoe	Formation Pore Pressure	Dry gas

Intermediate Casing Collapse Design		
Load Case	**External Pressure**	**Internal Pressure**
Full Evacuation	Water gradient in cement, mud above TOC	None
Cementing	Wet cement weight	Water (8.33ppg)

Intermediate Casing Tension Design	
Load Case	**Assumptions**
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A

Casing Assumptions and Load Cases

Production

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Production Casing Burst Design		
Load Case	**External Pressure**	**Internal Pressure**
Pressure Test	Formation Pore Pressure	Fluid in hole (water or produced water) + test psi
Tubing Leak	Formation Pore Pressure	Packer @ KOP, leak below surface 8.6 ppg packer fluid
Stimulation	Formation Pore Pressure	Max frac pressure with heaviest frac fluid

Production Casing Collapse Design		
Load Case	**External Pressure**	**Internal Pressure**
Full Evacuation	Water gradient in cement, mud above TOC.	None
Cementing	Wet cement weight	Water (8.33ppg)

Production Casing Tension Design	
Load Case	**Assumptions**
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Operator:	OGRID:
DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	6137
	Action Number: 26361
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
pkautz	Will require a File As Drilled C-102 and a Directional Survey with the C-104	6/14/2021
pkautz	Will require a administrative order for non-standard location prior to placing the well on production	6/14/2021
pkautz	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	6/14/2021