

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTN.M. OIL CONSERVATION
ARTESIA DISTRICTFORM APPROVED
OMB NO 1004-0137
Expires January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
Do not use this form for proposals to drill or to re-enter an abandoned well Use form 3160-3 (APD) for such proposals

APR 18 2018

RECEIVED

5	Lease Serial No NMNM22080
6	If Indian, Allottee or Tribe Name
7	If Unit or CA/Agreement, Name and/or No
8	Well Name and No 300150 TOMBRAIDER 312 F20118H
9	API Well No 30-015-44811-00-X1
10	Field and Pool or Exploratory Area LIVINGSTON RIDGE
11	County or Parish, State EDDY COUNTY, NM

SUBMIT IN TRIPLICATE - Other instructions on page 2

1	Type of Well ☒ Oil Well ☐ Gas Well ☐ Other
2	Name of Operator DEVON ENERGY PRODUCTION COMPANY LP Contact LINDA GOOD E-Mail linda.good@devn.com
3a	Address 333 WEST SHERIDAN AVENUE OKLAHOMA OK 73102
3b	Phone No (include area code) Ph 405 552 6558
4	Location of Well (Footage Sec T R M or Survey Description) Sec 1 T23S R31E 360FNL 1040FEL 32 339725 N Lat, 103 726326 W Lon

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

TYPE OF SUBMISSION	TYPE OF ACTION
☒ Notice of Intent	☐ Acidize ☐ Deepen ☐ Production (Start/Resume) ☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing ☐ Hydraulic Fracturing ☐ Reclamation ☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair ☐ New Construction ☐ Recomplete ☒ Other
	☐ Change Plans ☐ Plug and Abandon ☐ Temporarily Abandon ☐ Change to Original APD
	☐ Convert to Injection ☐ Plug Back ☐ Water Disposal

13 Describe Proposed or Completed Operation Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomple horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recomple in a new interval a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements including reclamation have been completed and the operator has determined that the site is ready for final inspection.

Devon Energy respectfully requests to amend the following items on the original APD

- 1 Change surface casing shoe from 771' to 750' MD
- 2 Amend hole size in primary casing design / make show intermediate casing shoe deeper
- 3 Add contingency casing design
- 4 Add contingency cement options for intermediate casing string
- 5 Update Other Facets of Operation section to include option to walk rig / batch drill
- 6 Change well name from Tomb Raider 312 F20118H to Tomb Raider 312 F20118H

Please see attached plan

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

14 I hereby certify that the foregoing is true and correct	
Electronic Submission #410775 verified by the BLM Well Information System For DEVON ENERGY PRODUCTION COMPANY LP, sent to the Carlsbad Committed to AFMSS for processing by PRISCILLA PEREZ on 04/09/2018 (18PP1476SE)	
Name (Printed/Typed) LINDA GOOD	Title REGULATORY SPECIALIST
Signature (Electronic Submission)	Date 04/09/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ZOTA STEVENS	Title PETROLEUM ENGINEER	Date 04/10/2018
Conditions of approval if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office Carlsbad

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

(Instructions on page 2)

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

RWP 4-18-18

Tomb Raider 1-12 Fed 718H

1 Geologic Formations

TVD of target	11,879	Pilot hole depth	N/A
MD at TD	21,944	Deepest expected fresh water	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Rustler	698		
Salado	1162		
Base of Salt/Delaware	4558		
Cherry Canyon	5431		
Lower Brushy	8082		
1st BSPG Lime	8359		
1st BSPG Sand	9458		
2nd BSPG Sand	10023		
3rd BSPG Sand	11230		
Wolfcamp	11660		
TZ Top	11829		
TZ Base	11880		
Wolfcamp 200	12127		

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

Tomb Raider 1-12 Fed 718H

2 Casing Program (3-String Primary Design)

Hole Size	Casing Interval		Csg Size	Wt (PPF)	Grade	Conn	Min SF Collapse	Min SF Burst	Min SF Tension
	From	To							
17 5"	0	750'	13 3/4"	54.5	J-55	BTC	1.125	1.00	1.6 Dry 1.8 Wet
12 25"	0	8,500'	7 6/8"	29.87	P-110	BTC	1.125	1.00	1.6 Dry 1.8 Wet
9 875"	8,500'	11,925'							
6 75"	0	21,944'	5 5"	20	P-110EC	VamSG	1.125	1.00	1.6 Dry 1.8 Wet
BLM Minimum Safety Factor							1.125	1.00	1.6 Dry 1.8 Wet

- All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III B 1 h Must have table for contingency casing
- Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed
- 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 7-5/8" casing and 5-1/2" SF/Flush casing

Casing Program (4-String Contingency Design)

Hole Size	Casing Interval		Csg Size	Wt. (PPF)	Grade	Conn	Min SF Collapse	Min SF Burst	Min SF Tension
	From	To							
17 5"	0	750'	13 3/4"	54.5	J-55	BTC	1.125	1.00	1.6 Dry 1.8 Wet
12 25"	0	4,500'	9 6/8"	40	J-55	BTC	1.125	1.00	1.6 Dry 1.8 Wet
	4,500'	6,000-8,500'			HCK-55	BTC	1.125	1.00	1.6 Dry 1.8 Wet
8 75"	6,000-8,500'	11,925'	7 6/8"	29.87	P-110	Flushmax	1.125	1.00	1.6 Dry 1.8 Wet
6 75"	0	21,944'	5 5"	20	P110	VamSG	1.125	1.00	1.6 Dry 1.8 Wet
BLM Minimum Safety Factor							1.125	1.00	1.6 Dry 1.8 Wet

- All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III B 1 h Must have table for contingency casing
- Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed
- Int 1 / Int 2 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 7-5/8" casing and 5-1/2" SF/Flush casing

Tomb Raider 1-12 Fed 718H

3 Cementing Program (3-String Primary Design)

Casing	# Sk	TOC	Wt. (lb/gal)	H ₂ O (gal/sk)	Yld (ft ³ /sack)	Slurry Description
13 3/8" Surface	604	Surf	12 9	6 33	1 33	Lead Class C Cement + additives
7-5/8" Int	3164	Surf	9	20 6	3 31	Lead Class C Cement + additives
	218	2000' above shoe	13 2	5 31	1 2	Tail Class H / C + additives
7-5/8" Int Two Stage	2250	Surf	9	20 6	3 31	1 st stage Lead Class C Cement + additives
	55	500' above shoe	14 5	5 31	1 2	1 st stage Tail Class H / C + additives
	725	Surf	9	20 6	3 31	2 nd stage Lead Class C Cement + additives
	55	500' above DV	14 5	5 31	1 2	2 nd stage Tail Class H / C + additives
7-5/8" Intermediate Squeeze	As needed	Surf	14 8	6 32	1 33	Squeeze Lead Class C Cement + additives
	3164	Surf	9	20 6	3 31	Lead Class C Cement + additives
	218	2000' above shoe	13 2	5 31	1 6	Tail Class H / C + additives
5 1/2" Production	791	200' tieback	13 2	5 31	1 6	Lead 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	TOC	% Excess
13 3/8" Surface	0ft	50%
7 1/2" Intermediate 1	0ft	30%
7 1/2" Intermediate 1 (Two Stage)	1 st Stage = 4500ft / 2 nd Stage = 0ft	25%
5 1/2" Prod	200' tie-back into Int casing shoe	10%

Tomb Raider 1-12 Fed 718H

	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 specification 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 3 rd 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 2 nd 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?	

Tomb Raider 1-12 Fed 718H

Cementing Program (4-String Contingency Design)

Casing	# Sk	TOC	Wt (lb/gal)	H ₂ O (gal/sk)	Yld (ft ³ /sack)	Slurry Description
13 3/8" Surface	604	Surf	12 9	6 33	1 33	Lead Class C Cement + additives
9-5/8" Int 1	1735	Surf	11 2	6 33	1 33	Lead Class C Cement + additives
	166	500' above shoe	14 8	6 33	1 33	Lead Class C Cement + additives
7-5/8" Int 2	628	Surf	9	20 6	3 31	Lead Class C Cement + additives
	106	2000' above shoe	13 2	5 31	1 2	Tail Class H / C + additives
7-5/8" Int 2 Two Stage	471	Surf	9	20 6	3 31	1 st stage Lead Class C Cement + additives
	57	500' above shoe	14 5	5 31	1 2	1 st stage Tail Class H / C + additives
	225	Surf	9	20 6	3 31	2 nd stage Lead Class C Cement + additives
	57	500' above DV	14 5	5 31	1 2	2 nd stage Tail Class H / C + additives
7-5/8" Int 2 Squeeze	As needed	Surf	14 8	6 32	1 33	Squeeze Lead Class C Cement + additives
	628	Surf	9	20 6	3 31	Lead Class C Cement + additives
	106	2000' above shoe	13 2	5 31	1 6	Tail Class H / C + additives
5 1/2" Production	791	200' tieback	13 2	5 31	1 6	Lead 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	TOC	% Excess
13-3/8" Surface	0'	50%
9 625" Intermediate	0	50%
7 5/8" Intermediate	200' tieback to previous string	25%
5-1/2" Production	200' tie-back into Int casing shoe	10%

Tomb Raider 1-12 Fed 718H

4 Pressure Control Equipment (Three String Design)

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

Tomb Raider 1-12 Fed 718H

Pressure Control Equipment (Four String Design)

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
Int 1	13-5/8"	5M	Annular	X	50% of rated working pressure
			Blind Ram	X	5M
			Pipe Ram	X	
			Double Ram	X	
			Other*		
Int 2	13-5/8"	5M	Annular (5M)	X	50% of rated working pressure
			Blind Ram	X	5M
			Pipe Ram	X	
			Double Ram	X	
			Other *		
Production	13-5/8"	5M	Annular (5M)	X	50% of rated working pressure
			Blind Ram	X	5M
			Pipe Ram	X	
			Double Ram	X	
			Other *		
N	A variance is requested for the use of a diverter on the surface casing See attached for schematic				

Tomb Raider 1-12 Fed 718H

5 Mud Program (3 String Design)

Depth		Type	Weight (ppg)	Vis	Water Loss
From	To				
0	750'	FW Gel	8 4-8 6	28-34	N/C
750'	11,925	ODBE / Cut Brine	8 6 - 9 3	28-34	N/C
11,925'	TD	OBM	9 8-11 0	28-34	N/C

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

Mud Program (4 String Design)

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	750'	FW Gel	8 4-8 6	28-34	N/C
750'	6000 - 8000'	DBE / Cut Brine	8 6 - 9 0	28-34	N/C
6000 - 8000'	11,925'	OBM / Cut Brine	9 0 - 9 3	28-34	N/C
11,925'	TD	OBM	9 8-11 0	28-34	N/C

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
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6 Logging and Testing Procedures

No change from permit

7 Drilling Conditions

No change from permit

Tomb Raider 1-12 Fed 718H

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 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 pad
- 6 The NMOCD will be contacted and notified 24 hours prior to commencing spudder rig operations
- 7 Drilling operations will be performed with the drilling rig At that time an approved BOP stack will be nipped 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

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Devon Energy Production
LEASE NO	NMNM22080
WELL NAME & NO.:	718H-Tomb Raider 1-12 Fed
SURFACE HOLE FOOTAGE.	360'/N & 980'/E
BOTTOM HOLE FOOTAGE	290'/S & 400'/E
LOCATION	Section 1, R 31 E, T 23S, NMPM
COUNTY	Eddy County , New Mexico

COA

All previous COA shall apply except the following

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

A Hydrogen Sulfide

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

B CASING PRIMARY PLAN

- 1 The 13-3/8 inch surface casing shall be set at approximately **750** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface
 - a If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b Wait on cement (WOC) time for a primary cement job will be a minimum of **24 hours in the Potash Area** 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

Operator shall filled 1/3rd of casing with fluid while running intermediate casing while running intermediate casing.

Operator proposed a intermediate squeeze. Notify BLM if operator will conduct a squeeze in the intermediate casing.

- 2 The minimum required fill of cement behind the 7-5/8 inch intermediate casing is

OPTION 1

- 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 DV tool. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe Operator shall submit sundry if DV tool depth cannot be set in this range If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe If it cannot be set below the shoe, a CBL shall be run to verify cement coverage

- 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

- 3 The minimum required fill of cement behind the 5-1/2 inch production casing is Cement should tie-back at least 500 feet into previous casing string Operator shall provide method of verification

CONTINGENCY PLAN

- 4 The 13-3/8 inch surface casing shall be set at approximately 750 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface
 - e 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

- f Wait on cement (WOC) time for a primary cement job will be a minimum of **24 hours in the Potash Area** or 500 pounds compressive strength, whichever is greater (This is to include the lead cement)
- g 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
- h If cement falls back, remedial cementing will be done prior to drilling out that string

Operator shall filled 1/3rd of casing with fluid while running 1st intermediate casing while running intermediate casing

Operator proposed a intermediate squeeze. Notify BLM if operator will conduct a squeeze in the intermediate casing.

- 2 The minimum required fill of cement behind the 9-5/8 inch intermediate casing is
 - Cement to surface If cement does not circulate see B 1 a, c-d above **Additional cement may be required Excess cement calculates to -7%**

Operator shall filled 1/3rd of casing with fluid while running 2nd intermediate casing while running intermediate casing

Operator proposed a intermediate squeeze. Notify BLM if operator will conduct a squeeze in the intermediate casing.

- 3 The minimum required fill of cement behind the 7-5/8 inch intermediate casing is

OPTION 1

- 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 DV tool DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe Operator shall submit sundry if DV tool depth cannot be set in this range If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe If it cannot be set below the shoe, a CBL shall be run to verify cement coverage. 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 Cement should tie-back at least 500 feet into previous casing string Operator shall provide method of verification

- 4 The minimum required fill of cement behind the 5-1/2 inch production casing is Cement should tie-back at least 500 feet into previous casing string Operator shall provide method of verification

C. PRESSURE CONTROL

- 1 Variance approved to use flex line from BOP to choke manifold Manufacturer's specification to be readily available No external damage to flex line Flex line to be installed as straight as possible (no hard bends)
- 2 Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness

- a Spudding well (minimum of 24 hours)
- b Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c BOPE tests (minimum of 4 hours)

☒ Chaves and Roosevelt Counties

Call the Roswell Field Office, 2909 West Second St , Roswell NM 88201
During office hours call (575) 627-0272
After office hours call (575)

☒ Eddy County

Call the Carlsbad Field Office, 620 East Greene St , Carlsbad, NM 88220,
(575) 361-2822

☒ Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)
393-3612

- 1 Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval
 - a In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s)
 - b When the operator proposes to set surface casing with Spudder Rig
 - Notify the BLM when moving in and removing the Spudder Rig

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

A CASING

- 1 Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#) Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc) The initial wellhead installed on the well will remain on the well with spools used as needed
- 2 Wait on cement (WOC) for Potash Areas After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours WOC time will be recorded in the driller's log The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug
- 3 Wait on cement (WOC) for Water Basin After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours WOC time will be recorded in the driller's log See individual casing strings for details regarding lead cement slurry requirements The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug

- 4 Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string Have well specific cement details onsite prior to pumping the cement for each casing string
- 5 No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer
- 6 On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well This test shall be performed before drilling more than 20 feet of new hole
- 7 If hardband drill pipe is rotated inside casing, returns will be monitored for metal If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations
- 8 Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed

B PRESSURE CONTROL

- 1 All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No 2 and API RP 53 Sec 17
- 2 If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply The flex line must meet the requirements of API 16C Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review These documents shall be posted in the company man's trailer and on the rig floor
- 3 5M or higher system requires an HCR valve, remote kill line and annular to match The remote kill line is to be installed prior to testing the system and tested to stack pressure
- 4 If the operator has proposed a multi-bowl wellhead assembly in the APD The following requirements must be met
 - a Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry

- b If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal
 - c Manufacturer representative shall install the test plug for the initial BOP test
 - d If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed
 - e Whenever any seal subject to test pressure is broken, all the tests in OOGO2 III A 2.1 must be followed
- 5 The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests
 - a In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified)
 - b In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs)
 - c The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office
 - d The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock
 - e All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office

- f The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes. This test shall be performed prior to the test at full stack pressure.
- g BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C DRILLING MUD

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

D WASTE MATERIAL AND FLUIDS

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

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

Waste Minimization Plan (WMP)

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

ZS 040918

Sec P KFC

13 3/8	surface csg in a	17 1/2	inch hole	Design Factors				SURFACE	
Segment	#ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight	
"A"	54 50	J 55	BUTT	20 87	3 37	0 69	750	40,875	
"B"							0	0	
w/8 4#/g mud 30min Sfc Csg Test psig 1,500				Tail Cmt	does	circ to sfc	Totals	750	40,875
Comparison of Proposed to Minimum Required Cement Volumes									
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
17 1/2	0 6946	604	803	575	40	8 60	2104	3M	1 56
Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0 70 OK									

9 5/8	casing inside the	13 3/8	A Buoyant	Design Factors				INTERMEDIATE	
Segment	#ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	40 00	J 55	BUTT	1 90	2 54	1 31	4,500	180,000	
"B"	40 00	HCK 55	BUTT	3 94	1 06	0 69	4,000	160,000	
w/8 4#/g mud 30min Sfc Csg Test psig							Totals	8,500	340,000
The cement volume(s) are intended to achieve a top of				0	ft from surface or a		750	overlap	
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0 3132	1901	2528	2718	-7	9 00	3138	5M	0 81
Class 'H' tail cmt yld > 1 20									
Burst Frac Gradient(s) for Segment(s) A B C D = a, 0 46, c, d < 0 70 a Problem!! ALT COLLAPSE SF 1.06*1 5=1.59									

7 5/8	casing inside the	9 5/8	A Buoyant	Design Factors				INTERMEDIATE	
Segment	#ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	29 70	P 110	Flushmax III	1 84	0 96	1 39	11 477	340 867	
"B"	29 70	P 110	Flushmax III	77 07	2 11	2 1	448	13,306	
w/8 4#/g mud 30min Sfc Csg Test psig 2,525							Totals	11,925	354,173
B would be				38 33	2 10	if it were a vertical wellbore			
No Pilot Hole Planned				MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Seventy°
				11925	11925	11925	11477	54	0
The cement volume(s) are intended to achieve a top of				8000	ft from surface or a		500	overlap	
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 3/4	0 1005	734	2206	410	438	9 30	4199	5M	0 56
Setting Depths for D V Tool(s)				8600			sum of sx	Σ CuFt	Σ % excess
% excess cmt by stage				371	1163		810	2441	496
ALT COLLAPSE SF 0 96*1 5=1 44									

5 1/2	casing inside the	7 5/8	Design Factors				PRODUCTION		
Segment	#ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	20 00	P 110	VAMSG	2 65	1 29	2 1	11,477	229 540	
"B"	20 00	P 110	VAMSG	6 84	1 13	2 1	10,467	209,340	
w/8 4#/g mud 30min Sfc Csg Test psig 2,525							Totals	21 944	438,880
Begment Design Factors would be				67 30	1 24	if it were a vertical wellbore			
No Pilot Hole Planned				MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Seventy°
				21944	11948	11948	11477	90	12
The cement volume(s) are intended to achieve a top of				11725	ft from surface or a		200	overlap	
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
6 3/4	0 0835	791	1266	861	47	11 00			0 53
Class 'H' tail cmt yld > 1 20 Capitan Reef est top XXXX									

Sec P KFC

13 3/8	surface csg in a	17 1/2	inch hole	Design Factors			SURFACE		
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight	
"A"	54 50	J 55	BUTT	20 87	3 45	0 47	750	40,875	
"B"							0	0	
w/8 4#/g mud, 30min Sfc Csg Test psig 1,500			Tail Cmt	does	circ to sfc	Totals	750	40,875	
Comparison of Proposed to Minimum Required Cement Volumes									
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole Cplg
17 1/2	0 6946	604	803	575	40	8 40	3138	5M	1 56
Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0 70, OK									

7 5/8	casing inside the	13 3/8	Design Factors				INTERMEDIATE		
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight	
"A"	29 70	P 110	BUTT	2 65	1 3	1 39	8,500	252,450	
"B"	29 70	P 110	BUTT	9 89	0 93	1 39	3,425	101,723	
w/8 4#/g mud 30min Sfc Csg Test psig						Totals	11,925	354,173	
B would be				9 24	0 93	if it were a vertical wellbore			
No Pilot Hole Planned			MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Seventy°	MEOC
			11925	11925	11925	11477	54	0	0
The cement volume(s) are intended to achieve a top of				0	ft from surface or a		750	overlap	
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0 5014	3382	10734	6027	78	9 30	4199	5M	1 88
D V Tool(s)			850	sum of sx			Σ CuFt	Σ%excess	
t by stage %			35	432	3085			9979	66

ALT COLLAPSE SF 0 93*1 5= 1 39

Tail cmt										
5 1/2	casing inside the	7 5/8	Design Factors				PRODUCTION			
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight		
"A"	20 00	P 110	VAM	2 65	4 32	2 1	3,425	68,500		
"B"	20 00	P 110	VAM	2 50	1 13	2 1	18,519	370,380		
w/8 4#/g mud, 30min Sfc Csg Test psig 1,500			Totals				21,944	438,880		
B	would be			3 72	1 24	if it were a vertical wellbore				
No Pilot Hole Planned		MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Seventy°	MEOC		
		21944	11948	11948	11477	90	12	12225		
The cement volume(s) are intended to achieve a top of				11425	ft from surface or a		500	overlap		
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist	
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole Cplg	
6 3/4	0 0835	791	1266	889	42	11 00			0 53	
Class 'H' tail cmt yld > 1 20										