Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM 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.

SUBMIT IN TRIPLICATE - Other instructions on page 2

HOBBS OCD
MAY 08 2018
RECEIVED

5. Lease Serial No.
NMNM27506

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
SD EA 29 FED COM P8 9H

2. Name of Operator
CHEVRON USA INC

Contact: LAURA BECERRA
E-Mail: LBECERRA@CHEVRON.COM

9. API Well No.
30-025-43268-00-X1

3a. Address
1616 W. BENDER BLVD
HOBBS, NM 88240

3b. Phone No. (include area code)
Ph: 432-687-7665

10. Field and Pool or Exploratory Area
WC025G06S263319P-BONE SPRING

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 29 T26S R33E NWNE 136FNL 1682FEL

11. County or Parish, State
LEA COUNTY, NM

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

Carlsbad Field Office
OCD Hobbs

TYPE OF SUBMISSION				
☒ 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 Drilling Operations
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete 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 recompletion 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.

Chevron respectfully requests the ability to set cement plugs to abandon the bottom portion of the current 9-5/8" casing and change the planned casing design as a result of the sidetrack around a fish in the current 9-5/8" casing.

Detailed drilling program, plot and wellpath attached.

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #412209 verified by the BLM Well Information System
For CHEVRON USA INC, sent to the Hobbs
Committed to AFMSS for processing by ZOTA STEVENS on 04/25/2018 (18ZS0063SE)

Name *(Printed/Typed)* LAURA BECERRA — Title PERMITTING SPECIALIST

Signature (Electronic Submission) — Date 04/24/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ZOTA STEVENS — Title PETROLEUM ENGINEER — Date 04/30/2018

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 Hobbs

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 ****

Delaware Basin
Changes to APD/COA for Federal Well

Well Names:

SD EA 29 Federal Com P8	9H	30-025-43268

Rig: Nabors X30

CVX CONTACT:

Jason Hannen
MCBU D&C Engineer
Chevron North America Exploration and Production Co.
MidContinent Business Unit
Office: (713) 372-1169
Cell: (432) 238-3004
Email: Jason.Hannen@chevron.com

Summary of Changes to APD Submission

Chevron respectfully requests the ability to set cement plugs to abandon the bottom portion of the current 9-5/8" casing and change the planned casing design as a result of the sidetrack around a fish in the current 9-5/8" casing.

Casing Program

Note the plan casing weights and grades will not change just some of the planned setting depths.

Purpose	From	To	Hole Size	Csg Size	Weight	Grade	Thread	Condition
Intermediate	0'	10,530' *Sidetrack Depth	12-1/4"	9-5/8"	43.5#	L80	LTC	New
Production	0'	19602	8-1/2"	5-1/2"	20.0 #	P-110-ICY	TXP BTC	New

If the plan FIT is not achieved then the below four string contingency will be used.

Purpose	From	To	Hole Size	Csg Size	Weight	Grade	Thread	Condition
Intermediate	0'	10,530' *Sidetrack Depth	12-1/4"	9-5/8"	43.5#	L80	LTC	New
Liner	10,230'	12,233'	8-1/2"	7-5/8"	29.7#	P110	W513	New
Production	0'	19602	6-3/4"	5.5 x 5	20 x 18#	P-110-ICY / P110IC	TXP BTC / W521	New

***The calculated Casing Safety Factors the original APD 9 Point Plan still represent "worst case".

Chevron will fill casing at a minimum of every 20 jts (840') while running for intermediate and production casing to maintain collapse SF.

Cement Program

Slurry	Type	Top	Bottom	Weight	Yield	%Excess	Sacks	Water
Intermediate								
Plug 1	Class H	11022	10672	16.4	1.06	NA	138	4.37
Plug 2	Class H	10421	10671	16.4	1.06	NA	99	4.37
Production								
Tail	Class H	10030'	19602	15.6	1.2	35	2444	5.05

The information for the contingency 4 string cement is below.

Slurry	Type	Top	Botto m	Weight	Yield	%Exces s	Sacks	Water
Liner								
Tail	Class C	10,230'	12,223'	14.8	1.33	35	154	6.65
Production								
Tail	Class H	9,930'	19602	15.6	1.2	35	1915	5.05

In the event that the 4 string contingency is used Chevron requests a variance to qualify the additional 300' of cement above the liner top as the required cement tieback interval with > 0.422 in clearance for the production casing cement job.

Mud Program

For sidetracked Production hole section

From	To	Type	Weight	F. Vis	Filtrate
10,530'	~~22,367'~~ 19602	Oil Based Mud	9.5-14.1	70 - 75	25 - 30

Pre Job Check List

1. Hold Rig Safety Orientation.
2. Confirm all applicable personnel roles and responsibilities.
3. Discuss Procedure with SLB & Nabors Representatives:
   - Confirm Casing Weights and ID's
   - Confirm ALL tubular minimum ID's (e-line accessible)
   - Critical depths within well
4. Review Shipping Tickets, for tool manifest, and confirm all tools are on location.
5. Strap all Equipment by measuring the OD, ID, length, and verify connections. (e-line accessible)
6. Check Drill Collar, HWDP, and Drill Pipe connections to confirm the necessary crossovers are available.

Hole Section	12 1/4"	11,170'
Casing String	9 5/8" OD / 8.755" ID	11,187' MD 11,175' TVD
Top of DV Tool	9 5/8" OD / 8.755" ID	4,875' MD 4,864' TVD
Top of ACP	9 5/8" OD / 8.755" ID	4,877' MD 4,867' TVD
Top of RBP Fish	Logan	11,023' MD 11,011' TVD
Sidetrack Location	SLB Whipstock	10,530' MD 10,509' TVD

Summary of Operations

1. Plug and abandon lower hole section
2. Perform scraper/cleanout run to TOF
3. Perform cased hole sidetrack at +/- 10,530' with whipstock/milling assembly
4. Perform FIT
   - Contingency 7-5/8" liner to be set at 12,233' MD / 12,175' TVD if unsuccessful FIT as per A2 Target OQE
5. Continue drilling 8-1/2" sidetrack to TD per directional plan, gaining separation from the original wellbore and the SD EA 29 COM FED P8 10H offset well
6. Run CSG and cement same
7. Secure well and release rig

Vendor Selection

CCL Log & Gauge Ring	Scientific Drilling
Whipstock; Milling assembly	Schlumberger
GYRO to orient whipstock; UBHO	Scientific Drilling
Liner hanger	Halliburton
Cement	Schlumberger

Drilling Fluid Considerations

- OBM from the rig's active system to allow for closed loop circulation through the pits
- Suction pit, trip tank, etc.
- Primary fluid system to be used is OBM from the active system at 9.4-9.5 ppg
- If wellbore instability is encountered while drilling 8-1/2" intermediate hole section, weight up OBM fluid system to 13.6 ppg to drill remaining footage to TD. Previous instability was experienced near 22,000' MD on the 11H.

Plug and Abandon Lower Hole Section

Make up the recommended BHA.

Item	QTY	Description	Connections	Vendor
1	1	Cross Over to DP	2 7/8" EUE Box x Rig DP Pin	TBD
2	17	2 7/8" 6.5# J-55 or better EUE	2 7/8" EUE Box x 2 7/8" EUE Pin	CVX

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1. Inform BLM of intent to pump cement.
2. Run in Hole with plugging BHA, taking care when passing thru BOP's, Wellhead & any changes in wellbore.
3. RIH with 5" DP & 2 7/8" stinger open ended to TOF. TOF tool depth per table above.
4. Tag TOF and pull up 1' above tag.
5. Circulate bottoms up, verify constant MW.
6. R/U cement equipment lines and trucks. (Contingency ensure enough cement and logistics for additional jobs top out jobs as necessary)
7. R/U TIW and swedge with low torque at rotary.
8. Tie in cement iron to swedge.
9. Test cement iron to 4,500 psi.
10. Base of balanced plug #1 to be 11,022' MD and top of plug #1 to be 10,672' MD. (350' plug)
11. Spot balanced plug #1 as follows (If rig power fails cementers must be lined up to turn hole over & if cement truck fails, iron must be on floor to rig into circulation line from side entry sub for rig to displace cement):
    - Break circulation with cement pump and pump 19.4 bbls of 11.5 ppg spacer @ 5 BPM (Record Start Time)
    - Drop foam ball
    - Pump 26.1 bbls of 16.4 ppg Class H cement slurry @ 5 BPM
    - Drop foam ball
    - Displace cement with 5.6 bbls of 11.5 ppg spacer @ 5BPM. Calculate necessary displacement (+/- 175.1 bbls) of rig system fluid +/- 9.5 ppg at +/- 5 bpm and have the cementer kick the pumps out and allow for plug to balance 5 barrels before the end of displacement. (Record end time.)
    - This displacement should leave +/- 6.7 bbls of cement inside the 2 7/8" stinger.
    - Monitor displacement tank. When it stops falling, it is an indication that the plug is balanced.
12. Monitor drill string and ensure it is static or on a vacuum.
13. Break off TIW and swedge. (If rig power fails cementers must be lined up to turn hole over & if cement truck fails, iron must be on floor to rig into circulation line from side entry sub for rig to displace cement)
14. POOH @ 30 ft/min (3 mins/stand) to 500' above cement plug (24 stands).
15. Drop 2 wiper balls and conventionally circulate SURF to SURF volume at max rate while rotating pipe.
16. Wait on 500 psi compressive strength for cement.
17. RIH and tag top of cement plug #1 with 10K and pumps on (Trip may be made for more rigid BHA if required with Tri-Cone Bit). Record top of plug #1.
18. Minimum tag criteria of plug #1 is 10,812' MD (210' plug) for BLM/Chevron regulatory requirements. If plug fails to meet required minimum criteria repeat process to bring TOC to required criteria.
19. Inform BLM of intent to pump cement.
20. POOH 1' MD above plug #1 and circulate bottoms up, verify constant MW.
21. R/U cement equipment lines and trucks. (Contingency ensure enough cement and logistics for additional jobs top out jobs as necessary)
22. R/U TIW and swedge with low torque at rotary.
23. Tie in cement iron to swedge.
24. Test cement iron to 4,500 psi.
25. Base of balanced plug #2 to be 10,671' MD and top of plug #2 to be 10,421' MD. (250' plug)
26. Spot balanced plug #2 as follows (If rig power fails cementers must be lined up to turn hole over & if cement truck fails, iron must be on floor to rig into circulation line from side entry sub for rig to displace cement):
    - Break circulation with cement pump and pump 19.2 bbls of 11.5 ppg spacer @ 5 BPM (Record Start Time)
    - Drop foam ball
    - Pump 18.6 bbls of 16.4 ppg Class H cement slurry @ 5 BPM
    - Drop foam ball
    - Displace cement with 5.8 bbls of 11.5 ppg spacer @ 5BPM. Calculate necessary displacement (+/- 172.9 bbls) of rig system fluid +/- 9.5 ppg at +/- 5 bpm and have the cementer kick the pumps out and allow for plug to balance 5 barrels before the end of displacement. (Record end time.)
    - This displacement should leave +/- 4.9 bbls of cement inside the 2 7/8" stinger.

- Monitor displacement tank. When it stops falling, it is an indication that the plug is balanced.

27. Monitor drill string and ensure it is static or on a vacuum.
28. Break off TIW and swedge. (If rig power fails cementers must be lined up to turn hole over & if cement truck fails, iron must be on floor to rig into circulation line from side entry sub for rig to displace cement)
29. POOH @ 30 ft/min (3 mins/stand) to 500' above cement plug (21 stands).
30. Drop 2 wiper balls and conventionally circulate SURF to SURF volume at max rate while rotating pipe.
31. Wait on 500 psi compressive strength for cement.
32. RIH and tag top of cement plug #2 with 10K and pumps on (Trip may be made for more rigid BHA if required). Record top of plug #2.
33. Minimum tag criteria of plug #2 is 10,571' MD (100' plug). If plug fails to meet required minimum criteria repeat process to bring TOC to required criteria.
34. POOH and L/D plugging BHA.

Clean Out Run

Make up the following BHA

Item	QTY	Description	Connections	Vendor
1	1	Cross Over to DP	4 ½" IF Box x Rig DP Pin	TBD
2	1	8.5" OD Watermelon Mill *Optional Cement Scraper	4 ½" IF Box x 4 ½" IF Pin	SLB
3	1	Bit Sub	4 ½" IF Box x 4 ½" REG Box	SLB
4	1	8.500" Smith Tri Cone	4 ½" REG Pin	SLB

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1. Run in Hole with clean out BHA, taking care when passing thru BOP's, Wellhead & any changes in wellbore ID.
2. Make note of any tight spots encountered while RIH and rotate through them with watermelon mill 2x while moving pipe up and down.
3. With static BHA and adequate flow rate, slack off to top of plug #2 10,421' MD and record tag depth.
4. If cement plug #2 was encountered above 10,550' MD dress top of plug down to this depth (121' plug).
5. Once plug is dressed, tag down 10K with pumps on to confirm final depth and record same.
6. Pick up off bottom 10' and circulate 3 BUs to ensure clean wellbore.
7. POOH with clean out BHA and L/D same.
8. R/U wireline logging unit to run CCL & gauge ring to verify whipstock set depth is not across a connection (Scientific to supply gauge ring)
9. POOH with wireline logging unit
10. Review CCL log and identify an appropriate whipstock set depth at 10,530' (+/-5' of bottom of slide & 90' geologic window for target)
11. Confirm planned set depth with Schlumberger's whipstock/milling technical representative and operations team
12. If gauge ring indicates cement stringers or other obstructions within the casing string, run Schlumberger's recommended clean out BHA to +/- 10,530' to clear obstructions and consider adding scraper to above mill.
13. Repeat process until casing restrictions are removed from wellbore.

Cased Hole Sidetrack

Make up the following BHA

Item	QTY	Description	Connections	Vendor
1	4	(2) 9.625" MagnoStar w/ 10' 5" DP Pup Joint (Optional)	Rig DP Box x Rig DP Pin	SLB
2	1	Cross Over to DP	4 ½" IF Box x Rig DP Pin	TBD
3	1	6.750" Muleshoe	4 ½" IF Box x 4 ½" IF Pin	SLB
4	1	6.875" Filter Sub	4 ½" IF Box x 4 ½" IF Pin	SLB
5	1	6.8125" MWD	4 ½" IF Box x 4 ½" IF Pin	SLB
6	1	6.750" Multi Cycle By-Pass	4 ½" IF Box x 4 ½" IF Pin	SLB
7	1	5" HWDP/DP	4 ½" IF Box x 4 ½" IF Pin	SLB
8	1	6" Flex-Sub	4 ½" IF Box x 4 ½" IF Pin	SLB
9	1	8.5" Trackmaster Tri-Mill	4 ½" IF Box x 4 ½" IF Pin	SLB

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1. Make up the BHA up to the Trackmaster Plus Mill.
2. Attach Trackmaster Plus Mill to the Whipstock Assembly.
3. Once the mill and whipstock are attached break connection at Running Tool and HFBPV. Once connection is broken fill running tool with clean hydraulic fluid.
4. Install plunger into the running tool and allow for all air to exit the column of clean fluid.
5. Make up HFBPV and Running Tool.
6. Pick up on whipstock assembly and scribe to UHBO sub. Adjust sleeve to match scribe line.
   - Do not rotate pipe during tripping in hole.
7. Begin TIH with whipstock assembly.
   - Note: The recommended weight of HWDP should accommodate the recommended milling weight.
8. TIH at approximately 2 minutes per stand, while tripping in it is necessary to be easy on and off the slips. Softly tag previously drilled cement plug at 10,540' MD to confirm depth and POOH to set depth.
9. Once desired setting depth is reached, 10,530' MD, work the string up and down to determine hole drag.
10. Rig up wire line and run Gyro down hole to orientate the whipstock to the proper orientation 78.075 degree azimuth per ST directional plan.
    - Note: Direction is to be confirmed by directional drilling company prior to setting whipstock.
11. Once orientated, POOH with Gyro and prepare to set the expandable anchor.
12. Begin pumping to close the HFBPV, once the valve is closed the anchor will start to see pressure.
13. Once the HFBPV is closed easy up on the pumps to 2000psi and hold, the anchor will start to activate, increase the pressure in increments of 500 psi till you get to 3500psi and hold to fully expand the anchor.
14. Once anchor is set conduct push/pull test to verify that the anchor properly set.
15. Shear mill off whipstock.
    - Shear bolts will require approximately 55 kips of tension to shear. Weaken bolts by picking up and slacking off in 25 kips increments.
16. Position the mill 2-3 feet above the top of the whipstock.
17. Slowly lower the mill until it contacts the top of the whipstock.
    - Monitor for a pressure drop as the break-off plugs break during the initial contact with the whipstock.
18. A light amount of weight, 2,000lbs, should be used during the initial milling. Continue milling according to the recommended milling parameters below.

Casing Size (in.)	Weight on Mill (klbs)	Mill (rpm)
9 5/8	2-15	60-120

    - Note: When the center point is reached, a decrease in torque and/or penetration may be experienced. Should this occur, increase the weight on the mill and decrease revolutions per minutes (rpm). This will cause the mill to flex away from the face of the whip and off the center point. When the center is passed, an increase in penetration and torque will be recognized. After one foot of penetration at the increased weight, bring the milling weight and rpm back to that previously used and continue milling the window.
    - Note: Target milling ROP to maintain proper geometry for window is 1-4 ft/hr. Milling too quickly or too slowly will affect geometry of window.
19. Mill off whipstock and mill 10-foot rat hole. To ensure a gauge hole work the mill in and out of the rat hole, if no torque is seen the hole is in gauge.
    - Note: If the penetration rate falls below what is expected for time spent milling, POOH and replace the mill and continue milling.
20. After milling is complete and the mill is at surface, gauge the mill if it is under gauge a second mill run will be needed to get the hole in gauge.

- For future drilling operations, it is recommended that a bit or stabilizer not be rotated down the face of the whip. Doing so may damage the edge or catch on the whip. Pass through the window very slowly on all trips.

Conduct FIT

1. Conduct FIT as per Drilling SOP and OPDP.
2. Planned and Minimum FIT to drill ahead to proposed TD of 19,602' MD with Max MW of 14.1 ppg in 8.5" hole same values as previous MOC 18-0309.

Casing Size	9.625	9.625
Planned MW (ppg)	14.10	14.10
Avg Gas Gradient (psi/ft)	0.100	0.100
Planned Last Casing Shoe MD (ft)	10,509	10,509
Min Last Casing Shoe MD (ft)	10,509	10,509
Planned well MD (ft)	12,402	12,402
Designed Kick Intensity (ppg)	0.10	0.10
Designed Kick Volume (bbl)	30.00	10.00
Open Hole ID (in)	8.500	8.500
Drill String OD (in)	5.000	5.000
Min LOT (min casing depth) (ppg)	15.06	14.51
Min LOT (planned casing depth)(ppg)	15.06	14.51

3. If unable to achieve 14.5 ppg MIN FIT for 8.5" TD well, utilize WC A liner contingency with Planned and Minimum FIT to drill ahead to liner TD of 12,233' MD with Max MW of 14.1 ppg submitted as A2 four string OQE.

Casing Size	9.625	9.625
Planned MW (ppg)	11.50	11.50
Avg Gas Gradient (psi/ft)	0.100	0.100
Planned Last Casing Shoe MD (ft)	10,509	10,509
Min Last Casing Shoe MD (ft)	10,509	10,509
Planned well MD (ft)	12,175	12,175
Designed Kick Intensity (ppg)	0.10	0.10
Designed Kick Volume (bbl)	30.00	10.00
Open Hole ID (in)	8.500	8.500
Drill String OD (in)	5.000	5.000
Min LOT (min casing depth) (ppg)	12.27	11.84
Min LOT (planned casing depth)(ppg)	12.27	11.84

4. Required Planned and Minimum FIT to drill ahead to proposed TD of 19,602' MD with Max MW of 14.1 ppg submitted as A2 four string OQE.

Casing Size	7.625	7.625
Planned MW (ppg)	14.10	14.10
Avg Gas Gradient (psi/ft)	0.100	0.100
Planned Last Casing Shoe MD (ft)	12,175	12,175
Min Last Casing Shoe MD (ft)	12,175	12,175
Planned well MD (ft)	12,402	12,402
Designed Kick Intensity (ppg)	0.10	0.10
Designed Kick Volume (bbl)	30.00	10.00
Open Hole ID (in)	6.750	6.750
Drill String OD (in)	5.000	5.000
Min LOT (min casing depth) (ppg)	15.59	14.69
Min LOT (planned casing depth)(ppg)	15.60	14.69

5. POOH and L/D mill assembly.

Continue Drilling Operations

Make up the following BHA based upon BH recommendations:

*GYRO MWD SURVEY NECESSARY UNTIL SEPARATION ACHIEVED

8.5 Conventional BHA_MS Slick_Otp #1

8.5 Conventional BHA_MS Slick_Short E

1. M/U 8-1/2" contingency BHA, per the table above, and TIH
2. Begin drilling 8-1/2" sidetrack per directional plan to depth designated by FIT
   - Communicate any indications of wellbore instability to operations team
   - Signs of instability: excessive drag, irregular cuttings to surface, severe stick/slip
   - If experience wellbore instability prior to reaching TD, weight up OBM, C&C hole clean, and continue drilling.
   - If experience wellbore instability at TD, perform short trip to confirm.
3. TOH with 8-1/2" directional BHA to whipstock set depth.
   - Note: stabilizer location in drill string and monitor hookloads while pulling across whipstock.
   - Note: orient motor to high side before attempting to cross WSTK to prevent damage to the bit.
4. Once the bit is above the whipstock, slack off and lower assembly through the milled window to verify there are no obstructions or damage to the top of the whipstock or window that would prevent the designated casing from reaching planned set depth.
5. Drill hole to proposed TD of 19,602' MD.
   - Note: instability of formation was noted in 11H have reamer on standby to make CO run.
6. Run casing and cement same based upon new MDs for cement volumes.
7. RD and release rig.

Chevron U.S.A. Inc.

Location: Lea County, NM
Field: Bone Spring (Lea County, NM) NAD 27
Facility: SD EA 29 Fed Com P8

Slot: SD EA 29 FED COM P8 9H
Well: SD EA 29 FED COM P8 9H ST01
Wellbore: SD EA 29 FED COM P8 9H ST01

BAKER HUGHES a GE company

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Top of Whipstock	10530.00	1.634	235.987	10518.39	-103.66	-154.26	0.28	102.50
Exit WS /w rat hole	10565.00	2.500	78.075	10553.38	-103.78	-153.92	11.60	102.62
BHA Exit	10645.00	2.500	78.075	10633.30	-103.06	-150.51	0.00	101.93
End of 3D Arc	10819.78	8.617	78.076	10807.17	-99.56	-133.95	3.50	98.56
End of Tangent	11869.26	8.617	78.076	11844.81	-67.07	19.90	0.00	67.22
Landing	12628.98	89.450	179.568	12331.27	-539.24	95.01	12.00	539.94
2	13863.49	89.450	179.568	12343.12	-1773.86	104.32	0.00	1774.39
End of 3D Arc	13875.48	89.210	179.560	12343.26	-1785.85	104.41	2.00	1786.38
End of Tangent	14825.24	89.210	179.560	12356.35	-2735.29	111.70	0.00	2736.05
End of 3D Arc	14830.69	89.101	179.558	12356.43	-2740.74	111.74	2.00	2741.50
End of Tangent	15748.11	89.101	179.558	12370.82	-3658.02	118.82	0.00	3658.81
End of 3D Arc	15754.25	89.224	179.564	12370.91	-3664.15	118.86	2.00	3664.94
End of Tangent	16436.41	89.224	179.564	12380.15	-4346.24	124.06	0.00	4347.05
End of 3D Arc	16453.96	89.574	179.548	12380.33	-4363.78	124.19	2.00	4364.59
5	16776.55	89.574	179.548	12382.73	-4686.35	126.74	0.00	4687.17
End of 3D Arc	16790.77	89.858	179.565	12382.80	-4700.57	126.85	2.00	4701.39
End of Tangent	17263.98	89.858	179.565	12383.97	-5173.77	130.44	0.00	5174.60
End of 3D Arc	17269.83	89.975	179.561	12383.98	-5179.62	130.49	2.00	5180.45
End of Tangent	17761.11	89.975	179.561	12384.19	-5670.88	134.25	0.00	5671.73
End of 3D Arc	17768.13	89.835	179.548	12384.20	-5677.90	134.31	2.00	5678.75
End of Tangent	18157.63	89.835	179.548	12385.32	-6067.40	137.38	0.00	6068.26
End of 3D Arc	18171.27	89.563	179.560	12385.39	-6081.03	137.49	2.00	6081.89
End of Tangent	18602.48	89.563	179.560	12386.68	-6512.21	140.80	0.00	6513.08
End of 3D Arc	18617.34	89.266	179.560	12386.83	-6527.07	140.91	2.00	6527.94
10	19264.17	89.266	179.560	12397.12	-7173.83	145.88	0.00	7174.72
End of 3D Arc	19274.68	89.141	179.391	12397.27	-7184.34	145.98	2.00	7185.23
End of Tangent	19602.34	89.141	179.391	12402.18	-7511.95	149.46	0.00	7512.86

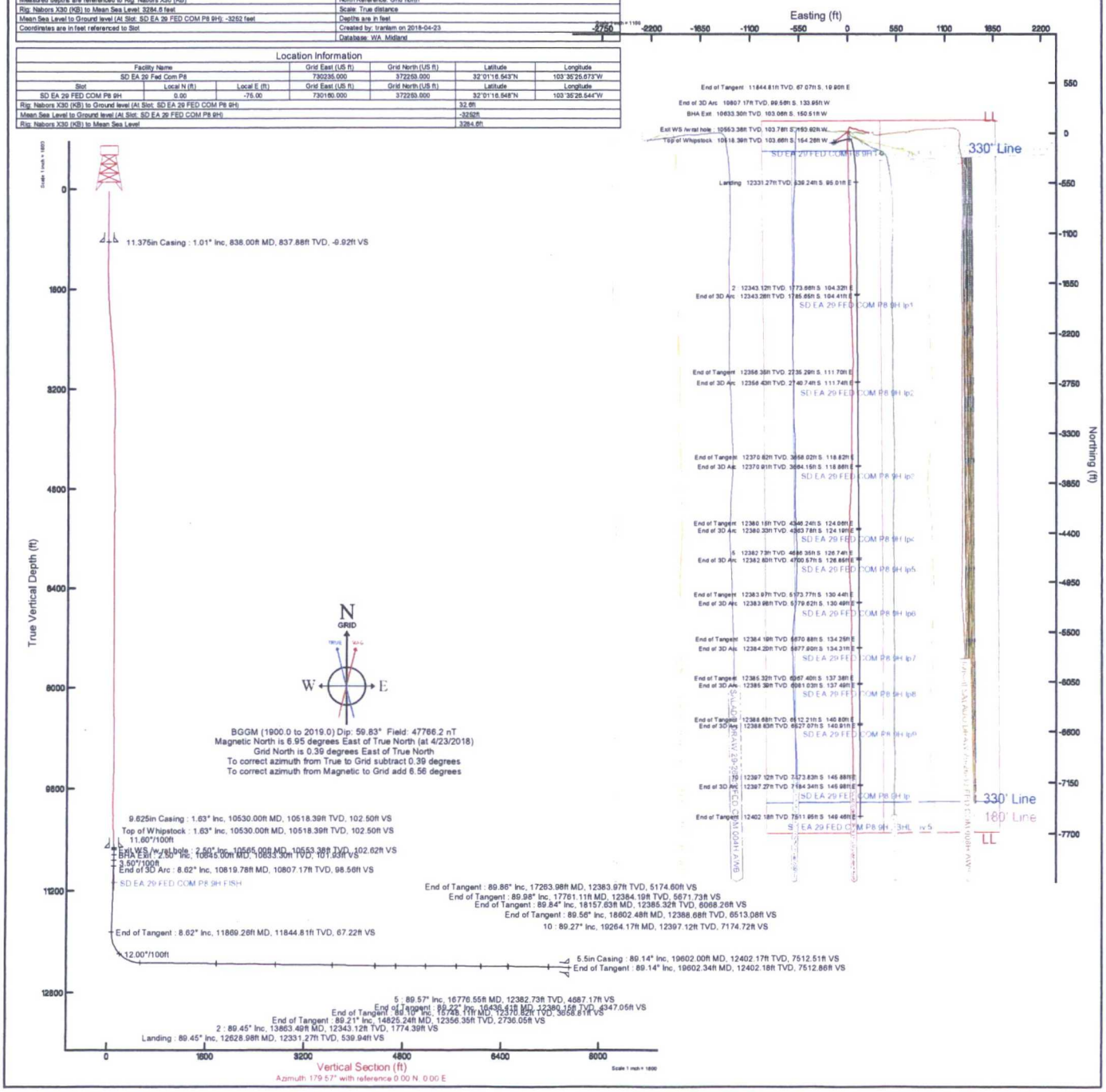
Bottom Hole Location

MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
19602.34	89.141	179.391	12402.18	-7511.95	149.46	730309.45	364741.29	32°00'02.203"N	103°35'25.408"W

Plot reference wellpath is SD EA 29 FED COM P8 9H ST01 Rev C.0	Grid System: NAD27 / TM New Mexico SP, Eastern Zone (3001), US feet
True vertical depths are referenced to Rig: Nabors X30 (KB)	* = Wellpath was transformed from a different geodetic datum
Measured depths are referenced to Rig: Nabors X30 (KB)	North Reference: Grid north
Rig: Nabors X30 (KB) to Mean Sea Level: 3284.6 feet	Scale: True distance
Mean Sea Level to Ground level (At Slot: SD EA 29 FED COM P8 9H): -3262 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: tranlam on 2018-04-23
	Database: WA_Midland

Location Information

Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SD EA 29 Fed Com P8			730235.000	372263.000	32°01'16.643"N	103°35'25.673"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SD EA 29 FED COM P8 9H	0.00	-76.00	730160.000	372263.000	32°01'16.548"N	103°35'26.644"W
Rig: Nabors X30 (KB) to Ground level (At Slot: SD EA 29 FED COM P8 9H)					32.6ft	
Mean Sea Level to Ground level (At Slot: SD EA 29 FED COM P8 9H)					-3262ft	
Rig: Nabors X30 (KB) to Mean Sea Level					3284.6ft	



PLANNED WELLPATH REPORT (CSV version)
Prepared by Baker Hughes
Software System: WellArchitect® 5.0

REFERENCE WELLPATH IDENTIFICATION

Operator	Chevron U.S.A. Inc.
Area	Lea County, NM
Field	Bone Spring (Lea County, NM) NAD 27
Facility	SD EA 29 Fed Com P8
Slot	SD EA 29 FED COM P8 9H
Well	SD EA 29 FED COM P8 9H ST01
Wellbore	SD EA 29 FED COM P8 9H ST01
Wellpath	SD EA 29 FED COM P8 9H ST01 Rev C.0
Sidetrack	SD EA 29 FED COM P8 9H PWB_awp at 10530.00 MD

REPORT SETUP INFORMATION

Projection System	NAD27 / TM New Mexico SP, Eastern Zone (3001), US feet
North Reference	Grid
Scale	0.99997
Convergence at slot	0.40° East
Software System	WellArchitect® 5.0
User	Tranlam
Report Generated	4/23/2018 at 10:20:01 AM
DataBase/Source file	WA_Midland/ev70.xml

WELLPATH LOCATION	Local North [ft]	Local East [ft]	Easting [US ft]	Northing [US ft]	Latitude	Longitude
Slot Location	0	-75	730160	372253	32°01'16.5	103°35'26.544"W
Facility Reference Pt			730235	372253	32°01'16.5	103°35'25.673"W
Field Reference Pt			152400.3	0	30°59'42.8	105°26'33.659"W

WELLPATH DATUM

Calculation	Minimum curvature
Horizontal	Slot
Vertical Re	Rig: Nabors X30 (KB)
MD Refere	Rig: Nabors X30 (KB)
Field Vertic	Mean Sea Level
Rig: Nabor	3284.60ft
Rig: Nabor	3284.60ft
Rig: Nabor	32.60ft
Section Ori	N 0.00, E 0.00 ft
Section Azi	179.57°

WELLPATH DATA † = interpolated/extrapolated station

	MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]	Comments
†	0	0	30.5	0	0	0	0	730160	372253	32°01'16.5	103°35'26.	0	0	0	
	32.6	0	30.5	32.6	0	0	0	730160	372253	32°01'16.5	103°35'26.	0	0	0	
	195	0.7	30.5	195	-0.85	0.85	0.5	730160.5	372253.9	32°01'16.5	103°35'26.	0.43	0.43	18.78	
	256	0.9	44.5	255.99	-1.51	1.52	1.03	730161	372254.5	32°01'16.5	103°35'26.	0.46	0.33	22.95	
	347	1	32.5	346.98	-2.68	2.7	1.96	730162	372255.7	32°01'16.5	103°35'26.	0.24	0.11	-13.19	
	352	1.1	49.5	351.98	-2.75	2.76	2.02	730162	372255.8	32°01'16.5	103°35'26.	6.52	2	340	
	444	1.2	47.5	443.96	-3.96	3.99	3.4	730163.4	372257	32°01'16.5	103°35'26.	0.12	0.11	-2.17	
	535	1.4	34.5	534.93	-5.51	5.55	4.73	730164.7	372258.6	32°01'16.6	103°35'26.	0.39	0.22	-14.29	
	627	1.1	20.5	626.91	-7.26	7.3	5.68	730165.7	372260.3	32°01'16.6	103°35'26.	0.46	-0.33	-15.22	
	717	0.9	43.5	716.9	-8.58	8.62	6.46	730166.5	372261.6	32°01'16.6	103°35'26.	0.49	-0.22	25.56	
	808	1	51.5	807.89	-9.58	9.64	7.58	730167.6	372262.6	32°01'16.6	103°35'26.	0.18	0.11	8.79	
	945	1.1	28.98	944.86	-11.46	11.53	9.15	730169.2	372264.5	32°01'16.6	103°35'26.	0.31	0.07	-16.44	
	1070	0.83	355.84	1069.85	-13.41	13.48	9.67	730169.7	372266.5	32°01'16.6	103°35'26.	0.49	-0.22	-26.51	
	1165	0.69	351.4	1164.84	-14.66	14.74	9.53	730169.5	372267.7	32°01'16.6	103°35'26.	0.16	-0.15	-4.67	
	1260	0.34	345.79	1259.84	-15.5	15.58	9.38	730169.4	372268.6	32°01'16.7	103°35'26.	0.37	-0.37	-5.91	
	1355	1.11	232.41	1354.83	-15.22	15.29	8.58	730168.6	372268.3	32°01'16.6	103°35'26.	1.35	0.81	-119.35	
	1451	2.99	225.91	1450.76	-12.93	12.98	6.04	730166	372266	32°01'16.6	103°35'26.	1.97	1.96	-6.77	
	1546	4.12	229.08	1545.58	-9.01	9.02	1.68	730161.7	372262	32°01'16.6	103°35'26.	1.21	1.19	3.34	
	1641	3.96	231.08	1640.34	-4.75	4.72	-3.45	730156.6	372257.7	32°01'16.5	103°35'26.	0.22	-0.17	2.11	
	1736	3.92	231.77	1735.12	-0.72	0.65	-8.55	730151.5	372253.7	32°01'16.5	103°35'26.	0.07	-0.04	0.73	
	1831	4.83	230.99	1829.84	3.77	-3.88	-14.21	730145.8	372249.1	32°01'16.5	103°35'26.	0.96	0.96	-0.82	
	1926	6.17	233.75	1924.4	9.25	-9.41	-21.43	730138.6	372243.6	32°01'16.4	103°35'26.	1.44	1.41	2.91	
	2112	7.22	230.5	2109.13	22.47	-22.76	-38.51	730121.5	372230.2	32°01'16.3	103°35'26.	0.6	0.56	-1.75	
	2302	7.38	231.4	2297.59	37.53	-37.96	-57.26	730102.7	372215	32°01'16.1	103°35'27.	0.1	0.08	0.47	
	2490	7.74	235.07	2483.96	52.17	-52.75	-77.08	730082.9	372200.3	32°01'16.0	103°35'27.	0.32	0.19	1.95	
	2681	7.35	237.15	2673.3	66	-66.74	-97.89	730062.1	372186.3	32°01'15.8	103°35'27.	0.25	-0.2	1.09	
	2870	6.71	230.93	2860.89	79.38	-80.26	-116.62	730043.4	372172.8	32°01'15.7	103°35'27.	0.53	-0.34	-3.29	
	3060	4.67	223.2	3049.94	91.91	-92.89	-130.53	730029.5	372160.1	32°01'15.6	103°35'28.	1.14	-1.07	-4.07	
	3249	1.17	213.96	3238.67	99.07	-100.1	-136.88	730023.1	372152.9	32°01'15.5	103°35'28.	1.86	-1.85	-4.89	
	3439	0.58	138.75	3428.65	101.4	-102.43	-137.33	730022.7	372150.6	32°01'15.5	103°35'28.	0.61	-0.31	-39.58	
	3628	2.22	94.46	3617.59	102.44	-103.44	-133.05	730027	372149.6	32°01'15.5	103°35'28.	0.98	0.87	-23.43	
	3816	2.39	13.66	3805.48	98.94	-99.91	-128.49	730031.5	372153.1	32°01'15.5	103°35'28.	1.59	0.09	-42.98	
	4004	0.22	152.1	3993.43	95.46	-96.42	-127.39	730032.6	372156.6	32°01'15.6	103°35'28.	1.36	-1.15	73.64	
	4193	0.37	62.18	4182.43	95.5	-96.46	-126.69	730033.3	372156.6	32°01'15.6	103°35'28.	0.23	0.08	-47.58	
	4383	1.37	96.7	4372.4	95.5	-96.44	-123.89	730036.1	372156.6	32°01'15.6	103°35'27.	0.57	0.53	18.17	
	4572	1.42	143.21	4561.35	97.67	-98.58	-120.24	730039.8	372154.4	32°01'15.5	103°35'27.	0.58	0.03	24.61	
	4762	1.92	148.03	4751.27	102.28	-103.16	-117.15	730042.9	372149.8	32°01'15.5	103°35'27.	0.27	0.26	2.54	
	4953	1.42	1.01	4942.24	102.64	-103.51	-115.41	730044.6	372149.5	32°01'15.5	103°35'27.	1.68	-0.26	-76.97	
	5142	1.11	5.69	5131.19	98.48	-99.35	-115.19	730044.8	372153.7	32°01'15.5	103°35'27.	0.17	-0.16	2.48	
	5332	0.76	348.88	5321.17	95.41	-96.28	-115.25	730044.8	372156.7	32°01'15.6	103°35'27.	0.23	-0.18	-8.85	
	5522	0.29	343.15	5511.16	93.71	-94.58	-115.63	730044.4	372158.4	32°01'15.6	103°35'27.	0.25	-0.25	-3.02	

	5712	0.22	295.5	5701.16	93.09	-93.96	-116.1	730043.9	372159	32°01'15.6	103°35'27.!	0.11	-0.04	-25.08	
	5903	0.23	270.28	5892.16	92.93	-93.8	-116.81	730043.2	372159.2	32°01'15.6	103°35'27.!	0.05	0.01	-13.2	
	6092	0.12	242.49	6081.16	93.01	-93.89	-117.37	730042.6	372159.1	32°01'15.6	103°35'27.!	0.07	-0.06	-14.7	
	6281	0.29	194.93	6270.15	93.56	-94.45	-117.67	730042.3	372158.6	32°01'15.6	103°35'27.!	0.12	0.09	-25.16	
	6470	0.13	89.1	6459.15	94.02	-94.91	-117.57	730042.4	372158.1	32°01'15.6	103°35'27.!	0.18	-0.08	-55.99	
	6660	0.1	59.41	6649.15	93.94	-94.82	-117.22	730042.8	372158.2	32°01'15.6	103°35'27.!	0.03	-0.02	-15.63	
	6850	0.04	209.8	6839.15	93.91	-94.79	-117.11	730042.9	372158.2	32°01'15.6	103°35'27.!	0.07	-0.03	79.15	
	7038	0.15	216.69	7027.15	94.16	-95.05	-117.29	730042.7	372158	32°01'15.6	103°35'27.!	0.06	0.06	3.66	
	7228	0.17	251.75	7217.15	94.45	-95.33	-117.7	730042.3	372157.7	32°01'15.6	103°35'27.!	0.05	0.01	18.45	
	7418	0.03	128.77	7407.15	94.57	-95.45	-117.93	730042.1	372157.6	32°01'15.6	103°35'27.!	0.1	-0.07	-64.73	
	7608	0.26	208.45	7597.15	94.97	-95.86	-118.1	730041.9	372157.1	32°01'15.6	103°35'27.!	0.13	0.12	41.94	
	7798	0.2	215.09	7787.15	95.62	-96.51	-118.49	730041.5	372156.5	32°01'15.6	103°35'27.!	0.03	-0.03	3.49	
	7986	0.22	146.83	7975.15	96.19	-97.08	-118.49	730041.5	372155.9	32°01'15.5	103°35'27.!	0.13	0.01	-36.31	
	8175	0.16	146.54	8164.15	96.72	-97.61	-118.14	730041.9	372155.4	32°01'15.5	103°35'27.!	0.03	-0.03	-0.15	
	8364	0.29	216.51	8353.15	97.32	-98.21	-118.28	730041.7	372154.8	32°01'15.5	103°35'27.!	0.15	0.07	37.02	
	8553	0.35	171.29	8542.14	98.28	-99.17	-118.48	730041.5	372153.8	32°01'15.5	103°35'27.!	0.13	0.03	-23.93	
	8741	0.35	180.4	8730.14	99.42	-100.31	-118.39	730041.6	372152.7	32°01'15.5	103°35'27.!	0.03	0	4.85	
	8929	0.31	209.23	8918.14	100.43	-101.33	-118.65	730041.4	372151.7	32°01'15.5	103°35'27.!	0.09	-0.02	15.34	
	9117	0.34	307.41	9106.14	100.53	-101.43	-119.34	730040.7	372151.6	32°01'15.5	103°35'27.!	0.26	0.02	52.22	
	9306	0.77	358.76	9295.13	98.92	-99.82	-119.81	730040.2	372153.2	32°01'15.5	103°35'27.!	0.33	0.23	27.17	
	9495	1.03	324.89	9484.11	96.25	-97.16	-120.82	730039.2	372155.8	32°01'15.5	103°35'27.!	0.31	0.14	-17.92	
	9684	2.63	300.37	9673.01	92.64	-93.58	-125.53	730034.5	372159.4	32°01'15.6	103°35'28.(	0.92	0.85	-12.97	
	9873	2.18	261.24	9861.85	90.94	-91.94	-132.83	730027.2	372161.1	32°01'15.6	103°35'28.(	0.88	-0.24	-20.7	
	10062	2.19	238.37	10050.72	93.33	-94.38	-139.46	730020.6	372158.6	32°01'15.6	103°35'28.	0.46	0.01	-12.1	
	10251	2.45	236.72	10239.56	97.39	-98.49	-145.91	730014.1	372154.5	32°01'15.5	103°35'28..	0.14	0.14	-0.87	
	10440	1.85	240.2	10428.43	101.08	-102.22	-151.93	730008.1	372150.8	32°01'15.5	103°35'28..	0.32	-0.32	1.84	
	10530	1.634	235.987	10518.39	102.5	-103.66	-154.26	730005.8	372149.3	32°01'15.5	103°35'28..	0.28	-0.24	-4.68	Top of Whipstock
	10565	2.5	78.075	10553.38	102.62	-103.78	-153.92	730006.1	372149.2	32°01'15.5	103°35'28..	11.6	2.47	-451.18	Exit WS /w rat hole
†	10630	2.5	78.075	10618.32	102.06	-103.2	-151.15	730008.9	372149.8	32°01'15.5	103°35'28..	0	0	0	
	10645	2.5	78.075	10633.3	101.93	-103.06	-150.51	730009.5	372149.9	32°01'15.5	103°35'28..	0	0	0	BHA Exit
†	10730	5.475	78.075	10718.09	100.75	-101.84	-144.73	730015.3	372151.2	32°01'15.5	103°35'28..	3.5	3.5	0	
	10819.78	8.617	78.076	10807.17	98.56	-99.56	-133.95	730026.1	372153.4	32°01'15.5	103°35'28.	3.5	3.5	0	End of 3D Arc
†	10830	8.617	78.076	10817.28	98.25	-99.25	-132.45	730027.6	372153.8	32°01'15.5	103°35'28.(	0	0	0	
†	10930	8.617	78.076	10916.15	95.27	-96.15	-117.79	730042.2	372156.9	32°01'15.6	103°35'27.!	0	0	0	
†	11030	8.617	78.076	11015.02	92.28	-93.06	-103.13	730056.9	372160	32°01'15.6	103°35'27.	0	0	0	
†	11130	8.617	78.076	11113.89	89.29	-89.96	-88.47	730071.5	372163	32°01'15.6	103°35'27.!	0	0	0	
†	11230	8.617	78.076	11212.77	86.31	-86.86	-73.81	730086.2	372166.1	32°01'15.6	103°35'27.(	0	0	0	
†	11330	8.617	78.076	11311.64	83.32	-83.77	-59.15	730100.9	372169.2	32°01'15.7	103°35'27..	0	0	0	
†	11430	8.617	78.076	11410.51	80.34	-80.67	-44.5	730115.5	372172.3	32°01'15.7	103°35'27.(	0	0	0	
†	11530	8.617	78.076	11509.38	77.35	-77.58	-29.84	730130.2	372175.4	32°01'15.7	103°35'26.:	0	0	0	
†	11630	8.617	78.076	11608.25	74.37	-74.48	-15.18	730144.8	372178.5	32°01'15.8	103°35'26.	0	0	0	
†	11730	8.617	78.076	11707.12	71.38	-71.39	-0.52	730159.5	372181.6	32°01'15.8	103°35'26.!	0	0	0	
†	11830	8.617	78.076	11805.99	68.39	-68.29	14.14	730174.1	372184.7	32°01'15.8	103°35'26..	0	0	0	
	11869.26	8.617	78.076	11844.81	67.22	-67.07	19.9	730179.9	372185.9	32°01'15.8	103°35'26..	0	0	0	End of Tangent

†	11930	10.103	123.221	11904.82	69.27	-69.06	28.82	730188.8	372184	32°01'15.8	103°35'26.	12	2.45	74.32		
†	12030	19.433	154.764	12001.55	89.3	-88.98	43.3	730203.3	372164	32°01'15.6	103°35'26.(	12	9.33	31.54		
†	12130	30.644	165.137	12092.05	129.23	-128.81	56.98	730217	372124.2	32°01'15.2	103°35'25.:	12	11.21	10.37		
†	12230	42.262	170.247	12172.36	187.31	-186.79	69.26	730229.3	372066.2	32°01'14.6	103°35'25.'	12	11.62	5.11		
†	12330	54.024	173.463	12238.98	260.99	-260.4	79.6	730239.6	371992.6	32°01'13.9	103°35'25.(	12	11.76	3.22		
†	12430	65.848	175.833	12288.99	347.07	-346.42	87.55	730247.6	371906.6	32°01'13.1	103°35'25.:	12	11.82	2.37		
†	12530	77.703	177.795	12320.22	441.77	-441.08	92.77	730252.8	371811.9	32°01'12.1	103°35'25.:	12	11.86	1.96		
	12628.98	89.45	179.568	12331.27	539.94	-539.24	95.01	730255	371713.8	32°01'11.2	103°35'25.(	12	11.87	1.79	Landing	
†	12630	89.45	179.568	12331.28	540.96	-540.26	95.02	730255	371712.8	32°01'11.1	103°35'25.(	0	0	0		
†	12730	89.45	179.568	12332.24	640.95	-640.25	95.77	730255.8	371612.8	32°01'10.2	103°35'25.(	0	0	0		
†	12830	89.45	179.568	12333.2	740.95	-740.25	96.52	730256.5	371512.8	32°01'09.2	103°35'25.(	0	0	0		
†	12930	89.45	179.568	12334.16	840.94	-840.24	97.28	730257.3	371412.8	32°01'08.2	103°35'25.(	0	0	0		
†	13030	89.45	179.568	12335.12	940.94	-940.23	98.03	730258	371312.8	32°01'07.2	103°35'25.(	0	0	0		
†	13130	89.45	179.568	12336.08	1040.94	-1040.22	98.79	730258.8	371212.8	32°01'06.2	103°35'25.(	0	0	0		
†	13230	89.45	179.568	12337.04	1140.93	-1140.22	99.54	730259.5	371112.8	32°01'05.2	103°35'25.(	0	0	0		
†	13330	89.45	179.568	12338	1240.93	-1240.21	100.29	730260.3	371012.8	32°01'04.2	103°35'25.(	0	0	0		
†	13430	89.45	179.568	12338.96	1340.92	-1340.2	101.05	730261	370912.8	32°01'03.2	103°35'25.(	0	0	0		
†	13530	89.45	179.568	12339.92	1440.92	-1440.19	101.8	730261.8	370812.9	32°01'02.2	103°35'25.(	0	0	0		
†	13630	89.45	179.568	12340.88	1540.91	-1540.19	102.56	730262.6	370712.9	32°01'01.3	103°35'25.(	0	0	0		
†	13730	89.45	179.568	12341.84	1640.91	-1640.18	103.31	730263.3	370612.9	32°01'00.3	103°35'25.(	0	0	0		
†	13830	89.45	179.568	12342.8	1740.9	-1740.17	104.06	730264.1	370512.9	32°00'59.3	103°35'25.(	0	0	0		
	13863.49	89.45	179.568	12343.12	1774.39	-1773.66	104.32	730264.3	370479.4	32°00'58.9	103°35'25.(	0	0	0	2	1
	13875.48	89.21	179.56	12343.26	1786.38	-1785.65	104.41	730264.4	370467.4	32°00'58.8	103°35'25.(	2	-2	-0.07	End of 3D Arc	
†	13930	89.21	179.56	12344.01	1840.9	-1840.16	104.83	730264.8	370412.9	32°00'58.3	103°35'25.(	0	0	0		
†	14030	89.21	179.56	12345.39	1940.89	-1940.15	105.59	730265.6	370312.9	32°00'57.3	103°35'25.(	0	0	0		
†	14130	89.21	179.56	12346.77	2040.88	-2040.14	106.36	730266.4	370212.9	32°00'56.3	103°35'25.(	0	0	0		
†	14230	89.21	179.56	12348.15	2140.87	-2140.12	107.13	730267.1	370113	32°00'55.3	103°35'25.(	0	0	0		
†	14330	89.21	179.56	12349.52	2240.86	-2240.11	107.9	730267.9	370013	32°00'54.3	103°35'25.(	0	0	0		
†	14430	89.21	179.56	12350.9	2340.85	-2340.1	108.67	730268.7	369913	32°00'53.3	103°35'25.(	0	0	0		
†	14530	89.21	179.56	12352.28	2440.84	-2440.09	109.43	730269.4	369813	32°00'52.3	103°35'25.(	0	0	0		
†	14630	89.21	179.56	12353.66	2540.83	-2540.07	110.2	730270.2	369713	32°00'51.4	103°35'25.(	0	0	0		
†	14730	89.21	179.56	12355.04	2640.82	-2640.06	110.97	730271	369613	32°00'50.4	103°35'25.(	0	0	0		
	14825.24	89.21	179.56	12356.35	2736.05	-2735.29	111.7	730271.7	369517.8	32°00'49.4	103°35'25.(	0	0	0	End of Tan	2
†	14830	89.115	179.558	12356.42	2740.81	-2740.05	111.74	730271.7	369513	32°00'49.4	103°35'25.(	2	-2	-0.04		
	14830.69	89.101	179.558	12356.43	2741.5	-2740.74	111.74	730271.7	369512.4	32°00'49.4	103°35'25.(	2	-2	0	End of 3D Arc	
†	14930	89.101	179.558	12357.99	2840.8	-2840.03	112.51	730272.5	369413.1	32°00'48.4	103°35'25.(	0	0	0		
†	15030	89.101	179.558	12359.56	2940.79	-2940.02	113.28	730273.3	369313.1	32°00'47.4	103°35'25.(	0	0	0		
†	15130	89.101	179.558	12361.12	3040.77	-3040	114.05	730274.1	369213.1	32°00'46.4	103°35'25.(	0	0	0		
†	15230	89.101	179.558	12362.69	3140.76	-3139.99	114.82	730274.8	369113.1	32°00'45.4	103°35'25.(	0	0	0		
†	15330	89.101	179.558	12364.26	3240.75	-3239.97	115.59	730275.6	369013.1	32°00'44.4	103°35'25.(	0	0	0		
†	15430	89.101	179.558	12365.83	3340.74	-3339.96	116.36	730276.4	368913.2	32°00'43.4	103°35'25.(	0	0	0		
†	15530	89.101	179.558	12367.4	3440.72	-3439.94	117.13	730277.1	368813.2	32°00'42.5	103°35'25.(	0	0	0		
†	15630	89.101	179.558	12368.97	3540.71	-3539.93	117.91	730277.9	368713.2	32°00'41.5	103°35'25.(	0	0	0		
†	15730	89.101	179.558	12370.54	3640.7	-3639.91	118.68	730278.7	368613.2	32°00'40.5	103°35'25.(	0	0	0		

	15748.11	89.101	179.558	12370.82	3658.81	-3658.02	118.82	730278.8	368595.1	32°00'40.3	103°35'25.	0	0	0	End of Tan	3
	15754.25	89.224	179.564	12370.91	3664.94	-3664.15	118.86	730278.9	368589	32°00'40.2	103°35'25.	2	2	0.09	End of 3D Arc	
†	15830	89.224	179.564	12371.94	3740.69	-3739.9	119.44	730279.4	368513.2	32°00'39.5	103°35'25.	0	0	0		
†	15930	89.224	179.564	12373.29	3840.68	-3839.89	120.2	730280.2	368413.2	32°00'38.5	103°35'25.	0	0	0		
†	16030	89.224	179.564	12374.64	3940.67	-3939.87	120.96	730281	368313.3	32°00'37.5	103°35'25.	0	0	0		
†	16130	89.224	179.564	12376	4040.66	-4039.86	121.72	730281.7	368213.3	32°00'36.5	103°35'25.	0	0	0		
†	16230	89.224	179.564	12377.35	4140.65	-4139.85	122.49	730282.5	368113.3	32°00'35.5	103°35'25.	0	0	0		
†	16330	89.224	179.564	12378.71	4240.64	-4239.84	123.25	730283.2	368013.3	32°00'34.5	103°35'25.	0	0	0		
†	16430	89.224	179.564	12380.06	4340.63	-4339.83	124.01	730284	367913.3	32°00'33.5	103°35'25.	0	0	0		
	16436.41	89.224	179.564	12380.15	4347.05	-4346.24	124.06	730284.1	367906.9	32°00'33.5	103°35'25.	0	0	0	End of Tan	4
	16453.96	89.574	179.548	12380.33	4364.59	-4363.78	124.19	730284.2	367889.4	32°00'33.3	103°35'25.	2	2	-0.09	End of 3D Arc	
†	16530	89.574	179.548	12380.9	4440.63	-4439.82	124.79	730284.8	367813.3	32°00'32.6	103°35'25.	0	0	0		
†	16630	89.574	179.548	12381.64	4540.63	-4539.81	125.58	730285.6	367713.3	32°00'31.6	103°35'25.	0	0	0		
†	16730	89.574	179.548	12382.38	4640.63	-4639.81	126.37	730286.4	367613.3	32°00'30.6	103°35'25.	0	0	0		
	16776.55	89.574	179.548	12382.73	4687.17	-4686.35	126.74	730286.7	367566.8	32°00'30.1	103°35'25.	0	0	0	5	5
	16790.77	89.858	179.565	12382.8	4701.39	-4700.57	126.85	730286.8	367552.6	32°00'30.0	103°35'25.	2	2	0.12	End of 3D Arc	
†	16830	89.858	179.565	12382.9	4740.62	-4739.8	127.15	730287.1	367513.4	32°00'29.6	103°35'25.	0	0	0		
†	16930	89.858	179.565	12383.14	4840.62	-4839.8	127.9	730287.9	367413.4	32°00'28.6	103°35'25.	0	0	0		
†	17030	89.858	179.565	12383.39	4940.62	-4939.8	128.66	730288.7	367313.4	32°00'27.6	103°35'25.	0	0	0		
†	17130	89.858	179.565	12383.64	5040.62	-5039.79	129.42	730289.4	367213.4	32°00'26.6	103°35'25.	0	0	0		
†	17230	89.858	179.565	12383.89	5140.62	-5139.79	130.18	730290.2	367113.4	32°00'25.6	103°35'25.	0	0	0		
	17263.98	89.858	179.565	12383.97	5174.6	-5173.77	130.44	730290.4	367079.4	32°00'25.3	103°35'25.	0	0	0	End of Tan	6
	17269.83	89.975	179.561	12383.98	5180.45	-5179.62	130.49	730290.5	367073.6	32°00'25.2	103°35'25.	2	2	-0.07	End of 3D Arc	
†	17330	89.975	179.561	12384	5240.62	-5239.79	130.95	730290.9	367013.4	32°00'24.6	103°35'25.	0	0	0		
†	17430	89.975	179.561	12384.05	5340.62	-5339.78	131.72	730291.7	366913.4	32°00'23.6	103°35'25.	0	0	0		
†	17530	89.975	179.561	12384.09	5440.62	-5439.78	132.48	730292.5	366813.4	32°00'22.7	103°35'25.	0	0	0		
†	17630	89.975	179.561	12384.13	5540.62	-5539.78	133.25	730293.2	366713.4	32°00'21.7	103°35'25.	0	0	0		
†	17730	89.975	179.561	12384.18	5640.62	-5639.78	134.02	730294	366613.4	32°00'20.7	103°35'25.	0	0	0		
	17761.11	89.975	179.561	12384.19	5671.73	-5670.88	134.25	730294.3	366582.3	32°00'20.4	103°35'25.	0	0	0	End of Tan	7
	17768.13	89.835	179.548	12384.2	5678.75	-5677.9	134.31	730294.3	366575.3	32°00'20.3	103°35'25.	2	-1.99	-0.18	End of 3D Arc	
†	17830	89.835	179.548	12384.38	5740.62	-5739.77	134.8	730294.8	366513.4	32°00'19.7	103°35'25.	0	0	0		
†	17930	89.835	179.548	12384.67	5840.62	-5839.77	135.58	730295.6	366413.4	32°00'18.7	103°35'25.	0	0	0		
†	18030	89.835	179.548	12384.95	5940.62	-5939.77	136.37	730296.4	366313.4	32°00'17.7	103°35'25.	0	0	0		
†	18130	89.835	179.548	12385.24	6040.62	-6039.76	137.16	730297.2	366213.4	32°00'16.7	103°35'25.	0	0	0		
	18157.63	89.835	179.548	12385.32	6068.26	-6067.4	137.38	730297.4	366185.8	32°00'16.4	103°35'25.	0	0	0	End of Tan	8
	18171.27	89.563	179.56	12385.39	6081.89	-6081.03	137.49	730297.5	366172.2	32°00'16.3	103°35'25.	2	-2	0.08	End of 3D Arc	
†	18230	89.563	179.56	12385.84	6140.62	-6139.76	137.94	730297.9	366113.4	32°00'15.7	103°35'25.	0	0	0		
†	18330	89.563	179.56	12386.6	6240.62	-6239.75	138.71	730298.7	366013.5	32°00'14.7	103°35'25.	0	0	0		
†	18430	89.563	179.56	12387.36	6340.61	-6339.74	139.47	730299.5	365913.5	32°00'13.8	103°35'25.	0	0	0		
†	18530	89.563	179.56	12388.13	6440.61	-6439.74	140.24	730300.2	365813.5	32°00'12.8	103°35'25.	0	0	0		
	18602.48	89.563	179.56	12388.68	6513.08	-6512.21	140.8	730300.8	365741	32°00'12.0	103°35'25.	0	0	0	End of Tan	9
	18617.34	89.266	179.56	12388.83	6527.94	-6527.07	140.91	730300.9	365726.1	32°00'11.9	103°35'25.	2	-2	0	End of 3D Arc	
†	18630	89.266	179.56	12388.99	6540.61	-6539.73	141.01	730301	365713.5	32°00'11.8	103°35'25.	0	0	0		
†	18730	89.266	179.56	12390.28	6640.6	-6639.72	141.78	730301.8	365613.5	32°00'10.8	103°35'25.	0	0	0		

†	18830	89.266	179.56	12391.56	6740.59	-6739.71	142.55	730302.5	365513.5	32°00'09.8	103°35'25.	0	0	0	
†	18930	89.266	179.56	12392.84	6840.58	-6839.7	143.31	730303.3	365413.5	32°00'08.8	103°35'25.	0	0	0	
†	19030	89.266	179.56	12394.12	6940.57	-6939.69	144.08	730304.1	365313.5	32°00'07.8	103°35'25.	0	0	0	
†	19130	89.266	179.56	12395.4	7040.57	-7039.68	144.85	730304.9	365213.6	32°00'06.8	103°35'25.	0	0	0	
†	19230	89.266	179.56	12396.68	7140.56	-7139.67	145.62	730305.6	365113.6	32°00'05.8	103°35'25.	0	0	0	
	19264.17	89.266	179.56	12397.12	7174.72	-7173.83	145.88	730305.9	365079.4	32°00'05.5	103°35'25.	0	0	0	10 10
	19274.68	89.141	179.391	12397.27	7185.23	-7184.34	145.98	730306	365068.9	32°00'05.4	103°35'25.	2	-1.19	-1.61	End of 3D Arc
†	19330	89.141	179.391	12398.1	7240.55	-7239.65	146.56	730306.6	365013.6	32°00'04.8	103°35'25.	0	0	0	
†	19430	89.141	179.391	12399.6	7340.53	-7339.63	147.63	730307.6	364913.6	32°00'03.9	103°35'25.	0	0	0	
†	19530	89.141	179.391	12401.1	7440.52	-7439.62	148.69	730308.7	364813.6	32°00'02.9	103°35'25.	0	0	0	
	19602.34	89.141	179.391	12402.18	7512.86	-7511.95	149.46	730309.5	364741.3	32°00'02.2	103°35'25.	0	0	0	End of Tan 11

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape	Comment
SD EA 29 FED COM P8	11068.15		-110.75	-168.34	729991.7	372142.3	32°01'15.4	103°35'28.	point	
(1) SD EA 2	13863.49	12343.12	-1773.66	104.32	730264.3	370479.4	32°00'58.9	103°35'25.	point	
(2) SD EA 2	14825.24	12356.35	-2735.29	111.7	730271.7	369517.8	32°00'49.4	103°35'25.	point	
(3) SD EA 2	15748.11	12370.82	-3658.02	118.82	730278.8	368595.1	32°00'40.3	103°35'25.	point	
(4) SD EA 2	16436.41	12380.15	-4346.24	124.06	730284.1	367906.9	32°00'33.5	103°35'25.	point	
(5) SD EA 2	16776.55	12382.73	-4686.35	126.74	730286.7	367566.8	32°00'30.1	103°35'25.	point	
(6) SD EA 2	17263.98	12383.97	-5173.77	130.44	730290.4	367079.4	32°00'25.3	103°35'25.	point	
(7) SD EA 2	17761.11	12384.19	-5670.88	134.25	730294.3	366582.3	32°00'20.4	103°35'25.	point	
(8) SD EA 2	18157.63	12385.32	-6067.4	137.38	730297.4	366185.8	32°00'16.4	103°35'25.	point	
(9) SD EA 2	18602.48	12388.68	-6512.21	140.8	730300.8	365741	32°00'12.0	103°35'25.	point	
(10) SD EA	19264.17	12397.12	-7173.83	145.88	730305.9	365079.4	32°00'05.5	103°35'25.	point	
(11) SD EA	19602.34	12402.18	-7511.95	149.46	730309.5	364741.3	32°00'02.2	103°35'25.	point	

SURVEY PROGRAM Ref Wellbore: SD EA 29 FED COM P8 9H ST01 Ref Wellpath: SD EA 29 FED COM P8 9H ST01 Rev C.0

Start MD [ft]	End MD [ft]	Pos Unc M	Log Name/ Wellbore
32.6	808	BHI Generic gyro - nort	SD EA 29 FED COM P8 9H PWB
808	10530	BHI NaviTrak (Axial)	SD EA 29 FED COM P8 9H PWB
10530	19614.27	BHI AutoTrak Curve (A	SD EA 29 FED COM P8 9H ST01

COMMENTS

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Chevron USA Inc**
LEASE NO.:	**NM27506**
WELL NAME & NO.:	**9H-SD EA 29 Fed Com P8**
SURFACE HOLE FOOTAGE:	**136'/N & 1682'/E**
BOTTOM HOLE FOOTAGE	**180'/S & 2312'/E, sec. 32**
LOCATION:	**Section 29, T. 26 S., R.33 E., NMPM**
COUNTY:	**Lea County, New Mexico**

TABLE OF CONTENTS

All previous COAs still apply expect the following

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

Medium Cave/Karst: If cement does not circulate to surface on the intermediate casing, the cement on the production casing must come to surface.

1. The minimum required fill of cement behind the **5-1/2** inch production casing is:

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

CONTINGENCY PLAN

If operator do not achieved a FIT operator will contact BLM before proceeding with the Contingency Plan.

Operator shall filled 1/3rd of casing with fluid while running liner to maintain collapse safety factor.

1. The minimum required fill of cement behind the **7 5/8** inch production liner is:
   - Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

Formation below the 7-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

Variance is approved for annular spacing between 6.75 "hole x 5.5" casing.

2. The minimum required fill of cement behind the **5.5 x 5** inch production casing is:
    - Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

ZS 082217

Stevens, Zota <zstevens@blm.gov>

[EXTERNAL] Chevron Annular Spacing Variance Request: SD RA 29 FED COM P8 & SD EA 18 19 FED COM P15

Hannen, Jason P <Jason.Hannen@chevron.com> Thu, Apr 26, 2018 at 1:00 PM
To: "Stevens, Zota" <zstevens@blm.gov>

Zota,

I have attached the 5" 18# W521 spec sheet to this email. We included the variance request for the casing clearance in the original Sundry under the proposed cement information.

Slurry	Type	Top	Botto m	Weight	Yield	%Exces s	Sacks	Water
Liner								
Tail	Class C	10,230'	12,223'	14.8	1.33	35	154	6.65
Production								
Tail	Class H	9,930'	19602	15.6	1.2	35	1915	5.05

In the event that the 4 string contingency is used Chevron requests a variance to qualify the additional 300' of cement above the liner top as the required cement tieback interval with > 0.422 in clearance for the production casing cement job.

Please let me know if you have any other questions.

Thank you,

Jason Hannen

D&C Engineer

Jason.Hannen@chevron.com

From: Stevens, Zota [mailto:zstevens@blm.gov]
Sent: Thursday, April 26, 2018 9:28 AM
To: Hannen, Jason P <Jason.Hannen@chevron.com>
Subject: [**EXTERNAL**] Re: [EXTERNAL] Chevron Annular Spacing Variance Request: SD RA 29 FED COM P8 & SD EA 18 19 FED COM P15

[Quoted text hidden]

Tenaris 5 18 # W521.pdf
103K

BUREAU OF LAND MANAGEMENT
Carlsbad Field Office
620 East Greene Street
Carlsbad, New Mexico 88220
575-234-5972

Permanent Abandonment of Production Zone Conditions of Approval

Failure to comply with the following Conditions of Approval may result in a Notice of Incidents of Noncompliance (INC) in accordance with 43 CFR 3163.1.

1. Plug back operations shall commence within **ninety (90)** days from this approval. **If you are unable to plug back the well by the 90th day provide this office, prior to the 90th day, with the reason for not meeting the deadline and a date when we can expect the well to be plugged back. Failure to do so will result in enforcement action.**

2. **Notification: Contact the appropriate BLM office at least 24 hours prior to the commencing of any plug back operations. For wells in Eddy County, call 575-361-2822. For wells in Lea County, call 575-393-3612**

3. Blowout Preventers: A blowout preventer (BOP), as appropriate, shall be installed before commencing any plugging operation. The BOP must be installed and maintained as per API and manufacturer recommendations. The minimum BOP requirement is a 2M system for a well not deeper than 9,090 feet; a 3M system for a well not deeper than 13,636 feet; and a 5M system for a well not deeper than 22,727 feet.

4. Mud Requirement: Mud shall be placed between all plugs. Minimum consistency of plugging mud shall be obtained by mixing at the rate of 25 sacks (50 pounds each) of gel per 100 barrels of **brine** water. Minimum nine (9) pounds per gallon.

5. Cement Requirement: Sufficient cement shall be used to bring any required plug to the specified depth and length. Any given cement volumes on the proposed plugging procedure are merely estimates and are not final. Unless specific approval is received, no plug except the surface plug shall be less than 25 sacks of cement. Any plug that requires a tag will have a minimum WOC time of 4 hours.
In lieu of a cement plug across perforations in a cased hole (not for any other plugs), a bridge plug set within 50 feet to 100 feet above the perforations shall be capped with 25 sacks of cement.
Before pumping cement on top of CIBP, tag will be required to verify depth. Based on depth, a tag of the cement may be deemed necessary.

Unless otherwise specified in the approved procedure, the cement plug shall consist of either **Neat Class "C"**, for up to 7,500 feet of depth or **Neat Class "H"**, for deeper than 7,500 feet plugs.

6. Subsequent Plug back Reporting: Within 30 days after plug back work is completed, file one original and three copies of the Subsequent Report, Form 3160-5 to BLM. The report should give in detail the manner in which the plug back work was carried out, the extent (by depths) of cement plugs placed, and the size and location (by depths) of casing left in the well. **Show date work was completed.** If plugging back to a new zone submit a Completion Report, form 3160-4 with the Subsequent Report.

7. Trash: All trash, junk and other waste material shall be contained in trash cages or bins to prevent scattering and will be removed and deposited in an approved sanitary landfill. Burial on site is not permitted.

13 3/8	surface csg in a		17 1/2	inch hole.		Design Factors		SURFACE	
Segment	#/ft	Grade		Coupling	Joint	Collapse	Burst	Length	Weight
"A"	54.50	J 55		ST&C	11.10	2.94	0.52	850	46,325
"B"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,500			Tail Cmt	does	circ to sfc.	Totals:	850	46,325

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	650	865	645	34	8.70	2931	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"	43.50	L 80		LT&C	2.04	0.73	0.73	10,505	456,968
"B"	43.50	L 80		LT&C	1185.56	0.73	0.73	25	1,088
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	10,530	458,055
The cement volume(s) are intended to achieve a top of					0	ft from surface or a		850	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	look ↘	0	3358		9.60	5969	10M	0.81
D V Tool(s):			4870				sum of sx	Σ CuFt	Σ%excess
t by stage % :		39	71				2367	5163	54

Class 'H' tail cmt yld > 1.20 MASP is within 10% of 5000psig, need

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.6, 0.6, c, d
<0.70 a Problem!!

ALT. COLLAPSE SF: 0.73*3 = 2.19; CURVE COLLASPE SF IS TOO CONSERVATIVE. IT IS GOOD.

Tail cmt

5 1/2	casing inside the		9 5/8			Design Factors		PRODUCTION	
Segment	#/ft	Grade		Coupling	Joint	Collapse	Burst	Length	Weight
"A"	20.00	P 110		LT&C	2.94	1.64	1.65	10,505	210,100
"B"	20.00	P 110		LT&C	8.18	1.24	1.45	9,097	181,940
w/8.4#/g mud, 30min Sfc Csg Test psig:	2,311						Totals:	19,602	392,040
B would be:					14.44	1.27	if it were a vertical wellbore.		

No Pilot Hole Planned	MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
	19602	12402	12402	10505	89	4	12629
The cement volume(s) are intended to achieve a top of			10330	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
8 1/2	0.2291	2444	2933	2134	37	13.50			1.20

13 3/8	surface csg in a		17 1/2	inch hole.		Design Factors		SURFACE	
Segment	#/ft	Grade		Coupling	Joint	Collapse	Burst	Length	Weight
"A"	54.50	J 55		ST&C	11.10	2.94	0.52	850	46,325
"B"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,500			Tail Cmt	does	circ to sfc.	Totals:	850	46,325

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	650	865	645	34	8.70	2931	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"	43.50	L 80		LT&C	2.04	0.73	0.74	10,505	456,968
"B"	43.50	L 80		LT&C	1185.56	0.73	0.74	25	1,088
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	10,530	458,055
B s would be:					747.59	0.73	if it were a vertical wellbore.		

No Pilot Hole Planned	MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
	10530	10518	10518	10505	2	0	0

The cement volume(s) are intended to achieve a top of 0 ft from surface or a 850 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	look ↘	0	3358		9.60	5903	10M	0.81
D V Tool(s):			4870				sum of sx	Σ CuFt	Σ%excess
t by stage %		39	71				2367	5163	54

Class 'H' tail cmt yld > 1.20 MASP is within 10% of 5000psig, need

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.6, 0.6, c, d <0.70 a Problem!! ALT. COLLAPSE SF 0.73*3=2.19

Tail cmt

7 5/8	Liner w/top @		10230			Design Factors		LINER	
Segment	#/ft	Grade		Coupling	Joint	Collapse	Burst	Length	Weight
"A"	29.70	P 110		#N/A	10.79	0.83	1.09	2,103	62,459
"B"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,277						Totals:	2,103	62,459
A would be:					9.03	0.83	if it were a vertical wellbore.		

No Pilot Hole Planned	MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
	12333	12264	12264	10505	60	-1	0

The cement volume(s) are intended to achieve a top of 10430 ft from surface or a 100 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 1/2	0.0770	154	205	160	28	13.50	5969	10M	0.44

Class 'H' tail cmt yld > 1.20 MASP is within 10% of 5000psig, need exrta equip?

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		TXP	2.59	1.51	1.45	10,505	210,100
"B"	20.00	P 110		TXP	3.26	1.25	1.45	1,828	36,560
"C"	18.00	P 110		W521	344.61	1.71	1.6	7,269	130,842
"D"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:	2,311						Totals:	19,602	377,502
B Segment Design Factors would be:					16.96	1.28	if it were a vertical wellbore.		

No Pilot Hole Planned	MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
	19602	12402	12402	10505	89	4	12629

The cement volume(s) are intended to achieve a top of 12133 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	1915	2298	630	265	13.50			0.33

Capitan Reef est top XXXX. MASP is within 10% of 5000psig, need exrta equip?