

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.

5. Lease Serial No.
NMNM100549

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

7. If Unit or CA/Agreement, Name and/or No.
NMNM138618

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

8. Well Name and No.
HH SO 17 20 FED 002 1H

2. Name of Operator
CHEVRON USA INCORPORATED
Contact: LAURA BECERRA
E-Mail: LBECCERRA@CHEVRON.COM

9. API Well No.
30-015-45104-00-X1

3a. Address
6301 DEAUVILLE BLVD
MIDLAND, TX 79706

3b. Phone No. (include area code)
Ph: 432-687-7655

10. Field and Pool or Exploratory Area
PURPLE SAGE-WOLFCAMP (GAS)

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 17 T26S R27E NWNE 212FNL 1725FEL
32.049168 N Lat, 104.209305 W Lon

11. County or Parish, State
EDDY COUNTY, NM

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 recompleat 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 USA Inc respectfully requests the following changes to the original APD approved 7/6/2018:

FTP - From: 330' FNL, 330' FEL (LAT: 32.049169/LONG: -104.209303)
To: 330' FNL, 2,178' FEL (LAT: 32.048849/LONG: -104.210763)

LTP - From: 330' FSL, 330' FEL (LAT: 32.021365/LONG: -104.204571)
To: 330' FSL, 2,178' FEL (LAT: 32.021372/LONG: -104.210535)

BHL - From: 280' FSL, 330' FEL (LAT: 32.021228/LONG: -104.204571)
To: 25' FSL, 2,178' FEL (LAT: 32.020534/LONG: -104.210529)

GC 11/7/19
Accepted for record - NMOC
NOV 05 2019
DISTRICT//ARTESIAO.C.
Carlsbad Field Office
OCD Artesia

See Additional COAs

RECEIVED

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

Electronic Submission #487874 verified by the BLM Well Information System
For CHEVRON USA INCORPORATED, sent to the Carlsbad
Committed to AFMSS for processing by PRISCILLA PEREZ on 10/15/2019 (20PP0111SE)

Name (Printed/Typed) LAURA BECERRA

Title REGULATORY SPECIALIST

Signature (Electronic Submission)

Date 10/14/2019

NOV 05 2019

DISTRICT//ARTESIAO.C.D.

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By NDUNGU KAMAU

Title PETROLEUM ENGINEER

Date 10/25/2019

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 **

RNP 11-22-19

Additional data for EC transaction #487874 that would not fit on the form

32. Additional remarks, continued

TVD/MD: 10,029'/20,402' to 9,109'/19,788'

We also propose to break test if able to finish the next hole section within 21 days of the previous full BOP test. Details attached.

Copies of revised certified plat, directional survey, and drilling plan with updated casing and cement details are attached.

Revisions to Operator-Submitted EC Data for Sundry Notice #487874

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	APDCH NOI	APDCH NOI
Lease:	NMNM100549	NMNM100549
Agreement:		NMNM138618 (NMNM138618)
Operator:	CHEVRON USA INC 6301 DEAUVILLE BLVD MIDLAND, TX 79706 Ph: 432-687-7665	CHEVRON USA INCORPORATED 6301 DEAUVILLE BLVD MIDLAND, TX 79706 Ph: 432 687 7100
Admin Contact:	LAURA BECERRA REGULATORY SPECIALIST E-Mail: LBECERRA@CHEVRON.COM Ph: 432-687-7665	LAURA BECERRA REGULATORY SPECIALIST E-Mail: LBECERRA@CHEVRON.COM Ph: 432-687-7655
Tech Contact:	LAURA BECERRA REGULATORY SPECIALIST E-Mail: LBECERRA@CHEVRON.COM Ph: 432-687-7665	LAURA BECERRA REGULATORY SPECIALIST E-Mail: LBECERRA@CHEVRON.COM Ph: 432-687-7655
Location: State: County:	NM EDDY	NM EDDY
Field/Pool:	PURPLE SAGE;WOLFCAMP (GAS)	PURPLE SAGE-WOLFCAMP (GAS)
Well/Facility:	HH SO 17 20 FED 002 1H Sec 17 T26S R27E Mer NMP NWNE 212FNL 1725FEL	HH SO 17 20 FED 002 1H Sec 17 T26S R27E NWNE 212FNL 1725FEL 32.049168 N Lat, 104.209305 W Lon

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	CHEVRON USA INC
LEASE NO.:	NMNM100549
WELL NAME & NO.:	HH SO 17 20 FED 002 1H
SURFACE HOLE FOOTAGE:	212' FNL & 1725' FEL
BOTTOM HOLE FOOTAGE:	25' FSL & 2178' FEL; Sec. 20
LOCATION:	Section 17, T. 26 S., R 27 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

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

Break Testing	☒ Yes	☐ No	
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ALL PREVIOUS COAs STILL APPLY.

A. CASING

Primary Casing Design:

1. The 13-3/8 inch surface casing shall be set at approximately **450 feet** (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the 9-5/8 inch intermediate casing is:
 - Cement to surface. If cement does not circulate see B.1.a, c-d above.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
- ❖ **In High Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.**
3. The minimum required fill of cement behind the 7-5/8 inch 2nd intermediate liner is:
 - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
4. 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.

B. PRESSURE CONTROL

1. **Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'**
2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M) psi**.
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.

- c. Manufacturer representative shall install the test plug for the initial BOP test.
- d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
- e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

C. SPECIAL REQUIREMENT (S)

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

- While in transfer between wells, the BOPE shall be secured by the hydraulic carrier or cradle.
- Any well control event while drilling require notification to the BLM Petroleum Engineer prior to the commencement of any BOP Break Testing operations.
- A full BOP test is required prior to drilling the first deep intermediate hole section. If any subsequent hole interval is deeper than the first, a full BOP test will be required.

OTA10252019

Delaware Basin Changes to APD/COA for Federal Well



Well Name:

Well Name		API #
HH SO 17 20 FED 002	1H	30-015-45104

Rig: Patterson 257

CVX CONTACT:

Hannah Wardo
MCBU D&C Engineer – Patterson 257
Chevron North America Exploration and Production Co.
MidContinent Business Unit
Office: (713) 372-9032
Cell: (832) 963-9814
Email: Hannah.wardo@chevron.com

Summary of Changes to original APD

Chevron USA Inc is requesting the following changes to the original APD approved 7/6/2018:

- FTP - From: 330' FNL, 330' FEL (LAT: 32.049169/LONG: -104.209303)
To: 100' FNL, 2,178' FEL (LAT: 32.048849/LONG: -104.210763)
- LTP - From: 330' FSL, 330' FEL (LAT: 32.021365/LONG: -104.204571)
To: 330' FSL, 2,178' FEL (LAT: 32.021372/LONG: -104.210535)
- BHL - From: 280' FSL, 330' FEL (LAT: 32.021228/LONG: -104.204571)
To: 25' FSL, 2,178' FEL (LAT: 32.020534/LONG: -104.210529)
- TVD/MD: 10,029'/20,402' to 9,109'/19,788'
- A variance from the Onshore Order 2 where it states "(A full BOP Test) shall be performed: when initially installed and whenever any seal subject to test pressure is broken." We propose to break test if able to finish the next hole section within 21 days of the previous full BOP test. Upon the first nipple up of the pad a full BOP test will be performed. A break test will consist of a 250 psi low / $\geq 5,000$ psi high 10 min ea test against the connection that was broken when skidding the rig. A break test will not be performed on our last production section. A break test will only be performed on operations where BLM documentation states a 5M or less BOP can be utilized.

See drilling sequence below that indicates the potential hole sections break testing can be performed given they meet the above criteria.

HNM 26 27 Sec 17 20 Pad 93, Pkg 6

[illegible]

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

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

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

☒ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-015-45104		² Pool Code 98220		³ Pool Name PURPLE SAGE; WOLFCAMP (GAS)	
⁴ Property Code 321650		⁵ Property Name HH SO 17 20 FED 002		⁶ Well Number 1H	
⁷ OGRID No. 4323		⁸ Operator Name CHEVRON U.S.A. INC.		⁹ Elevation 3247'	

¹⁰ Surface Location									
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	17	26 SOUTH	27 EAST, N.M.P.M.		212'	NORTH	1725'	EAST	EDDY

¹¹ Bottom Hole Location If Different From Surface									
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	20	26 SOUTH	27 EAST, N.M.P.M.		25'	SOUTH	2178'	EAST	EDDY

¹² Dedicated Acres 640	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

¹⁶ <table border="1"> <tr> <th colspan="2">PROPOSED FIRST TAKE POINT</th> </tr> <tr> <td>X= 538,129' Y= 381,474' LAT. 32.048727° N LONG. 104.210270° W X= 579,313' Y= 381,531' LAT. 32.048849° N LONG. 104.210763° W</td> </tr> <tr> <th colspan="2">PROPOSED MID POINT</th> </tr> <tr> <td>X= 538,176' Y= 376,477' LAT. 32.034990° N LONG. 104.210136° W X= 579,360' Y= 376,534' LAT. 32.035112° N LONG. 104.210629° W</td> </tr> <tr> <th colspan="2">PROPOSED LAST TAKE POINT</th> </tr> <tr> <td>X= 538,211' Y= 371,479' LAT. 32.021250° N LONG. 104.210042° W X= 579,395' Y= 371,536' LAT. 32.021372° N LONG. 104.210535° W</td> </tr> </table> <table border="1"> <tr> <th colspan="2">CORNER COORDINATES TABLE (NAD 27)</th> </tr> <tr> <td>A - Y=361810.94, X=534988.20</td> <td></td> </tr> <tr> <td>B - Y=381799.23, X=540303.95</td> <td></td> </tr> <tr> <td>C - Y=376480.27, X=535066.16</td> <td></td> </tr> <tr> <td>D - Y=376474.90, X=540354.10</td> <td></td> </tr> <tr> <td>E - Y=371149.70, X=535082.62</td> <td></td> </tr> <tr> <td>F - Y=371148.59, X=540391.30</td> <td></td> </tr> </table> <table border="1"> <tr> <th colspan="2">PROPOSED BOTTOM HOLE LOCATION</th> </tr> <tr> <td>X= 538,213' Y= 371,174' LAT. 32.020412° N LONG. 104.210036° W X= 579,397' Y= 371,231' LAT. 32.020534° N LONG. 104.210529° W</td> </tr> </table>	PROPOSED FIRST TAKE POINT		X= 538,129' Y= 381,474' LAT. 32.048727° N LONG. 104.210270° W X= 579,313' Y= 381,531' LAT. 32.048849° N LONG. 104.210763° W	PROPOSED MID POINT		X= 538,176' Y= 376,477' LAT. 32.034990° N LONG. 104.210136° W X= 579,360' Y= 376,534' LAT. 32.035112° N LONG. 104.210629° W	PROPOSED LAST TAKE POINT		X= 538,211' Y= 371,479' LAT. 32.021250° N LONG. 104.210042° W X= 579,395' Y= 371,536' LAT. 32.021372° N LONG. 104.210535° W	CORNER COORDINATES TABLE (NAD 27)		A - Y=361810.94, X=534988.20		B - Y=381799.23, X=540303.95		C - Y=376480.27, X=535066.16		D - Y=376474.90, X=540354.10		E - Y=371149.70, X=535082.62		F - Y=371148.59, X=540391.30		PROPOSED BOTTOM HOLE LOCATION		X= 538,213' Y= 371,174' LAT. 32.020412° N LONG. 104.210036° W X= 579,397' Y= 371,231' LAT. 32.020534° N LONG. 104.210529° W		¹⁷ OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature: Date: 9/18/2019 Printed Name: Laura Becerra E-mail Address: LBecerra@Chevron.com ¹⁸ SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. Date of Survey: 06/15/2017 Signature and Seal of Professional Surveyor: Certificate Number: 22921 Date: 07/22/2019
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RWP 11-22-19

Pad Summary

The table below lists all the wells for the given pad and their respective name and TVD's (ft) for their production target intervals:

Well Name(s)	Target TVD	Formation Desc.
HH SO 17 20 FED 002 1H	9,109	Wolfcamp A
HH SO 17 20 FED 002 2H	9,718	Wolfcamp C
HH SO 17 20 FED 002 3H	9,188	Wolfcamp A
HH SO 17 20 FED 002 4H	9,849	Wolfcamp D
HH SO 17 20 FED 002 5H	9,111	Wolfcamp A
HH SO 17 20 FED 002 6H	9,720	Wolfcamp C

1. FORMATION TOPS

The estimated tops of important geologic markers are as follows:

Elevation: 3275 ft

FORMATION	SUB-SEA TVD	TVD	MD	LITHOLOGIES	MIN. RESOURCES	PROD. FORMATION
Rustler	3275		-	ANHYD	N/A	
Salado	2630	645	645	SALT	N/A	
Lamar	1177	2,098	2,098	LIMESTONE	N/A	
Bell Canyon	1148	2,127	2,127	SAND STONE	N/A	
Cherry Canyon	325	2,950	2,950	SAND STONE	N/A	
Brushy Canyon	-791	4,066	4,066	SAND STONE	N/A	
Bone Spring Limestone	-2400	5,675	5,675	LIMESTONE	N/A	
Avalon	-2543	5,818	5,818	SHALE	Oil	
Top Bone Spring 1	-3324	6,599	6,599	SHALE	Oil	
Top Bone Spring 2	-3857	7,132	7,132	SHALE	Oil	
Top Bone Spring 3	-4973	8,248	8,248	SHALE	Oil	
Wolfcamp	-5576	8,851	8,951	SHALE	Oil	
WCA	-5834	9,109	9,479	SHALE	Oil	Yes

WELLBORE LOCATIONS	SUB-SEA TVD	RKB TVD	MD
SHL	3275	-	-
KOP	-5261	8,536	8,579
FTP	-5834	9,109	9,479
LTP	-5834	9,109	19,788

Bottom hole temperature: 150 degrees F

2. ESTIMATED DEPTH OF WATER, OIL, GAS & OTHER MINERAL BEARING FORMATIONS

The estimated depths at which the top and bottom of the anticipated water, oil, gas, or other mineral bearing formations are expected to be encountered are as follows:

Substance	Formation	Depth
Deepest Expected Base of Fresh Water		450
Water	Rustler	-
Water	Salado	645
Water	Lamar	2,098
Oil/Gas	Bell Canyon	2,127
Oil/Gas	Cherry Canyon	2,950
Oil/Gas	Brushy Canyon	4,066
Oil/Gas	Bone Spring Limestone	5,675
Oil/Gas	Avalon	5,818
Oil/Gas	Top Bone Spring 1	6,599
Oil/Gas	Top Bone Spring 2	7,132
Oil/Gas	Top Bone Spring 3	8,248
Oil/Gas	Wolfcamp	8,851
Oil/Gas	WCA	9,109

All shows of fresh water and minerals will be reported and protected.

3. BOP EQUIPMENT

Chevron will have a minimum of a 5,000 psi rig stack (see proposed schematic) for drill out below surface casing. The stack will be tested as specified in the attached testing requirements. Batch drilling of the surface, intermediate, and production will take place. A full BOP test will be performed per hole section, unless approval from BLM is received otherwise. Flex choke hose will be used for all wells on the pad (see attached specs and variance). BOP test will be conducted by a third party.

Chevron requests a variance to use a FMC Technologies UH-S Multibowl wellhead, which will be run through the rig floor on surface casing. BOPE will be nipped up and tested after cementing surface casing. Subsequent tests will be performed as needed, not to exceed 30 days. The field report from FMC Technologies and BOP test information will be provided in a subsequent report at the end of the well. Please see the attached wellhead schematic. An installation manual has been placed on file with the BLM office and remains unchanged from previous submittal. All tests performed by third party.

4. CASING PROGRAM

a. The proposed casing program will be as follows:

Purpose	From	To	Hole Size	Csg Size	Weight	Grade	Thread	Condition
Surface	0'	450'	17-1/2"	13-3/8"	54.5 #	J-55	STC/BTC	New
Intermediate	0'	2,100'	12-1/4"	9-5/8"	43.5 #	L-80	LTC	New
INT2 Liner	1,800'	8,400'	8-1/2"	7-5/8"	29.7 #	P-110	W-513	New
Production (Tapered String)	0'	7,900'	6-3/4"	5-1/2"	20.0 #	P-110	TXP-BTC	New
	0'	19,788'	6-3/4"	5"	18.0 #	P-110	W-521	New

Purpose	Hole Size	Casing Size	Top (MD)	Btm (MD)	Top (TVD)	Btm (TVD)	Top (SSTVD)	Btm (SSTVD)	Grade	Weight	Joint type
Surface	17-1/2"	13-3/8"	0'	450'	0'	450'	3,275'	2,825'	J-55	54.5 #	STC/BTC
Intermediate	12-1/4"	9-5/8"	0'	2,100'	0'	2,100'	3,275'	1,175'	L-80	43.5 #	LTC
Intermediate Liner	8-1/2"	7-5/8"	1,800'	8,400'	1,800'	8,400'	1,475'	-5,125'	P110	29.7 #	W-513
Production (Tapered String)	6-3/4"	5-1/2"	0'	7,900'	0'	7,900'	3,275'	-4,625'	P110	20.0 #	TXP-BTC
	6-3/4"	5"	7,900'	19,788'	7,900'	9,109'	-4,625'	-5,834'	P110	18.0 #	W-521

b. Casing design subject to revision based on geologic conditions encountered.

A "Worst Case" casing design for wells in a particular area is used below to calculate the Casing Safety Factors. If for any reason the casing design for a particular well requires setting casing deeper than the following "worst case" design, then the Casing Safety Factors will be recalculated & sent to the BLM prior to drilling.

d. Chevron will fill casing at a minimum of every 20 Jts (~640') while running for intermediate and production casing in order to maintain collapse SF.

SF Calculations based on the following "Worst Case" casing design:

Surface Casing:	450'	ftTVD
Intermediate Casing:	2,100'	ftTVD
INT2 Liner	8,400'	ftTVD
Production Casing:	19,788'	ftMD (10,414' VS)

Casing String	Min SF Burst	Min SF Collapse	Min SF Tension	Min SF Tri-Axial
Surface	1.48	2.10	4.91	1.80
Intermediate	1.52	1.87	2.79	1.83
Intermediate	1.33	2.59	1.60	1.66
Production	1.10	1.39	1.61	1.32

The following worst case load cases were considered for calculation of the above Min. Safety Factors:

Burst Design	Surf	Int	Prod
Pressure Test- Surface, Int, Prod Csg P external: Mud weight above TOC, PP below P internal: Test psi + next section heaviest mud in csg	X	X	X
Displace to Gas- Surf Csg P external: Mud weight above TOC, PP below P internal: Dry Gas from Next Csg Point	X		
Gas over mud (60/40) - Int Csg P external: Mud weight above TOC, PP below P internal: 60% gas over 40% mud from hole TD PP		X	
Stimulation (Frac) Pressures- Prod Csg P external: Mud weight above TOC, PP below P internal: Max inj pressure w/ heaviest injected fluid			X
Tubing leak- Prod Csg (packer at KOP) P external: Mud weight above TOC, PP below P internal: Leak just below surf, 8.45 ppg packer fluid			X
Collapse Design	Surf	Int	Prod
Full Evacuation P external: Mud weight gradient P internal: none	X	X	X
Cementing- Surf, Int, Prod Csg P external: Wet cement P internal: displacement fluid - water	X	X	X
Tension Design	Surf	Int	Prod
100k lb overpull	X	X	X

5. **CEMENTING PROGRAM**

Slurry	Type	Top	Bottom	Sacks	Yield (cu ft/sk)	Density (ppg)	%Excess Open Hole	Water gal/sk	Volume cuft	Additives
Surface										
Tail	Class C	0'	450'	488	1.34	14.8	50	6.40	654	Extender, Antifoam, Retarder
Intermediate Csg										
Lead	Class C	0'	1,100'	398	1.73	12.8	100	9.26	689	Extender, Antifoam, Retarder, Viscosifier
Tail	Class C	1,100'	2,100'	334	1.33	14.8	30	6.38	445	Extender, Antifoam, Retarder, Viscosifier
Intermediate 2 Csg										
Lead	Class C	1,800'	7,900'	464	2.43	11.9	140	12.54	1127	Extender, Antifoam, Retarder, Viscosifier
Tail	Class C	7,900'	8,400'	43	1.335	14.8	50	6.29	58	Extender, Antifoam, Retarder, Viscosifier
Production										
Lead	Class H	7,900'	18,788'	996	1.84	13.2	50	9.85	1832	Extender, Antifoam, Retarder, Viscosifier
Tail	Class H	18,788'	19,788'	78	2.16	15	50	9.22	168	Extender, Antifoam, Retarder, Viscosifier

1. Final cement volumes will be determined by caliper.
2. Surface casing shall have at least one centralizer installed on each of the bottom three joints starting with the shoe joint.
3. Production casing will have one solid body type centralizer on every joint in the lateral, then every other joint to KOP. Bowspring type centralizers will be run from KOP to intermediate casing and surface.

6. **MUD PROGRAM**

From	To	TVD Top	TVD Btm	Type	Weight	Viscosity	Filtrate
0'	450'	0'	880'	Fresh water mud	8.3 - 9.0	28-30	N/C
450'	2,100'	880'	2,100'	Brine/OBM	8.8 - 10.6	28-70	15-30
2,100'	8,400'	2,100'	8,400'	Cut Brine/OBM	8.8 - 10.0	28-70	15-30
8,400'	19,788'	8,400'	9,109'	OBM	9.5 - 12.0	50-70	10 - 25

A closed system will be used consisting of above ground steel tanks. All wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill. Sanitary wastes will be contained in a chemical porta-toilet and then hauled to an approved sanitary landfill.

All fluids and cuttings will be disposed of in accordance with New Mexico Oil Conservation Division rules and regulations. And transporting of E&P waste will follow EPA regulations and accompanying manifests.

A mud test shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

Visual mud monitoring equipment shall be in place to detect volume changes indicating loss or gain of circulating fluid volume. When abnormal pressures are anticipated -- a pit volume totalizer (PVT), stroke counter, and flow sensor will be used to detect volume changes indicating loss or gain of circulating fluid volume.

A weighting agent and lost circulating material (LCM) will be onsite to mitigate pressure or lost circulation as hole conditions dictate.

7. TESTING, LOGGING, AND CORING

The anticipated type and amount of testing, logging, and coring are as follows:

- a. Drill stem tests are not planned.
- b. The logging program will be as follows:

TYPE	Logs	Interval	Timing
Mudlogs	2 man mudlog	Surface casing shoe through prod hole TD	While drilling or circulating
LWD	MWD Gamma	Int. and Prod. Hole	While Drilling

- c. Conventional whole core samples are not planned.
- d. A directional survey will be run.

8. ABNORMAL PRESSURES AND HYDROGEN SULFIDE

- a. No abnormal pressure or temperatures are expected. Estimated BHP is: psi (MASP)
- b. Hydrogen sulfide gas is not anticipated. An H2S Contingency plan is attached with this APD in the event that H2S is encountered

PLANNED WELLPATH REPORT (CSV version)

Prepared by Baker Hughes, a GE company

Software System: WellArchitect® 5.1

REFERENCE WELLPATH IDENTIFICATION

Operator Chevron U.S.A. Inc.
Area Eddy County, NM
Field Purple Sage, Wolfcamp (Eddy Co., NM) NAD 27
Facility HNM 26 27 Pkg 6 Pad 93
Slot HH SO 17 20 Fed 002 No. 1H
Well HH SO 17 20 Fed 002 No. 1H
Wellbore HH SO 17 20 Fed 002 No. 1H PWB
Wellpath HH SO 17 20 Fed 002 No. 1H Rev-A.0
Sidetrack (none)

REPORT SETUP INFORMATION

Projection NAD27 / TM New Mexico SP, Eastern Zone (3001), US feet
North Refe Grid
Scale 0.999911
Convergen 0.07° East
Software S WellArchitect® 5.1
User Moyagusa
Report Ger 27/Aug/2019 at 10:09
DataBase/\\WA_HOU_Midland_Defn\\ev1530.xml

WELLPATH Local North	Local East	Easting	Northing	Latitude	Longitude
[ft]	[ft]	[US ft]	[US ft]		
Slot Locati	0	0	538581	381591	32°02'56.5" 104°12'31.716"W
Facility Ref			538581	381591	32°02'56.5" 104°12'31.716"W
Field Refer		152400.3		0	30°59'42.8" 105°26'33.659"W

WELLPATH DATUM

Calculation Minimum curvature
Horizontal Slot
Vertical Re Patterson 257 (KB)
MD Refere Patterson 257 (KB)
Field Vertic Mean Sea Level
Patterson ± 3275.00ft
Patterson ± 3275.00ft
Patterson ± 28.00ft
Section Ori N 0.00, E 0.00 ft
Section Azi 179.53°

WELLPATH DATA † = interpolated, ‡ = extrapolated station

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	DLS	Build Rate	Turn Rate	Comments
[ft]	[°]	[°]	[ft]	[ft]	[ft]	[ft]	[US ft]	[US ft]			[°/100ft]	[°/100ft]	[°/100ft]	
†	0	0	181.5	0	0	0	538581	381591	32°02'56.5" 104°12'31.716"W		0	0	0	
	28	0	181.5	28	0	0	538581	381591	32°02'56.5" 104°12'31.716"W		0	0	0	
	166.4	1.8	181.5	166.38	2.17	-2.17	-0.06	538580.9	381588.8	32°02'56.5" 104°12'31.716"W	1.3	1.3	-128.97	
	259.4	1.8	189.5	259.33	5.07	-5.07	-0.34	538580.7	381585.9	32°02'56.5" 104°12'31.716"W	0.27	0	8.6	
	353.4	2	191.5	353.28	8.13	-8.14	-0.91	538580.1	381582.9	32°02'56.4" 104°12'31.716"W	0.22	0.21	2.13	
	415.4	2.2	194.5	415.24	10.34	-10.35	-1.42	538579.6	381580.7	32°02'56.4" 104°12'31.716"W	0.37	0.32	4.84	Tie On
†	515.4	2.2	194.5	515.16	14.05	-14.07	-2.38	538578.6	381576.9	32°02'56.4" 104°12'31.716"W	0	0	0	
	550.26	2.2	194.5	550	15.34	-15.36	-2.72	538578.3	381575.6	32°02'56.4" 104°12'31.716"W	0	0	0	Start Build
†	615.4	1.468	215.253	615.11	17.22	-17.25	-3.51	538577.5	381573.8	32°02'56.4" 104°12'31.716"W	1.5	-1.12	31.86	
†	715.4	1.322	280.044	715.08	18.05	-18.1	-5.39	538575.6	381572.9	32°02'56.3" 104°12'31.716"W	1.5	-0.15	64.79	
†	815.4	2.417	313.388	815.03	16.38	-16.45	-8.06	538572.9	381574.6	32°02'56.4" 104°12'31.716"W	1.5	1.09	33.34	
†	915.4	3.799	324.425	914.88	12.21	-12.31	-11.52	538569.5	381578.7	32°02'56.4" 104°12'31.716"W	1.5	1.38	11.04	
†	1015.4	5.246	329.491	1014.57	5.54	-5.67	-15.76	538565.2	381585.3	32°02'56.5" 104°12'31.716"W	1.5	1.45	5.07	
†	1115.4	6.717	332.358	1114.02	-3.62	3.45	-20.8	538560.2	381594.5	32°02'56.6" 104°12'31.716"W	1.5	1.47	2.87	
†	1215.4	8.198	334.196	1213.17	-15.27	15.05	-26.62	538554.4	381606.1	32°02'56.7" 104°12'32.1"W	1.5	1.48	1.84	
†	1315.4	9.685	335.474	1311.95	-29.39	29.12	-33.21	538547.8	381620.1	32°02'56.8" 104°12'32.1"W	1.5	1.49	1.28	
	1376.78	10.599	336.082	1372.38	-39.29	38.98	-37.64	538543.4	381630	32°02'56.9" 104°12'32.1"W	1.5	1.49	0.99	End Build
†	1415.4	10.599	336.082	1410.34	-45.8	45.47	-40.52	538540.5	381636.5	32°02'57.0" 104°12'32.1"W	0	0	0	
†	1515.4	10.599	336.082	1508.63	-62.68	62.29	-47.98	538533	381653.3	32°02'57.1" 104°12'32.1"W	0	0	0	
†	1615.4	10.599	336.082	1606.92	-79.55	79.1	-55.44	538525.6	381670.1	32°02'57.3" 104°12'32.1"W	0	0	0	
†	1715.4	10.599	336.082	1705.22	-96.43	95.92	-62.9	538518.1	381686.9	32°02'57.5" 104°12'32.1"W	0	0	0	
†	1815.4	10.599	336.082	1803.51	-113.3	112.73	-70.35	538510.7	381703.7	32°02'57.6" 104°12'32.1"W	0	0	0	
†	1915.4	10.599	336.082	1901.8	-130.18	129.55	-77.81	538503.2	381720.5	32°02'57.8" 104°12'32.1"W	0	0	0	
†	2015.4	10.599	336.082	2000.1	-147.05	146.36	-85.27	538495.7	381737.4	32°02'58.0" 104°12'32.1"W	0	0	0	
†	2115.4	10.599	336.082	2098.39	-163.93	163.17	-92.73	538488.3	381754.2	32°02'58.1" 104°12'32.1"W	0	0	0	
†	2215.4	10.599	336.082	2196.68	-180.8	179.99	-100.18	538480.8	381771	32°02'58.3" 104°12'32.1"W	0	0	0	
†	2315.4	10.599	336.082	2294.98	-197.68	196.8	-107.64	538473.4	381787.8	32°02'58.5" 104°12'32.1"W	0	0	0	
†	2415.4	10.599	336.082	2393.27	-214.56	213.62	-115.1	538465.9	381804.6	32°02'58.6" 104°12'33.1"W	0	0	0	
†	2515.4	10.599	336.082	2491.57	-231.43	230.43	-122.56	538458.5	381821.4	32°02'58.8" 104°12'33.1"W	0	0	0	

†	2615.4	10.599	336.082	2589.86	-248.31	247.25	-130.01	538451	381838.2	32°02'59.0" 104°12'33.1"	0	0	0
†	2715.4	10.599	336.082	2688.15	-265.18	264.06	-137.47	538443.5	381855.3	32°02'59.1" 104°12'33.1"	0	0	0
†	2815.4	10.599	336.082	2786.45	-282.06	280.88	-144.93	538436.1	381871.9	32°02'59.3" 104°12'33.1"	0	0	0
†	2915.4	10.599	336.082	2884.74	-298.93	297.69	-152.39	538428.6	381888.7	32°02'59.5" 104°12'33.1"	0	0	0
†	3015.4	10.599	336.082	2983.03	-315.81	314.51	-159.84	538421.2	381905.5	32°02'59.6" 104°12'33.1"	0	0	0
†	3115.4	10.599	336.082	3081.33	-332.68	331.32	-167.3	538413.7	381922.3	32°02'59.8" 104°12'33.1"	0	0	0
†	3215.4	10.599	336.082	3179.62	-349.56	348.13	-174.76	538406.3	381939.1	32°03'00.0" 104°12'33.1"	0	0	0
†	3315.4	10.599	336.082	3277.92	-366.43	364.95	-182.22	538398.8	381955.9	32°03'00.1" 104°12'33.1"	0	0	0
	3402.37	10.599	336.082	3363.4	-381.11	379.57	-188.7	538392.3	381970.5	32°03'00.3" 104°12'33.1"	0	0	0 Start Drop
†	3415.4	10.404	336.082	3376.21	-383.29	381.74	-189.66	538391.4	381972.7	32°03'00.3" 104°12'33.1"	1.5	-1.5	0
†	3515.4	8.904	336.082	3474.79	-398.67	397.07	-196.46	538384.6	381988.3	32°03'00.5" 104°12'33.1"	1.5	-1.5	0
†	3615.4	7.404	336.082	3573.78	-411.68	410.04	-202.21	538378.8	382001.3	32°03'00.6" 104°12'34.1"	1.5	-1.5	0
†	3715.4	5.904	336.082	3673.1	-422.31	420.63	-206.91	538374.1	382011.6	32°03'00.7" 104°12'34.1"	1.5	-1.5	0
†	3815.4	4.404	336.082	3772.7	-430.55	428.84	-210.55	538370.5	382019.8	32°03'00.8" 104°12'34.1"	1.5	-1.5	0
†	3915.4	2.904	336.082	3872.49	-436.4	434.67	-213.14	538367.9	382025.6	32°03'00.8" 104°12'34.1"	1.5	-1.5	0
†	4015.4	1.404	336.082	3972.42	-439.85	438.1	-214.66	538366.4	382029.1	32°03'00.9" 104°12'34.1"	1.5	-1.5	0
	4108.99	0	193.825	4066	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	1.5	-1.5	25.56 End Drop
†	4115.4	0	193.825	4072.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	4215.4	0	193.825	4172.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	4315.4	0	193.825	4272.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	4415.4	0	193.825	4372.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	4515.4	0	193.825	4472.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	4615.4	0	193.825	4572.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	4715.4	0	193.825	4672.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	4815.4	0	193.825	4772.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	4915.4	0	193.825	4872.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	5015.4	0	193.825	4972.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	5115.4	0	193.825	5072.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	5215.4	0	193.825	5172.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	5315.4	0	193.825	5272.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	5415.4	0	193.825	5372.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	5515.4	0	193.825	5472.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	5615.4	0	193.825	5572.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	5715.4	0	193.825	5672.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	5815.4	0	193.825	5772.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	5915.4	0	193.825	5872.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	6015.4	0	193.825	5972.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	6115.4	0	193.825	6072.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	6215.4	0	193.825	6172.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	6315.4	0	193.825	6272.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	6415.4	0	193.825	6372.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	6515.4	0	193.825	6472.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	6615.4	0	193.825	6572.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	6715.4	0	193.825	6672.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	6815.4	0	193.825	6772.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	6915.4	0	193.825	6872.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	7015.4	0	193.825	6972.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	7115.4	0	193.825	7072.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	7215.4	0	193.825	7172.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	7315.4	0	193.825	7272.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	7415.4	0	193.825	7372.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	7515.4	0	193.825	7472.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	7615.4	0	193.825	7572.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	7715.4	0	193.825	7672.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	7815.4	0	193.825	7772.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	7915.4	0	193.825	7872.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	8015.4	0	193.825	7972.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	8115.4	0	193.825	8072.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	8215.4	0	193.825	8172.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	8315.4	0	193.825	8272.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	8415.4	0	193.825	8372.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
†	8515.4	0	193.825	8472.41	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0
	8579.03	0	193.825	8536.04	-440.9	439.15	-215.12	538365.9	382030.1	32°03'00.9" 104°12'34.1"	0	0	0 Curve KOP
†	8615.4	3.637	193.825	8572.38	-439.78	438.03	-215.4	538365.6	382029.3	32°03'00.9" 104°12'34.1"	10	10	-456.95
†	8715.4	13.637	193.825	8671.12	-425.25	423.47	-218.98	538362	382014.4	32°03'00.7" 104°12'34.1"	10	10	0
†	8815.4	23.637	193.825	8765.76	-394.32	392.47	-226.61	538354.4	381983.4	32°03'00.4" 104°12'34.1"	10	10	0
†	8915.4	33.637	193.825	8853.42	-347.94	346	-238.05	538343	381937.3	32°02'59.9" 104°12'34.1"	10	10	0
†	9015.4	43.637	193.825	8931.43	-287.51	285.44	-252.95	538328.1	381876.4	32°02'59.3" 104°12'34.1"	10	10	0
†	9115.4	53.637	193.825	8997.43	-214.87	212.66	-270.86	538310.2	381803.6	32°02'58.6" 104°12'34.1"	10	10	0
†	9215.4	63.637	193.825	9049.41	-132.23	129.85	-291.24	538289.8	381720.8	32°02'57.8" 104°12'35.1"	10	10	0
†	9315.4	73.637	193.825	9085.79	-42.1	39.53	-313.46	538267.6	381630.5	32°02'56.9" 104°12'35.1"	10	10	0
†	9415.4	83.637	193.825	9105.47	52.78	-55.55	-336.86	538244.2	381535.5	32°02'56.0" 104°12'35.1"	10	10	0
	9479.03	90	193.825	9109	114.32	-117.21	-352.03	538229	381473.8	32°02'55.4" 104°12'35.1"	10	10	0 End Build -
†	9515.4	90	193.825	9109	149.56	-152.52	-360.72	538220.3	381438.5	32°02'55.0" 104°12'35.1"	0	0	0
	9521.21	90	193.825	9109	155.19	-158.17	-362.11	538218.9	381432.9	32°02'55.0" 104°12'35.1"	0	0	0 Start Turn
†	9615.4	90	191.941	9109	246.83	-249.98	-383.11	538197.9	381341	32°02'54.1" 104°12'36.1"	2	0	-2

†	9715.4	90	189.941	9109	344.85	-348.16	-402.09	538179	381242.9	32°02'53.1" 104°12'36.1"	2	0	-2
†	9815.4	90	187.941	9109	443.5	-446.94	-417.63	538163.4	381144.1	32°02'52.1" 104°12'36.1"	2	0	-2
†	9915.4	90	185.941	9109	542.66	-546.2	-429.71	538151.3	381044.9	32°02'51.1" 104°12'36.1"	2	0	-2
†	10015.4	90	183.941	9109	642.21	-645.82	-438.32	538142.7	380945.2	32°02'50.1" 104°12'36.1"	2	0	-2
†	10115.4	90	181.941	9109	742.02	-745.69	-443.45	538137.6	380845.4	32°02'49.1" 104°12'36.1"	2	0	-2
†	10215.4	90	179.941	9109	841.99	-845.67	-445.1	538135.9	380745.4	32°02'48.2" 104°12'36.1"	2	0	-2
†	10239.39	90	179.461	9109	865.97	-869.65	-444.97	538136.1	380721.4	32°02'47.9" 104°12'36.1"	2	0	-2 End Turn
†	10315.4	90	179.461	9109	941.99	-945.66	-444.26	538136.8	380645.4	32°02'47.2" 104°12'36.1"	0	0	0
†	10415.4	90	179.461	9109	1041.99	-1045.66	-443.31	538137.7	380545.4	32°02'46.2" 104°12'36.1"	0	0	0
†	10515.4	90	179.461	9109	1141.99	-1145.66	-442.37	538138.7	380445.5	32°02'45.2" 104°12'36.1"	0	0	0
†	10615.4	90	179.461	9109	1241.99	-1245.65	-441.43	538139.6	380345.5	32°02'44.2" 104°12'36.1"	0	0	0
†	10715.4	90	179.461	9109	1341.99	-1345.65	-440.49	538140.6	380245.5	32°02'43.2" 104°12'36.1"	0	0	0
†	10815.4	90	179.461	9109	1441.99	-1445.64	-439.55	538141.5	380145.5	32°02'42.2" 104°12'36.1"	0	0	0
†	10915.4	90	179.461	9109	1541.99	-1545.64	-438.61	538142.4	380045.5	32°02'41.2" 104°12'36.1"	0	0	0
†	11015.4	90	179.461	9109	1641.99	-1645.63	-437.67	538143.4	379945.5	32°02'40.2" 104°12'36.1"	0	0	0
†	11115.4	90	179.461	9109	1741.99	-1745.63	-436.73	538144.3	379845.5	32°02'39.3" 104°12'36.1"	0	0	0
†	11215.4	90	179.461	9109	1841.99	-1845.62	-435.79	538145.3	379745.5	32°02'38.3" 104°12'36.1"	0	0	0
†	11315.4	90	179.461	9109	1941.99	-1945.62	-434.85	538146.2	379645.6	32°02'37.3" 104°12'36.1"	0	0	0
†	11415.4	90	179.461	9109	2041.99	-2045.62	-433.91	538147.1	379545.6	32°02'36.3" 104°12'36.1"	0	0	0
†	11515.4	90	179.461	9109	2141.99	-2145.61	-432.97	538148.1	379445.6	32°02'35.3" 104°12'36.1"	0	0	0
†	11615.4	90	179.461	9109	2241.99	-2245.61	-432.03	538149	379345.6	32°02'34.3" 104°12'36.1"	0	0	0
†	11715.4	90	179.461	9109	2341.99	-2345.6	-431.09	538150	379245.6	32°02'33.3" 104°12'36.1"	0	0	0
†	11815.4	90	179.461	9109	2441.99	-2445.6	-430.14	538150.9	379145.6	32°02'32.3" 104°12'36.1"	0	0	0
†	11915.4	90	179.461	9109	2541.99	-2545.59	-429.2	538151.8	379045.6	32°02'31.3" 104°12'36.1"	0	0	0
†	12015.4	90	179.461	9109	2641.99	-2645.59	-428.26	538152.8	378945.7	32°02'30.3" 104°12'36.1"	0	0	0
†	12115.4	90	179.461	9109	2741.99	-2745.58	-427.32	538153.7	378845.7	32°02'29.4" 104°12'36.1"	0	0	0
†	12215.4	90	179.461	9109	2841.99	-2845.58	-426.38	538154.7	378745.7	32°02'28.4" 104°12'36.1"	0	0	0
†	12315.4	90	179.461	9109	2941.99	-2945.58	-425.44	538155.6	378645.7	32°02'27.4" 104°12'36.1"	0	0	0
†	12415.4	90	179.461	9109	3041.99	-3045.57	-424.5	538156.5	378545.7	32°02'26.4" 104°12'36.1"	0	0	0
†	12515.4	90	179.461	9109	3141.99	-3145.57	-423.56	538157.5	378445.7	32°02'25.4" 104°12'36.1"	0	0	0
†	12615.4	90	179.461	9109	3241.99	-3245.56	-422.62	538158.4	378345.7	32°02'24.4" 104°12'36.1"	0	0	0
†	12715.4	90	179.461	9109	3341.99	-3345.56	-421.68	538159.4	378245.8	32°02'23.4" 104°12'36.1"	0	0	0
†	12815.4	90	179.461	9109	3441.99	-3445.55	-420.74	538160.3	378145.8	32°02'22.4" 104°12'36.1"	0	0	0
†	12915.4	90	179.461	9109	3541.99	-3545.55	-419.8	538161.2	378045.8	32°02'21.4" 104°12'36.1"	0	0	0
†	13015.4	90	179.461	9109	3641.99	-3645.54	-418.86	538162.2	377945.8	32°02'20.5" 104°12'36.1"	0	0	0
†	13115.4	90	179.461	9109	3741.99	-3745.54	-417.92	538163.1	377845.8	32°02'19.5" 104°12'36.1"	0	0	0
†	13215.4	90	179.461	9109	3841.99	-3845.54	-416.97	538164.1	377745.8	32°02'18.5" 104°12'36.1"	0	0	0
†	13315.4	90	179.461	9109	3941.99	-3945.53	-416.03	538165	377645.8	32°02'17.5" 104°12'36.1"	0	0	0
†	13415.4	90	179.461	9109	4041.99	-4045.53	-415.09	538165.9	377545.8	32°02'16.5" 104°12'36.1"	0	0	0
†	13515.4	90	179.461	9109	4141.99	-4145.52	-414.15	538166.9	377445.9	32°02'15.5" 104°12'36.1"	0	0	0
†	13615.4	90	179.461	9109	4241.99	-4245.52	-413.21	538167.8	377345.9	32°02'14.5" 104°12'36.1"	0	0	0
†	13715.4	90	179.461	9109	4341.99	-4345.51	-412.27	538168.8	377245.9	32°02'13.5" 104°12'36.1"	0	0	0
†	13815.4	90	179.461	9109	4441.99	-4445.51	-411.33	538169.7	377145.9	32°02'12.5" 104°12'36.1"	0	0	0
†	13915.4	90	179.461	9109	4541.99	-4545.5	-410.39	538170.7	377045.9	32°02'11.5" 104°12'36.1"	0	0	0
†	14015.4	90	179.461	9109	4641.99	-4645.5	-409.45	538171.6	376945.9	32°02'10.6" 104°12'36.1"	0	0	0
†	14115.4	90	179.461	9109	4741.99	-4745.5	-408.51	538172.5	376845.9	32°02'09.6" 104°12'36.1"	0	0	0
†	14215.4	90	179.461	9109	4841.99	-4845.49	-407.57	538173.5	376746	32°02'08.6" 104°12'36.1"	0	0	0
†	14315.4	90	179.461	9109	4941.99	-4945.49	-406.63	538174.4	376646	32°02'07.6" 104°12'36.1"	0	0	0
†	14415.4	90	179.461	9109	5041.99	-5045.48	-405.69	538175.4	376546	32°02'06.6" 104°12'36.1"	0	0	0
†	14484.39	90	179.461	9109	5110.97	-5114.47	-405.04	538176	376477	32°02'05.9" 104°12'36.1"	0	0	0 Start Turn
†	14491.35	90	179.6	9109	5117.94	-5121.43	-404.98	538176.1	376470	32°02'05.8" 104°12'36.1"	2	0	2 End Turn
†	14515.4	90	179.6	9109	5141.99	-5145.48	-404.81	538176.2	376446	32°02'05.6" 104°12'36.1"	0	0	0
†	14615.4	90	179.6	9109	5241.98	-5245.48	-404.11	538176.9	376346	32°02'04.6" 104°12'36.1"	0	0	0
†	14715.4	90	179.6	9109	5341.98	-5345.47	-403.42	538177.6	376246	32°02'03.6" 104°12'36.1"	0	0	0
†	14815.4	90	179.6	9109	5441.98	-5445.47	-402.72	538178.3	376146	32°02'02.6" 104°12'36.1"	0	0	0
†	14915.4	90	179.6	9109	5541.98	-5545.47	-402.02	538179	376046	32°02'01.6" 104°12'36.1"	0	0	0
†	15015.4	90	179.6	9109	5641.98	-5645.47	-401.32	538179.7	375946.1	32°02'00.7" 104°12'36.1"	0	0	0
†	15115.4	90	179.6	9109	5741.98	-5745.46	-400.63	538180.4	375846.1	32°01'59.7" 104°12'36.1"	0	0	0
†	15215.4	90	179.6	9109	5841.98	-5845.46	-399.93	538181.1	375746.1	32°01'58.7" 104°12'36.1"	0	0	0
†	15315.4	90	179.6	9109	5941.98	-5945.46	-399.23	538181.8	375646.1	32°01'57.7" 104°12'36.1"	0	0	0
†	15415.4	90	179.6	9109	6041.98	-6045.46	-398.53	538182.5	375546.1	32°01'56.7" 104°12'36.1"	0	0	0
†	15515.4	90	179.6	9109	6141.98	-6145.45	-397.84	538183.2	375446.1	32°01'55.7" 104°12'36.1"	0	0	0
†	15615.4	90	179.6	9109	6241.98	-6245.45	-397.14	538183.9	375346.1	32°01'54.7" 104°12'36.1"	0	0	0
†	15715.4	90	179.6	9109	6341.98	-6345.45	-396.44	538184.6	375246.1	32°01'53.7" 104°12'36.1"	0	0	0
†	15815.4	90	179.6	9109	6441.98	-6445.45	-395.74	538185.3	375146.1	32°01'52.7" 104°12'36.1"	0	0	0
†	15915.4	90	179.6	9109	6541.98	-6545.44	-395.05	538186	375046.2	32°01'51.8" 104°12'36.1"	0	0	0
†	16015.4	90	179.6	9109	6641.98	-6645.44	-394.35	538186.7	374946.2	32°01'50.8" 104°12'36.1"	0	0	0
†	16115.4	90	179.6	9109	6741.98	-6745.44	-393.65	538187.4	374846.2	32°01'49.8" 104°12'36.1"	0	0	0
†	16215.4	90	179.6	9109	6841.98	-6845.44	-392.95	538188.1	374746.2	32°01'48.8" 104°12'36.1"	0	0	0
†	16315.4	90	179.6	9109	6941.98	-6945.44	-392.26	538188.8	374646.2	32°01'47.8" 104°12'36.1"	0	0	0
†	16415.4	90	179.6	9109	7041.98	-7045.43	-391.56	538189.5	374546.2	32°01'46.8" 104°12'36.1"	0	0	0
†	16515.4	90	179.6	9109	7141.98	-7145.43	-390.86	538190.2	374446.2	32°01'45.8" 104°12'36.1"	0	0	0
†	16615.4	90	179.6	9109	7241.98	-7245.43	-390.16	538190.9	374346.2	32°01'44.8" 104°12'36.1"	0	0	0
†	16715.4	90	179.6	9109	7341.98	-7345.43	-389.47	538191.6	374246.2	32°01'43.8" 104°12'36.1"	0	0	0
†	16815.4	90	179.6	9109	7441.98	-7445.42	-388.77	538192.3	374146.3	32°01'42.8" 104°12'36.1"	0	0	0
†	16915.4	90	179.6	9109	7541.98	-7545.42	-388.07	538193	374046.3	32°01'41.9" 104°12'36.1"	0	0	0

†	17015.4	90	179.6	9109	7641.98	-7645.42	-387.37	538193.7	373946.3	32°01'40.9" 104°12'36.1"	0	0	0
†	17115.4	90	179.6	9109	7741.98	-7745.42	-386.68	538194.4	373846.3	32°01'39.9" 104°12'36.1"	0	0	0
†	17215.4	90	179.6	9109	7841.98	-7845.41	-385.98	538195.1	373746.3	32°01'38.9" 104°12'36.1"	0	0	0
†	17315.4	90	179.6	9109	7941.98	-7945.41	-385.28	538195.8	373646.3	32°01'37.9" 104°12'36.1"	0	0	0
†	17415.4	90	179.6	9109	8041.98	-8045.41	-384.58	538196.5	373546.3	32°01'36.9" 104°12'36.1"	0	0	0
†	17515.4	90	179.6	9109	8141.98	-8145.41	-383.89	538197.2	373446.3	32°01'35.9" 104°12'36.1"	0	0	0
†	17615.4	90	179.6	9109	8241.98	-8245.4	-383.19	538197.9	373346.4	32°01'34.9" 104°12'36.1"	0	0	0
†	17715.4	90	179.6	9109	8341.98	-8345.4	-382.49	538198.5	373246.4	32°01'33.9" 104°12'36.1"	0	0	0
†	17815.4	90	179.6	9109	8441.98	-8445.4	-381.79	538199.2	373146.4	32°01'33.0" 104°12'36.1"	0	0	0
†	17915.4	90	179.6	9109	8541.98	-8545.4	-381.1	538199.9	373046.4	32°01'32.0" 104°12'36.1"	0	0	0
†	18015.4	90	179.6	9109	8641.98	-8645.39	-380.4	538200.6	372946.4	32°01'31.0" 104°12'36.1"	0	0	0
†	18115.4	90	179.6	9109	8741.98	-8745.39	-379.7	538201.3	372846.4	32°01'30.0" 104°12'36.1"	0	0	0
†	18215.4	90	179.6	9109	8841.98	-8845.39	-379	538202	372746.4	32°01'29.0" 104°12'36.1"	0	0	0
†	18315.4	90	179.6	9109	8941.98	-8945.39	-378.31	538202.7	372646.4	32°01'28.0" 104°12'36.1"	0	0	0
†	18415.4	90	179.6	9109	9041.98	-9045.38	-377.61	538203.4	372546.4	32°01'27.0" 104°12'36.1"	0	0	0
†	18515.4	90	179.6	9109	9141.98	-9145.38	-376.91	538204.1	372446.5	32°01'26.0" 104°12'36.1"	0	0	0
†	18615.4	90	179.6	9109	9241.98	-9245.38	-376.21	538204.8	372346.5	32°01'25.0" 104°12'36.1"	0	0	0
†	18715.4	90	179.6	9109	9341.98	-9345.38	-375.52	538205.5	372246.5	32°01'24.0" 104°12'36.1"	0	0	0
†	18815.4	90	179.6	9109	9441.98	-9445.37	-374.82	538206.2	372146.5	32°01'23.1" 104°12'36.1"	0	0	0
†	18915.4	90	179.6	9109	9541.98	-9545.37	-374.12	538206.9	372046.5	32°01'22.1" 104°12'36.1"	0	0	0
†	19015.4	90	179.6	9109	9641.98	-9645.37	-373.42	538207.6	371946.5	32°01'21.1" 104°12'36.1"	0	0	0
†	19115.4	90	179.6	9109	9741.98	-9745.37	-372.73	538208.3	371846.5	32°01'20.1" 104°12'36.1"	0	0	0
†	19215.4	90	179.6	9109	9841.98	-9845.36	-372.03	538209	371746.5	32°01'19.1" 104°12'36.1"	0	0	0
†	19315.4	90	179.6	9109	9941.98	-9945.36	-371.33	538209.7	371646.5	32°01'18.1" 104°12'36.1"	0	0	0
†	19415.4	90	179.6	9109	10041.98	-10045.36	-370.63	538210.4	371546.6	32°01'17.1" 104°12'36.1"	0	0	0
†	19515.4	90	179.6	9109	10141.98	-10145.36	-369.94	538211.1	371446.6	32°01'16.1" 104°12'36.1"	0	0	0
†	19615.4	90	179.6	9109	10241.98	-10245.35	-369.24	538211.8	371346.6	32°01'15.1" 104°12'36.1"	0	0	0
†	19715.4	90	179.6	9109	10341.98	-10345.35	-368.54	538212.5	371246.6	32°01'14.2" 104°12'36.1"	0	0	0
	19788	90	179.6	9109	10414.58	-10417.95	-368.03	538213	371174	32°01'13.4" 104°12'36.1"	0	0	0 PBHL (25'

HOLE AND CASING SECTIONS Ref Wellbore: HH SO 17 20 Fed 002 No. 1H PWB Ref Wellpath: HH SO 17 20 Fed 002 No. 1H Rev-A.0

String/Diar	Start MD	End MD	Interval	Start TVD	End TVD	Start N/S	Start E/W	End N/S	End E/W
	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]
13.375in C	28	445	417	28	444.82	0	0	-11.45	-1.71
9.625in C	28	8290.99	8262.99	28	8248	0	0	439.15	-215.12
5.5in Casin	28	19788	19760	28	9109	0	0	-10417.95	-368.03

TARGETS

Name	MD	TVD	North	East	Grid East	Grid North	Latitude	Longitude	Shape	Comment
	[ft]	[ft]	[ft]	[ft]	[US ft]	[US ft]				
HH SO 17 20 Fed 002 N		9109	-117.01	-452.04	538129	381474	32°02'55.4" 104°12'36.1"		point	
HH SO 17 20 Fed 002 N		9109	-10112.92	-370.03	538211	371479	32°01'16.5" 104°12'36.1"		point	
(1) HH SO 1	14484.39	9109	-5114.47	-405.04	538176	376477	32°02'05.9" 104°12'36.1"		point	
(2) HH SO 1	19788	9109	-10417.95	-368.03	538213	371174	32°01'13.4" 104°12'36.1"		point	

SURVEY PROGRAM Ref Wellbore: HH SO 17 20 Fed 002 No. 1H PWB Ref Wellpath: HH SO 17 20 Fed 002 No. 1H Rev-A.0

Start MD	End MD	Pos Unc	Log Name/ Wellbore
[ft]	[ft]		
28	415.4		OWSG MW MWD Surv- HH SO 17 20 Fed 002 No. 1H AWB
415.4	8300		OWSG MWD rev2 + H HH SO 17 20 Fed 002 No. 1H PWB
8300	21000		OWSG MWD rev2 + H HH SO 17 20 Fed 002 No. 1H PWB

COMMENTS