

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM 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 27. If Unit or CA/Agreement, Name and/or No.
NMNM138618

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other8. Well Name and No.
HH SO 17 20 FED 002 3H2. Name of Operator
CHEVRON USA INCORPORATEDContact: LAURA BECERRA
E-Mail: LBECERRA@CHEVRON.COM9. API Well No.
30-015-45106-00-X13a. Address
6301 DEAUVILLE BLVD
MIDLAND, TX 797063b. Phone No. (include area code)
Ph: 432-687-765510. 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 1675FEL
32.049168 N Lat, 104.209145 W Lon11. 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 A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	PD

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

FTP - From: 330' FNL, 2,010' FEL (LAT: 32.048848/LONG: -104.210221)
TO: 330' FNL, 1,254' FEL (LAT: 32.048841/LONG: -104.207781)LTP - From: 330' FSL, 2,010' FEL (LAT: 32.021372/LONG: -104.209993)
TO: 330' FSL, 1,254' FEL (LAT: 32.021369/LONG: -104.207553)BHL - From: 280' FSL, 2,010' FEL (LAT: 32.021234/LONG: -104.209992)
TO: 25' FSL, 1,254' FEL (LAT: 32.020530/LONG: -104.207547)

TVD/MD: 10,029/20,402' to 9,188/19,941'

Carlsbad Field Office
OCD Artesia*See Additional COAs.*

14. I hereby certify that the foregoing is true and correct.	
Electronic Submission #487903 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 (20PP0113SE)	
Name (Printed/Typed) LAURA BECERRA	Title REGULATORY SPECIALIST
Signature (Electronic Submission)	Date 10/14/2019

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 *****RW 10-30-19*

Additional data for EC transaction #487903 that would not fit on the form

32. Additional remarks, continued

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 #487903

	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:	NM	NM
County:	EDDY	EDDY
Field/Pool:	PURPLE SAGE;WOLFCAMP (GAS)	PURPLE SAGE-WOLFCAMP (GAS)
Well/Facility:	HH SO 17 20 FED 002 3H Sec 17 T26S R27E Mer NMP NWNE 212FNL 1675FEL	HH SO 17 20 FED 002 3H Sec 17 T26S R27E NWNE 212FNL 1675FEL 32.049168 N Lat, 104.209145 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 3H
SURFACE HOLE FOOTAGE:	212' FNL & 1675' FEL
BOTTOM HOLE FOOTAGE	25' FSL & 1254' 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.

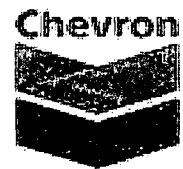
C. SPECIAL REQUIREMENT (S)

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	3H	30-015-45106

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, 2,010' FEL (LAT: 32.048848/LONG: -104.210221)
To: 330' FNL, 1,254' FEL (LAT: 32.048841/LONG: -104.207781)

LTP - From: 330' FSL, 2,010' FEL (LAT: 32.021372/LONG: -104.209993)
To: 330' FSL, 1,254' FEL (LAT: 32.021369/LONG: -104.207553)

BHL - From: 280' FSL, 2,010' FEL (LAT: 32.021234/LONG: -104.209992)
To: 25' FSL, 1,254' FEL (LAT: 32.020530/LONG: -104.207547)
- TVD/MD: 10,029'/20,402' to 9,188'/19,941'
- 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.

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 30-015-45106	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 3H
⁷ OGRID No. 4323	⁸ Operator Name CHEVRON U.S.A. INC.	⁹ Elevation 3248'

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	1675'	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
P	20	26 SOUTH	27 EAST, N.M.P.M.		25'	SOUTH	1254'	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 	HH SO 17 20 FED 002 3H WELL X= 538,631' Y= 381,591' NAD 27 LAT. 32.049046° N LONG. 104.208648° W X= 579,815' Y= 381,648' NAD83/86 LAT. 32.049168° N LONG. 104.209141° W ELEV. +3248' NAVD88	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. <i>[Signature]</i> 9/18/2019 Signature Date Laura Becerra Printed Name L.Becerra@Chevron.com E-mail Address	
	PROPOSED FIRST TAKE POINT X= 539,053' Y= 381,472' NAD 27 LAT. 32.048719° N LONG. 104.207287° W X= 580,237' Y= 381,529' NAD83/86 LAT. 32.048841° N LONG. 104.207781° W	CORNER COORDINATES TABLE (NAD 27) A - Y=381810.94, 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=371148.58, X=540391.30	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. 06/15/2017 Date of Survey <i>[Signature]</i> Signature and Seal of Professional Surveyor Steven M. Coleman PROFESSIONAL SURVEYOR 22921
	PROPOSED MID POINT X= 539,100' Y= 376,476' NAD 27 LAT. 32.034985° N LONG. 104.207154° W X= 580,284' Y= 376,533' NAD83/86 LAT. 32.035107° N LONG. 104.207647° W	PROPOSED BOTTOM HOLE LOCATION X= 539,137' Y= 371,174' NAD 27 LAT. 32.020408° N LONG. 104.207055° W X= 580,321' Y= 371,231' NAD83/86 LAT. 32.020530° N LONG. 104.207547° W	07/22/2019 Certificate Number
	PROPOSED LAST TAKE POINT X= 539,135' Y= 371,479' NAD 27 LAT. 32.021247° N LONG. 104.207060° W X= 580,319' Y= 371,536' NAD83/86 LAT. 32.021369° N LONG. 104.207553° W		

RWP10-30-19

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	
WCA	-5577	8,852	8,912	SHALE	Oil	Yes

WELLBORE LOCATIONS	SUB-SEA TVD	RKB TVD	MD
SHL	3275	-	-
KOP	-5308	8,583	8,626
FTP	-5913	9,188	9,640
LTP	-5913	9,188	19,941

Bottom hole temperature:	150 degrees F
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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	WCA	8,852

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'	19,941'	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'	19,941'	7,900'	9,188'	-4,625'	-5,913'	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 (~840') 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:	19,941'	ftMD (10421' 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'	18,941'	1010	1.84	13.2	50	9.85	1857	Extender, Antifoam, Retarder, Viscosifier
Tail	Class H	18,941'	19,941'	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'	19,941'	8,400'	9,188'	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. 3H
 Well HH SO 17 20 Fed 002 No. 3H
 Wellbore HH SO 17 20 Fed 002 No. 3H PWB
 Wellpath HH SO 17 20 Fed 002 No. 3H 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 11:07
 DataBase/ WA_HOU_Midland_Defn/ev1530.xml

WELLPATH Local North	Local East	Easting	Northing	Latitude	Longitude
[ft]	[ft]	[US ft]	[US ft]		
Slot Location	0	50	538631	381591 32°02'56.5"	104°12'31.135"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 ± 3276.00ft
 Patterson ± 3276.00ft
 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	268.5	0	0	0	0	538631	381591	32°02'56.5"	104°12'31.1	0	0	0	
	28	0	268.5	28	0	0	0	538631	381591	32°02'56.5"	104°12'31.1	0	0	0	
	166.4	1	268.5	166.39	0.02	-0.03	-1.21	538629.8	381591	32°02'56.5"	104°12'31.1	0.72	0.72	-66.11	
	259.4	1.2	256.5	259.38	0.26	-0.28	-2.97	538628	381590.7	32°02'56.5"	104°12'31.1	0.33	0.22	-12.9	
	308.4	1.4	278.5	308.36	0.28	-0.31	-4.06	538626.9	381590.7	32°02'56.5"	104°12'31.1	1.09	0.41	44.9	
	412.4	1.4	275.5	412.33	-0.05	0	-6.58	538624.4	381591	32°02'56.5"	104°12'31.1	0.07	0	-2.88	Tie On
†	512.4	1.4	275.5	512.3	-0.31	0.23	-9.01	538622	381591.2	32°02'56.5"	104°12'31.1	0	0	0	
	550	1.4	275.5	549.89	-0.4	0.32	-9.92	538621.1	381591.3	32°02'56.5"	104°12'31.1	0	0	0	Drop to Ve
†	612.4	0.464	275.5	612.28	-0.51	0.42	-10.93	538620.1	381591.4	32°02'56.5"	104°12'31.1	1.5	-1.5	0	
	643.33	0	13.61	643.22	-0.52	0.43	-11.06	538619.9	381591.4	32°02'56.5"	104°12'31.1	1.5	-1.5	273.17	Hold Vertic
†	712.4	0	13.61	712.28	-0.52	0.43	-11.06	538619.9	381591.4	32°02'56.5"	104°12'31.1	0	0	0	
	750.12	0	13.61	750	-0.52	0.43	-11.06	538619.9	381591.4	32°02'56.5"	104°12'31.1	0	0	0	Start Build
†	812.4	0.934	13.61	812.28	-1.01	0.92	-10.94	538620.1	381591.9	32°02'56.5"	104°12'31.1	1.5	1.5	21.85	
†	912.4	2.434	13.61	912.23	-3.86	3.78	-10.25	538620.8	381594.8	32°02'56.6"	104°12'31.1	1.5	1.5	0	
†	1012.4	3.934	13.61	1012.08	-9.25	9.18	-8.94	538622.1	381600.2	32°02'56.6"	104°12'31.1	1.5	1.5	0	
†	1112.4	5.434	13.61	1111.74	-17.17	17.11	-7.02	538624	381608.1	32°02'56.7"	104°12'31.1	1.5	1.5	0	
†	1212.4	6.934	13.61	1211.15	-27.62	27.58	-4.48	538626.5	381618.6	32°02'56.8"	104°12'31.1	1.5	1.5	0	
†	1312.4	8.434	13.61	1310.25	-40.59	40.58	-1.34	538629.7	381631.6	32°02'56.9"	104°12'31.1	1.5	1.5	0	
†	1412.4	9.934	13.61	1408.97	-56.07	56.09	2.42	538633.4	381647.1	32°02'57.1"	104°12'31.1	1.5	1.5	0	
	1477.25	10.907	13.61	1472.75	-67.45	67.49	5.18	538636.2	381658.5	32°02'57.2"	104°12'31.1	1.5	1.5	0	End Build
†	1512.4	10.907	13.61	1507.26	-73.9	73.96	6.74	538637.7	381665	32°02'57.3"	104°12'31.1	0	0	0	
†	1612.4	10.907	13.61	1605.46	-92.25	92.35	11.2	538642.2	381683.3	32°02'57.4"	104°12'31.1	0	0	0	
†	1712.4	10.907	13.61	1703.65	-110.61	110.74	15.65	538646.7	381701.7	32°02'57.6"	104°12'30.9	0	0	0	
†	1812.4	10.907	13.61	1801.84	-128.96	129.13	20.1	538651.1	381720.1	32°02'57.8"	104°12'30.9	0	0	0	
†	1912.4	10.907	13.61	1900.04	-147.31	147.52	24.55	538655.6	381738.5	32°02'58.0"	104°12'30.9	0	0	0	
†	2012.4	10.907	13.61	1998.23	-165.66	165.91	29.01	538660	381756.9	32°02'58.2"	104°12'30.9	0	0	0	
†	2112.4	10.907	13.61	2096.42	-184.02	184.3	33.46	538664.5	381775.3	32°02'58.3"	104°12'30.9	0	0	0	
†	2212.4	10.907	13.61	2194.62	-202.37	202.69	37.91	538668.9	381793.7	32°02'58.5"	104°12'30.9	0	0	0	
†	2312.4	10.907	13.61	2292.81	-220.72	221.08	42.36	538673.4	381812.1	32°02'58.7"	104°12'30.9	0	0	0	

+	2412.4	10.907	13.61	2391.01	-239.08	239.47	46.82	538677.8	381830.5	32°02'58.9" 104°12'30.1"	0	0	0
+	2512.4	10.907	13.61	2489.2	-257.43	257.86	51.27	538682.3	381848.8	32°02'59.1" 104°12'30.1"	0	0	0
+	2612.4	10.907	13.61	2587.39	-275.78	276.25	55.72	538686.7	381867.2	32°02'59.3" 104°12'30.1"	0	0	0
+	2712.4	10.907	13.61	2685.59	-294.14	294.64	60.17	538691.2	381885.6	32°02'59.4" 104°12'30.1"	0	0	0
+	2812.4	10.907	13.61	2783.78	-312.49	313.03	64.63	538695.6	381904	32°02'59.6" 104°12'30.1"	0	0	0
+	2912.4	10.907	13.61	2881.97	-330.84	331.42	69.08	538700.1	381922.4	32°02'59.8" 104°12'30.1"	0	0	0
+	3012.4	10.907	13.61	2980.17	-349.19	349.81	73.53	538704.5	381940.8	32°03'00.0" 104°12'30.1"	0	0	0
+	3112.4	10.907	13.61	3078.36	-367.55	368.2	77.98	538709	381959.2	32°03'00.2" 104°12'30.1"	0	0	0
+	3212.4	10.907	13.61	3176.55	-385.9	386.59	82.44	538713.4	381977.6	32°03'00.3" 104°12'30.1"	0	0	0
+	3312.4	10.907	13.61	3274.75	-404.25	404.98	86.89	538717.9	381995.9	32°03'00.5" 104°12'30.1"	0	0	0
+	3383.18	10.907	13.61	3344.25	-417.24	418	90.04	538721	382009	32°03'00.7" 104°12'30.1"	0	0	0 Start Drop
+	3412.4	10.469	13.61	3372.96	-422.5	423.26	91.32	538722.3	382014.2	32°03'00.7" 104°12'30.1"	1.5	-1.5	0
+	3512.4	8.969	13.61	3471.52	-438.87	439.67	95.29	538726.3	382030.6	32°03'00.9" 104°12'30.1"	1.5	-1.5	0
+	3612.4	7.469	13.61	3570.49	-452.74	453.56	98.65	538729.6	382044.5	32°03'01.0" 104°12'29.1"	1.5	-1.5	0
+	3712.4	5.969	13.61	3669.8	-464.09	464.93	101.4	538732.4	382055.9	32°03'01.1" 104°12'29.1"	1.5	-1.5	0
+	3812.4	4.469	13.61	3769.39	-472.91	473.77	103.54	538734.5	382064.7	32°03'01.2" 104°12'29.1"	1.5	-1.5	0
+	3912.4	2.969	13.61	3869.17	-479.2	480.08	105.07	538736.1	382071	32°03'01.3" 104°12'29.1"	1.5	-1.5	0
+	4012.4	1.469	13.61	3969.1	-482.96	483.84	105.98	538737	382074.8	32°03'01.3" 104°12'29.1"	1.5	-1.5	0
+	4110.32	0	145	4067	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	1.5	-1.5	-13.9 End Drop
+	4112.4	0	145	4069.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	4212.4	0	145	4169.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	4312.4	0	145	4269.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	4412.4	0	145	4369.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	4512.4	0	145	4469.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	4612.4	0	145	4569.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	4712.4	0	145	4669.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	4812.4	0	145	4769.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	4912.4	0	145	4869.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	5012.4	0	145	4969.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	5112.4	0	145	5069.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	5212.4	0	145	5169.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	5312.4	0	145	5269.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	5412.4	0	145	5369.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	5512.4	0	145	5469.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	5612.4	0	145	5569.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	5712.4	0	145	5669.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	5812.4	0	145	5769.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	5912.4	0	145	5869.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	6012.4	0	145	5969.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	6112.4	0	145	6069.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	6212.4	0	145	6169.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	6312.4	0	145	6269.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	6412.4	0	145	6369.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	6512.4	0	145	6469.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	6612.4	0	145	6569.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	6712.4	0	145	6669.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	6812.4	0	145	6769.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	6912.4	0	145	6869.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	7012.4	0	145	6969.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	7112.4	0	145	7069.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	7212.4	0	145	7169.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	7312.4	0	145	7269.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	7412.4	0	145	7369.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	7512.4	0	145	7469.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	7612.4	0	145	7569.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	7712.4	0	145	7669.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	7812.4	0	145	7769.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	7912.4	0	145	7869.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	8012.4	0	145	7969.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	8112.4	0	145	8069.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	8212.4	0	145	8169.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	8312.4	0	145	8269.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	8412.4	0	145	8369.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	8512.4	0	145	8469.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	8612.4	0	145	8569.09	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0
+	8626.84	0	145	8583.53	-484.17	485.06	106.28	538737.3	382076	32°03'01.3" 104°12'29.1"	0	0	0 Curve KOP
+	8712.4	8.556	145	8668.77	-478.92	479.84	109.93	538740.9	382070.8	32°03'01.3" 104°12'29.1"	10	10	169.47
+	8812.4	18.556	145	8765.86	-459.63	460.66	123.36	538754.4	382051.6	32°03'01.1" 104°12'29.1"	10	10	0
+	8912.4	28.556	145	8857.41	-426.75	427.97	146.26	538777.2	382018.9	32°03'00.8" 104°12'29.1"	10	10	0
+	9012.4	38.556	145	8940.64	-381.27	382.74	177.92	538808.9	381973.7	32°03'00.3" 104°12'29.1"	10	10	0
+	9112.4	48.556	145	9013.02	-324.58	326.37	217.39	538848.4	381917.3	32°02'59.7" 104°12'28.1"	10	10	0
+	9212.4	58.556	145	9072.34	-258.39	260.56	263.47	538894.5	381851.5	32°02'59.1" 104°12'28.1"	10	10	0
+	9226.84	60	145	9079.72	-248.16	250.39	270.59	538901.6	381841.4	32°02'59.0" 104°12'27.1"	10	10	0 Cont. Build
+	9312.4	65.79	152.083	9118.73	-182.89	185.44	310.19	538941.2	381776.4	32°02'58.4" 104°12'27.1"	10	6.77	8.28
+	9412.4	72.927	159.575	9154	-97.28	100.14	348.31	538979.3	381691.1	32°02'57.5" 104°12'27.1"	10	7.14	7.49
+	9512.4	80.319	166.504	9177.15	-4.1	7.19	376.57	539007.5	381598.2	32°02'56.6" 104°12'26.1"	10	7.39	6.93

†	9612.4	87.843	173.131	9187.46	93.82	-90.59	394.09	539025.1	381500.4	32°02'55.6" 104°12'26.1"	10	7.52	6.63
	9640.94	90	175	9188	122.22	-118.97	397.04	539028	381472	32°02'55.3" 104°12'26.1"	10	7.56	6.55 End Build/
†	9712.4	90	175	9188	193.46	-190.16	403.27	539034.2	381400.9	32°02'54.6" 104°12'26.1"	0	0	0
†	9812.4	90	175	9188	293.15	-289.78	411.98	539043	381301.2	32°02'53.6" 104°12'26.1"	0	0	0
	9850.94	90	175	9188	331.57	-328.17	415.34	539046.3	381262.9	32°02'53.3" 104°12'26.1"	0	0	0 Start Turn
†	9912.4	90	176.229	9188	392.89	-389.45	420.04	539051	381201.6	32°02'52.7" 104°12'26.1"	2	0	2
†	10012.4	90	178.229	9188	492.8	-489.33	424.88	539055.8	381101.7	32°02'51.7" 104°12'26.1"	2	0	2
	10074	90	179.461	9188	554.39	-550.91	426.12	539057.1	381040.1	32°02'51.1" 104°12'26.1"	2	0	2 Ent Turn
†	10112.4	90	179.461	9188	592.79	-589.32	426.48	539057.4	381001.7	32°02'50.7" 104°12'26.1"	0	0	0
†	10212.4	90	179.461	9188	692.79	-689.31	427.42	539058.4	380901.8	32°02'49.7" 104°12'26.1"	0	0	0
†	10312.4	90	179.461	9188	792.79	-789.31	428.36	539059.3	380801.8	32°02'48.7" 104°12'26.1"	0	0	0
†	10412.4	90	179.461	9188	892.79	-889.3	429.3	539060.3	380701.8	32°02'47.7" 104°12'26.1"	0	0	0
†	10512.4	90	179.461	9188	992.79	-989.3	430.24	539061.2	380601.8	32°02'46.7" 104°12'26.1"	0	0	0
†	10612.4	90	179.461	9188	1092.79	-1089.29	431.18	539062.1	380501.8	32°02'45.7" 104°12'26.1"	0	0	0
†	10712.4	90	179.461	9188	1192.79	-1189.29	432.12	539063.1	380401.8	32°02'44.7" 104°12'26.1"	0	0	0
†	10812.4	90	179.461	9188	1292.79	-1289.29	433.06	539064	380301.8	32°02'43.8" 104°12'26.1"	0	0	0
†	10912.4	90	179.461	9188	1392.79	-1389.28	434	539065	380201.9	32°02'42.8" 104°12'26.1"	0	0	0
†	11012.4	90	179.461	9188	1492.79	-1489.28	434.94	539065.9	380101.9	32°02'41.8" 104°12'26.1"	0	0	0
†	11112.4	90	179.461	9188	1592.79	-1589.27	435.88	539066.8	380001.9	32°02'40.8" 104°12'26.1"	0	0	0
†	11212.4	90	179.461	9188	1692.79	-1689.27	436.82	539067.8	379901.9	32°02'39.8" 104°12'26.1"	0	0	0
†	11312.4	90	179.461	9188	1792.79	-1789.26	437.76	539068.7	379801.9	32°02'38.8" 104°12'26.1"	0	0	0
†	11412.4	90	179.461	9188	1892.79	-1889.26	438.7	539069.7	379701.9	32°02'37.8" 104°12'26.1"	0	0	0
†	11512.4	90	179.461	9188	1992.79	-1989.25	439.64	539070.6	379601.9	32°02'36.8" 104°12'26.1"	0	0	0
†	11612.4	90	179.461	9188	2092.79	-2089.25	440.58	539071.5	379501.9	32°02'35.8" 104°12'26.1"	0	0	0
†	11712.4	90	179.461	9188	2192.79	-2189.25	441.52	539072.5	379402	32°02'34.9" 104°12'26.1"	0	0	0
†	11812.4	90	179.461	9188	2292.79	-2289.24	442.46	539073.4	379302	32°02'33.9" 104°12'26.1"	0	0	0
†	11912.4	90	179.461	9188	2392.79	-2389.24	443.41	539074.4	379202	32°02'32.9" 104°12'26.1"	0	0	0
†	12012.4	90	179.461	9188	2492.79	-2489.23	444.35	539075.3	379102	32°02'31.9" 104°12'26.1"	0	0	0
†	12112.4	90	179.461	9188	2592.79	-2589.23	445.29	539076.3	379002	32°02'30.9" 104°12'25.1"	0	0	0
†	12212.4	90	179.461	9188	2692.79	-2689.22	446.23	539077.2	378902	32°02'29.9" 104°12'25.1"	0	0	0
†	12312.4	90	179.461	9188	2792.79	-2789.22	447.17	539078.1	378802	32°02'28.9" 104°12'25.1"	0	0	0
†	12412.4	90	179.461	9188	2892.79	-2889.21	448.11	539079.1	378702.1	32°02'27.9" 104°12'25.1"	0	0	0
†	12512.4	90	179.461	9188	2992.79	-2989.21	449.05	539080	378602.1	32°02'26.9" 104°12'25.1"	0	0	0
†	12612.4	90	179.461	9188	3092.79	-3089.21	449.99	539081	378502.1	32°02'25.9" 104°12'25.1"	0	0	0
†	12712.4	90	179.461	9188	3192.79	-3189.2	450.93	539081.9	378402.1	32°02'25.0" 104°12'25.1"	0	0	0
†	12812.4	90	179.461	9188	3292.79	-3289.2	451.87	539082.8	378302.1	32°02'24.0" 104°12'25.1"	0	0	0
†	12912.4	90	179.461	9188	3392.79	-3389.19	452.81	539083.8	378202.1	32°02'23.0" 104°12'25.1"	0	0	0
†	13012.4	90	179.461	9188	3492.79	-3489.19	453.75	539084.7	378102.1	32°02'22.0" 104°12'25.1"	0	0	0
†	13112.4	90	179.461	9188	3592.79	-3589.18	454.69	539085.7	378002.1	32°02'21.0" 104°12'25.1"	0	0	0
†	13212.4	90	179.461	9188	3692.79	-3689.18	455.63	539086.6	377902.2	32°02'20.0" 104°12'25.1"	0	0	0
†	13312.4	90	179.461	9188	3792.79	-3789.17	456.57	539087.5	377802.2	32°02'19.0" 104°12'25.1"	0	0	0
†	13412.4	90	179.461	9188	3892.79	-3889.17	457.51	539088.5	377702.2	32°02'18.0" 104°12'25.1"	0	0	0
†	13512.4	90	179.461	9188	3992.79	-3989.17	458.45	539089.4	377602.2	32°02'17.0" 104°12'25.1"	0	0	0
†	13612.4	90	179.461	9188	4092.79	-4089.16	459.39	539090.4	377502.2	32°02'16.1" 104°12'25.1"	0	0	0
†	13712.4	90	179.461	9188	4192.79	-4189.16	460.33	539091.3	377402.2	32°02'15.1" 104°12'25.1"	0	0	0
†	13812.4	90	179.461	9188	4292.79	-4289.15	461.27	539092.2	377302.2	32°02'14.1" 104°12'25.1"	0	0	0
†	13912.4	90	179.461	9188	4392.79	-4389.15	462.21	539093.2	377202.3	32°02'13.1" 104°12'25.1"	0	0	0
†	14012.4	90	179.461	9188	4492.79	-4489.14	463.15	539094.1	377102.3	32°02'12.1" 104°12'25.1"	0	0	0
†	14112.4	90	179.461	9188	4592.79	-4589.14	464.09	539095.1	377002.3	32°02'11.1" 104°12'25.1"	0	0	0
†	14212.4	90	179.461	9188	4692.79	-4689.14	465.03	539096	376902.3	32°02'10.1" 104°12'25.1"	0	0	0
†	14312.4	90	179.461	9188	4792.79	-4789.13	465.97	539096.9	376802.3	32°02'09.1" 104°12'25.1"	0	0	0
†	14412.4	90	179.461	9188	4892.79	-4889.13	466.91	539097.9	376702.3	32°02'08.1" 104°12'25.1"	0	0	0
†	14512.4	90	179.461	9188	4992.79	-4989.12	467.85	539098.8	376602.3	32°02'07.1" 104°12'25.1"	0	0	0
†	14612.4	90	179.461	9188	5092.79	-5089.12	468.79	539099.8	376502.4	32°02'06.2" 104°12'25.1"	0	0	0
	14638.75	90	179.461	9188	5119.14	-5115.47	469.04	539100	376476	32°02'05.9" 104°12'25.1"	0	0	0 Start Turn
	14645.7	90	179.6	9188	5126.09	-5122.42	469.1	539100.1	376469.1	32°02'05.8" 104°12'25.1"	2	0	2 End Turn
†	14712.4	90	179.6	9188	5192.79	-5189.11	469.57	539100.5	376402.4	32°02'05.2" 104°12'25.1"	0	0	0
†	14812.4	90	179.6	9188	5292.79	-5289.11	470.26	539101.2	376302.4	32°02'04.2" 104°12'25.1"	0	0	0
†	14912.4	90	179.6	9188	5392.79	-5389.11	470.96	539101.9	376202.4	32°02'03.2" 104°12'25.1"	0	0	0
†	15012.4	90	179.6	9188	5492.79	-5489.11	471.66	539102.6	376102.4	32°02'02.2" 104°12'25.1"	0	0	0
†	15112.4	90	179.6	9188	5592.79	-5589.1	472.36	539103.3	376002.4	32°02'01.2" 104°12'25.1"	0	0	0
†	15212.4	90	179.6	9188	5692.79	-5689.1	473.05	539104	375902.4	32°02'00.2" 104°12'25.1"	0	0	0
†	15312.4	90	179.6	9188	5792.79	-5789.1	473.75	539104.7	375802.4	32°01'59.2" 104°12'25.1"	0	0	0
†	15412.4	90	179.6	9188	5892.79	-5889.1	474.45	539105.4	375702.4	32°01'58.2" 104°12'25.1"	0	0	0
†	15512.4	90	179.6	9188	5992.79	-5989.09	475.15	539106.1	375602.5	32°01'57.2" 104°12'25.1"	0	0	0
†	15612.4	90	179.6	9188	6092.79	-6089.09	475.84	539106.8	375502.5	32°01'56.3" 104°12'25.1"	0	0	0
†	15712.4	90	179.6	9188	6192.79	-6189.09	476.54	539107.5	375402.5	32°01'55.3" 104°12'25.1"	0	0	0
†	15812.4	90	179.6	9188	6292.79	-6289.09	477.24	539108.2	375302.5	32°01'54.3" 104°12'25.1"	0	0	0
†	15912.4	90	179.6	9188	6392.79	-6389.09	477.94	539108.9	375202.5	32°01'53.3" 104°12'25.1"	0	0	0
†	16012.4	90	179.6	9188	6492.79	-6489.08	478.63	539109.6	375102.5	32°01'52.3" 104°12'25.1"	0	0	0
†	16112.4	90	179.6	9188	6592.79	-6589.08	479.33	539110.3	375002.5	32°01'51.3" 104°12'25.1"	0	0	0
†	16212.4	90	179.6	9188	6692.79	-6689.08	480.03	539111	374902.5	32°01'50.3" 104°12'25.1"	0	0	0
†	16312.4	90	179.6	9188	6792.79	-6789.08	480.73	539111.7	374802.5	32°01'49.3" 104°12'25.1"	0	0	0
†	16412.4	90	179.6	9188	6892.79	-6889.07	481.43	539112.4	374702.6	32°01'48.3" 104°12'25.1"	0	0	0
†	16512.4	90	179.6	9188	6992.79	-6989.07	482.12	539113.1	374602.6	32°01'47.4" 104°12'25.1"	0	0	0
†	16612.4	90	179.6	9188	7092.79	-7089.07	482.82	539113.8	374502.6	32°01'46.4" 104°12'25.1"	0	0	0

†	16712.4	90	179.6	9188	7192.79	-7189.07	483.52	539114.5	374402.6	32°01'45.4" 104°12'25.1"	0	0	0
†	16812.4	90	179.6	9188	7292.79	-7289.06	484.22	539115.2	374302.6	32°01'44.4" 104°12'25.1"	0	0	0
†	16912.4	90	179.6	9188	7392.79	-7389.06	484.91	539115.9	374202.6	32°01'43.4" 104°12'25.1"	0	0	0
†	17012.4	90	179.6	9188	7492.79	-7489.06	485.61	539116.6	374102.6	32°01'42.4" 104°12'25.1"	0	0	0
†	17112.4	90	179.6	9188	7592.79	-7589.06	486.31	539117.3	374002.6	32°01'41.4" 104°12'25.1"	0	0	0
†	17212.4	90	179.6	9188	7692.79	-7689.05	487.01	539118	373902.7	32°01'40.4" 104°12'25.1"	0	0	0
†	17312.4	90	179.6	9188	7792.79	-7789.05	487.7	539118.7	373802.7	32°01'39.4" 104°12'25.1"	0	0	0
†	17412.4	90	179.6	9188	7892.79	-7889.05	488.4	539119.4	373702.7	32°01'38.4" 104°12'25.1"	0	0	0
†	17512.4	90	179.6	9188	7992.79	-7989.05	489.1	539120.1	373602.7	32°01'37.5" 104°12'25.1"	0	0	0
†	17612.4	90	179.6	9188	8092.79	-8089.04	489.8	539120.8	373502.7	32°01'36.5" 104°12'25.1"	0	0	0
†	17712.4	90	179.6	9188	8192.79	-8189.04	490.5	539121.5	373402.7	32°01'35.5" 104°12'25.1"	0	0	0
†	17812.4	90	179.6	9188	8292.79	-8289.04	491.19	539122.2	373302.7	32°01'34.5" 104°12'25.1"	0	0	0
†	17912.4	90	179.6	9188	8392.79	-8389.04	491.89	539122.9	373202.7	32°01'33.5" 104°12'25.1"	0	0	0
†	18012.4	90	179.6	9188	8492.79	-8489.03	492.59	539123.5	373102.7	32°01'32.5" 104°12'25.1"	0	0	0
†	18112.4	90	179.6	9188	8592.79	-8589.03	493.29	539124.2	373002.8	32°01'31.5" 104°12'25.1"	0	0	0
†	18212.4	90	179.6	9188	8692.79	-8689.03	493.98	539124.9	372902.8	32°01'30.5" 104°12'25.1"	0	0	0
†	18312.4	90	179.6	9188	8792.79	-8789.03	494.68	539125.6	372802.8	32°01'29.5" 104°12'25.1"	0	0	0
†	18412.4	90	179.6	9188	8892.79	-8889.02	495.38	539126.3	372702.8	32°01'28.6" 104°12'25.1"	0	0	0
†	18512.4	90	179.6	9188	8992.79	-8989.02	496.08	539127	372602.8	32°01'27.6" 104°12'25.1"	0	0	0
†	18612.4	90	179.6	9188	9092.79	-9089.02	496.77	539127.7	372502.8	32°01'26.6" 104°12'25.1"	0	0	0
†	18712.4	90	179.6	9188	9192.79	-9189.02	497.47	539128.4	372402.8	32°01'25.6" 104°12'25.1"	0	0	0
†	18812.4	90	179.6	9188	9292.79	-9289.01	498.17	539129.1	372302.8	32°01'24.6" 104°12'25.1"	0	0	0
†	18912.4	90	179.6	9188	9392.79	-9389.01	498.87	539129.8	372202.8	32°01'23.6" 104°12'25.1"	0	0	0
†	19012.4	90	179.6	9188	9492.79	-9489.01	499.57	539130.5	372102.9	32°01'22.6" 104°12'25.1"	0	0	0
†	19112.4	90	179.6	9188	9592.79	-9589.01	500.26	539131.2	372002.9	32°01'21.6" 104°12'25.1"	0	0	0
†	19212.4	90	179.6	9188	9692.79	-9689	500.96	539131.9	371902.9	32°01'20.6" 104°12'25.1"	0	0	0
†	19312.4	90	179.6	9188	9792.79	-9789	501.66	539132.6	371802.9	32°01'19.6" 104°12'25.1"	0	0	0
†	19412.4	90	179.6	9188	9892.79	-9889	502.36	539133.3	371702.9	32°01'18.7" 104°12'25.1"	0	0	0
†	19512.4	90	179.6	9188	9992.79	-9989	503.05	539134	371602.9	32°01'17.7" 104°12'25.1"	0	0	0
†	19612.4	90	179.6	9188	10092.79	-10089	503.75	539134.7	371502.9	32°01'16.7" 104°12'25.1"	0	0	0
†	19712.4	90	179.6	9188	10192.79	-10188.99	504.45	539135.4	371402.9	32°01'15.7" 104°12'25.1"	0	0	0
†	19812.4	90	179.6	9188	10292.79	-10288.99	505.15	539136.1	371303	32°01'14.7" 104°12'25.1"	0	0	0
†	19912.4	90	179.6	9188	10392.79	-10388.99	505.84	539136.8	371203	32°01'13.7" 104°12'25.1"	0	0	0
	19941.36	90	179.6	9188	10421.75	-10417.95	506.05	539137	371174	32°01'13.4" 104°12'25.1"	0	0	0 PBHL (25'f

HOLE AND CASING SECTIONS Ref Wellbore: HH SO 17 20 Fed 002 No. 3H PWB Ref Wellpath: HH SO 17 20 Fed 002 No. 3H 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	442	414	28	441.92	0	0	0.07	-7.3
9.625in Cas	28	8292.31	8264.31	28	8249	0	0	485.06	106.28
5.5in Casin	28	19941.36	19913.36	28	9188	0	0	-10417.95	506.05

T A R G E T S

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		9188	-119.01	422.04	539053	381472	32°02'55.3" 104°12'26.1"		point	
HH SO 17 20 Fed 002 N		9188	-10112.92	504.05	539135	371479	32°01'16.4" 104°12'25.1"		point	
(1) HH SO 1	14638.75	9188	-5115.47	469.04	539100	376476	32°02'05.9" 104°12'25.1"		point	
(2) HH SO 1	19941.36	9188	-10417.95	506.05	539137	371174	32°01'13.4" 104°12'25.1"		point	

SURVEY PROGRAM Ref Wellbore: HH SO 17 20 Fed 002 No. 3H PWB Ref Wellpath: HH SO 17 20 Fed 002 No. 3H Rev-A.0

Start MD End MD Pos Unc M Log Name/ Wellbore

	(ft)	(ft)	
28	412.4	OWSG MW MWD Surv	HH SO 17 20 Fed 002 No. 3H AWB
412.4	8300	OWSG MWD rev2 + HF	HH SO 17 20 Fed 002 No. 3H PWB
8300	21000	OWSG MWD rev2 + HF	HH SO 17 20 Fed 002 No. 3H PWB

C O M M E N T S