Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Carlsbad Field Office
OCD Artesia

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

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2

5. Lease Serial No.
NMNM121473

6. If Indian, Allottee or Tribe Name

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

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

8. Well Name and No.
Multiple--See Attached

2. Name of Operator
CHEVRON USA INCORPORATED
Contact: DORIAN K FUENTES
E-Mail: DJVO@CHEVRON.COM

9. API Well No.
Multiple--See Attached

3a. Address
6301 DEAUVILLE BLVD
MIDLAND, TX 79706

3b. Phone No. (include area code)
Ph: 432-687-7631

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

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Multiple--See Attached

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 to Original A PD
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

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

CHEVRON RESPECTFULLY REQUEST A VARIANCE TO CHANGE THE INTERMEDIATE CASING SETTING DEPTHS TO AVOID A POSSIBLE FRAC HIT. WE WILL SET THE CASING IN THE 3RD BONE SPRING CARBONATE FORMATION TO ENSURE A GOOD FIT AND TO AVOID A FRAC HIT FOR THE FOLLOWING WELLS LISTED BELOW. REFER TO THE ATTACHED CEMENT VOLUMES AND SPECIFICATIONS.

HH SO 10 15 FED 002 1H 30-015-44352
HH SO 10 15 FED 002 2H 30-015-44354
HH SO 10 15 FED 002 3H 30-015-44351
HH SO 10 15 FED 002 4H 30-015-44353
HH SO 10 15 FED 002 5H 30-015-44371
HH SO 10 15 FED 002 6H 30-015-44367

NM OIL CONSERVATION
ARTESIA DISTRICT
JAN 16 2018
RECEIVED

SEE ATTACHED FOR CONDITIONS OF APPROVAL

SC 1-16-18
Accepted for record - NMOCD

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

Electronic Submission #399736 verified by the BLM Well Information System
For CHEVRON USA INCORPORATED, sent to the Carlsbad
Committed to AFMSS for processing by ZOTA STEVENS on 01/08/2018 (18ZS0027SE)

Name *(Printed/Typed)* DORIAN K FUENTES — Title REGULATORY SPECIALIST

Signature (Electronic Submission) — Date 01/05/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ZOTA STEVENS — Title PETROLEUM ENGINEER — Date 01/10/2018

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office Carlsbad

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

(Instructions on page 2)

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

Additional data for EC transaction #399736 that would not fit on the form

Wells/Facilities, continued

Agreement	Lease	Well/Fac Name, Number	API Number	Location
NMNM121473	NMNM121473	HH SO 10 15 FED 002 1H	30-015-44352-00-X1	Sec 3 T26S R27E NWNW 189FSL 833FWL 32.064526 N Lat, 104.184273 W Lon
NMNM121473	NMNM121473	HH SO 10 15 FED 002 2H	30-015-44354-00-X1	Sec 3 T26S R27E SWSW 214FSL 833FWL 32.064594 N Lat, 104.184273 W Lon
NMNM121473	NMNM121473	HH SO 10 15 FED 002 3H	30-015-44351-00-X1	Sec 3 T26S R27E SWSW 239FSL 833FWL 32.064663 N Lat, 104.184273 W Lon
NMNM121473	NMNM121473	HH SO 10 15 FED 002 4H	30-015-44353-00-X1	Sec 3 T26S R27E SWSW 264FSL 833FWL 32.064732 N Lat, 104.184265 W Lon
NMNM121473	NMNM121473	HH SO 10 15 FED 002 5H	30-015-44371-00-X1	Sec 3 T26S R27E SWSW 289FSL 833FWL 32.064800 N Lat, 104.184265 W Lon
NMNM121473	NMNM121473	HH SO 10 15 FED 002 6H	30-015-44367-00-X1	Sec 3 T26S R27E SWSW 314FSL 833FWL 32.064869 N Lat, 104.184265 W Lon

32. Additional remarks, continued

TXP® BTC

Printed on: 08/01/2018

		Min. Wall Thickness	87.5%	(*)GradeL80 Type 1	
Outside Diameter	9.625 in.	Connection OD Option	REGULAR	Coupling	Pipe Body
Wall Thickness	0.395 in.	Drift	API Standard	Body: Red	1st Band: Red
Grade	L80 Type 1*	Type	Casing	1st Band: Brown	2nd Band: Brown
				2nd Band: -	3rd Band: -
				3rd Band: -	4th Band: -

PIPE BODY DATA

Geometry

Nominal OD	9.625 in.	Nominal Weight	40 lbs/ft	Drift	8.679 in.
Nominal ID	8.835 in.	Wall Thickness	0.395 in.	Plain End Weight	38.97 lbs/ft
OD Tolerance	API				

Performance

Body Yield Strength	916 x1000 lbs	Internal Yield	5750 psi	SMYS	80000 psi
Collapse	3090 psi				

CONNECTION DATA

Geometry

Connection OD	10.625 in.	Coupling Length	10.825 in.	Connection ID	8.823 in.
Make-up Loss	4.891 in.	Threads per in	5	Connection OD Option	REGULAR

Performance

Tension Efficiency	100.0 %	Joint Yield Strength	916.000 x1000 lbs	Internal Pressure Capacity [1]	5750.000 psi
Compression Efficiency	100 %	Compression Strength	916.000 x1000 lbs	Max. Allowable Bending	38 °/100 ft
External Pressure Capacity	3090.000 psi				

Make-Up Torques

Minimum	18860 ft-lbs	Optimum	20960 ft-lbs	Maximum	23060 ft-lbs

Operation Limit Torques

Operating Torque	35600 ft-lbs	Yield Torque	43400 ft-lbs

Notes

[illegible]

XP BTC [illegible]

For the latest performance data, always visit our website: www.tenaris.com

February 08 2017

Tenaris

Size: 9.625 in.
Wall: 0.435 in.
Weight: 43.50 lbs/ft
Grade: L80.1
Min. Wall Thickness: 87.5 %

Connection: TenarisXP® BTC
Casing/Tubing: CAS
Coupling Option: REGULAR

PIPE BODY DATA

GEOMETRY

Nominal OD	**9.625** in.	Nominal Weight	**43.50** lbs/ft	Standard Drift Diameter	**8.599** in.
Nominal ID	**8.755** in.	Wall Thickness	**0.435** in.	Special Drift Diameter	**N/A**
Plain End Weight	**42.73** lbs/ft				

PERFORMANCE

Body Yield Strength	**1005** x 1000 lbs	Internal Yield	**6330** psi	SMYS	**80000** psi
Collapse	**3810** psi				

TENARISXP® BTC CONNECTION DATA

GEOMETRY

Connection OD	**10.625** in.	Coupling Length	**10.825** in.	Connection ID	**8.743** in.
Critical Section Area	**12.559** sq. in.	Threads per in.	**5.00**	Make-Up Loss	**4.891** in.

PERFORMANCE

Tension Efficiency	**100** %	Joint Yield Strength	**1005** x 1000 lbs	Internal Pressure Capacity[1]	**6330** psi
Structural Compression Efficiency	**100** %	Structural Compression Strength	**1005** x 1000 lbs	Structural Bending[2]	**38** °/100 ft
External Pressure Capacity	**3810** psi				

ESTIMATED MAKE-UP TORQUES[3]

Minimum	**20240** ft-lbs	Optimum	**22490** ft-lbs	Maximum	**24740** ft-lbs

OPERATIONAL LIMIT TORQUES

Operating Torque	**ASK**	Yield Torque	**45900** ft-lbs		

Delaware Basin
Changes to APD/COA for Federal Well

Chevron

Well Names:

HH SO 10 15 FED 002	1H	30-015-44352
HH SO 10 15 FED 002	2H	30-015-44354
HH SO 10 15 FED 002	3H	30-015-44351
HH SO 10 15 FED 002	4H	30-015-44353
HH SO 10 15 FED 002	5H	30-015-44371
HH SO 10 15 FED 002	6H	30-015-44367

Rig: Patterson 815

CVX CONTACT:

Roderick Milligan
MCBU Drilling Engineer
Chevron North America Exploration and Production Co.
MidContinent Business Unit
Office: (713) 372-2011
Cell: (281) 413-9794
Email: RXMQ@CHEVRON.COM

Summary of Changes to APD Submission

Chevron respectfully request to change the intermediate casing setting depths to avoid a possible frac hit. We will set the casing in the Third BoneSpring carbonate formation to ensure a good FIT and to avoid a frac hit. The cement volumes have been updated to reflect the change to the setting depth.

4. **CASING PROGRAM**

Purpose	From	To	Hole Size	Csg Size	Weight	Grade	Thread	Condition
Surface	0'	450'	17-1/2"	13-3/8"	54.5 #	K-55	STC	New
Intermediate	0'	8,700'	12-1/4"	9-5/8"	40.0 #	L-80	TXP	New
Production	0'	XXXX	8-1/2"	5-1/2"	20.0 #	P-110	TXP	New

Slurry	Type	Cement Top	Cement Bottom	Weight	Yield	% Excess	Sacks	Water
Intermediate								
Stage 2 Lead	50:50 Poz: Class C + Antifoam, Extender, Salt, Retarder	0'	1,100'	11.9	2.43	0	142	14.21
Stage 2 Tail	Class C + Antifoam, Retarder, Viscosifier	1,100'	2,100'	14.8	1.33	0	235	6.37
DV Tool		2,100'						
Stage 1 Lead	50:50 Poz: Class C	2,100'	8,015'	11.9	2.43	0	762	13.76
Stage 1 Tail	Class H	8,015'	8,700'	15.6	1.21	0	259	5.54

Changes Summary

Summary: Variance to change the intermediate casing setting depths to avoid a possible frac hit. We will set the casing in the Third BoneSpring carbonate to ensure a good FIT and to avoid a frac hit. The cement volumes have been updated to reflect the change to the setting depth.

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Chevron USA Inc.
LEASE NO.:	NMNM121473
WELL NAME & NO.:	2H-HH SO 10 15 Fed 002
SURFACE HOLE FOOTAGE:	214'/S & 833'/W
BOTTOM HOLE FOOTAGE	280'/S & 1254'/W
LOCATION:	Section 3, T.26 S., R.27 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

All previous COAs still apply except the following:

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

A. Hydrogen Sulfide

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

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **450** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **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.

Operator shall filled 2/3rd of intermediate casing with fluid while drilling to maintain collapse safety factor.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is: Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job. **Additional cement maybe required. Excess calculates to 4%.**

b. Second stage above DV tool:Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement maybe required. Excess calculates to -3%.**

❖ 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 **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.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **5000 (5M)** psi.

GENERAL REQUIREMENTS

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

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

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
    e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including

lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

e. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes. This test shall be performed prior to the test at full stack pressure.

g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

Waste Minimization Plan (WMP)

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

ZS 011018

Medium Cave Karst: two casing strings, both to circulate cement to surface.

13 3/8	surface csg in a		17 1/2	inch hole.		Design Factors		SURFACE	
Segment	**#/ft**	**Grade**		**Coupling**	**Joint**	**Collapse**	**Burst**	**Length**	**Weight**
"A"	54.50	K 55		ST&C	22.30	5.56	0.64	450	24,525
"B"								**0**	**0**
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,500			Tail Cmt	does	circ to sfc.	Totals:	450	24,525

Comparison of Proposed to Minimum Required Cement Volumes

Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	**Volume**	**Cmt Sx**	**CuFt Cmt**	**Cu Ft**	**% Excess**	**Mud Wt**	**MASP**	**BOPE**	**Hole-Cplg**
17 1/2	0.6946	**356**	473	**367**	29	**8.70**	2380	**3M**	1.56

Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK.

9 5/8	casing inside the		13 3/8			Design Factors		INTERMEDIATE	
Segment	**#/ft**	**Grade**		**Coupling**	**Joint**	**Collapse**	**Burst**	**Length**	**Weight**
"A"	40.00	L 80		TXP	2.63	0.72	0.89	8,700	348,000
"B"								**0**	**0**
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	8,700	348,000
The cement volume(s) are intended to achieve a top of					0	ft from surface or a		**450**	overlap.

Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	**Volume**	**Cmt Sx**	**CuFt Cmt**	**Cu Ft**	**% Excess**	**Mud Wt**	**MASP**	**BOPE**	**Hole-Cplg**
12 1/4	0.3132	look ↘	0	**2766**		**9.50**	4440	**5M**	0.81
D V Tool(s):			2100				sum of sx	Σ CuFt	Σ%excess
t by stage % :		**4**	**-3**				1398	2823	2

Class 'H' tail cmt yld > 1.20

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.66, b, c, d

<0.70 a Problem!!

Collapse Accounted for 2/3 fill

Tail cmt

5 1/2	casing inside the		9 5/8			Design Factors		PRODUCTION	
Segment	**#/ft**	**Grade**		**Coupling**	**Joint**	**Collapse**	**Burst**	**Length**	**Weight**
"A"	20.00	P 110		TXP	3.47	1.83	2.01	8,665	173,300
"B"	**20.00**	**P 110**		**TXP**	7.99	**1.57**	**2.01**	**10,892**	**217,840**
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,906						Totals:	19,557	391,140
B would be:					57.13	1.72	if it were a vertical wellbore.		

No Pilot Hole Planned

MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
19557	9226	9226	8665	90	10	9573

The cement volume(s) are intended to achieve a top of 7015 ft from surface or a **1685** overlap.

Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	**Volume**	**Cmt Sx**	**CuFt Cmt**	**Cu Ft**	**% Excess**	**Mud Wt**	**MASP**	**BOPE**	**Hole-Cplg**
8 1/2	0.2291	**4033**	4844	**2930**	65	**13.50**			1.20