

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.  
NMLC066438

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.  
891001066X8. Well Name and No.  
BELL LAKE UNIT NORTH 301H9. API Well No.  
30-025-44691-00-X110. Field and Pool or Exploratory Area  
ANTELOPE RIDGE-BONE SPRING, W11. County or Parish, State  
LEA COUNTY, NM**SUBMIT IN TRIPLICATE - Other instructions on page 2**

AUG 06 2018

## 1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other2. Name of Operator  
KAISER FRANCIS OIL COMPANYContact: MELANIE WILSON  
E-Mail: mjp1692@gmail.com

## 3a. Address

TULSA, OK 74121-1468

3b. Phone No. (include area code)  
Ph: 575-914-1461

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

Sec 1 T23S R33E SWNW 2120FNL 325FWL  
32.335110 N Lat, 103.533562 W Lon

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

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original A
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> 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 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 recompleat 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.

Kaiser-Francis Oil Company respectfully requests permission to make the following changes to the approved APD:

## Intermediate Casing

From: 9 5/8 inch 40 lb HCP-110 LTC set at 5200 ft

To: 9 5/8 inch 53.5 lb L-80 BTC set at 11200 ft, cement in two stages as follows:

DVT at 5000 ft

Stage 1 - Cmt 5000-11200 ft w/860 sx NeoCem w/3#/sk Kol-Seal, yield 2.846, density 11, volume 2448, 50% excess. Tail cmt 330 sx Halcem w/0.3% Halad-9, yield 1.196, density 15.6, volume 395, 25% excess

Stage 2 - Cmt 0-5000 ft w/800 sx NeoCem, yield 2.808, density 11, volume 2246, 50% excess. Tail cmt 85 sx Halcem w/0.2 HR-800, yield 1.334, density 14.8, volume 113, 50% excess

**SEE ATTACHED FOR  
CONDITIONS OF APPROVAL**

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

Electronic Submission #414040 verified by the BLM Well Information System  
For KAISER FRANCIS OIL COMPANY, sent to the Hobbs  
Committed to AFMSS for processing by PRISCILLA PEREZ on 05/04/2018 (18PP0944SE)

Name (Printed/Typed) MELANIE WILSON

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 04/25/2018

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved By ZOTA STEVENS

Title PETROLEUM ENGINEER

Date 08/01/2018

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

Office Hobbs

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

(Instructions on page 2)

**\*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\***

Kaiser-Francis Oil Company  
Bell Lake Unit North 301H  
Casing Assumptions - Revised 04/25/2018

Formation Name	Formation Top TVD	Interval	Length	Casing Size	Weight (#/ft)	Grade	Thread	Condition	Hole Size	TVD (ft)	Mud Type	Mud Weight Hole Control	Viscosity	Fluid Loss	Anticipated Mud Weight (ppg)	Max Pore Pressure (psi)	Collapse (psi)	Burst (psi)	Body Tensile Strength	Joint Tensile Strength	Collapse Safety Factor (Min 1.1)	Burst Safety Factor (Min 1.0)	Body Tensile Safety Factor (Min 1.8)	Joint Tensile Safety Factor (Min 1.8)
Rustler	1226	Conductor	120'	20"				New		120'	FW	8.4 - 9.0	32 - 34	NC	9	632	1130	2730	853000	514000	1.8	4.3	11.6	7.0
Salado	1623	Surface	1250'	13-5/8"	54.5	J-55	STC	New	17-1/2"	1350'	Cut Brine	8.6-8.8	28	NC	8.8	5125	6620	7930	1244000	1286000	1.3	1.5	2.1	2.1
Top of Salt	1950	Intermediate	11200'	9-5/8"	53.5	L-80	BTC	New	12-1/4"	11200'	Cut Brine	8.7 - 8.9	28-29	NC	8.9	5415	11100	12640	641000	788000	2.0	2.3	2.7	3.4
Base of Salt	4950	Production	19527'	5-1/2"	20	P110	GBCD	New	8-3/4"	11700'														
Lamar	5200																							
Bell Canyon	5500																							
Cherry Canyon	6700																							
Brushy Canyon	8401																							
Bone Spring	8925																							
Avalon	8988																							
1 BSS	9976																							
2 BSS	10501																							
3 BSL	11026																							
3 BSS	11551																							
Wolfcamp	11851																							

Surface - 1065'

2800  
750  
1850

Casing: 5.5 OD, 20 ppf  
 Casing Grade: P-110

Connection: GB CD Butt 6.200  
 Coupling Grade: API P-110

PIPE BODY GEOMETRY					
Nominal OD (in.)	5 1/2	Wall Thickness (in.)	0.361	Drift Diameter (in.)	4.653
Nominal Weight (ppf)	20.00	Nominal ID (in.)	4.778	API Alternate Drift Dia. (in.)	N/A
Plain End Weight (ppf)	19.83	Plain End Area (in. <sup>2</sup> )	5.828		

PIPE BODY PERFORMANCE					
Material Specification	P-110	Min. Yield Str. (psi)	110,000	Min. Ultimate Str. (psi)	125,000
<b>Collapse</b>		<b>Tension</b>		<b>Pressure</b>	
API (psi)	11,100	Pl. End Yield Str. (kips)	641	Min. Int. Yield Press. (psi)	12,640
High Collapse (psi)	N/A	<b>Torque</b>		<b>Bending</b>	
		Yield Torque (ft-lbs)	74,420	Build Rate to Yield (°/100 ft)	91.7

GB CD Butt 6.200 COUPLING GEOMETRY			
Coupling OD (in.)	6.200	Makeup Loss (in.)	4.2500
Coupling Length (in.)	8.500	Critical Cross-Sect. (in. <sup>2</sup> )	7.545

GB CD Butt 6.200 CONNECTION PERFORMANCE RATINGS/EFFICIENCIES					
Material Specification	API P-110	Min. Yield Str. (psi)	110,000	Min. Ultimate Str. (psi)	125,000
<b>Tension</b>		<b>Efficiency</b>		<b>Bending</b>	
Thread Str. (kips)	667	Internal Pressure (%)	100%	Build Rate to Yield (°/100 ft)	81.3
Min. Tension Yield (kips)	788	External Pressure (%)	100%	<b>Yield Torque</b>	
Min. Tension Ult. (kips)	896	Tension (%)	100%	Yield Torque (ft-lbs)	31,180
Joint Str. (kips)	667	Compression (%)	100%		
		Ratio of Areas (Cplg/Pipe)	1.29		

MAKEUP TORQUE			
Min. MU Tq. (ft-lbs)	10,000	Max. MU Tq. (ft-lbs)	20,000
		Running Tq. (ft-lbs)	See GBT RP
		Max. Operating Tq. (ft-lbs)*	29,620

Units: US Customary (lbm, in., °F, lbf)

1 kip = 1,000 lbs

\* See Running Procedure for description and limitations.

See attached: Notes for GB Connection Performance Properties.

GBT Running Procedure (GBT RP): [www.gbtubulars.com/pdf/RP-GB-DWC-Connections.pdf](http://www.gbtubulars.com/pdf/RP-GB-DWC-Connections.pdf)

Blanking Dimensions: [www.gbtubulars.com/pdf/GB-DWC-Blanking-Dimensions.pdf](http://www.gbtubulars.com/pdf/GB-DWC-Blanking-Dimensions.pdf)

Connection yield torque rating based on physical testing or extrapolation therefrom

**Additional data for EC transaction #414040 that would not fit on the form**

**32. Additional remarks, continued**

Drill 8 3/4 inch pilot hole to 13000 ft and log. Cement pilot hole w/495 sx 15.6 Halcem.

# PECOS DISTRICT

## DRILLING CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	<b>Kaiser Francis Oil Co</b>
<b>LEASE NO.:</b>	<b>LC066438</b>
<b>WELL NAME &amp; NO.:</b>	<b>301H – Bell Lake Unit North</b>
<b>SURFACE HOLE FOOTAGE:</b>	<b>2120'/N &amp; 325'/W</b>
<b>BOTTOM HOLE FOOTAGE:</b>	<b>330'/S &amp; 350'/W, sec. 12</b>
<b>LOCATION:</b>	<b>Sec. 1, T. 23 S, R. 33 E</b>
<b>COUNTY:</b>	<b>Lea County, New Mexico</b>

COA

H2S	<input checked="" type="radio"/> Yes	<input checked="" type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input checked="" type="radio"/> Secretary	<input checked="" type="radio"/> R-111-P
Cave/Karst Potential	<input checked="" type="radio"/> Low	<input checked="" type="radio"/> Medium	<input checked="" type="radio"/> High
Variance	<input checked="" type="radio"/> None	<input checked="" type="radio"/> Flex Hose	<input checked="" type="radio"/> Other
Wellhead	<input checked="" type="radio"/> Conventional	<input checked="" type="radio"/> Multibowl	<input checked="" type="radio"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> 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 **1065** 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.
- 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.
  - 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.

**Pilot hole is required to have a plug at the bottom of the hole. If two plugs are set, the BLM is to be contacted (575-361-2822) prior to tag of bottom plug, which must be a minimum of 200' in length. Operator can set one plug from bottom of pilot hole to kick-off point and save the WOC time for tagging the first plug. Note plug tops on subsequent drilling report.**

**During drilling of intermediate hole from 250-1900 feet fresh water will be used unless lost circulation is encountered then air may be used concurrently to lighten the hydrostatic pressure.**

### **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.

## **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)

☒ Lea County

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
  - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
  - b. When the operator proposes to set surface casing with Spudder Rig
    - Notify the BLM when moving in and removing the Spudder Rig.
    - Notify the BLM when moving in the 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

#### A. CASING

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

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOC 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 080118**



Stevens, Zota <zstevens@blm.gov>

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**[EXTERNAL] KAISER-FRANCIS - BELL LAKE UNIT NORTH 301H APD CHG SUNDRY**

1 message

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**Curt Jones** <curtj@kfoc.net>

Wed, Aug 1, 2018 at 6:48 AM

To: "zstevens@blm.gov" <zstevens@blm.gov>

Cc: Melanie Wilson <mjp1692@gmail.com>

The pilot hole cement yield is 1.196 ft<sup>3</sup>/sack

Thanks for your help

Curt

233301E SUNDRY BELL LAKE UNIT NORTH 301H 30015 NMLC066438 KAISER FRANCIS  
OIL COMPANY 12-55 414040 08012018 ZS

13 3/8	surface csg in a	17 1/2	inch hole.	Design Factors			SURFACE		
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	54.50	J 55	ST&C	8.86	2.27	0.53	1,065	58,043	
"B"							0	0	
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,446				Tail Cmt	does not	circ to sfc.	Totals:	1,065 58,043	
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	1052	1801	794	127	9.00	2656	3M	1.56
Class 'C' tail cmt yield above 1.35.									
Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK.									

9 5/8	casing inside the	13 3/8	A Buoyant		Design Factors		INTERMEDIATE		
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	53.50	L 80	LT&C	2.01	1.29	1.46	11,200	599,200	
"B"							0	0	
w/8.4#/g mud, 30min Sfc Csg Test psig:						Totals:	11,200	599,200	
The cement volume(s) are intended to achieve a top of				0	ft from surface or a		1065	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 v	0	3578		8.80	2872	3M	0.81
D V Tool(s):			5000	sum of sx			Σ CuFt	Σ%excess	
t by stage % :			45	46	2075			5205	45

Tail cmt					Design Factors			PRODUCTION	
5 1/2	casing inside the	9 5/8	-						
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	20.00	P 110	#N/A	2.74	2.14	2.32	11,127	222,540	
"B"	20.00	P 110	#N/A	7.94	1.84	2.32	8,435	168,700	
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,448							Totals:	19,562	391,240
B	would be:			55.93	2.04	if it were a vertical wellbore.			
No Pilot Hole Planned		MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC	
		19562	11700	11700	11127	90	10	12028	
The cement volume(s) are intended to achieve a top of				11000	ft from surface or a		200	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 3/4	0.2526	2482	4320	2164	100	8.96			1.28
Class 'H' tail cmt yld > 1.20									