Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED
JUL 23 2019
DISTRICT II-ARTESIA O.C.D.

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

SUNDRY NOTICES AND REPORTS ON WELLS

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

5. Lease Serial No.
NMNM94651

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

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

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

8. Well Name and No.
OXBOW CC 17-08 FEDERAL COM 33H

2. Name of Operator
OXY USA INCORPORATED
Contact: SARAH E CHAPMAN
E-Mail: SARAH_CHAPMAN@OXY.COM

9. API Well No.
30-015-45085-00-X1

3a. Address
5 GREENWAY PLAZA SUITE 110
HOUSTON, TX 77046-0521

3b. Phone No. (include area code)
Ph: 713-350-4997

10. Field and Pool or Exploratory Area
PIERCE CROSSING-BONE SPRING

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 17 T24S R29E SWSW 432FSL 1293FWL
32.211529 N Lat, 104.010925 W Lon

11. County or Parish, State
EDDY COUNTY, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Change to Original APD
	☐ 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.

OXY USA Inc. respectfully requests to amend the original APD with the following changes:

1. Update pool, permitted in Purple Sage Wolfcamp, moving to Pierce Crossing Bone Spring
2. BHL is moving 490' west be 1650' FWL
3. Drill Plan w/ new TD, casing depths, cementing volumes, offline cementing, etc.
4. Directional Plan/Plot

Please find all supporting documentation attached for your review.

Thank you.

RECEIVED
JUL 2
DISTRICT II-ARTESIA O.C.D.

Carlsbad Field Office
OCD Artesia

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

Electronic Submission #468684 verified by the BLM Well Information System
For OXY USA INCORPORATED, sent to the Carlsbad
Committed to AFMSS for processing by PRISCILLA PEREZ on 06/13/2019 (19PP2415SE)

Name *(Printed/Typed)* SARAH E CHAPMAN — Title REGULATORY SPECIALIST

Signature (Electronic Submission) — Date 06/12/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By NDUNGU KAMAU — Title PETROLEUM ENGINEER — Date 07/11/2019

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 ****

RWP 10-21-19.

Revisions to Operator-Submitted EC Data for Sundry Notice #468684

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	APDCH NOI	APDCH NOI
Lease:	NMNM94651	NMNM94651
Agreement:		
Operator:	OXY USA INC. P.O. BOX 4294 HOUSTON, TX 77210 Ph: 713-350-4997	OXY USA INCORPORATED 5 GREENWAY PLAZA SUITE 110 HOUSTON, TX 77046-0521 Ph: 713.350.4816
Admin Contact:	SARAH E CHAPMAN REGULATORY SPECIALIST E-Mail: SARAH_CHAPMAN@OXY.COM Cell: 281-642-5503 Ph: 713-350-4997	SARAH E CHAPMAN REGULATORY SPECIALIST E-Mail: SARAH_CHAPMAN@OXY.COM Cell: 281-642-5503 Ph: 713-350-4997
Tech Contact:	SARAH E CHAPMAN REGULATORY SPECIALIST E-Mail: SARAH_CHAPMAN@OXY.COM Cell: 281-642-5503 Ph: 713-350-4997	SARAH E CHAPMAN REGULATORY SPECIALIST E-Mail: SARAH_CHAPMAN@OXY.COM Cell: 281-642-5503 Ph: 713-350-4997
Location: State: County:	 NM EDDY	 NM EDDY
Field/Pool:	PURPLE SAGE WOLFCAMP	PIERCE CROSSING-BONE SPRING
Well/Facility:	OXBOW CC 17-8 FEDERAL COM 33H Sec 17 T24S R29E Mer NMP SWSW 432FSL 1293FWL 32.211527 N Lat, 104.010928 W Lon	OXBOW CC 17-08 FEDERAL COM 33H Sec 17 T24S R29E SWSW 432FSL 1293FWL 32.211529 N Lat, 104.010925 W Lon

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	OXY USA INC.
LEASE NO.:	NMNM 094651
WELL NAME & NO.:	33H-OXBOW CC 17-08 FED COM
SURFACE HOLE FOOTAGE:	432'/S & 1293'/W
BOTTOM HOLE FOOTAGE	20'/N & 1650'/W
LOCATION:	T-24S, R-29E, S-17. NMPM
COUNTY:	EDDY, NM

COA

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
Other	☑ Fluid Filled	☑ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☑ COM	☐ Unit

ALL PREVIOUS COAs STILL APPLY

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

Casing Design:

1. The **10-3/4** inch surface casing shall be set at approximately **400** 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.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

2. The minimum required fill of cement behind the **7-5/8** inch intermediate casing is:

Option 1 (Single Stage):

- 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.**

Option 2:

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.

b. Second stage above DV tool:

- Cement to surface. If cement does not circulate, contact the appropriate BLM office.
  Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

❖ In Medium 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.

Operator has proposed to pump down 9-5/8" X 7-5/8" annulus. Operator must run a CBL from TD of the 7-5/8" casing to surface. Submit results to BLM. Excess calculates to 7% - additional cement might be required.

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

Option 1 (Single Stage):

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification. **Excess calculates to 19% - additional cement might be required.**

Option 2:

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.

b. Second stage above DV tool:

- 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.

Option 1:

a. 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.

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

Option 2:

1. 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.

D. SPECIAL REQUIREMENT (S)

BOP Break Testing Variance

- 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.

Offline Cementing

- Contact the BLM prior to the commencement of any offline cementing procedure.

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

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)

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

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

☒ 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 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.

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.

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: 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. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
    e. 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.

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.

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

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. The results of the test shall be reported to the appropriate BLM office.

f. 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.

g. 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 if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

h. 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.

NMK07122019

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

API Number	Pool Code	Pool Name
30-015-45085	50371	Pierce Crossing Bone Spring

Property Code	Property Name	Well Number
321633	OXBOW CC "17-8" FEDERAL COM	33H

OGRID No.	Operator Name	Elevation
16696	OXY USA INC.	2937.9'

Surface Location

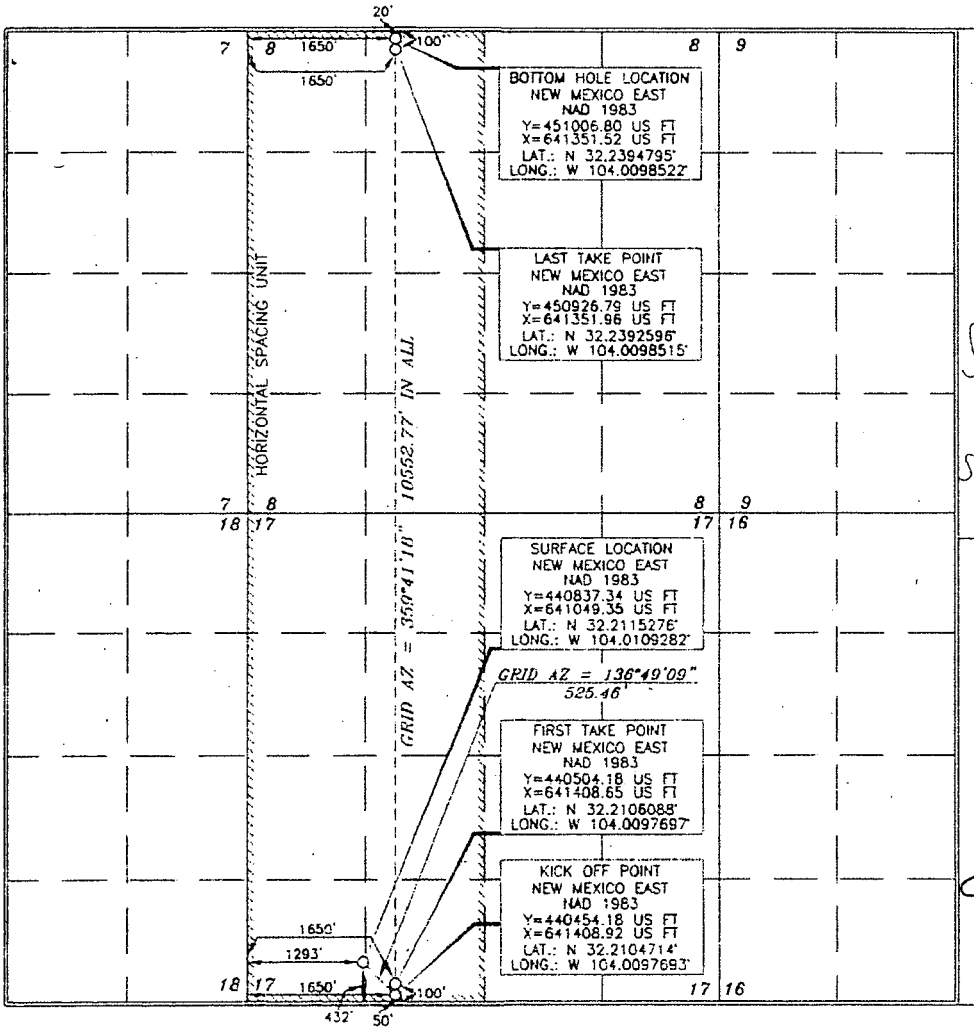
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	17	24 SOUTH	29 EAST, N.M.P.M.		432'	SOUTH	1293'	WEST	EDDY

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
C	8	24 SOUTH	29 EAST, N.M.P.M.		20'	NORTH	1650'	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
640			

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.



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.

Sarah Chapman 6/12/19
Signature Date

Sarah Chapman
Printed Name

sarah_chapman@oxy.com
E-mail Address

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.

15079
OCTOBER 19, 2017
Date of Survey

Signature and Seal of Professional Surveyor

JERRY J. ASEL
NEW MEXICO
15079
REGISTERED PROFESSIONAL LAND SURVEYOR

Jerry J. Asel 5/2/2019
Certificate Number 15079

WO# 171019WL-a (Rev. A) (KA)

RVP 10-21-19

Intent [X] As Drilled [ ]

API #
30-015-45085

Operator Name:	Property Name:	Well Number
OXY USA Inc.	OXBOW CC 17-8 Federal Com	33H

Kick Off Point (KOP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
N	17	24S	29E		50	South	1650	West	EDDY
Latitude					**Longitude**				**NAD**
32.2104714					-104.0097693				NAD83

First Take Point (FTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
N	17	24S	29E		100	South	1650	West	EDDY
Latitude					**Longitude**				**NAD**
32.2106888					-104.0097697				NAD83

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
C	8	24S	29E		100	North	1650	West	EDDY
Latitude					**Longitude**				**NAD**
32.2392596					-104.0098515				NAD83

Is this well the defining well for the Horizontal Spacing Unit? [X]

Is this well an infill well? [ ]

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API #

Operator Name:	Property Name:	Well Number

KZ 06/29/2018

Oxy USA Inc. - Oxbow CC 17-8 Federal Com 33H

1. Geologic Formations

TVD of target	9824'	Pilot Hole Depth	N/A
MD at TD:	20734'	Deepest Expected fresh water:	281'

Delaware Basin

Formation	TVD - RKB	Expected Fluids
Rustler	281	
Salado	596	Salt
Castile	1,237	Salt
Lamar/Delaware	2,790	Oil/Gas/Brine
Bell Canyon	2,841	Oil/Gas/Brine
Cherry Canyon	3,722	Oil/Gas/Brine
Brushy Canyon	4,966	Losses
Bone Spring	6,581	Oil/Gas
1st Bone Spring	7,522	Oil/Gas
2nd Bone Spring	8,347	Oil/Gas
3rd Bone Spring	**9,445**	**Oil/Gas**

*H2S, water flows, loss of circulation, abnormal pressures, etc.

2. Casing Program

Hole Size (in)	Casing Interval From (ft)	Casing Interval To (ft)	Csg. Size (in)	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	Buoyant Body SF Tension	Buoyant Joint SF Tension
14.75	0	536	10.75	40.5	J-55	BTC	1.125	1.2	1.4	1.4
9.875	0	9373	7.625	26.4	L-80 HC	BTC	1.125	1.2	1.4	1.4
6.75	0	20734	5.5	20	P-110	DQX	1.125	1.2	1.4	1.4
							SF Values will meet or Exceed			

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

*Oxy requests the option to set casing shallower yet still below the salts if losses or hole conditions require this. Cement volumes may be adjusted if casing is set shallower and a DV tool may be run in case hole conditions merit pumping a second stage cement job to comply with permitted top of cement. If cement circulated to surface during first stage, we will drop a cancelation cone and not pump the second stage.

*Oxy requests the option to run production casing with DQX, SF TORQ, and/or DQW TORQ connections to accommodate hole conditions or drilling operations.

Oxy USA Inc. - Oxbow CC 17-8 Federal Com 33H

Annular Clearance Variance Request

As per the agreement reached in the Oxy/BLM face-to-face meeting on Feb 22, 2018, Oxy requests permission to allow deviation from the 0.422" annular clearance requirement from Onshore Order #2 under the following conditions:

1. Annular clearance to meet or exceed 0.422" between intermediate casing ID and production casing coupling only on the first 500' overlap between both casings.
2. Annular clearance less than 0.422" is acceptable for the curve and lateral portions of the production open hole section.

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	Y
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program

Casing String	# Sks	Wt. (lb/gal)	Yld (ft3/sack)	H20 (gal/sk)	500# Comp. Strength (hours)	Slurry Description
Surface (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Surface (Tail)	435	14.8	1.33	6.365	5:26	Class C Cement, Accelerator
Intermediate 1st Stage (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate 1st Stage (Tail)	575	13.2	1.65	8.640	11:54	Class H Cement, Retarder, Dispersant, Salt
Intermediate 2nd Stage (Tail Slurry) to be pumped as Bradenhead Squeeze from surface, down the Intermediate annulus						
Intermediate 2nd Stage (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Intermediate 2nd Stage (Tail)	642	12.9	1.92	10.41	23:10	Class C Cement, Accelerator
Production (Lead)	N/A	N/A	N/A	N/A	N/A	N/A
Production (Tail)	869	13.2	1.38	6.686	3:39	Class H Cement, Retarder, Dispersant, Salt

Casing String	Top (ft)	Bottom (ft)	% Excess
Surface (Lead)	N/A	N/A	N/A
Surface (Tail)	0	536	100%
Intermediate 1st Stage (Lead)	N/A	N/A	N/A
Intermediate 1st Stage (Tail)	5216	9373	5%
Intermediate 2nd Stage (Lead)	N/A	N/A	N/A
Intermediate 2nd Stage (Tail)	0	5216	10%
Production (Lead)	N/A	N/A	N/A
Production (Tail)	8873	20734	20%

Offline Cementing

Oxy requests a variance to cement the 9.625" and/or 7.625" intermediate casing strings offline in accordance to the approved variance, EC Tran 461365.

The summarized operational sequence will be as follows:

1. Run casing as per normal operations. While running casing, conduct negative pressure test and confirm integrity of the float equipment (float collar and shoe).
2. Land casing.
3. Fill pipe with kill weight fluid, and confirm well is static.
    a. If well is not static notify BLM and kill well.
    b. Once well is static notify BLM with intent to proceed with nipple down and offline cementing.
4. Set and pressure test annular packoff.
5. After confirmation of both annular barriers and internal barriers, nipple down BOP and install cap flange. If any barrier fails to test, the BOP stack will not be nippled down until after the cement job is completed.
6. Skid rig to next well on pad.
7. Confirm well is static before removing cap flange.
8. If well is not static notify BLM and kill well prior to cementing or nippling up for further remediation.

9. Install offline cement tool.
10. Rig up cement equipment.
    a. Notify BLM prior to cement job.
11. Perform cement job.
12. Confirm well is static and floats are holding after cement job.
13. Remove cement equipment, offline cement tools and install night cap with pressure gauge for monitoring.

4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
9.875" Hole	13-5/8"	3M	Annular	✓	70% of working pressure
		3M	Blind Ram	✓	250 psi / 3000 psi
			Pipe Ram		
			Double Ram	✓	
			Other*		
6.75" Hole	13-5/8"	5M	Annular	✓	70% of working pressure
		5M	Blind Ram	✓	250 psi / 5000 psi
			Pipe Ram		
			Double Ram	✓	
			Other*		

*Specify if additional ram is utilized.

Oxy will utilize a 5M annular with a 10M BOPE stack. The BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or 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. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
Y	Are anchors required by manufacturer?
	A multibowl or a unionized multibowl wellhead system will be employed. The wellhead and connection to the BOPE will meet all API 6A requirements. The BOP will be tested

	per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. We will test the flange connection of the wellhead with a test port that is directly in the flange. We are proposing that we will run the wellhead through the rotary prior to cementing surface casing as discussed with the BLM on October 8, 2015. See attached schematics.

BOP Break Testing Request

As per the agreement reached in the Oxy/BLM face-to-face meeting on Feb 22, 2018, Oxy requests permission to allow BOP Break Testing under the following conditions:

- After a full BOP test is conducted on the first well on the pad.
- When skidding to drill an intermediate section that does not penetrate into the Wolfcamp.
- Full BOP test will be required prior to drilling any production hole.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From (ft)	To (ft)				
0	536	Water-Based Mud	8.6-8.8	40-60	N/C
536	9373	Saturated Brine-Based or Oil-Based Mud	8.0-10.0	35-45	N/C
9373	20734	Water-Based or Oil-Based Mud	9.5-12.0	38-50	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times. The following is a general list of products: Barite, Bentonite, Gypsum, Lime, Soda Ash, Caustic Soda, Nut Plug, Cedar Fiber, Cotton Seed Hulls, Drilling Paper, Salt Water Clay, CACL2. Oxy will use a closed mud system.

What will be used to monitor the loss or gain of fluid?	PVT/MD Totco/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing.	
Yes	Will run GR from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
No	Logs are planned based on well control or offset log information.
No	Drill stem test? If yes, explain
No	Coring? If yes, explain

Additional logs planned		Interval
No	Resistivity	
No	Density	
No	CBL	
Yes	Mud log	ICP - TD
No	PEX	

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	6131 psi
Abnormal Temperature	No
BH Temperature at deepest TVD	159°F

Pump high viscosity sweeps as needed for hole cleaning. The mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times. Appropriately weighted mud will be used to isolate potential gas, oil, and water zones until such time as casing can be cemented into place for zonal isolation.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

8. Other facets of operation

	Yes/No
Will the well be drilled with a walking/skidding operation? If yes, describe. • We plan to drill the three well pad in batch by section: all surface sections, intermediate sections and production sections. The wellhead will be secured with a night cap whenever the rig is not over the well.	Yes
Will more than one drilling rig be used for drilling operations? If yes, describe. • Oxy requests the option to contract a Surface Rig to drill, set surface casing, and cement for this well. If the timing between rigs is such that Oxy would not be able to preset surface, the Primary Rig will MIRU and drill the well in its entirety per the APD. Please see the attached document for information on the spudder rig.	Yes

Total estimated cuttings volume: 1453.3 bbls.

Attachments
_x__ Directional Plan
_x__ H2S Contingency Plan
_x__ Flex III Attachments
_x__ Spudder Rig Attachment
_x__ Premium Connection Specs

9. Company Personnel

Name	Title	Office Phone	Mobile Phone
Ben Pelton	Drilling Engineer	713-497-2379	701-690-8645
Margaret Giltner	Drilling Engineer Supervisor	713-366-5026	210-683-8480
Simon Benavides	Drilling Superintendent	713-522-8652	281-684-6897
Diego Tellez	Drilling Manager	713-350-4602	713-303-4932

OXY

PRD NM DIRECTIONAL PLANS (NAD 1983)
OXBOW CC 17-08 FED COM
Oxbow CC 17-08 Federal Com 33H

WB00

Plan: Permitting Plan

Standard Planning Report

23 May, 2019

Oxy

Planning Report

Database:	HOPSPP	**Local Co-ordinate Reference:**	Well Oxbow CC 17-08 Federal Com 33H
Company:	ENGINEERING DESIGNS	**TVD Reference:**	RKB=26.5' @ 2964.40ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	RKB=26.5' @ 2964.40ft
Site:	OXBOW CC 17-08 FED COM	**North Reference:**	Grid
Well:	Oxbow CC 17-08 Federal Com 33H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Project PRD NM DIRECTIONAL PLANS (NAD 1983)

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		Using geodetic scale factor

Site OXBOW CC 17-08 FED COM

Site Position:		**Northing:**	440,994.67 usft	**Latitude:**	32° 12' 42.973882 N
From:	Map	**Easting:**	643,785.93 usft	**Longitude:**	104° 0' 7.482139 W
Position Uncertainty:	50.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.18 °

Well Oxbow CC 17-08 Federal Com 33H

Well Position	**+N/-S**	-157.34 ft	**Northing:**	440,837.34 usft	**Latitude:**	32° 12' 41.499301 N
	+E/-W	-2,736.80 ft	**Easting:**	641,049.35 usft	**Longitude:**	104° 0' 39.341469 W
Position Uncertainty		2.00 ft	**Wellhead Elevation:**	0.00 ft	**Ground Level:**	2,937.90 ft

Wellbore WB00

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/23/2019	6.98	59.93	47,902

Design Permitting Plan

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	1.70

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,827.00	0.00	0.00	3,827.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,526.83	14.00	161.03	4,519.89	-80.44	27.64	2.00	2.00	0.00	161.03	
8,092.35	14.00	161.03	7,979.55	-896.00	307.91	0.00	0.00	0.00	0.00	
9,473.31	14.00	359.69	9,346.06	-886.72	362.34	2.00	0.00	-11.68	-170.39	
10,230.91	89.76	359.69	9,780.40	-333.19	359.33	10.00	10.00	0.00	0.00	FTP (Oxbow CC
20,734.63	89.76	359.69	9,824.40	10,170.29	302.19	0.00	0.00	0.00	0.00	PBHL (Oxbow CC

Database:	HOPSPP	**Local Co-ordinate Reference:**	Well Oxbow CC 17-08 Federal Com 33H
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Site:	OXBOW CC 17-08 FED COM	**North Reference:**	Grid
Well:	Oxbow CC 17-08 Federal Com 33H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,827.00	0.00	0.00	3,827.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	1.46	161.03	3,899.99	-0.88	0.30	-0.87	2.00	2.00	0.00
4,000.00	3.46	161.03	3,999.89	-4.94	1.70	-4.89	2.00	2.00	0.00
4,100.00	5.46	161.03	4,099.59	-12.29	4.22	-12.16	2.00	2.00	0.00
4,200.00	7.46	161.03	4,198.95	-22.93	7.88	-22.69	2.00	2.00	0.00
4,300.00	9.46	161.03	4,297.85	-36.84	12.66	-36.45	2.00	2.00	0.00
4,400.00	11.46	161.03	4,396.19	-54.01	18.56	-53.44	2.00	2.00	0.00
4,500.00	13.46	161.03	4,493.83	-74.42	25.57	-73.62	2.00	2.00	0.00
4,526.83	14.00	161.03	4,519.89	-80.44	27.64	-79.58	2.00	2.00	0.00
4,600.00	14.00	161.03	4,590.89	-97.17	33.39	-96.14	0.00	0.00	0.00
4,700.00	14.00	161.03	4,687.92	-120.05	41.26	-118.77	0.00	0.00	0.00
4,800.00	14.00	161.03	4,784.95	-142.92	49.12	-141.40	0.00	0.00	0.00
4,900.00	14.00	161.03	4,881.98	-165.80	56.98	-164.03	0.00	0.00	0.00
5,000.00	14.00	161.03	4,979.01	-188.67	64.84	-186.66	0.00	0.00	0.00
5,100.00	14.00	161.03	5,076.04	-211.54	72.70	-209.29	0.00	0.00	0.00

Database:	HOPSPP	**Local Co-ordinate Reference:**	Well Oxbow CC 17-08 Federal Com 33H
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Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	RKB=26.5' @ 2964.40ft
Site:	OXBOW CC 17-08 FED COM	**North Reference:**	Grid
Well:	Oxbow CC 17-08 Federal Com 33H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,200.00	14.00	161.03	5,173.07	-234.42	80.56	-231.92	0.00	0.00	0.00
5,300.00	14.00	161.03	5,270.10	-257.29	88.42	-254.55	0.00	0.00	0.00
5,400.00	14.00	161.03	5,367.14	-280.16	96.28	-277.18	0.00	0.00	0.00
5,500.00	14.00	161.03	5,464.17	-303.04	104.14	-299.81	0.00	0.00	0.00
5,600.00	14.00	161.03	5,561.20	-325.91	112.00	-322.44	0.00	0.00	0.00
5,700.00	14.00	161.03	5,658.23	-348.78	119.86	-345.07	0.00	0.00	0.00
5,800.00	14.00	161.03	5,755.26	-371.66	127.72	-367.70	0.00	0.00	0.00
5,900.00	14.00	161.03	5,852.29	-394.53	135.58	-390.33	0.00	0.00	0.00
6,000.00	14.00	161.03	5,949.32	-417.40	143.44	-412.96	0.00	0.00	0.00
6,100.00	14.00	161.03	6,046.35	-440.28	151.30	-435.59	0.00	0.00	0.00
6,200.00	14.00	161.03	6,143.38	-463.15	159.16	-458.22	0.00	0.00	0.00
6,300.00	14.00	161.03	6,240.41	-486.03	167.03	-480.85	0.00	0.00	0.00
6,400.00	14.00	161.03	6,337.45	-508.90	174.89	-503.48	0.00	0.00	0.00
6,500.00	14.00	161.03	6,434.48	-531.77	182.75	-526.11	0.00	0.00	0.00
6,600.00	14.00	161.03	6,531.51	-554.65	190.61	-548.74	0.00	0.00	0.00
6,700.00	14.00	161.03	6,628.54	-577.52	198.47	-571.37	0.00	0.00	0.00
6,800.00	14.00	161.03	6,725.57	-600.39	206.33	-594.00	0.00	0.00	0.00
6,900.00	14.00	161.03	6,822.60	-623.27	214.19	-616.63	0.00	0.00	0.00
7,000.00	14.00	161.03	6,919.63	-646.14	222.05	-639.26	0.00	0.00	0.00
7,100.00	14.00	161.03	7,016.66	-669.01	229.91	-661.89	0.00	0.00	0.00
7,200.00	14.00	161.03	7,113.69	-691.89	237.77	-684.52	0.00	0.00	0.00
7,300.00	14.00	161.03	7,210.72	-714.76	245.63	-707.15	0.00	0.00	0.00
7,400.00	14.00	161.03	7,307.76	-737.64	253.49	-729.78	0.00	0.00	0.00
7,500.00	14.00	161.03	7,404.79	-760.51	261.35	-752.41	0.00	0.00	0.00
7,600.00	14.00	161.03	7,501.82	-783.38	269.21	-775.04	0.00	0.00	0.00
7,700.00	14.00	161.03	7,598.85	-806.26	277.07	-797.67	0.00	0.00	0.00
7,800.00	14.00	161.03	7,695.88	-829.13	284.93	-820.30	0.00	0.00	0.00
7,900.00	14.00	161.03	7,792.91	-852.00	292.80	-842.93	0.00	0.00	0.00
8,000.00	14.00	161.03	7,889.94	-874.88	300.66	-865.56	0.00	0.00	0.00
8,092.35	14.00	161.03	7,979.55	-896.00	307.91	-886.46	0.00	0.00	0.00
8,100.00	13.85	160.93	7,986.97	-897.74	308.51	-888.18	2.00	-1.97	-1.39
8,200.00	11.88	159.29	8,084.46	-918.68	316.07	-908.89	2.00	-1.97	-1.64
8,300.00	9.93	157.01	8,182.65	-936.24	323.07	-926.23	2.00	-1.95	-2.28
8,400.00	7.99	153.64	8,281.43	-950.41	329.53	-940.20	2.00	-1.93	-3.37
8,500.00	6.11	148.18	8,380.67	-961.16	335.42	-950.78	2.00	-1.89	-5.46
8,600.00	4.32	138.07	8,480.25	-968.49	340.74	-957.94	2.00	-1.78	-10.11
8,700.00	2.84	115.95	8,580.06	-972.38	345.49	-961.69	2.00	-1.48	-22.12
8,800.00	2.34	71.88	8,679.96	-972.83	349.67	-962.02	2.00	-0.51	-44.08
8,900.00	3.29	34.95	8,779.85	-969.84	353.25	-958.92	2.00	0.95	-36.92
9,000.00	4.92	18.34	8,879.59	-963.41	356.25	-952.41	2.00	1.63	-16.61
9,100.00	6.75	10.32	8,979.07	-953.56	358.65	-942.49	2.00	1.83	-8.03
9,200.00	8.66	5.75	9,078.17	-940.28	360.46	-929.16	2.00	1.91	-4.57
9,300.00	10.60	2.83	9,176.75	-923.61	361.67	-912.46	2.00	1.94	-2.92
9,400.00	12.56	0.81	9,274.71	-903.55	362.28	-892.39	2.00	1.96	-2.02
9,473.31	14.00	359.69	9,346.06	-886.72	362.34	-875.56	2.00	1.97	-1.54
9,500.00	16.67	359.69	9,371.80	-879.66	362.30	-868.51	10.00	10.00	0.00
9,600.00	26.67	359.69	9,464.61	-842.78	362.10	-831.65	10.00	10.00	0.00
9,700.00	36.67	359.69	9,549.62	-790.35	361.82	-779.25	10.00	10.00	0.00
9,800.00	46.67	359.69	9,624.22	-723.95	361.45	-712.89	10.00	10.00	0.00
9,900.00	56.67	359.69	9,686.16	-645.60	361.03	-634.60	10.00	10.00	0.00
10,000.00	66.67	359.69	9,733.56	-557.70	360.55	-546.74	10.00	10.00	0.00
10,100.00	76.67	359.69	9,764.97	-462.89	360.03	-451.99	10.00	10.00	0.00
10,200.00	86.67	359.69	9,779.44	-364.07	359.50	-353.24	10.00	10.00	0.00
10,230.91	89.76	359.69	9,780.40	-333.19	359.33	-322.37	10.00	10.00	0.00

Database:	HOPSPP	**Local Co-ordinate Reference:**	Well Oxbow CC 17-08 Federal Com 33H
Company:	ENGINEERING DESIGNS	**TVD Reference:**	RKB=26.5' @ 2964.40ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	RKB=26.5' @ 2964.40ft
Site:	OXBOW CC 17-08 FED COM	**North Reference:**	Grid
Well:	Oxbow CC 17-08 Federal Com 33H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,300.00	89.76	359.69	9,780.69	-264.09	358.95	-253.32	0.00	0.00	0.00
10,400.00	89.76	359.69	9,781.11	-164.10	358.41	-153.38	0.00	0.00	0.00
10,500.00	89.76	359.69	9,781.53	-64.10	357.87	-53.44	0.00	0.00	0.00
10,600.00	89.76	359.69	9,781.95	35.90	357.32	46.50	0.00	0.00	0.00
10,700.00	89.76	359.69	9,782.37	135.90	356.78	146.43	0.00	0.00	0.00
10,800.00	89.76	359.69	9,782.78	235.89	356.23	246.37	0.00	0.00	0.00
10,900.00	89.76	359.69	9,783.20	335.89	355.69	346.31	0.00	0.00	0.00
11,000.00	89.76	359.69	9,783.62	435.89	355.15	446.24	0.00	0.00	0.00
11,100.00	89.76	359.69	9,784.04	535.89	354.60	546.18	0.00	0.00	0.00
11,200.00	89.76	359.69	9,784.46	635.88	354.06	646.12	0.00	0.00	0.00
11,300.00	89.76	359.69	9,784.88	735.88	353.51	746.06	0.00	0.00	0.00
11,400.00	89.76	359.69	9,785.30	835.88	352.97	845.99	0.00	0.00	0.00
11,500.00	89.76	359.69	9,785.72	935.88	352.43	945.93	0.00	0.00	0.00
11,600.00	89.76	359.69	9,786.14	1,035.87	351.88	1,045.87	0.00	0.00	0.00
11,700.00	89.76	359.69	9,786.55	1,135.87	351.34	1,145.81	0.00	0.00	0.00
11,800.00	89.76	359.69	9,786.97	1,235.87	350.79	1,245.74	0.00	0.00	0.00
11,900.00	89.76	359.69	9,787.39	1,335.87	350.25	1,345.68	0.00	0.00	0.00
12,000.00	89.76	359.69	9,787.81	1,435.87	349.71	1,445.62	0.00	0.00	0.00
12,100.00	89.76	359.69	9,788.23	1,535.86	349.16	1,545.56	0.00	0.00	0.00
12,200.00	89.76	359.69	9,788.65	1,635.86	348.62	1,645.49	0.00	0.00	0.00
12,300.00	89.76	359.69	9,789.07	1,735.86	348.07	1,745.43	0.00	0.00	0.00
12,400.00	89.76	359.69	9,789.49	1,835.86	347.53	1,845.37	0.00	0.00	0.00
12,500.00	89.76	359.69	9,789.91	1,935.85	346.99	1,945.31	0.00	0.00	0.00
12,600.00	89.76	359.69	9,790.32	2,035.85	346.44	2,045.24	0.00	0.00	0.00
12,700.00	89.76	359.69	9,790.74	2,135.85	345.90	2,145.18	0.00	0.00	0.00
12,800.00	89.76	359.69	9,791.16	2,235.85	345.35	2,245.12	0.00	0.00	0.00
12,900.00	89.76	359.69	9,791.58	2,335.84	344.81	2,345.05	0.00	0.00	0.00
13,000.00	89.76	359.69	9,792.00	2,435.84	344.27	2,444.99	0.00	0.00	0.00
13,100.00	89.76	359.69	9,792.42	2,535.84	343.72	2,544.93	0.00	0.00	0.00
13,200.00	89.76	359.69	9,792.84	2,635.84	343.18	2,644.87	0.00	0.00	0.00
13,300.00	89.76	359.69	9,793.26	2,735.83	342.64	2,744.80	0.00	0.00	0.00
13,400.00	89.76	359.69	9,793.68	2,835.83	342.09	2,844.74	0.00	0.00	0.00
13,500.00	89.76	359.69	9,794.09	2,935.83	341.55	2,944.68	0.00	0.00	0.00
13,600.00	89.76	359.69	9,794.51	3,035.83	341.00	3,044.62	0.00	0.00	0.00
13,700.00	89.76	359.69	9,794.93	3,135.83	340.46	3,144.55	0.00	0.00	0.00
13,800.00	89.76	359.69	9,795.35	3,235.82	339.92	3,244.49	0.00	0.00	0.00
13,900.00	89.76	359.69	9,795.77	3,335.82	339.37	3,344.43	0.00	0.00	0.00
14,000.00	89.76	359.69	9,796.19	3,435.82	338.83	3,444.37	0.00	0.00	0.00
14,100.00	89.76	359.69	9,796.61	3,535.82	338.28	3,544.30	0.00	0.00	0.00
14,200.00	89.76	359.69	9,797.03	3,635.81	337.74	3,644.24	0.00	0.00	0.00
14,300.00	89.76	359.69	9,797.45	3,735.81	337.20	3,744.18	0.00	0.00	0.00
14,400.00	89.76	359.69	9,797.86	3,835.81	336.65	3,844.12	0.00	0.00	0.00
14,500.00	89.76	359.69	9,798.28	3,935.81	336.11	3,944.05	0.00	0.00	0.00
14,600.00	89.76	359.69	9,798.70	4,035.80	335.56	4,043.99	0.00	0.00	0.00
14,700.00	89.76	359.69	9,799.12	4,135.80	335.02	4,143.93	0.00	0.00	0.00
14,800.00	89.76	359.69	9,799.54	4,235.80	334.48	4,243.86	0.00	0.00	0.00
14,900.00	89.76	359.69	9,799.96	4,335.80	333.93	4,343.80	0.00	0.00	0.00
15,000.00	89.76	359.69	9,800.38	4,435.79	333.39	4,443.74	0.00	0.00	0.00
15,100.00	89.76	359.69	9,800.80	4,535.79	332.84	4,543.68	0.00	0.00	0.00
15,200.00	89.76	359.69	9,801.22	4,635.79	332.30	4,643.61	0.00	0.00	0.00
15,300.00	89.76	359.69	9,801.63	4,735.79	331.76	4,743.55	0.00	0.00	0.00
15,400.00	89.76	359.69	9,802.05	4,835.79	331.21	4,843.49	0.00	0.00	0.00
15,500.00	89.76	359.69	9,802.47	4,935.78	330.67	4,943.43	0.00	0.00	0.00
15,600.00	89.76	359.69	9,802.89	5,035.78	330.12	5,043.36	0.00	0.00	0.00

Database:	HOPSPP	**Local Co-ordinate Reference:**	Well Oxbow CC 17-08 Federal Com 33H
Company:	ENGINEERING DESIGNS	**TVD Reference:**	RKB=26.5' @ 2964.40ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	RKB=26.5' @ 2964.40ft
Site:	OXBOW CC 17-08 FED COM	**North Reference:**	Grid
Well:	Oxbow CC 17-08 Federal Com 33H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
15,700.00	89.76	359.69	9,803.31	5,135.78	329.58	5,143.30	0.00	0.00	0.00
15,800.00	89.76	359.69	9,803.73	5,235.78	329.04	5,243.24	0.00	0.00	0.00
15,900.00	89.76	359.69	9,804.15	5,335.77	328.49	5,343.18	0.00	0.00	0.00
16,000.00	89.76	359.69	9,804.57	5,435.77	327.95	5,443.11	0.00	0.00	0.00
16,100.00	89.76	359.69	9,804.99	5,535.77	327.40	5,543.05	0.00	0.00	0.00
16,200.00	89.76	359.69	9,805.40	5,635.77	326.86	5,642.99	0.00	0.00	0.00
16,300.00	89.76	359.69	9,805.82	5,735.76	326.32	5,742.93	0.00	0.00	0.00
16,400.00	89.76	359.69	9,806.24	5,835.76	325.77	5,842.86	0.00	0.00	0.00
16,500.00	89.76	359.69	9,806.66	5,935.76	325.23	5,942.80	0.00	0.00	0.00
16,600.00	89.76	359.69	9,807.08	6,035.76	324.68	6,042.74	0.00	0.00	0.00
16,700.00	89.76	359.69	9,807.50	6,135.75	324.14	6,142.68	0.00	0.00	0.00
16,800.00	89.76	359.69	9,807.92	6,235.75	323.60	6,242.61	0.00	0.00	0.00
16,900.00	89.76	359.69	9,808.34	6,335.75	323.05	6,342.55	0.00	0.00	0.00
17,000.00	89.76	359.69	9,808.76	6,435.75	322.51	6,442.49	0.00	0.00	0.00
17,100.00	89.76	359.69	9,809.17	6,535.75	321.97	6,542.42	0.00	0.00	0.00
17,200.00	89.76	359.69	9,809.59	6,635.74	321.42	6,642.36	0.00	0.00	0.00
17,300.00	89.76	359.69	9,810.01	6,735.74	320.88	6,742.30	0.00	0.00	0.00
17,400.00	89.76	359.69	9,810.43	6,835.74	320.33	6,842.24	0.00	0.00	0.00
17,500.00	89.76	359.69	9,810.85	6,935.74	319.79	6,942.17	0.00	0.00	0.00
17,600.00	89.76	359.69	9,811.27	7,035.73	319.25	7,042.11	0.00	0.00	0.00
17,700.00	89.76	359.69	9,811.69	7,135.73	318.70	7,142.05	0.00	0.00	0.00
17,800.00	89.76	359.69	9,812.11	7,235.73	318.16	7,241.99	0.00	0.00	0.00
17,900.00	89.76	359.69	9,812.53	7,335.73	317.61	7,341.92	0.00	0.00	0.00
18,000.00	89.76	359.69	9,812.94	7,435.72	317.07	7,441.86	0.00	0.00	0.00
18,100.00	89.76	359.69	9,813.36	7,535.72	316.53	7,541.80	0.00	0.00	0.00
18,200.00	89.76	359.69	9,813.78	7,635.72	315.98	7,641.74	0.00	0.00	0.00
18,300.00	89.76	359.69	9,814.20	7,735.72	315.44	7,741.67	0.00	0.00	0.00
18,400.00	89.76	359.69	9,814.62	7,835.71	314.89	7,841.61	0.00	0.00	0.00
18,500.00	89.76	359.69	9,815.04	7,935.71	314.35	7,941.55	0.00	0.00	0.00
18,600.00	89.76	359.69	9,815.46	8,035.71	313.81	8,041.49	0.00	0.00	0.00
18,700.00	89.76	359.69	9,815.88	8,135.71	313.26	8,141.42	0.00	0.00	0.00
18,800.00	89.76	359.69	9,816.30	8,235.71	312.72	8,241.36	0.00	0.00	0.00
18,900.00	89.76	359.69	9,816.71	8,335.70	312.17	8,341.30	0.00	0.00	0.00
19,000.00	89.76	359.69	9,817.13	8,435.70	311.63	8,441.23	0.00	0.00	0.00
19,100.00	89.76	359.69	9,817.55	8,535.70	311.09	8,541.17	0.00	0.00	0.00
19,200.00	89.76	359.69	9,817.97	8,635.70	310.54	8,641.11	0.00	0.00	0.00
19,300.00	89.76	359.69	9,818.39	8,735.69	310.00	8,741.05	0.00	0.00	0.00
19,400.00	89.76	359.69	9,818.81	8,835.69	309.45	8,840.98	0.00	0.00	0.00
19,500.00	89.76	359.69	9,819.23	8,935.69	308.91	8,940.92	0.00	0.00	0.00
19,600.00	89.76	359.69	9,819.65	9,035.69	308.37	9,040.86	0.00	0.00	0.00
19,700.00	89.76	359.69	9,820.07	9,135.68	307.82	9,140.80	0.00	0.00	0.00
19,800.00	89.76	359.69	9,820.49	9,235.68	307.28	9,240.73	0.00	0.00	0.00
19,900.00	89.76	359.69	9,820.90	9,335.68	306.73	9,340.67	0.00	0.00	0.00
20,000.00	89.76	359.69	9,821.32	9,435.68	306.19	9,440.61	0.00	0.00	0.00
20,100.00	89.76	359.69	9,821.74	9,535.67	305.65	9,540.55	0.00	0.00	0.00
20,200.00	89.76	359.69	9,822.16	9,635.67	305.10	9,640.48	0.00	0.00	0.00
20,300.00	89.76	359.69	9,822.58	9,735.67	304.56	9,740.42	0.00	0.00	0.00
20,400.00	89.76	359.69	9,823.00	9,835.67	304.01	9,840.36	0.00	0.00	0.00
20,500.00	89.76	359.69	9,823.42	9,935.67	303.47	9,940.30	0.00	0.00	0.00
20,600.00	89.76	359.69	9,823.84	10,035.66	302.93	10,040.23	0.00	0.00	0.00
20,700.00	89.76	359.69	9,824.26	10,135.66	302.38	10,140.17	0.00	0.00	0.00
20,734.63	89.76	359.69	9,824.40	10,170.29	302.19	10,174.78	0.00	0.00	0.00

Database:	HOPSPP	**Local Co-ordinate Reference:**	Well Oxbow CC 17-08 Federal Com 33H
Company:	ENGINEERING DESIGNS	**TVD Reference:**	RKB=26.5' @ 2964.40ft
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	RKB=26.5' @ 2964.40ft
Site:	OXBOW CC 17-08 FED COM	**North Reference:**	Grid
Well:	Oxbow CC 17-08 Federal Com 33H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
FTP (Oxbow CC 17-8 - plan hits target center - Point	0.00	0.00	9,780.40	-333.19	359.33	440,504.18	641,408.65	32° 12' 38.191690 N	104° 0' 35.170902
PBHL (Oxbow CC - plan hits target center - Point	0.00	0.00	9,824.40	10,170.29	302.19	451,006.80	641,351.52	32° 14' 22.126324 N	104° 0' 35.467839

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
3,827.00	3,827.00	0.00	0.00	Build 2.00°/100'
4,526.83	4,519.89	-80.44	27.64	Hold 14.00° Tangent
8,092.35	7,979.55	-896.00	307.91	Turn 2.00°/100'
9,473.31	9,346.06	-886.72	362.34	KOP, Build 10.00°/100'
10,230.91	9,780.40	-333.19	359.33	Landing Point
20,734.63	9,824.40	10,170.29	302.19	TD at 20734.63' MD

Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: OXBOW CC 17-08 FED COM
Well: Oxbow CC 17-08 Federal Com 33H
Wellbore: WB00
Design: Permitting Plan

PROJECT DETAILS: NM DIRECTIONAL PLANS (NAD 1983)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone

System Datum: Mean Sea Level

T G M

Azimuths to Grid North
True North: -0.17°
Magnetic North: 6.81°

Magnetic Field
Strength: 47901.6snT
Dip Angle: 59.93°
Date: 5/23/2019
Model: HDGM

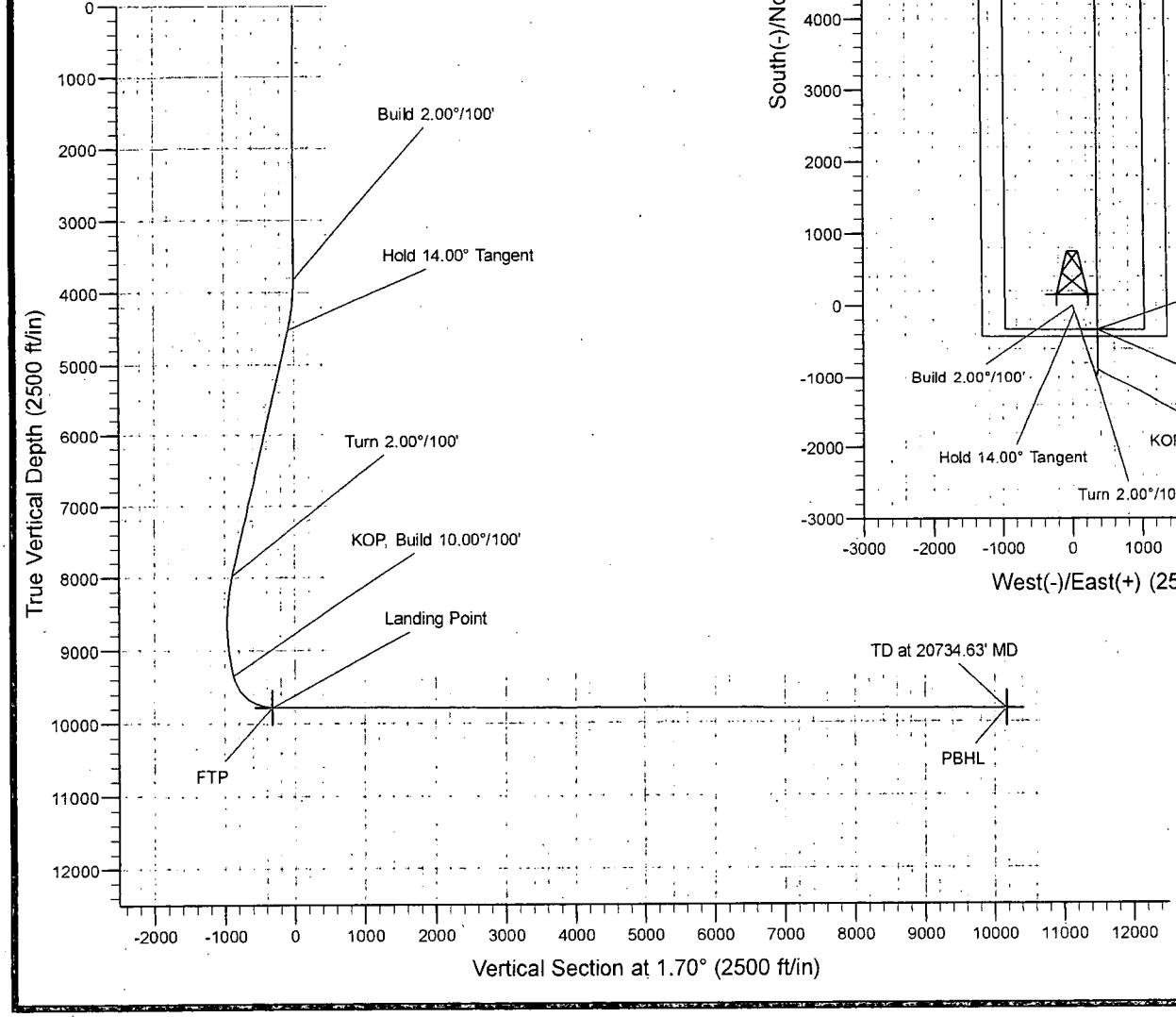
WELL DETAILS: Oxbow CC 17-08 Federal Com 33H

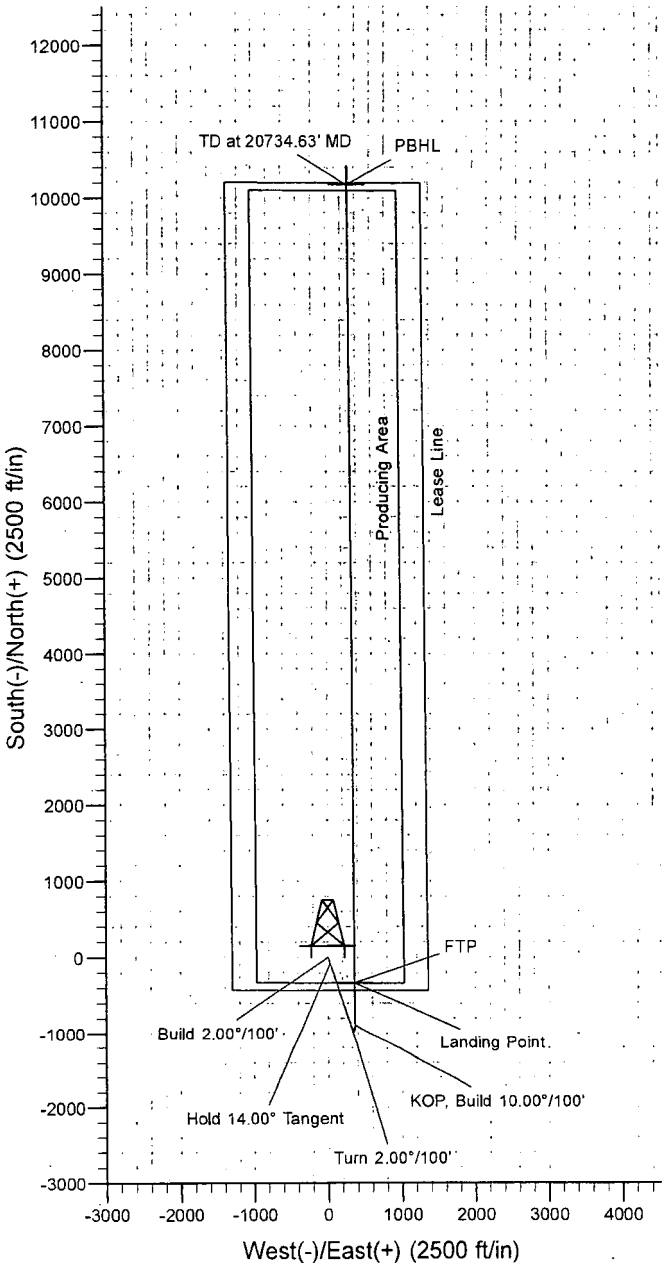
Ground Level: 2937.90

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	440837.34	641049.35	32° 12' 41.499301 N	104° 0' 39.341469 W

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3827.00	0.00	0.00	3827.00	0.00	0.00	0.00	0.00	0.00	Build 2.00°/100'
4526.83	14.00	161.03	4519.89	-80.44	27.64	2.00	161.03	-79.58	Hold 14.00° Tangent
8092.35	14.00	161.03	7979.55	-896.00	307.91	0.00	0.00	-886.46	Turn 2.00°/100'
9473.31	14.00	359.69	9346.06	-886.72	362.34	2.00	-170.39	-875.56	KOP, Build 10.00°/100'
10230.91	89.76	359.69	9780.40	-333.19	359.33	10.00	0.00	-322.37	Landing Point
20734.63	89.76	359.69	9824.40	10170.29	302.19	0.00	0.00	10174.78	TD at 20734.63' MD





PERFORMANCE DATA

TMK UP TORQ™ DQW **5.500 in** **20.00 lbs/ft** **P110 CY**

Technical Data Sheet

Tubular Parameters

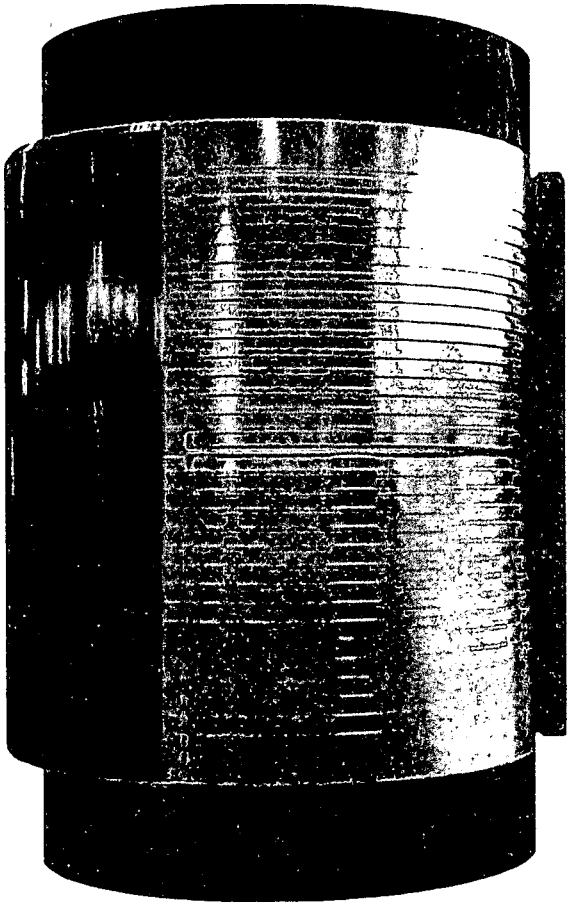
Size	5.500	in	Minimum Yield	110,000	psi
Nominal Weight	20.00	lbs/ft	Minimum Tensile	125,000	psi
Grade	P110 CY		Yield Load	641,000	lbs
PE Weight	19.81	lbs/ft	Tensile Load	729,000	lbs
Wall Thickness	0.361	in	Min. Internal Yield Pressure	12,640	psi
Nominal ID	4.778	in	Collapse Pressure	11,110	psi
Drift Diameter	4.653	in			
Nom. Pipe Body Area	5.828	in²			

Connection Parameters

Connection OD	6.050	in
Connection ID	4.778	in
Make-Up Loss	4.324	in
Critical Section Area	5.828	in²
Tension Efficiency	100.0	%
Compression Efficiency	100.0	%
Yield Load In Tension	641,000	lbs
Min. Internal Yield Pressure	12,640	psi
Collapse Pressure	11,110	psi
Uniaxial Bending	92	°/ 100 ft

Make-Up Torques

Min. Make-Up Torque	14,000	ft-lbs
Opt. Make-Up Torque	16,000	ft-lbs
Max. Make-Up Torque	18,000	ft-lbs
Operating Torque	36,800	ft-lbs
Yield Torque	46,000	ft-lbs



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PERFORMANCE DATA

TMK UP DQX **5.500 in** **20.00 lbs/ft** **P-110**
Technical Data Sheet

Tubular Parameters

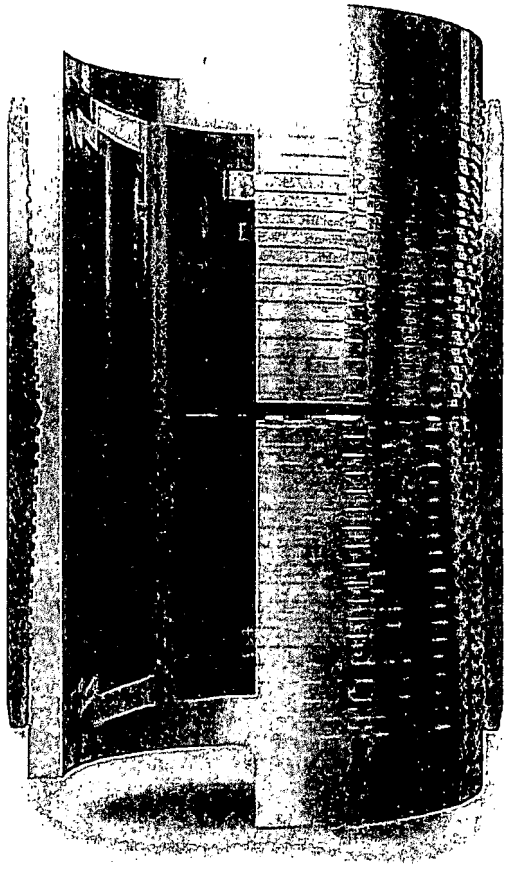
Size	5.500	in	Minimum Yield	110,000	psi
Nominal Weight	20.00	lbs/ft	Minimum Tensile	125,000	psi
Grade	P-110		Yield Load	641,000	lbs
PE Weight	19.81	lbs/ft	Tensile Load	729,000	lbs
Wall Thickness	0.361	in	Min. Internal Yield Pressure	12,600	psi
Nominal ID	4.778	in	Collapse Pressure	11,100	psi
Drift Diameter	4.653	in			
Nom. Pipe Body Area	5.828	in²			

Connection Parameters

Connection OD	6.050	in
Connection ID	4.778	in
Make-Up Loss	4.122	in
Critical Section Area	5.828	in²
Tension Efficiency	100.0	%
Compression Efficiency	100.0	%
Yield Load In Tension	641,000	lbs
Min. Internal Yield Pressure	12,600	psi
Collapse Pressure	11,100	psi

Make-Up Torques

Min. Make-Up Torque	11,600	ft-lbs
Opt. Make-Up Torque	12,900	ft-lbs
Max. Make-Up Torque	14,100	ft-lbs
Yield Torque	20,600	ft-lbs



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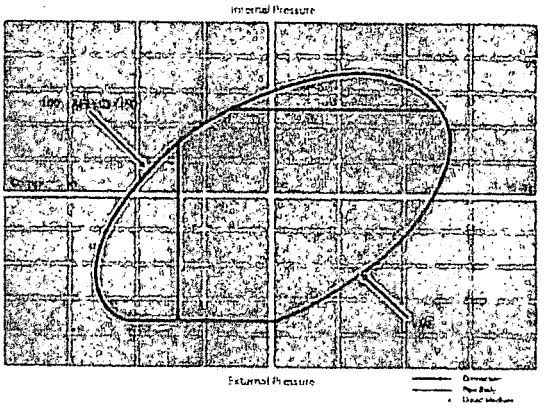
TECHNICAL DATA SHEET TMK UP DQX 5.5 X 20 P110

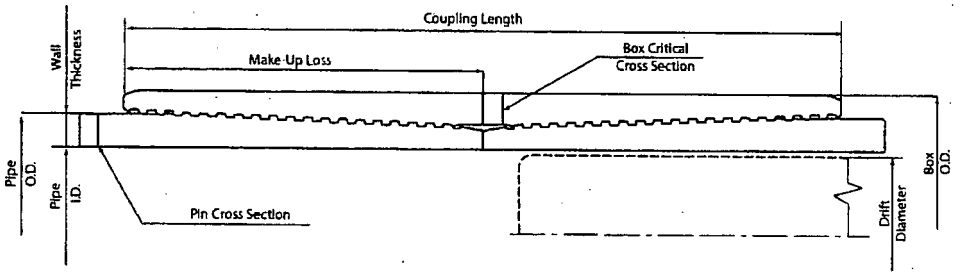
TUBULAR PARAMETERS	
Nominal OD, (inch)	5.500
Wall Thickness, (inch)	0.361
Pipe Grade	P110
Coupling	Regular
Coupling Grade	P110
Drift	Standard

CONNECTION PARAMETERS	
Connection OD (inch)	6.05
Connection ID, (inch)	4.778
Make-Up Loss, (inch)	4.122
Connection Critical Area, (sq inch)	5.828
Yield Strength in Tension, (klbs)	641
Yeld Strength in Compression, (klbs)	641
Tension Efficiency	100%
Compression Efficiency	100%
Min. Internal Yield Pressure, (psi)	12 640
Collapse Pressure, (psi)	11 110
Uniaxial Bending (deg/100ft)	91.7

MAKE-UP TORQUES	
Yield Torque, (ft-lb)	20 600
Minimum Make-Up Torque, (ft-lb)	11 600
Optimum Make-Up Torque, (ft-lb)	12 900
Maximum Make-Up Torque, (ft-lb)	14 100

PIPE BODY PROPERTIES	
PE Weight, (lbs/ft)	19.81
Nominal Weight, (lbs/ft)	20.00
Nominal ID, (inch)	4.778
Drift Diameter, (inch)	4.653
Nominal Pipe Body Area, (sq inch)	5.828
Yield Strength in Tension, (klbs)	641
Min. Internal Yield Pressure, (psi)	12 640
Collapse Pressure, (psi)	11 110





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PERFORMANCE DATA

TMK UP SF TORQ™ **5.500 in** **20.00 lbs/ft** **P110 HC**

Technical Data Sheet

Tubular Parameters

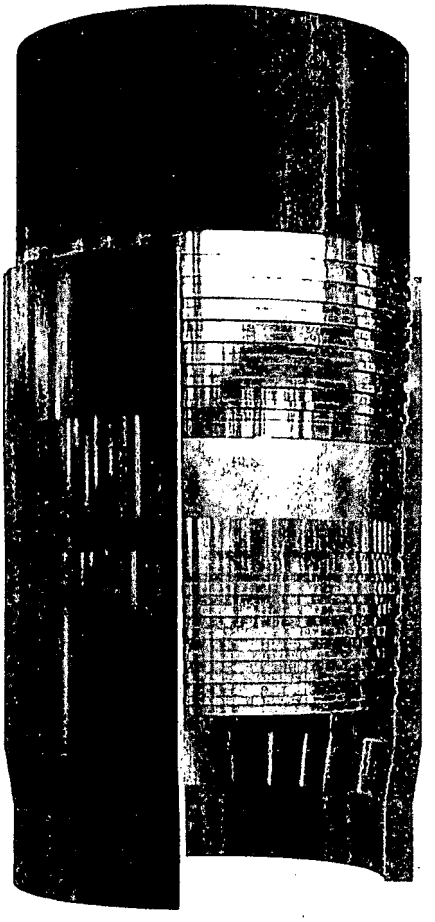
Size	5.500	in	Minimum Yield	110,000	psi
Nominal Weight	20.00	lbs/ft	Minimum Tensile	125,000	psi
Grade	P110 HC		Yield Load	641,000	lbs
PE Weight	19.81	lbs/ft	Tensile Load	728,000	lbs
Wall Thickness	0.361	in	Min. Internal Yield Pressure	12,640	psi
Nominal ID	4.778	in	Collapse Pressure	12,780	psi
Drift Diameter	4.653	in			
Nom. Pipe Body Area	5.828	in²			

Connection Parameters

Connection OD	5.777	in
Connection ID	4.734	in
Make-Up Loss	5.823	in
Critical Section Area	5.875	in²
Tension Efficiency	90.0	%
Compression Efficiency	90.0	%
Yield Load In Tension	576,000	lbs
Min. Internal Yield Pressure	12,640	psi
Collapse Pressure	12,780	psi
Uniaxial Bending	83	°/100 ft

Make-Up Torques

Min. Make-Up Torque	15,700	ft-lbs
Opt. Make-Up Torque	19,600	ft-lbs
Max. Make-Up Torque	21,600	ft-lbs
Operating Torque	29,000	ft-lbs
Yield Torque	36,000	ft-lbs



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