

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

AUG 17 2018

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 abandon a well. Use form 3160-3 (APD) for such proposals.**5. Lease Serial No.  
NMNM40659

6. If Indian, Allottee or Tribe Name

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

SUBMIT IN TRIPLICATE - Other instructions on page 2

OCD Artesia

|  |   |   |
|--|---|---|
| 1. Type of Well<br><input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other                   |   | 8. Well Name and No.<br>IRIDIUM MDP1 28-21 FEDERAL COM 11H        |
| 2. Name of Operator<br>OXY USA INC<br>Contact: DAVID STEWART<br>E-Mail: david_stewart@oxy.com  |   | 9. API Well No.<br>30-015-45073                                   |
| 3a. Address<br>P.O. BOX 50250<br>MIDLAND, TX 79710   | 3b. Phone No. (include area code)<br>Ph: 432-685-5717 | 10. Field and Pool or Exploratory Area<br>INGLE WELLS BONE SPRING |
| 4. Location of Well (Footage, Sec., T., R., M., or Survey Description)<br>Sec 28 T23S R31E SWSW 430FSL 648FWL<br>32.269362 N Lat, 103.789196 W Lon |   | 11. County or Parish, State<br>EDDY COUNTY, NM                    |

## 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 <input type="checkbox"/> Change to Original APD |
|  | <input type="checkbox"/> Convert to Injection <input type="checkbox"/> Plug Back <input type="checkbox"/> 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 APD with the following changes.

1. Amend the TMD, TVD, see attached.

2. Amend the surface, intermediate and production casings size, type, and depth and add the contingency intermediate casing string and annular clearance request, see attached.

OXY requests the option to run the 7.625" Intermediate II as a contingency casing string to be run only if severe hole conditions dictate an additional casing string. The Intermediate II cement job will only occur if OXY elects to run a second intermediate casing string. See attached drill plan for the three string primary casing/cementing plan.

GC 8-31-18  
Accepted for record - NMOCDSEE ATTACHED FOR  
CONDITIONS OF APPROVAL

|  |                              |
|--|------------------------------|
| 14. I hereby certify that the foregoing is true and correct.<br>Electronic Submission #430030 verified by the BLM Well Information System<br>For OXY USA INC, sent to the Carlsbad<br>Committed to AFMSS for processing by MUSTAFA HAQUE on 08/15/2018 ( ) |                              |
| Name (Printed/Typed) DAVID STEWART   | Title SR. REGULATORY ADVISOR |
| Signature (Electronic Submission)  | Date 08/06/2018              |

## THIS SPACE FOR FEDERAL OR STATE OFFICE USE

|   |   |                        |
|---|---|------------------------|
| Approved By <u>Mustafa Haque</u>  | Title <b>Petroleum Engineer</b><br><b>Carlsbad Field Office</b> | Date <u>08-15-2018</u> |
| 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  |   |                        |

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)

\*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\*

## **Additional data for EC transaction #430030 that would not fit on the form**

### **32. Additional remarks, continued**

Annular Clearance Variance Request as per the agreement reached in the Oxy/BLM 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:

- a. 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.
- b. Annular clearance less than 0.422" is acceptable for the curve and lateral portions of the production open hole section.

2. Amend the cementing program and add bradenhead squeeze stage, see attached.

OXY requests to pump a two stage cement job on either the intermediate II or production casing string with the first stage being pumped conventionally with the calculated TOC @ the Brushy Canyon and the second stage performed as a bradenhead squeeze with planned cement from the Brushy Canyon to surface.

3. Amend BOP program and add BOP Break Testing request, see attached.

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

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

4. Amend the mud program, depth and type, see attached.

5. Amend the drilling conditions, see attached.

# OXY USA Inc. - Iridium MDP1 28-21 Federal Com 11H – Amended Drill Plan

## 1. Geologic Formations

|               |        |                               |      |
|---------------|--------|-------------------------------|------|
| TVD of target | 9970'  | Pilot Hole Depth              | N/A  |
| MD at TD:     | 20441' | Deepest Expected fresh water: | 432' |

## Delaware Basin

| Formation       | TVD - RKB | Expected Fluids  |
|-----------------|-----------|------------------|
| Rustler         | 432       |                  |
| Salado          | 789       |                  |
| Castile         | 2,724     |                  |
| Lamar/Delaware  | 4,176     |                  |
| Bell Canyon     | 4,211     | Water (inj zone) |
| Cherry Canyon   | 5,097     |                  |
| Brushy Canyon   | 6,396     |                  |
| Bone Spring     | 8,000     | Oil/Gas/Water    |
| 1st Bone Spring | 8,762     | Oil/Gas/Water    |
| 2nd Bone Spring | 9,316     | Oil/Gas/Water    |

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

## 2. Casing Program

### Primary Plan:

| Hole Size (in)                | Casing Interval |                    | Csg. Size (in) | Weight (lbs) | Grade | Conn. | SF       | SF    | Buoyant         | Buoyant          |
|-------------------------------|-----------------|--------------------|----------------|--------------|-------|-------|----------|-------|-----------------|------------------|
|                               | From (ft)       | To (ft)            |                |              |       |       | Collapse | Burst | Body SF Tension | Joint SF Tension |
| 17.5                          | 0               | 483 <del>SAO</del> | 13.375         | 54.5         | J-55  | BTC   | 1.125    | 1.2   | 1.4             | 1.4              |
| 12.25                         | 0               | 4,227              | 9.625          | 43.5         | L-80  | BTC   | 1.125    | 1.2   | 1.4             | 1.4              |
| 8.5                           | 0               | 20,441             | 5.5            | 20           | P-110 | DQX   | 1.125    | 1.2   | 1.4             | 1.4              |
| SF Values will meet or Exceed |                 |                    |                |              |       |       |          |       |                 |                  |

### Contingency Plans

| Hole Size (in)                | Casing Interval |                    | Csg. Size (in) | Weight (lbs) | Grade  | Conn. | SF       | SF    | Buoyant         | Buoyant          |
|-------------------------------|-----------------|--------------------|----------------|--------------|--------|-------|----------|-------|-----------------|------------------|
|                               | From (ft)       | To (ft)            |                |              |        |       | Collapse | Burst | Body SF Tension | Joint SF Tension |
| 17.5                          | 0               | 483 <del>SAO</del> | 13.375         | 54.5         | J-55   | BTC   | 1.125    | 1.2   | 1.4             | 1.4              |
| 12.25                         | 0               | 4,227              | 9.625          | 43.5         | L-80   | BTC   | 1.125    | 1.2   | 1.4             | 1.4              |
| 8.5                           | 0               | 4,000              | 7.625          | 26.4         | HCL-80 | SF    | 1.125    | 1.2   | 1.4             | 1.4              |
|                               | 4,000           | 8,500              | 7.625          | 26.4         | HCL-80 | FJ    | 1.125    | 1.2   | 1.4             | 1.4              |
| 6.75                          | 0               | 20,441             | 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 run the 7.625" Intermediate II as a contingency string to be run only if severe hole conditions dictate an additional casing string necessary.

# OXY USA Inc. - Iridium MDP1 28-21 Federal Com 11H – Amended Drill Plan

\*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 cancellation cone and not pump the second stage.

## **Annular Clearance Variance Request**

As per the agreement reached in the Oxy/BLM 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 3 <sup>rd</sup> string cement tied back 500' into previous casing?                       |        |
| Is well located in R-111-P and SOPA?   | Y      |
| If yes, are the first three strings cemented to surface?   | Y      |
| Is 2 <sup>nd</sup> string set 100' to 600' below the base of salt?   | Y      |
| 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**

**Primary Plan:**

| Casing   | Slurry | #Sks  | Wt.<br>(Lb/gal) | Yld<br>ft3/sack | H2O<br>gal/sk | 500#<br>Comp.<br>Strength | Slurry<br>Description  |
|--|--------|-------|-----------------|-----------------|---------------|---------------------------|--|
| Surface  | Tail   | 491   | 14.8            | 1.33            | 6.365         | 5:26                      | Accelerator  |
| Intermediate   | Lead   | 1,028 | 12.9            | 1.88            | 10.13         | 7:32                      | Retarder,<br>Extender,<br>Dispersant                           |
|  | Tail   | 141   | 14.8            | 1.33            | 6.42          | 6:31                      | Retarder,<br>Dispersant,<br>Salt                               |
| 1st Stage<br>Production  | Lead   | 234   | 13.2            | 1.65            | 6.686         | 3:49                      | Extender.<br>Accelerator,<br>Dispersant                        |
|  | Tail   | 1,814 | 13.2            | 1.65            | 6.686         | 3:49                      | Extender.<br>Accelerator,<br>Dispersant                        |
| 2nd Stage<br>Production  | Tail   | 359   | 12.9            | 1.88            | 9.356         | 9:49                      | Retarder,<br>Dispersant,<br>Fluid Loss<br>Control,<br>Extender |
| <b>2nd Stage Production cement will be pumped from surface as a bradenhead squeeze</b> |        |       |                 |                 |               |                           |  |

| Casing<br>String        | Top of<br>Lead<br>(ft) | Bottom<br>of Lead<br>(ft) | Top of<br>Tail (ft)  | Bottom<br>of Tail<br>(ft) | %<br>Excess<br>Lead | %<br>Excess<br>Tail |
|-------------------------|------------------------|---------------------------|----------------------|---------------------------|---------------------|---------------------|
| Surface                 | N/A                    | N/A                       | 0                    | 483                       | N/A                 | 100%                |
| Intermediate            | 0                      | 3727                      | 3727                 | 4227                      | 75%                 | 20%                 |
| 1st Stage<br>Production | 6396                   | 8000                      | 8000                 | 20441                     | 5%                  | 5%                  |
| 2nd Stage<br>Production | N/A                    | N/A                       | <del>3727</del><br>0 | 6396                      | N/A                 | 25%                 |

**OXY USA Inc. - Iridium MDP1 28-21 Federal Com 11H – Amended Drill Plan**

**Contingency Plan:**

| Casing   | Slurry | #Sks | Wt.<br>(Lb/gal) | Yld<br>ft3/sack | H2O<br>gal/sk | 500#<br>Comp.<br>Strength | Slurry<br>Description                                       |
|--|--------|------|-----------------|-----------------|---------------|---------------------------|---|
| Surface  | Lead   | N/A  | N/A             | N/A             | N/A           | N/A                       | N/A   |
|  | Tail   | 491  | 14.8            | 1.33            | 6.365         | 5:26                      | Class C Cement,<br>Accelerator                              |
| Intermediate I   | Lead   | 1028 | 12.9            | 1.88            | 10.13         | 7:32                      | Retarder,<br>Extender,<br>Dispersant                        |
|  | Tail   | 141  | 14.8            | 1.33            | 6.42          | 6:31                      | Retarder,<br>Dispersant, Salt                               |
| Intermediate II<br>1st Stage   | Lead   | 54   | 13.2            | 1.65            | 6.686         | 3:49                      | Retarder,<br>Dispersant, Salt                               |
|  | Tail   | 29   | 13.2            | 1.65            | 6.69          | 3:49                      | Retarder,<br>Dispersant, Salt                               |
| <b><u>Intermediate II 2nd Stage (Tail Slurry) to be pumped as Bradenhead Squeeze from surface, down the Intermediate annulus</u></b> |        |      |                 |                 |               |                           |   |
| Intermediate II<br>2nd Stage   | Lead   | N/A  | N/A             | N/A             | N/A           | N/A                       | N/A   |
|  | Tail   | 377  | 12.8            | 1.76            | 9.38          | 9:49                      | Extender,<br>Accelerator,<br>Dispersant                     |
| Production   | Lead   | N/A  | N/A             | N/A             | N/A           | N/A                       | N/A   |
|  | Tail   | 911  | 13.2            | 1.38            | 6.686         | 3:49                      | Retarder,<br>Dispersant, Fluid<br>Loss Control,<br>Extender |

| Casing String      | Top of Lead (ft) | Bottom of Lead (ft) | Top of Tail (ft) | Bottom of Tail (ft) | % Excess Lead | % Excess Tail |
|--------------------|------------------|---------------------|------------------|---------------------|---------------|---------------|
| Surface            | N/A              | N/A                 | 0                | 483                 | N/A           | 100%          |
| Int I              | 0                | 3727                | 3727             | 4227                | 75%           | 20%           |
| Int II (1st Stage) | 6896             | 8000                | 8000             | 8500                | 25%           | 5%            |
| Int II (2nd Stage) | N/A              | N/A                 | 0                | 6896                | N/A           | 5%            |
| Production         | N/A              | N/A                 | 8000             | 20441               | N/A           | 20%           |

**\*Contingency design will only be employed if Oxy elects to run 7.625" Intermediate II string.**

**4. Pressure Control Equipment**

| BOP installed and tested before drilling which hole? | Size?   | Min. Required WP | Type       | ✓ | Tested to:              |
|--|---------|------------------|------------|---|-------------------------|
| 12.25" Hole  | 13-5/8" | 5M               | Annular    | ✓ | 70% of working pressure |
|  |         |                  | Blind Ram  | ✓ | 250/5000psi             |
|  |         |                  | Pipe Ram   |   |                         |
|  |         |                  | Double Ram | ✓ |                         |
|  |         |                  | Other*     |   |                         |

\*Specify if additional ram is utilized.

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.<br>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 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.

# OXY USA Inc. - Iridium MDP1 28-21 Federal Com 11H – Amended Drill Plan

## 5. Mud Program

| Depth     |         | Type                         | Weight (ppg) | Viscosity | Water Loss |
|-----------|---------|------------------------------|--------------|-----------|------------|
| From (ft) | To (ft) |                              |              |           |            |
| 0         | 483     | Water-Based Mud              | 8.6-8.8      | 40-60     | N/C        |
| 483       | 4227    | Saturated Brine-Based Mud    | 9.8-10.0     | 35-45     | N/C        |
| 4227      | 20441   | Water-Based or Oil-Based Mud | 8.0-9.5      | 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    | 6222 psi                     |
| Abnormal Temperature          | No                           |
| BH Temperature at deepest TVD | 160°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 (H<sub>2</sub>S) monitors will be installed prior to drilling out the surface shoe. If H<sub>2</sub>S 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 | H <sub>2</sub> S is present    |
| Y | H <sub>2</sub> S Plan attached |

**8. Other facets of operation**

|  | Yes/No |
|--|--------|
| Will the well be drilled with a walking/skidding operation? If yes, describe. <ul style="list-style-type: none"> <li>We plan to drill the two 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.</li> </ul>   | Yes    |
| Will more than one drilling rig be used for drilling operations? If yes, describe. <ul style="list-style-type: none"> <li>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.</li> </ul> | Yes    |

**Total estimated cuttings volume: 1517.9 bbls.**

**9. Company Personnel**

| Name            | Title                        | Office Phone | Mobile Phone |
|-----------------|------------------------------|--------------|--------------|
| Garrett Granier | Drilling Engineer            | 713-513-6633 | 832-265-0581 |
| Randy Neel      | Drilling Engineer Supervisor | 713-215-7987 | 713-517-5544 |
| Simon Benavides | Drilling Superintendent      | 713-522-8652 | 281-684-6897 |
| John Willis     | Drilling Manager             | 713-366-5556 | 713-259-1417 |

# Oxy Iridium MDP1 28-21 Federal Com 11H Rev3 APS 24Jul18 Proposal

## Geodetic Report

(Def Plan)



Report Date: July 24, 2018 - 01:33 PM  
 Client: OXY  
 Field: NM Eddy County (NAD 83)  
 Structure / Slot: Oxy Iridium MDP1 28-21 Federal Com 11H / Iridium MDP1 28-21 Federal Com 11H  
 Well: Iridium MDP1 28-21 Federal Com 11H  
 Borehole: Original Borehole  
 UWI / API#: Unknown / Unknown  
 Survey Name: Oxy Iridium MDP1 28-21 Federal Com 11H Rev3 APS 24Jul18  
 Survey Date: July 17, 2018  
 Tort / AHD / DDI / ERD Ratio: 114.539 \* / 11312.810 ft / 8.424 / 1.135  
 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet  
 Location Lat / Long: N 32° 18' 9.70272", W 103° 47' 21.10589"  
 Location Grid N/E Y/X: N 462153.250 ftUS, E 709519.880 ftUS  
 CRS Grid Convergence Angle: 0.2905 \*  
 Grid Scale Factor: 0.99994149  
 Version / Patch: 2.10.740.0

Survey / DLS Computation: Minimum Curvature / Lubinski  
 Vertical Section Azimuth: 358.125 \* (Grid North)  
 Vertical Section Origin: 0.000 ft, 0.000 ft  
 TVD Reference Datum: RKB=30'  
 TVD Reference Elevation: 3400.300 ft above MSL  
 Seabed / Ground Elevation: 3370.300 ft above MSL  
 Magnetic Declination: 8.909 \*  
 Total Gravity Field Strength: 998.4510mgm (9.80865 Based)  
 Gravity Model: GARM  
 Total Magnetic Field Strength: 48031.552 nT  
 Magnetic Dip Angle: 60.018 \*  
 Declination Date: July 17, 2018  
 Magnetic Declination Model: HDGM 2018  
 North Reference: Grid North  
 Grid Convergence Used: 0.2905 \*  
 Total Corr Mag North->Grid: 6.6184 \*  
 North: Well Head  
 Local Coord Referenced To: Well Head

| Comments                                | MD<br>(ft) | Incl<br>(°) | Azlm Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>(*/100ft) | Northing<br>(ftUS) | Easting<br>(ftUS) | Latitude<br>(N/S ° ' '') | Longitude<br>(E/W ° ' '') |
|---|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-------------------|--------------------------|---------------------------|
| SHL                                     | 0.00       | 0.00        | 0.00             | 0.00        | 0.00         | 0.00       | 0.00       | N/A              | 462153.25          | 709519.88         | N 32 18 9.70             | W 103 47 21.11            |
| Rustler                                 | 432.00     | 0.00        | 190.90           | 432.00      | 0.00         | 0.00       | 0.00       | 0.00             | 462153.25          | 709519.88         | N 32 18 9.70             | W 103 47 21.11            |
| Salado                                  | 789.00     | 0.00        | 190.90           | 789.00      | 0.00         | 0.00       | 0.00       | 0.00             | 462153.25          | 709519.88         | N 32 18 9.70             | W 103 47 21.11            |
| Castile                                 | 2724.00    | 0.00        | 190.90           | 2724.00     | 0.00         | 0.00       | 0.00       | 0.00             | 462153.25          | 709519.88         | N 32 18 9.70             | W 103 47 21.11            |
| Lamar                                   | 4176.00    | 0.00        | 190.90           | 4176.00     | 0.00         | 0.00       | 0.00       | 0.00             | 462153.25          | 709519.88         | N 32 18 9.70             | W 103 47 21.11            |
| Bell Canyon                             | 4211.00    | 0.00        | 190.90           | 4211.00     | 0.00         | 0.00       | 0.00       | 0.00             | 462153.25          | 709519.88         | N 32 18 9.70             | W 103 47 21.11            |
| Cherry Canyon                           | 5097.00    | 0.00        | 190.90           | 5097.00     | 0.00         | 0.00       | 0.00       | 0.00             | 462153.25          | 709519.88         | N 32 18 9.70             | W 103 47 21.11            |
| Build 2"/100'                           | 5640.00    | 0.00        | 190.90           | 5640.00     | 0.00         | 0.00       | 0.00       | 0.00             | 462153.25          | 709519.88         | N 32 18 9.70             | W 103 47 21.11            |
| Hold Tangent                            | 6239.88    | 12.00       | 190.90           | 6235.51     | -81.03       | -81.45     | -11.84     | 2.00             | 462091.80          | 709507.84         | N 32 18 9.10             | W 103 47 21.25            |
| Brushy Canyon                           | 6403.96    | 12.00       | 190.90           | 6396.00     | -94.29       | -94.94     | -18.29     | 0.00             | 462058.32          | 709501.39         | N 32 18 8.76             | W 103 47 21.32            |
| Bone Spring                             | 8043.78    | 12.00       | 190.90           | 8000.00     | -426.72      | -428.66    | -82.76     | 0.00             | 461723.62          | 709436.92         | N 32 18 5.46             | W 103 47 22.09            |
| Turn 2"/100'                            | 8443.79    | 12.00       | 190.90           | 8391.27     | -507.81      | -511.31    | -98.49     | 0.00             | 461641.97          | 709421.20         | N 32 18 4.65             | W 103 47 22.28            |
| First Bone Spring                       | 8819.00    | 5.65        | 219.12           | 8762.00     | -559.86      | -564.00    | -117.54    | 2.00             | 461589.28          | 709402.15         | N 32 18 4.13             | W 103 47 22.51            |
| Second Bone Spring                      | 9375.68    | 8.53        | 320.78           | 9318.00     | -547.67      | -553.23    | -181.07    | 2.00             | 461600.05          | 709358.62         | N 32 18 4.24             | W 103 47 23.01            |
| Build/Turn 10"/100'                     | 9567.02    | 12.00       | 330.00           | 9504.26     | -518.83      | -525.00    | -180.00    | 2.00             | 461628.28          | 709339.69         | N 32 18 4.52             | W 103 47 23.23            |
| Build/Turn 10"/100'                     | 9903.53    | 45.00       | 346.75           | 9798.25     | -368.95      | -374.55    | -226.09    | 10.00            | 461778.72          | 709293.60         | N 32 18 6.01             | W 103 47 23.76            |
| Landing Point                           | 10367.79   | 90.00       | 359.64           | 9970.00     | 49.02        | 40.30      | -267.47    | 10.00            | 462193.54          | 709252.23         | N 32 18 10.11            | W 103 47 24.22            |
| Iridium MDP1 28-21 Federal Com 11H PBHL | 20440.66   | 90.00       | 359.64           | 9970.00     | 10118.39     | 10112.97   | -331.04    | 0.00             | 472265.61          | 709188.66         | N 32 17 49.79            | W 103 47 24.36            |

Survey Type: Def Plan

Survey Error Model: ISCWSA Rev 0 \*\*\* 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

| Description | Part | MD From<br>(ft) | MD To<br>(ft) | EOU Freq<br>(ft) | Hole Size<br>(in) | Casing Diameter<br>(in) | Expected Max<br>Inclination<br>(deg) | Survey Tool Type         | Borehole / Survey  |
|-------------|------|-----------------|---------------|------------------|-------------------|-------------------------|--------------------------------------|--------------------------|--|
|             | 1    | 0.000           | 30.000        | 1/100.000        | 30.000            | 30.000                  |                                      | NAL_NSG+MSHOT-Depth Only | Original Borehole / Oxy Iridium MDP1 28-21 Federal Com 11H |
|             | 1    | 30.000          | 500.000       | 1/100.000        | 30.000            | 30.000                  |                                      | NAL_NSG+MSHOT            | Original Borehole / Oxy Iridium MDP1 28-21 Federal Com 11H |
|             | 1    | 500.000         | 20440.661     | 1/100.000        | 30.000            | 30.000                  |                                      | NAL_MWD_PLUS_0.5_DEG     | Original Borehole / Oxy Iridium MDP1 28-21 Federal Com 11H |

# Schlumberger

OXY



Borehole: Original Borehole Well: Iridium MDP1 28-21 Federal Com 11H Field: NM Eddy County (NAD 83) Structure: Oxy Iridium MDP1 28-21 Federal Com 11H

## Gravity &amp; Magnetic Parameters

Model: HODM 2018 Dip: 60.918° Date: 17-Jul-2018  
MagDec: 6.809° FS: 48031.552nT Gravity FS: 998.451mg (9.80665 Based)

## Surface Location NAD83 New Mexico State Plane, Eastern Zone, US Feet

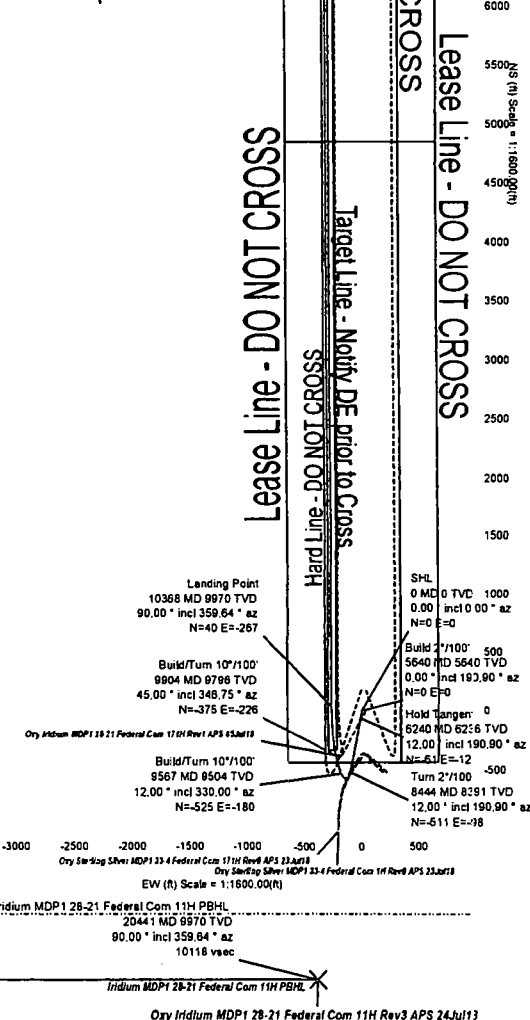
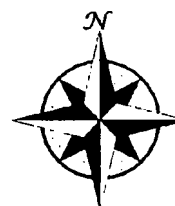
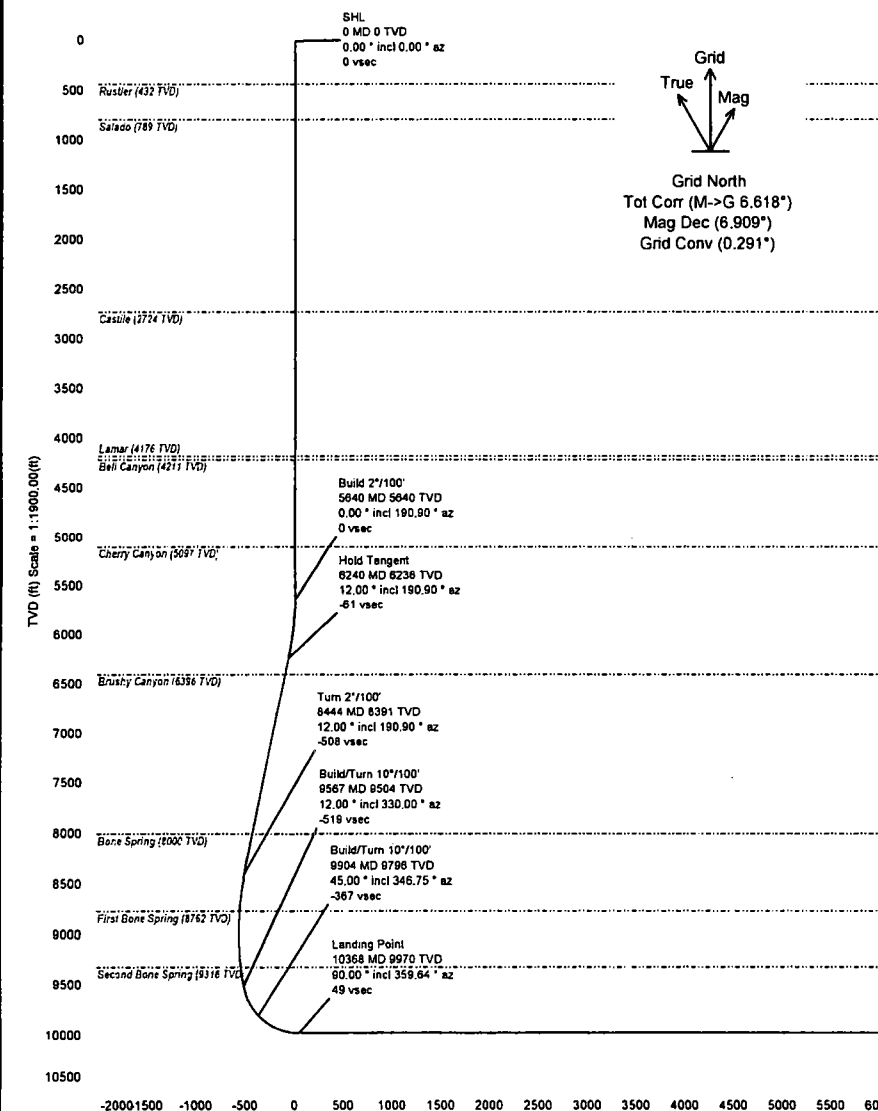
Lat: N 32 16 9.70 Northing: 462163.38US Grid Conv: 0.2805°  
Lon: W 103 47 21.11 Easting: 709919.68US Scale Fact: 0.99994149

## Miscellaneous

Iridium MDP1 28-21 Federal Com 11H Rev3 APS 24Jul18  
Plan: Oxy Iridium MDP1 28-21 Federal Com 11H Rev3 APS 24Jul18

## Critical Points

| Critical Point                          | MD       | INCL  | AZIM   | TVD     | VSEC     | N(°)/S(°) | E(°)/W(°) | DLS   |
|---|----------|-------|--------|---------|----------|-----------|-----------|-------|
| SHL                                     | 0.00     | 0.00  | 0.00   | 0.00    | 0.00     | 0.00      | 0.00      |       |
| Rustler                                 | 432.00   | 0.00  | 190.90 | 432.00  | 0.00     | 0.00      | 0.00      | 0.00  |
| Salado                                  | 789.00   | 0.00  | 190.90 | 789.00  | 0.00     | 0.00      | 0.00      | 0.00  |
| Castile                                 | 2724.00  | 0.00  | 190.90 | 2724.00 | 0.00     | 0.00      | 0.00      | 0.00  |
| Lamar                                   | 4176.00  | 0.00  | 190.90 | 4176.00 | 0.00     | 0.00      | 0.00      | 0.00  |
| Bell Canyon                             | 4211.00  | 0.00  | 190.90 | 4211.00 | 0.00     | 0.00      | 0.00      | 0.00  |
| Cherry Canyon                           | 5097.00  | 0.00  | 190.90 | 5097.00 | 0.00     | 0.00      | 0.00      | 0.00  |
| Build 2°/100'                           | 5640.00  | 0.00  | 190.90 | 5640.00 | 0.00     | 0.00      | 0.00      | 0.00  |
| Hold Tangent                            | 6238.88  | 12.00 | 190.90 | 6235.51 | -61.03   | -61.45    | -11.84    | 2.00  |
| Brushy Canyon                           | 6403.96  | 12.00 | 190.90 | 6396.00 | -94.29   | -94.94    | -18.29    | 0.00  |
| Bone Spring                             | 8043.78  | 12.00 | 190.90 | 8000.00 | -426.72  | -429.66   | -82.76    | 0.00  |
| Turn 2°/100'                            | 8443.79  | 12.00 | 190.90 | 8391.27 | -507.81  | -511.31   | -88.49    | 0.00  |
| First Bone Spring                       | 8819.00  | 5.65  | 218.12 | 8762.00 | -559.86  | -564.00   | -117.54   | 2.00  |
| Second Bone Spring                      | 9375.88  | 8.53  | 320.78 | 9316.00 | -547.67  | -553.23   | -161.07   | 2.00  |
| Build/Turn 10°/100'                     | 9567.02  | 12.00 | 330.00 | 9504.26 | -518.83  | -525.00   | -180.00   | 2.00  |
| Build/Turn 10°/100'                     | 9903.53  | 45.00 | 346.75 | 9796.25 | -366.95  | -374.55   | -226.09   | 10.00 |
| Landing Point                           | 10367.79 | 90.00 | 359.64 | 9970.00 | 49.02    | 40.30     | -267.47   | 10.00 |
| Iridium MDP1 28-21 Federal Com 11H PBHL | 20440.66 | 90.00 | 359.64 | 9970.00 | 10118.39 | 10112.97  | -331.04   | 0.00  |



# TUBULAR PARAMETERS

|                        |          |
|------------------------|----------|
| Nominal OD, (inch)     | 7.625    |
| Wall Thickness, (inch) | 0.328    |
| Pipe Grade             | L80 HC   |
| Drift                  | Standard |

# PIPE BODY PROPERTIES

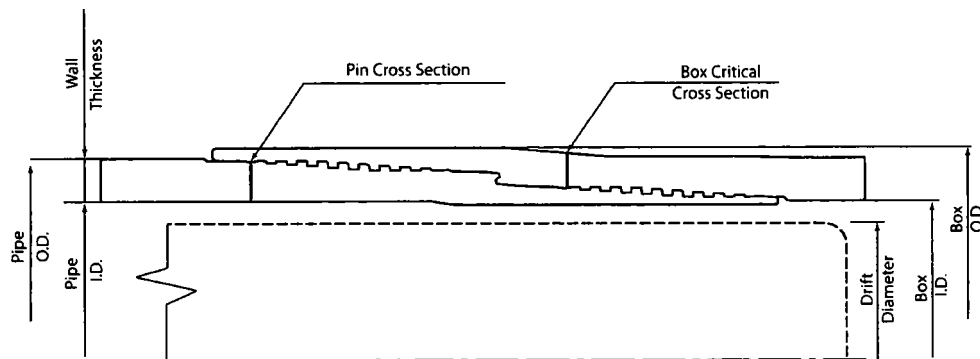
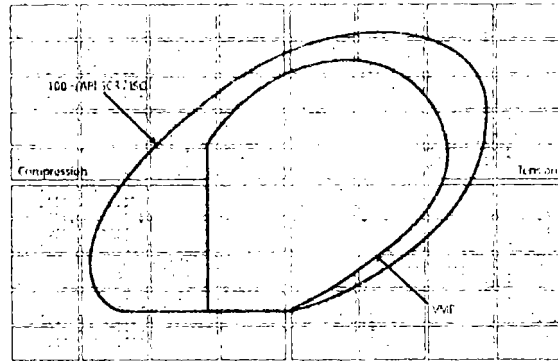
|                                     |       |
|-------------------------------------|-------|
| PE Weight, (lbs/ft)                 | 25.56 |
| Nominal Weight, (lbs/ft)            | 26.40 |
| Nominal ID, (inch)                  | 6.969 |
| Drift Diameter, (inch)              | 6.844 |
| Nominal Pipe Body Area, (sq inch)   | 7.519 |
| Yield Strength in Tension, (klbs)   | 601   |
| Min. Internal Yield Pressure, (psi) | 6 020 |
| Collapse Pressure, (psi)            | 3 910 |

# CONNECTION PARAMETERS

|                                       |       |
|---------------------------------------|-------|
| Connection OD (inch)                  | 7.79  |
| Connection ID, (inch)                 | 6.938 |
| Make-Up Loss, (inch)                  | 6.029 |
| Connection Critical Area, (sq inch)   | 5.948 |
| Yield Strength in Tension, (klbs)     | 533   |
| Yield Strength in Compression, (klbs) | 533   |
| Tension Efficiency                    | 89%   |
| Compression Efficiency                | 89%   |
| Min. Internal Yield Pressure, (psi)   | 6 020 |
| Collapse Pressure, (psi)              | 3 910 |
| Uniaxial Bending (deg/100ft)          | 42.7  |

# MAKE-UP TORQUES

|                                 |        |
|---------------------------------|--------|
| Yield Torque, (ft-lb)           | 22 600 |
| Minimum Make-Up Torque, (ft-lb) | 15 000 |
| Optimum Make-Up Torque, (ft-lb) | 16 500 |
| Maximum Make-Up Torque, (ft-lb) | 18 200 |



NOTE: Content of this Technical Data Sheet is for general informational purposes only and does not guarantee performance or apply to a particular pile, post, or pile group. It does not constitute a contract. It is subject to change without notice. This information supersedes all previous versions for this section. Information on this document is downloaded from the internet and may not be the latest information. Anyone using this information assumes all liability. To verify the accuracy of the latest technical information, please contact: 403-331-1000 Technical Sales - Russia. Tel: +7 (495) 576-0600. E-mail: techsales@trinitycorp.com and TRINITYCORP@North America. Tel: +1 (281) 949-1044. E-mail: techsales@trinitycorp.com.

**TUBULAR PARAMETERS**

|                        |          |
|------------------------|----------|
| Nominal OD, (inch)     | 7.625    |
| Wall Thickness, (inch) | 0.328    |
| Pipe Grade             | L80 HC   |
| Drift                  | Standard |

**PIPE BODY PROPERTIES**

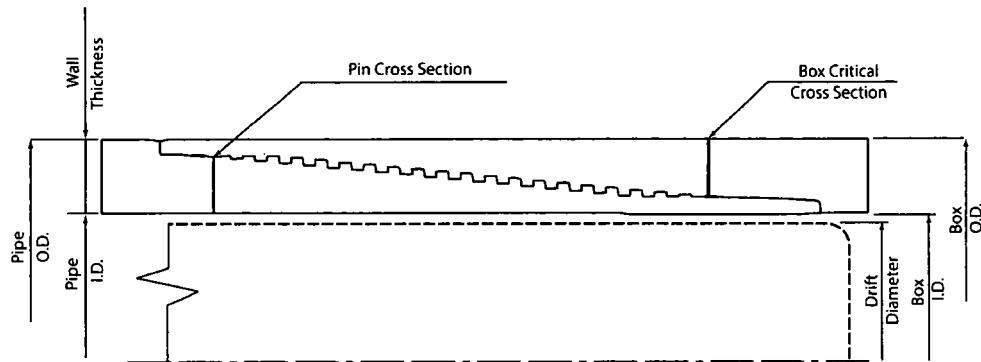
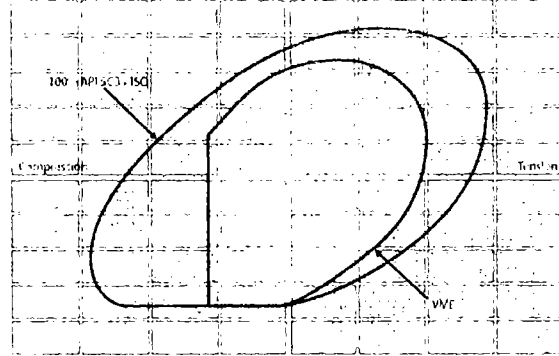
|                                     |       |
|-------------------------------------|-------|
| PE Weight, (lbs/ft)                 | 25.56 |
| Nominal Weight, (lbs/ft)            | 26.40 |
| Nominal ID, (inch)                  | 6.969 |
| Drift Diameter, (inch)              | 6.844 |
| Nominal Pipe Body Area, (sq inch)   | 7.519 |
| Yield Strength in Tension, (klbs)   | 601   |
| Min. Internal Yield Pressure, (psi) | 6 020 |
| Collapse Pressure, (psi)            | 3 910 |

**CONNECTION PARAMETERS**

|                                       |       |
|---------------------------------------|-------|
| Connection OD (inch)                  | 7.63  |
| Connection ID, (inch)                 | 6.975 |
| Make-Up Loss, (inch)                  | 4.165 |
| Connection Critical Area, (sq inch)   | 2.520 |
| Yield Strength in Tension, (klbs)     | 347   |
| Yield Strength in Compression, (klbs) | 347   |
| Tension Efficiency                    | 58%   |
| Compression Efficiency                | 58%   |
| Min. Internal Yield Pressure, (psi)   | 6 020 |
| Collapse Pressure, (psi)              | 3 910 |
| Uniaxial Bending (deg/100ft)          | 28.0  |

**MAKE-UP TORQUES**

|                                 |        |
|---------------------------------|--------|
| Yield Torque, (ft-lb)           | 22 200 |
| Minimum Make-Up Torque, (ft-lb) | 12 500 |
| Optimum Make-Up Torque, (ft-lb) | 13 900 |
| Maximum Make-Up Torque, (ft-lb) | 15 300 |



NOTE: The content of this Technical Data Sheet is for general information only. It does not guarantee performance or quality for a particular purpose, which only a complete engineering analysis can determine. The user is responsible for the selection and operation of the equipment. This information supersedes all previous versions. For this connection information that is printed or downloaded, the user is responsible for the latest information. Anyone using the information herein does so at their own risk. To verify that you have the latest technical information, please contact TMK Technical Sales, Russia (Tel: +7 495 757 67 00, Email: technical@tmk-group.com) and TMK PSC in North America (Tel: +1 951 946 1044, Email: info@tmk-usa.com).

## PERFORMANCE DATA

# TMK UP DQX

## Technical Data Sheet

5.500 in

20.00 lbs/ft

P-410

### 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 | in <sup>2</sup> |                              |         |     |

## Connection Parameters

|                              |         |                 |
|------------------------------|---------|-----------------|
| Connection OD                | 6.050   | in              |
| Connection ID                | 4.778   | in              |
| Make-Up Loss                 | 4.122   | in              |
| Critical Section Area        | 5.828   | in <sup>2</sup> |
| 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 |

Printed on: July-23-2014



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[illegible]

**IPSCO**

# PECOS DISTRICT

## DRILLING CONDITIONS OF APPROVAL

|                       |                                |
|-----------------------|--------------------------------|
| OPERATOR'S NAME:      | OXY USA Inc                    |
| LEASE NO.:            | NMNM40659                      |
| WELL NAME & NO.:      | Iridium MDP1 28-21 Fed Com 11H |
| SURFACE HOLE FOOTAGE: | 430'/S & 648'/W                |
| BOTTOM HOLE FOOTAGE   | 180'/N & 380'/W, sec. 7        |
| LOCATION:             | Sec. 28, T. 23 S, R. 31 E      |
| COUNTY:               | Lea County                     |

|                      |  |  |  |
|----------------------|--|--|--|
| Potash               | <input type="radio"/> None             | <input type="radio"/> Secretary            | <input checked="" type="radio"/> R-111-P |
| Cave/Karst Potential | <input checked="" type="radio"/> Low   | <input type="radio"/> Medium               | <input type="radio"/> High               |
| Variance             | <input type="radio"/> None             | <input checked="" type="radio"/> Flex Hose | <input type="radio"/> Other              |
| Wellhead             | <input type="radio"/> Conventional     | <input checked="" type="radio"/> Multibowl |  |
| Other                | <input type="checkbox"/> 4 String Area | <input type="checkbox"/> Capitan Reef      | <input type="checkbox"/> WIPP            |

**All previous COAs still apply except for the following:**

### A. CASING

#### Primary Design:

1. The **13 3/8** inch surface casing shall be set at approximately **590** 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 **24 hours in the Potash Area** 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, contact the appropriate BLM office. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to potash.**

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

- Cement to surface. Operator shall provide method of verification.

**Operator has proposed to pump down 9 5/8" X 5 1/2" annulus. Operator must run a CBL from the TD of the 5 1/2" casing to 9 5/8" casing shoe.**

### **Casing Design** (Contingency)

4. The 13 3/8 inch surface casing shall be set at approximately **590** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
  - e. 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.
  - f. Wait on cement (WOC) time for a primary cement job will be a minimum of **24 hours in the Potash Area** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
  - g. 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.
  - h. If cement falls back, remedial cementing will be done prior to drilling out that string.
5. The minimum required fill of cement behind the 9 5/8 inch first intermediate casing is:
  - 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 potash.**

**Second intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.**



6. The minimum required fill of cement behind the 7 5/8 inch second intermediate casing is:
- Cement to surface. If cement does not circulate, contact the appropriate BLM office.

**Operator has proposed to pump down 9 5/8" X 7 5/8" annulus. Operator must run a CBL from the TD of the 7 5/8 casing to 9 5/8" casing shoe.**

7. The minimum required fill of cement behind the 5 1/2 inch production casing is:
- Cement as proposed. Operator shall provide method of verification.  
**Excess calculates to 19% - additional cement might be required.**

**MHH 08152018**

## 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

### 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.