

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Carlsbad Field Office

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.

OCD Artesia

5. Lease Serial No.
NMNM40659

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.

IRIDIUM MDP1 28-21 FEDERAL COM 11H

2. Name of Operator
OXY USA INCContact: DAVID STEWART
E-Mail: david_stewart@oxy.com

9. API Well No.

30-015-45073

3a. Address

P.O. BOX 50250
MIDLAND, TX 79710

3b. Phone No. (include area code)

Ph: 432-685-5717

10. Field and Pool or Exploratory Area
INGLE WELLS BONE SPRING

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

Sec 28 T23S R31E SWSW 430FSL 648FWL
32.269362 N Lat, 103.789196 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 Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original APD
	☐ 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 recomple 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 recomple 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.

RECEIVED

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

1. Amend the TMD, TVD, to add 6-3/4" pilot hole and plug back cement plan, see attached.

SEP 06 2018

2. Amend the 7-5/8" and/or 5-1/2" casing grade, weight and/or connection, see attached for specifics.

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

DISTRICT II-ARTESIA O.C.D.
SEE ATTACHED FOR
CONDITIONS OF APPROVAL

4. Amend the logging program, see attached.

5. Amend the drilling conditions, see attached.

GC 9-7-18
Accepted for record - NMOCD

14. I hereby certify that the foregoing is true and correct.	
Electronic Submission #433024 verified by the BLM Well Information System For OXY USA INC, sent to the Carlsbad Committed to AFMSS for processing by MUSTAFA HAQUE on 08/30/2018 ()	
Name (Printed/Typed) DAVID STEWART	Title SR. REGULATORY ADVISOR
Signature (Electronic Submission)	Date 08/28/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By <u>MUSTAFA HAQUE</u>	Title Petroleum Engineer Carlsbad Field Office	Date 8-30-2018
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		
Office		

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 ****

OXY USA Inc. - Iridium MDP1 28-21 Federal Com 11H – Amended Drill Plan (2)

1. Geologic Formations

TVD of target	9,970'	Pilot Hole Depth	10,409'
MD at TD:	20,147'	Deepest Expected fresh water:	432'

Delaware Basin

Formation	TVD - RKB	Expected Fluids
Rustler	432	
Salado	789	Salt
Castile	2,724	Salt
Lamar/Delaware	4,176	
Bell Canyon	4,211	Water (inj zone)
Cherry Canyon	5,097	
Brushy Canyon	6,396	Losses
Bone Spring	8,000	Oil/Gas/Water
1st Bone Spring	8,762	Oil/Gas/Water
2nd Bone Spring (Lateral)	9,319	Oil/Gas/Water
3rd Bone Spring (Pilot)	10,162	Oil/Gas/Water

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

2. Casing Program *DSEE CoA*

Hole Size (in)	Casing Interval		Csg. Size (in)	Weight (lbs)	Grade	Conn.	SF		Buoyant Body SF	Buoyant Joint SF
	From (ft)	To (ft)					Collapse	Burst	Tension	Tension
17.5	0	662 <i>590</i>	13.375	54.5	J-55	BTC	1.125	1.2	1.4	1.4
12.25	0	4,281	9.625	43.5	HCL-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	8,000	7.625	26.4	L-80	FJ	1.125	1.2	1.4	1.4
6.75	0	20,147	5.5	23	CYHP P-110	SFTORQ	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 cancellation cone and not pump the second stage.

OXY USA Inc. - Iridium MDP1 28-21 Federal Com 11H – Amended Drill Plan (2)

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 rd 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 nd 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?	

OXY USA Inc. - Iridium MDP1 28-21 Federal Com 11H – Amended Drill Plan (2)

3. Cementing Program

Casing	Slurry	#Sks	Wt. (Lb/gal)	Yld ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength	Slurry Description
Surface	Lead	N/A	N/A	N/A	N/A	N/A	N/A
	Tail	678	14.8	1.33	6.365	5:26	Class C Cement, Accelerator
Intermediate I	Lead	1167	12.9	1.88	10.13	7:32	Retarder, Extender, Dispersant
	Tail	141	14.8	1.33	6.42	6:31	Retarder, Dispersant, Salt
Intermediate II 1st Stage	Lead	N/A	N/A	N/A	N/A	N/A	N/A
	Tail	66	13.2	1.65	6.69	3:49	Retarder, Dispersant, Salt
Intermediate II 2nd Stage (Tail Slurry) to be pumped as Bradenhead Squeeze from surface, down the Intermediate annulus							
Intermediate II 2nd Stage	Lead	N/A	N/A	N/A	N/A	N/A	N/A
	Tail	354	12.8	1.76	9.38	9:49	Extender, Accelerator, Dispersant
Production	Lead	N/A	N/A	N/A	N/A	N/A	N/A
	Tail	918	13.2	1.38	6.686	3:49	Retarder, Dispersant, Fluid Loss Control, 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	662	N/A	100%
Int I	0	3781	3781	4281	100%	20%
Int II (1st Stage)	N/A	N/A	6648	8000	N/A	5%
Int II (2nd Stage)	N/A	N/A	0	6648	N/A	5%
Production	N/A	N/A	7500	20147	N/A	20%

Pilot Hole Cementing Specs:

Pilot Hole Depth: 10,409' MD

KOP: 9,319' MD (Open Hole)

Plug Top (MD)	Plug Bottom (MD)	Excess	No. Sacks	Wt. (lb/gal)	Yld (ft ³ /sack)	Water (gal/sk)	Slurry Description and Cement Type
9,709	10,409	10%	185	16.4	1.032	4.13	NeoCem TM
9,009	9,709	10%	201	17.5	0.952	3.51	Class H Cement, Retarder

OXY USA Inc. - Iridium MDP1 28-21 Federal Com 11H – Amended Drill Plan (2)

4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12.25" Intermediate	13-5/8"	3M	Annular	✓	70% of working pressure
			Blind Ram	✓	250/2000psi
			Pipe Ram		
			Double Ram	✓	
			Other*		
8.5" Intermediate II	13-5/8"	5M	Annular	✓	70% of working pressure
			Blind Ram	✓	250/5000psi
			Pipe Ram		
			Double Ram	✓	
			Other*		
6.75" Pilot	13-5/8"	5M	Annular	✓	70% of working pressure
		5M	Blind Ram	✓	250/5000psi
			Pipe Ram		
			Double Ram	✓	
			Other*		
6.75" Lateral	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. 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?

OXY USA Inc. - Iridium MDP1 28-21 Federal Com 11H – Amended Drill Plan (2)

	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.
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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.

5. Mud Program

PILOT

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From (ft)	To (ft)				
0	662 590	Water-Based Mud	8.6-8.8	40-60	N/C
662 590	4,281	Saturated Brine-Based Mud	9.8-10.0	35-45	N/C
4,281	8,000	Water-Based Mud	9.0-9.5	38-50	N/C
8,000	10,409	Water-Based Mud	9.0-9.5	42-48	< 10cc

LATERAL

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From (ft)	To (ft)				
8,000	20,147	Oil-Based Mud	8.2-8.7	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
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OXY USA Inc. - Iridium MDP1 28-21 Federal Com 11H – Amended Drill Plan (2)

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
Yes	Coring? If yes, explain (1) Rotary sidewall core (Pilot Hole)

Additional logs planned		Interval
No	Resistivity	
No	Density	
No	CBL	
Yes	Mud Log	Pilot & Lateral
Yes	Triple Combo (Spectral Gamma, Dipole Sonic, CMR)	Pilot

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	6478 psi (Pilot) 4978 psi (Lateral)
Abnormal Temperature	No
BH Temperature at deepest TVD	164 °F (Pilot) 160 °F (Lateral)

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 ₂ S) monitors will be installed prior to drilling out the surface shoe. If H ₂ 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 ₂ S is present
Y	H ₂ S Plan attached

OXY USA Inc. - Iridium MDP1 28-21 Federal Com 11H – Amended Drill Plan (2)

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 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.	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: 1628 bbls (Pilot & Lateral)

9. Company Personnel

<u>Name</u>	<u>Title</u>	<u>Office Phone</u>	<u>Mobile Phone</u>
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

Schlumberger

OXY



Borehole:

Well:

Field:

Structure:

ST01

Iridium MDP1 28-21 Federal Com 11H

NM Eddy County (NAD 83)

Oxy Iridium MDP1 28-21 Federal Com 11H

Gravity & Magnetic Parameters

Model: HDGM 2018 Dip: 60.213° Date: 26-Aug-2018
 MagDec: 6.899° FS: 48018.781nT Gravity FS: 958.451mg (9.80665 Based)

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

Lat: N 32 16 8.70 Northing: 462153.25RUS
 Lon: W 103 47 21.11 Easting: 708019.68RUS

Miscellaneous

Iridium MDP1 28-21 Federal Com 11H
 3 bit: 21 Federal Com TVD Ref: RKB = 30' (2406.21 above MSL)
 11H
 Plan: Oxy Iridium MDP1 28-21 Federal Com 11H ST01 Rev0 ALS 26AUG18

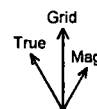
Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
Ruiter	432.01	0.51	109.63	432.00	0.04	0.11	2.17	0.19
Salado	789.01	0.02	63.90	789.00	-1.12	-1.01	3.53	0.07
Castile	2724.01	0.00	182.77	2724.00	-1.27	-1.15	3.95	0.06
Lamar	4176.71	2.54	160.51	4176.00	-29.01	-28.48	16.94	0.00
Bell Canyon	4211.75	2.54	160.51	4211.00	-30.49	-29.94	17.45	0.00
Cherry Canyon	5100.09	0.05	160.51	5097.00	-88.39	-87.20	37.72	2.00
Brushy Canyon	6399.09	0.00	160.51	6396.00	-88.39	-87.20	37.72	0.00
Bone Spring	8003.09	0.00	160.51	8000.00	-88.39	-87.20	37.72	0.00
First Bone Spring	8771.03	10.00	205.43	8762.00	-161.74	-161.74	2.57	0.02
Tie-In to OH	9200.00	10.00	205.90	9184.43	-229.11	-230.12	-27.24	
KOP 10 DLS	9319.20	10.00	205.90	9301.62	-247.42	-248.74	-36.27	0.00
Second Bone Spring	9333.56	9.24	213.20	9318.00	-248.15	-249.59	-39.91	10.00
Build & Turn 10 DLS	9719.21	35.00	320.00	9678.02	-185.36	-189.69	-128.98	10.00
Landing Point	10356.93	90.00	359.60	9970.00	331.79	323.36	-262.87	10.00
Iridium MDP1 28-21 Federal Com 11H PBHL	20146.77	90.00	359.60	9970.00	10118.38	10112.97	-331.02	0.00

Oxy Iridium MDP1 28-21 Federal Com 11H ST01 Rev0 ALS 26AUG18

Iridium MDP1 28-21 Federal Com 11H PBHL
 30' 47' MSL 6.773 TVD
 10.05' incl 32.00' az
 10' 12' 13' E+321

Lease Line - DO NOT CROSS



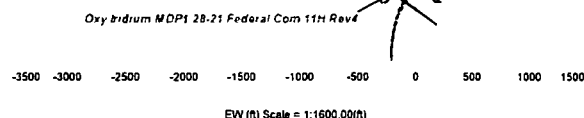
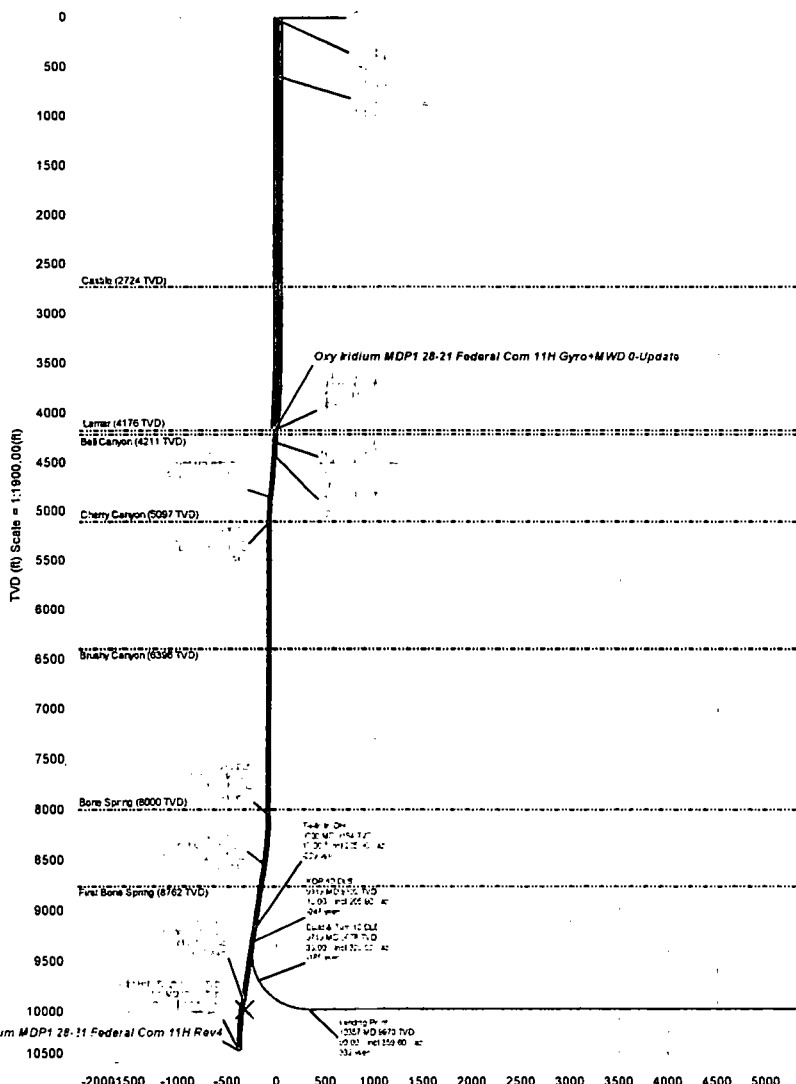
Grid North
 Tot Corr (M->G 6.608°)
 Mag Dec (6.899°)
 Grid Conv (0.291°)

Lease Line - DO NOT CROSS

Target Line - Notify DE prior to Cross

Hard Line - DO NOT CROSS

10500
10000
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500



Oxy Iridium MDP1 28-21 Federal Com 11H ST01 Rev0 ALS 26AUG18

Iridium MDP1 28-21 Federal Com 11H PBHL
 30' 47' MSL 6.773 TVD
 10.05' incl 32.00' az
 10' 12' 13' E+321

Oxy Iridium MDP1 28-21 Federal Com 11H ST01 Rev0 ALS 26AUG18

Proposal Geodetic Report

(Def Plan)



Report Date: August 26, 2018 - 12:14 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: ST01
 UWI / API#: Unknown / Unknown
 Survey Name: Oxy Iridium MDP1 28-21 Federal Com 11H ST01 Rev0 ALS 26AUG18
 Survey Date: August 26, 2018
 Tort / AHD / DDI / ERD Ratio: 128.690' / 10727.442 ft / 6.446' / 1.076
 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
 Location Lat / Long: N 32° 16' 9.70272", W 103° 47' 21.10569"
 Location Grid N/E Y/X: N 462153.250 RUS, E 709519.880 ftUS
 CRS Grid Convergence Angle: 0.2905 °
 Grid Scale Factor: 0.99994149
 Version / Patch: 2.10.720.0

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: 6.899 °
 Total Gravity Field Strength: 998.4510mgn (9.80665 Based)
 Gravity Model: GARM
 Total Magnetic Field Strength: 48018.781 nT
 Magnetic Dip Angle: 60.013 °
 Declination Date: August 26, 2018
 Magnetic Declination Model: HDGM 2018
 North Reference: Grid North
 Grid Convergence Used: 0.2905 °
 Total Corr Mag North->Grid North: 6.6082 °
 Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (RUS)	Easting (RUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
RKB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	462153.25	709519.68	N 32 16 9.70 W 103 47 21.11	
SHL	30.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00	462153.25	709519.68	N 32 16 9.70 W 103 47 21.11	
	100.00	0.32	51.20	100.00	0.12	0.12	0.15	0.48	462153.37	709519.83	N 32 16 9.70 W 103 47 21.10	
	156.00	0.38	62.40	156.00	0.29	0.31	0.44	0.18	462153.58	709520.12	N 32 16 9.71 W 103 47 21.10	
	241.00	0.27	93.86	241.00	0.39	0.42	0.89	0.24	462153.67	709520.57	N 32 16 9.71 W 103 47 21.10	
	334.00	0.40	103.26	334.00	0.29	0.33	1.42	0.15	462153.58	709521.10	N 32 16 9.71 W 103 47 21.09	
	429.00	0.51	109.05	428.99	0.05	0.12	2.15	0.13	462153.37	709521.83	N 32 16 9.70 W 103 47 21.08	
Rustler	432.01	0.51	109.63	432.00	0.04	0.11	2.17	0.19	462153.36	709521.85	N 32 16 9.70 W 103 47 21.08	
	523.62	0.47	129.27	523.61	-0.36	-0.26	2.84	0.19	462152.99	709522.52	N 32 16 9.70 W 103 47 21.07	
Last Gyro	586.00	0.44	137.09	585.99	-0.76	-0.65	3.26	0.10	462152.80	709522.94	N 32 16 9.70 W 103 47 21.07	
	665.00	0.13	153.83	664.99	-1.03	-0.92	3.48	0.48	462152.33	709523.18	N 32 16 9.69 W 103 47 21.07	
	757.00	0.00	143.84	756.99	-1.13	-1.01	3.52	0.14	462152.24	709523.20	N 32 16 9.69 W 103 47 21.06	
Salado	789.01	0.02	63.90	789.00	-1.12	-1.01	3.53	0.07	462152.24	709523.21	N 32 16 9.69 W 103 47 21.06	
	848.00	0.06	63.90	847.99	-1.11	-0.99	3.57	0.07	462152.26	709523.25	N 32 16 9.69 W 103 47 21.06	
	940.00	0.06	128.69	939.99	-1.12	-1.00	3.65	0.07	462152.25	709523.33	N 32 16 9.69 W 103 47 21.06	
	1031.00	0.06	352.99	1030.99	-1.10	-0.98	3.68	0.12	462152.27	709523.36	N 32 16 9.69 W 103 47 21.06	
	1120.00	0.06	80.70	1119.99	-1.05	-0.93	3.72	0.09	462152.32	709523.40	N 32 16 9.69 W 103 47 21.06	
	1302.00	0.06	98.25	1301.99	-1.05	-0.93	3.91	0.01	462152.32	709523.59	N 32 16 9.69 W 103 47 21.06	
	1393.00	0.08	182.27	1392.99	-1.12	-0.99	3.97	0.08	462152.26	709523.65	N 32 16 9.69 W 103 47 21.06	
	1487.00	0.06	205.89	1486.99	-1.23	-1.10	3.97	0.06	462152.15	709523.65	N 32 16 9.69 W 103 47 21.06	
	1582.00	0.00	75.76	1581.99	-1.27	-1.15	3.95	0.06	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
	1676.00	0.00	272.00	1675.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
	1771.00	0.00	56.89	1770.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
	1865.00	0.00	15.65	1864.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
	2054.00	0.00	105.09	2053.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
	2149.00	0.00	53.37	2148.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
	2244.00	0.00	223.10	2243.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
	2338.00	0.00	289.15	2337.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
	2433.00	0.00	271.43	2432.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
	2622.00	0.00	222.74	2621.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
	2717.00	0.00	151.59	2716.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
Castile	2724.01	0.00	182.77	2724.00	-1.27	-1.15	3.95	0.06	462152.10	709523.63	N 32 16 9.69 W 103 47 21.06	
	2812.00	0.06	182.77	2811.99	-1.32	-1.20	3.95	0.06	462152.05	709523.63	N 32 16 9.69 W 103 47 21.06	
	2906.00	0.00	25.72	2905.99	-1.37	-1.24	3.95	0.06	462152.01	709523.63	N 32 16 9.69 W 103 47 21.06	
	3096.00	0.00	278.75	3095.99	-1.37	-1.24	3.95	0.00	462152.01	709523.63	N 32 16 9.69 W 103 47 21.06	
	3191.00	0.17	310.45	3190.99	-1.28	-1.15	3.84	0.18	462152.10	709523.52	N 32 16 9.69 W 103 47 21.06	
	3285.00	0.35	296.69	3284.98	-1.05	-0.93	3.48	0.20	462152.32	709523.16	N 32 16 9.69 W 103 47 21.07	
	3380.00	0.13	182.56	3379.98	-1.01	-0.91	3.25	0.47	462152.34	709522.93	N 32 16 9.69 W 103 47 21.07	
	3569.00	1.59	148.22	3568.98	-3.49	-3.34	4.69	0.77	462149.91	709524.37	N 32 16 9.67 W 103 47 21.05	
	3684.00	1.86	148.70	3683.91	-5.98	-5.78	6.19	0.28	462147.47	709525.87	N 32 16 9.65 W 103 47 21.03	
	3759.00	2.49	152.09	3758.85	-9.17	-8.92	7.96	0.68	462144.33	709527.64	N 32 16 9.61 W 103 47 21.01	
	3948.00	3.44	155.02	3947.59	-18.08	-17.69	12.27	0.51	462135.56	709531.95	N 32 16 9.53 W 103 47 20.98	
	4042.00	3.02	155.12	4041.44	-22.95	-22.49	14.51	0.45	462130.76	709534.18	N 32 16 9.48 W 103 47 20.94	
Tie In: Survey	4181.00	2.54	160.51	4180.30	-28.35	-27.82	16.70	0.46	462125.43	709536.38	N 32 16 9.43 W 103 47 20.91	
Lamar	4178.71	2.54	160.51	4176.00	-29.01	-28.48	16.94	0.00	462124.78	709536.62	N 32 16 9.42 W 103 47 20.91	
Bell Canyon	4211.75	2.54	160.51	4211.00	-30.49	-29.94	17.45	0.00	462123.31	709537.13	N 32 16 9.41 W 103 47 20.90	
Proj. to Bit -	4291.00	2.54	160.51	4290.17	-33.84	-33.25	18.63	0.00	462120.00	709538.31	N 32 16 9.37 W 103 47 20.89	
Build 2 DLS	4414.00	5.00	160.51	4412.90	-41.55	-40.87	21.32	2.00	462112.38	709541.00	N 32 16 9.30 W 103 47 20.86	
Hold Tangent	4852.77	5.00	160.51	4850.00	-78.00	-76.92	34.08	0.00	462076.33	709553.76	N 32 16 8.94 W 103 47 20.71	
Drop 2 DLS	5100.09	0.05	160.51	5097.00	-88.39	-87.20	37.72	2.00	462068.06	709557.40	N 32 16 8.84 W 103 47 20.67	
Cherry Canyon	5102.77	0.00	160.51	5099.68	-88.39	-87.20	37.72	2.00	462068.05	709557.40	N 32 16 8.84 W 103 47 20.67	
Hold Vertical	6399.09	0.00	160.51	6396.00	-88.39	-87.20	37.72	0.00	462068.05	709557.40	N 32 16 8.84 W 103 47 20.67	
Brushy Canyon	8003.09	0.00	160.51	8000.00	-88.39	-87.20	37.72	0.00	462068.05	709557.40	N 32 16 8.84 W 103 47 20.67	
Bone Spring	8047.09	0.00	160.51	8044.00	-88.39	-87.20	37.72	0.00	462068.05	709557.40	N 32 16 8.84 W 103 47 20.67	
Build 2 DLS	8547.21	10.00	205.19	8541.59	-127.16	-126.60	19.19	2.00	462026.65	709538.87	N 32 16 8.45 W 103 47 20.89	
Hold Tangent	8771.03	10.00	205.43	8762.00	-161.74	-161.74	2.57	0.02	461991.52	709522.25	N 32 16 8.10 W 103 47 21.09	
First Bone	9200.00	10.00	205.90	9184.46	-227.79	-228.89	-29.69	0.02	461924.38	709489.99	N 32 16 7.44 W 103 47 21.47	
Spring	9319.20	10.00	205.90	9301.84	-246.10	-247.50	-38.73	0.00	461905.76	709480.95	N 32 16 7.26 W 103 47 21.57	
Tie-In to OH	9333.56	9.24	213.20	9318.00	-248.15	-249.59	-39.91	10.00	461903.87	709479.77	N 32 16 7.24 W 103 47 21.59	
KOP 10 DLS	9719.21	35.00	320.00	9678.05	-184.05	-188.45	-131.44	10.00	461964.81	709388.25	N 32 16 7.84 W 103 47 22.65	
Second Bone	10356.93	90.00	359.60	9970.03	333.11	324.60	-265.33	10.00	462477.83	709254.36	N 32 16 12.93 W 103 47 24.18	
Spring	20146.77	90.00	359.60	9970.03	10119.70	10114.21	-333.48	0.00	472266.84	709186.22	N 32 17 49.80 W 103 47 24.39	
Build & Turn 10												
DLS												
Landing Point												
Iridium MDP1 28-												
21 Federal Com												
11H PBHL												

Survey Type: Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7655 sigma

Survey Program:

Comments	MD (ft)	Incl (°)	Azlm Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey			
	1	0.000	30.000	Act Sins	30.000	30.000		NAL_NSG+MSHOT-Depth Only	Original Borehole / Oxy Iridium			
	1	30.000	596.000	Act Sins	30.000	30.000		NAL_NSG+MSHOT	MDP1 28-21 Federal Com 11H			
	1	596.000	4161.000	Act Sins	30.000	30.000		NAL_MWD_PLUS_0.5_DEG	Original Borehole / Oxy Iridium			
	1	4161.000	9200.000	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG	MDP1 28-21 Federal Com 11H			
	1	9200.000	20146.771	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG	Original Borehole / Oxy Iridium			
									MDP1 28-21 Federal Com 11H			
									ST01 / Oxy Iridium MDP1 28-21			
									Federal Com 11H ST01 Rev0			

Oxy Iridium MDP1 28-21 Federal Com 11H ST01 Rev0 ALS 26AUG18

Proposal Geodetic Report

(Def Plan)



Report Date: August 26, 2018 - 12:16 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: ST01 UWI / APW: Unknown / Unknown Survey Name: Oxy Iridium MDP1 28-21 Federal Com 11H ST01 Rev0 ALS 26AUG18 Survey Date: August 28, 2018 Tort / AHD / DDI / ERD Ratio: 128.890 * / 10727.442 ft / 8.446 / 1.078 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet Location Lat / Long: N 32° 16' 9.70272", W 103° 47' 21.10589" Location Grid N/E Y/X: N 462153.250 RUS, E 709519.880 RUS CRS Grid Convergence Angle: 0.2905 * Grid Scale Factor: 0.99994149 Version / Patch: 2.10.720.0	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: 6.889 * Total Gravity Field Strength: 998.4510mgN (9.80665 Based) Gravity Model: GARM Total Magnetic Field Strength: 48018.781 nT Magnetic Dip Angle: 80.013 * Declination Date: August 26, 2018 Magnetic Declination Model: HDGM 2018 North Reference: Grid North Grid Convergence Used: 0.2905 * Total Corr Mag North->Grid North: 6.6082 * Local Coord Referenced To: Well Head
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Comments	MD (ft)	Incl (°)	Azlm Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (RUS)	Easting (RUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
RKB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	462153.25	709519.68	N 32 16 9.70	W 103 47 21.11
SHL	30.00		0.00	30.00	0.00	0.00	0.00		462153.25	709519.68	N 32 16 9.70	W 103 47 21.11
	100.00	0.32	51.20	100.00	0.12	0.12	0.15	0.46	462153.37	709519.83	N 32 16 9.70	W 103 47 21.10
	156.00	0.38	82.40	156.00	0.29	0.31	0.44	0.18	462153.56	709520.12	N 32 16 9.71	W 103 47 21.10
	241.00	0.27	93.86	241.00	0.39	0.42	0.89	0.24	462153.67	709520.57	N 32 16 9.71	W 103 47 21.10
	334.00	0.40	103.26	334.00	0.29	0.33	1.42	0.15	462153.58	709521.10	N 32 16 9.71	W 103 47 21.09
	429.00	0.51	109.05	428.99	0.05	0.12	2.15	0.13	462153.37	709521.83	N 32 16 9.70	W 103 47 21.08
	523.62	0.47	129.27	523.61	-0.36	-0.26	2.84	0.19	462152.99	709522.52	N 32 16 9.70	W 103 47 21.07
Last Gyro	596.00	0.44	137.09	595.99	-0.76	-0.65	3.26	0.10	462152.80	709522.94	N 32 16 9.70	W 103 47 21.07
	685.00	0.13	153.83	684.99	-1.03	-0.92	3.48	0.46	462152.33	709523.16	N 32 16 9.69	W 103 47 21.07
	757.00	0.00	143.84	756.99	-1.13	-1.01	3.52	0.14	462152.24	709523.20	N 32 16 9.69	W 103 47 21.06
	848.00	0.06	83.90	847.99	-1.11	-0.99	3.57	0.07	462152.28	709523.25	N 32 16 9.69	W 103 47 21.06
	940.00	0.06	128.69	939.99	-1.12	-1.00	3.65	0.07	462152.25	709523.33	N 32 16 9.69	W 103 47 21.06
	1031.00	0.06	352.99	1030.99	-1.10	-0.98	3.68	0.12	462152.27	709523.36	N 32 16 9.69	W 103 47 21.06
	1120.00	0.06	80.70	1119.99	-1.05	-0.93	3.72	0.09	462152.32	709523.40	N 32 16 9.69	W 103 47 21.06
	1302.00	0.06	98.25	1301.99	-1.05	-0.93	3.91	0.01	462152.32	709523.59	N 32 16 9.69	W 103 47 21.06
	1393.00	0.08	182.27	1392.99	-1.12	-0.99	3.97	0.08	462152.26	709523.65	N 32 16 9.69	W 103 47 21.06
	1487.00	0.06	205.89	1486.99	-1.23	-1.10	3.97	0.06	462152.15	709523.65	N 32 16 9.69	W 103 47 21.06
	1582.00	0.00	75.76	1581.99	-1.27	-1.15	3.95	0.06	462152.10	709523.63	N 32 16 9.69	W 103 47 21.06
	1676.00	0.00	272.00	1675.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69	W 103 47 21.06
	1771.00	0.00	56.89	1770.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69	W 103 47 21.06
	1865.00	0.00	15.85	1864.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69	W 103 47 21.06
	2054.00	0.00	105.09	2053.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69	W 103 47 21.06
	2146.00	0.00	53.37	2146.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69	W 103 47 21.06
	2244.00	0.00	223.10	2243.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69	W 103 47 21.06
	2338.00	0.00	289.15	2337.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69	W 103 47 21.06
	2433.00	0.00	271.43	2432.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69	W 103 47 21.06
	2622.00	0.00	222.74	2621.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69	W 103 47 21.06
	2717.00	0.00	151.59	2716.99	-1.27	-1.15	3.95	0.00	462152.10	709523.63	N 32 16 9.69	W 103 47 21.06
	2812.00	0.06	182.77	2811.99	-1.32	-1.20	3.95	0.06	462152.05	709523.63	N 32 16 9.69	W 103 47 21.06
	2906.00	0.00	25.72	2905.99	-1.37	-1.24	3.95	0.06	462152.01	709523.63	N 32 16 9.69	W 103 47 21.06
	3096.00	0.00	278.75	3095.99	-1.37	-1.24	3.95	0.00	462152.01	709523.63	N 32 16 9.69	W 103 47 21.06
	3191.00	0.17	310.45	3190.99	-1.28	-1.15	3.84	0.18	462152.10	709523.52	N 32 16 9.69	W 103 47 21.06
	3285.00	0.35	296.69	3284.98	-1.05	-0.93	3.48	0.20	462152.32	709523.16	N 32 16 9.69	W 103 47 21.07
	3380.00	0.13	162.56	3379.98	-1.01	-0.91	3.25	0.47	462152.34	709522.93	N 32 16 9.69	W 103 47 21.07
	3569.00	1.59	148.22	3568.96	-3.49	-3.34	4.69	0.77	462149.91	709524.37	N 32 16 9.67	W 103 47 21.05
	3664.00	1.86	148.70	3663.91	-5.98	-5.78	6.19	0.28	462147.47	709525.87	N 32 16 9.65	W 103 47 21.03
	3759.00	2.49	152.09	3758.85	-0.17	-8.92	7.96	0.68	462144.33	709527.64	N 32 16 9.61	W 103 47 21.01
	3948.00	3.44	155.02	3947.59	-18.08	-17.69	12.27	0.51	462135.56	709531.95	N 32 16 9.53	W 103 47 20.98
	4042.00	3.02	155.12	4041.44	-22.95	-22.49	14.51	0.45	462130.76	709534.18	N 32 16 9.48	W 103 47 20.94
	4181.00	2.54	160.51	4180.30	-28.35	-27.82	16.70	0.46	462125.43	709536.38	N 32 16 9.43	W 103 47 20.91
Tie In: Survey												
Proj. to Bit -												
Build 2 DLS	4291.00	2.54	160.51	4290.17	-33.84	-33.25	18.63	0.00	462120.00	709538.31	N 32 16 9.37	W 103 47 20.89
Hold Tangent												
Drop 2 DLS	4414.00	5.00	160.51	4412.90	-41.55	-40.87	21.32	2.00	462112.38	709541.00	N 32 16 9.30	W 103 47 20.86
Hold Vertical	4852.77	5.00	160.51	4850.00	-78.00	-76.92	34.08	0.00	462076.33	709553.76	N 32 16 8.94	W 103 47 20.71
Build 2 DLS	5102.77	0.00	160.51	5099.68	-88.39	-87.20	37.72	2.00	462068.05	709557.40	N 32 16 8.84	W 103 47 20.67
Hold 2 DLS	8047.09	0.00	160.51	8044.00	-88.39	-87.20	37.72	0.00	462068.05	709557.40	N 32 16 8.84	W 103 47 20.67
Hold Tangent	8547.21	10.00	205.19	8541.59	-127.16	-126.60	19.19	2.00	462026.65	709538.87	N 32 16 8.45	W 103 47 20.89
Tie-In to OH	9200.00	10.00	205.90	9184.46	-227.79	-228.89	-29.69	0.02	461924.38	709489.99	N 32 16 7.44	W 103 47 21.47
	9300.00	10.00	205.90	9282.91	-244.47	-245.74	-34.82	0.00	461907.52	709484.86	N 32 16 7.27	W 103 47 21.53
KOP 10 DLS	9319.20	10.00	205.90	9301.84	-246.10	-247.50	-38.73	0.00	461905.76	709480.95	N 32 16 7.26	W 103 47 21.57
	9400.00	8.43	257.23	9381.70	-254.76	-256.37	-45.13	10.00	461896.89	709474.55	N 32 16 7.17	W 103 47 21.65
	9500.00	14.66	298.67	9479.78	-249.70	-251.91	-63.43	10.00	461901.35	709456.26	N 32 16 7.21	W 103 47 21.88
	9600.00	23.61	312.69	9574.21	-229.17	-232.21	-89.31	10.00	461921.05	709430.37	N 32 16 7.41	W 103 47 22.16
	9700.00	33.14	319.13	9662.11	-193.78	-197.88	-122.00	10.00	461955.39	709397.69	N 32 16 7.75	W 103 47 22.54
Build & Turn 10												
DLS	9719.21	35.00	320.00	9678.05	-184.05	-188.45	-131.44	10.00	461984.81	709388.25	N 32 16 7.84	W 103 47 22.65
	9800.00	41.04	328.75	9741.69	-143.96	-149.19	-157.88	10.00	462004.06	709362.01	N 32 16 8.23	W 103 47 22.95
	9900.00	49.20	336.94	9812.26	-79.90	-86.15	-189.61	10.00	462087.11	709330.08	N 32 16 8.88	W 103 47 23.32
	10000.00	57.81	343.28	9871.72	-3.51	-10.61	-216.68	10.00	462142.64	709303.01	N 32 16 9.61	W 103 47 23.63
	10100.00	66.68	348.51	9918.27	82.88	75.13	-238.06	10.00	462228.37	709281.84	N 32 16 10.46	W 103 47 23.87
	10200.00	75.70	353.07	9950.50	176.64	168.45	-253.09	10.00	462321.69	709266.60	N 32 16 11.38	W 103 47 24.04
	10300.00	84.80	357.27	9987.42	274.95	268.54	-261.33	10.00	462419.77	709258.37	N 32 16 12.35	W 103 47 24.13
Landing Point	10356.93	90.00	358.60	9970.03	333.11	324.60	-265.33	10.00	462477.83	709254.36	N 32 16 12.93	W 103 47 24.18
	10400.00	90.00	358.60	9970.00	374.85	368.43	-263.17	0.00	462519.66	709256.52	N 32 16 13.34	W 103 47 24.15
	10500.00	90.00	358.60	9970.00	474.82	466.43	-263.67	0.00	462619.65	709255.83	N 32 16 14.33	W 103 47 24.15
	10600.00	90.00	358.60	9970.00	574.78	568.43	-264.57	0.00	462719.64	709255.13	N 32 16 15.32	W 103 47 24.15
	10700.00	90.00	358.60	9970.00	674.75	666.43	-265.26	0.00	462819.64	709254.43	N 32 16 16.31	W 103 47 24.16
	10800.00	90.00	358.60	9970.00	774.72	768.42	-265.96	0.00	462919.63	709253.74	N 32 16 17.30	W 103 47 24.16
	10900.00	90.00	358.60	9970.00	874.68	866.42	-266.65	0.00	463019.62	709253.04	N 32 16 18.29	W 103 47 24.16
	11000.00	90.00	358.60	9970.00	974.65	966.42	-267.35	0.00	463119.61	709252.35	N 32 16 19.28	W 103 47 24.16
	11100.00	90.00	358.60	9970.00	1074.62	1068.42	-268.05	0.00	463219.60	709251.65	N 32 16 20.27	W 103 47 24.16
	11200.00	90.00	358.60	9970.00	1174.58	1168.41	-268.74	0.00	463319.59	709250.95	N 32 16 21.26	W 103 47 24.17
	11300.00	90.00	358.60	9970.00	1274.55	1266.41	-269.44	0.00	463419.59	709250.26	N 32 16 22.25	W 103 47 24.17
	11400.00	90.00	358.60	9970.00	1374.52	1366.41	-270.13	0.00	463519.58	709249.56	N 32 16 23.24	W 103 47 24.17
	11500.00	90.00	358.60	9970.00	1474.48	1466.41	-270.83	0.00	463619.57	709248.87	N 32 16	

Comments	MD	Incl	Adm Grd	TVD	VSEC	NS	EW	DLS	Northing	Easting	Latitude	Longitude
	(m)	(°)		(m)	(m)	(m)	(m)	(m)	(m)	(m)	(N)	(E)
	11700.00	90.00	356.80	9970.00	1874.42	1666.40	-272.22	0.00	463818.55	709274.71	N 32 16 26.21	W 103 47 24.16
	11800.00	90.00	356.80	9970.00	1174.38	1166.40	-272.82	0.00	463818.54	709274.68	N 32 16 27.18	W 103 47 24.16
	11900.00	90.00	356.80	9970.00	1874.38	1666.40	-273.61	0.00	463818.53	709274.68	N 32 16 28.18	W 103 47 24.16
	12000.00	90.00	356.80	9970.00	2074.28	2066.39	-274.31	0.00	464118.52	709274.69	N 32 16 29.17	W 103 47 24.16
	12100.00	90.00	356.80	9970.00	2174.25	2166.38	-275.01	0.00	464218.52	709274.69	N 32 16 30.18	W 103 47 24.16
	12200.00	90.00	356.80	9970.00	2274.22	2266.38	-275.70	0.00	464318.50	709274.69	N 32 16 31.15	W 103 47 24.16
	12300.00	90.00	356.80	9970.00	2374.18	2366.38	-277.78	0.00	464418.50	709274.69	N 32 16 32.14	W 103 47 24.16
	12400.00	90.00	356.80	9970.00	2474.16	2466.38	-277.78	0.00	464518.46	709274.69	N 32 16 33.13	W 103 47 24.16
	12500.00	90.00	356.80	9970.00	2574.12	2566.38	-278.48	0.00	464718.46	709274.69	N 32 16 34.12	W 103 47 24.16
	12600.00	90.00	356.80	9970.00	2674.08	2666.38	-278.48	0.00	464818.47	709274.69	N 32 16 35.10	W 103 47 24.16
	12700.00	90.00	356.80	9970.00	2774.05	2766.38	-278.88	0.00	464918.46	709274.68	N 32 16 37.08	W 103 47 24.20
	12800.00	90.00	356.80	9970.00	2874.02	2866.37	-280.58	0.00	465018.45	709274.68	N 32 16 38.08	W 103 47 24.20
	12900.00	90.00	356.80	9970.00	2973.99	2966.37	-281.27	0.00	465118.44	709274.68	N 32 16 39.08	W 103 47 24.21
	13000.00	90.00	356.80	9970.00	3073.95	3066.37	-282.66	0.00	465218.43	709274.68	N 32 16 40.08	W 103 47 24.21
	13100.00	90.00	356.80	9970.00	3173.92	3166.36	-283.36	0.00	465318.42	709274.68	N 32 16 42.04	W 103 47 24.21
	13200.00	90.00	356.80	9970.00	3273.88	3266.36	-284.06	0.00	465418.41	709274.68	N 32 16 43.03	W 103 47 24.22
	13300.00	90.00	356.80	9970.00	3373.85	3366.36	-284.75	0.00	465518.41	709274.65	N 32 16 44.02	W 103 47 24.22
	13400.00	90.00	356.80	9970.00	3473.82	3466.36	-285.45	0.00	465718.39	709274.65	N 32 16 45.01	W 103 47 24.22
	13500.00	90.00	356.80	9970.00	3573.79	3566.35	-286.14	0.00	465818.38	709274.65	N 32 16 46.00	W 103 47 24.22
	13600.00	90.00	356.80	9970.00	3673.75	3666.35	-286.84	0.00	465918.37	709274.65	N 32 16 46.98	W 103 47 24.22
	13700.00	90.00	356.80	9970.00	3773.72	3766.35	-287.54	0.00	466018.37	709274.65	N 32 16 47.97	W 103 47 24.22
	13800.00	90.00	356.80	9970.00	3873.69	3866.35	-288.23	0.00	466118.36	709274.65	N 32 16 48.96	W 103 47 24.23
	13900.00	90.00	356.80	9970.00	3973.65	3966.35	-288.93	0.00	466218.35	709274.65	N 32 16 51.03	W 103 47 24.23
	14000.00	90.00	356.80	9970.00	4073.62	4066.34	-289.62	0.00	466318.34	709274.65	N 32 16 51.03	W 103 47 24.23
	14100.00	90.00	356.80	9970.00	4173.59	4166.34	-290.32	0.00	466418.33	709274.65	N 32 16 52.02	W 103 47 24.24
	14200.00	90.00	356.80	9970.00	4273.56	4266.34	-291.02	0.00	466518.32	709274.68	N 32 16 52.02	W 103 47 24.24
	14300.00	90.00	356.80	9970.00	4373.52	4366.33	-292.41	0.00	466618.31	709274.68	N 32 16 54.90	W 103 47 24.24
	14400.00	90.00	356.80	9970.00	4473.48	4466.33	-292.41	0.00	466718.31	709274.68	N 32 16 54.90	W 103 47 24.24
	14500.00	90.00	356.80	9970.00	4573.45	4566.33	-293.10	0.00	466818.30	709274.68	N 32 16 55.88	W 103 47 24.25
	14600.00	90.00	356.80	9970.00	4673.42	4666.33	-293.80	0.00	466918.29	709274.68	N 32 16 56.87	W 103 47 24.25
	14700.00	90.00	356.80	9970.00	4773.38	4766.33	-294.50	0.00	467018.28	709274.68	N 32 16 57.87	W 103 47 24.25
	14800.00	90.00	356.80	9970.00	4873.35	4866.32	-295.19	0.00	467118.27	709274.68	N 32 16 58.86	W 103 47 24.25
	14900.00	90.00	356.80	9970.00	4973.32	4966.32	-295.89	0.00	467218.26	709274.68	N 32 16 59.85	W 103 47 24.26
	15000.00	90.00	356.80	9970.00	5073.29	5066.32	-296.58	0.00	467318.25	709274.68	N 32 17 00.84	W 103 47 24.26
	15100.00	90.00	356.80	9970.00	5173.26	5166.32	-297.28	0.00	467418.24	709274.68	N 32 17 01.83	W 103 47 24.26
	15200.00	90.00	356.80	9970.00	5273.22	5266.31	-297.98	0.00	467518.23	709274.68	N 32 17 02.82	W 103 47 24.26
	15300.00	90.00	356.80	9970.00	5373.18	5366.31	-298.67	0.00	467618.22	709274.68	N 32 17 03.81	W 103 47 24.26
	15400.00	90.00	356.80	9970.00	5473.16	5466.31	-298.67	0.00	467718.22	709274.68	N 32 17 04.79	W 103 47 24.26
	15500.00	90.00	356.80	9970.00	5573.12	5566.31	-299.07	0.00	467818.21	709274.68	N 32 17 05.78	W 103 47 24.26
	15600.00	90.00	356.80	9970.00	5673.08	5666.30	-300.76	0.00	467918.20	709274.68	N 32 17 06.77	W 103 47 24.27
	15700.00	90.00	356.80	9970.00	5773.06	5766.30	-301.46	0.00	468018.19	709274.68	N 32 17 07.76	W 103 47 24.27
	15800.00	90.00	356.80	9970.00	5873.02	5866.30	-302.15	0.00	468118.18	709274.68	N 32 17 08.75	W 103 47 24.27
	15900.00	90.00	356.80	9970.00	5972.98	5966.30	-302.85	0.00	468218.18	709274.68	N 32 17 09.74	W 103 47 24.28
	16000.00	90.00	356.80	9970.00	6072.94	6066.30	-303.55	0.00	468318.17	709274.68	N 32 17 10.73	W 103 47 24.28
	16100.00	90.00	356.80	9970.00	6172.92	6166.29	-304.24	0.00	468418.16	709274.68	N 32 17 11.72	W 103 47 24.28
	16200.00	90.00	356.80	9970.00	6272.89	6266.29	-304.94	0.00	468518.15	709274.68	N 32 17 12.71	W 103 47 24.28
	16300.00	90.00	356.80	9970.00	6372.86	6366.29	-305.63	0.00	468618.14	709274.68	N 32 17 13.70	W 103 47 24.28
	16400.00	90.00	356.80	9970.00	6472.82	6466.28	-306.33	0.00	468718.14	709274.68	N 32 17 14.69	W 103 47 24.29
	16500.00	90.00	356.80	9970.00	6572.79	6566.28	-307.03	0.00	468818.13	709274.68	N 32 17 15.68	W 103 47 24.29
	16600.00	90.00	356.80	9970.00	6672.76	6666.28	-307.72	0.00	468918.12	709274.68	N 32 17 16.67	W 103 47 24.29
	16700.00	90.00	356.80	9970.00	6772.72	6766.28	-308.42	0.00	469018.11	709274.68	N 32 17 17.66	W 103 47 24.29
	16800.00	90.00	356.80	9970.00	6872.69	6866.28	-309.11	0.00	469118.10	709274.68	N 32 17 18.65	W 103 47 24.29
	16900.00	90.00	356.80	9970.00	6972.62	6966.27	-300.81	0.00	469218.09	709274.68	N 32 17 19.64	W 103 47 24.30
	17000.00	90.00	356.80	9970.00	7072.62	7066.27	-311.20	0.00	469318.08	709274.68	N 32 17 20.63	W 103 47 24.30
	17100.00	90.00	356.80	9970.00	7172.58	7166.27	-311.50	0.00	469418.08	709274.68	N 32 17 21.62	W 103 47 24.30
	17200.00	90.00	356.80	9970.00	7272.56	7266.27	-312.59	0.00	469518.07	709274.68	N 32 17 22.61	W 103 47 24.30
	17300.00	90.00	356.80	9970.00	7372.53	7366.26	-312.59	0.00	469618.06	709274.68	N 32 17 23.60	W 103 47 24.31
	17400.00	90.00	356.80	9970.00	7472.48	7466.26	-313.99	0.00	469718.05	709274.68	N 32 17 24.59	W 103 47 24.31
	17500.00	90.00	356.80	9970.00	7572.46	7566.26	-314.68	0.00	469818.04	709274.68	N 32 17 25.58	W 103 47 24.31
	17600.00	90.00	356.80	9970.00	7672.43	7666.25	-315.38	0.00	469918.03	709274.68	N 32 17 26.57	W 103 47 24.31
	17700.00	90.00	356.80	9970.00	7772.39	7766.25	-316.07	0.00	470018.02	709274.68	N 32 17 27.56	W 103 47 24.32
	17800.00	90.00	356.80	9970.00	7872.33	7866.25	-316.77	0.00	470118.01	709274.68	N 32 17 28.55	W 103 47 24.32
	17900.00	90.00	356.80	9970.00	7972.28	7966.24	-317.47	0.00	470218.01	709274.68	N 32 17 29.54	W 103 47 24.32
	18000.00	90.00	356.80	9970.00	8072.23	8066.24	-318.16	0.00	470318.00	709274.68	N 32 17 30.53	W 103 47 24.32
	18100.00	90.00	356.80	9970.00	8172.26	8166.24	-318.86	0.00	470418.00	709274.68	N 32 17 31.51	W 103 47 24.33
	18200.00	90.00	356.80	9970.00	8272.23	8266.24	-318.86	0.00	470518.00	709274.68	N 32 17 32.50	W 103 47 24.33
	18300.00	90.00	356.80	9970.00	8372.19	8366.24	-320.25	0.00	470618.00	709274.68	N 32 17 33.48	W 103 47 24.33
	18400.00	90.00	356.80	9970.00	8472.16	8466.24	-320.25	0.00	470718.00	709274.68	N 32 17 34.48	W 103 47 24.33
	18500.00	90.00	356.80	9970.00	8572.13	8566.23	-320.25	0.00	470818.00	709274.68	N 32 17 35.47	W 103 47 24.33
	18600.00	90.00	356.80	9970.00	8672.08	8666.23	-321.64	0.00	470918.00	709274.68	N 32 17 36.46	W 103 47 24.33
	18700.00	90.00	356.80	9970.00	8772.06	8766.23	-322.34	0.00	471018.00	709274.68	N 32 17 37.45	W 103 47 24.34
	18800.00	90.00	356.80	9970.00	8872.00	8866.23	-323.04	0.00	471118.00	709274.68	N 32 17 38.44	W 103 47 24.34
	18900.00	90.00	356.80	9970.00	8971.98	8966.22	-323.73	0.00	471218.00	709274.68	N 32 17 39.43	W 103 47 24.34
	19000.00	90.00	356.80	9970.00	9071.93	9066.22	-324.43	0.00	471318.00	709274.68	N 32 17 40.42	W 103 47 24.34
	19100.00	90.00	356.80	9970.00	9171.83	9166.22	-325.12	0.00	471418.01	709274.68	N 32 17 41.41	W 103 47 24.35
	19200.00	90.00	356.80	99								

PERFORMANCE DATA

TMK UP SF TORQ™

5.500 in

23.00 lbs/ft

P110 CYHP

Technical Data Sheet

Tubular Parameters

Size	5.500	in	Minimum Yield	125,000	psi
Nominal Weight	23.00	lbs/ft	Minimum Tensile	135,000	psi
Grade	P110 CYHP		Yield Load	828,000	lbs
PE Weight	22.54	lbs/ft	Tensile Load	894,000	lbs
Wall Thickness	0.415	in	Min. Internal Yield Pressure	16,510	psi
Nominal ID	4.670	in	Collapse Pressure	15,990	psi
Drift Diameter	4.545	in			
Nom Pipe Body Area	6.630	in²			

Connection Parameters

Connection OD	5.830	in
Connection ID	4.626	in
Make-Up Loss	5.592	in
Critical Section Area	6.518	in²
Tension Efficiency	90.0	%
Compression Efficiency	90.0	%
Yield Load In Tension	745,000	lbs
Min. Internal Yield Pressure	16,510	psi
Collapse Pressure	15,990	psi
Uniaxial Bending	94	1/100 ft

Make-Up Torques

Min. Make-Up Torque	16,100	ft-lbs
Opt. Make-Up Torque	23,000	ft-lbs
Max. Make-Up Torque	25,300	ft-lbs
Operating Torque	36,000	ft-lbs
Yield Torque	45,000	ft-lbs

Printed on: August-02-2018

NOTE:

The content of this Technical Data Sheet is for general information only and does not guarantee performance or imply fitness for a particular purpose, which only a competent drilling professional can determine considering the specific installation and operation parameters. Information that is printed or downloaded is no longer controlled by TMK IPSCO and might not be the latest information. Anyone using the information herein does so at their own risk. To verify that you have the latest TMK IPSCO technical information, please contact TMK IPSCO Technical Sales toll-free at 1-888-256-2000.



IPSCO

TECHNICAL DATA SHEET TMK UP SF 7.625 X 26.4 L80 HC

TUBULAR PARAMETERS

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

PIPE BODY PROPERTIES

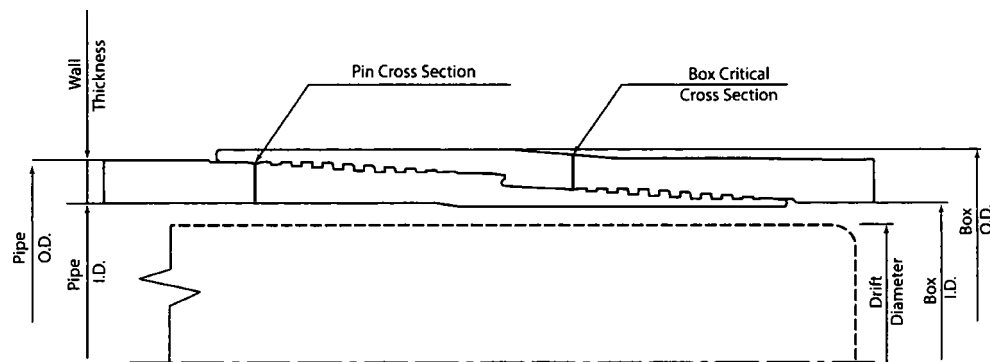
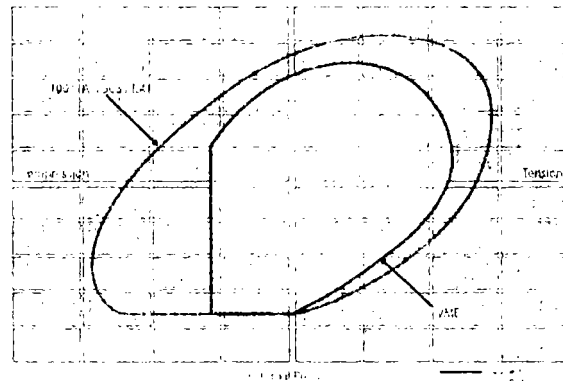
PE Weight, (lbs/ft)	25.56
Nominal Weight, (lbs/ft)	26.40
Nominal ID, (inch)	6.969
Drift Diameter, (inch)	6.844
Nominal Pipe Body Area, (sq inch)	7.519
Yield Strength in Tension, (klbs)	601
Min. Internal Yield Pressure, (psi)	6 020
Collapse Pressure, (psi)	3 910

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: The content of this Technical Data Sheet is for general information only and does not constitute a contract or warranty for any particular purpose, which only a competent engineering professional can determine. Considering the safety of installation and operation parameters, this information supersedes all previous versions for the connection line. It is the user's responsibility to ensure that the product is properly installed and operated. The information herein does not constitute a recommendation. To verify that you have the latest technical information please contact TMK Technical Sales. Russia: Tel.: +7 495 775-7600. Email: techsales@tmk-group.ru. TMK IPSCO in North America: Tel.: (313) 649-1044. Email: techsales@tmk.com

Print date: 07/10/2018 20:00

Print date: 07/10/2018 20:11

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	☐ None	☐ Secretary	☒ R-111-P
Cave/Karst Potential	☒ Low	☐ Medium	☐ High
Variance	☐ None	☒ Flex Hose	☐ Other
Wellhead	☐ Conventional	☒ Multibowl	
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP

All previous COAs still apply except for the following:

A. CASING

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 first intermediate casing is:

Option 1 (Single Stage):

- 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.**

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.

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

3. 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.

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

4. 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 18% - additional cement might be required.**

MHH 08302018

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.