Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

SUNDRY NOTICES AND REPORTS ON WELLS

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

SUBMIT IN TRIPLICATE - Other instructions on page 2

5. Lease Serial No.
NMLC064827A

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.
891000558X

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

8. Well Name and No.
JAMES RANCH UNIT DI 1A 203H

2. Name of Operator
BOPCO LP
Contact: KELLY KARDOS
E-Mail: kelly_kardos@xtoenergy.com

9. API Well No.
30-015-43237-00-X1

3a. Address
6401 HOLIDAY HILL RD BLDG 5 SUITE 200
MIDLAND, TX 79707

3b. Phone No. (include area code)
Ph: 432-620-4374

10. Field and Pool or Exploratory Area
~~UNDESIGNATED~~
WC G-07 S223021G Bone Spring

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 21 T22S R30E SENW 1360FNL 2560FWL
32.225195 N Lat, 103.531022 W Lon

11. County or Parish, State
EDDY COUNTY, NM

Carlsbad Field Office
OCD Artesia

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

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

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

BOPCO, LP requests approval of the following changes to the original APD:

C102 – BHL change
Drilling Program
BOP/Choke Design
Directional Drill Plan
Flex Hose Variance

Please see attached.....

RECEIVED

JUL 06 2018

DISTRICT II-ARTESIA O.C.D.

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

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

Electronic Submission #405713 verified by the BLM Well Information System
For BOPCO LP, sent to the Carlsbad
Committed to AFMSS for processing by PRISCILLA PEREZ on 03/08/2018 (18PP1252SE)

Name *(Printed/Typed)* KELLY KARDOS — Title REGULATORY COORDINATOR

Signature (Electronic Submission) — Date 02/26/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ZOTA STEVENS — Title PETROLEUM ENGINEER — Date 06/28/2018

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

Office Carlsbad

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

(Instructions on page 2)

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

RVS - 7-13-18

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

RECEIVED
JUL 06 2018
DISTRICT II-ARTESIA O.C.D.

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office
AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

30-015-43237 | 97905 | WC, Bone Spring | G-09 S223021G

[1] API Number	[2] Pool Code	[3] Pool Name
30-015-43237	97905	WC, Bone Spring

[4] Property Code	[5] Property Name	[6] Well Number
	JAMES RANCH UNIT DI 1A	203H

[7] OGRID No.	[8] Operator Name	[9] Elevation
260737	XTO ENERGY, INC.	3155'

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
F	21	22 S	30 E		1,360	NORTH	2,560	WEST	EDDY

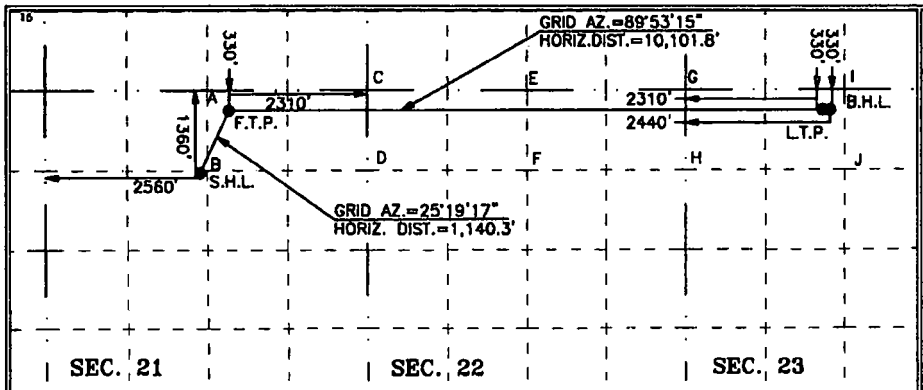
[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	23	22 S	30 E		330	NORTH	2,440	WEST	EDDY

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
320			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

[16]



SURFACE LOCATION NAD 27 NME	LAST TAKE POINT NAD 27 NME	SURFACE LOCATION NAD 83 NME	LAST TAKE POINT NAD 83 NME
Y= 502,646.1	Y= 503,696.4	Y= 502,706.4	Y= 503,756.7
X= 638,042.9	X= 648,502.5	X= 679,224.7	X= 689,684.3
LAT.= 32.381096'N	LAT.= 32.383858'N	LAT.= 32.381218'N	LAT.= 32.383980'N
LONG.= 103.886168'W	LONG.= 103.852272'W	LONG.=103.886663'W	LONG.= 103.852766'W

FIRST TAKE POINT NAD 27 NME	BOTTOM HOLE LOCATION NAD 27 NME	FIRST TAKE POINT NAD 83 NME	BOTTOM HOLE LOCATION NAD 83 NME
Y= 503,676.8	Y= 503,696.7	Y= 503,737.1	Y= 503,757.0
X= 638,530.7	X= 648,632.5	X= 679,712.4	X= 689,814.3
LAT.= 32.383924'N	LAT.= 32.383857'N	LAT.= 32.384045'N	LAT.= 32.383979'N
LONG.= 103.884575'W	LONG.= 103.851851'W	LONG.= 103.885069'W	LONG.= 103.852345'W

CORNER COORDINATES TABLE NAD 27 NME

A - Y= 504,006.3 N,	X= 638,159.5 E	
B - Y= 502,686.5 N,	X= 638,162.8 E	
C - Y= 504,010.0 N,	X= 640,839.9 E	
D - Y= 502,689.8 N,	X= 640,843.1 E	
E - Y= 504,015.2 N,	X= 643,515.8 E	
F - Y= 502,695.6 N,	X= 643,517.4 E	
G - Y= 504,021.4 N,	X= 646,192.5 E	
H - Y= 502,702.0 N,	X= 646,192.5 E	
I - Y= 504,027.2 N,	X= 648,874.4 E	
J - Y= 502,707.8 N,	X= 648,873.2 E	

CORNER COORDINATES TABLE NAD 83 NME

A - Y= 504,066.6 N,	X= 679,341.2 E	
B - Y= 502,746.8 N,	X= 679,344.6 E	
C - Y= 504,070.3 N,	X= 682,021.6 E	
D - Y= 502,750.1 N,	X= 682,024.9 E	
E - Y= 504,075.5 N,	X= 684,697.5 E	
F - Y= 502,755.9 N,	X= 684,699.2 E	
G - Y= 504,081.7 N,	X= 687,374.2 E	
H - Y= 502,762.3 N,	X= 687,374.3 E	
I - Y= 504,087.5 N,	X= 690,056.2 E	
J - Y= 502,768.1 N,	X= 690,055.0 E	

[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division

Kelly Hardies 2/23/18
Signature Date

Kelly Hardies
Printed Name

Kelly.Hardies@XTOenergy.com
E-mail Address

[18] SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

05-24-2017
Date of Survey

Signature and Seal of Professional Surveyor:

MARK DILLON HARP
NEW MEXICO
23786
PROFESSIONAL SURVEYOR

MARK DILLON HARP 23786
Certificate Number RR 20170506555

RVP 7-13-18

DRILLING PLAN: BLM COMPLIANCE
(Supplement to BLM 3160-3)

BOPCO, LP
JRU DI 1A 203H
Projected TD: 21259' MD / 10692' TVD
SHL: 1400' FNL & 2560' FWL , Section 21, T22S, R30E
BHL: 330' FNL & 2440' FWL , Section 23, T22S, R30E
Eddy County, NM

1. Geologic Name of Surface Formation

A. Quaternary

2. Estimated Tops of Geological Markers & Depths of Anticipated Fresh Water, Oil or Gas:

Formation	Well Depth (TVD)	Water/Oil/Gas
Rustler	186'	Water
Top of Salt	551'	Water
Base of Salt	3266'	Water
Delaware / Lamar	3531'	Water
Bone Spring	7369'	Water/Oil/Gas
1st Bone Spring Ss	8383'	Water/Oil/Gas
2nd Bone Spring Ss	9118'	Water/Oil/Gas
3rd Bone Spring Ss	9539'	Water/Oil/Gas
Target/Land Curve	10692'	Water/Oil/Gas

*** Hydrocarbons @ Brushy Canyon
*** Groundwater depth 40' (per NM State Engineers Office).

No other formations are expected to yield oil, gas or fresh water in measurable volumes. The surface fresh water sands will be protected by setting 13-3/8 inch casing @ 520' (31' above the salt) and circulating cement back to surface. The salt will be isolated by setting 9-5/8 inch casing at 8400' and circulating cement to surface. An 8-3/4 inch curve and 8-1/2 inch lateral hole will be drilled to MD/TD and 5-1/2 inch casing will be set at TD and cemented back up to the 9-5/8 inch casing shoe.

3. Casing Design

Hole Size	Depth	OD Csg	Weight	Collar	Grade	New/Used	SF Burst	SF Collapse	SF Tension
17-1/2"	0' – 520'	13-3/8"	54.5	STC	~~H40~~ J-55	New	1.06	4.75	18.14
12-1/4"	0' – 8400'	9-5/8"	40	LTC	J-55	New	1.89	1.63	2.49
8-3/4" x 8-1/2"	0' – 21259'	5-1/2"	17	BTC	P-110	New	1.12	1.39	2.19

· XTO requests to utilize centralizers only in the curve after the KOP and only a minimum of one every other joint.
· 9-5/8" Collapse analyzed using 50% evacuation based on regional experience.
· 5-1/2" tension calculated using vertical hanging weight plus the lateral weight multiplied by a friction factor of 0.3

WELLHEAD:

Permanent Wellhead – GE RSH Multibowl System

A. Starting Head: 13-5/8" 5M top flange x 13-3/8" SOW bottom
B. Tubing Head: 13-5/8" 5M bottom flange x 7-1/16" 10M top flange
· Wellhead will be installed by manufacturer's representatives.
· Manufacturer will monitor welding process to ensure appropriate temperature of seal.
· Manufacturer will witness installation of test plug for initial test.
· Operator will test the 9-5/8" casing per BLM Onshore Order 2

4. Cement Program

Surface Casing: 13-3/8", 54.5 New H-40, STC casing to be set at +/- 520'

Lead: 160 sxs EconoCem-HLTRRC (mixed at 12.9 ppg, 1.87 ft3/sx, 10.13 gal/sx water)
Tail: 300 sxs Halcem-C + 2% CaCl (mixed at 14.8 ppg, 1.35 ft3/sx, 6.39 gal/sx water)
Compressives: 12-hr = 900 psi 24 hr = 1500 psi

Intermediate Casing: 9-5/8", 40 New J-55, LTC casing to be set at +/- 8400

Lead: 2630 sxs Halcem-C + 2% CaCl (mixed at 12.9 ppg, 1.88 ft3/sx, 9.61 gal/sx water)

Tail: 230 sxs Halcem-C + 2% CaCl (mixed at 14.8 ppg, 1.33 ft3/sx, 6.39 gal/sx water)
Compressives: 12-hr = 900 psi 24 hr = 1500 psi

Production Casing: 5-1/2", 17 New P-110, BTC casing to be set at +/- 21259'

Lead: 1130 sxs NeoCem (mixed at 10.5 ppg, 2.69 ft3/sx, 12.26 gal/sx water)

Tail: 2250 sxs VersaCem (mixed at 13.2 ppg, 1.61 ft3/sx, 8.38 gal/sx water)
Compressives: 12-hr = 1375 psi 24 hr = 2285 psi

5. Pressure Control Equipment

The blow out preventer equipment (BOP) for this well consists of a 13-5/8" minimum 5M Hydril and a 13-5/8" minimum 5M Double Ram BOP. MASP should not exceed 3041 psi.

All BOP testing will be done by an independent service company. Annular pressure tests will be limited to 50% of the working pressure. When nippling up on the 13-5/8" 5M bradenhead and flange, the BOP test will be limited to 5000 psi. When nippling up on the 9-5/8", the BOP will be tested to a minimum of 5000 psi. All BOP tests will include a low pressure test as per BLM regulations. The 5M BOP diagrams are attached. Blind rams will be functioned tested each trip, pipe rams will be functioned tested each day.

A variance is requested to allow use of a flex hose as the choke line from the BOP to the Choke Manifold. If this hose is used, a copy of the manufacturer's certification and pressure test chart will be kept on the rig. Attached is an example of a certification and pressure test chart. The manufacturer does not require anchors.

6. Proposed Mud Circulation System

INTERVAL	Hole Size	Mud Type	MW (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
0' to 520'	17-1/2"	FW/Native	8.4-8.8	35-40	NC
520' to 8400'	12-1/4"	Brine/Gel Sweeps	9.8-10.2	30-32	NC
8400' to 21259'	8-3/4" x 8-1/2"	FW / Cut Brine / Polymer	9.4 - 9.7	29-32	NC - 20

The necessary mud products for weight addition and fluid loss control will be on location at all times
Spud with fresh water/native mud. Drill out from under 13-3/8" surface casing with brine solution. A 9.8ppg-10.2ppg brine mud will be used while drilling through the salt formation. Use fibrous materials as needed to control seepage and lost circulation. Pump viscous sweeps as needed for hole cleaning. Pump speed will be recorded on a daily drilling report after mudding up. A Pason or Totco will be used to detect changes in loss or gain of mud volume. A mud test will be performed every 24 hours to determine: density, viscosity, strength, filtration and pH as necessary. Use available solids controls equipment to help keep mud weight down after mud up. Rig up solids control equipment to operate as a closed loop system.

7. Auxiliary Well Control and Monitoring Equipment

A. A Kelly cock will be in the drill string at all times.
B. A full opening drill pipe stabbing valve having appropriate connections will be on the rig floor at all times.
C. H2S monitors will be on location when drilling below the 13-3/8" casing.

8. Logging, Coring and Testing Program

Mud Logger: Mud Logging Unit (2 man) below intermediate casing.

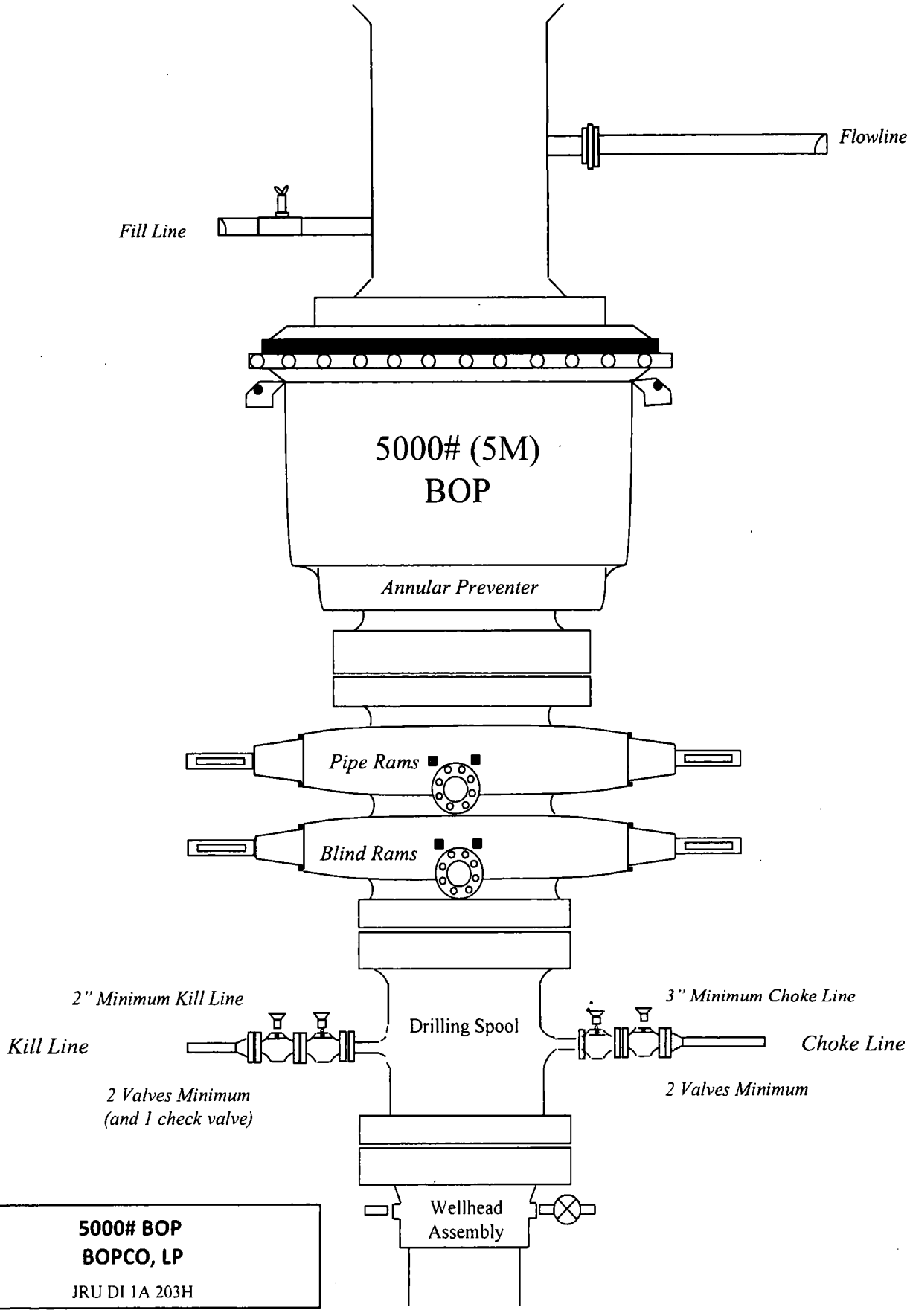
Open hole logging will not be done on this well.

9. Abnormal Pressures and Temperatures / Potential Hazards

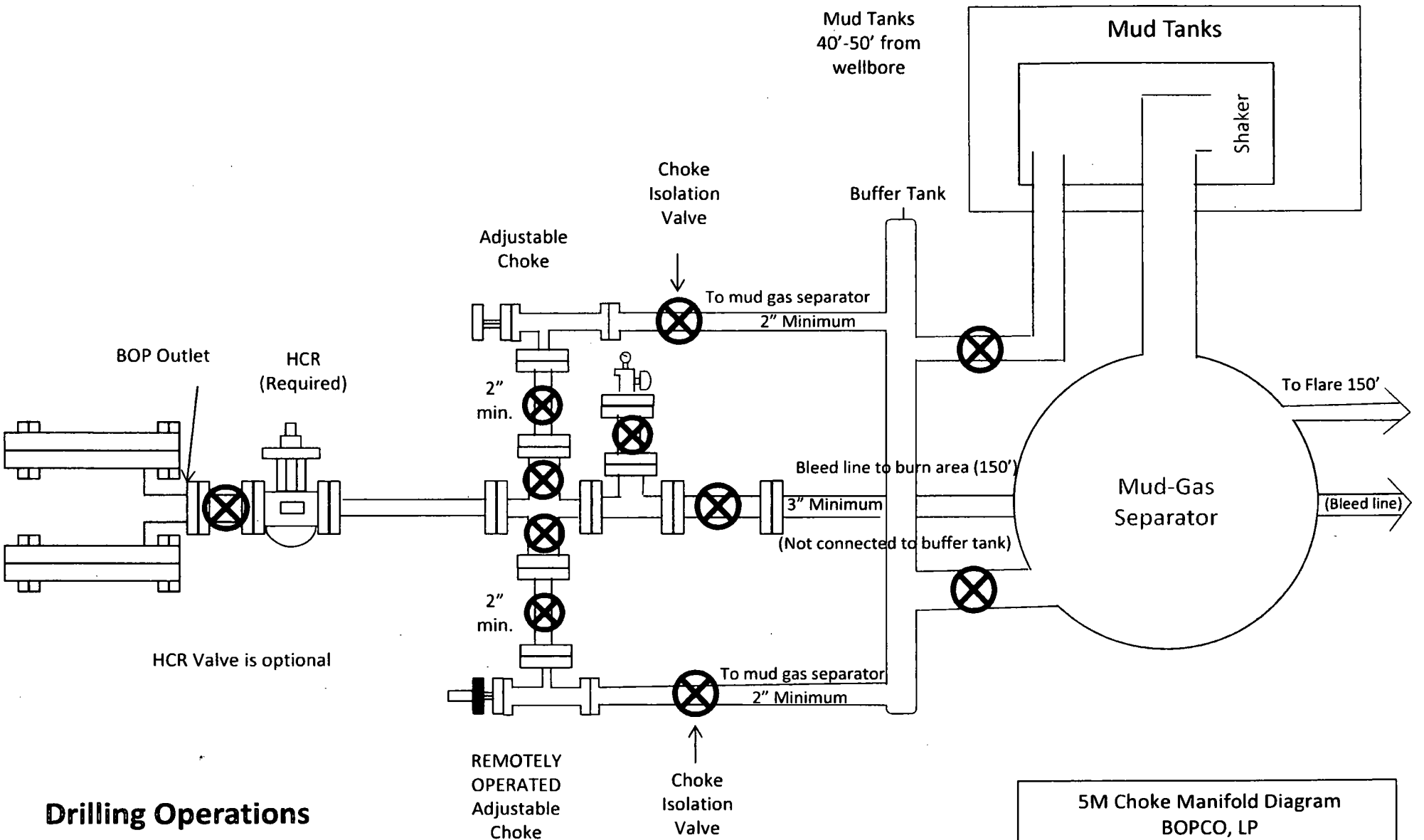
None Anticipated. BHT of 150 to 170 F is anticipated. No H2S is expected but monitors will be in place to detect any H2S occurrences. Should these circumstances be encountered the operator and drilling contractor are prepared to take all necessary steps to ensure safety of all personnel and environment. Lost circulation could occur but is not expected to be a serious problem in this area and hole seepage will be compensated for by additions of small amounts of LCM in the drilling fluid. The maximum anticipated bottom hole pressure for this well is 5393 psi.

10. Anticipated Starting Date and Duration of Operations

Road and location construction will begin after Santa Fe and BLM have approved the APD. Anticipated spud date will be as soon after Santa Fe and BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 40 days. If production casing is run, an additional 30 days will be needed to complete well and construct surface facilities and/or lay flow lines in order to place well on production.



5000# BOP
BOPCO, LP
JRU DI 1A 203H



Drilling Operations
Choke Manifold
5M Service

5M Choke Manifold Diagram
BOPCO, LP

JRU DI 1A 203H

XTO ENERGY, INC.

Eddy County, NM
Sec 21, T22S, R30E
James Ranch Unit DI 1A #203H

Wellbore #1

Plan: Design #1

QES Well Planning Report

22 November, 2017

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well James Ranch Unit DI 1A #203H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3179.0usft (Noram #25)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3179.0usft (Noram #25)
Site:	Sec 21, T22S, R30E	**North Reference:**	Grid
Well:	James Ranch Unit DI 1A #203H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Eddy County, NM		
Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec 21, T22S, R30E				
Site Position:		**Northing:**	502,495.20 usft	**Latitude:**	32° 22' 50.401 N
From:	Map	**Easting:**	639,272.00 usft	**Longitude:**	103° 52' 55.882 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.24 °

Well	James Ranch Unit DI 1A #203H					
Well Position	**+N/-S**	150.9 usft	**Northing:**	502,646.10 usft	**Latitude:**	32° 22' 51.945 N
	+E/-W	-1,229.1 usft	**Easting:**	638,042.90 usft	**Longitude:**	103° 53' 10.207 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	3,155.0 usft

Wellbore	Wellbore #1				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	11/21/2017	7.07	60.15	47,955.66405628

Design	Design #1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.0	0.0	0.0	84.33	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,326.7	4.90	343.00	1,326.3	13.3	-4.1	1.50	1.50	0.00	343.00	
9,776.7	4.90	343.00	9,745.4	703.6	-215.1	0.00	0.00	0.00	0.00	
9,987.9	21.75	349.90	9,950.2	751.1	-224.7	8.00	7.98	3.27	8.81	
11,157.4	89.86	89.89	10,660.0	1,030.7	487.8	8.00	5.82	8.55	99.34	FTP - JRU DI 1A #20
21,259.3	89.86	89.89	10,685.0	1,050.6	10,589.6	0.00	0.00	0.00	0.00	PBHL - JRU DI 1A #2

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well James Ranch Unit DI 1A #203H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3179.0usft (Noram #25)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3179.0usft (Noram #25)
Site:	Sec 21, T22S, R30E	**North Reference:**	Grid
Well:	James Ranch Unit DI 1A #203H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
Rustler									
179.0	0.00	0.00	179.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
Salado									
544.0	0.00	0.00	544.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
Build 1.5°/100'									
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	1.50	343.00	1,100.0	1.3	-0.4	-0.3	1.50	1.50	0.00
1,200.0	3.00	343.00	1,199.9	5.0	-1.5	-1.0	1.50	1.50	0.00
1,300.0	4.50	343.00	1,299.7	11.3	-3.4	-2.3	1.50	1.50	0.00
EOB @ 4.90° Inc / 343.00° Azm									
1,326.7	4.90	343.00	1,326.3	13.3	-4.1	-2.7	1.50	1.50	0.00
1,400.0	4.90	343.00	1,399.3	19.3	-5.9	-4.0	0.00	0.00	0.00
1,500.0	4.90	343.00	1,499.0	27.5	-8.4	-5.7	0.00	0.00	0.00
1,600.0	4.90	343.00	1,598.6	35.7	-10.9	-7.3	0.00	0.00	0.00
1,700.0	4.90	343.00	1,698.2	43.8	-13.4	-9.0	0.00	0.00	0.00
1,800.0	4.90	343.00	1,797.9	52.0	-15.9	-10.7	0.00	0.00	0.00
1,900.0	4.90	343.00	1,897.5	60.2	-18.4	-12.4	0.00	0.00	0.00
2,000.0	4.90	343.00	1,997.1	68.4	-20.9	-14.0	0.00	0.00	0.00
2,100.0	4.90	343.00	2,096.8	76.5	-23.4	-15.7	0.00	0.00	0.00
2,200.0	4.90	343.00	2,196.4	84.7	-25.9	-17.4	0.00	0.00	0.00
2,300.0	4.90	343.00	2,296.0	92.9	-28.4	-19.1	0.00	0.00	0.00
2,400.0	4.90	343.00	2,395.7	101.0	-30.9	-20.8	0.00	0.00	0.00
2,500.0	4.90	343.00	2,495.3	109.2	-33.4	-22.4	0.00	0.00	0.00
2,600.0	4.90	343.00	2,594.9	117.4	-35.9	-24.1	0.00	0.00	0.00
2,700.0	4.90	343.00	2,694.6	125.5	-38.4	-25.8	0.00	0.00	0.00
2,800.0	4.90	343.00	2,794.2	133.7	-40.9	-27.5	0.00	0.00	0.00
2,900.0	4.90	343.00	2,893.9	141.9	-43.4	-29.2	0.00	0.00	0.00
3,000.0	4.90	343.00	2,993.5	150.0	-45.9	-30.8	0.00	0.00	0.00
3,100.0	4.90	343.00	3,093.1	158.2	-48.4	-32.5	0.00	0.00	0.00
3,200.0	4.90	343.00	3,192.8	166.4	-50.9	-34.2	0.00	0.00	0.00
Base Salt									
3,266.5	4.90	343.00	3,259.0	171.8	-52.5	-35.3	0.00	0.00	0.00
3,300.0	4.90	343.00	3,292.4	174.5	-53.4	-35.9	0.00	0.00	0.00
3,400.0	4.90	343.00	3,392.0	182.7	-55.9	-37.5	0.00	0.00	0.00
3,500.0	4.90	343.00	3,491.7	190.9	-58.4	-39.2	0.00	0.00	0.00
Delaware/Lamar									
3,532.5	4.90	343.00	3,524.0	193.5	-59.2	-39.8	0.00	0.00	0.00
Bell Canyon									
3,577.6	4.90	343.00	3,569.0	197.2	-60.3	-40.5	0.00	0.00	0.00
3,600.0	4.90	343.00	3,591.3	199.0	-60.9	-40.9	0.00	0.00	0.00
3,700.0	4.90	343.00	3,690.9	207.2	-63.4	-42.6	0.00	0.00	0.00
3,800.0	4.90	343.00	3,790.6	215.4	-65.8	-44.3	0.00	0.00	0.00
3,900.0	4.90	343.00	3,890.2	223.6	-68.3	-45.9	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well James Ranch Unit DI 1A #203H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3179.0usft (Noram #25)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3179.0usft (Noram #25)
Site:	Sec 21, T22S, R30E	**North Reference:**	Grid
Well:	James Ranch Unit DI 1A #203H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,000.0	4.90	343.00	3,989.8	231.7	-70.8	-47.6	0.00	0.00	0.00
4,100.0	4.90	343.00	4,089.5	239.9	-73.3	-49.3	0.00	0.00	0.00
4,200.0	4.90	343.00	4,189.1	248.1	-75.8	-51.0	0.00	0.00	0.00
4,300.0	4.90	343.00	4,288.7	256.2	-78.3	-52.7	0.00	0.00	0.00
4,400.0	4.90	343.00	4,388.4	264.4	-80.8	-54.3	0.00	0.00	0.00
Cherry Canyon									
4,458.8	4.90	343.00	4,447.0	269.2	-82.3	-55.3	0.00	0.00	0.00
4,500.0	4.90	343.00	4,488.0	272.6	-83.3	-56.0	0.00	0.00	0.00
4,600.0	4.90	343.00	4,587.6	280.7	-85.8	-57.7	0.00	0.00	0.00
Base Manzanita									
4,647.5	4.90	343.00	4,635.0	284.6	-87.0	-58.5	0.00	0.00	0.00
4,700.0	4.90	343.00	4,687.3	288.9	-88.3	-59.4	0.00	0.00	0.00
4,800.0	4.90	343.00	4,786.9	297.1	-90.8	-61.1	0.00	0.00	0.00
4,900.0	4.90	343.00	4,886.5	305.2	-93.3	-62.7	0.00	0.00	0.00
5,000.0	4.90	343.00	4,986.2	313.4	-95.8	-64.4	0.00	0.00	0.00
5,100.0	4.90	343.00	5,085.8	321.6	-98.3	-66.1	0.00	0.00	0.00
5,200.0	4.90	343.00	5,185.4	329.7	-100.8	-67.8	0.00	0.00	0.00
5,300.0	4.90	343.00	5,285.1	337.9	-103.3	-69.4	0.00	0.00	0.00
5,400.0	4.90	343.00	5,384.7	346.1	-105.8	-71.1	0.00	0.00	0.00
5,500.0	4.90	343.00	5,484.3	354.2	-108.3	-72.8	0.00	0.00	0.00
5,600.0	4.90	343.00	5,584.0	362.4	-110.8	-74.5	0.00	0.00	0.00
5,700.0	4.90	343.00	5,683.6	370.6	-113.3	-76.2	0.00	0.00	0.00
5,800.0	4.90	343.00	5,783.3	378.8	-115.8	-77.8	0.00	0.00	0.00
5,900.0	4.90	343.00	5,882.9	386.9	-118.3	-79.5	0.00	0.00	0.00
6,000.0	4.90	343.00	5,982.5	395.1	-120.8	-81.2	0.00	0.00	0.00
Brushy Canyon									
6,021.6	4.90	343.00	6,004.0	396.9	-121.3	-81.6	0.00	0.00	0.00
6,100.0	4.90	343.00	6,082.2	403.3	-123.3	-82.9	0.00	0.00	0.00
6,200.0	4.90	343.00	6,181.8	411.4	-125.8	-84.6	0.00	0.00	0.00
6,300.0	4.90	343.00	6,281.4	419.6	-128.3	-86.2	0.00	0.00	0.00
6,400.0	4.90	343.00	6,381.1	427.8	-130.8	-87.9	0.00	0.00	0.00
6,500.0	4.90	343.00	6,480.7	435.9	-133.3	-89.6	0.00	0.00	0.00
6,600.0	4.90	343.00	6,580.3	444.1	-135.8	-91.3	0.00	0.00	0.00
6,700.0	4.90	343.00	6,680.0	452.3	-138.3	-92.9	0.00	0.00	0.00
6,800.0	4.90	343.00	6,779.6	460.4	-140.8	-94.6	0.00	0.00	0.00
6,900.0	4.90	343.00	6,879.2	468.6	-143.3	-96.3	0.00	0.00	0.00
7,000.0	4.90	343.00	6,978.9	476.8	-145.8	-98.0	0.00	0.00	0.00
7,100.0	4.90	343.00	7,078.5	484.9	-148.3	-99.7	0.00	0.00	0.00
Basal Brushy Canyon									
7,101.5	4.90	343.00	7,080.0	485.1	-148.3	-99.7	0.00	0.00	0.00
7,200.0	4.90	343.00	7,178.1	493.1	-150.8	-101.3	0.00	0.00	0.00
7,300.0	4.90	343.00	7,277.8	501.3	-153.3	-103.0	0.00	0.00	0.00
Base Brushy Canyon Sands									
7,358.4	4.90	343.00	7,336.0	506.1	-154.7	-104.0	0.00	0.00	0.00
Bone Spring									
7,384.5	4.90	343.00	7,362.0	508.2	-155.4	-104.4	0.00	0.00	0.00
7,400.0	4.90	343.00	7,377.4	509.4	-155.8	-104.7	0.00	0.00	0.00
Avalon Sand									
7,488.9	4.90	343.00	7,466.0	516.7	-158.0	-106.2	0.00	0.00	0.00
7,500.0	4.90	343.00	7,477.0	517.6	-158.3	-106.4	0.00	0.00	0.00
7,600.0	4.90	343.00	7,576.7	525.8	-160.7	-108.1	0.00	0.00	0.00
7,700.0	4.90	343.00	7,676.3	534.0	-163.2	-109.7	0.00	0.00	0.00
7,800.0	4.90	343.00	7,775.9	542.1	-165.7	-111.4	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well James Ranch Unit DI 1A #203H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3179.0usft (Noram #25)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3179.0usft (Noram #25)
Site:	Sec 21, T22S, R30E	**North Reference:**	Grid
Well:	James Ranch Unit DI 1A #203H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,900.0	4.90	343.00	7,875.6	550.3	-168.2	-113.1	0.00	0.00	0.00
Lower Avalon Shale									
7,979.7	4.90	343.00	7,955.0	556.8	-170.2	-114.4	0.00	0.00	0.00
8,000.0	4.90	343.00	7,975.2	558.5	-170.7	-114.8	0.00	0.00	0.00
8,100.0	4.90	343.00	8,074.8	566.6	-173.2	-116.4	0.00	0.00	0.00
8,200.0	4.90	343.00	8,174.5	574.8	-175.7	-118.1	0.00	0.00	0.00
8,300.0	4.90	343.00	8,274.1	583.0	-178.2	-119.8	0.00	0.00	0.00
8,400.0	4.90	343.00	8,373.8	591.1	-180.7	-121.5	0.00	0.00	0.00
First Bone Spring Sand									
8,402.3	4.90	343.00	8,376.0	591.3	-180.8	-121.5	0.00	0.00	0.00
8,500.0	4.90	343.00	8,473.4	599.3	-183.2	-123.2	0.00	0.00	0.00
8,600.0	4.90	343.00	8,573.0	607.5	-185.7	-124.8	0.00	0.00	0.00
8,700.0	4.90	343.00	8,672.7	615.6	-188.2	-126.5	0.00	0.00	0.00
8,800.0	4.90	343.00	8,772.3	623.8	-190.7	-128.2	0.00	0.00	0.00
Second Bone Spring Limestone									
8,872.0	4.90	343.00	8,844.0	629.7	-192.5	-129.4	0.00	0.00	0.00
8,900.0	4.90	343.00	8,871.9	632.0	-193.2	-129.9	0.00	0.00	0.00
9,000.0	4.90	343.00	8,971.6	640.1	-195.7	-131.6	0.00	0.00	0.00
9,100.0	4.90	343.00	9,071.2	648.3	-198.2	-133.2	0.00	0.00	0.00
Second Bone Spring Sand									
9,140.0	4.90	343.00	9,111.0	651.6	-199.2	-133.9	0.00	0.00	0.00
9,200.0	4.90	343.00	9,170.8	656.5	-200.7	-134.9	0.00	0.00	0.00
9,300.0	4.90	343.00	9,270.5	664.6	-203.2	-136.6	0.00	0.00	0.00
9,400.0	4.90	343.00	9,370.1	672.8	-205.7	-138.3	0.00	0.00	0.00
9,500.0	4.90	343.00	9,469.7	681.0	-208.2	-140.0	0.00	0.00	0.00
Third Bone Spring Limestone									
9,562.5	4.90	343.00	9,532.0	686.1	-209.8	-141.0	0.00	0.00	0.00
9,600.0	4.90	343.00	9,569.4	689.2	-210.7	-141.6	0.00	0.00	0.00
9,700.0	4.90	343.00	9,669.0	697.3	-213.2	-143.3	0.00	0.00	0.00
Build 8°/100'									
9,776.7	4.90	343.00	9,745.4	703.6	-215.1	-144.6	0.00	0.00	0.00
9,800.0	6.75	345.43	9,768.6	705.9	-215.7	-145.0	8.00	7.93	10.42
9,850.0	10.74	347.82	9,818.0	713.3	-217.5	-146.0	8.00	7.97	4.78
9,900.0	14.73	348.92	9,866.8	724.1	-219.7	-147.1	8.00	7.99	2.21
9,950.0	18.72	349.57	9,914.6	738.2	-222.3	-148.4	8.00	7.99	1.28
EOB @ 21.75° Inc / 349.90° Azm - Build/Turn 8°/100'									
9,987.9	21.75	349.90	9,950.2	751.1	-224.7	-149.4	8.00	7.99	0.88
10,000.0	21.62	352.49	9,961.4	755.5	-225.4	-149.7	8.00	-1.13	21.43
10,050.0	21.49	3.39	10,008.0	773.8	-226.0	-148.5	8.00	-0.26	21.79
10,100.0	22.06	14.08	10,054.4	792.0	-223.2	-143.9	8.00	1.14	21.37
10,150.0	23.28	23.97	10,100.6	810.2	-216.9	-135.9	8.00	2.44	19.79
10,200.0	25.05	32.74	10,146.2	828.1	-207.2	-124.4	8.00	3.55	17.53
10,250.0	27.27	40.29	10,191.1	845.8	-194.0	-109.6	8.00	4.44	15.11
10,300.0	29.84	46.72	10,235.0	863.1	-177.5	-91.5	8.00	5.14	12.84
10,350.0	32.68	52.16	10,277.8	879.9	-157.8	-70.2	8.00	5.67	10.90
Third Bone Spring Sand									
10,388.8	35.02	55.83	10,310.0	892.6	-140.3	-51.5	8.00	6.03	9.44
10,400.0	35.71	56.81	10,319.1	896.1	-134.9	-45.8	8.00	6.20	8.73
10,450.0	38.90	60.80	10,358.9	911.8	-109.0	-18.5	8.00	6.37	7.98
10,500.0	42.20	64.27	10,396.9	926.8	-80.2	11.7	8.00	6.61	6.93
10,550.0	45.60	67.31	10,432.9	940.9	-48.6	44.6	8.00	6.79	6.09
10,600.0	49.07	70.02	10,466.8	954.3	-14.3	80.0	8.00	6.94	5.42
10,650.0	52.59	72.46	10,498.4	966.7	22.4	117.7	8.00	7.05	4.87

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well James Ranch Unit DI 1A #203H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3179.0usft (Noram #25)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3179.0usft (Noram #25)
Site:	Sec 21, T22S, R30E	**North Reference:**	Grid
Well:	James Ranch Unit DI 1A #203H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,700.0	56.17	74.67	10,527.5	978.2	61.4	157.6	8.00	7.14	4.43
10,750.0	59.77	76.71	10,554.0	988.7	102.4	199.5	8.00	7.22	4.07
10,800.0	63.41	78.60	10,577.8	998.1	145.4	243.2	8.00	7.27	3.78
Third Bone Spring RH Sand									
10,845.6	66.75	80.22	10,597.0	1,005.6	186.0	284.4	8.00	7.32	3.56
10,850.0	67.07	80.38	10,598.7	1,006.3	190.0	288.4	8.00	7.34	3.46
10,900.0	70.75	82.06	10,616.7	1,013.4	236.1	335.0	8.00	7.36	3.36
10,950.0	74.44	83.66	10,631.7	1,019.4	283.4	382.7	8.00	7.39	3.21
11,000.0	78.15	85.21	10,643.5	1,024.1	331.8	431.3	8.00	7.41	3.10
11,050.0	81.86	86.72	10,652.2	1,027.5	380.9	480.5	8.00	7.43	3.02
11,100.0	85.58	88.20	10,657.7	1,029.7	430.5	530.1	8.00	7.44	2.96
11,150.0	89.30	89.67	10,659.9	1,030.7	480.5	579.9	8.00	7.44	2.93
EOC @ 89.85° Inc / 89.89° Azm / 10659.9' TVD									
11,157.4	89.86	89.89	10,660.0	1,030.7	487.8	587.2	8.00	7.45	2.93
11,200.0	89.86	89.89	10,660.1	1,030.8	530.4	629.5	0.00	0.00	0.00
11,300.0	89.86	89.89	10,660.4	1,031.0	630.4	729.1	0.00	0.00	0.00
11,400.0	89.86	89.89	10,660.6	1,031.2	730.4	828.6	0.00	0.00	0.00
11,500.0	89.86	89.89	10,660.8	1,031.4	830.4	928.1	0.00	0.00	0.00
11,600.0	89.86	89.89	10,661.1	1,031.6	930.4	1,027.6	0.00	0.00	0.00
11,700.0	89.86	89.89	10,661.3	1,031.8	1,030.4	1,127.2	0.00	0.00	0.00
11,800.0	89.86	89.89	10,661.6	1,032.0	1,130.4	1,226.7	0.00	0.00	0.00
11,900.0	89.86	89.89	10,661.8	1,032.2	1,230.4	1,326.2	0.00	0.00	0.00
12,000.0	89.86	89.89	10,662.1	1,032.4	1,330.3	1,425.8	0.00	0.00	0.00
12,100.0	89.86	89.89	10,662.3	1,032.6	1,430.3	1,525.3	0.00	0.00	0.00
12,200.0	89.86	89.89	10,662.6	1,032.8	1,530.3	1,624.8	0.00	0.00	0.00
12,300.0	89.86	89.89	10,662.8	1,033.0	1,630.3	1,724.4	0.00	0.00	0.00
12,400.0	89.86	89.89	10,663.1	1,033.1	1,730.3	1,823.9	0.00	0.00	0.00
12,500.0	89.86	89.89	10,663.3	1,033.3	1,830.3	1,923.4	0.00	0.00	0.00
12,600.0	89.86	89.89	10,663.6	1,033.5	1,930.3	2,023.0	0.00	0.00	0.00
12,700.0	89.86	89.89	10,663.8	1,033.7	2,030.3	2,122.5	0.00	0.00	0.00
12,800.0	89.86	89.89	10,664.1	1,033.9	2,130.3	2,222.0	0.00	0.00	0.00
12,900.0	89.86	89.89	10,664.3	1,034.1	2,230.3	2,321.5	0.00	0.00	0.00
13,000.0	89.86	89.89	10,664.6	1,034.3	2,330.3	2,421.1	0.00	0.00	0.00
13,100.0	89.86	89.89	10,664.8	1,034.5	2,430.3	2,520.6	0.00	0.00	0.00
13,200.0	89.86	89.89	10,665.1	1,034.7	2,530.3	2,620.1	0.00	0.00	0.00
13,300.0	89.86	89.89	10,665.3	1,034.9	2,630.3	2,719.7	0.00	0.00	0.00
13,400.0	89.86	89.89	10,665.5	1,035.1	2,730.3	2,819.2	0.00	0.00	0.00
13,500.0	89.86	89.89	10,665.8	1,035.3	2,830.3	2,918.7	0.00	0.00	0.00
13,600.0	89.86	89.89	10,666.0	1,035.5	2,930.3	3,018.3	0.00	0.00	0.00
13,700.0	89.86	89.89	10,666.3	1,035.7	3,030.3	3,117.8	0.00	0.00	0.00
13,800.0	89.86	89.89	10,666.5	1,035.9	3,130.3	3,217.3	0.00	0.00	0.00
13,900.0	89.86	89.89	10,666.8	1,036.1	3,230.3	3,316.8	0.00	0.00	0.00
14,000.0	89.86	89.89	10,667.0	1,036.3	3,330.3	3,416.4	0.00	0.00	0.00
14,100.0	89.86	89.89	10,667.3	1,036.5	3,430.3	3,515.9	0.00	0.00	0.00
14,200.0	89.86	89.89	10,667.5	1,036.7	3,530.3	3,615.4	0.00	0.00	0.00
14,300.0	89.86	89.89	10,667.8	1,036.9	3,630.3	3,715.0	0.00	0.00	0.00
14,400.0	89.86	89.89	10,668.0	1,037.1	3,730.3	3,814.5	0.00	0.00	0.00
14,500.0	89.86	89.89	10,668.3	1,037.3	3,830.3	3,914.0	0.00	0.00	0.00
14,600.0	89.86	89.89	10,668.5	1,037.5	3,930.3	4,013.6	0.00	0.00	0.00
14,700.0	89.86	89.89	10,668.8	1,037.7	4,030.3	4,113.1	0.00	0.00	0.00
14,800.0	89.86	89.89	10,669.0	1,037.9	4,130.3	4,212.6	0.00	0.00	0.00
14,900.0	89.86	89.89	10,669.3	1,038.1	4,230.3	4,312.2	0.00	0.00	0.00
15,000.0	89.86	89.89	10,669.5	1,038.3	4,330.3	4,411.7	0.00	0.00	0.00
15,100.0	89.86	89.89	10,669.8	1,038.5	4,430.3	4,511.2	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well James Ranch Unit DI 1A #203H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3179.0usft (Noram #25)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3179.0usft (Noram #25)
Site:	Sec 21, T22S, R30E	**North Reference:**	Grid
Well:	James Ranch Unit DI 1A #203H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,200.0	89.86	89.89	10,670.0	1,038.7	4,530.3	4,610.7	0.00	0.00	0.00
15,300.0	89.86	89.89	10,670.3	1,038.9	4,630.3	4,710.3	0.00	0.00	0.00
15,400.0	89.86	89.89	10,670.5	1,039.1	4,730.3	4,809.8	0.00	0.00	0.00
15,500.0	89.86	89.89	10,670.7	1,039.3	4,830.3	4,909.3	0.00	0.00	0.00
15,600.0	89.86	89.89	10,671.0	1,039.5	4,930.3	5,008.9	0.00	0.00	0.00
15,700.0	89.86	89.89	10,671.2	1,039.6	5,030.3	5,108.4	0.00	0.00	0.00
15,800.0	89.86	89.89	10,671.5	1,039.8	5,130.3	5,207.9	0.00	0.00	0.00
15,900.0	89.86	89.89	10,671.7	1,040.0	5,230.3	5,307.5	0.00	0.00	0.00
16,000.0	89.86	89.89	10,672.0	1,040.2	5,330.3	5,407.0	0.00	0.00	0.00
16,100.0	89.86	89.89	10,672.2	1,040.4	5,430.3	5,506.5	0.00	0.00	0.00
16,200.0	89.86	89.89	10,672.5	1,040.6	5,530.3	5,606.0	0.00	0.00	0.00
16,300.0	89.86	89.89	10,672.7	1,040.8	5,630.3	5,705.6	0.00	0.00	0.00
16,400.0	89.86	89.89	10,673.0	1,041.0	5,730.3	5,805.1	0.00	0.00	0.00
16,500.0	89.86	89.89	10,673.2	1,041.2	5,830.3	5,904.6	0.00	0.00	0.00
16,600.0	89.86	89.89	10,673.5	1,041.4	5,930.3	6,004.2	0.00	0.00	0.00
16,700.0	89.86	89.89	10,673.7	1,041.6	6,030.3	6,103.7	0.00	0.00	0.00
16,800.0	89.86	89.89	10,674.0	1,041.8	6,130.3	6,203.2	0.00	0.00	0.00
16,900.0	89.86	89.89	10,674.2	1,042.0	6,230.3	6,302.8	0.00	0.00	0.00
17,000.0	89.86	89.89	10,674.5	1,042.2	6,330.3	6,402.3	0.00	0.00	0.00
17,100.0	89.86	89.89	10,674.7	1,042.4	6,430.3	6,501.8	0.00	0.00	0.00
17,200.0	89.86	89.89	10,675.0	1,042.6	6,530.3	6,601.4	0.00	0.00	0.00
17,300.0	89.86	89.89	10,675.2	1,042.8	6,630.3	6,700.9	0.00	0.00	0.00
17,400.0	89.86	89.89	10,675.4	1,043.0	6,730.3	6,800.4	0.00	0.00	0.00
17,500.0	89.86	89.89	10,675.7	1,043.2	6,830.3	6,899.9	0.00	0.00	0.00
17,600.0	89.86	89.89	10,675.9	1,043.4	6,930.3	6,999.5	0.00	0.00	0.00
17,700.0	89.86	89.89	10,676.2	1,043.6	7,030.3	7,099.0	0.00	0.00	0.00
17,800.0	89.86	89.89	10,676.4	1,043.8	7,130.3	7,198.5	0.00	0.00	0.00
17,900.0	89.86	89.89	10,676.7	1,044.0	7,230.3	7,298.1	0.00	0.00	0.00
18,000.0	89.86	89.89	10,676.9	1,044.2	7,330.3	7,397.6	0.00	0.00	0.00
18,100.0	89.86	89.89	10,677.2	1,044.4	7,430.3	7,497.1	0.00	0.00	0.00
18,200.0	89.86	89.89	10,677.4	1,044.6	7,530.3	7,596.7	0.00	0.00	0.00
18,300.0	89.86	89.89	10,677.7	1,044.8	7,630.3	7,696.2	0.00	0.00	0.00
18,400.0	89.86	89.89	10,677.9	1,045.0	7,730.3	7,795.7	0.00	0.00	0.00
18,500.0	89.86	89.89	10,678.2	1,045.2	7,830.3	7,895.2	0.00	0.00	0.00
18,600.0	89.86	89.89	10,678.4	1,045.4	7,930.3	7,994.8	0.00	0.00	0.00
18,700.0	89.86	89.89	10,678.7	1,045.6	8,030.3	8,094.3	0.00	0.00	0.00
18,800.0	89.86	89.89	10,678.9	1,045.8	8,130.3	8,193.8	0.00	0.00	0.00
18,900.0	89.86	89.89	10,679.2	1,046.0	8,230.3	8,293.4	0.00	0.00	0.00
19,000.0	89.86	89.89	10,679.4	1,046.1	8,330.3	8,392.9	0.00	0.00	0.00
19,100.0	89.86	89.89	10,679.7	1,046.3	8,430.3	8,492.4	0.00	0.00	0.00
19,200.0	89.86	89.89	10,679.9	1,046.5	8,530.3	8,592.0	0.00	0.00	0.00
19,300.0	89.86	89.89	10,680.2	1,046.7	8,630.3	8,691.5	0.00	0.00	0.00
19,400.0	89.86	89.89	10,680.4	1,046.9	8,730.3	8,791.0	0.00	0.00	0.00
19,500.0	89.86	89.89	10,680.6	1,047.1	8,830.3	8,890.6	0.00	0.00	0.00
19,600.0	89.86	89.89	10,680.9	1,047.3	8,930.3	8,990.1	0.00	0.00	0.00
19,700.0	89.86	89.89	10,681.1	1,047.5	9,030.3	9,089.6	0.00	0.00	0.00
19,800.0	89.86	89.89	10,681.4	1,047.7	9,130.3	9,189.1	0.00	0.00	0.00
19,900.0	89.86	89.89	10,681.6	1,047.9	9,230.3	9,288.7	0.00	0.00	0.00
20,000.0	89.86	89.89	10,681.9	1,048.1	9,330.3	9,388.2	0.00	0.00	0.00
20,100.0	89.86	89.89	10,682.1	1,048.3	9,430.3	9,487.7	0.00	0.00	0.00
20,200.0	89.86	89.89	10,682.4	1,048.5	9,530.3	9,587.3	0.00	0.00	0.00
20,300.0	89.86	89.89	10,682.6	1,048.7	9,630.3	9,686.8	0.00	0.00	0.00
20,400.0	89.86	89.89	10,682.9	1,048.9	9,730.3	9,786.3	0.00	0.00	0.00
20,500.0	89.86	89.89	10,683.1	1,049.1	9,830.3	9,885.9	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well James Ranch Unit DI 1A #203H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3179.0usft (Noram #25)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3179.0usft (Noram #25)
Site:	Sec 21, T22S, R30E	**North Reference:**	Grid
Well:	James Ranch Unit DI 1A #203H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
20,600.0	89.86	89.89	10,683.4	1,049.3	9,930.3	9,985.4	0.00	0.00	0.00
20,700.0	89.86	89.89	10,683.6	1,049.5	10,030.3	10,084.9	0.00	0.00	0.00
20,800.0	89.86	89.89	10,683.9	1,049.7	10,130.3	10,184.4	0.00	0.00	0.00
20,900.0	89.86	89.89	10,684.1	1,049.9	10,230.3	10,284.0	0.00	0.00	0.00
21,000.0	89.86	89.89	10,684.4	1,050.1	10,330.3	10,383.5	0.00	0.00	0.00
21,100.0	89.86	89.89	10,684.6	1,050.3	10,430.3	10,483.0	0.00	0.00	0.00
21,200.0	89.86	89.89	10,684.9	1,050.5	10,530.3	10,582.6	0.00	0.00	0.00
TD @ 21259.3' MD / 10685.0' TVD									
21,259.3	89.86	89.89	10,685.0	1,050.6	10,589.6	10,641.6	0.00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LTP - JRU DI 1A #203H - plan misses target center by 10512.2usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E) - Point	0.00	0.00	0.0	1,050.3	10,459.6	503,696.40	648,502.50	32° 23' 1.890 N	103° 51' 8.180 W
FTP - JRU DI 1A #203H - plan hits target center - Point	0.00	0.00	10,660.0	1,030.7	487.8	503,676.80	638,530.70	32° 23' 2.125 N	103° 53' 4.468 W
PBHL - JRU DI 1A #203I - plan hits target center - Point	0.00	0.00	10,685.0	1,050.6	10,589.6	503,696.70	648,632.50	32° 23' 1.887 N	103° 51' 6.664 W

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well James Ranch Unit DI 1A #203H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3179.0usft (Noram #25)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3179.0usft (Noram #25)
Site:	Sec 21, T22S, R30E	**North Reference:**	Grid
Well:	James Ranch Unit DI 1A #203H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
179.0	179.0	Rustler			
544.0	544.0	Salado			
3,266.5	3,259.0	Base Salt			
3,532.5	3,524.0	Delaware/Lamar			
3,577.6	3,569.0	Bell Canyon			
4,458.8	4,447.0	Cherry Canyon			
4,647.5	4,635.0	Base Manzanita			
6,021.6	6,004.0	Brushy Canyon			
7,101.5	7,080.0	Basal Brushy Canyon			
7,358.4	7,336.0	Base Brushy Canyon Sands			
7,384.5	7,362.0	Bone Spring			
7,488.9	7,466.0	Avalon Sand			
7,979.7	7,955.0	Lower Avalon Shale			
8,402.3	8,376.0	First Bone Spring Sand			
8,872.0	8,844.0	Second Bone Spring Limestone			
9,140.0	9,111.0	Second Bone Spring Sand			
9,562.5	9,532.0	Third Bone Spring Limestone			
10,388.8	10,310.0	Third Bone Spring Sand			
10,845.6	10,597.0	Third Bone Spring RH Sand			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,000.0	1,000.0	0.0	0.0	Build 1.5°/100'
1,326.7	1,326.3	13.3	-4.1	EOB @ 4.90° Inc / 343.00° Azm
9,776.7	9,745.4	703.6	-215.1	Build 8°/100'
9,987.9	9,950.2	751.1	-224.7	EOB @ 21.75° Inc / 349.90° Azm - Build/Turn 8°/100'
11,157.4	10,660.0	1,030.7	487.8	EOC @ 89.85° Inc / 89.89° Azm / 10659.9' TVD
21,259.3	10,685.0	1,050.6	10,589.6	TD @ 21259.3' MD / 10685.0' TVD

GATES E & S NORTH AMERICA, INC
DU-TEX
134 44TH STREET
CORPUS CHRISTI, TEXAS 78405

PHONE: 361-887-9807
FAX: 361-887-0812
EMAIL: crpe&s@gates.com
WEB: www.gates.com

GRADE D PRESSURE TEST CERTIFICATE

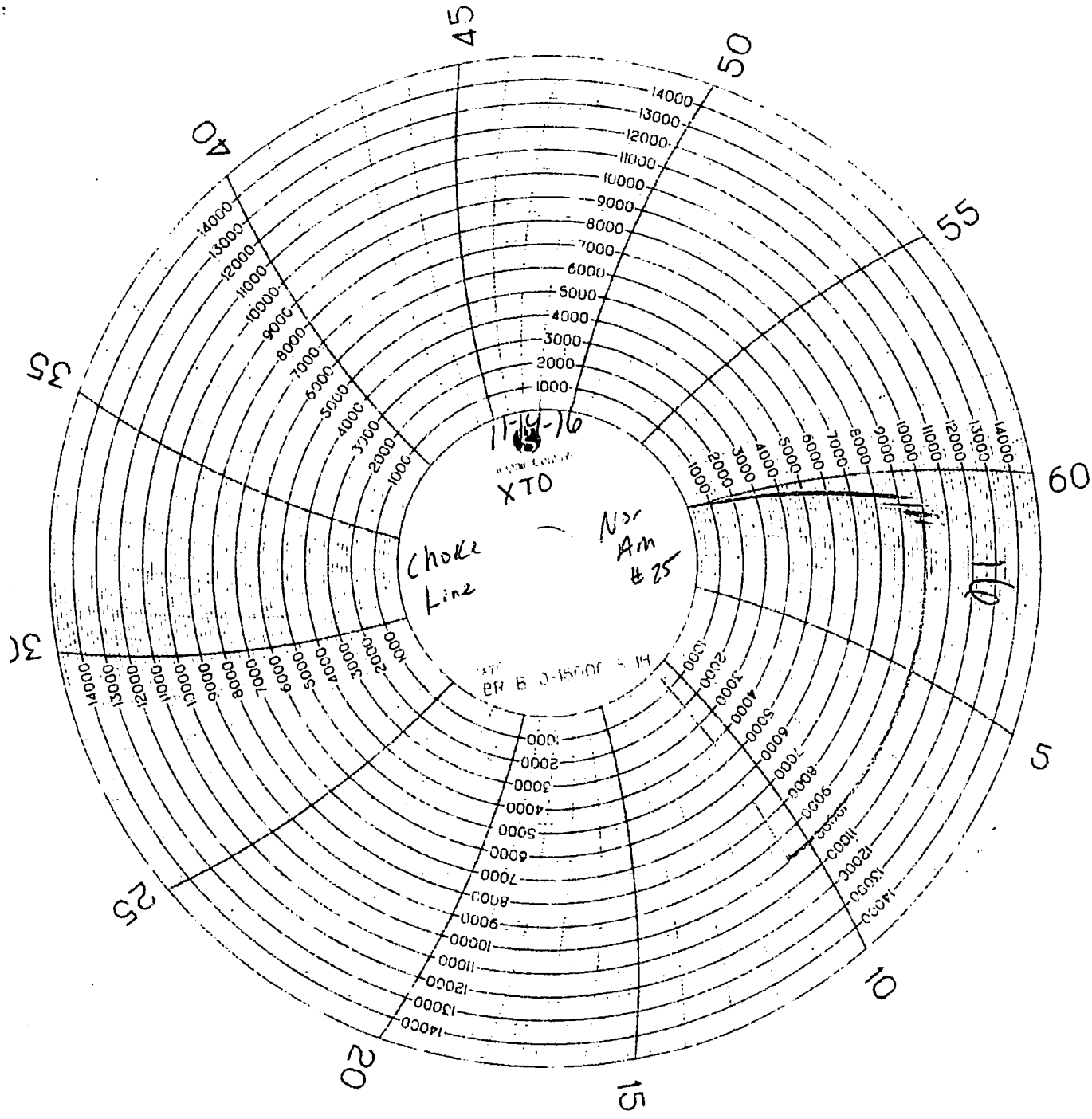
Customer:	AUSTIN DISTRIBUTING	Test Date:	6/8/2014
Customer Ref. :	PENDING	Hose Serial No..	D-060814-1
Invoice No. :	201709	Created By.	NORMA

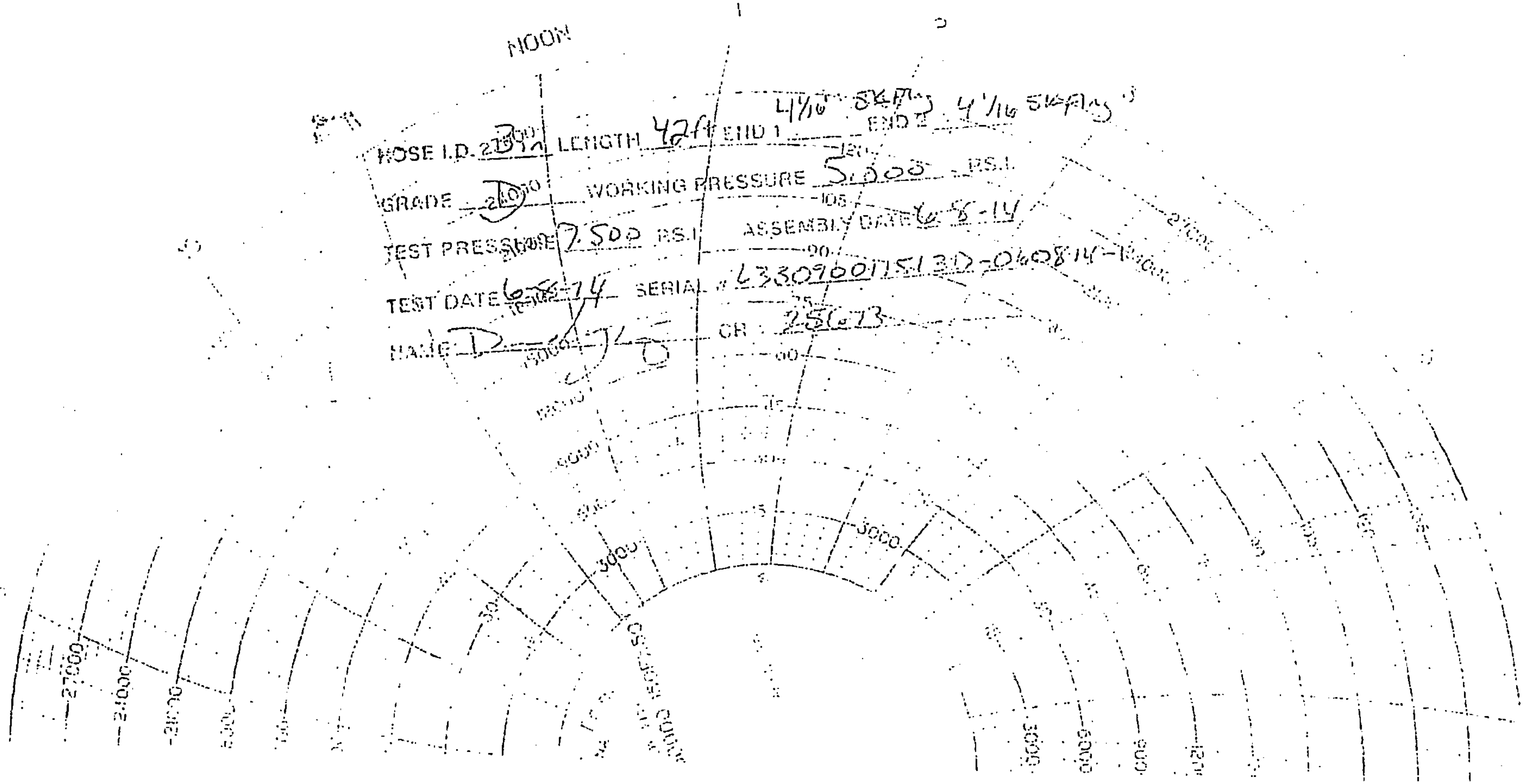
Product Description:	FD3.0-2.0R41/16.5KFLGE/E LE

End Fitting 1 :	4 1/16 in.5K FLG	End Fitting 2 :	4 1/16 in.5K FLG
Gates Part No. :	4774-6001	Assembly Code :	L33090011513D-060814-1
Working Pressure :	5,000 PSI	Test Pressure :	7,500 PSI

Gates E & S North America, Inc. certifies that the following hose assembly has been tested to the Gates Oilfield Roughneck Agreement/Specification requirements and passed the 15 minute hydrostatic test per API Spec 7K/Q1, Fifth Edition, June 2010, Test pressure 9.6.7 and per Table 9 to 7,500 psi in accordance with this product number. Hose burst pressure 9.6.7.2 exceeds the minimum of 2.5 times the working pressure per Table 9.

Quality:	QUALITY	Technical Supervisor :	PRODUCTION
Date:	6/8/2014	Date :	6/8/2014
Signature :		Signature :	


11-14-16
XTO
Choke Line
Nor Am #25


NOON
HOSE I.D. 3" LENGTH 42ft END 1 4 1/16 5K Flg END 2 4 1/16 5K Flg
GRADE D WORKING PRESSURE 5,000 P.S.I.
TEST PRESSURE 7,500 P.S.I. ASSEMBLY DATE 6-8-14
TEST DATE 6-8-14 SERIAL # 633090011513D-060814-1
NAME
CR 25673

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**BOPCO LP**
LEASE NO.:	**NMLC064827A**
WELL NAME & NO.:	**JAMES RANCH UNIT DI 1A 203H**
SURFACE HOLE FOOTAGE:	**1360' FNL & 2560' FWL**
BOTTOM HOLE FOOTAGE	**330' FNL & 2440' FWL**
LOCATION:	**Section 21, T. 22 S., R 30 E., NMPM**
COUNTY:	**Eddy County, New Mexico**

COA

All previous COAs still apply expect the following:

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

A. Hydrogen Sulfide

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

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **520** 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.

Operator shall filled 50% of casing with fluid while running intermediate casing to maintain collapse safety factor.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
   - Cement to surface. If cement does not circulate see B.1.a, c-d above.

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

❖ In High Cave/Karst Areas if cement does not circulate to surface on the first two casing strings , the cement on the 3rd casing string must come to surface.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
   - Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement maybe required. Excess calculates to 22%.**

C. PRESSURE CONTROL

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

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

GENERAL REQUIREMENTS

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

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

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

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

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

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

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

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

A. CASING

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

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the

following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

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

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

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

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

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

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

B. PRESSURE CONTROL

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

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating.

Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

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

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

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

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

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

    c. The tests shall be done by an independent service company utilizing a test

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

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

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

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

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

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

Waste Minimization Plan (WMP)

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

ZS 062718

223021 SUNDRY -405713 James Ranch Unit DI 1A 203H 30015 NMLC-0064827A BOPCO ZS 06.27.2018 v12.0

R-111-P Section: 3 strings circ. a casing seal test of 600psi(hydrl) for the surface and 1000 for intermediate, <100psi drop in 30min. High Cave Karst: two casing strings, both to circulate cement to surface.

13 3/8	surface csg in a		17 1/2	inch hole.		Design Factors		SURFACE	
Segment	#/ft	Grade		Coupling	Joint	Collapse	Burst	Length	Weight
"A"	54.50	J 55		ST&C	18.14	4.75	0.61	520	28,340
"B"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,500			Tail Cmt	does	circ to sfc.	Totals:	520	28,340

Comparison of Proposed to Minimum Required Cement Volumes

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
17 1/2	0.6946	460	704	415	70	8.80	2603	3M	1.56

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

9 5/8	casing inside the		13 3/8	A Buoyant		Design Factors		INTERMEDIATE	
Segment	#/ft	Grade		Coupling	Joint	Collapse	Burst	Length	Weight
"A"	40.00	J 55		LT&C	1.81	0.58	0.73	8,400	336,000
"B"								0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	8,400	336,000
The cement volume(s) are intended to achieve a top of					0	ft from surface or a		520	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0.3132	2860	5250	2675	96	10.20	3033	5M	0.81

Class 'H' tail cmt yld > 1.20

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.47, b, c, d <0.70 a Problem!!

ALT. COLLAPSE SF: 058*2=1.16

Tail cmt

5 1/2	casing inside the		9 5/8			Design Factors		PRODUCTION	
Segment	#/ft	Grade		Coupling	Body	Collapse	Burst	Length	Weight
"A"	17.00	P 110		BUTT	3.01	1.52	1.98	9,777	166,209
"B"	17.00	P 110		BUTT	10.14	1.31	1.98	11,482	195,194
w/8.4#/g mud, 30min Sfc Csg Test psig:	2,151						Totals:	21,259	361,403
B would be:					35.36	1.39	if it were a vertical wellbore.		

No Pilot Hole Planned	MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
	21259	10685	10685	9777	90	7	11157

The cement volume(s) are intended to achieve a top of 0 ft from surface or a 8400 overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 3/4	0.2526	3380	6662	5444	22	9.70			1.35

Class 'H' tail cmt yld > 1.20