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Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM032636

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☑ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

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

8. Lease Name and Well No.
MOSAIC FED 2419 WC
1H 327120

2. Name of Operator
KAISER FRANCIS OIL COMPANY

9. API Well No.
30-015-46680

3a. Address	3b. Phone No. *(include area code)*	10. Field and Pool, or Exploratory
6733 S. Yale Ave. Tulsa OK 74121	(918)491-0000	WILDCAT / WOLFCAMP, (GAS)

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface NWNW / 985 FNL / 156 FWL / LAT 32.2955621 / LONG -104.0491513
At proposed prod. zone NENE / 660 FNL / 330 FEL / LAT 32.296047 / LONG -104.0166009

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 24 / T23S / R28E / NMP

14. Distance in miles and direction from nearest town or post office*	12. County or Parish	13. State
3 miles	EDDY	NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
0 feet	1040.32	640

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
30 feet	10686 feet / 20552 feet	FED: WYB000055

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
2987 feet	06/01/2019	40 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Stormi Davis / Ph: (575)308-3765	02/08/2019

Title
Regulatory Analyst

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	01/28/2020

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

Application approval 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.
Conditions of approval, if any, are attached.

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.

APPROVED WITH CONDITIONS
Approval Date: 01/28/2020

KS 2-10-20

(Continued on page 2)

*(Instructions on page 2)

Additional Operator Remarks

Location of Well

1. SHL: NWNW / 985 FNL / 156 FWL / TWSP: 23S / RANGE: 28E / SECTION: 24 / LAT: 32.2955621 / LONG: -104.0491513 (TVD: 0 feet, MD: 0 feet)
   PPP: NWNW / 660 FNL / 330 FWL / TWSP: 23S / RANGE: 28E / SECTION: 24 / LAT: 32.296453 / LONG: -104.04859 (TVD: 10513 feet, MD: 10650 feet)
   PPP: NWNE / 660 FNL / 2640 FWL / TWSP: 23S / RANGE: 28E / SECTION: 24 / LAT: 32.296435 / LONG: -104.041115 (TVD: 10686 feet, MD: 12960 feet)
   PPP: NWNW / 660 FNL / 0 FWL / TWSP: 23S / RANGE: 29E / SECTION: 19 / LAT: 32.296415 / LONG: -104.0325717 (TVD: 10686 feet, MD: 15600 feet)
   PPP: NENE / 660 FNL / 1320 FEL / TWSP: 23S / RANGE: 28E / SECTION: 24 / LAT: 32.296425 / LONG: -104.036843 (TVD: 10686 feet, MD: 14280 feet)
   BHL: NENE / 660 FNL / 330 FEL / TWSP: 23S / RANGE: 29E / SECTION: 19 / LAT: 32.296047 / LONG: -104.0166009 (TVD: 10686 feet, MD: 20552 feet)

BLM Point of Contact

Name: Deborah Ham
Title: Legal Landlaw Examiner
Phone: 5752345965
Email: dham@blm.gov

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Kaiser Francis Oil Company**
LEASE NO.:	**NMNM032636**
WELL NAME & NO.:	**Mosaic Fed 2419 WC 1H**
SURFACE HOLE FOOTAGE:	**985' FNL & 156' FWL**
BOTTOM HOLE FOOTAGE	**660' FNL & 330' FEL**
LOCATION:	**Section 24, T 23S, R 28E, NMPM**
COUNTY:	**Eddy County, New Mexico**

H2S	○ Yes	◉ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	○ Low	◉ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☑ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☑ COM	☐ Unit

A. HYDROGEN SULFIDE

1. 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"** surface casing shall be set at approximately **500'** (a minimum of 75' into the Rustler Anhydrite and above the salt) and cemented to surface.
   a. **If cement does not circulate to 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 **6 hours** after pumping cement, ideally between 8-10 hours after.
   b. WOC time for a primary cement job will be a minimum of **8 hours** or **500 psi** compressive strength, whichever is greater. This is to include the lead cement.
   c. If cement falls back, remedial cementing will be done prior to drilling out the shoe.
   d. WOC time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 psi compressive strength, whichever is greater.

Approval Date: 01/28/2020

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 the portion of 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. 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 Onshore Order 2 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 BOP/BOPE 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 which 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 made available upon request.

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

e. The 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.

f. BOP/BOPE must be tested 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

1. 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

1. 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.
2. Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Operator Certification Data Report

01/29/2020

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: Stormi Davis

Signed on: 02/05/2019

Title: Regulatory Analyst

Street Address: 106 W. Riverside Drive

City: Carlsbad **State:** NM **Zip:** 88220

Phone: (575)308-3765

Email address: nmogrservices@gmail.com

Field Representative

Representative Name:

Street Address: P.O. Box 21468

City: Tulsa **State:** OK **Zip:** 74121-1468

Phone: (918)527-5260

Email address:

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Application Data Report

01/29/2020

APD ID: 10400038953 **Submission Date:** 02/08/2019

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: MOSAIC FED 2419 WC **Well Number:** 1H

Well Type: CONVENTIONAL GAS WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

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Section 1 - General

APD ID: 10400038953 **Tie to previous NOS?** N **Submission Date:** 02/08/2019

BLM Office: CARLSBAD **User:** Stormi Davis **Title:** Regulatory Analyst

Federal/Indian APD: FED **Is the first lease penetrated for production Federal or Indian?** FED

Lease number: NMNM032636 **Lease Acres:** 1040.32

Surface access agreement in place? **Allotted?** **Reservation:**

Agreement in place? NO **Federal or Indian agreement:**

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO **APD Operator:** KAISER FRANCIS OIL COMPANY

Operator letter of designation:

Operator Info

Operator Organization Name: KAISER FRANCIS OIL COMPANY

Operator Address: 6733 S. Yale Ave. **Zip:** 74121

Operator PO Box: PO Box 21468

Operator City: Tulsa **State:** OK

Operator Phone: (918)491-0000

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO **Master Development Plan name:**

Well in Master SUPO? NO **Master SUPO name:**

Well in Master Drilling Plan? NO **Master Drilling Plan name:**

Well Name: MOSAIC FED 2419 WC **Well Number:** 1H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** WILDCAT **Pool Name:** WOLFCAMP, (GAS)

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: MOSAIC FED 2419 WC **Well Number:** 1H

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** MOSAIC FED 2419 **Number:** 1

Well Class: HORIZONTAL **Number of Legs:** 1

Well Work Type: Drill

Well Type: CONVENTIONAL GAS WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 3 Miles **Distance to nearest well:** 30 FT **Distance to lease line:** 0 FT

Reservoir well spacing assigned acres Measurement: 640 Acres

Well plat: Mosaic_Fed_2419_WC_1H_C_102_20190208093236.pdf

Well work start Date: 06/01/2019 **Duration:** 40 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 6828 **Reference Datum:**

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
SHL Leg #1	985	FNL	156	FWL	23S	28E	24	Aliquot NWNW	32.2955621	-104.0491513	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	2987	0	0	
KOP Leg #1	985	FNL	156	FWL	23S	28E	24	Aliquot NWNW	32.2955621	-104.0491513	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	-7025	10012	10012	
PPP Leg #1-1	660	FNL	1320	FEL	23S	28E	24	Aliquot NENE	32.296425	-104.036843	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 134866	-7699	14280	10686	

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: MOSAIC FED 2419 WC **Well Number:** 1H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
PPP Leg #1-2	660	FNL	0	FWL	23S	29E	19	Aliquot NWNW	32.296415	-104.0325717	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	-7699	15600	10686	
PPP Leg #1-3	660	FNL	2640	FWL	23S	28E	24	Aliquot NWNE	32.296435	-104.041115	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 032636	-7699	12960	10686	
PPP Leg #1-4	660	FNL	330	FWL	23S	28E	24	Aliquot NWNW	32.296453	-104.04859	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	-7526	10650	10513	
EXIT Leg #1	660	FNL	330	FEL	23S	29E	19	Aliquot NENE	32.296047	-104.0166009	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	-7699	20552	10686	
BHL Leg #1	660	FNL	330	FEL	23S	29E	19	Aliquot NENE	32.296047	-104.0166009	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	-7699	20552	10686	

Drilling Plan Data Report

01/29/2020

APD ID: 10400038953 **Submission Date:** 02/08/2019

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: MOSAIC FED 2419 WC **Well Number:** 1H

Well Type: CONVENTIONAL GAS WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

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Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
393790	---	2987	0	0		NONE	N
393795	DELAWARE	336	2651	2651		NATURAL GAS, OIL	N
393797	CHERRY CANYON	-394	3381	3381		NATURAL GAS, OIL	N
393798	BRUSHY CANYON	-1779	4766	4766		NATURAL GAS, OIL	N
393799	BONE SPRING	-3279	6266	6266		NATURAL GAS, OIL	N
393800	FIRST BONE SPRING SAND	-4329	7316	7316		NATURAL GAS, OIL	N
393801	BONE SPRING 2ND	-5099	8086	8086		NATURAL GAS, OIL	N
393804	BONE SPRING 3RD	-6354	9341	9341		NATURAL GAS, OIL	N
393805	WOLFCAMP	-6604	9591	9591		NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M **Rating Depth:** 18000

Equipment: A 10M system will be installed according to Onshore Order #2 consisting of an Annular Preventer, BOP with two rams and a blind ram. BOP will be equipped with 2 side outlets (choke side shall be a minimum 3" line, and kill side will be a minimum 2" line). Kill line will be installed with (2) valves and a check valve (2" min) of proper pressure rating for the system. Remote kill line (2' min) will be installed and ran to the outer edge of the substructure and be unobstructed. A manual and hydraulic valve (3" min) will be installed on the choke line, 3 chokes will be used with one being remotely controlled. Fill up line will be installed above the uppermost preventer. Pressure gauge of proper pressure rating will be installed on choke manifold. Upper and lower kelly cocks will be utilized with handles readily available in plain sight. A float sub will be available at all times. All connections subject to well pressure will be flanged, welded, or clamped.

Requesting Variance? YES

Variance request: Flex Hose Variance

Testing Procedure: 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 of the components installed will be functional and tested.

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: MOSAIC FED 2419 WC **Well Number:** 1H

Choke Diagram Attachment:

Mosaic_Fed_2419_WC_1H_Choke_Manifold_20190208113843.pdf

BOP Diagram Attachment:

Mosaic_Fed_2419_WC_1H_BOP_10M_5M_20190208113926.pdf

Mosaic_Fed_2419_WC_1H_Flex_Hose_Data_20190208114114.pdf

Mosaic_Fed_2419_WC_1H_Wellhead_Diagram_20191024123548.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	500	0	500			500	H-40	48	ST&C	3.3	7.4	DRY	13.4	DRY	22.5
2	INTERMEDIATE	12.25	10.75	NEW	API	N	0	2850	0	2850			2850	J-55	40.5	BUTT	1.1	2.1	DRY	3.6	DRY	5.4
3	INTERMEDIATE	9.875	7.625	NEW	API	N	0	9200	0	9200			9200	P-110	29.7	BUTT	1.6	2.2	DRY	2.8	DRY	3.4
4	PRODUCTION	6.75	5.5	NEW	API	N	0	20552	0	10686			20552	P-110	20	OTHER - USS Eagle	2	2.2	DRY	2.9	DRY	3.4

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Mosaic_Fed_2419_WC_1H_Casing_Assumptions_20190208114452.pdf

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: MOSAIC FED 2419 WC **Well Number:** 1H

Casing Attachments

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Mosaic_Fed_2419_WC_1H_Casing_Assumptions_20190208114512.pdf

Casing ID: 3 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Mosaic_Fed_2419_WC_1H_Casing_Assumptions_20190208114522.pdf

Casing ID: 4 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

5.5_x_20_P110_HP_USS_EAGLE_SFH_Performance_Sheet_20190208114733.pdf

Mosaic_Fed_2419_WC_1H_Casing_Assumptions_20190208114734.pdf

Section 4 - Cement

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: MOSAIC FED 2419 WC **Well Number:** 1H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	500	396	1.75	13.5	693	100	ExtendaCem	KOL-Seal
INTERMEDIATE	Lead		0	2850	340	2.46	11.9	836.4	75	EconoCem C	None
INTERMEDIATE	Tail		0	2850	212	1.33	14.8	282	50	Halcem	none
INTERMEDIATE	Lead		0	9200	1291	2.77	11	3576	50	NeoCem	LCM
INTERMEDIATE	Tail		0	9200	568	1.2	15.6	680	50	Halcem	Halad
PRODUCTION	Lead		8200	20552	410	1.44	13	590	15	NeoCem	None
PRODUCTION	Tail		8200	20552	483	1.22	14.5	591	15	Versacem	Halad

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
9200	20552	OIL-BASED MUD	12.5	13							

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: MOSAIC FED 2419 WC **Well Number:** 1H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
500	2850	OTHER : Brine	10	10							
0	500	OTHER : Fresh Water	8.4	9							
2850	9200	OTHER : Diesel Brine Emulsion	9	9.3							

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

Top of cement on production casing will be determined by calculation.

List of open and cased hole logs run in the well:

DS,GR,MUDLOG

Coring operation description for the well:

None planned

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 7224 **Anticipated Surface Pressure:** 4873.08

Anticipated Bottom Hole Temperature(F): 195

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Mosaic_Fed_2419_Pad_1_H2S_Plan_20190205114237.pdf

Operator Name: KAISER FRANCIS OIL COMPANY

Well Name: MOSAIC FED 2419 WC **Well Number:** 1H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Mosaic_Fed_2419_WC_1H___Well_Plan_v1_20190208142649.pdf

Other proposed operations facets description:

Gas Capture Plan attached

Other proposed operations facets attachment:

Mosaic_Fed_2419_Pad_1_GCP_20190205114357.pdf

Other Variance attachment:

Mosaic_Fed_2419_WC_1H_Flex_Hose_Data_20190208142539.pdf

Kaiser-Francis Oil Company
Mosaic Federal 2419 WC 1H

Casing Assumptions

Interval	Length	Casing Size	Weight (#/ft)	Grade	Thread	Condition	Hole Size	TVD (ft)
Conductor	120	20"				New		120
Surface	500	13-3/8"	48	H-40	STC	New	17-1/2"	500
Intermediate	2850	10-3/4"	40.5	J55	BTC API Special Clearance	New	12-1/4"	2850
Intermediate	9200	7-5/8"	29.7	P110	BTC	New	9-7/8"	9200
Production	20552	5-1/2"	20	P110 HC	USS Eagle SFH	New	6-3/4"	10686

Mud Type	Mud Weight Hole Control	Depth	Viscosity	Fluid Loss
FW	8.4 - 9.0	500.0	32 - 34	NC
Brine	10.0	2850.0	28-32	LCM
DBE	9-9.3	9300.0	28-29	NC
OBM	12.5-13	10686.0	55-70	LCM

Anticipated Mud Weight (ppg)	Max Pore Pressure (psi)	Collapse (psi)	Burst (psi)	Body Tensile Strength	Joint Tensile Strength
9	234	770	1730	541000	322000
10.0	1482	1580	3130	629000	420000
8.9	4258	6700	9460	940000	769000
12	6668	13150	14360	729000	629000

Collapse Safety Factor (Min 1.1)	Burst Safety Factor (Min 1.0)	Body Tensile Safety Factor (Min 1.8)	Joint Tensile Safety Factor (Min 1.8)
3.3	7.4	22.5	13.4
1.1	2.1	5.4	3.6
1.6	2.2	3.4	2.8
2.0	2.2	3.4	2.9

Kaiser-Francis Oil Company

Company: Kaiser-Francis
Well: Mosaic Fed 2419 WC 1H
County: Eddy County, New Mexico (NAD 27)
Rig: Cactus 171
Wellbore: Wellbore #1
Design: Design #1
Created By: BSW
Date: 12:52, February 01 2019

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

To convert a Magnetic Direction to a Grid Direction, Add 6.915°
To convert a Magnetic Direction to a True Direction, Add 7.068° East
To convert a True Direction to a Grid Direction, Subtract 0.152°

Azimuths to Grid North
True North: -0.15°
Magnetic North: 6.92°

Magnetic Field
Strength: 47811.2nT
Dip Angle: 59.97°
Date: 2/21/2019
Model: BGGM2018

WELL DETAILS: Mosaic Fed 2419 WC 1H

+N/-S	+E/-W	GL @ 2986.90 Northing	WELL @ 3009.90usft (Cactus 171) Easting	Latitude	Longitude
0.00	0.00	471315.10	587964.02	32° 17' 43.587 N	104° 2' 55.167 W

SECTION DETAILS

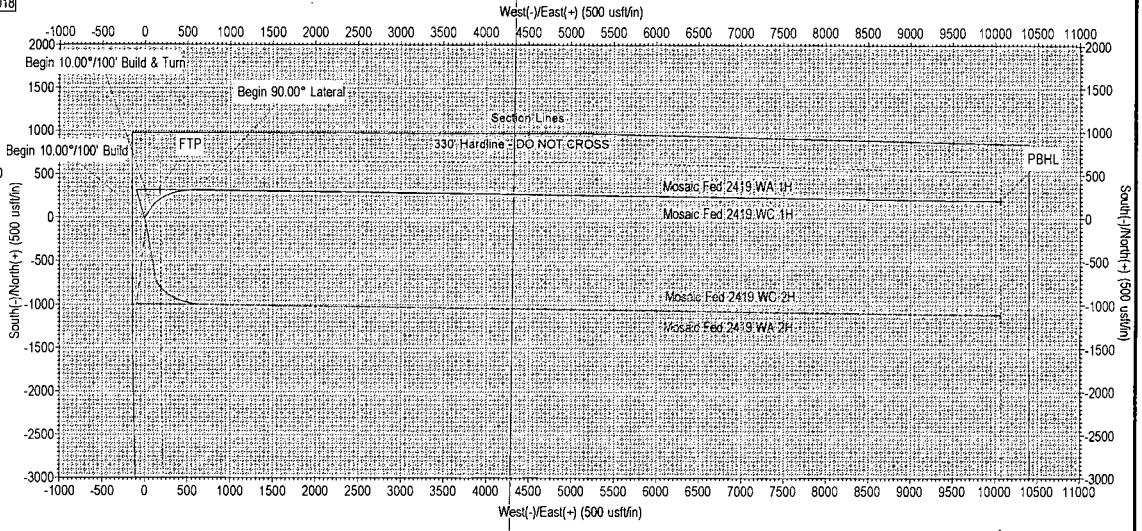
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
10012.52	0.00	0.00	10012.52	0.00	0.00	0.00	0.000	0.00	Begin 10.00°/100' Build
10412.52	40.00	33.50	10380.81	111.78	73.99	10.00	33.500	72.61	Begin 10.00°/100' Build & Turn
11108.77	90.00	90.70	10686.00	320.43	613.70	10.00	63.728	609.74	Begin 90.00° Lateral
20552.90	90.00	90.70	10686.00	204.45	10057.12	0.00	0.000	10053.87	PBHL

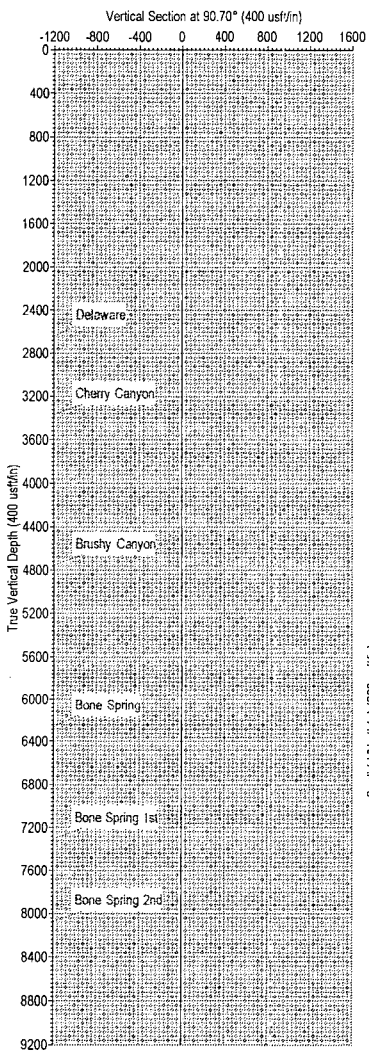
DESIGN TARGET DETAILS

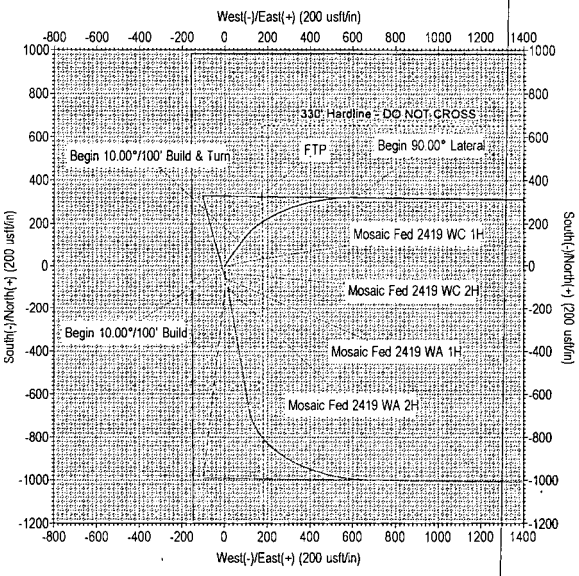
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - Mosaic Fed 2419 WC 1H	10686.00	204.45	10057.12	471519.55	598021.14	32° 17' 45.331 N	104° 0' 57.990 W
FTP - Mosaic Fed 2419 WC 1H	10686.00	324.56	172.05	471639.66	588136.07	32° 17' 46.794 N	104° 2' 53.152 W

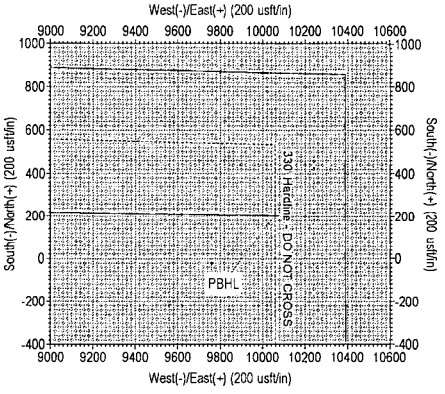
SURVEY PROGRAM

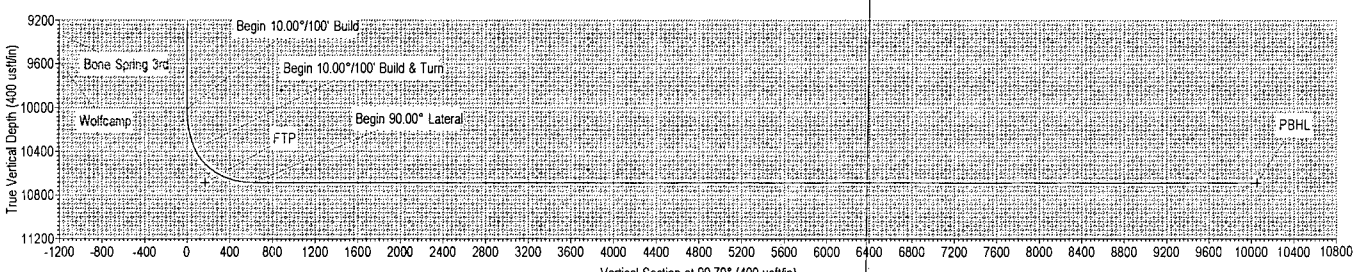
Depth From	Depth To	Survey/Plan	Tool
0.00	20552.90	Design #1 (Wellbore #1)	MWD











MS Directional

Kaiser-Francis Oil Company

Kaiser-Francis

Eddy County, New Mexico (NAD 27)
Mosaic Fed 2419
Mosaic Fed 2419 WC 1H

Wellbore #1

Plan: Design #1

Standard Planning Report

01 February, 2019

MS Directional

Database:	EDM 5000.14 Conroe Db	**Local Co-ordinate Reference:**	Well Mosaic Fed 2419 WC 1H
Company:	Kaiser-Francis	**TVD Reference:**	WELL @ 3009.90usft (Cactus 171)
Project:	Eddy County, New Mexico (NAD 27)	**MD Reference:**	WELL @ 3009.90usft (Cactus 171)
Site:	Mosaic Fed 2419	**North Reference:**	Grid
Well:	Mosaic Fed 2419 WC 1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project Eddy County, New Mexico (NAD 27)

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 Mosaic Fed 2419

Site Position:		**Northing:**	471,255.07 usft	**Latitude:**	32° 17' 42.993 N
From:	Map	**Easting:**	587,964.28 usft	**Longitude:**	104° 2' 55.166 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "		

Well Mosaic Fed 2419 WC 1H

Well Position	**+N/-S**	0.00 usft	**Northing:**	471,315.10 usft	**Latitude:**	32° 17' 43.587 N
	+E/-W	0.00 usft	**Easting:**	587,964.02 usft	**Longitude:**	104° 2' 55.167 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	2,986.90 usft
Grid Convergence:		0.152 °				

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2018	2/21/2019	7.068	59.971	47,811.20

Design Design #1

Audit Notes:

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

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	90.70

Plan Survey Tool Program Date 2/1/2019

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	20,552.90	Design #1 (Wellbore #1)	MWD	
				OWSG MWD - Standard	

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
10,012.52	0.00	0.00	10,012.52	0.00	0.00	0.00	0.00	0.00	0.000	
10,412.52	40.00	33.50	10,380.81	111.78	73.99	10.00	10.00	0.00	33.500	
11,108.77	90.00	90.70	10,686.00	320.43	613.70	10.00	7.18	8.22	63.728	
20,552.90	90.00	90.70	10,686.00	204.45	10,057.12	0.00	0.00	0.00	0.000	PBHL - Mosaic Fed

Database:	EDM 5000.14 Conroe Db	**Local Co-ordinate Reference:**	Well Mosaic Fed 2419 WC 1H
Company:	Kaiser-Francis	**TVD Reference:**	WELL @ 3009.90usft (Cactus 171)
Project:	Eddy County, New Mexico (NAD 27)	**MD Reference:**	WELL @ 3009.90usft (Cactus 171)
Site:	Mosaic Fed 2419	**North Reference:**	Grid
Well:	Mosaic Fed 2419 WC 1H	**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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,639.90	0.00	0.00	2,639.90	0.00	0.00	0.00	0.00	0.00	0.00
Delaware									
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,369.90	0.00	0.00	3,369.90	0.00	0.00	0.00	0.00	0.00	0.00
Cherry Canyon									
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,754.90	0.00	0.00	4,754.90	0.00	0.00	0.00	0.00	0.00	0.00

Database:	EDM 5000.14 Conroe Db	**Local Co-ordinate Reference:**	Well Mosaic Fed 2419 WC 1H
Company:	Kaiser-Francis	**TVD Reference:**	WELL @ 3009.90usft (Cactus 171)
Project:	Eddy County, New Mexico (NAD 27)	**MD Reference:**	WELL @ 3009.90usft (Cactus 171)
Site:	Mosaic Fed 2419	**North Reference:**	Grid
Well:	Mosaic Fed 2419 WC 1H	**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)
Brushy Canyon									
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,254.90	0.00	0.00	6,254.90	0.00	0.00	0.00	0.00	0.00	0.00
Bone Spring									
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,304.90	0.00	0.00	7,304.90	0.00	0.00	0.00	0.00	0.00	0.00
Bone Spring 1st									
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,074.90	0.00	0.00	8,074.90	0.00	0.00	0.00	0.00	0.00	0.00
Bone Spring 2nd									
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	0.00	0.00
8,800.00	0.00	0.00	8,800.00	0.00	0.00	0.00	0.00	0.00	0.00
8,900.00	0.00	0.00	8,900.00	0.00	0.00	0.00	0.00	0.00	0.00
9,000.00	0.00	0.00	9,000.00	0.00	0.00	0.00	0.00	0.00	0.00
9,100.00	0.00	0.00	9,100.00	0.00	0.00	0.00	0.00	0.00	0.00
9,200.00	0.00	0.00	9,200.00	0.00	0.00	0.00	0.00	0.00	0.00
9,300.00	0.00	0.00	9,300.00	0.00	0.00	0.00	0.00	0.00	0.00

Database:	EDM 5000.14 Conroe Db	**Local Co-ordinate Reference:**	Well Mosaic Fed 2419 WC 1H
Company:	Kaiser-Francis	**TVD Reference:**	WELL @ 3009.90usft (Cactus 171)
Project:	Eddy County, New Mexico (NAD 27)	**MD Reference:**	WELL @ 3009.90usft (Cactus 171)
Site:	Mosaic Fed 2419	**North Reference:**	Grid
Well:	Mosaic Fed 2419 WC 1H	**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)
9,329.90	0.00	0.00	9,329.90	0.00	0.00	0.00	0.00	0.00	0.00
Bone Spring 3rd									
9,400.00	0.00	0.00	9,400.00	0.00	0.00	0.00	0.00	0.00	0.00
9,500.00	0.00	0.00	9,500.00	0.00	0.00	0.00	0.00	0.00	0.00
9,579.90	0.00	0.00	9,579.90	0.00	0.00	0.00	0.00	0.00	0.00
Wolfcamp									
9,600.00	0.00	0.00	9,600.00	0.00	0.00	0.00	0.00	0.00	0.00
9,700.00	0.00	0.00	9,700.00	0.00	0.00	0.00	0.00	0.00	0.00
9,800.00	0.00	0.00	9,800.00	0.00	0.00	0.00	0.00	0.00	0.00
9,900.00	0.00	0.00	9,900.00	0.00	0.00	0.00	0.00	0.00	0.00
10,000.00	0.00	0.00	10,000.00	0.00	0.00	0.00	0.00	0.00	0.00
10,012.52	0.00	0.00	10,012.52	0.00	0.00	0.00	0.00	0.00	0.00
Begin 10.00°/100' Build									
10,100.00	8.75	33.50	10,099.66	5.56	3.68	3.61	10.00	10.00	0.00
10,200.00	18.75	33.50	10,196.67	25.35	16.78	16.47	10.00	10.00	0.00
10,300.00	28.75	33.50	10,288.09	58.89	38.98	38.26	10.00	10.00	0.00
10,400.00	38.75	33.50	10,371.13	105.16	69.60	68.31	10.00	10.00	0.00
10,412.52	40.00	33.50	10,380.81	111.78	73.99	72.61	10.00	10.00	0.00
Begin 10.00°/100' Build & Turn									
10,500.00	44.45	44.73	10,445.67	157.07	111.13	109.20	10.00	5.09	12.84
10,600.00	50.66	55.38	10,513.23	204.04	167.74	165.23	10.00	6.21	10.65
10,700.00	57.67	64.19	10,571.82	244.50	237.77	234.77	10.00	7.01	8.81
10,800.00	65.21	71.69	10,619.64	277.24	319.11	315.70	10.00	7.53	7.50
10,900.00	73.07	78.31	10,655.26	301.26	409.27	405.56	10.00	7.86	6.62
11,000.00	81.13	84.38	10,677.59	315.83	505.52	501.62	10.00	8.06	6.08
11,100.00	89.28	90.20	10,685.95	320.50	604.93	600.97	10.00	8.15	5.81
11,108.77	90.00	90.70	10,686.00	320.43	613.70	609.74	10.00	8.17	5.76
Begin 90.00° Lateral									
11,200.00	90.00	90.70	10,686.00	319.31	704.92	700.97	0.00	0.00	0.00
11,300.00	90.00	90.70	10,686.00	318.08	804.92	800.97	0.00	0.00	0.00
11,400.00	90.00	90.70	10,686.00	316.86	904.91	900.97	0.00	0.00	0.00
11,500.00	90.00	90.70	10,686.00	315.63	1,004.90	1,000.97	0.00	0.00	0.00
11,600.00	90.00	90.70	10,686.00	314.40	1,104.89	1,100.97	0.00	0.00	0.00
11,700.00	90.00	90.70	10,686.00	313.17	1,204.89	1,200.97	0.00	0.00	0.00
11,800.00	90.00	90.70	10,686.00	311.94	1,304.88	1,300.97	0.00	0.00	0.00
11,900.00	90.00	90.70	10,686.00	310.72	1,404.87	1,400.97	0.00	0.00	0.00
12,000.00	90.00	90.70	10,686.00	309.49	1,504.86	1,500.97	0.00	0.00	0.00
12,100.00	90.00	90.70	10,686.00	308.26	1,604.86	1,600.97	0.00	0.00	0.00
12,200.00	90.00	90.70	10,686.00	307.03	1,704.85	1,700.97	0.00	0.00	0.00
12,300.00	90.00	90.70	10,686.00	305.80	1,804.84	1,800.97	0.00	0.00	0.00
12,400.00	90.00	90.70	10,686.00	304.58	1,904.83	1,900.97	0.00	0.00	0.00
12,500.00	90.00	90.70	10,686.00	303.35	2,004.83	2,000.97	0.00	0.00	0.00
12,600.00	90.00	90.70	10,686.00	302.12	2,104.82	2,100.97	0.00	0.00	0.00
12,700.00	90.00	90.70	10,686.00	300.89	2,204.81	2,200.97	0.00	0.00	0.00
12,800.00	90.00	90.70	10,686.00	299.66	2,304.80	2,300.97	0.00	0.00	0.00
12,900.00	90.00	90.70	10,686.00	298.44	2,404.80	2,400.97	0.00	0.00	0.00
13,000.00	90.00	90.70	10,686.00	297.21	2,504.79	2,500.97	0.00	0.00	0.00
13,100.00	90.00	90.70	10,686.00	295.98	2,604.78	2,600.97	0.00	0.00	0.00
13,200.00	90.00	90.70	10,686.00	294.75	2,704.77	2,700.97	0.00	0.00	0.00
13,300.00	90.00	90.70	10,686.00	293.52	2,804.77	2,800.97	0.00	0.00	0.00
13,400.00	90.00	90.70	10,686.00	292.29	2,904.76	2,900.97	0.00	0.00	0.00
13,500.00	90.00	90.70	10,686.00	291.07	3,004.75	3,000.97	0.00	0.00	0.00
13,600.00	90.00	90.70	10,686.00	289.84	3,104.74	3,100.97	0.00	0.00	0.00
13,700.00	90.00	90.70	10,686.00	288.61	3,204.74	3,200.97	0.00	0.00	0.00

Database:	EDM 5000.14 Conroe Db	**Local Co-ordinate Reference:**	Well Mosaic Fed 2419 WC 1H
Company:	Kaiser-Francis	**TVD Reference:**	WELL @ 3009.90usft (Cactus 171)
Project:	Eddy County, New Mexico (NAD 27)	**MD Reference:**	WELL @ 3009.90usft (Cactus 171)
Site:	Mosaic Fed 2419	**North Reference:**	Grid
Well:	Mosaic Fed 2419 WC 1H	**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)
13,800.00	90.00	90.70	10,686.00	287.38	3,304.73	3,300.97	0.00	0.00	0.00
13,900.00	90.00	90.70	10,686.00	286.15	3,404.72	3,400.97	0.00	0.00	0.00
14,000.00	90.00	90.70	10,686.00	284.93	3,504.71	3,500.97	0.00	0.00	0.00
14,100.00	90.00	90.70	10,686.00	283.70	3,604.71	3,600.97	0.00	0.00	0.00
14,200.00	90.00	90.70	10,686.00	282.47	3,704.70	3,700.97	0.00	0.00	0.00
14,300.00	90.00	90.70	10,686.00	281.24	3,804.69	3,800.97	0.00	0.00	0.00
14,400.00	90.00	90.70	10,686.00	280.01	3,904.68	3,900.97	0.00	0.00	0.00
14,500.00	90.00	90.70	10,686.00	278.79	4,004.68	4,000.97	0.00	0.00	0.00
14,600.00	90.00	90.70	10,686.00	277.56	4,104.67	4,100.97	0.00	0.00	0.00
14,700.00	90.00	90.70	10,686.00	276.33	4,204.66	4,200.97	0.00	0.00	0.00
14,800.00	90.00	90.70	10,686.00	275.10	4,304.65	4,300.97	0.00	0.00	0.00
14,900.00	90.00	90.70	10,686.00	273.87	4,404.65	4,400.97	0.00	0.00	0.00
15,000.00	90.00	90.70	10,686.00	272.65	4,504.64	4,500.97	0.00	0.00	0.00
15,100.00	90.00	90.70	10,686.00	271.42	4,604.63	4,600.97	0.00	0.00	0.00
15,200.00	90.00	90.70	10,686.00	270.19	4,704.62	4,700.97	0.00	0.00	0.00
15,300.00	90.00	90.70	10,686.00	268.96	4,804.61	4,800.97	0.00	0.00	0.00
15,400.00	90.00	90.70	10,686.00	267.73	4,904.61	4,900.97	0.00	0.00	0.00
15,500.00	90.00	90.70	10,686.00	266.50	5,004.60	5,000.97	0.00	0.00	0.00
15,600.00	90.00	90.70	10,686.00	265.28	5,104.59	5,100.97	0.00	0.00	0.00
15,700.00	90.00	90.70	10,686.00	264.05	5,204.58	5,200.97	0.00	0.00	0.00
15,800.00	90.00	90.70	10,686.00	262.82	5,304.58	5,300.97	0.00	0.00	0.00
15,900.00	90.00	90.70	10,686.00	261.59	5,404.57	5,400.97	0.00	0.00	0.00
16,000.00	90.00	90.70	10,686.00	260.36	5,504.56	5,500.97	0.00	0.00	0.00
16,100.00	90.00	90.70	10,686.00	259.14	5,604.55	5,600.97	0.00	0.00	0.00
16,200.00	90.00	90.70	10,686.00	257.91	5,704.55	5,700.97	0.00	0.00	0.00
16,300.00	90.00	90.70	10,686.00	256.68	5,804.54	5,800.97	0.00	0.00	0.00
16,400.00	90.00	90.70	10,686.00	255.45	5,904.53	5,900.97	0.00	0.00	0.00
16,500.00	90.00	90.70	10,686.00	254.22	6,004.52	6,000.97	0.00	0.00	0.00
16,600.00	90.00	90.70	10,686.00	253.00	6,104.52	6,100.97	0.00	0.00	0.00
16,700.00	90.00	90.70	10,686.00	251.77	6,204.51	6,200.97	0.00	0.00	0.00
16,800.00	90.00	90.70	10,686.00	250.54	6,304.50	6,300.97	0.00	0.00	0.00
16,900.00	90.00	90.70	10,686.00	249.31	6,404.49	6,400.97	0.00	0.00	0.00
17,000.00	90.00	90.70	10,686.00	248.08	6,504.49	6,500.97	0.00	0.00	0.00
17,100.00	90.00	90.70	10,686.00	246.86	6,604.48	6,600.97	0.00	0.00	0.00
17,200.00	90.00	90.70	10,686.00	245.63	6,704.47	6,700.97	0.00	0.00	0.00
17,300.00	90.00	90.70	10,686.00	244.40	6,804.46	6,800.97	0.00	0.00	0.00
17,400.00	90.00	90.70	10,686.00	243.17	6,904.46	6,900.97	0.00	0.00	0.00
17,500.00	90.00	90.70	10,686.00	241.94	7,004.45	7,000.97	0.00	0.00	0.00
17,600.00	90.00	90.70	10,686.00	240.71	7,104.44	7,100.97	0.00	0.00	0.00
17,700.00	90.00	90.70	10,686.00	239.49	7,204.43	7,200.97	0.00	0.00	0.00
17,800.00	90.00	90.70	10,686.00	238.26	7,304.43	7,300.97	0.00	0.00	0.00
17,900.00	90.00	90.70	10,686.00	237.03	7,404.42	7,400.97	0.00	0.00	0.00
18,000.00	90.00	90.70	10,686.00	235.80	7,504.41	7,500.97	0.00	0.00	0.00
18,100.00	90.00	90.70	10,686.00	234.57	7,604.40	7,600.97	0.00	0.00	0.00
18,200.00	90.00	90.70	10,686.00	233.35	7,704.40	7,700.97	0.00	0.00	0.00
18,300.00	90.00	90.70	10,686.00	232.12	7,804.39	7,800.97	0.00	0.00	0.00
18,400.00	90.00	90.70	10,686.00	230.89	7,904.38	7,900.97	0.00	0.00	0.00
18,500.00	90.00	90.70	10,686.00	229.66	8,004.37	8,000.97	0.00	0.00	0.00
18,600.00	90.00	90.70	10,686.00	228.43	8,104.37	8,100.97	0.00	0.00	0.00
18,700.00	90.00	90.70	10,686.00	227.21	8,204.36	8,200.97	0.00	0.00	0.00
18,800.00	90.00	90.70	10,686.00	225.98	8,304.35	8,300.97	0.00	0.00	0.00
18,900.00	90.00	90.70	10,686.00	224.75	8,404.34	8,400.97	0.00	0.00	0.00
19,000.00	90.00	90.70	10,686.00	223.52	8,504.34	8,500.97	0.00	0.00	0.00
19,100.00	90.00	90.70	10,686.00	222.29	8,604.33	8,600.97	0.00	0.00	0.00

Database:	EDM 5000.14 Conroe Db	**Local Co-ordinate Reference:**	Well Mosaic Fed 2419 WC 1H
Company:	Kaiser-Francis	**TVD Reference:**	WELL @ 3009.90usft (Cactus 171)
Project:	Eddy County, New Mexico (NAD 27)	**MD Reference:**	WELL @ 3009.90usft (Cactus 171)
Site:	Mosaic Fed 2419	**North Reference:**	Grid
Well:	Mosaic Fed 2419 WC 1H	**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)
19,200.00	90.00	90.70	10,686.00	221.06	8,704.32	8,700.97	0.00	0.00	0.00
19,300.00	90.00	90.70	10,686.00	219.84	8,804.31	8,800.97	0.00	0.00	0.00
19,400.00	90.00	90.70	10,686.00	218.61	8,904.31	8,900.97	0.00	0.00	0.00
19,500.00	90.00	90.70	10,686.00	217.38	9,004.30	9,000.97	0.00	0.00	0.00
19,600.00	90.00	90.70	10,686.00	216.15	9,104.29	9,100.97	0.00	0.00	0.00
19,700.00	90.00	90.70	10,686.00	214.92	9,204.28	9,200.97	0.00	0.00	0.00
19,800.00	90.00	90.70	10,686.00	213.70	9,304.28	9,300.97	0.00	0.00	0.00
19,900.00	90.00	90.70	10,686.00	212.47	9,404.27	9,400.97	0.00	0.00	0.00
20,000.00	90.00	90.70	10,686.00	211.24	9,504.26	9,500.97	0.00	0.00	0.00
20,100.00	90.00	90.70	10,686.00	210.01	9,604.25	9,600.97	0.00	0.00	0.00
20,200.00	90.00	90.70	10,686.00	208.78	9,704.25	9,700.97	0.00	0.00	0.00
20,300.00	90.00	90.70	10,686.00	207.56	9,804.24	9,800.97	0.00	0.00	0.00
20,400.00	90.00	90.70	10,686.00	206.33	9,904.23	9,900.97	0.00	0.00	0.00
20,500.00	90.00	90.70	10,686.00	205.10	10,004.22	10,000.97	0.00	0.00	0.00
20,552.90	90.00	90.70	10,686.00	204.45	10,057.12	10,053.87	0.00	0.00	0.00
PBHL									

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
PBHL - Mosaic Fed 2 - plan hits target center - Point	0.00	0.00	10,686.00	204.45	10,057.12	471,519.55	598,021.14	32° 17' 45.331 N	104° 0' 57.990 W
FTP - Mosaic Fed 241 - plan misses target center by 149.97usft at 10727.44usft MD (10586.08 TVD, 254.30 N, 259.06 E) - Point	0.00	0.00	10,686.00	324.56	172.05	471,639.66	588,136.07	32° 17' 46.794 N	104° 2' 53.152 W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,639.90	2,639.90	Delaware		0.000	
3,369.90	3,369.90	Cherry Canyon		0.000	
4,754.90	4,754.90	Brushy Canyon		0.000	
6,254.90	6,254.90	Bone Spring		0.000	
7,304.90	7,304.90	Bone Spring 1st		0.000	
8,074.90	8,074.90	Bone Spring 2nd		0.000	
9,329.90	9,329.90	Bone Spring 3rd		0.000	
9,579.90	9,579.90	Wolfcamp		0.000	

Database:	EDM 5000.14 Conroe Db	**Local Co-ordinate Reference:**	Well Mosaic Fed 2419 WC 1H
Company:	Kaiser-Francis	**TVD Reference:**	WELL @ 3009.90usft (Cactus 171)
Project:	Eddy County, New Mexico (NAD 27)	**MD Reference:**	WELL @ 3009.90usft (Cactus 171)
Site:	Mosaic Fed 2419	**North Reference:**	Grid
Well:	Mosaic Fed 2419 WC 1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,012.52	10,012.52	0.00	0.00	Begin 10.00°/100' Build
10,412.52	10,380.81	111.78	73.99	Begin 10.00°/100' Build & Turn
11,108.77	10,686.00	320.43	613.70	Begin 90.00° Lateral
20,552.90	10,686.00	204.45	10,057.12	PBHL