

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 Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170

District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

Form C-101
August 1, 2011

Permit 271589

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address MARATHON OIL PERMIAN LLC 5555 San Felipe St. Houston, TX 77056		2. OGRID Number 372098
		3. API Number 30-015-46272
4. Property Code 326076	5. Property Name THOR 28 WXY FEE	6. Well No. 005H

7. Surface Location

UL - Lot M	Section 28	Township 23S	Range 28E	Lot Idn	Feet From 612	N/S Line S	Feet From 1192	E/W Line W	County Eddy
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8. Proposed Bottom Hole Location

UL - Lot D	Section 28	Township 23S	Range 28E	Lot Idn D	Feet From 330	N/S Line N	Feet From 330	E/W Line W	County Eddy
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9. Pool Information

PURPLE SAGE;WOLFCAMP (GAS)	98220
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Additional Well Information

11. Work Type New Well	12. Well Type GAS	13. Cable/Rotary	14. Lease Type Private	15. Ground Level Elevation 3083
16. Multiple N	17. Proposed Depth 14294	18. Formation Wolfcamp	19. Contractor	20. Spud Date 1/22/2020
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

We will be using a closed-loop system in lieu of lined pits

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surf	17.5	13.375	54.5	350	366	0
Int1	12.25	9.625	36	2500	725	0
Prod	8.75	7	29	9898	703	2200
Liner1	6.125	4.5	13.5	14294	471	9598

Casing/Cement Program: Additional Comments

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22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Annular	5000	2500	
Double Ram	5000	5000	
Pipe	5000	5000	
Blind	5000	5000	

<p>23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief. I further certify I have complied with 19.15.14.9 (A) NMAC <input checked="" type="checkbox"/> and/or 19.15.14.9 (B) NMAC <input checked="" type="checkbox"/>, if applicable.</p> <p>Signature:</p> <p>Printed Name: Electronically filed by Melissa Szudera</p> <p>Title: Regulatory Compliance Representative</p> <p>Email Address: mszudera@marathonoil.com</p> <p>Date: 8/27/2019</p> <p>Phone: 701-260-7272</p>	<p>OIL CONSERVATION DIVISION</p> <p>Approved By: Raymond Podany</p> <p>Title: Geologist</p> <p>Approved Date: 9/11/2019</p> <p>Expiration Date: 9/11/2021</p> <p>Conditions of Approval Attached</p>
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District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

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

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number		² Pool Code 98220		³ Pool Name PURPLE SAGE; WOLFCAMP (GAS)	
⁴ Property Code		⁵ Property Name THOR 28 WXY FEE			⁶ Well Number 5H
⁷ OGRID No. 372098		⁸ Operator Name MARATHON OIL PERMIAN LLC			⁹ Elevation 3083'

¹⁰ Surface Location

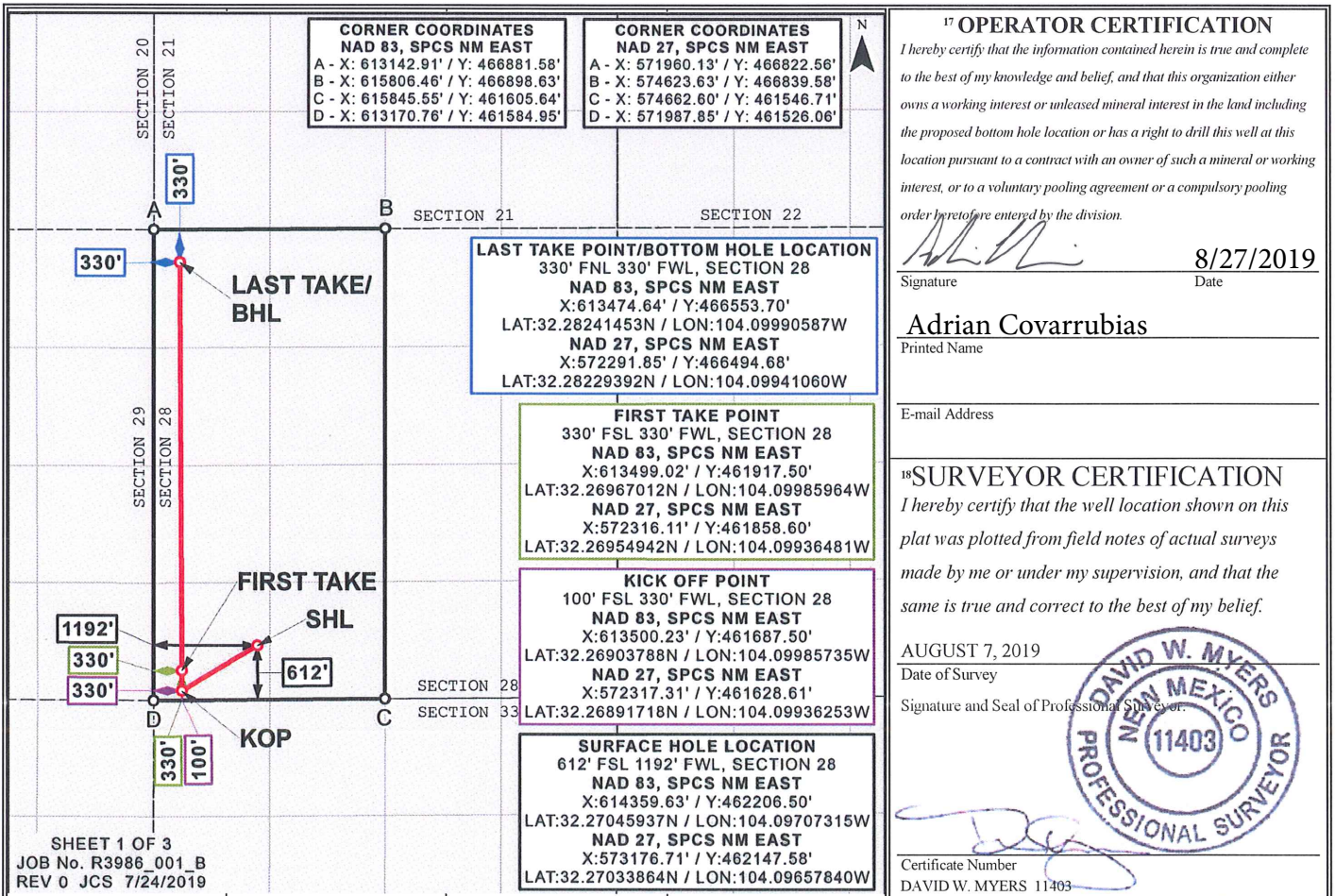
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	28	23S	28E		612	SOUTH	1192	WEST	EDDY

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
D	28	23S	28E		330	NORTH	330	WEST	EDDY

¹² Dedicated Acres 320.0	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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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.



Distances/areas relative to NAD 83 Combined Scale Factor: 0.999915187 Convergence: 00°07'33.71903"

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Form APD Comments

Permit 271589

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

PERMIT COMMENTS

Operator Name and Address: MARATHON OIL PERMIAN LLC [372098] 5555 San Felipe St. Houston, TX 77056	API Number: 30-015-46272
	Well: THOR 28 WXY FEE #005H

Created By	Comment	Comment Date
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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

PERMIT CONDITIONS OF APPROVAL

Operator Name and Address: MARATHON OIL PERMIAN LLC [372098] 5555 San Felipe St. Houston, TX 77056	API Number: 30-015-46272
	Well: THOR 28 WXY FEE #005H

OCD Reviewer	Condition
rpodany	Will require a directional survey with the C-104

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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	Thor 28 (1-3-5-8)				
Site Position:		Northing:	462,147.63 usft	Latitude:	32° 16' 13.218256 N
From:	Map	Easting:	573,236.71 usft	Longitude:	104° 5' 46.983432 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.13 °

Well	WXY Fee #5H					
Well Position	+N/-S	0.00 usft	Northing:	462,147.58 usft	Latitude:	32° 16' 13.219072 N
	+E/-W	0.00 usft	Easting:	573,176.71 usft	Longitude:	104° 5' 47.682272 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,083.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/15/2019	7.12	59.98	47,872.20

Design	Prelim Plan A			
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	359.70

Survey Tool Program	Date	8/15/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	1,850.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
1,850.00	5,400.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
5,400.00	9,000.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
9,000.00	14,294.96	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM

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	
[ThorWXY#5H]FTP										
100.00	0.00	0.00	100.00	0.00	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	0.00
300.00	0.00	0.00	300.00	0.00	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	0.00
500.00	0.00	0.00	500.00	0.00	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	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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)
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	2.00	235.64	1,599.98	-0.99	-1.44	-0.98	2.00	2.00	0.00
1,700.00	4.00	235.64	1,699.84	-3.94	-5.76	-3.91	2.00	2.00	0.00
1,800.00	6.00	235.64	1,799.45	-8.86	-12.95	-8.79	2.00	2.00	0.00
1,900.00	8.00	235.64	1,898.70	-15.74	-23.01	-15.62	2.00	2.00	0.00
2,000.00	10.00	235.64	1,997.47	-24.57	-35.93	-24.38	2.00	2.00	0.00
2,100.00	10.00	235.64	2,095.95	-34.37	-50.26	-34.10	0.00	0.00	0.00
2,200.00	10.00	235.64	2,194.43	-44.17	-64.60	-43.83	0.00	0.00	0.00
2,300.00	10.00	235.64	2,292.91	-53.97	-78.93	-53.55	0.00	0.00	0.00
2,400.00	10.00	235.64	2,391.39	-63.77	-93.26	-63.28	0.00	0.00	0.00
2,500.00	10.00	235.64	2,489.87	-73.57	-107.60	-73.01	0.00	0.00	0.00
2,600.00	10.00	235.64	2,588.35	-83.37	-121.93	-82.73	0.00	0.00	0.00
2,700.00	10.00	235.64	2,686.83	-93.17	-136.27	-92.46	0.00	0.00	0.00
2,800.00	10.00	235.64	2,785.31	-102.97	-150.60	-102.18	0.00	0.00	0.00
2,900.00	10.00	235.64	2,883.79	-112.78	-164.94	-111.91	0.00	0.00	0.00
3,000.00	10.00	235.64	2,982.27	-122.58	-179.27	-121.64	0.00	0.00	0.00
3,100.00	10.00	235.64	3,080.75	-132.38	-193.61	-131.36	0.00	0.00	0.00
3,200.00	10.00	235.64	3,179.23	-142.18	-207.94	-141.09	0.00	0.00	0.00
3,300.00	10.00	235.64	3,277.72	-151.98	-222.27	-150.81	0.00	0.00	0.00
3,400.00	10.00	235.64	3,376.20	-161.78	-236.61	-160.54	0.00	0.00	0.00
3,500.00	10.00	235.64	3,474.68	-171.58	-250.94	-170.27	0.00	0.00	0.00
3,600.00	10.00	235.64	3,573.16	-181.38	-265.28	-179.99	0.00	0.00	0.00
3,700.00	10.00	235.64	3,671.64	-191.19	-279.61	-189.72	0.00	0.00	0.00
3,800.00	10.00	235.64	3,770.12	-200.99	-293.95	-199.44	0.00	0.00	0.00
3,900.00	10.00	235.64	3,868.60	-210.79	-308.28	-209.17	0.00	0.00	0.00
4,000.00	10.00	235.64	3,967.08	-220.59	-322.61	-218.90	0.00	0.00	0.00
4,100.00	10.00	235.64	4,065.56	-230.39	-336.95	-228.62	0.00	0.00	0.00
4,200.00	10.00	235.64	4,164.04	-240.19	-351.28	-238.35	0.00	0.00	0.00
4,300.00	10.00	235.64	4,262.52	-249.99	-365.62	-248.07	0.00	0.00	0.00
4,400.00	10.00	235.64	4,361.00	-259.79	-379.95	-257.80	0.00	0.00	0.00
4,500.00	10.00	235.64	4,459.48	-269.59	-394.29	-267.53	0.00	0.00	0.00
4,600.00	10.00	235.64	4,557.97	-279.40	-408.62	-277.25	0.00	0.00	0.00
4,700.00	10.00	235.64	4,656.45	-289.20	-422.95	-286.98	0.00	0.00	0.00
4,800.00	10.00	235.64	4,754.93	-299.00	-437.29	-296.70	0.00	0.00	0.00
4,900.00	10.00	235.64	4,853.41	-308.80	-451.62	-306.43	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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)
5,000.00	10.00	235.64	4,951.89	-318.60	-465.96	-316.16	0.00	0.00	0.00
5,100.00	10.00	235.64	5,050.37	-328.40	-480.29	-325.88	0.00	0.00	0.00
5,200.00	10.00	235.64	5,148.85	-338.20	-494.63	-335.61	0.00	0.00	0.00
5,300.00	10.00	235.64	5,247.33	-348.00	-508.96	-345.33	0.00	0.00	0.00
5,400.00	10.00	235.64	5,345.81	-357.81	-523.30	-355.06	0.00	0.00	0.00
5,500.00	10.00	235.64	5,444.29	-367.61	-537.63	-364.79	0.00	0.00	0.00
5,600.00	10.00	235.64	5,542.77	-377.41	-551.96	-374.51	0.00	0.00	0.00
5,700.00	10.00	235.64	5,641.25	-387.21	-566.30	-384.24	0.00	0.00	0.00
5,800.00	10.00	235.64	5,739.73	-397.01	-580.63	-393.96	0.00	0.00	0.00
5,900.00	10.00	235.64	5,838.22	-406.81	-594.97	-403.69	0.00	0.00	0.00
6,000.00	10.00	235.64	5,936.70	-416.61	-609.30	-413.42	0.00	0.00	0.00
6,100.00	10.00	235.64	6,035.18	-426.41	-623.64	-423.14	0.00	0.00	0.00
6,200.00	10.00	235.64	6,133.66	-436.22	-637.97	-432.87	0.00	0.00	0.00
6,300.00	10.00	235.64	6,232.14	-446.02	-652.30	-442.59	0.00	0.00	0.00
6,400.00	10.00	235.64	6,330.62	-455.82	-666.64	-452.32	0.00	0.00	0.00
6,500.00	10.00	235.64	6,429.10	-465.62	-680.97	-462.05	0.00	0.00	0.00
6,600.00	10.00	235.64	6,527.58	-475.42	-695.31	-471.77	0.00	0.00	0.00
6,700.00	10.00	235.64	6,626.06	-485.22	-709.64	-481.50	0.00	0.00	0.00
6,793.70	10.00	235.64	6,718.34	-494.40	-723.07	-490.61	0.00	0.00	0.00
6,800.00	9.87	235.64	6,724.54	-495.02	-723.97	-491.22	2.00	-2.00	0.00
6,900.00	7.87	235.64	6,823.34	-503.72	-736.70	-499.86	2.00	-2.00	0.00
7,000.00	5.87	235.64	6,922.62	-510.48	-746.58	-506.56	2.00	-2.00	0.00
7,100.00	3.87	235.64	7,022.25	-515.28	-753.60	-511.32	2.00	-2.00	0.00
7,200.00	1.87	235.64	7,122.12	-518.11	-757.74	-514.13	2.00	-2.00	0.00
7,293.70	0.00	0.00	7,215.80	-518.97	-759.00	-514.99	2.00	-2.00	0.00
7,300.00	0.00	0.00	7,222.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,400.00	0.00	0.00	7,322.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,500.00	0.00	0.00	7,422.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,600.00	0.00	0.00	7,522.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,700.00	0.00	0.00	7,622.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,800.00	0.00	0.00	7,722.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,900.00	0.00	0.00	7,822.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,000.00	0.00	0.00	7,922.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,100.00	0.00	0.00	8,022.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,200.00	0.00	0.00	8,122.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,300.00	0.00	0.00	8,222.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,400.00	0.00	0.00	8,322.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,500.00	0.00	0.00	8,422.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,600.00	0.00	0.00	8,522.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,700.00	0.00	0.00	8,622.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,800.00	0.00	0.00	8,722.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,900.00	0.00	0.00	8,822.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
9,000.00	0.00	0.00	8,922.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
9,100.00	0.00	0.00	9,022.10	-518.97	-759.00	-514.99	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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)
9,148.40	0.00	0.00	9,070.50	-518.97	-759.00	-514.99	0.00	0.00	0.00
[ThorWXY#5H]KOP									
9,150.00	0.19	350.55	9,072.10	-518.97	-759.00	-514.99	12.00	12.00	0.00
9,175.00	3.19	350.55	9,097.09	-518.24	-759.12	-514.26	12.00	12.00	0.00
9,200.00	6.19	350.55	9,122.00	-516.22	-759.46	-512.24	12.00	12.00	0.00
9,225.00	9.19	350.55	9,146.78	-512.92	-760.01	-508.93	12.00	12.00	0.00
9,250.00	12.19	350.55	9,171.34	-508.35	-760.77	-504.36	12.00	12.00	0.00
9,275.00	15.19	350.55	9,195.63	-502.51	-761.74	-498.51	12.00	12.00	0.00
9,300.00	18.19	350.55	9,219.57	-495.43	-762.92	-491.43	12.00	12.00	0.00
9,325.00	21.19	350.55	9,243.10	-487.12	-764.30	-483.11	12.00	12.00	0.00
9,350.00	24.19	350.55	9,266.17	-477.61	-765.88	-473.59	12.00	12.00	0.00
9,375.00	27.19	350.55	9,288.69	-466.92	-767.66	-462.89	12.00	12.00	0.00
9,400.00	30.19	350.55	9,310.62	-455.08	-769.63	-451.04	12.00	12.00	0.00
9,425.00	33.19	350.55	9,331.89	-442.12	-771.79	-438.08	12.00	12.00	0.00
9,450.00	36.19	350.55	9,352.44	-428.09	-774.13	-424.03	12.00	12.00	0.00
9,475.00	39.19	350.55	9,372.22	-413.01	-776.64	-408.94	12.00	12.00	0.00
9,500.00	42.19	350.55	9,391.18	-396.93	-779.31	-392.85	12.00	12.00	0.00
9,525.00	45.19	350.55	9,409.25	-379.90	-782.15	-375.80	12.00	12.00	0.00
9,550.00	48.19	350.55	9,426.40	-361.96	-785.13	-357.84	12.00	12.00	0.00
9,575.00	51.19	350.55	9,442.57	-343.15	-788.26	-339.02	12.00	12.00	0.00
9,600.00	54.19	350.55	9,457.72	-323.54	-791.53	-319.39	12.00	12.00	0.00
9,625.00	57.19	350.55	9,471.81	-303.17	-794.92	-299.01	12.00	12.00	0.00
9,650.00	60.19	350.55	9,484.80	-282.11	-798.42	-277.92	12.00	12.00	0.00
9,675.00	63.19	350.55	9,496.65	-260.40	-802.04	-256.19	12.00	12.00	0.00
9,700.00	66.19	350.55	9,507.34	-238.11	-805.75	-233.88	12.00	12.00	0.00
9,725.00	69.19	350.55	9,516.82	-215.29	-809.55	-211.05	12.00	12.00	0.00
9,750.00	72.19	350.55	9,525.09	-192.02	-813.42	-187.76	12.00	12.00	0.00
9,775.00	75.19	350.55	9,532.11	-168.36	-817.36	-164.07	12.00	12.00	0.00
9,800.00	78.19	350.55	9,537.86	-144.36	-821.35	-140.06	12.00	12.00	0.00
9,825.00	81.19	350.55	9,542.33	-120.10	-825.39	-115.78	12.00	12.00	0.00
9,850.00	84.19	350.55	9,545.51	-95.64	-829.46	-91.30	12.00	12.00	0.00
9,875.00	87.19	350.55	9,547.39	-71.05	-833.55	-66.69	12.00	12.00	0.00
9,898.40	90.00	350.55	9,547.97	-47.98	-837.39	-43.60	12.00	12.00	0.00
9,900.00	90.00	350.60	9,547.97	-46.40	-837.66	-42.02	3.00	0.00	3.00
10,000.00	90.00	353.60	9,547.97	52.64	-851.40	57.09	3.00	0.00	3.00
10,100.00	90.00	356.60	9,547.97	152.26	-859.95	156.76	3.00	0.00	3.00
10,203.33	90.00	359.70	9,547.97	255.52	-863.29	260.04	3.00	0.00	3.00
10,300.00	90.00	359.70	9,547.97	352.19	-863.79	356.71	0.00	0.00	0.00
10,400.00	90.00	359.70	9,547.97	452.19	-864.32	456.71	0.00	0.00	0.00
10,500.00	90.00	359.70	9,547.97	552.19	-864.85	556.71	0.00	0.00	0.00
10,600.00	90.00	359.70	9,547.97	652.19	-865.38	656.71	0.00	0.00	0.00
10,700.00	90.00	359.70	9,547.97	752.19	-865.90	756.71	0.00	0.00	0.00
10,800.00	90.00	359.70	9,547.97	852.18	-866.43	856.71	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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)
10,900.00	90.00	359.70	9,547.97	952.18	-866.96	956.71	0.00	0.00	0.00
11,000.00	90.00	359.70	9,547.97	1,052.18	-867.49	1,056.71	0.00	0.00	0.00
11,100.00	90.00	359.70	9,547.97	1,152.18	-868.01	1,156.71	0.00	0.00	0.00
11,200.00	90.00	359.70	9,547.97	1,252.18	-868.54	1,256.71	0.00	0.00	0.00
11,300.00	90.00	359.70	9,547.98	1,352.18	-869.07	1,356.71	0.00	0.00	0.00
11,400.00	90.00	359.70	9,547.98	1,452.18	-869.60	1,456.71	0.00	0.00	0.00
11,500.00	90.00	359.70	9,547.98	1,552.17	-870.12	1,556.71	0.00	0.00	0.00
11,600.00	90.00	359.70	9,547.98	1,652.17	-870.65	1,656.71	0.00	0.00	0.00
11,700.00	90.00	359.70	9,547.98	1,752.17	-871.18	1,756.71	0.00	0.00	0.00
11,800.00	90.00	359.70	9,547.98	1,852.17	-871.70	1,856.71	0.00	0.00	0.00
11,900.00	90.00	359.70	9,547.98	1,952.17	-872.23	1,956.71	0.00	0.00	0.00
12,000.00	90.00	359.70	9,547.98	2,052.17	-872.76	2,056.71	0.00	0.00	0.00
12,100.00	90.00	359.70	9,547.98	2,152.17	-873.29	2,156.71	0.00	0.00	0.00
12,200.00	90.00	359.70	9,547.98	2,252.17	-873.81	2,256.71	0.00	0.00	0.00
12,300.00	90.00	359.70	9,547.98	2,352.16	-874.34	2,356.71	0.00	0.00	0.00
12,400.00	90.00	359.70	9,547.98	2,452.16	-874.87	2,456.71	0.00	0.00	0.00
12,500.00	90.00	359.70	9,547.99	2,552.16	-875.40	2,556.71	0.00	0.00	0.00
12,600.00	90.00	359.70	9,547.99	2,652.16	-875.92	2,656.71	0.00	0.00	0.00
12,700.00	90.00	359.70	9,547.99	2,752.16	-876.45	2,756.71	0.00	0.00	0.00
12,800.00	90.00	359.70	9,547.99	2,852.16	-876.98	2,856.71	0.00	0.00	0.00
12,900.00	90.00	359.70	9,547.99	2,952.16	-877.50	2,956.71	0.00	0.00	0.00
13,000.00	90.00	359.70	9,547.99	3,052.15	-878.03	3,056.71	0.00	0.00	0.00
13,100.00	90.00	359.70	9,547.99	3,152.15	-878.56	3,156.71	0.00	0.00	0.00
13,200.00	90.00	359.70	9,547.99	3,252.15	-879.09	3,256.71	0.00	0.00	0.00
13,300.00	90.00	359.70	9,547.99	3,352.15	-879.61	3,356.71	0.00	0.00	0.00
13,400.00	90.00	359.70	9,547.99	3,452.15	-880.14	3,456.71	0.00	0.00	0.00
13,500.00	90.00	359.70	9,547.99	3,552.15	-880.67	3,556.71	0.00	0.00	0.00
13,600.00	90.00	359.70	9,547.99	3,652.15	-881.20	3,656.71	0.00	0.00	0.00
13,700.00	90.00	359.70	9,548.00	3,752.14	-881.72	3,756.71	0.00	0.00	0.00
13,800.00	90.00	359.70	9,548.00	3,852.14	-882.25	3,856.71	0.00	0.00	0.00
13,900.00	90.00	359.70	9,548.00	3,952.14	-882.78	3,956.71	0.00	0.00	0.00
14,000.00	90.00	359.70	9,548.00	4,052.14	-883.30	4,056.71	0.00	0.00	0.00
14,100.00	90.00	359.70	9,548.00	4,152.14	-883.83	4,156.71	0.00	0.00	0.00
14,200.00	90.00	359.70	9,548.00	4,252.14	-884.36	4,256.71	0.00	0.00	0.00
14,294.96	90.00	359.70	9,548.00	4,347.10	-884.86	4,351.67	0.00	0.00	0.00

[ThorWXY#5H]LTP/BHL

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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
[ThorWXY#5H]FTP - plan misses target center by 907.82usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	-288.98	-860.60	461,858.60	572,316.11	32° 16' 10.377939 N	104° 5' 57.713282 W
[ThorWXY#5H]KOP - plan hits target center - Point	0.00	0.00	9,070.50	-518.97	-759.00	461,628.61	572,417.71	32° 16' 8.099712 N	104° 5' 56.535774 W
[ThorWXY#5H]LTP/BHL - plan hits target center - Point	0.00	0.00	9,548.00	4,347.10	-884.86	466,494.68	572,291.85	32° 16' 56.258123 N	104° 5' 57.878120 W

Checked By: _____ Approved By: _____ Date: _____

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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	Thor 28 (1-3-5-8)		
Site Position:		Northing:	462,147.63 usft
From:	Map	Easting:	573,236.71 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 16' 13.218256 N
		Longitude:	104° 5' 46.983432 W
		Grid Convergence:	0.13 °

Well	WXY Fee #5H				
Well Position	+N/-S	0.00 usft	Northing:	462,147.58 usft	
	+E/-W	0.00 usft	Easting:	573,176.71 usft	
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,083.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/15/2019	7.12	59.98	47,872.20

Design	Prelim Plan A			
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	359.70

Survey Tool Program	Date	8/15/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	1,850.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
1,850.00	5,400.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
5,400.00	9,000.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
9,000.00	14,294.96	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM

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	
[ThorWXY#5H]FTP										
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	

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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)
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	2.00	235.64	1,599.98	-0.99	-1.44	-0.98	2.00	2.00	0.00
1,700.00	4.00	235.64	1,699.84	-3.94	-5.76	-3.91	2.00	2.00	0.00
1,800.00	6.00	235.64	1,799.45	-8.86	-12.95	-8.79	2.00	2.00	0.00
1,900.00	8.00	235.64	1,898.70	-15.74	-23.01	-15.62	2.00	2.00	0.00
2,000.00	10.00	235.64	1,997.47	-24.57	-35.93	-24.38	2.00	2.00	0.00
2,100.00	10.00	235.64	2,095.95	-34.37	-50.26	-34.10	0.00	0.00	0.00
2,200.00	10.00	235.64	2,194.43	-44.17	-64.60	-43.83	0.00	0.00	0.00
2,300.00	10.00	235.64	2,292.91	-53.97	-78.93	-53.55	0.00	0.00	0.00
2,400.00	10.00	235.64	2,391.39	-63.77	-93.26	-63.28	0.00	0.00	0.00
2,500.00	10.00	235.64	2,489.87	-73.57	-107.60	-73.01	0.00	0.00	0.00
2,600.00	10.00	235.64	2,588.35	-83.37	-121.93	-82.73	0.00	0.00	0.00
2,700.00	10.00	235.64	2,686.83	-93.17	-136.27	-92.46	0.00	0.00	0.00
2,800.00	10.00	235.64	2,785.31	-102.97	-150.60	-102.18	0.00	0.00	0.00
2,900.00	10.00	235.64	2,883.79	-112.78	-164.94	-111.91	0.00	0.00	0.00
3,000.00	10.00	235.64	2,982.27	-122.58	-179.27	-121.64	0.00	0.00	0.00
3,100.00	10.00	235.64	3,080.75	-132.38	-193.61	-131.36	0.00	0.00	0.00
3,200.00	10.00	235.64	3,179.23	-142.18	-207.94	-141.09	0.00	0.00	0.00
3,300.00	10.00	235.64	3,277.72	-151.98	-222.27	-150.81	0.00	0.00	0.00
3,400.00	10.00	235.64	3,376.20	-161.78	-236.61	-160.54	0.00	0.00	0.00
3,500.00	10.00	235.64	3,474.68	-171.58	-250.94	-170.27	0.00	0.00	0.00
3,600.00	10.00	235.64	3,573.16	-181.38	-265.28	-179.99	0.00	0.00	0.00
3,700.00	10.00	235.64	3,671.64	-191.19	-279.61	-189.72	0.00	0.00	0.00
3,800.00	10.00	235.64	3,770.12	-200.99	-293.95	-199.44	0.00	0.00	0.00
3,900.00	10.00	235.64	3,868.60	-210.79	-308.28	-209.17	0.00	0.00	0.00
4,000.00	10.00	235.64	3,967.08	-220.59	-322.61	-218.90	0.00	0.00	0.00
4,100.00	10.00	235.64	4,065.56	-230.39	-336.95	-228.62	0.00	0.00	0.00
4,200.00	10.00	235.64	4,164.04	-240.19	-351.28	-238.35	0.00	0.00	0.00
4,300.00	10.00	235.64	4,262.52	-249.99	-365.62	-248.07	0.00	0.00	0.00
4,400.00	10.00	235.64	4,361.00	-259.79	-379.95	-257.80	0.00	0.00	0.00
4,500.00	10.00	235.64	4,459.48	-269.59	-394.29	-267.53	0.00	0.00	0.00
4,600.00	10.00	235.64	4,557.97	-279.40	-408.62	-277.25	0.00	0.00	0.00
4,700.00	10.00	235.64	4,656.45	-289.20	-422.95	-286.98	0.00	0.00	0.00
4,800.00	10.00	235.64	4,754.93	-299.00	-437.29	-296.70	0.00	0.00	0.00
4,900.00	10.00	235.64	4,853.41	-308.80	-451.62	-306.43	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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)
5,000.00	10.00	235.64	4,951.89	-318.60	-465.96	-316.16	0.00	0.00	0.00
5,100.00	10.00	235.64	5,050.37	-328.40	-480.29	-325.88	0.00	0.00	0.00
5,200.00	10.00	235.64	5,148.85	-338.20	-494.63	-335.61	0.00	0.00	0.00
5,300.00	10.00	235.64	5,247.33	-348.00	-508.96	-345.33	0.00	0.00	0.00
5,400.00	10.00	235.64	5,345.81	-357.81	-523.30	-355.06	0.00	0.00	0.00
5,500.00	10.00	235.64	5,444.29	-367.61	-537.63	-364.79	0.00	0.00	0.00
5,600.00	10.00	235.64	5,542.77	-377.41	-551.96	-374.51	0.00	0.00	0.00
5,700.00	10.00	235.64	5,641.25	-387.21	-566.30	-384.24	0.00	0.00	0.00
5,800.00	10.00	235.64	5,739.73	-397.01	-580.63	-393.96	0.00	0.00	0.00
5,900.00	10.00	235.64	5,838.22	-406.81	-594.97	-403.69	0.00	0.00	0.00
6,000.00	10.00	235.64	5,936.70	-416.61	-609.30	-413.42	0.00	0.00	0.00
6,100.00	10.00	235.64	6,035.18	-426.41	-623.64	-423.14	0.00	0.00	0.00
6,200.00	10.00	235.64	6,133.66	-436.22	-637.97	-432.87	0.00	0.00	0.00
6,300.00	10.00	235.64	6,232.14	-446.02	-652.30	-442.59	0.00	0.00	0.00
6,400.00	10.00	235.64	6,330.62	-455.82	-666.64	-452.32	0.00	0.00	0.00
6,500.00	10.00	235.64	6,429.10	-465.62	-680.97	-462.05	0.00	0.00	0.00
6,600.00	10.00	235.64	6,527.58	-475.42	-695.31	-471.77	0.00	0.00	0.00
6,700.00	10.00	235.64	6,626.06	-485.22	-709.64	-481.50	0.00	0.00	0.00
6,793.70	10.00	235.64	6,718.34	-494.40	-723.07	-490.61	0.00	0.00	0.00
6,800.00	9.87	235.64	6,724.54	-495.02	-723.97	-491.22	2.00	-2.00	0.00
6,900.00	7.87	235.64	6,823.34	-503.72	-736.70	-499.86	2.00	-2.00	0.00
7,000.00	5.87	235.64	6,922.62	-510.48	-746.58	-506.56	2.00	-2.00	0.00
7,100.00	3.87	235.64	7,022.25	-515.28	-753.60	-511.32	2.00	-2.00	0.00
7,200.00	1.87	235.64	7,122.12	-518.11	-757.74	-514.13	2.00	-2.00	0.00
7,293.70	0.00	0.00	7,215.80	-518.97	-759.00	-514.99	2.00	-2.00	0.00
7,300.00	0.00	0.00	7,222.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,400.00	0.00	0.00	7,322.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,500.00	0.00	0.00	7,422.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,600.00	0.00	0.00	7,522.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,700.00	0.00	0.00	7,622.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,800.00	0.00	0.00	7,722.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,900.00	0.00	0.00	7,822.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,000.00	0.00	0.00	7,922.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,100.00	0.00	0.00	8,022.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,200.00	0.00	0.00	8,122.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,300.00	0.00	0.00	8,222.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,400.00	0.00	0.00	8,322.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,500.00	0.00	0.00	8,422.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,600.00	0.00	0.00	8,522.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,700.00	0.00	0.00	8,622.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,800.00	0.00	0.00	8,722.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,900.00	0.00	0.00	8,822.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
9,000.00	0.00	0.00	8,922.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
9,100.00	0.00	0.00	9,022.10	-518.97	-759.00	-514.99	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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)	
9,148.40	0.00	0.00	9,070.50	-518.97	-759.00	-514.99	0.00	0.00	0.00	
[ThorWXY#5H]KOP										
9,150.00	0.19	350.55	9,072.10	-518.97	-759.00	-514.99	12.00	12.00	0.00	
9,175.00	3.19	350.55	9,097.09	-518.24	-759.12	-514.26	12.00	12.00	0.00	
9,200.00	6.19	350.55	9,122.00	-516.22	-759.46	-512.24	12.00	12.00	0.00	
9,225.00	9.19	350.55	9,146.78	-512.92	-760.01	-508.93	12.00	12.00	0.00	
9,250.00	12.19	350.55	9,171.34	-508.35	-760.77	-504.36	12.00	12.00	0.00	
9,275.00	15.19	350.55	9,195.63	-502.51	-761.74	-498.51	12.00	12.00	0.00	
9,300.00	18.19	350.55	9,219.57	-495.43	-762.92	-491.43	12.00	12.00	0.00	
9,325.00	21.19	350.55	9,243.10	-487.12	-764.30	-483.11	12.00	12.00	0.00	
9,350.00	24.19	350.55	9,266.17	-477.61	-765.88	-473.59	12.00	12.00	0.00	
9,375.00	27.19	350.55	9,288.69	-466.92	-767.66	-462.89	12.00	12.00	0.00	
9,400.00	30.19	350.55	9,310.62	-455.08	-769.63	-451.04	12.00	12.00	0.00	
9,425.00	33.19	350.55	9,331.89	-442.12	-771.79	-438.08	12.00	12.00	0.00	
9,450.00	36.19	350.55	9,352.44	-428.09	-774.13	-424.03	12.00	12.00	0.00	
9,475.00	39.19	350.55	9,372.22	-413.01	-776.64	-408.94	12.00	12.00	0.00	
9,500.00	42.19	350.55	9,391.18	-396.93	-779.31	-392.85	12.00	12.00	0.00	
9,525.00	45.19	350.55	9,409.25	-379.90	-782.15	-375.80	12.00	12.00	0.00	
9,550.00	48.19	350.55	9,426.40	-361.96	-785.13	-357.84	12.00	12.00	0.00	
9,575.00	51.19	350.55	9,442.57	-343.15	-788.26	-339.02	12.00	12.00	0.00	
9,600.00	54.19	350.55	9,457.72	-323.54	-791.53	-319.39	12.00	12.00	0.00	
9,625.00	57.19	350.55	9,471.81	-303.17	-794.92	-299.01	12.00	12.00	0.00	
9,650.00	60.19	350.55	9,484.80	-282.11	-798.42	-277.92	12.00	12.00	0.00	
9,675.00	63.19	350.55	9,496.65	-260.40	-802.04	-256.19	12.00	12.00	0.00	
9,700.00	66.19	350.55	9,507.34	-238.11	-805.75	-233.88	12.00	12.00	0.00	
9,725.00	69.19	350.55	9,516.82	-215.29	-809.55	-211.05	12.00	12.00	0.00	
9,750.00	72.19	350.55	9,525.09	-192.02	-813.42	-187.76	12.00	12.00	0.00	
9,775.00	75.19	350.55	9,532.11	-168.36	-817.36	-164.07	12.00	12.00	0.00	
9,800.00	78.19	350.55	9,537.86	-144.36	-821.35	-140.06	12.00	12.00	0.00	
9,825.00	81.19	350.55	9,542.33	-120.10	-825.39	-115.78	12.00	12.00	0.00	
9,850.00	84.19	350.55	9,545.51	-95.64	-829.46	-91.30	12.00	12.00	0.00	
9,875.00	87.19	350.55	9,547.39	-71.05	-833.55	-66.69	12.00	12.00	0.00	
9,898.40	90.00	350.55	9,547.97	-47.98	-837.39	-43.60	12.00	12.00	0.00	
9,900.00	90.00	350.60	9,547.97	-46.40	-837.66	-42.02	3.00	0.00	3.00	
10,000.00	90.00	353.60	9,547.97	52.64	-851.40	57.09	3.00	0.00	3.00	
10,100.00	90.00	356.60	9,547.97	152.26	-859.95	156.76	3.00	0.00	3.00	
10,203.33	90.00	359.70	9,547.97	255.52	-863.29	260.04	3.00	0.00	3.00	
10,300.00	90.00	359.70	9,547.97	352.19	-863.79	356.71	0.00	0.00	0.00	
10,400.00	90.00	359.70	9,547.97	452.19	-864.32	456.71	0.00	0.00	0.00	
10,500.00	90.00	359.70	9,547.97	552.19	-864.85	556.71	0.00	0.00	0.00	
10,600.00	90.00	359.70	9,547.97	652.19	-865.38	656.71	0.00	0.00	0.00	
10,700.00	90.00	359.70	9,547.97	752.19	-865.90	756.71	0.00	0.00	0.00	
10,800.00	90.00	359.70	9,547.97	852.18	-866.43	856.71	0.00	0.00	0.00	

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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)
10,900.00	90.00	359.70	9,547.97	952.18	-866.96	956.71	0.00	0.00	0.00
11,000.00	90.00	359.70	9,547.97	1,052.18	-867.49	1,056.71	0.00	0.00	0.00
11,100.00	90.00	359.70	9,547.97	1,152.18	-868.01	1,156.71	0.00	0.00	0.00
11,200.00	90.00	359.70	9,547.97	1,252.18	-868.54	1,256.71	0.00	0.00	0.00
11,300.00	90.00	359.70	9,547.98	1,352.18	-869.07	1,356.71	0.00	0.00	0.00
11,400.00	90.00	359.70	9,547.98	1,452.18	-869.60	1,456.71	0.00	0.00	0.00
11,500.00	90.00	359.70	9,547.98	1,552.17	-870.12	1,556.71	0.00	0.00	0.00
11,600.00	90.00	359.70	9,547.98	1,652.17	-870.65	1,656.71	0.00	0.00	0.00
11,700.00	90.00	359.70	9,547.98	1,752.17	-871.18	1,756.71	0.00	0.00	0.00
11,800.00	90.00	359.70	9,547.98	1,852.17	-871.70	1,856.71	0.00	0.00	0.00
11,900.00	90.00	359.70	9,547.98	1,952.17	-872.23	1,956.71	0.00	0.00	0.00
12,000.00	90.00	359.70	9,547.98	2,052.17	-872.76	2,056.71	0.00	0.00	0.00
12,100.00	90.00	359.70	9,547.98	2,152.17	-873.29	2,156.71	0.00	0.00	0.00
12,200.00	90.00	359.70	9,547.98	2,252.17	-873.81	2,256.71	0.00	0.00	0.00
12,300.00	90.00	359.70	9,547.98	2,352.16	-874.34	2,356.71	0.00	0.00	0.00
12,400.00	90.00	359.70	9,547.98	2,452.16	-874.87	2,456.71	0.00	0.00	0.00
12,500.00	90.00	359.70	9,547.99	2,552.16	-875.40	2,556.71	0.00	0.00	0.00
12,600.00	90.00	359.70	9,547.99	2,652.16	-875.92	2,656.71	0.00	0.00	0.00
12,700.00	90.00	359.70	9,547.99	2,752.16	-876.45	2,756.71	0.00	0.00	0.00
12,800.00	90.00	359.70	9,547.99	2,852.16	-876.98	2,856.71	0.00	0.00	0.00
12,900.00	90.00	359.70	9,547.99	2,952.16	-877.50	2,956.71	0.00	0.00	0.00
13,000.00	90.00	359.70	9,547.99	3,052.15	-878.03	3,056.71	0.00	0.00	0.00
13,100.00	90.00	359.70	9,547.99	3,152.15	-878.56	3,156.71	0.00	0.00	0.00
13,200.00	90.00	359.70	9,547.99	3,252.15	-879.09	3,256.71	0.00	0.00	0.00
13,300.00	90.00	359.70	9,547.99	3,352.15	-879.61	3,356.71	0.00	0.00	0.00
13,400.00	90.00	359.70	9,547.99	3,452.15	-880.14	3,456.71	0.00	0.00	0.00
13,500.00	90.00	359.70	9,547.99	3,552.15	-880.67	3,556.71	0.00	0.00	0.00
13,600.00	90.00	359.70	9,547.99	3,652.15	-881.20	3,656.71	0.00	0.00	0.00
13,700.00	90.00	359.70	9,548.00	3,752.14	-881.72	3,756.71	0.00	0.00	0.00
13,800.00	90.00	359.70	9,548.00	3,852.14	-882.25	3,856.71	0.00	0.00	0.00
13,900.00	90.00	359.70	9,548.00	3,952.14	-882.78	3,956.71	0.00	0.00	0.00
14,000.00	90.00	359.70	9,548.00	4,052.14	-883.30	4,056.71	0.00	0.00	0.00
14,100.00	90.00	359.70	9,548.00	4,152.14	-883.83	4,156.71	0.00	0.00	0.00
14,200.00	90.00	359.70	9,548.00	4,252.14	-884.36	4,256.71	0.00	0.00	0.00
14,294.96	90.00	359.70	9,548.00	4,347.10	-884.86	4,351.67	0.00	0.00	0.00

[ThorWXY#5H]LTP/BHL

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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
[ThorWXY#5H]FTP - plan misses target center by 907.82usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	-288.98	-860.60	461,858.60	572,316.11	32° 16' 10.377939 N	104° 5' 57.713282 W
[ThorWXY#5H]KOP - plan hits target center - Point	0.00	0.00	9,070.50	-518.97	-759.00	461,628.61	572,417.71	32° 16' 8.099712 N	104° 5' 56.535774 W
[ThorWXY#5H]LTP/BHL - plan hits target center - Point	0.00	0.00	9,548.00	4,347.10	-884.86	466,494.68	572,291.85	32° 16' 56.258123 N	104° 5' 57.878120 W

Checked By: _____	Approved By: _____	Date: _____
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