

Well Name: MAMMOTH FEDERAL 26 34 1 TB	Well Location: T26S / R34E / SEC 1 / SESE / 32.0675287 / -103.4190888	County or Parish/State: LEA / NM
Well Number: 17H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM113970	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546129	Well Status: Approved Application for Permit to Drill	Operator: MARATHON OIL PERMIAN LLC

Notice of Intent

Type of Submission: Notice of Intent	Type of Action Other
Date Sundry Submitted: 03/30/2021	Time Sundry Submitted: 06:07
Date proposed operation will begin: 05/14/2021	

Procedure Description: Marathon Oil respectfully requests to make the following changes to the above listed well: - Well Name from Mammoth Federal 26 34 1 TB 17H to Thunderbird 1 TB Federal 17H - SHL - FTP and LTP See attached for original sundry (submitted in WIS and resubmitted in AFMSS at the BLM's request), C102 Well Plat, Directional Survey and Drill Plan attachments for more details. In addition, Marathon Oil has changed the pad size and layout to better accommodate the Facility needs and disturbance footprint. The revised layout is depicted in the attached plats and was On-sited with MRO and BLM personnel on November 21st, 2019.

Surface Disturbance

Is any additional surface disturbance proposed?: Yes		
Proposed Disturbance(acres): 5	Interim Reclamation (acres): 2	Long Term Disturbance (acres): 3
Surface Disturbance: See attached.		

NOI Attachments

Procedure Description

BLM_WIS_SUB_SUNDRY_EC536292_Thunderbird_1_TB_Fed_17H_11.3.2020_20210330180640.pdf

Surface Disturbance

FINAL_Pad_Plat_Pkg_THUNDERBIRD_1_FED_TB14H17HWA18HWXY21H_Certd_10.08.2020_20210330180714.pdf

Received by OCD: 5/6/2021 7:31:18 AM

Page 2 of 27

Well Name: MAMMOTH FEDERAL 26 34 1 TB	Well Location: T26S / R34E / SEC 1 / SESE / 32.0675287 / -103.4190888	County or Parish/State: LEA / NM
Well Number: 17H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM113970	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546129	Well Status: Approved Application for Permit to Drill	Operator: MARATHON OIL PERMIAN LLC

Operator Certification

I certify that the foregoing is true and correct. 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. Electronic submission of Sundry Notices through this system satisfies regulations requiring a submission of Form 3160-5 or a Sundry Notice.

Operator Electronic Signature: MELISSA SZUDERA	Signed on: MAR 30, 2021 06:07 PM
Name: MARATHON OIL PERMIAN LLC	
Title: REGULATORY COMPLIANCE REPRESENTATIVE	
Street Address: 5555 San Felipe St.	
City: Houston	State: TX
Phone: (713) 296-3179	
Email address: mszudera@marathonoil.com	

Field Representative

Representative Name:		
Street Address:		
City:	State:	Zip:
Phone:		
Email address:		

BLM Point of Contact

BLM POC Name: Cody Layton	BLM POC Title: Assistant Field Manager Lands & Minerals
BLM POC Phone: 5752345959	BLM POC Email Address: clayton@blm.gov
Disposition: Approved	Disposition Date: 05/04/2021
Signature: Cody R. Layton	

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

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

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

☒ AMENDED REPORT
Name, Dedicated Acres
SHL, FTP, LTP

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 3002546129	² Pool Code 96661	³ Pool Name HARDIN TANK; BONE SPRING
⁴ Property Code	⁵ Property Name THUNDERBIRD 1 TB FED	⁶ Well Number 17H
⁷ OGRID No. 372098	⁸ Operator Name MARATHON OIL PERMIAN LLC	⁹ Elevation 3281'

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
P	1	26S	34E		818	SOUTH	1279	EAST	LEA

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
A	1	26S	34E		100	NORTH	1320	EAST	LEA

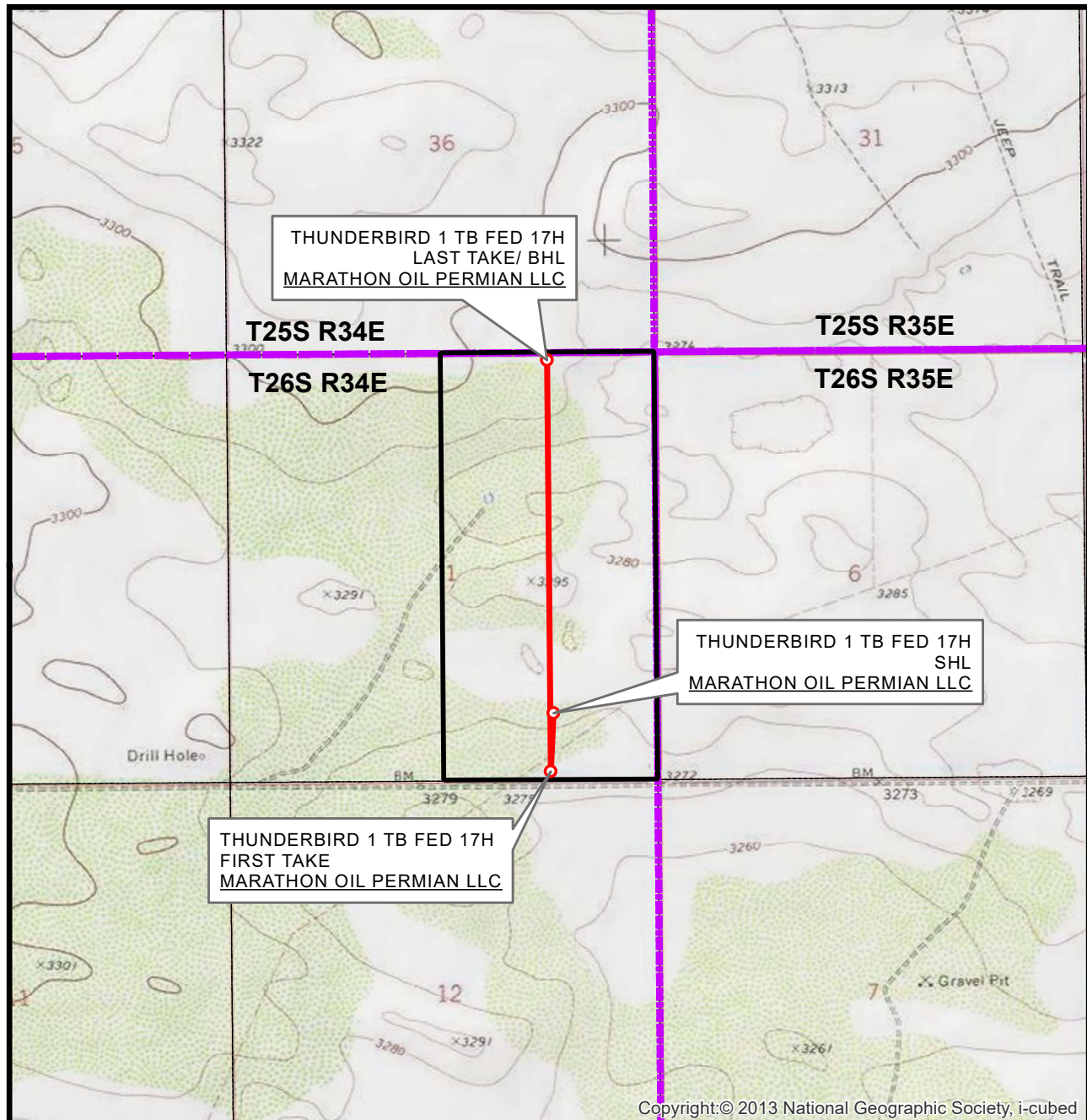
¹² Dedicated Acres 320.0	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
--	-------------------------------	----------------------------------	-------------------------

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.

DEFINING 	CORNER COORDINATES NAD 83, SPCS NM EAST A - X: 823088.17' / Y: 393904.53' B - X: 825728.39' / Y: 393922.74' C - X: 825774.41' / Y: 388641.60' D - X: 823132.38' / Y: 388627.40'	CORNER COORDINATES NAD 27, SPCS NM EAST A - X: 781900.88' / Y: 393846.90' B - X: 784541.07' / Y: 393865.08' C - X: 784586.85' / Y: 388584.08' D - X: 781944.85' / Y: 388569.90'	¹⁷ OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Date 10/26/2020 Printed Name Melissa Szudera E-mail Address mszudera@marathonoil.com
	LAST TAKE POINT/BOTTOM HOLE LOCATION 100' FNL 1320' FEL, SECTION 1 NAD 83, SPCS NM EAST X: 824409.29' / Y: 393813.64' LAT: 32.07937703N / LON: 103.41939214W NAD 27, SPCS NM EAST X: 783221.98' / Y: 393755.99' LAT: 32.07925114N / LON: 103.41892805W		
	KICK OFF POINT/FIRST TAKE POINT 100' FSL 1320' FEL, SECTION 1 NAD 83, SPCS NM EAST X: 824453.55' / Y: 388734.50' LAT: 32.06541536N / LON: 103.41938815W NAD 27, SPCS NM EAST X: 783266.01' / Y: 388676.99' LAT: 32.06526940N / LON: 103.41892488W		
	SURFACE HOLE LOCATION 818' FSL 1279' FEL, SECTION 1 NAD 83, SPCS NM EAST X: 824487.97' / Y: 389452.40' LAT: 32.06738778N / LON: 103.41925741W NAD 27, SPCS NM EAST X: 783300.46' / Y: 389394.86' LAT: 32.06726182N / LON: 103.41879404W		
SHEET 1 OF 3 JOB No. R4043_002 REV 1 WHM 9/30/2020			¹⁸ SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. OCTOBER 8, 2020 Date of Survey Signature and Seal of Professional Surveyor: Certificate Number DAVID W. MYERS 11403

Distances/areas relative to NAD 83 Combined Scale Factor: 0.99985058 Convergence Angle: 00°29'34.80475"

LOCATION VERIFICATION MAP



SEC. 1 TWP. 26-S RGE. 34-E
 SURVEY: N.M.P.M.
 COUNTY: LEA
 OPERATOR: MARATHON OIL PERMIAN LLC
 DESCRIPTION: 818' FSL & 1279' FEL
 ELEVATION: 3281'
 LEASE: THUNDERBIRD 1 FED
 U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE, NM, TX.

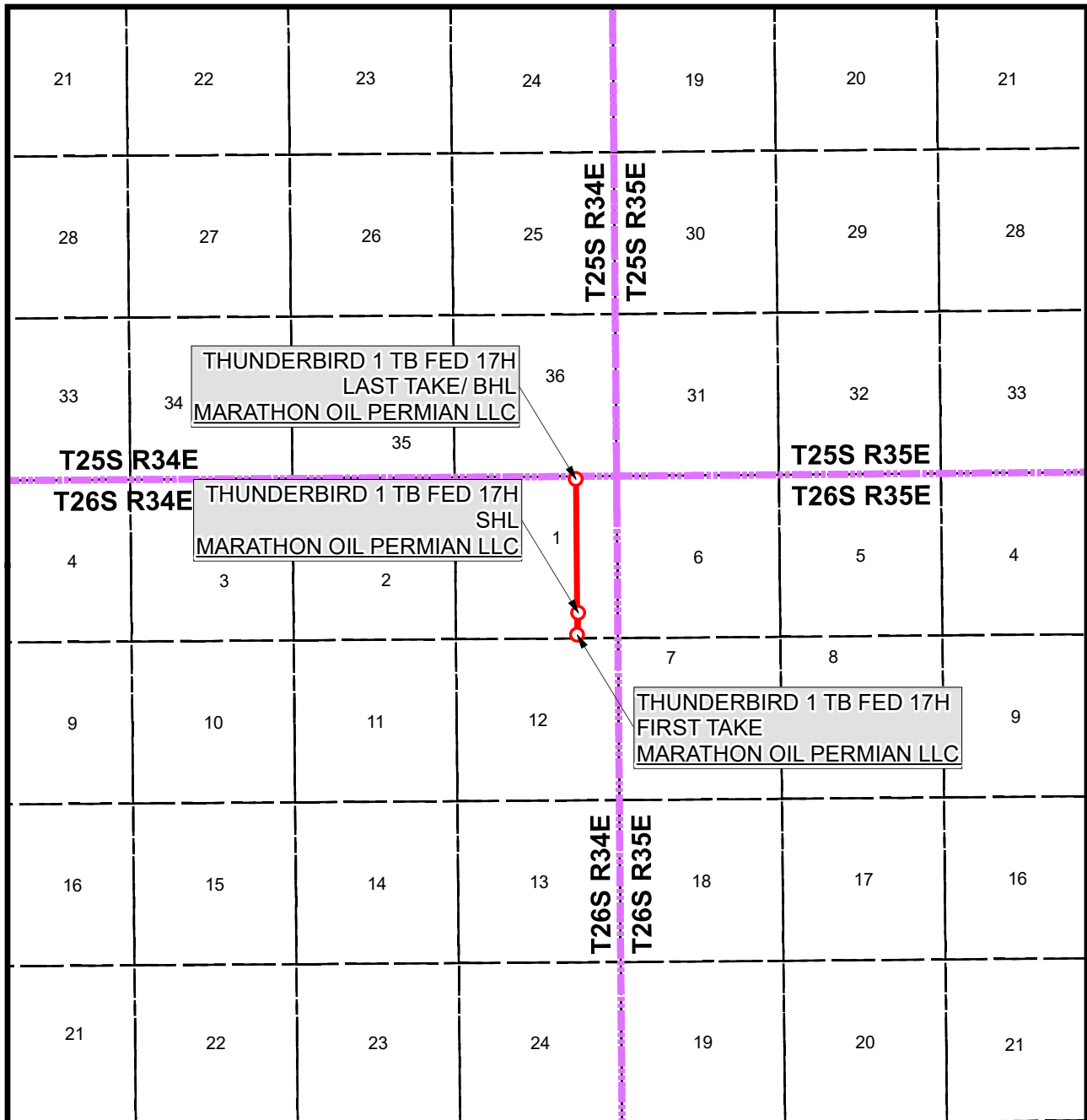
1" = 2,000'
 CONTOUR INTERVAL = 10'



SHEET 2 OF 3

PREPARED BY:
 R-SQUARED GLOBAL, LLC
 1309 LOUISVILLE AVENUE, MONROE, LA 71201
 318-323-6900 OFFICE
 JOB No. R4043_002

VICINITY MAP



SEC. 1 TWP. 26-S RGE. 34-E
 SURVEY: N.M.P.M.
 COUNTY: LEA
 OPERATOR: MARATHON OIL PERMIAN LLC
 DESCRIPTION: 818' FSL & 1279' FEL
 ELEVATION: 3281'
 LEASE: THUNDERBIRD 1 FED
 U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE, NM,TX.

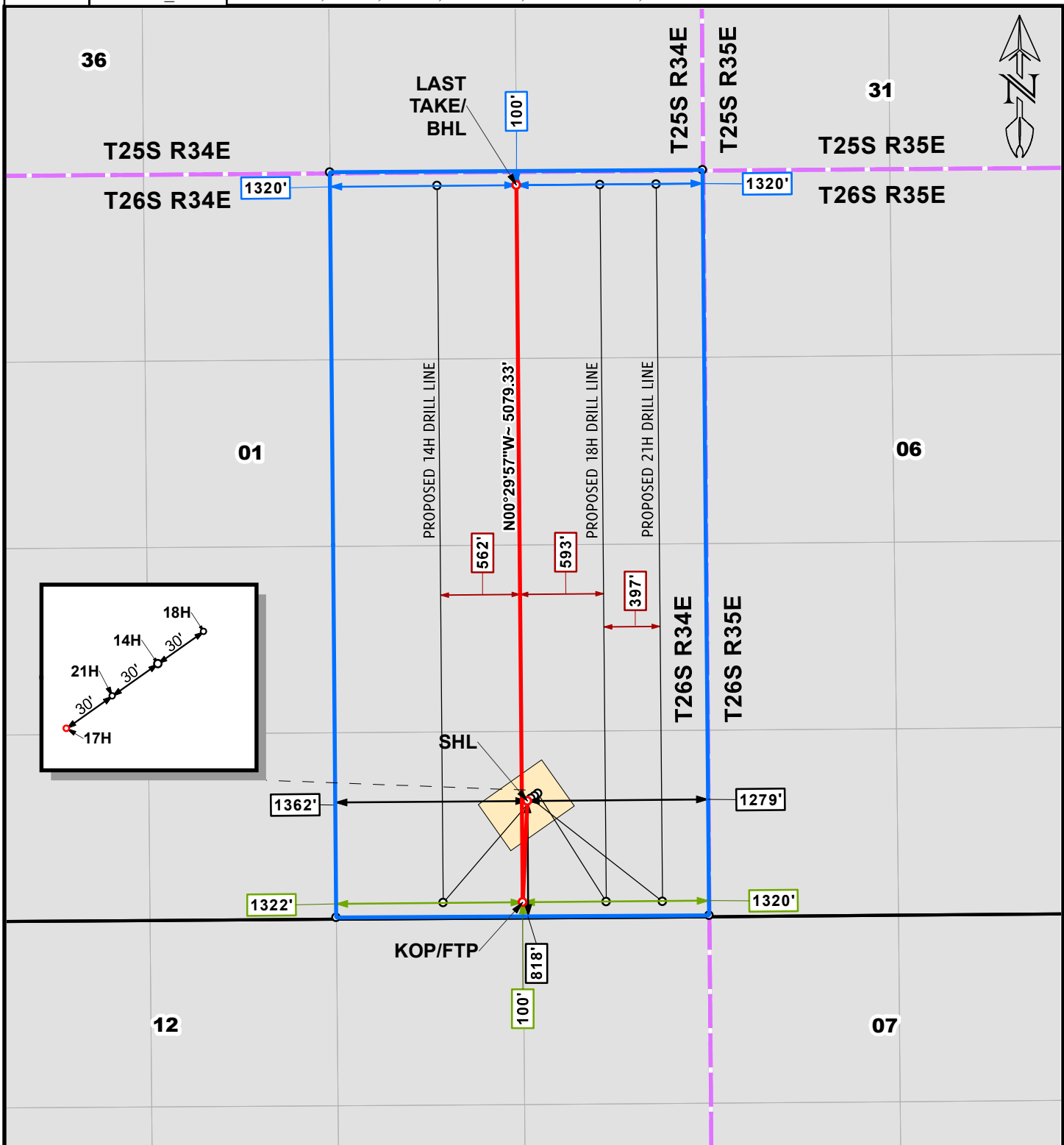
1" = 1 MILE



SHEET 3 OF 3

PREPARED BY:
 R-SQUARED GLOBAL, LLC
 1309 LOUISVILLE AVENUE, MONROE, LA 71201
 318-323-6900 OFFICE
 JOB No. R4043_002

JOB No. R4043_002 SECTION 1, T-26-S, R-34-E, N.M.P.M., LEA COUNTY, NEW MEXICO



810 0 810
1 inch = 76 feet

MarathonOil
Permian LLC



THUNDERBIRD 1 TB FED
17H

DATE SURVEYED: 11/08/19

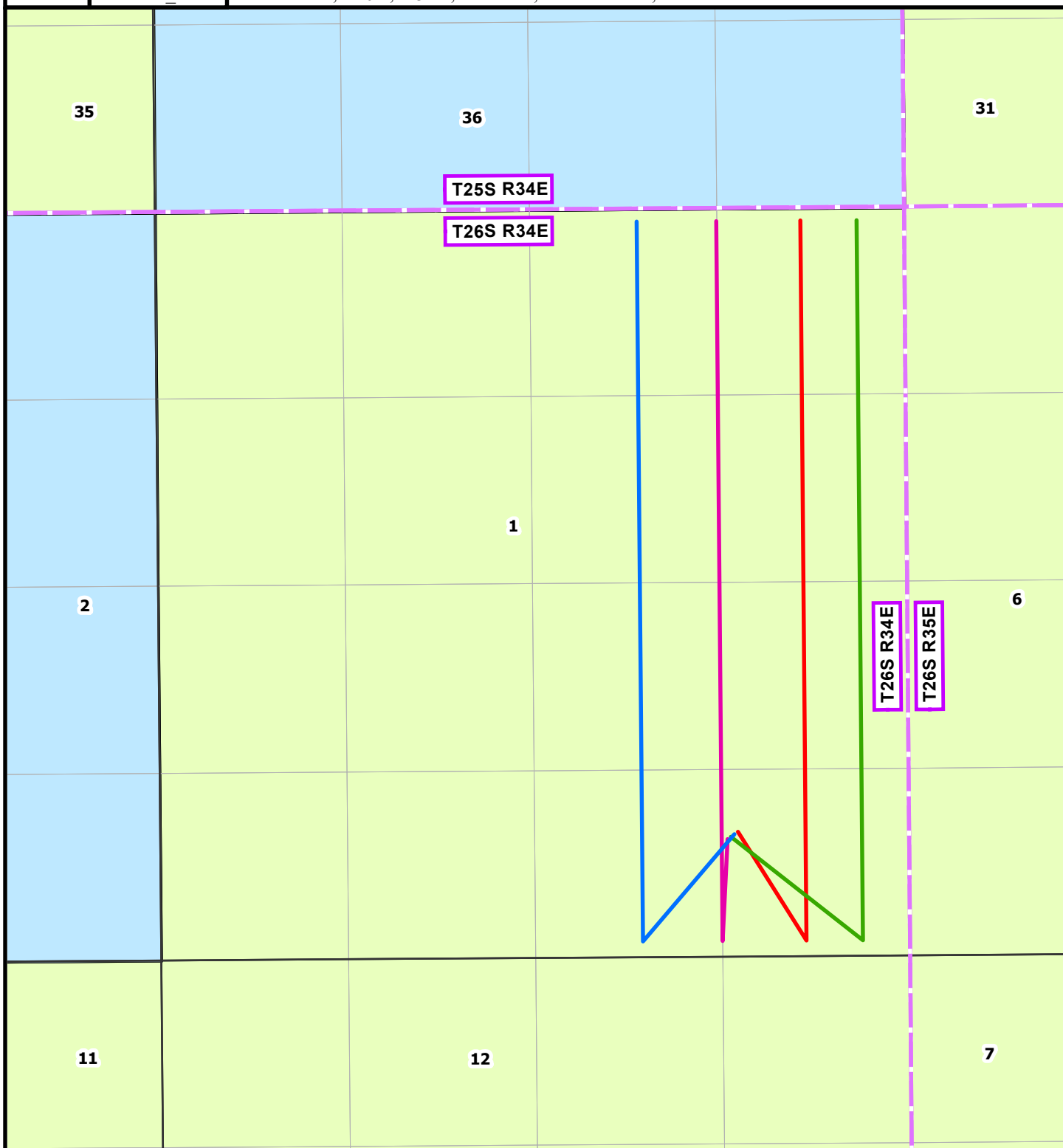
LEGEND

- | | |
|--|---|
| ● DRILL LINE HOLES | — OTHER DRILL LINES |
| — SUBJECT WELL / DRILL LINE | TOWN-RANGE LINE |
| — SURVEY/SECTION LINE | WELL PAD |
| — LEASE LINE | |

0				
REV.	DATE	DESCRIPTION	BY	CHKD
SHEET 1 OF 1		1309 LOUISVILLE AVE. MONROE, LA 71201 (318) 323-6900		
DRAWN BY: WHM				
DATE DRAWN: 10/1/2020				
CHECKED BY: MWS				

Released to Imaging: 8/25/2021 11:39:53 AM

JOB No. R4043_002 SECTIONS 1, T-26-S, R-34-E, N.M.P.M., LEA COUNTY, NEW MEXICO



1,000 0 1,000
1 inch = 1,000 feet

MarathonOil
Permian LLC



**THUNDERBIRD 1 FED
SURFACE OWNERSHIP
MAP**

DATE SURVEYED: 11/08/19

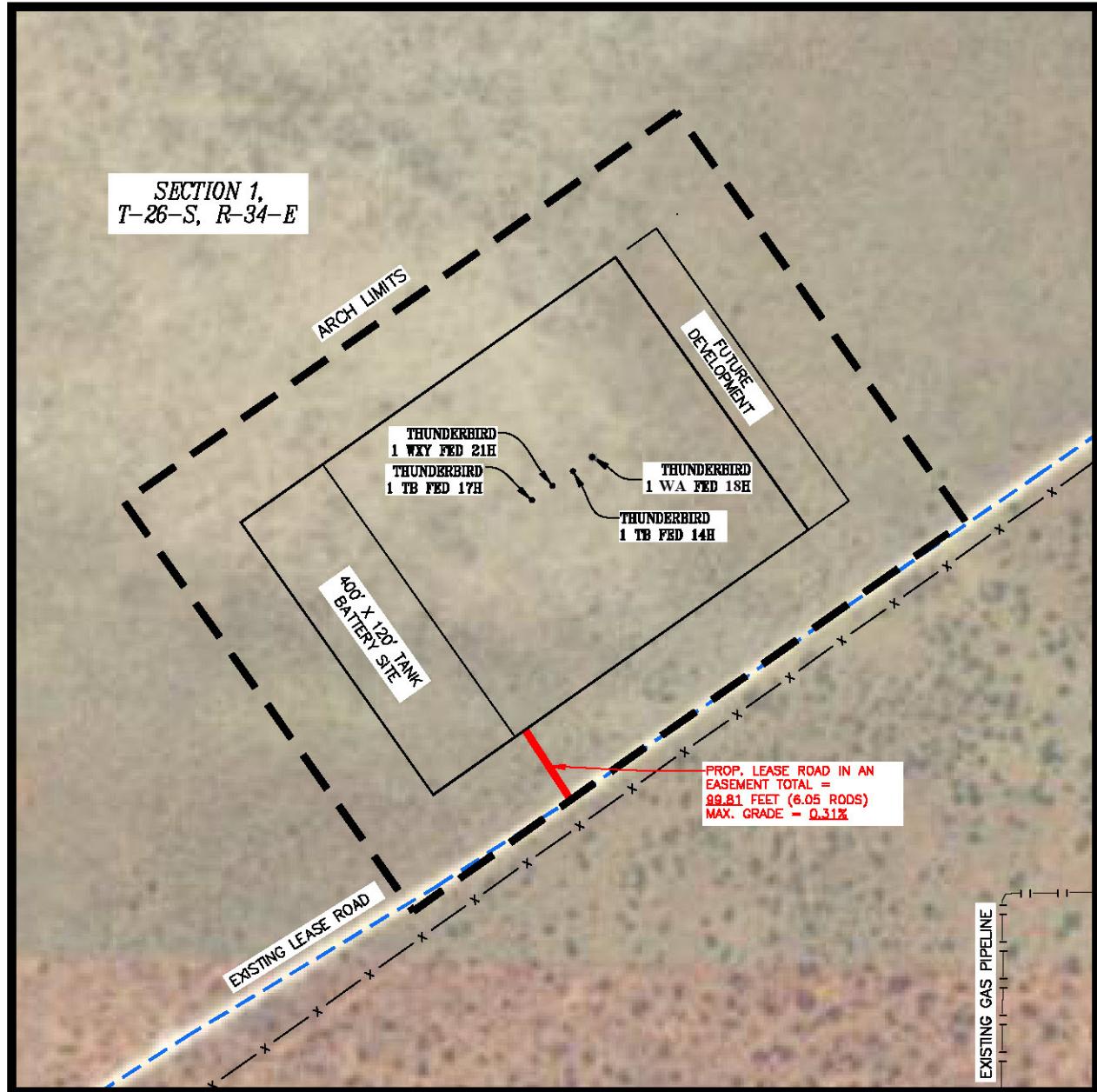
1	09/29/20	CLIENT REDESIGN	WM	MWS
REV.	DATE	DESCRIPTION	BY	CHKD
SHEET 1 OF 1		1309 LOUISVILLE AVE. MONROE, LA 71201 (318) 323-6900		
DRAWN BY: WHM				
DATE DRAWN: 10/1/2020				
CHECKED BY: MWS				

TB 14H
 WXY 21H
 TB 17H
 WA 18H
 BLM Surface
 NMSLO Surface



NEW OR RECONSTRUCTED ACCESS ROADS

THUNDERBIRD 1 FED
 SEC. 1 TWP. 26-S RGE. 34-E
 SURVEY: N.M.P.M.
 COUNTY: LEA
 OPERATOR: MARATHON OIL PERMIAN LLC
 U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE N.M.



5	10/01/2020	DEF
REV.	DATE	BY

SCALE: 1" = 200'

LEGEND

PROPOSED WELL PAD	—————	WATER LINE	— W — W —
ARCH SURVEY LIMITS	— — — — —	OVERHEAD POWER LINE	— OHP — OHP —
EXISTING LEASE ROAD	— — — — —	PROPOSED FLOWLINE	—————
PROPOSED LEASE ROAD	—————	EXISTING PIPELINE	— — — — — —
SECTION LINE	— — — — —	FENCE	— x — x —
PROPERTY LINE	— — — — —	WELLS	•
EDGE OF ROAD	=====	FUTURE WELLS	☆

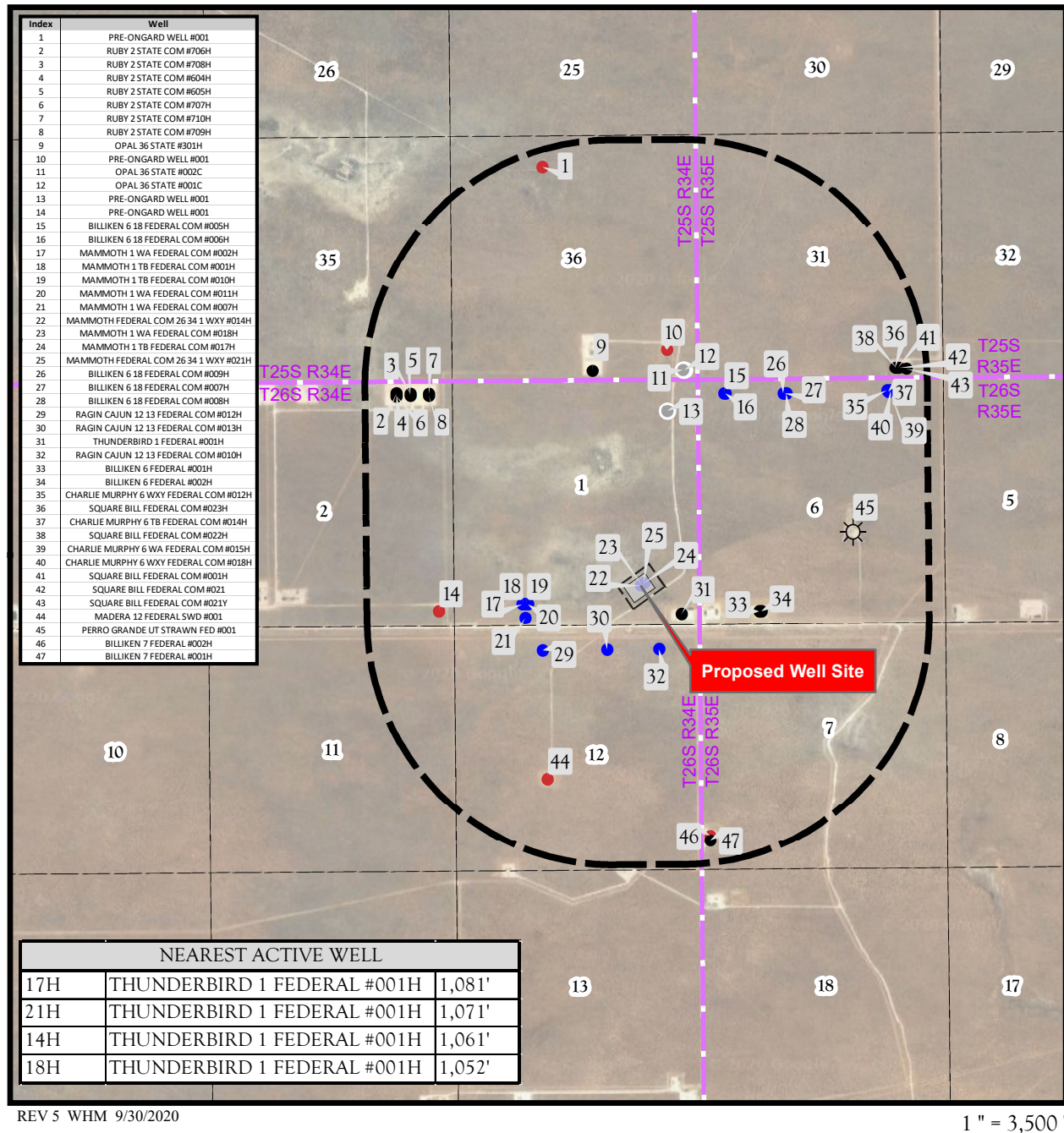
SHEET 1 OF 8

PREPARED BY:
 R-SQUARED GLOBAL, LLC
 1309 LOUISVILLE AVENUE,
 MONROE, LA 71201
 318-323-8900 OFFICE
 JOB No. R4043_002

ONE-MILE RADIUS MAP

THUNDERBIRD 1 FED
SEC. 1 TWP. 26-S RGE. 34-E
SURVEY: N.M.P.M.
COUNTY: LEA

OPERATOR: MARATHON OIL PERMIAN LLC
U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE, NM, TX.



Proposed Well
Pad



☀ Gas, Active

☀ Gas, Cancelled

☀ Gas, New

☀ Gas, Plugged

☀ Gas, Abandoned

☀ Injection, Active

☀ Injection, New

☀ Injection, Plugged

☀ CO2 Active

☀ CO2 Cancelled

☀ CO2, Plugged



△ Salt Water Injection, Cancelled



○ Injection, Abandoned



● Oil, Active



● Oil, Cancelled



● Oil, New



● Oil, Plugged



● Oil, Abandoned



△ Salt Water Injection, Active

△ Salt Water Injection, New

△ Salt Water Injection, Plugged



● Water, Active



● Water, Plugged



SHEET 2 OF 8

PREPARED BY:
RSQUARED GLOBAL, LLC
1309 LOUISVILLE AVENUE, MONROE, LA 71201
318-323-6900 OFFICE
JOB No. R4043_002

WELL PAD PLAT

THUNDERBIRD 1 FED

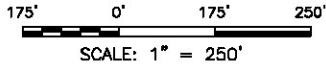
SEC. 1 TWP. 26-S RGE. 34-E

SURVEY: N.M.P.M.

COUNTY: LEA

OPERATOR: MARATHON OIL PERMIAN LLC

U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE N.M.

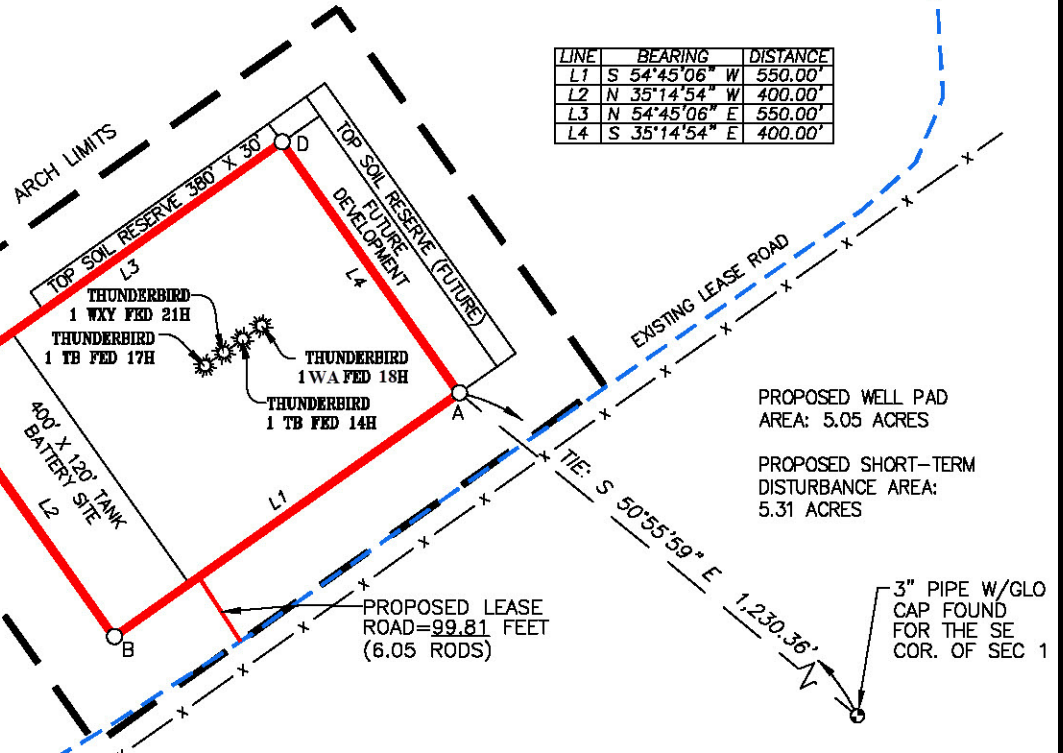


NAD 83			
A	E:(X)824819.15 N:(Y)389417.01	LAT:32.06728279 LON:-103.41818938	
B	E:(X)824369.99 N:(Y)389099.59	LAT:32.06642079 LON:-103.41964789	
C	E:(X)824139.14 N:(Y)389426.25	LAT:32.06732404 LON:-103.42038412	
D	E:(X)824588.30 N:(Y)389743.67	LAT:32.06818605 LON:-103.41892560	

LINE	BEARING	DISTANCE
L1	S 54°45'06" W	550.00'
L2	N 35°14'54" W	400.00'
L3	N 54°45'06" E	550.00'
L4	S 35°14'54" E	400.00'

SECTION 1,
T-26-S, R-34-E

NAD 27			
A	E:(X)783631.63 N:(Y)389359.47	LAT:32.06715683 LON:-103.41772604	
B	E:(X)783182.46 N:(Y)389042.07	LAT:32.06629484 LON:-103.41918455	
C	E:(X)782951.63 N:(Y)389368.72	LAT:32.06719809 LON:-103.4199207	
D	E:(X)783400.80 N:(Y)389686.13	LAT:32.06806009 LON:-103.41846218	



FIELD NOTES DESCRIBING

A tract of land being 5.05 acres. Said tract being located in Section 1, Township 26 South, Range 34 East, New Mexico Principal Meridian, Lea County, New Mexico.

Being more particularly described by metes and bounds as follows:

BEGINNING at a point from which a 3 inch pipe with a GLO cap found for the Southeast corner of said Section 1 bears S 50°55'59" E a distance of 1,230.36 feet.

THENCE

S 54°45'06" W a distance of 550.00 feet, N 35°14'54" W a distance of 400.00 feet, N 54°45'06" E a distance of 550.00 feet, and S 35°14'54" E a distance of 400.00 feet to the **POINT OF BEGINNING**.

The total area of the herein described tract in said Section 1 contains 5.05 acres of land.

All bearings and coordinates refer to NAD 83, New Mexico State Plane Coordinate System, East Zone, U.S. Survey Feet. (All bearings, distances, coordinates and areas are based on grid measurements utilizing a combined scale factor of 0.99985058, convergence angle of 0.49800132°.)

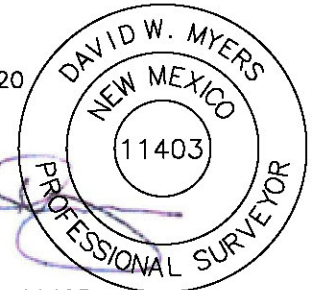
Title information furnished by Marathon Oil Permian LLC.

Reference accompanying Certificate of Survey prepared in conjunction with this legal description for easement.

**STATE OF NEW MEXICO
COUNTY OF LEA**

I, David W. Myers, New Mexico Professional Surveyor No. 11403, do hereby certify that this easement survey plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that I am responsible for this survey; that this survey meets the minimum standards for surveying in New Mexico; and that it is true and correct to the best of my knowledge and belief. I further certify that this survey is not a land division or subdivision as defined in the New Mexico Subdivision Act and that this instrument is an easement survey plat crossing an existing tract or tracts.

OCTOBER 8, 2020



DAVID W. MYERS 11403

PLAT FOR A SURFACE SITE ON THE PROPERTY OF
BUREAU OF LAND MANAGEMENT
LEA COUNTY, NEW MEXICO

LEGEND P.O.B. POINT OF BEGINNING

---	EXISTING ROAD	---	ARCH LIMITS
---	PROPOSED ROAD	---	FENCE
---	SURFACE SITE EDGE	---	SECTION LINE
---	EXIST. PIPELINE	---	EDGE OF ROAD
---	MONUMENT	---	DITCH
---	QUARTER SPLIT	---	HIGHWAY R.O.W.

R4043_002

5	10/01/2020	RE-DESIGN	DEF	MWS
REV.	DATE	DESCRIPTION	BY	CHKD
SHEET 3 OF 8				
DRAWN BY: JCS				
DATE: 4/23/2018				
CHECKED BY: MWS				



1309 LOUISVILLE AVE.
MONROE, LA 71201
(318) 323-6900
FAX (318) 362-0064

LEGEND

PROPOSED WELL PAD —————
ARCH SURVEY LIMITS ■ ■
PROPOSED LEASE ROAD ————
EXISTING LEASE ROAD - - - - -
PIPELINE | — | — | — | —
SECTION LINE — — — — —
EXISTING FENCE — x — x —

WELL LOCATION MAP

THUNDERBIRD 1 FED
SEC. 1 TWP. 26-S RGE. 34-E
SURVEY: N.M.P.M.
COUNTY: LEA

OPERATOR: MARATHON OIL PERMIAN LLC

U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE N.M.



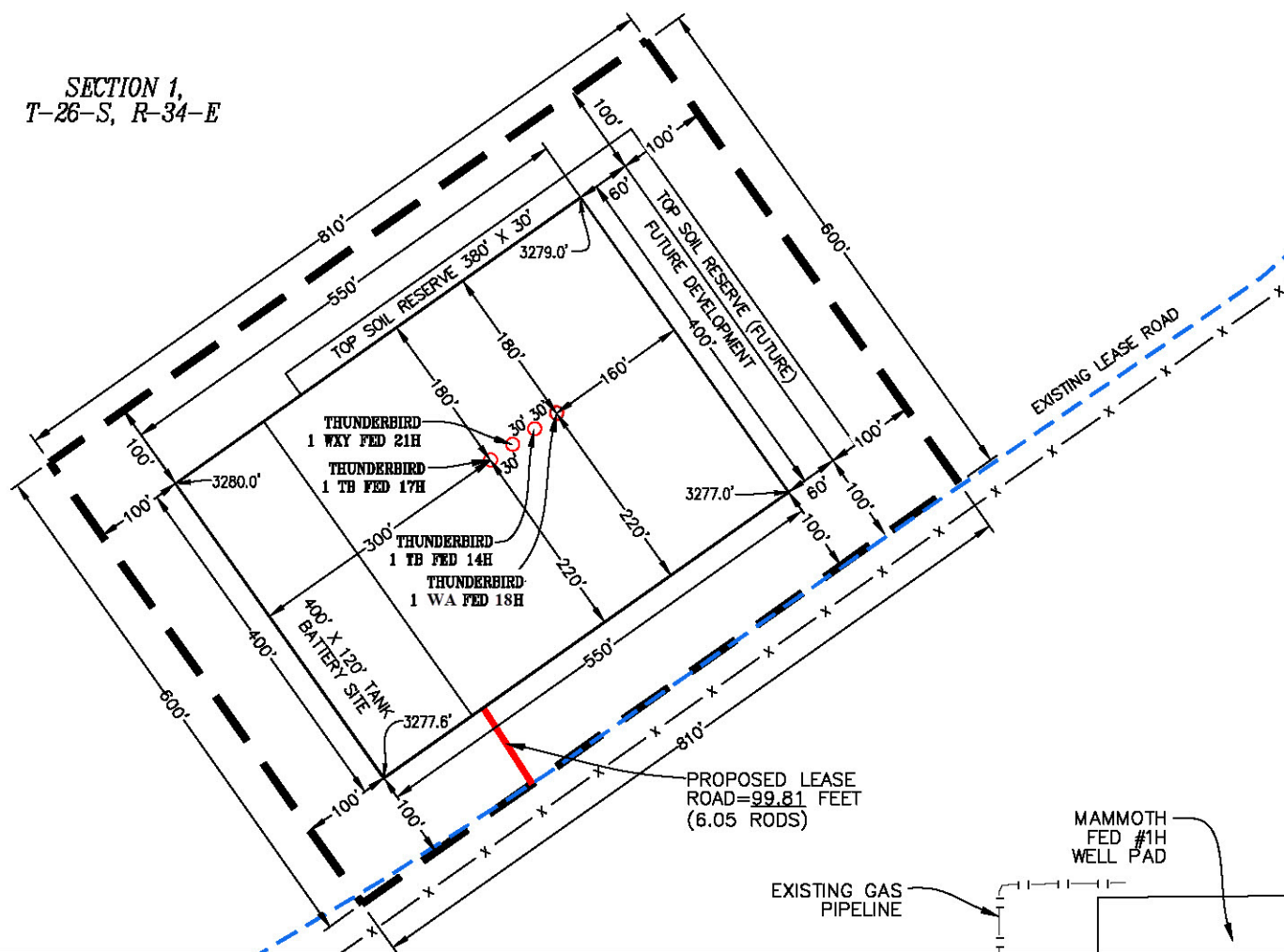
THUNDERBIRD 1 TB FED 17H
MARATHON OIL PERMIAN LLC
818' FSL 1279' FEL, SECTION 1
NAD 83, SPCS NM EAST
X: 824487.97' / Y: 389452.40'
LAT: 32.06738778N / LON: 103.41925741W
NAD 27, SPCS NM EAST
X: 783300.46' / Y: 389394.86'
LAT: 32.06726182N / LON: 103.41879404W
ELEVATION = 3.281'

THUNDERBIRD 1 WXY FED 21H
MARATHON OIL PERMIAN LLC
835' FSL 1255' FEL, SECTION 1
NAD 83, SPCS NM EAST
X: 824512.55' / Y: 389469.75'
LAT: 32.06743490N / LON: 103.41917762W
NAD 27, SPCS NM EAST
X: 783325.03' / Y: 389412.21'
LAT: 32.06730894N / LON: 103.41871424W
ELEVATION = 3.281'

THUNDERBIRD 1 TB FED 14H
MARATHON OIL PERMIAN LLC
852' FSL 1230' FEL, SECTION 1
NAD 83, SPCS NM EAST
X: 824536.99' / Y: 389487.10'
LAT: 32.06748203N / LON: 103.41909823W
NAD 27, SPCS NM EAST
X: 783349.48' / Y: 389429.57'
LAT: 32.06735607N / LON: 103.41863485W
ELEVATION = 3.281'

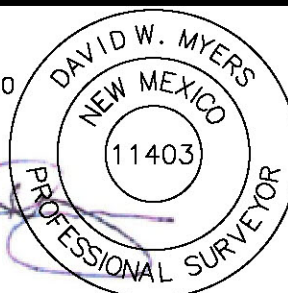
THUNDERBIRD 1 WA FED 18H
MARATHON OIL PERMIAN LLC
869' FSL 1205' FEL, SECTION 1
NAD 83, SPCS NM EAST
X:824561.58' / Y:389504.37'
LAT:32.06752893N / LON:103.49101840W
NAD 27, SPCS NM EAST
X:783374.07' / Y:389446.84'
LAT:32.06740297N / LON:103.41855502W
FI VALVE = 3.781'

SECTION 1,
T-26-S, R-34-E



NOTE:
THIS IS NOT A BOUNDARY SURVEY,
APPARENT PROPERTY CORNERS AND
PROPERTY LINES ARE SHOWN FOR
INFORMATION ONLY. BOUNDARY DATA SHOWN
IS FROM STATE OF NEW MEXICO OIL
CONSERVATION DIVISION FORM C-102
INCLUDED IN THIS SUBMITTAL.

OCTOBER 8, 2020



DAVID W. MYERS 11403

5	10/01/2020	DEF
REV.	DATE	BY

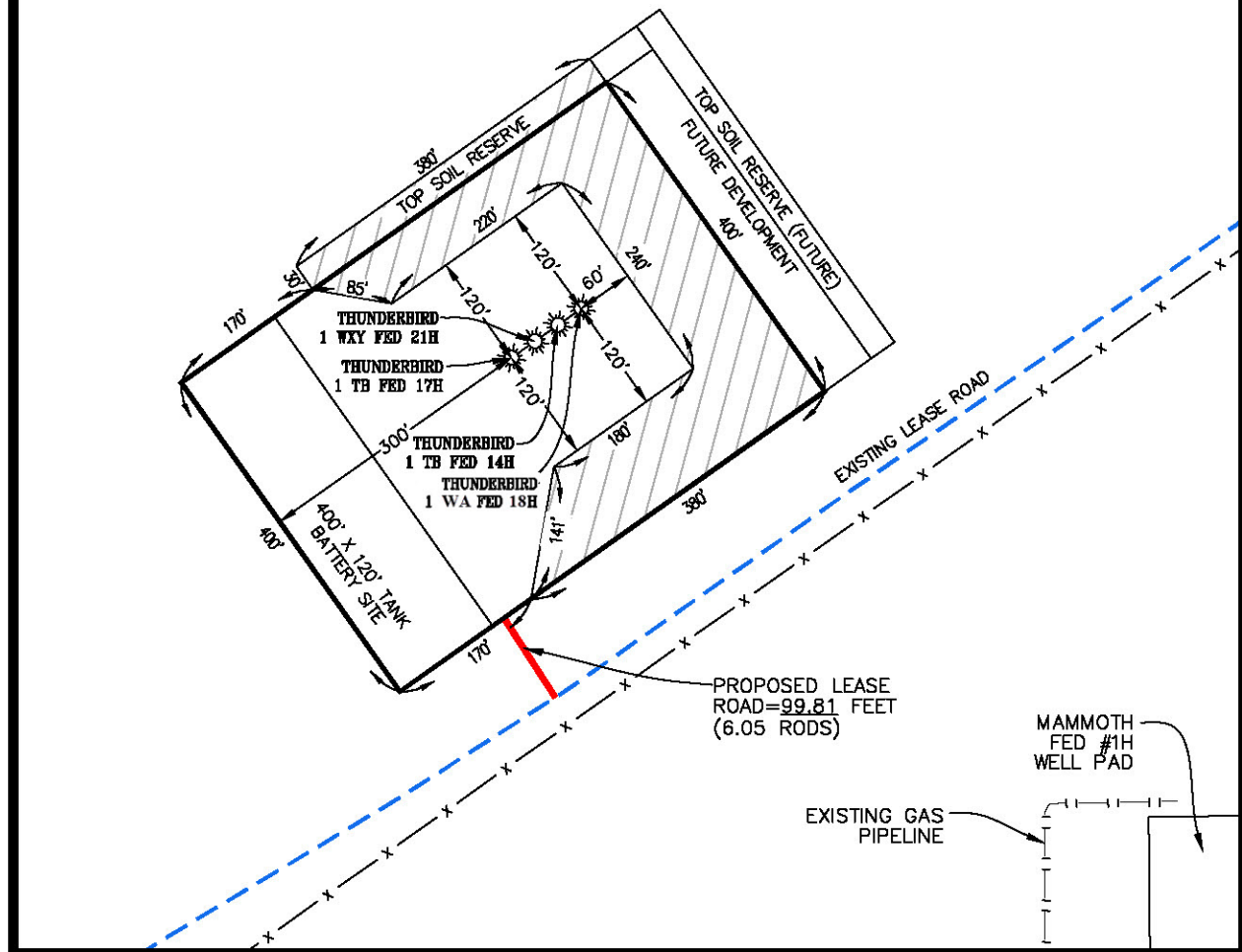
SHEET 4 OF 8

PREPARED BY:
R-SQUARED GLOBAL, LLC
1309 LOUISVILLE AVENUE,
MONROE, LA 71201
318-323-8900 OFFICE
JOB No. R4043_002

SCALE: 1" = 200'

OPERATOR: MARATHON OIL PERMIAN LLC
U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE N.M.

SECTION 1,
T-26-S, R-34-E



5	10/01/2020	DEF
REV.	DATE	BY

PROPOSED WELL PAD —————

PROPOSED LEASE ROAD —————

EXISTING LEASE ROAD - - - - -

FENCE — x — x —

EXISTING GAS PIPELINE — | — | — | —

PREPARED BY:
R-SQUARED GLOBAL, LLC
1309 LOUISVILLE AVENUE,
MONROE, LA 71201
318-323-8900 OFFICE
JOB No. R4043_002

A horizontal graphic scale bar with four segments. The first segment is hatched and labeled '100'' above it. The second segment is white and labeled '0'' above it. The third segment is white and labeled '100'' above it. The fourth segment is hatched and labeled '200'' above it.

Released to Imaging: 8/25/2021 11:39:53 AM

VICINITY AND EXISTING ROADS MAP

THUNDERBIRD 1 FED

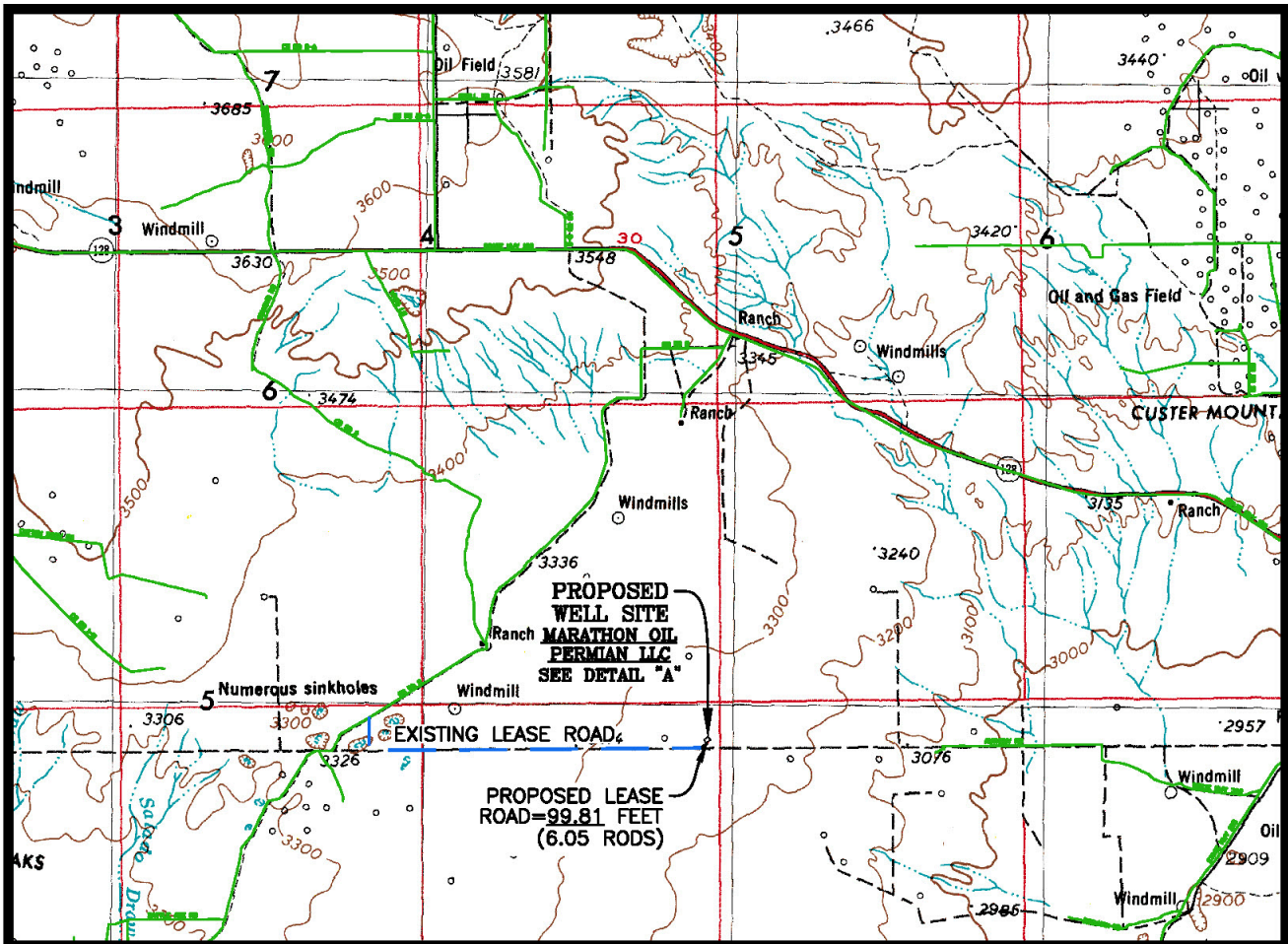
SEC. 1 TWP. 26-S RGE. 34-E

SURVEY: N.M.P.M.

COUNTY: LEA

OPERATOR: MARATHON OIL PERMIAN LLC

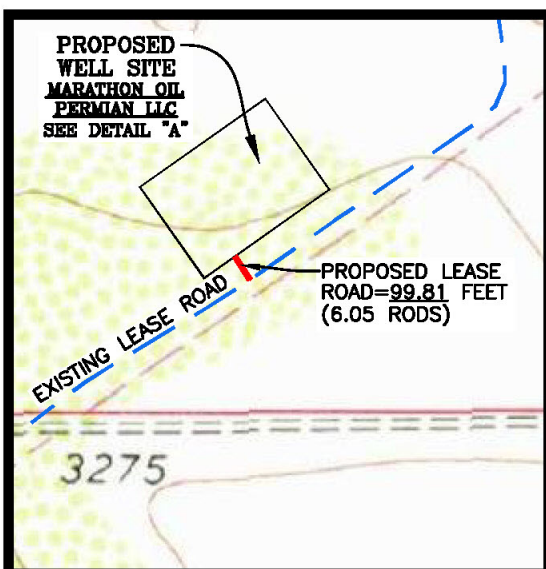
U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE N.M.



SCALE: 1" = 20,000'
CONTOUR INTERVAL = 100'

DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF US HWY 128 AND NM HWY 31, HEAD EAST ON NM HWY 31, FOR 7.7 MILES TO NM HWY 128 E. TURN RIGHT ONTO NM HWY 128 E, HEADING EAST, FOR 38.7 MILES TO BATTLE AXE ROAD (COUNTY ROAD 2). TURN RIGHT ONTO BATTLE AXE ROAD, HEADING SOUTH, FOR 0.3 MILES. KEEP RIGHT TO STAY ON BATTLE AXE ROAD, HEADING WEST, FOR 2.6 MILES. TURN RIGHT TO STAY ON BATTLE AXE ROAD, HEADING WEST, FOR 9.3 MILES TO A CALICHE ROAD. TURN LEFT ON CALICHE ROAD, HEADING SOUTH, FOR 0.7 MILES TO A "T" INTERSECTION OF CALICHE ROADS. TURN LEFT ONTO CALICHE ROAD, HEADING EAST FOR 6.7 MILES TO A CALICHE ROAD. KEEP LEFT ONTO THE CALICHE ROAD, HEADING NORTHEAST, FOR 0.2 MILE TO THE PROPOSED LEASE ROAD FOR THE THUNDERBIRD 1 FED TB14H/WXY21H/TB17H/WA18H WELL PAD. TURN LEFT ONTO SAID PROPOSED LEASE ROAD, HEADING NORTHWEST, FOR 100 FEET, ENTERING THE SOUTH CORNER OF SAID WELL PAD.



DETAIL A
N.T.S.

5	10/01/2020	DEF
REV.	DATE	BY

SHEET 6 OF 8

PREPARED BY:
R-SQUARED GLOBAL, LLC
1309 LOUISVILLE AVENUE,
MONROE, LA 71201
318-323-6900 OFFICE
JOB No. R4043_002

MARATHON OIL PERMIAN LLC

DRILLING AND OPERATIONS PLAN

WELL NAME / NUMBER: THUNDERBIRD 1 TB FED 17H

STATE: NEW MEXICO COUNTY: LEA

Application Data Report

1. WELL LOCATION TABLE

Traverse Segment	Latitude NAD83	Longitude NAD83	Elevation (ft SS)	MD (RKB)	TVD (RKB)	Lease Serial	NS Foot	NS Indicator	EW Foot	EW Indicator	TWSP	Range	Section	Aliquot/Lot	Lease Type
SHL	32.06738778	-103.41925741	3281	0	0	NMNM113970	818	FSL	1279	FEL	26S	34E	1	SESE	F
KOP/FTP	32.06541536	-103.41938815	-8588	11902	11869	NMNM113970	100	FSL	1320	FEL	26S	34E	1	SESE	F
LTP/BHL	32.07937703	-103.41939214	-9161	17308	12442	NMNM113970	100	FNL	1320	FEL	26S	34E	1	NENE	F

Drilling Plan Data Report

1. GEOLOGIC FORMATIONS

Formation	True Vertical Depth (ft)	Measured Depth (ft)	Lithologies	Mineral Resources
Rustler	995	995	Salt/Anhydrite	BRINE
Castile	2801	2802	Salt/Anhydrite	BRINE
Base of Salt	5353	5364	Limy Sands	BRINE
Lamar	5353	5364	Sand/Shales	NONE
Delaware	5382	5394	Sands/Shale	OIL
Bone Spring	9313	9341	Sands/Carbonates	OIL
Wolfcamp	12465	12578	Carbonates/Shales/Sands	OIL

2. BLOWOUT PREVENTION

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
14 3/4"	13 5/8"	10000	Annular	X	100% of working pressure
			BOP Stack	X	10000
9 7/8"	13 5/8"	10000	Annular	X	100% of working pressure
			BOP Stack	X	10000
6 3/4"	13 5/8"	10000	Annular	X	100% of working pressure
			BOP Stack	X	10000

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock, full opening safety valve / inside BOP and choke lines and choke manifold. See attached schematics.

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.	
Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.	
	N	Are anchors required by manufacturer?
Y	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested	

3. CASING PROGRAM

String Type	Hole Size	Csg Size	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Weight (lbs/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
Surface	14 3/4"	10 3/4"	0	1200	0	1200	3281	2081	40.5	J-55	STC	6.57	1.95	2.98
Intermediate	9 7/8"	7 5/8"	0	11500	0	11467	3281	-8186	29.7	P-110	BTC	2.3	1.24	2.35
Production	6 3/4"	5 1/2"	0	17308	0	12442	3281	-9161	20	P-110	BTC	1.33	1.24	1.86

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

4. CEMENT

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity (sks)	Yield (ft3/sks)	Density (ppg)	Slurry Volume (ft3)	Excess (%)	Cement Type	Additives
Surface	Lead	--	0	960	772	1.73	13.5	1335	150	Class C	LCM
Surface	Tail	--	960	1200	201	1.33	14.8	267	100	Class C	Accelerator
Intermediate	Lead	--	0	10500	1811	2.49	11.0	4510	100	Class C	Extender, Accelerator
Intermediate	Tail	--	10500	11500	218	1.28	13.8	279	30	Class H	Retarder
Production	Lead	--	9000	9500	47	1.29	14.5	60	30	Class H	Viscosifier, Retarder
Production	Tail	--	9500	17308	800	1.09	14.5	871	30	Class H	Extender, Fluid Loss, Dispersant

Stage tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Stage tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Pilot hole depth: N/A TVD/MD

KOP: N/A TVD/MD

Plug Top	Plug Bottom	Excess (%)	Quantity (sx)	Density (ppg)	Yield (ft3/sks)	Water gal/sk	Slurry Description and Cement Type

Attach plugging procedure for pilot hole: N/A

5. CIRCULATING MEDIUM

Top Depth	Bottom Depth	Mud Type	Min. Weight (ppg)	Max Weight (ppg)
0	1200	Water Based Mud	8.4	8.8
1200	11500	Brine	9.2	10.2
11500	17308	Oil Based Mud	10.5	12.5

Losses or gains in the mud system will be monitored visually/manually as well as with an electronic PVT.
The necessary mud products for additional weight and fluid loss control will be on location at all times.

6. TEST, LOGGING, CORING

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

GR from TD to surface (horizontal well - vertical portion of hole)

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

GR while drilling from intermediate casing shoe to TD.

Coring operation description for the well:

No coring is planned at this time.

Mud Logger: None.

DST's: None.

7. PRESSURE

ANTICIPATED BOTTOM HOLE PRESSURE: 8,087 psi
 ANTICIPATED BOTTOM HOLE TEMPERATURE: 195 °F
 ANTICIPATED ABNORMAL PRESSURE: N
 ANTICIPATED ABNORMAL TEMPERATURE: N
 POTENTIAL HAZARDS:

A. H2S detection equipment will be in operation after drilling out the surface casing shoe until the production casing has been cemented. Breathing equipment will be on location from drilling out the surface shoe until production casing is cemented. If H2S is encountered the operator will comply with Onshore Order #6.

B. No abnormal temperatures or pressures are anticipated. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

C. No losses are anticipated at this time.

D. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well.

8. OTHER

Other Well Information**AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT**

A Kelly cock will be in the drill string at all times.

A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor unobstructed and readily accessible at all times.

Hydrogen Sulfide detection equipment will be in operation after drilling out the surface casing shoe until the production casing is cemented.

Breathing equipment will be on location upon drilling the surface casing shoe until total depth is reached. **If Hydrogen Sulfide is encountered, measured amounts and formations will be reported to the BLM**

ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS

Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 30 days.

Company Name: Marathon Oil Permian LLC
Thunderbird 1 TB Fed 17H
Lea County, New Mexico (NAD 27)
Rig:
Created By: Chase Chambers
Date: 11:40, October 22 2020

WELL DETAILS: Thunderbird 1 TB Fed 17H					
+N/-S	+E/-W	Northing	Ground Level:	3281.0	
0.0	0.0	389394.86	Easting	Latitude	Longitude
			783300.46	32° 4' 2.143 N	103° 25' 7.659 W



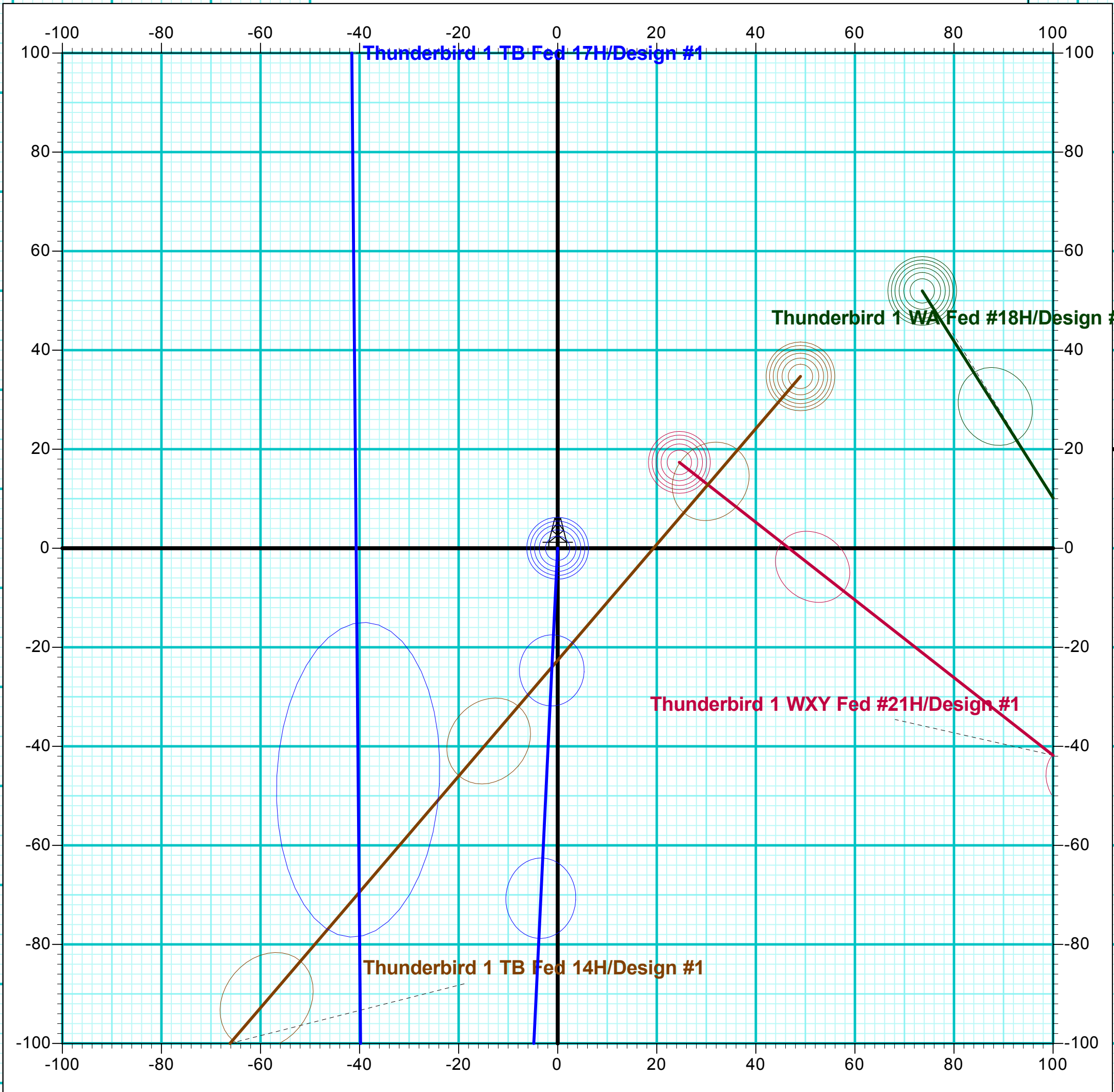
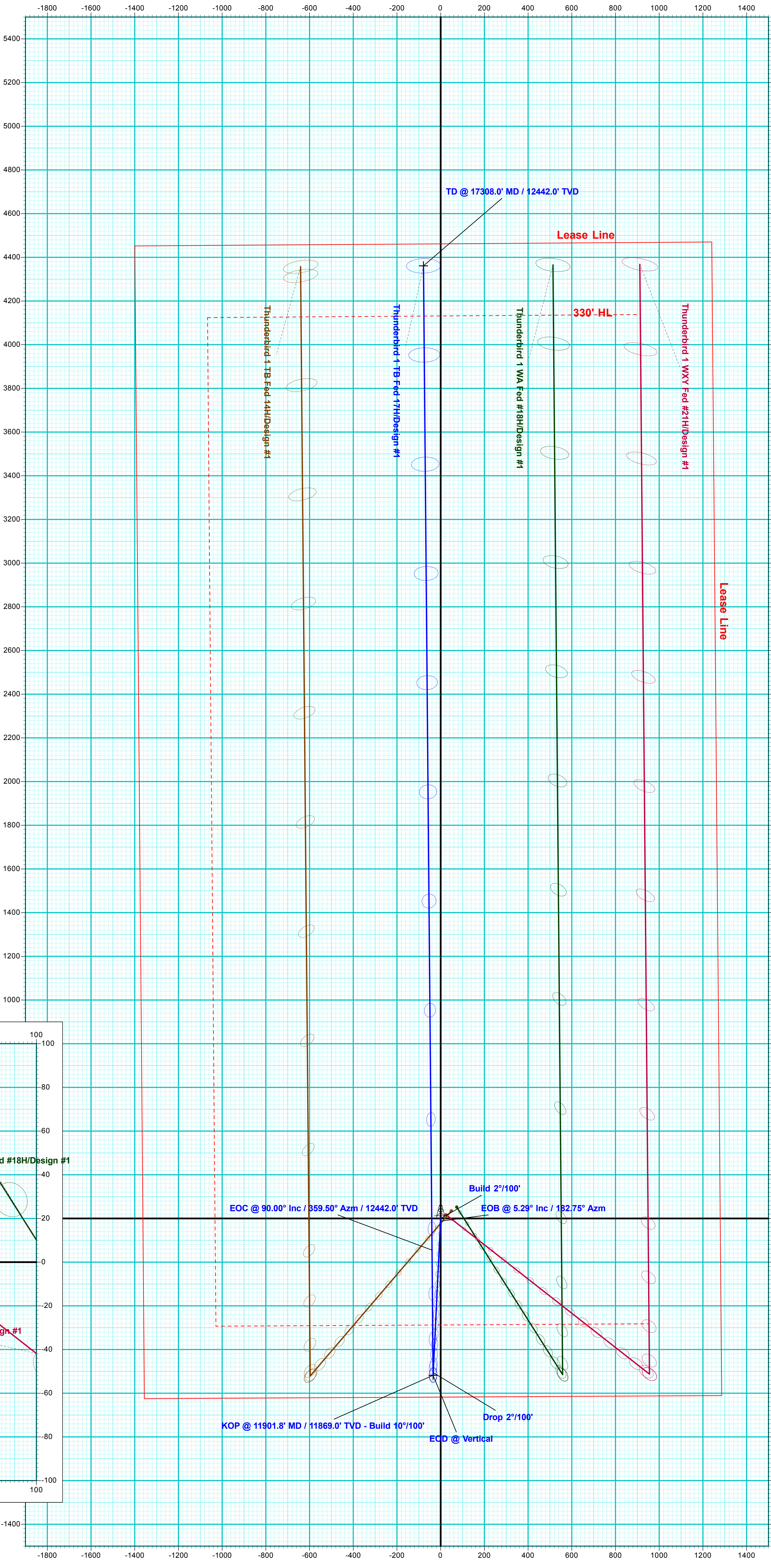
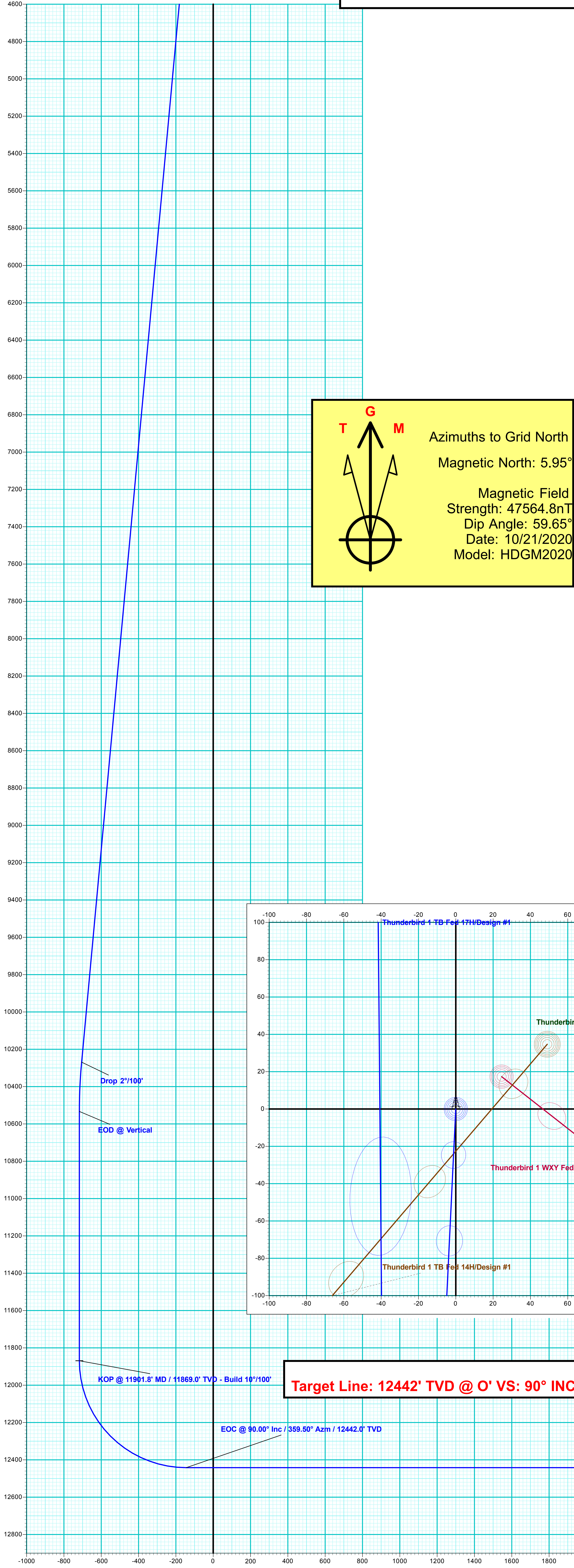
PROJECT DETAILS: Lea County, New Mexico (NAD 27)

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

DESIGN ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation	
2500.0	0.00	0.00	2500.0	0.0	0.0	0.0	0.0	Build 2°/100'	
2764.3	5.29	182.75	2763.9	-12.2	-0.6	-12.2	12.2	EOB @ 5.29° Inc / 182.75° Azm	
10301.5	5.29	182.75	10269.1	-705.7	-33.9	-705.0	706.5	Drop 2°/100'	
10565.8	0.00	0.00	10533.0	-717.9	-34.5	-717.1	718.7	EOD @ Vertical	
11901.8	0.00	0.00	11869.0	-717.9	-34.5	-717.1	718.7	KOP @ 11901.8' MD / 11869.0' TVD - Build 10°/100'	
12801.8	90.00	359.50	12442.0	-144.9	-39.4	-144.2	1291.6	EOC @ 90.00° Inc / 359.50° Azm / 12442.0' TVD	
17308.0	90.00	359.50	12442.0	4361.1	-78.5	4361.8	5797.9	TD @ 17308.0' MD / 12442.0' TVD	

Thunderbird 1 TB Fed 17H
Lea County, New Mexico (NAD 27)
Q20*** & WT-20***
Design #1

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
T 1 TB Fed 17H-KOP/FTP	11869.0	-717.9	-34.5	388676.99	783266.00	32° 3' 55.042 N	103° 25' 8.130 W
T 1 TB Fed 17H-LTP/BHL	12442.0	4361.1	-78.5	393755.99	783221.98	32° 4' 45.304 N	103° 25' 8.141 W



Target Line: 12442' TVD @ 0° VS: 90° INC

Vertical Section at 358.97° (200 usf/in)



Marathon Oil Permian LLC

Lea County, New Mexico (NAD 27)

Sec 1. T26S, R34E

Thunderbird 1 TB Fed 17H

Wellbore #1

Plan: Design #1

QES Well Planning Report

22 October, 2020





Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Thunderbird 1 TB Fed 17H
Company:	Marathon Oil Permian LLC	TVD Reference:	KB=25' @ 3306.0usft
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	KB=25' @ 3306.0usft
Site:	Sec 1. T26S, R34E	North Reference:	Grid
Well:	Thunderbird 1 TB Fed 17H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Lea 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	Sec 1. T26S, R34E				
Site Position:		Northing:	389,429.56 usft	Latitude:	32° 4' 2.482 N
From:	Lat/Long	Easting:	783,349.48 usft	Longitude:	103° 25' 7.085 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.49

Well	Thunderbird 1 TB Fed 17H					
Well Position	+N/-S	-34.7 usft	Northing:	389,394.86 usft	Latitude:	32° 4' 2.143 N
	+E/-W	-49.0 usft	Easting:	783,300.45 usft	Longitude:	103° 25' 7.659 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	3,281.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2020	10/21/2020	6.43	59.65	47,564.80000000

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	358.97

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,764.3	5.29	182.75	2,763.9	-12.2	-0.6	2.00	2.00	0.00	182.75	
10,301.5	5.29	182.75	10,269.1	-705.7	-33.9	0.00	0.00	0.00	0.00	
10,565.8	0.00	0.00	10,533.0	-717.9	-34.5	2.00	-2.00	0.00	180.00	
11,901.8	0.00	0.00	11,869.0	-717.9	-34.5	0.00	0.00	0.00	0.00	T 1 TB Fed 17H-KOP.
12,801.8	90.00	359.50	12,442.0	-144.9	-39.4	10.00	10.00	-0.06	359.50	
17,308.0	90.00	359.50	12,442.0	4,361.1	-78.5	0.00	0.00	0.00	0.00	T 1 TB Fed 17H-LTP/I



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Thunderbird 1 TB Fed 17H
Company:	Marathon Oil Permian LLC	TVD Reference:	KB=25' @ 3306.0usft
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	KB=25' @ 3306.0usft
Site:	Sec 1. T26S, R34E	North Reference:	Grid
Well:	Thunderbird 1 TB Fed 17H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
Build 2°/100'									
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	2.00	182.75	2,600.0	-1.7	-0.1	-1.7	2.00	2.00	0.00
2,700.0	4.00	182.75	2,699.8	-7.0	-0.3	-7.0	2.00	2.00	0.00
EOB @ 5.29° Inc / 182.75° Azm									
2,764.3	5.29	182.75	2,763.9	-12.2	-0.6	-12.2	2.00	2.00	0.00
2,800.0	5.29	182.75	2,799.5	-15.5	-0.7	-15.4	0.00	0.00	0.00
2,900.0	5.29	182.75	2,899.0	-24.7	-1.2	-24.6	0.00	0.00	0.00
3,000.0	5.29	182.75	2,998.6	-33.9	-1.6	-33.8	0.00	0.00	0.00
3,100.0	5.29	182.75	3,098.2	-43.1	-2.1	-43.0	0.00	0.00	0.00
3,200.0	5.29	182.75	3,197.8	-52.3	-2.5	-52.2	0.00	0.00	0.00
3,300.0	5.29	182.75	3,297.3	-61.5	-2.9	-61.4	0.00	0.00	0.00
3,400.0	5.29	182.75	3,396.9	-70.7	-3.4	-70.6	0.00	0.00	0.00
3,500.0	5.29	182.75	3,496.5	-79.9	-3.8	-79.8	0.00	0.00	0.00
3,600.0	5.29	182.75	3,596.1	-89.1	-4.3	-89.0	0.00	0.00	0.00
3,700.0	5.29	182.75	3,695.6	-98.3	-4.7	-98.2	0.00	0.00	0.00
3,800.0	5.29	182.75	3,795.2	-107.5	-5.2	-107.4	0.00	0.00	0.00
3,900.0	5.29	182.75	3,894.8	-116.7	-5.6	-116.6	0.00	0.00	0.00
4,000.0	5.29	182.75	3,994.4	-125.9	-6.0	-125.7	0.00	0.00	0.00
4,100.0	5.29	182.75	4,093.9	-135.1	-6.5	-134.9	0.00	0.00	0.00
4,200.0	5.29	182.75	4,193.5	-144.3	-6.9	-144.1	0.00	0.00	0.00
4,300.0	5.29	182.75	4,293.1	-153.5	-7.4	-153.3	0.00	0.00	0.00
4,400.0	5.29	182.75	4,392.7	-162.7	-7.8	-162.5	0.00	0.00	0.00
4,500.0	5.29	182.75	4,492.2	-171.9	-8.2	-171.7	0.00	0.00	0.00
4,600.0	5.29	182.75	4,591.8	-181.1	-8.7	-180.9	0.00	0.00	0.00
4,700.0	5.29	182.75	4,691.4	-190.3	-9.1	-190.1	0.00	0.00	0.00
4,800.0	5.29	182.75	4,791.0	-199.5	-9.6	-199.3	0.00	0.00	0.00
4,900.0	5.29	182.75	4,890.5	-208.7	-10.0	-208.5	0.00	0.00	0.00
5,000.0	5.29	182.75	4,990.1	-217.9	-10.5	-217.7	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Thunderbird 1 TB Fed 17H
Company:	Marathon Oil Permian LLC	TVD Reference:	KB=25' @ 3306.0usft
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	KB=25' @ 3306.0usft
Site:	Sec 1. T26S, R34E	North Reference:	Grid
Well:	Thunderbird 1 TB Fed 17H	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)
5,100.0	5.29	182.75	5,089.7	-227.1	-10.9	-226.9	0.00	0.00	0.00
5,200.0	5.29	182.75	5,189.3	-236.3	-11.3	-236.0	0.00	0.00	0.00
5,300.0	5.29	182.75	5,288.8	-245.5	-11.8	-245.2	0.00	0.00	0.00
5,400.0	5.29	182.75	5,388.4	-254.7	-12.2	-254.4	0.00	0.00	0.00
5,500.0	5.29	182.75	5,488.0	-263.9	-12.7	-263.6	0.00	0.00	0.00
5,600.0	5.29	182.75	5,587.6	-273.1	-13.1	-272.8	0.00	0.00	0.00
5,700.0	5.29	182.75	5,687.1	-282.3	-13.5	-282.0	0.00	0.00	0.00
5,800.0	5.29	182.75	5,786.7	-291.5	-14.0	-291.2	0.00	0.00	0.00
5,900.0	5.29	182.75	5,886.3	-300.7	-14.4	-300.4	0.00	0.00	0.00
6,000.0	5.29	182.75	5,985.9	-309.9	-14.9	-309.6	0.00	0.00	0.00
6,100.0	5.29	182.75	6,085.4	-319.1	-15.3	-318.8	0.00	0.00	0.00
6,200.0	5.29	182.75	6,185.0	-328.3	-15.8	-328.0	0.00	0.00	0.00
6,300.0	5.29	182.75	6,284.6	-337.5	-16.2	-337.2	0.00	0.00	0.00
6,400.0	5.29	182.75	6,384.2	-346.7	-16.6	-346.4	0.00	0.00	0.00
6,500.0	5.29	182.75	6,483.7	-355.9	-17.1	-355.5	0.00	0.00	0.00
6,600.0	5.29	182.75	6,583.3	-365.1	-17.5	-364.7	0.00	0.00	0.00
6,700.0	5.29	182.75	6,682.9	-374.3	-18.0	-373.9	0.00	0.00	0.00
6,800.0	5.29	182.75	6,782.5	-383.5	-18.4	-383.1	0.00	0.00	0.00
6,900.0	5.29	182.75	6,882.0	-392.7	-18.8	-392.3	0.00	0.00	0.00
7,000.0	5.29	182.75	6,981.6	-401.9	-19.3	-401.5	0.00	0.00	0.00
7,100.0	5.29	182.75	7,081.2	-411.1	-19.7	-410.7	0.00	0.00	0.00
7,200.0	5.29	182.75	7,180.8	-420.3	-20.2	-419.9	0.00	0.00	0.00
7,300.0	5.29	182.75	7,280.3	-429.5	-20.6	-429.1	0.00	0.00	0.00
7,400.0	5.29	182.75	7,379.9	-438.7	-21.1	-438.3	0.00	0.00	0.00
7,500.0	5.29	182.75	7,479.5	-447.9	-21.5	-447.5	0.00	0.00	0.00
7,600.0	5.29	182.75	7,579.1	-457.1	-21.9	-456.7	0.00	0.00	0.00
7,700.0	5.29	182.75	7,678.6	-466.3	-22.4	-465.8	0.00	0.00	0.00
7,800.0	5.29	182.75	7,778.2	-475.5	-22.8	-475.0	0.00	0.00	0.00
7,900.0	5.29	182.75	7,877.8	-484.7	-23.3	-484.2	0.00	0.00	0.00
8,000.0	5.29	182.75	7,977.4	-493.9	-23.7	-493.4	0.00	0.00	0.00
8,100.0	5.29	182.75	8,076.9	-503.1	-24.1	-502.6	0.00	0.00	0.00
8,200.0	5.29	182.75	8,176.5	-512.3	-24.6	-511.8	0.00	0.00	0.00
8,300.0	5.29	182.75	8,276.1	-521.5	-25.0	-521.0	0.00	0.00	0.00
8,400.0	5.29	182.75	8,375.7	-530.7	-25.5	-530.2	0.00	0.00	0.00
8,500.0	5.29	182.75	8,475.2	-539.9	-25.9	-539.4	0.00	0.00	0.00
8,600.0	5.29	182.75	8,574.8	-549.1	-26.4	-548.6	0.00	0.00	0.00
8,700.0	5.29	182.75	8,674.4	-558.3	-26.8	-557.8	0.00	0.00	0.00
8,800.0	5.29	182.75	8,774.0	-567.5	-27.2	-567.0	0.00	0.00	0.00
8,900.0	5.29	182.75	8,873.5	-576.7	-27.7	-576.2	0.00	0.00	0.00
9,000.0	5.29	182.75	8,973.1	-585.9	-28.1	-585.3	0.00	0.00	0.00
9,100.0	5.29	182.75	9,072.7	-595.1	-28.6	-594.5	0.00	0.00	0.00
9,200.0	5.29	182.75	9,172.3	-604.3	-29.0	-603.7	0.00	0.00	0.00
9,300.0	5.29	182.75	9,271.8	-613.5	-29.4	-612.9	0.00	0.00	0.00
9,400.0	5.29	182.75	9,371.4	-622.8	-29.9	-622.1	0.00	0.00	0.00
9,500.0	5.29	182.75	9,471.0	-632.0	-30.3	-631.3	0.00	0.00	0.00
9,600.0	5.29	182.75	9,570.6	-641.2	-30.8	-640.5	0.00	0.00	0.00
9,700.0	5.29	182.75	9,670.1	-650.4	-31.2	-649.7	0.00	0.00	0.00
9,800.0	5.29	182.75	9,769.7	-659.6	-31.7	-658.9	0.00	0.00	0.00
9,900.0	5.29	182.75	9,869.3	-668.8	-32.1	-668.1	0.00	0.00	0.00
10,000.0	5.29	182.75	9,968.9	-678.0	-32.5	-677.3	0.00	0.00	0.00
10,100.0	5.29	182.75	10,068.4	-687.2	-33.0	-686.5	0.00	0.00	0.00
10,200.0	5.29	182.75	10,168.0	-696.4	-33.4	-695.6	0.00	0.00	0.00
Drop 2°/100'									
10,301.5	5.29	182.75	10,269.1	-705.7	-33.9	-705.0	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Thunderbird 1 TB Fed 17H
Company:	Marathon Oil Permian LLC	TVD Reference:	KB=25' @ 3306.0usft
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	KB=25' @ 3306.0usft
Site:	Sec 1. T26S, R34E	North Reference:	Grid
Well:	Thunderbird 1 TB Fed 17H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,400.0	3.32	182.75	10,367.3	-713.1	-34.2	-712.3	2.00	-2.00	0.00
10,500.0	1.32	182.75	10,467.2	-717.1	-34.4	-716.4	2.00	-2.00	0.00
EOD @ Vertical									
10,565.8	0.00	0.00	10,533.0	-717.9	-34.5	-717.1	2.00	-2.00	0.00
10,600.0	0.00	0.00	10,567.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
10,700.0	0.00	0.00	10,667.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
10,800.0	0.00	0.00	10,767.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
10,900.0	0.00	0.00	10,867.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
11,000.0	0.00	0.00	10,967.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
11,100.0	0.00	0.00	11,067.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
11,200.0	0.00	0.00	11,167.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
11,300.0	0.00	0.00	11,267.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
11,400.0	0.00	0.00	11,367.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
11,500.0	0.00	0.00	11,467.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
11,600.0	0.00	0.00	11,567.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
11,700.0	0.00	0.00	11,667.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
11,800.0	0.00	0.00	11,767.2	-717.9	-34.5	-717.1	0.00	0.00	0.00
KOP @ 11901.8' MD / 11869.0' TVD - Build 10°/100'									
11,901.8	0.00	0.00	11,869.0	-717.9	-34.5	-717.1	0.00	0.00	0.00
11,950.0	4.82	359.50	11,917.1	-715.8	-34.5	-715.1	10.00	10.00	0.00
12,000.0	9.82	359.50	11,966.7	-709.5	-34.5	-708.7	10.00	10.00	0.00
12,050.0	14.82	359.50	12,015.6	-698.8	-34.6	-698.1	10.00	10.00	0.00
12,100.0	19.82	359.50	12,063.3	-683.9	-34.7	-683.2	10.00	10.00	0.00
12,150.0	24.82	359.50	12,109.5	-664.9	-34.9	-664.2	10.00	10.00	0.00
12,200.0	29.82	359.50	12,153.9	-642.0	-35.1	-641.3	10.00	10.00	0.00
12,250.0	34.82	359.50	12,196.2	-615.3	-35.3	-614.6	10.00	10.00	0.00
12,300.0	39.82	359.50	12,235.9	-585.0	-35.6	-584.2	10.00	10.00	0.00
12,350.0	44.82	359.50	12,272.9	-551.3	-35.9	-550.6	10.00	10.00	0.00
12,400.0	49.82	359.50	12,306.8	-514.6	-36.2	-513.9	10.00	10.00	0.00
12,450.0	54.82	359.50	12,337.3	-475.0	-36.6	-474.3	10.00	10.00	0.00
12,500.0	59.82	359.50	12,364.3	-433.0	-36.9	-432.2	10.00	10.00	0.00
12,550.0	64.82	359.50	12,387.5	-388.7	-37.3	-388.0	10.00	10.00	0.00
12,600.0	69.82	359.50	12,406.8	-342.6	-37.7	-341.8	10.00	10.00	0.00
12,650.0	74.82	359.50	12,422.0	-295.0	-38.1	-294.2	10.00	10.00	0.00
12,700.0	79.82	359.50	12,432.9	-246.2	-38.5	-245.5	10.00	10.00	0.00
12,750.0	84.82	359.50	12,439.6	-196.7	-39.0	-195.9	10.00	10.00	0.00
EOC @ 90.00° Inc / 359.50° Azm / 12442.0' TVD									
12,801.8	90.00	359.50	12,442.0	-144.9	-39.4	-144.2	10.00	10.00	0.00
12,900.0	90.00	359.50	12,442.0	-46.7	-40.3	-46.0	0.00	0.00	0.00
13,000.0	90.00	359.50	12,442.0	53.3	-41.1	54.0	0.00	0.00	0.00
13,100.0	90.00	359.50	12,442.0	153.3	-42.0	154.0	0.00	0.00	0.00
13,200.0	90.00	359.50	12,442.0	253.3	-42.9	254.0	0.00	0.00	0.00
13,300.0	90.00	359.50	12,442.0	353.2	-43.7	354.0	0.00	0.00	0.00
13,400.0	90.00	359.50	12,442.0	453.2	-44.6	454.0	0.00	0.00	0.00
13,500.0	90.00	359.50	12,442.0	553.2	-45.5	554.0	0.00	0.00	0.00
13,600.0	90.00	359.50	12,442.0	653.2	-46.3	654.0	0.00	0.00	0.00
13,700.0	90.00	359.50	12,442.0	753.2	-47.2	754.0	0.00	0.00	0.00
13,800.0	90.00	359.50	12,442.0	853.2	-48.1	854.0	0.00	0.00	0.00
13,900.0	90.00	359.50	12,442.0	953.2	-48.9	954.0	0.00	0.00	0.00
14,000.0	90.00	359.50	12,442.0	1,053.2	-49.8	1,053.9	0.00	0.00	0.00
14,100.0	90.00	359.50	12,442.0	1,153.2	-50.7	1,153.9	0.00	0.00	0.00
14,200.0	90.00	359.50	12,442.0	1,253.2	-51.5	1,253.9	0.00	0.00	0.00
14,300.0	90.00	359.50	12,442.0	1,353.2	-52.4	1,353.9	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Thunderbird 1 TB Fed 17H
Company:	Marathon Oil Permian LLC	TVD Reference:	KB=25' @ 3306.0usft
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	KB=25' @ 3306.0usft
Site:	Sec 1. T26S, R34E	North Reference:	Grid
Well:	Thunderbird 1 TB Fed 17H	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)	
14,400.0	90.00	359.50	12,442.0	1,453.2	-53.3	1,453.9	0.00	0.00	0.00	
14,500.0	90.00	359.50	12,442.0	1,553.2	-54.1	1,553.9	0.00	0.00	0.00	
14,600.0	90.00	359.50	12,442.0	1,653.2	-55.0	1,653.9	0.00	0.00	0.00	
14,700.0	90.00	359.50	12,442.0	1,753.2	-55.9	1,753.9	0.00	0.00	0.00	
14,800.0	90.00	359.50	12,442.0	1,853.2	-56.7	1,853.9	0.00	0.00	0.00	
14,900.0	90.00	359.50	12,442.0	1,953.2	-57.6	1,953.9	0.00	0.00	0.00	
15,000.0	90.00	359.50	12,442.0	2,053.2	-58.5	2,053.9	0.00	0.00	0.00	
15,100.0	90.00	359.50	12,442.0	2,153.2	-59.3	2,153.9	0.00	0.00	0.00	
15,200.0	90.00	359.50	12,442.0	2,253.2	-60.2	2,253.9	0.00	0.00	0.00	
15,300.0	90.00	359.50	12,442.0	2,353.2	-61.1	2,353.9	0.00	0.00	0.00	
15,400.0	90.00	359.50	12,442.0	2,453.2	-61.9	2,453.9	0.00	0.00	0.00	
15,500.0	90.00	359.50	12,442.0	2,553.2	-62.8	2,553.9	0.00	0.00	0.00	
15,600.0	90.00	359.50	12,442.0	2,653.2	-63.7	2,653.9	0.00	0.00	0.00	
15,700.0	90.00	359.50	12,442.0	2,753.2	-64.5	2,753.9	0.00	0.00	0.00	
15,800.0	90.00	359.50	12,442.0	2,853.2	-65.4	2,853.9	0.00	0.00	0.00	
15,900.0	90.00	359.50	12,442.0	2,953.1	-66.3	2,953.9	0.00	0.00	0.00	
16,000.0	90.00	359.50	12,442.0	3,053.1	-67.1	3,053.9	0.00	0.00	0.00	
16,100.0	90.00	359.50	12,442.0	3,153.1	-68.0	3,153.9	0.00	0.00	0.00	
16,200.0	90.00	359.50	12,442.0	3,253.1	-68.9	3,253.9	0.00	0.00	0.00	
16,300.0	90.00	359.50	12,442.0	3,353.1	-69.7	3,353.8	0.00	0.00	0.00	
16,400.0	90.00	359.50	12,442.0	3,453.1	-70.6	3,453.8	0.00	0.00	0.00	
16,500.0	90.00	359.50	12,442.0	3,553.1	-71.5	3,553.8	0.00	0.00	0.00	
16,600.0	90.00	359.50	12,442.0	3,653.1	-72.3	3,653.8	0.00	0.00	0.00	
16,700.0	90.00	359.50	12,442.0	3,753.1	-73.2	3,753.8	0.00	0.00	0.00	
16,800.0	90.00	359.50	12,442.0	3,853.1	-74.1	3,853.8	0.00	0.00	0.00	
16,900.0	90.00	359.50	12,442.0	3,953.1	-74.9	3,953.8	0.00	0.00	0.00	
17,000.0	90.00	359.50	12,442.0	4,053.1	-75.8	4,053.8	0.00	0.00	0.00	
17,100.0	90.00	359.50	12,442.0	4,153.1	-76.7	4,153.8	0.00	0.00	0.00	
17,200.0	90.00	359.50	12,442.0	4,253.1	-77.5	4,253.8	0.00	0.00	0.00	
TD @ 17308.0' MD / 12442.0' TVD										
17,308.0	90.00	359.50	12,442.0	4,361.1	-78.5	4,361.8	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
T 1 TB Fed 17H-KOP/F1	0.00	0.00	11,869.0	-717.9	-34.5	388,676.99	783,266.00	32° 3' 55.042 N	103° 25' 8.130 W	
- plan hits target center										
- Point										
T 1 TB Fed 17H-LTP/BH	0.00	0.00	12,442.0	4,361.1	-78.5	393,755.99	783,221.98	32° 4' 45.304 N	103° 25' 8.141 W	
- plan hits target center										
- Point										



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Thunderbird 1 TB Fed 17H
Company:	Marathon Oil Permian LLC	TVD Reference:	KB=25' @ 3306.0usft
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	KB=25' @ 3306.0usft
Site:	Sec 1. T26S, R34E	North Reference:	Grid
Well:	Thunderbird 1 TB Fed 17H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,500.0	2,500.0	0.0	0.0	Build 2°/100'
2,764.3	2,763.9	-12.2	-0.6	EOB @ 5.29° Inc / 182.75° Azm
10,301.5	10,269.1	-705.7	-33.9	Drop 2°/100'
10,565.8	10,533.0	-717.9	-34.5	EOD @ Vertical
11,901.8	11,869.0	-717.9	-34.5	KOP @ 11901.8' MD / 11869.0' TVD - Build 10°/100'
12,801.8	12,442.0	-144.9	-39.4	EOC @ 90.00° Inc / 359.50° Azm / 12442.0' TVD
17,308.0	12,442.0	4,361.1	-78.5	TD @ 17308.0' MD / 12442.0' TVD

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

COMMENTS

Action 27088

COMMENTS

Operator: MARATHON OIL PERMIAN LLC 5555 San Felipe St. Houston, TX 77056	OGRID: 372098
	Action Number: 27088
	Action Type: [C-103] NOI Change of Plans (C-103A)

COMMENTS

Created By	Comment	Comment Date
pkautz	NEW PROP-ID 331371	8/25/2021

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CONDITIONS

Action 27088

CONDITIONS

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	Action Number: 27088
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
pkautz	None	8/25/2021