

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

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		5. Lease Serial No. 6. If Indian, Allottee or Tribe Name 7. If Unit or CA Agreement, Name and No. 8. Lease Name and Well No.
2. Name of Operator		9. API Well No. 30-015-53941
3a. Address	3b. Phone No. (include area code)	10. Field and Pool, or Exploratory
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface At proposed prod. zone		11. Sec., T. R. M. or Blk. and Survey or Area
14. Distance in miles and direction from nearest town or post office*		12. County or Parish
13. State		
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
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
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
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
Title		
Approved by (Signature)	Name (Printed/Typed)	Date
Title		
Office		

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.

(Continued on page 2)

*(Instructions on page 2)



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

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-015-53941	² Pool Code 98220	³ Pool Name PURPLE SAGE (WOLFCAMP)
⁴ Property Code 325395	⁵ Property Name BLUE STEEL 21 WD FEE	⁶ Well Number 10H
⁷ OGRID No. 372098	⁸ Operator Name MARATHON OIL PERMIAN LLC	⁹ Elevation 2999'

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
D	28	23S	29E		470	NORTH	1164	WEST	EDDY

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	16	23S	29E		100	NORTH	1650	WEST	EDDY

¹² Dedicated Acres 640.0	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.

	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. Signature: <i>[Signature]</i> Date: 04/29/2020 Printed Name: Melissa Szudera E-mail Address: mszudera@marathonoil.com
	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. Date of Survey: OCTOBER 17, 2018 Signature and Seal of Professional Surveyor: <i>[Signature]</i> Certificate Number: LLOYD P. SHORT 21653
	CORNER COORDINATES NAD 83, SPCS NM EAST A - X: 644867.18' / Y: 477568.44' B - X: 647506.95' / Y: 477578.03' C - X: 647475.03' / Y: 466934.71' D - X: 644816.72' / Y: 466932.98'
	CORNER COORDINATES NAD 27, SPCS NM EAST A - X: 603684.20' / Y: 477508.77' B - X: 606323.97' / Y: 477518.36' C - X: 606291.75' / Y: 466875.28' D - X: 603633.45' / Y: 466873.55'

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

Section 1 – Plan Description

Effective May 25, 2021

I. Operator: MARATHON OIL PERMIAN, LLC. **OGRID:** 372098 **Date:** 06 / 12 / 2023

II. Type: ☒ Original ☐ Amendment due to ☐ 19.15.27.9.D(6)(a) NMAC ☐ 19.15.27.9.D(6)(b) NMAC ☐ Other.

If Other, please describe: _____

III. Well(s): Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Blue Steel 21 WD Fee 10H		D-28-23S-29E	470 FNL 1164 FNL	2700	5200	4900
Blue Steel 21 WD Fee 23H		D-28-23S-29E	470 FNL 1254 FNL	2700	5200	4900

IV. Central Delivery Point Name: Blue Steel WD Fee CTB [See 19.15.27.9(D)(1) NMAC]

V. Anticipated Schedule: Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Blue Steel 21 WD Fee 10H		01/20/2025	02/20/2025	08/20/2025	09/25/2025	09/25/2025
Blue Steel 21 WD Fee 23H		02/20/2025	03/20/2025	09/20/2025	10/25/2025	10/25/2025

VI. Separation Equipment: ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.

VII. Operational Practices: ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

VIII. Best Management Practices: ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

Section 2 – Enhanced Plan

EFFECTIVE APRIL 1, 2022

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

☒ Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

IX. Anticipated Natural Gas Production:

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

X. Natural Gas Gathering System (NGGS):

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

XI. Map. ☐ Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

XII. Line Capacity. The natural gas gathering system ☐ will ☐ will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

XIII. Line Pressure. Operator ☐ does ☐ does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

☐ Attach Operator's plan to manage production in response to the increased line pressure.

XIV. Confidentiality: ☐ Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

☒ Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

☐ Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system.

If Operator checks this box, Operator will select one of the following:

Well Shut-In. ☐ Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

Venting and Flaring Plan. ☐ Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- (a) power generation on lease;
- (b) power generation for grid;
- (c) compression on lease;
- (d) liquids removal on lease;
- (e) reinjection for underground storage;
- (f) reinjection for temporary storage;
- (g) reinjection for enhanced oil recovery;
- (h) fuel cell production; and
- (i) other alternative beneficial uses approved by the division.

Section 4 - Notices

1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature: *Thomas Moore*

Printed Name: Thomas Moore

Title: Regulatory and Land Technician

E-mail Address: tmoore@marathonoil.com

Date: 6/13/2023

Phone:

OIL CONSERVATION DIVISION
(Only applicable when submitted as a standalone form)

Approved By:

Title:

Approval Date:

Conditions of Approval:

APPENDIX

Section 1 - Parts VI, VII, and VIII

VI. Separation Equipment: ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.

- Separation equipment is sized to allow for retention time and velocity to adequately separate oil, gas, and water at anticipated peak rates.
- All central tank battery equipment is designed to efficiently capture the remaining gas from the liquid phase.
- Valves and meters are designed to service without flow interruption or venting of gas.

VII. Operational Practices: ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

◆ **19.15.27.8 (A) – Venting and Flaring Of Natural Gas**

- Marathon Oil Permian's field operations are designed with the goal of minimizing flaring and preventing venting of natural gas. If capturing the gas is not possible then the gas is combusted/flared using properly sized flares or combustors in accordance with state air permit rules.

◆ **19.15.27.8 (B) – Venting and Flaring During Drilling Operations**

- A properly-sized flare stack will be located at a minimum 100' from the nearest surface hole location on the pad.
- All natural gas produced during drilling operations will be flared. Venting will only occur if there is an equipment malfunction and/or to avoid risk of an immediate and substantial adverse impact on safety, public health, or the environment.

◆ **19.15.27.8 (C) – Venting and Flaring During Completion or Recompletion Operations**

- During all phases of flowback, wells will flow through a sand separator, or other appropriate flowback separation equipment, and the well stream will be directed to a central tank battery (CTB) through properly sized flowlines.
- The CTB will have properly sized separation equipment for maximum anticipated flow rates.
- Multiple stages of separation will be used to separate gas from liquids. All gas will be routed to a sales outlet. Fluids will be routed to tanks equipped with a closed loop system that will recover any residual gas from the tanks and route such gas to a sales outlet.

◆ **19.15.27.8 (D) – Venting and Flaring During Production Operations**

- During production, the well stream will be routed to the CTB where multiple stages of separation will separate gas from liquids. All gas will be routed to a sales outlet. Fluids will be routed to tanks equipped with a closed loop system that will recover any residual gas from the tanks and route such gas to a sales outlet, minimizing tank emissions.
- Flares are equipped with auto-ignition systems and continuous pilot operations.
- Automatic gauging equipment is installed on all tanks.

◆ **19.15.27.8 (E) – Performance Standards**

- Production equipment will be designed to handle maximum anticipated rates and pressure.
- Automatic gauging equipment is installed on all tanks to minimize venting.
- All flared gas will be combusted in a flare stack that is properly sized and designed to ensure proper combustion.
- Flares are equipped with continuous pilots and auto-ignitors along with remote monitoring of the pilot status.
- Weekly AVOs and monthly LDAR inspections will be performed on all wells and facilities that produce more than 60 MCFD.
- Gas/H₂S detectors will be installed throughout the facilities and wellheads to detect leaks and enable timely repairs.

◆ 19.15.27.8 (F) – Measurement or Estimation of Vented and Flared Natural Gas

- All high pressure flared gas is measured by equipment conforming to API 14.10.
- No meter bypasses are installed.
- When metering is not practical due to low pressure/low rate, the vented or flared volume will be estimated through flare flow curves with the assistance of air emissions consultants, as necessary.

VIII. Best Management Practices: ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

- Marathon Oil Permian will use best management practices to vent as minimally as possible during well intervention operations and downhole well maintenance.
- All natural gas is routed into the gas gathering system and directed to one of Marathon Oil Permian's multiple gas sales outlets.
- All venting events will be recorded and all start-up, shutdown, maintenance logs will be kept for control equipment.
- All control equipment will be maintained to provide highest run-time possible.
- All procedures are drafted to keep venting and flaring to the absolute minimum.



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

Drilling Plan Data Report

05/01/2023

APD ID: 10400063511

Submission Date: 10/16/2020

Highlighted data
reflects the most
recent changes

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: BLUE STEEL 21 WD FEE

Well Number: 10H

Well Type: CONVENTIONAL GAS WELL

Well Work Type: Drill

[Show Final Text](#)

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical	Measured Depth	Lithologies	Mineral Resources	Producing Formatio
913093	RUSTLER	2999	0	0	ANHYDRITE	OTHER : BRINE	N
7702926	SALADO	2643	356	356	ANHYDRITE, SALT	OTHER : BRINE	N
7702927	CASTILE	2013	986	986	ANHYDRITE, SALT	OTHER : BRINE	N
913095	BASE OF SALT	33	2966	2966	LIMESTONE, SANDSTONE	OTHER : BRINE	N
913098	LAMAR	33	2966	2966	SANDSTONE, SHALE	NONE	N
913102	BELL CANYON	-19	3018	3018	SANDSTONE	OIL	N
913099	CHERRY CANYON	-857	3856	3856	SANDSTONE	OIL	N
913103	BRUSHY CANYON	-2000	4999	4999	SANDSTONE	OIL	N
913104	BONE SPRING LIME	-3646	6645	6645	LIMESTONE	NONE	N
7702952	UPPER AVALON SHALE	-3721	6720	6720	SHALE	OIL	N
7702953	BONE SPRING 1ST	-4683	7682	7682	SANDSTONE	OIL	N
7702954	BONE SPRING 2ND	-5462	8461	8461	SANDSTONE	OIL	N
7702955	BONE SPRING 3RD	-6612	9611	9611	SANDSTONE	OIL	N
7702956	WOLFCAMP	-6943	9942	9942	OTHER, SANDSTONE, SHALE : CARBONATES	NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Operator Name: MARATHON OIL PERMIAN LLC**Well Name:** BLUE STEEL 21 WD FEE**Well Number:** 10H**Pressure Rating (PSI):** 5M**Rating Depth:** 20000

Equipment: 13 5/8 5M Annular & BOP Stack will be installed and tested for the 12 1/4", 8 3/4", and 6 3/4" sections. Min WP is 5000, annular will be tested to 50% of the WP and BOP Stack will be tested 5000. Check and kill valve will meet or exceed minimum BOP requirements.

Requesting Variance? YES

Variance request: 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.

Testing Procedure: BOP/BOPE will be tested to 250 psi low and the high pressure indicated above by an independent service company 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. Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i. A 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. See attached schematic.

Choke Diagram Attachment:

DRILL_2_CHOKE___Choke_Line_Flex_III_Rig_20201014121812.pdf

DRILL_2_CHOKE___Contitech_Hose_SN_663393_20201014121814.pdf

DRILL_2_CHOKE___Choke_Line_Test_Chart_SN_63393_20201014121815.pdf

DRILL_2_CHOKE_5M_10M.TWO_CHOKE_MANIFOLD.BLM.r1_20201015084618.pdf

BOP Diagram Attachment:

DRILL_2_BOP___10_5M_Flex.BOPE.BLM_20201014121732.pdf

DRILL_2_BOP_Well_Control_Plan___Permian_20201015085400.pdf

DRILL_2_BOP3H5H10H23H_WH_TH_4_String_20201015120805.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	420	0	420	2999	2579	420	J-55	54.5	ST&C	5.52	2.5	BUOY	2.5	BUOY	2.5
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	3050	0	3039	2901	-40	3050	J-55	36	LT&C	1.39	1.42	BUOY	1.8	BUOY	1.8
3	INTERMEDIATE	8.75	7.625	NEW	API	N	0	10100	0	10036	3049	-7037	10100	P-110	29.7	OTHER - WEDGE 523	3.12	1.16	BUOY	2.37	BUOY	2.37

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: BLUE STEEL 21 WD FEE

Well Number: 10H

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
4	PRODUCTI ON	6.75	5.5	NEW	API	N	0	21273	0	10965	2999	-7966	21273	P-110	23	OTHER - WEDGE	1.73	1.2	BUOY	2.09	BUOY	2.09

Casing Attachments

Casing ID: 1

String

SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

DRILL_3_3H5H10H23H_Red_Hills_WC_Surface_20201015121131.pdf

Casing ID: 2

String

INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

DRILL_3_3H5H10H23H_Red_Hills_WC_Intermediate_I_20201015121231.pdf

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: BLUE STEEL 21 WD FEE

Well Number: 10H

Casing Attachments

Casing ID: 3

String

INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

DRILL_3_3H5H10H23H_Red_Hills_WC_Intermediate_II_20201015132441.pdf

Casing ID: 4

String

PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

DRILL_3_3H5H10H23H_Red_Hills_WC_Production_20201015121416.pdf

5.500_20.00_BEN_P110_CY_TLW_SC_5.875_20211019100654.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	220	177	1.73	13.5	306	100	Class C	LCM
SURFACE	Tail		220	420	209	1.33	14.8	278	100	CLASS C	N/A
INTERMEDIATE	Lead		0	2050	508	2.21	12.8	1124	75	CLASS C	EXTENDER, ACCELERATOR.
INTERMEDIATE	Tail		2050	3050	353	1.33	14.8	470	50	CLASS C	RETARDER

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: BLUE STEEL 21 WD FEE

Well Number: 10H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Lead		2750	9100	338	3.21	11	1085	70	Class C	Viscosifier, Retarder.
INTERMEDIATE	Tail		9100	10100	114	1.15	13.8	131	30	CLASS H	Extender, Fluid Loss, Dispersant
PRODUCTION	Lead		8100	10100	68	3.21	11	217	30	CLASS H	EXTENDER, RETARDER, DEFOAMER, VISCOSIFIER, FLUID LOSS
PRODUCTION	Tail		10100	21273	994	1.22	14.5	1213	30	CLASS H	RETARDER, EXTENDER, FLUID LOSS, DISPERSANT

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: The necessary mud products for additional weight and fluid loss control will be on location at all times.

Describe the mud monitoring system utilized: Losses or gains in the mud system will be monitored visually/manually as well as with an electronic PVT.

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
10100	21273	OIL-BASED MUD	13	14							
0	420	WATER-BASED MUD	8.4	8.8							
420	3050	OTHER : Brine	8.8	9.8							

Operator Name: MARATHON OIL PERMIAN LLC**Well Name:** BLUE STEEL 21 WD FEE**Well Number:** 10H

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
3050	1010 0	OTHER : Brine or OBM	8.8	9.8							

Section 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). GR while drilling from Intermediate casing shoe to TD.

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

GAMMA RAY LOG,

Coring operation description for the well:

Run gamma-ray (GR) and corrected neutron log (CNL) or analogous to surface for future development of the area, one per shared well pad not to exceed 200 radial distance.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 7412

Anticipated Surface Pressure: 4999

Anticipated Bottom Hole Temperature(F): 195

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

Describe:

Contingency Plans geohazards description:

Contingency Plans geohazards

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations

DRILL_7_Marathon_Blue_Steel_FEE_3h_4h_5h_7h_10h_23h_Contingency_Plan_040820_20201014125949.pdf

DRILL_7__BLUE_STEEL_21_FEE_H2S_Layout_20201015084707.pdf

DRILL_7__BLUE_STEEL_21_FEE_Rig_Layout_20201015084708.pdf

DRILL_7__GCP_BLUE_STEEL_FEE__4H7H3H5H10H23H__04_29_2020_20201014130025.pdf

Operator Name: MARATHON OIL PERMIAN LLC**Well Name:** BLUE STEEL 21 WD FEE**Well Number:** 10H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

DRILL_8PD_Blue_Steel_Fee_FedCom_Surface_Lease_Map_20201015123351.pdf
DRILL_8__BLUE_STEEL_FEE__FED__S_ROW__Lease_Ownership_Map_20201015123351.pdf
DRILL_8_PD__Marathon_BlueSteel21WD10H_PrelimA_36x48WM_20201015133258.PDF
DRILL_8_PD__Marathon_BlueSteel21WD10H_PrelimA_ACRReport_20201015133258.pdf
DRILL_8_PD__Marathon_BlueSteel21WD10H_PrelimA_WPReport_20201015133258.pdf
DRILL_PLAN_Blue_Steel_21_WD_Fee_10H_rev_10.19.21_20211019100849.pdf

Other proposed operations facets description:

- 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.

Potential Hazards:

- 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.
- 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.
- No losses are anticipated at this time.
- 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.

Other proposed operations facets attachment:

DRILL_8_OF_Batch_Drilling_Plan_and_Surface_Rig_Request_20201006091233.pdf

Other Variance attachment:

MARATHON OIL PERMIAN LLC
DRILLING AND OPERATIONS PLAN

BLUE STEEL 21 WD FEE 10H

SEC. 28, TWP. 23S, RNG. 29E

EDDY COUNTY, NEW MEXICO

1. GEOLOGICAL FORMATIONS

Formation at Surface	Elevation
Permian	2999

Formation	TVD	MD	Elevation	Lithology	Mineral Resources	Producing Formation
Rustler	0	0	2999	Anhydrite	Brine	No
Salado	356	356	2643	Salt/Anhydrite	Brine	No
Castile	986	986	2013	Salt/Anhydrite	Brine	No
Base of Salt (BX)	2966	2966	33	Salt/Anhydrite	Brine	No
Lamar	2966	2966	33	Sandstone/Shale	None	No
Bell Canyon	3018	3018	-19	Sandstone	Oil	No
Cherry Canyon	3856	3856	-857	Sandstone	Oil	No
Brushy Canyon	4999	4999	-2000	Sandstone	Oil	No
Bone Spring Lime	6645	6645	-3646	Limestone	None	No
Upper Avalon Shale	6720	6720	-3721	Shale	Oil	Yes
1st Bone Spring Sand	7682	7682	-4683	Sandstone	Oil	Yes
2nd Bone Spring Carbonate	7963	7963	-4964	Limestone	None	No
2nd Bone Spring Sand	8461	8461	-5462	Sandstone	Oil	Yes
3rd Bone Spring Carbonate	8804	8804	-5805	Limestone	Oil	No
3rd Bone Spring Sand	9611	9611	-6612	Sandstone	Oil	Yes
Wolfcamp	9942	9942	-6943	Sandstone/Shale/Carbonates	Natural Gas/Oil	Yes
Wolfcamp A	10081	10081	-7082	Sandstone/Shale/Carbonates	Natural Gas/Oil	Yes
Wolfcamp B	10321	10321	-7322	Sandstone/Shale/Carbonates	Natural Gas/Oil	No
Wolfcamp C	10670	10670	-7671	Sandstone/Shale/Carbonates	Natural Gas/Oil	No
Wolfcamp D	11040	11040	-8041	Sandstone/Shale/Carbonates	Natural Gas/Oil	No

2. BLOWOUT PREVENTER TESTING PROCEDURE

BOP installed and tested before drilling which hole?	Size	Min. Required WP	Type	✓	Type
12 1/4	13 5/8	5000	Annular	x	50% of working pressure
			Blind Ram		5000
			Pipe Ram		
			Double Ram		
			Other* BOP Stack	x	
8 3/4	13 5/8	5000	Annular	x	50% of working pressure
			Blind Ram		5000
			Pipe Ram		
			Double Ram		
			Other* BOP Stack	x	
6 3/4	13 5/8	5000	Annular	x	50% of working pressure
			Blind Ram		5000
			Pipe Ram		
			Double Ram		
			Other* BOP Stack	x	

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. See attached schematic.	

3. CASING PROGRAM

String Type	Hole Size	Csg Size	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Weight (lbs/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
Surface	17 1/2	13 3/8	0	420	0	420	54.5	J55	STC	5.52	2.5	2.5
Intermediate I	12 1/4	9 5/8	0	3050	0	3040	36	J55	LTC	1.39	1.42	1.8
Intermediate II	8 3/4	7 5/8	0	10100	0	10036	29.7	P110	Wedge 523	3.12	1.16	2.37
Production	6 3/4	5 1/2	0	21273	0	10965	23	P110	Wedge	1.73	1.2	2.09

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

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	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
	Y or N
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.	
	Y or N
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?	

	Y or N
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?	
	Y or N
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?	
	Y or N
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

4. CEMENT PROGRAM

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity (sx)	Yield (ft3/sx)	Density (ppg)	Slurry Volume (ft3)	Excess (%)	Cement Type	Additives
Surface	Lead	--	0	220	177	1.73	13.5	306	100	Class C	LCM
Surface	Tail	--	220	420	209	1.33	14.8	278	100	Class C	N/A
Intermediate I	Lead	--	0	2050	508	2.21	12.8	1124	75	Class C	Extender, Accelerator
Intermediate I	Tail	--	2050	3050	353	1.33	14.8	470	50	Class C	Retarder
Intermediate II	Lead	--	2750	9100	338	3.21	11	1085	70	Class C	Viscosifier, Retarder
Intermediate II	Tail	--	9100	10100	114	1.15	13.8	131	30	Class H	Extender, Fluid Loss, Dispersant
Production	Lead	--	8100	10100	68	3.21	11	217	30	Class H	Extender, Retarder, Defoamer, Viscosifier, Fluid Loss
Production	Tail	--	10100	21273	994	1.22	14.5	1213	30	Class H	Retarder, 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/sx)	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	420	Water Based Mud	8.4	8.8
420	3050	Brine	8.8	9.8
3050	10100	Brine or Oil Based Mud	8.8	9.8
10100	21273	Oil Based Mud	13.0	14.0

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. TESTING, 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:

Run gamma-ray (GR) and corrected neutron log (CNL) or analogous to surface for future development of the area, one per shared well pad not to exceed 200' radial distance.

Mud Logger: None

DST's: None

Open Hole Logs: GR while drilling from Intermediate casing shoe to TD.

7. ANTICIPATED PRESSURE

Anticipated Bottom Hole Pressure: 7412 PSI

Anticipated Bottom Hole Temperature: 195 °F

Anticipate Abnormal Pressure? No

Anticipated Abnormal Temperature? No

- 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.
- E. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

8. OTHER INFORMATION

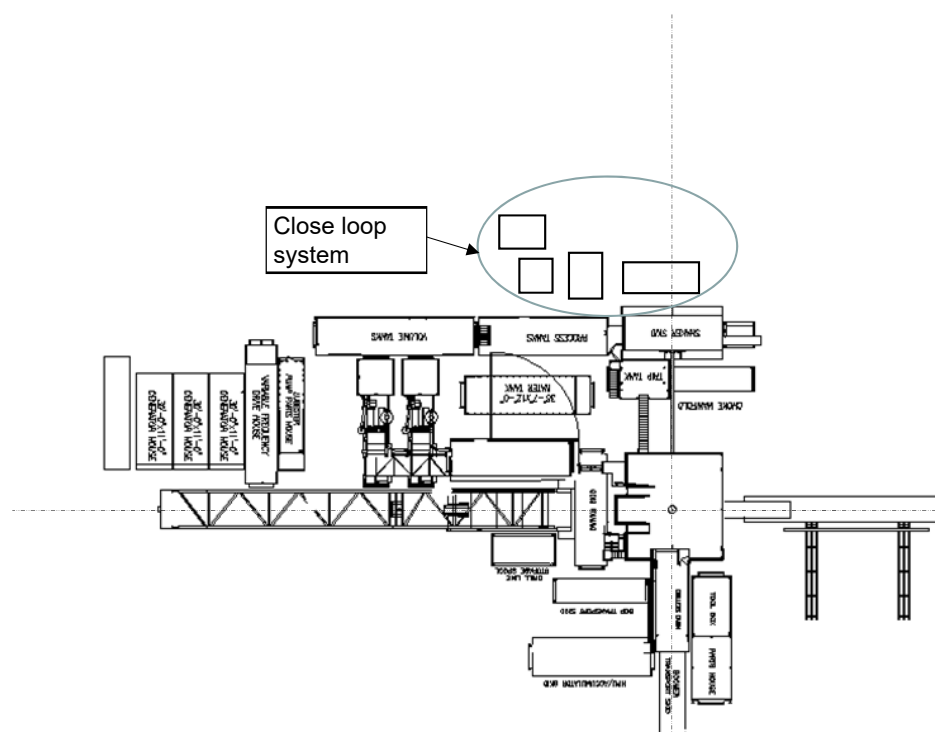
A. Auxiliary Well Control and Monitoring Equipment

- i. A Kelly cock will be in the drill string at all times.
- ii. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor unobstructed and readily accessible at all times.
- iii. 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

- B.** Anticipated Starting Date and Duration of Operations
 - i.* 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.
- C.** 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.
- D.** No losses are anticipated at this time.
- E.** All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well.
- F.** Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

775'

775'



Bunk House

Rig Mgr.	
Trailer	

Company
Rep Trailer

Safety
Trailer

Access Road

500'

BLUE STEEL 21 FEE

SB 4H, SB 7H, WD 3H, WD 5H, WD 10H, WD 23H



US State Plane 1927 (Exact solution)
NAD 1927 (NADCON CONUS)
Clarke 1866
New Mexico East 3001
Mean Sea Level

RKB Elevation: well @ 3026.00usft

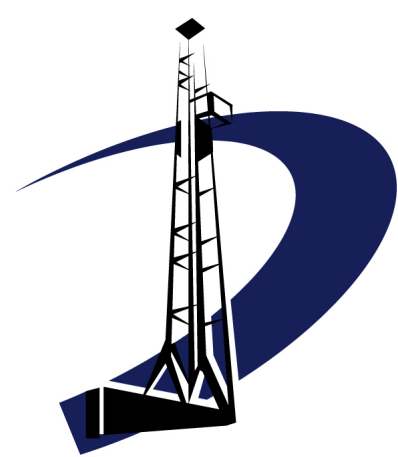
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	466404.20	604800.56	32.2818065	-103.9942208	

SECTION DETAILS

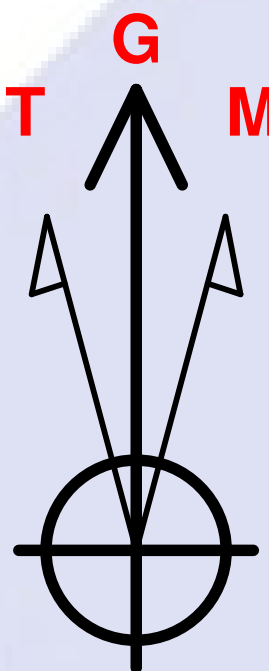
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00
3	800.00	2.00	180.00	799.96	-3.49	0.00	1.00	-3.49
4	2000.77	2.00	180.00	2000.00	-45.40	0.00	0.00	-45.40
5	2580.50	10.00	40.51	2577.12	-17.14	32.81	2.00	-17.01
6	6400.89	10.00	40.51	6339.45	487.33	463.82	0.00	489.11
7	6900.98	0.00	0.00	6837.00	520.43	492.10	2.00	522.32
8	10455.98	0.00	0.00	10392.00	520.43	492.10	0.00	522.32
9	11355.98	90.00	0.22	10964.96	1093.38	494.33	10.00	1095.27
10	21273.23	90.00	0.22	10965.00	11010.56	532.89	0.00	11012.52

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[BlueSteel21#10H]FTP	0.00	570.43	492.16	466974.63	605292.72
[BlueSteel21#10H]KOP	10392.00	520.43	492.10	466924.63	605292.66
[BlueSteel21#10H]LTP/BHL	10965.00	11010.56	532.89	477414.76	605333.45



PRODIRECTIONAL



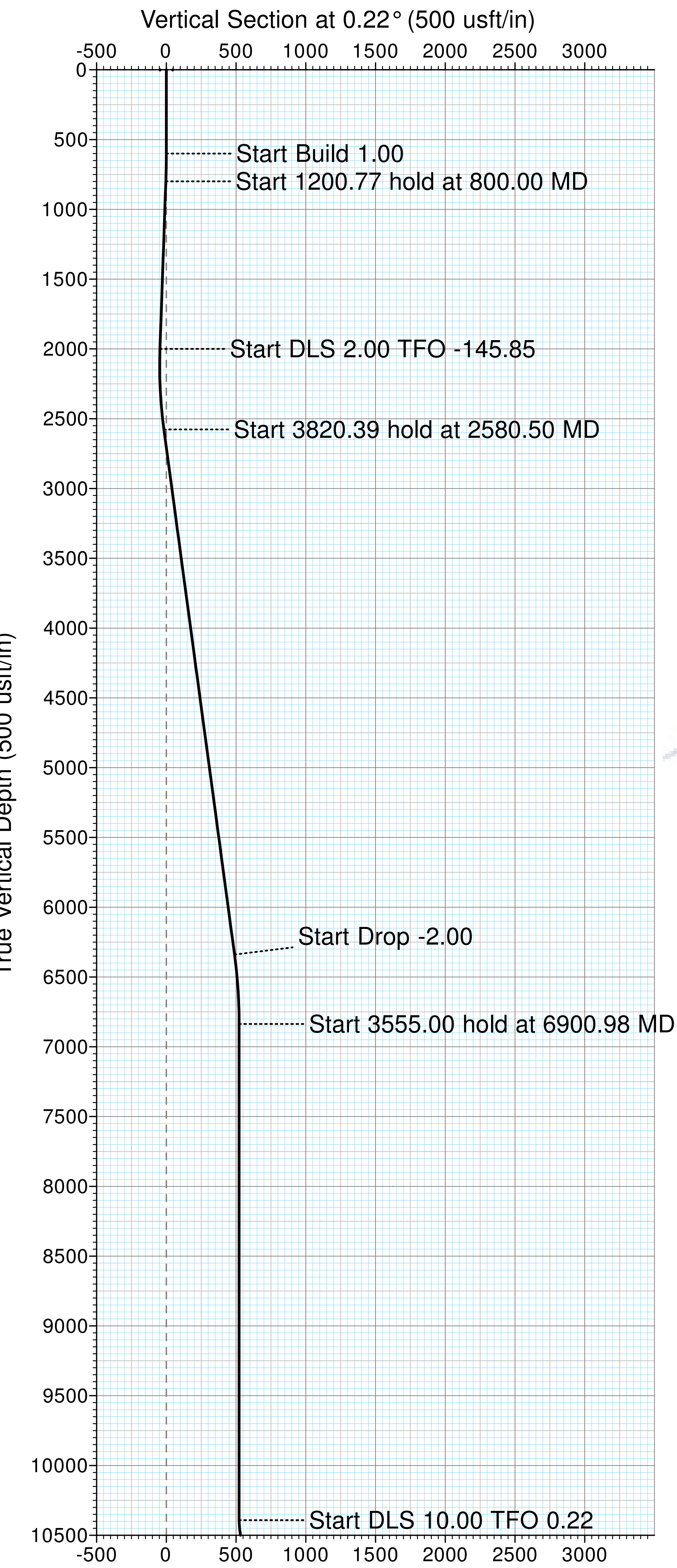
Azimuths to Grid North
True North: -0.18°
Magnetic North: 6.75°

Magnetic Field
Strength: 47832.2snT
Dip Angle: 60.00°
Date: 4/3/2020
Model: HDGM

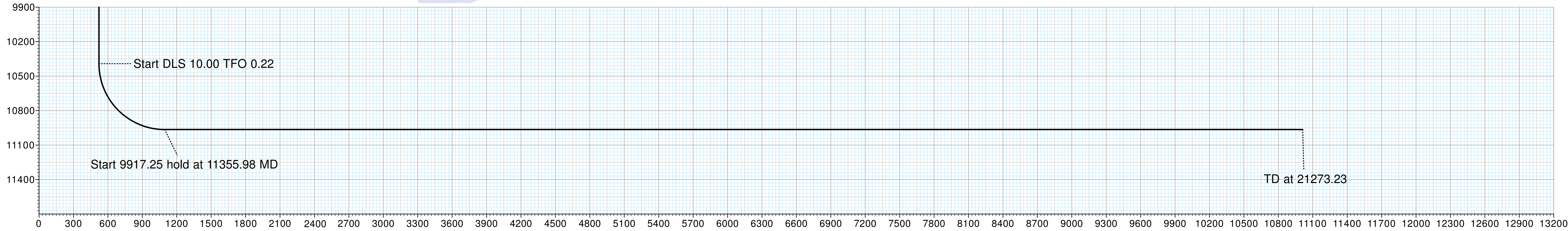
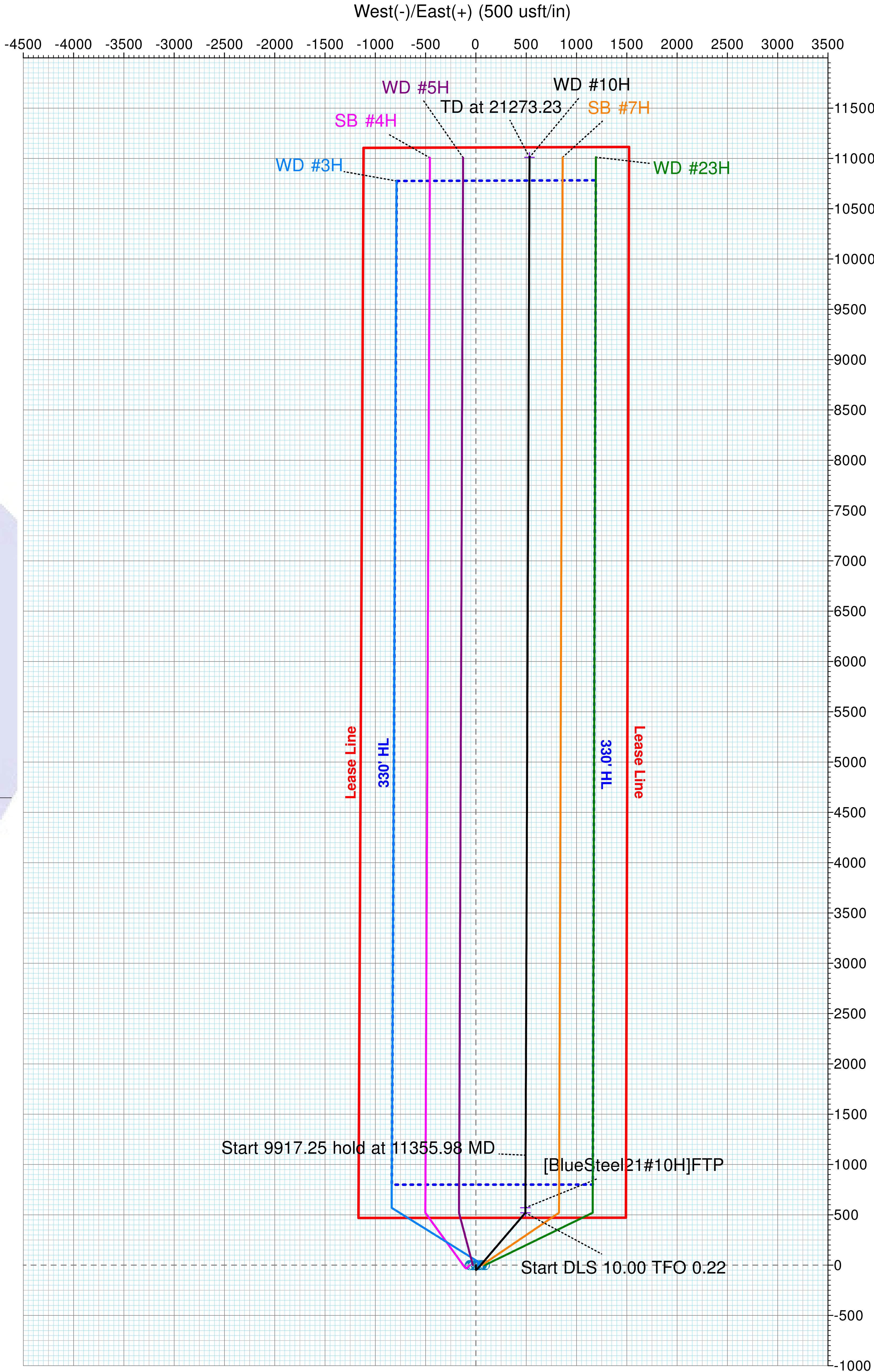
Azimuth Corrections

Total Magnetic Corr. (M to G): 6.75°

Declination (M to T): 6.93° East



Target Line: 10965' TVD @ 0' VS: 90° INC



36" x 48"



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Reference	Prelim Plan A		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 20,000.00 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 4/6/2020	
From (usft)	To (usft)	Survey (Wellbore)
0.00	21,273.23	Prelim Plan A (OH)
		Tool Name
		MWD+IFR1
		Description
		OWSG MWD + IFR1

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Blue Steel 21 Fee						
SB #4H - OH - Prelim Plan A	600.00	601.00	59.95	56.10	15.572	CC
SB #4H - OH - Prelim Plan A	700.00	700.26	60.58	56.04	13.366	ES
SB #4H - OH - Prelim Plan A	2,100.00	2,097.19	97.25	82.93	6.790	SF
SB #7H - OH - Prelim Plan A	600.00	600.00	60.07	56.22	15.617	CC
SB #7H - OH - Prelim Plan A	1,100.00	1,100.22	61.69	54.35	8.407	ES
SB #7H - OH - Prelim Plan A	8,500.00	8,500.87	338.38	277.74	5.580	SF
WD #23H - OH - Prelim Plan A	600.00	600.00	89.91	86.06	23.375	CC
WD #23H - OH - Prelim Plan A	1,200.00	1,199.72	91.63	83.59	11.393	ES
WD #23H - OH - Prelim Plan A	21,273.23	21,188.46	670.84	448.01	3.010	SF
WD #3H - OH - Prelim Plan A	600.00	600.00	29.95	26.10	7.787	CC
WD #3H - OH - Prelim Plan A	700.00	699.97	30.01	25.46	6.601	ES
WD #3H - OH - Prelim Plan A	1,000.00	1,000.73	36.58	29.95	5.515	SF
WD #5H - OH - Prelim Plan A	600.00	601.00	30.06	26.21	7.808	CC
WD #5H - OH - Prelim Plan A	700.00	700.83	30.34	25.79	6.671	ES
WD #5H - OH - Prelim Plan A	21,273.23	21,105.65	677.07	457.21	3.080	SF

Offset Design Blue Steel 21 Fee - SB #4H - OH - Prelim Plan A												
Survey Program: 0-MWD+IFR1												
Reference												
Offset												
Semi Major Axis												
Distance												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor
0.00	0.00	1.00	0.00	0.00	0.00	-89.89	0.12	-59.95	59.95			
100.00	100.00	101.00	100.00	0.13	0.13	-89.89	0.12	-59.95	59.95	59.68	0.27	225.997
200.00	200.00	201.00	200.00	0.49	0.49	-89.89	0.12	-59.95	59.95	58.97	0.98	61.036
300.00	300.00	301.00	300.00	0.85	0.85	-89.89	0.12	-59.95	59.95	58.25	1.70	35.282
400.00	400.00	401.00	400.00	1.21	1.21	-89.89	0.12	-59.95	59.95	57.53	2.42	24.813
500.00	500.00	501.00	500.00	1.56	1.57	-89.89	0.12	-59.95	59.95	56.82	3.13	19.135
600.00	600.00	601.00	600.00	1.92	1.93	-89.89	0.12	-59.95	59.95	56.10	3.85	15.572 CC
700.00	699.99	700.26	699.25	2.26	2.27	90.34	-0.50	-60.57	60.58	56.04	4.53	13.366 ES
800.00	799.96	800.51	798.45	2.60	2.60	91.01	-2.34	-62.41	62.43	57.24	5.20	12.011
900.00	899.90	900.55	898.35	2.93	2.95	91.87	-4.80	-64.87	64.93	59.05	5.88	11.049
1,000.00	999.84	1,000.58	998.25	3.28	3.29	92.67	-7.27	-67.34	67.43	60.87	6.56	10.274
1,100.00	1,099.78	1,100.62	1,098.16	3.62	3.64	93.41	-9.74	-69.81	69.95	62.69	7.26	9.639
1,200.00	1,199.72	1,200.66	1,198.06	3.97	3.99	94.10	-12.20	-72.27	72.48	64.53	7.96	9.110

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - SB #4H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
1,300.00	1,299.65	1,300.69	1,297.96	4.32	4.34	94.75	-14.67	-74.74	75.02	66.36	8.66	8.664		
1,400.00	1,399.59	1,400.73	1,397.87	4.67	4.70	95.35	-17.14	-77.21	77.57	68.21	9.36	8.284		
1,500.00	1,499.53	1,500.76	1,497.77	5.03	5.05	95.91	-19.60	-79.67	80.13	70.05	10.07	7.955		
1,600.00	1,599.47	1,600.80	1,597.67	5.38	5.41	96.44	-22.07	-82.14	82.69	71.91	10.78	7.670		
1,700.00	1,699.41	1,700.83	1,697.58	5.74	5.76	96.94	-24.54	-84.61	85.26	73.77	11.49	7.419		
1,800.00	1,799.35	1,800.87	1,797.48	6.09	6.12	97.40	-27.00	-87.07	87.84	75.63	12.20	7.197		
1,900.00	1,899.29	1,900.91	1,897.38	6.45	6.47	97.84	-29.47	-89.54	90.42	77.50	12.92	7.000		
2,000.00	1,999.23	1,999.06	1,997.29	6.80	6.83	98.26	-31.94	-92.01	93.00	79.38	13.62	6.826		
2,100.00	2,099.20	2,097.19	2,095.37	7.16	7.18	170.81	-32.89	-95.12	97.25	82.93	14.32	6.790 SF		
2,200.00	2,199.15	2,194.98	2,193.02	7.50	7.52	-141.05	-30.81	-99.64	104.90	89.90	15.01	6.991		
2,300.00	2,298.95	2,292.29	2,290.01	7.85	7.86	-129.75	-25.75	-105.53	115.92	100.25	15.67	7.396		
2,400.00	2,398.50	2,388.95	2,386.07	8.19	8.20	-125.25	-17.77	-112.77	130.29	113.95	16.34	7.976		
2,500.00	2,497.66	2,484.82	2,480.94	8.54	8.54	-122.89	-6.95	-121.29	147.95	130.96	16.99	8.708		
2,600.00	2,596.32	2,581.47	2,576.17	8.88	8.88	-121.89	6.38	-131.01	168.54	150.89	17.66	9.544		
2,700.00	2,694.80	2,679.17	2,672.38	9.23	9.22	-122.56	20.13	-140.95	189.80	171.45	18.35	10.345		
2,800.00	2,793.28	2,776.86	2,768.59	9.58	9.56	-123.08	33.87	-150.89	211.08	192.04	19.04	11.087		
2,900.00	2,891.76	2,874.55	2,864.80	9.93	9.90	-123.51	47.61	-160.84	232.37	212.63	19.73	11.775		
3,000.00	2,990.24	2,972.25	2,961.01	10.29	10.25	-123.87	61.35	-170.78	253.67	233.24	20.43	12.414		
3,100.00	3,088.72	3,069.94	3,057.22	10.64	10.60	-124.18	75.10	-180.72	274.98	253.84	21.14	13.010		
3,200.00	3,187.20	3,167.63	3,153.43	11.00	10.96	-124.44	88.84	-190.67	296.30	274.45	21.84	13.566		
3,300.00	3,285.68	3,265.33	3,249.64	11.36	11.31	-124.66	102.58	-200.61	317.62	295.07	22.55	14.086		
3,400.00	3,384.16	3,363.02	3,345.85	11.73	11.67	-124.86	116.32	-210.55	338.94	315.68	23.26	14.573		
3,500.00	3,482.64	3,460.71	3,442.06	12.09	12.03	-125.03	130.07	-220.50	360.27	336.30	23.97	15.030		
3,600.00	3,581.12	3,558.41	3,538.27	12.46	12.39	-125.19	143.81	-230.44	381.60	356.92	24.68	15.460		
3,700.00	3,679.60	3,656.10	3,634.48	12.82	12.75	-125.32	157.55	-240.38	402.93	377.53	25.40	15.864		
3,800.00	3,778.08	3,753.80	3,730.69	13.19	13.11	-125.45	171.29	-250.33	424.27	398.15	26.12	16.246		
3,900.00	3,876.56	3,851.49	3,826.90	13.56	13.47	-125.56	185.04	-260.27	445.60	418.77	26.83	16.606		
4,000.00	3,975.04	3,949.18	3,923.11	13.93	13.83	-125.66	198.78	-270.21	466.94	439.39	27.55	16.946		
4,100.00	4,073.52	4,046.88	4,019.32	14.29	14.20	-125.75	212.52	-280.16	488.28	460.01	28.28	17.269		
4,200.00	4,172.00	4,144.57	4,115.53	14.66	14.56	-125.84	226.26	-290.10	509.62	480.62	29.00	17.574		
4,300.00	4,270.49	4,242.26	4,211.74	15.04	14.92	-125.92	240.01	-300.04	530.96	501.24	29.72	17.864		
4,400.00	4,368.97	4,339.96	4,307.95	15.41	15.29	-125.99	253.75	-309.99	552.31	521.86	30.45	18.140		
4,500.00	4,467.45	4,437.65	4,404.16	15.78	15.66	-126.06	267.49	-319.93	573.65	542.48	31.17	18.402		
4,600.00	4,565.93	4,535.35	4,500.37	16.15	16.02	-126.12	281.23	-329.87	594.99	563.09	31.90	18.652		
4,700.00	4,664.41	4,633.04	4,596.58	16.53	16.39	-126.18	294.98	-339.82	616.34	583.71	32.63	18.890		
4,800.00	4,762.89	4,730.73	4,692.79	16.90	16.76	-126.23	308.72	-349.76	637.68	604.33	33.36	19.118		
4,900.00	4,861.37	4,828.43	4,789.00	17.27	17.12	-126.28	322.46	-359.70	659.03	624.94	34.09	19.335		
5,000.00	4,959.85	4,926.12	4,885.21	17.65	17.49	-126.33	336.20	-369.65	680.37	645.56	34.82	19.543		
5,100.00	5,058.33	5,023.81	4,981.42	18.02	17.86	-126.37	349.95	-379.59	701.72	666.18	35.55	19.741		
5,200.00	5,156.81	5,121.51	5,077.63	18.40	18.23	-126.41	363.69	-389.53	723.07	686.79	36.28	19.932		
5,300.00	5,255.29	5,219.20	5,173.83	18.77	18.60	-126.45	377.43	-399.48	744.42	707.41	37.01	20.114		
5,400.00	5,353.77	5,316.89	5,270.04	19.15	18.97	-126.49	391.18	-409.42	765.76	728.02	37.74	20.290		
5,500.00	5,452.25	5,414.59	5,366.25	19.53	19.34	-126.52	404.92	-419.36	787.11	748.64	38.47	20.458		
5,600.00	5,550.73	5,512.28	5,462.46	19.90	19.71	-126.56	418.66	-429.31	808.46	769.25	39.21	20.620		
5,700.00	5,649.21	5,609.98	5,558.67	20.28	20.08	-126.59	432.40	-439.25	829.81	789.87	39.94	20.775		
5,800.00	5,747.69	5,707.67	5,654.88	20.66	20.45	-126.62	446.15	-449.19	851.16	810.48	40.68	20.925		
5,900.00	5,846.17	5,805.36	5,751.09	21.03	20.82	-126.65	459.89	-459.14	872.50	831.09	41.41	21.069		
6,000.00	5,944.65	5,903.06	5,847.30	21.41	21.19	-126.67	473.63	-469.08	893.85	851.71	42.15	21.208		
6,100.00	6,043.13	6,005.82	5,948.52	21.79	21.58	-126.71	487.37	-479.07	915.15	872.22	42.92	21.321		
6,200.00	6,141.61	6,128.69	6,070.11	22.17	22.04	-126.92	502.30	-489.83	934.64	890.81	43.83	21.324		
6,300.00	6,240.09	6,252.43	6,193.20	22.55	22.49	-127.37	512.43	-497.15	951.52	906.81	44.71	21.283		
6,400.00	6,338.57	6,376.57	6,317.13	22.92	22.93	-128.07	518.25	-501.37	965.82	920.27	45.55	21.201		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - SB #4H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
6,500.00	6,437.33	6,503.21	6,437.33	23.30	23.37	-129.02	519.78	-502.47	976.59	930.22	46.37	21.061		
6,600.00	6,536.57	6,603.96	6,536.57	23.67	23.71	-129.69	519.78	-502.47	984.37	937.30	47.08	20.910		
6,700.00	6,636.19	6,704.35	6,636.19	24.03	24.05	-130.17	519.78	-502.47	990.00	942.22	47.78	20.721		
6,800.00	6,736.04	6,804.49	6,736.04	24.38	24.40	-130.45	519.78	-502.47	993.41	944.94	48.47	20.494		
6,900.00	6,836.02	6,904.52	6,836.02	24.73	24.74	-130.55	519.78	-502.47	994.57	945.41	49.16	20.231		
7,000.00	6,936.02	7,004.52	6,936.02	25.07	25.08	-90.04	519.78	-502.47	994.57	944.73	49.84	19.954		
7,100.00	7,036.02	7,104.52	7,036.02	25.41	25.43	-90.04	519.78	-502.47	994.57	944.04	50.53	19.684		
7,200.00	7,136.02	7,204.52	7,136.02	25.75	25.77	-90.04	519.78	-502.47	994.57	943.36	51.21	19.421		
7,300.00	7,236.02	7,304.52	7,236.02	26.09	26.11	-90.04	519.78	-502.47	994.57	942.68	51.90	19.165		
7,400.00	7,336.02	7,404.52	7,336.02	26.43	26.46	-90.04	519.78	-502.47	994.57	941.99	52.58	18.915		
7,500.00	7,436.02	7,504.52	7,436.02	26.77	26.80	-90.04	519.78	-502.47	994.57	941.30	53.27	18.671		
7,600.00	7,536.02	7,604.52	7,536.02	27.12	27.15	-90.04	519.78	-502.47	994.57	940.61	53.96	18.433		
7,700.00	7,636.02	7,704.52	7,636.02	27.46	27.50	-90.04	519.78	-502.47	994.57	939.93	54.64	18.201		
7,800.00	7,736.02	7,804.52	7,736.02	27.81	27.84	-90.04	519.78	-502.47	994.57	939.24	55.33	17.974		
7,900.00	7,836.02	7,904.52	7,836.02	28.15	28.19	-90.04	519.78	-502.47	994.57	938.55	56.02	17.753		
8,000.00	7,936.02	8,004.52	7,936.02	28.49	28.54	-90.04	519.78	-502.47	994.57	937.86	56.71	17.537		
8,100.00	8,036.02	8,104.52	8,036.02	28.84	28.88	-90.04	519.78	-502.47	994.57	937.17	57.40	17.326		
8,200.00	8,136.02	8,195.48	8,136.02	29.18	29.20	-90.04	519.78	-502.47	994.57	936.51	58.06	17.129		
8,300.00	8,236.02	8,295.71	8,236.04	29.53	29.55	-89.76	524.58	-502.45	994.56	935.80	58.76	16.925		
8,301.12	8,237.14	8,296.82	8,237.14	29.53	29.56	-89.75	524.73	-502.45	994.56	935.79	58.77	16.923		
8,400.00	8,336.02	8,391.80	8,328.84	29.88	29.90	-88.59	544.91	-502.36	994.78	935.32	59.46	16.731		
8,500.00	8,436.02	8,479.00	8,410.95	30.22	30.22	-86.76	576.69	-502.22	996.23	936.11	60.12	16.572		
8,600.00	8,536.02	8,555.10	8,477.10	30.57	30.49	-84.61	614.21	-502.06	1,000.31	939.62	60.69	16.482		
8,700.00	8,636.02	8,619.92	8,529.11	30.92	30.71	-82.41	652.84	-501.90	1,008.46	947.34	61.12	16.500		
8,800.00	8,736.02	8,674.48	8,569.27	31.26	30.89	-80.33	689.73	-501.74	1,021.85	960.51	61.34	16.658		
8,900.00	8,836.02	8,720.25	8,600.13	31.61	31.05	-78.45	723.52	-501.59	1,041.30	979.98	61.32	16.981		
9,000.00	8,936.02	8,758.74	8,623.92	31.96	31.17	-76.78	753.76	-501.46	1,067.24	1,006.20	61.04	17.483		
9,100.00	9,036.02	8,791.27	8,642.42	32.31	31.28	-75.33	780.52	-501.34	1,099.77	1,039.24	60.53	18.170		
9,200.00	9,136.02	8,818.97	8,656.95	32.65	31.37	-74.06	804.10	-501.24	1,138.73	1,078.92	59.81	19.040		
9,300.00	9,236.02	8,850.00	8,671.84	33.00	31.47	-72.62	831.31	-501.12	1,183.82	1,124.79	59.04	20.052		
9,400.00	9,336.02	8,863.28	8,677.76	33.35	31.51	-72.00	843.20	-501.07	1,234.45	1,176.49	57.96	21.298		
9,500.00	9,436.02	8,881.17	8,685.30	33.70	31.57	-71.15	859.42	-501.00	1,290.25	1,233.31	56.94	22.661		
9,600.00	9,536.02	8,900.00	8,692.69	34.05	31.63	-70.26	876.74	-500.93	1,350.66	1,294.71	55.94	24.143		
9,700.00	9,636.02	8,900.00	8,692.69	34.40	31.63	-70.26	876.74	-500.93	1,415.25	1,360.53	54.72	25.862		
9,800.00	9,736.02	8,923.04	8,700.94	34.75	31.70	-69.17	898.25	-500.83	1,483.26	1,429.36	53.90	27.518		
9,900.00	9,836.02	8,934.04	8,704.58	35.10	31.74	-68.65	908.63	-500.79	1,554.57	1,501.59	52.98	29.340		
10,000.00	9,936.02	8,950.00	8,709.49	35.45	31.79	-67.89	923.82	-500.72	1,628.74	1,576.52	52.22	31.191		
10,100.00	10,036.02	8,950.00	8,709.49	35.80	31.79	-67.89	923.82	-500.72	1,705.31	1,653.99	51.32	33.229		
10,200.00	10,136.02	8,950.00	8,709.49	36.15	31.79	-67.89	923.82	-500.72	1,784.21	1,733.69	50.51	35.320		
10,300.00	10,236.02	8,968.30	8,714.61	36.50	31.84	-67.02	941.39	-500.65	1,864.79	1,814.77	50.03	37.275		
10,400.00	10,336.02	8,975.04	8,716.35	36.85	31.86	-66.70	947.90	-500.62	1,947.19	1,897.72	49.47	39.360		
10,500.00	10,435.98	8,981.62	8,717.98	37.20	31.88	-66.66	954.27	-500.59	2,030.70	1,981.72	48.98	41.463		
10,600.00	10,534.51	9,000.00	8,722.13	37.56	31.94	-48.91	972.18	-500.51	2,111.46	2,062.86	48.60	43.448		
10,700.00	10,628.71	9,000.00	8,722.13	37.91	31.94	-40.87	972.18	-500.51	2,186.59	2,138.60	47.99	45.562		
10,800.00	10,715.72	9,000.00	8,722.13	38.25	31.94	-35.13	972.18	-500.51	2,254.78	2,207.39	47.39	47.576		
10,900.00	10,792.89	9,050.00	8,730.51	38.56	32.09	-30.60	1,021.45	-500.30	2,313.74	2,266.46	47.29	48.930		
11,000.00	10,857.88	9,050.00	8,730.51	38.86	32.09	-27.88	1,021.45	-500.30	2,362.39	2,315.65	46.73	50.551		
11,100.00	10,908.72	9,070.99	8,732.74	39.14	32.15	-25.92	1,042.32	-500.21	2,400.15	2,353.73	46.42	51.710		
11,200.00	10,943.86	9,100.00	8,734.56	39.40	32.23	-24.69	1,071.27	-500.09	2,426.13	2,379.91	46.22	52.490		
11,300.00	10,962.23	9,111.04	8,734.86	39.64	32.26	-24.12	1,082.31	-500.04	2,439.57	2,393.57	46.00	53.032		
11,400.00	10,964.96	9,170.44	8,734.96	39.86	32.43	-24.03	1,141.71	-499.78	2,441.62	2,395.46	46.16	52.892		
11,500.00	10,964.96	9,270.44	8,734.96	40.09	32.73	-24.03	1,241.71	-499.35	2,441.60	2,395.00	46.60	52.392		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - SB #4H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
11,600.00	10,964.96	9,370.44	8,734.96	40.35	33.06	-24.03	1,341.71	-498.92	2,441.59	2,394.49	47.09	51.845		
11,700.00	10,964.96	9,470.44	8,734.96	40.62	33.41	-24.03	1,441.71	-498.49	2,441.57	2,393.93	47.64	51.254		
11,800.00	10,964.96	9,570.44	8,734.96	40.92	33.78	-24.03	1,541.71	-498.05	2,441.55	2,393.32	48.23	50.626		
11,900.00	10,964.96	9,670.44	8,734.96	41.24	34.18	-24.03	1,641.71	-497.62	2,441.53	2,392.67	48.87	49.964		
12,000.00	10,964.96	9,770.44	8,734.96	41.58	34.60	-24.03	1,741.70	-497.19	2,441.52	2,391.97	49.55	49.274		
12,100.00	10,964.96	9,870.44	8,734.96	41.93	35.04	-24.02	1,841.70	-496.76	2,441.50	2,391.22	50.28	48.561		
12,200.00	10,964.96	9,970.44	8,734.96	42.31	35.50	-24.02	1,941.70	-496.33	2,441.48	2,390.43	51.05	47.829		
12,300.00	10,964.96	10,070.44	8,734.96	42.70	35.98	-24.02	2,041.70	-495.89	2,441.46	2,389.61	51.85	47.083		
12,400.00	10,964.96	10,170.44	8,734.96	43.12	36.49	-24.02	2,141.70	-495.46	2,441.44	2,388.74	52.70	46.327		
12,500.00	10,964.96	10,270.44	8,734.96	43.55	37.01	-24.02	2,241.70	-495.03	2,441.43	2,387.84	53.58	45.564		
12,600.00	10,964.96	10,370.44	8,734.96	43.99	37.54	-24.02	2,341.70	-494.60	2,441.41	2,386.91	54.50	44.797		
12,700.00	10,964.96	10,470.44	8,734.96	44.46	38.10	-24.02	2,441.70	-494.16	2,441.39	2,385.94	55.45	44.030		
12,800.00	10,964.96	10,570.44	8,734.96	44.94	38.67	-24.02	2,541.70	-493.73	2,441.37	2,384.95	56.43	43.265		
12,900.00	10,964.96	10,670.44	8,734.96	45.43	39.25	-24.02	2,641.70	-493.30	2,441.36	2,383.92	57.44	42.504		
13,000.00	10,964.97	10,770.44	8,734.97	45.94	39.85	-24.02	2,741.70	-492.87	2,441.34	2,382.86	58.48	41.750		
13,100.00	10,964.97	10,870.44	8,734.97	46.47	40.47	-24.01	2,841.69	-492.44	2,441.32	2,381.78	59.54	41.004		
13,200.00	10,964.97	10,970.44	8,734.97	47.00	41.10	-24.01	2,941.69	-492.00	2,441.30	2,380.68	60.63	40.267		
13,300.00	10,964.97	11,070.44	8,734.97	47.56	41.74	-24.01	3,041.69	-491.57	2,441.29	2,379.55	61.74	39.541		
13,400.00	10,964.97	11,170.44	8,734.97	48.12	42.39	-24.01	3,141.69	-491.14	2,441.27	2,378.39	62.88	38.827		
13,500.00	10,964.97	11,270.44	8,734.97	48.70	43.06	-24.01	3,241.69	-490.71	2,441.25	2,377.22	64.03	38.126		
13,600.00	10,964.97	11,370.44	8,734.97	49.29	43.73	-24.01	3,341.69	-490.28	2,441.23	2,376.03	65.21	37.437		
13,700.00	10,964.97	11,470.44	8,734.97	49.89	44.42	-24.01	3,441.69	-489.84	2,441.22	2,374.81	66.40	36.763		
13,800.00	10,964.97	11,570.44	8,734.97	50.50	45.12	-24.01	3,541.69	-489.41	2,441.20	2,373.58	67.62	36.103		
13,900.00	10,964.97	11,670.44	8,734.97	51.13	45.82	-24.01	3,641.69	-488.98	2,441.18	2,372.33	68.85	35.457		
14,000.00	10,964.97	11,770.44	8,734.97	51.76	46.54	-24.01	3,741.69	-488.55	2,441.16	2,371.07	70.10	34.826		
14,100.00	10,964.97	11,870.44	8,734.97	52.41	47.27	-24.01	3,841.68	-488.11	2,441.15	2,369.79	71.36	34.209		
14,200.00	10,964.97	11,970.44	8,734.97	53.06	48.00	-24.00	3,941.68	-487.68	2,441.13	2,368.49	72.64	33.607		
14,300.00	10,964.97	12,070.44	8,734.97	53.73	48.74	-24.00	4,041.68	-487.25	2,441.11	2,367.18	73.93	33.020		
14,400.00	10,964.97	12,170.44	8,734.97	54.40	49.49	-24.00	4,141.68	-486.82	2,441.09	2,365.86	75.23	32.447		
14,500.00	10,964.97	12,270.44	8,734.97	55.08	50.25	-24.00	4,241.68	-486.39	2,441.07	2,364.53	76.55	31.889		
14,600.00	10,964.97	12,370.44	8,734.97	55.77	51.01	-24.00	4,341.68	-485.95	2,441.06	2,363.18	77.88	31.344		
14,700.00	10,964.97	12,470.44	8,734.97	56.47	51.78	-24.00	4,441.68	-485.52	2,441.04	2,361.82	79.22	30.814		
14,800.00	10,964.97	12,570.44	8,734.97	57.17	52.56	-24.00	4,541.68	-485.09	2,441.02	2,360.45	80.57	30.297		
14,900.00	10,964.97	12,670.44	8,734.97	57.89	53.35	-24.00	4,641.68	-484.66	2,441.00	2,359.07	81.93	29.793		
15,000.00	10,964.97	12,770.44	8,734.97	58.61	54.14	-24.00	4,741.68	-484.23	2,440.99	2,357.68	83.30	29.303		
15,100.00	10,964.97	12,870.44	8,734.97	59.34	54.93	-24.00	4,841.68	-483.79	2,440.97	2,356.29	84.68	28.825		
15,200.00	10,964.97	12,970.44	8,734.97	60.07	55.73	-24.00	4,941.67	-483.36	2,440.95	2,354.88	86.07	28.359		
15,300.00	10,964.97	13,070.44	8,734.97	60.81	56.54	-23.99	5,041.67	-482.93	2,440.93	2,353.46	87.47	27.906		
15,400.00	10,964.98	13,170.44	8,734.98	61.56	57.35	-23.99	5,141.67	-482.50	2,440.92	2,352.04	88.87	27.465		
15,500.00	10,964.98	13,270.44	8,734.98	62.31	58.16	-23.99	5,241.67	-482.06	2,440.90	2,350.61	90.29	27.035		
15,600.00	10,964.98	13,370.44	8,734.98	63.07	58.99	-23.99	5,341.67	-481.63	2,440.88	2,349.17	91.71	26.616		
15,700.00	10,964.98	13,470.44	8,734.98	63.84	59.81	-23.99	5,441.67	-481.20	2,440.86	2,347.73	93.14	26.207		
15,800.00	10,964.98	13,570.44	8,734.98	64.61	60.64	-23.99	5,541.67	-480.77	2,440.85	2,346.28	94.57	25.810		
15,900.00	10,964.98	13,670.44	8,734.98	65.38	61.47	-23.99	5,641.67	-480.34	2,440.83	2,344.82	96.01	25.422		
16,000.00	10,964.98	13,770.44	8,734.98	66.17	62.31	-23.99	5,741.67	-479.90	2,440.81	2,343.35	97.46	25.045		
16,100.00	10,964.98	13,870.44	8,734.98	66.95	63.15	-23.99	5,841.67	-479.47	2,440.79	2,341.88	98.91	24.677		
16,200.00	10,964.98	13,970.44	8,734.98	67.74	63.99	-23.99	5,941.66	-479.04	2,440.78	2,340.41	100.37	24.318		
16,300.00	10,964.98	14,070.44	8,734.98	68.54	64.84	-23.99	6,041.66	-478.61	2,440.76	2,338.93	101.83	23.969		
16,400.00	10,964.98	14,170.44	8,734.98	69.34	65.69	-23.98	6,141.66	-478.18	2,440.74	2,337.44	103.30	23.628		
16,500.00	10,964.98	14,270.44	8,734.98	70.14	66.55	-23.98	6,241.66	-477.74	2,440.72	2,335.95	104.77	23.296		
16,600.00	10,964.98	14,370.44	8,734.98	70.95	67.40	-23.98	6,341.66	-477.31	2,440.71	2,334.46	106.25	22.971		
16,700.00	10,964.98	14,470.44	8,734.98	71.76	68.26	-23.98	6,441.66	-476.88	2,440.69	2,332.96	107.73	22.655		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - SB #4H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
16,800.00	10,964.98	14,570.44	8,734.98	72.57	69.13	-23.98	6,541.66	-476.45	2,440.67	2,331.45	109.22	22.347		
16,900.00	10,964.98	14,670.44	8,734.98	73.39	69.99	-23.98	6,641.66	-476.01	2,440.65	2,329.94	110.71	22.045		
17,000.00	10,964.98	14,770.44	8,734.98	74.21	70.86	-23.98	6,741.66	-475.58	2,440.63	2,328.43	112.20	21.752		
17,100.00	10,964.98	14,870.44	8,734.98	75.04	71.73	-23.98	6,841.66	-475.15	2,440.62	2,326.91	113.70	21.465		
17,200.00	10,964.98	14,970.44	8,734.98	75.87	72.60	-23.98	6,941.66	-474.72	2,440.60	2,325.39	115.21	21.185		
17,300.00	10,964.98	15,070.44	8,734.98	76.70	73.48	-23.98	7,041.65	-474.29	2,440.58	2,323.87	116.71	20.911		
17,400.00	10,964.98	15,170.44	8,734.98	77.54	74.36	-23.97	7,141.65	-473.85	2,440.56	2,322.34	118.22	20.644		
17,500.00	10,964.98	15,270.44	8,734.98	78.38	75.24	-23.97	7,241.65	-473.42	2,440.55	2,320.81	119.73	20.383		
17,600.00	10,964.98	15,370.44	8,734.98	79.22	76.12	-23.97	7,341.65	-472.99	2,440.53	2,319.28	121.25	20.128		
17,700.00	10,964.99	15,470.44	8,734.99	80.06	77.00	-23.97	7,441.65	-472.56	2,440.51	2,317.74	122.77	19.879		
17,800.00	10,964.99	15,570.44	8,734.99	80.91	77.89	-23.97	7,541.65	-472.13	2,440.49	2,316.21	124.29	19.636		
17,900.00	10,964.99	15,670.44	8,734.99	81.76	78.78	-23.97	7,641.65	-471.69	2,440.48	2,314.66	125.81	19.398		
18,000.00	10,964.99	15,770.44	8,734.99	82.61	79.67	-23.97	7,741.65	-471.26	2,440.46	2,313.12	127.34	19.165		
18,100.00	10,964.99	15,870.44	8,734.99	83.47	80.56	-23.97	7,841.65	-470.83	2,440.44	2,311.57	128.87	18.937		
18,200.00	10,964.99	15,970.44	8,734.99	84.33	81.45	-23.97	7,941.65	-470.40	2,440.42	2,310.02	130.40	18.715		
18,300.00	10,964.99	16,070.44	8,734.99	85.18	82.35	-23.97	8,041.65	-469.96	2,440.41	2,308.47	131.94	18.497		
18,400.00	10,964.99	16,170.44	8,734.99	86.05	83.24	-23.97	8,141.64	-469.53	2,440.39	2,306.92	133.47	18.284		
18,500.00	10,964.99	16,270.44	8,734.99	86.91	84.14	-23.96	8,241.64	-469.10	2,440.37	2,305.36	135.01	18.075		
18,600.00	10,964.99	16,370.44	8,734.99	87.78	85.04	-23.96	8,341.64	-468.67	2,440.35	2,303.80	136.55	17.871		
18,700.00	10,964.99	16,470.44	8,734.99	88.65	85.94	-23.96	8,441.64	-468.24	2,440.34	2,302.24	138.10	17.671		
18,800.00	10,964.99	16,570.44	8,734.99	89.52	86.85	-23.96	8,541.64	-467.80	2,440.32	2,300.68	139.64	17.475		
18,900.00	10,964.99	16,670.44	8,734.99	90.39	87.75	-23.96	8,641.64	-467.37	2,440.30	2,299.11	141.19	17.284		
19,000.00	10,964.99	16,770.44	8,734.99	91.26	88.66	-23.96	8,741.64	-466.94	2,440.28	2,297.54	142.74	17.096		
19,100.00	10,964.99	16,870.44	8,734.99	92.14	89.56	-23.96	8,841.64	-466.51	2,440.27	2,295.97	144.29	16.912		
19,200.00	10,964.99	16,970.44	8,734.99	93.02	90.47	-23.96	8,941.64	-466.08	2,440.25	2,294.40	145.84	16.732		
19,300.00	10,964.99	17,070.44	8,734.99	93.90	91.38	-23.96	9,041.64	-465.64	2,440.23	2,292.83	147.40	16.555		
19,400.00	10,964.99	17,170.44	8,734.99	94.78	92.29	-23.96	9,141.63	-465.21	2,440.21	2,291.26	148.95	16.382		
19,500.00	10,964.99	17,270.44	8,734.99	95.66	93.20	-23.96	9,241.63	-464.78	2,440.19	2,289.68	150.51	16.213		
19,600.00	10,964.99	17,370.44	8,734.99	96.55	94.11	-23.95	9,341.63	-464.35	2,440.18	2,288.10	152.07	16.046		
19,700.00	10,964.99	17,470.44	8,734.99	97.43	95.03	-23.95	9,441.63	-463.91	2,440.16	2,286.53	153.63	15.883		
19,800.00	10,964.99	17,570.44	8,734.99	98.32	95.94	-23.95	9,541.63	-463.48	2,440.14	2,284.95	155.20	15.723		
19,900.00	10,964.99	17,670.44	8,734.99	99.21	96.86	-23.95	9,641.63	-463.05	2,440.12	2,283.36	156.76	15.566		
20,000.00	10,964.99	17,770.44	8,734.99	100.10	97.77	-23.95	9,741.63	-462.62	2,440.11	2,281.78	158.33	15.412		
20,100.00	10,965.00	17,870.44	8,735.00	100.99	98.69	-23.95	9,841.63	-462.19	2,440.09	2,280.20	159.89	15.261		
20,200.00	10,965.00	17,970.44	8,735.00	101.89	99.61	-23.95	9,941.63	-461.75	2,440.07	2,278.61	161.46	15.112		
20,300.00	10,965.00	18,070.44	8,735.00	102.78	100.53	-23.95	10,041.63	-461.32	2,440.05	2,277.02	163.03	14.967		
20,400.00	10,965.00	18,170.44	8,735.00	103.68	101.45	-23.95	10,141.63	-460.89	2,440.04	2,275.44	164.60	14.824		
20,500.00	10,965.00	18,270.44	8,735.00	104.58	102.37	-23.95	10,241.62	-460.46	2,440.02	2,273.85	166.17	14.684		
20,600.00	10,965.00	18,370.44	8,735.00	105.48	103.29	-23.95	10,341.62	-460.03	2,440.00	2,272.26	167.75	14.546		
20,700.00	10,965.00	18,470.44	8,735.00	106.38	104.22	-23.94	10,441.62	-459.59	2,439.98	2,270.66	169.32	14.410		
20,800.00	10,965.00	18,570.44	8,735.00	107.28	105.14	-23.94	10,541.62	-459.16	2,439.97	2,269.07	170.90	14.278		
20,900.00	10,965.00	18,670.44	8,735.00	108.18	106.07	-23.94	10,641.62	-458.73	2,439.95	2,267.48	172.47	14.147		
21,000.00	10,965.00	18,770.44	8,735.00	109.08	106.99	-23.94	10,741.62	-458.30	2,439.93	2,265.88	174.05	14.019		
21,100.00	10,965.00	18,870.44	8,735.00	109.99	107.92	-23.94	10,841.62	-457.86	2,439.91	2,264.29	175.63	13.893		
21,200.00	10,965.00	18,970.44	8,735.00	110.89	108.84	-23.94	10,941.62	-457.43	2,439.90	2,262.69	177.21	13.769		
21,265.75	10,965.00	19,036.20	8,735.00	111.49	109.45	-23.94	11,007.37	-457.15	2,439.88	2,261.64	178.25	13.688		
21,273.23	10,965.00	19,035.79	8,735.00	111.56	109.45	-23.94	11,006.97	-457.15	2,439.90	2,261.61	178.29	13.685		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - SB #7H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	89.93	0.07	60.07	60.07					
100.00	100.00	100.00	100.00	0.13	0.13	89.93	0.07	60.07	60.07	59.81	0.26	229.551		
200.00	200.00	200.00	200.00	0.49	0.49	89.93	0.07	60.07	60.07	59.09	0.98	61.382		
300.00	300.00	300.00	300.00	0.85	0.85	89.93	0.07	60.07	60.07	58.37	1.70	35.428		
400.00	400.00	400.00	400.00	1.21	1.21	89.93	0.07	60.07	60.07	57.66	2.41	24.899		
500.00	500.00	500.00	500.00	1.56	1.56	89.93	0.07	60.07	60.07	56.94	3.13	19.195		
600.00	600.00	600.00	600.00	1.92	1.92	89.93	0.07	60.07	60.07	56.22	3.85	15.617 CC		
602.42	602.42	602.42	602.42	1.93	1.93	-90.07	0.07	60.07	60.07	56.21	3.86	15.549		
700.00	699.99	700.01	699.99	2.26	2.28	-90.90	0.07	60.07	60.08	55.53	4.55	13.216		
800.00	799.96	800.04	799.96	2.60	2.64	-93.39	0.07	60.07	60.18	54.94	5.24	11.495		
900.00	899.90	900.10	899.90	2.93	3.00	-96.69	0.07	60.07	60.48	54.55	5.93	10.197		
1,000.00	999.84	1,000.16	999.84	3.28	3.36	-99.95	0.07	60.07	60.99	54.36	6.63	9.195		
1,100.00	1,099.78	1,100.22	1,099.78	3.62	3.72	-103.14	0.07	60.07	61.69	54.35	7.34	8.407 ES		
1,200.00	1,199.72	1,200.28	1,199.72	3.97	4.08	-106.25	0.07	60.07	62.57	54.53	8.04	7.778		
1,300.00	1,299.65	1,300.35	1,299.65	4.32	4.43	-109.27	0.07	60.07	63.64	54.88	8.75	7.270		
1,400.00	1,399.59	1,400.41	1,399.59	4.67	4.79	-112.18	0.07	60.07	64.87	55.41	9.46	6.855		
1,500.00	1,499.53	1,499.53	1,499.53	5.03	5.15	-114.97	0.07	60.07	66.27	56.10	10.17	6.515		
1,600.00	1,599.47	1,597.15	1,597.13	5.38	5.49	-117.74	1.00	61.43	69.49	58.63	10.87	6.395		
1,700.00	1,699.41	1,694.40	1,694.25	5.74	5.84	-120.42	3.77	65.52	76.26	64.72	11.55	6.605		
1,800.00	1,799.35	1,791.07	1,790.57	6.09	6.18	-122.71	8.37	72.29	86.54	74.33	12.21	7.087		
1,900.00	1,899.29	1,886.96	1,885.79	6.45	6.52	-124.49	14.73	81.66	100.27	87.41	12.86	7.797		
2,000.00	1,999.23	1,981.86	1,979.59	6.80	6.86	-125.79	22.78	93.52	117.37	103.88	13.49	8.698		
2,100.00	2,099.20	2,079.50	2,075.76	7.16	7.21	-54.43	32.28	107.50	135.10	120.93	14.17	9.531		
2,200.00	2,199.15	2,178.43	2,173.19	7.50	7.57	-6.73	41.93	121.71	149.65	134.78	14.87	10.065		
2,300.00	2,298.95	2,277.79	2,271.03	7.85	7.93	4.70	51.62	135.98	160.93	145.37	15.56	10.340		
2,400.00	2,398.50	2,377.44	2,369.17	8.19	8.29	9.78	61.34	150.30	168.95	152.68	16.26	10.389		
2,500.00	2,497.66	2,477.28	2,467.49	8.54	8.66	13.13	71.08	164.64	173.72	156.76	16.97	10.240		
2,600.00	2,596.32	2,577.17	2,565.87	8.88	9.03	15.72	80.83	178.99	175.37	157.70	17.67	9.924		
2,700.00	2,694.80	2,677.07	2,664.24	9.23	9.40	17.20	90.57	193.34	176.09	157.71	18.38	9.579		
2,800.00	2,793.28	2,776.96	2,762.62	9.58	9.77	18.68	100.32	207.69	176.92	157.83	19.10	9.265		
2,900.00	2,891.76	2,876.85	2,861.00	9.93	10.14	20.14	110.06	222.04	177.87	158.06	19.81	8.977		
3,000.00	2,990.24	2,976.74	2,959.37	10.29	10.51	21.58	119.81	236.39	178.94	158.40	20.54	8.714		
3,100.00	3,088.72	3,076.64	3,057.75	10.64	10.89	23.01	129.55	250.74	180.11	158.85	21.26	8.472		
3,200.00	3,187.20	3,176.53	3,156.12	11.00	11.26	24.42	139.29	265.09	181.40	159.41	21.99	8.251		
3,300.00	3,285.68	3,276.42	3,254.50	11.36	11.64	25.80	149.04	279.44	182.79	160.08	22.71	8.047		
3,400.00	3,384.16	3,376.32	3,352.87	11.73	12.02	27.17	158.78	293.79	184.29	160.85	23.45	7.860		
3,500.00	3,482.64	3,476.21	3,451.25	12.09	12.39	28.51	168.53	308.14	185.90	161.72	24.18	7.688		
3,600.00	3,581.12	3,576.10	3,549.62	12.46	12.77	29.83	178.27	322.49	187.60	162.69	24.91	7.530		
3,700.00	3,679.60	3,675.99	3,648.00	12.82	13.15	31.12	188.02	336.84	189.40	163.75	25.65	7.384		
3,800.00	3,778.08	3,775.89	3,746.37	13.19	13.53	32.39	197.76	351.19	191.30	164.91	26.39	7.249		
3,900.00	3,876.56	3,875.78	3,844.75	13.56	13.91	33.64	207.51	365.54	193.29	166.16	27.13	7.125		
4,000.00	3,975.04	3,975.67	3,943.12	13.93	14.29	34.85	217.25	379.89	195.37	167.50	27.87	7.010		
4,100.00	4,073.52	4,075.57	4,041.50	14.29	14.67	36.05	227.00	394.24	197.53	168.92	28.61	6.903		
4,200.00	4,172.00	4,175.46	4,139.88	14.66	15.05	37.21	236.74	408.59	199.78	170.42	29.36	6.805		
4,300.00	4,270.49	4,275.35	4,238.25	15.04	15.43	38.35	246.49	422.94	202.11	172.01	30.10	6.714		
4,400.00	4,368.97	4,375.25	4,336.63	15.41	15.81	39.46	256.23	437.29	204.52	173.67	30.85	6.629		
4,500.00	4,467.45	4,475.14	4,435.00	15.78	16.19	40.55	265.98	451.64	207.00	175.40	31.60	6.551		
4,600.00	4,565.93	4,575.03	4,533.38	16.15	16.57	41.61	275.72	465.99	209.55	177.21	32.35	6.478		
4,700.00	4,664.41	4,674.92	4,631.75	16.53	16.95	42.64	285.47	480.34	212.18	179.08	33.10	6.411		
4,800.00	4,762.89	4,774.82	4,730.13	16.90	17.33	43.65	295.21	494.69	214.87	181.03	33.85	6.348		
4,900.00	4,861.37	4,874.71	4,828.50	17.27	17.71	44.64	304.96	509.04	217.63	183.03	34.60	6.290		
5,000.00	4,959.85	4,974.60	4,926.88	17.65	18.09	45.60	314.70	523.39	220.45	185.10	35.35	6.236		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - SB #7H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance								Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,100.00	5,058.33	5,074.50	5,025.25	18.02	18.48	46.53	324.45	537.75	223.33	187.23	36.10	6.186		
5,200.00	5,156.81	5,174.39	5,123.63	18.40	18.86	47.44	334.19	552.10	226.27	189.41	36.86	6.139		
5,300.00	5,255.29	5,274.28	5,222.00	18.77	19.24	48.33	343.94	566.45	229.26	191.65	37.61	6.096		
5,400.00	5,353.77	5,374.18	5,320.38	19.15	19.62	49.19	353.68	580.80	232.31	193.95	38.37	6.055		
5,500.00	5,452.25	5,474.07	5,418.75	19.53	20.01	50.03	363.43	595.15	235.41	196.29	39.12	6.018		
5,600.00	5,550.73	5,573.96	5,517.13	19.90	20.39	50.85	373.17	609.50	238.56	198.68	39.88	5.982		
5,700.00	5,649.21	5,673.85	5,615.51	20.28	20.77	51.65	382.92	623.85	241.75	201.12	40.63	5.950		
5,800.00	5,747.69	5,773.75	5,713.88	20.66	21.15	52.43	392.66	638.20	245.00	203.61	41.39	5.919		
5,900.00	5,846.17	5,873.64	5,812.26	21.03	21.54	53.18	402.41	652.55	248.28	206.13	42.15	5.891		
6,000.00	5,944.65	5,973.53	5,910.63	21.41	21.92	53.92	412.15	666.90	251.61	208.70	42.91	5.864		
6,100.00	6,043.13	6,073.43	6,009.01	21.79	22.30	54.64	421.90	681.25	254.98	211.31	43.66	5.839		
6,200.00	6,141.61	6,173.32	6,107.38	22.17	22.69	55.33	431.64	695.60	258.39	213.96	44.42	5.816		
6,300.00	6,240.09	6,273.21	6,205.76	22.55	23.07	56.01	441.39	709.95	261.83	216.65	45.18	5.795		
6,400.00	6,338.57	6,373.10	6,304.13	22.92	23.45	56.68	451.13	724.30	265.31	219.37	45.94	5.775		
6,500.00	6,437.33	6,472.99	6,402.50	23.30	23.84	57.09	460.88	738.65	269.75	223.06	46.70	5.777		
6,600.00	6,536.57	6,572.77	6,500.77	23.67	24.22	56.91	470.61	752.98	276.10	228.66	47.44	5.820		
6,700.00	6,636.19	6,672.34	6,598.82	24.03	24.60	56.19	480.32	767.28	284.38	236.21	48.16	5.904		
6,800.00	6,736.04	6,771.56	6,696.53	24.38	24.99	55.00	490.00	781.54	294.71	245.83	48.88	6.030		
6,900.00	6,836.02	6,873.58	6,797.05	24.73	25.38	53.37	499.81	795.98	307.07	257.46	49.61	6.190		
7,000.00	6,936.02	6,982.05	6,904.41	25.07	25.78	92.17	508.44	808.70	318.40	268.03	50.36	6.322		
7,100.00	7,036.02	7,091.54	7,013.30	25.41	26.18	90.98	514.84	818.11	326.85	275.76	51.09	6.398		
7,200.00	7,136.02	7,201.74	7,123.27	25.75	26.58	90.26	518.91	824.10	332.25	280.49	51.76	6.418		
7,300.00	7,236.02	7,312.35	7,233.82	26.09	26.96	89.97	520.60	826.60	334.50	282.10	52.40	6.384		
7,400.00	7,336.02	7,414.55	7,336.02	26.43	27.30	89.96	520.65	826.67	334.57	281.51	53.06	6.305		
7,500.00	7,436.02	7,514.55	7,436.02	26.77	27.64	89.96	520.65	826.67	334.57	280.83	53.74	6.225		
7,600.00	7,536.02	7,614.55	7,536.02	27.12	27.98	89.96	520.65	826.67	334.57	280.14	54.43	6.147		
7,700.00	7,636.02	7,714.55	7,636.02	27.46	28.32	89.96	520.65	826.67	334.57	279.46	55.11	6.071		
7,800.00	7,736.02	7,814.55	7,736.02	27.81	28.66	89.96	520.65	826.67	334.57	278.78	55.79	5.997		
7,900.00	7,836.02	7,914.55	7,836.02	28.15	29.00	89.96	520.65	826.67	334.57	278.09	56.48	5.924		
8,000.00	7,936.02	8,014.55	7,936.02	28.49	29.34	89.96	520.65	826.67	334.57	277.41	57.16	5.853		
8,100.00	8,036.02	8,114.55	8,036.02	28.84	29.68	89.96	520.65	826.67	334.57	276.72	57.85	5.784		
8,200.00	8,136.02	8,214.55	8,136.02	29.18	30.02	89.96	520.65	826.67	334.57	276.03	58.54	5.716		
8,201.36	8,137.38	8,215.91	8,137.38	29.19	30.03	89.96	520.65	826.67	334.57	276.02	58.55	5.715		
8,300.00	8,236.02	8,314.36	8,235.80	29.53	30.36	89.69	522.25	826.68	334.58	275.36	59.22	5.649		
8,400.00	8,336.02	8,411.36	8,331.45	29.88	30.71	87.06	537.63	826.73	335.10	275.18	59.92	5.592		
8,500.00	8,436.02	8,500.87	8,416.27	30.22	31.02	82.26	565.94	826.83	338.38	277.74	60.64	5.580 SF		
8,600.00	8,536.02	8,580.00	8,486.79	30.57	31.28	76.36	601.70	826.95	348.07	286.87	61.20	5.687		
8,700.00	8,636.02	8,647.98	8,542.95	30.92	31.50	70.37	639.94	827.08	367.64	306.41	61.23	6.004		
8,800.00	8,736.02	8,705.47	8,586.63	31.26	31.66	64.92	677.27	827.21	399.02	338.53	60.49	6.597		
8,900.00	8,836.02	8,750.00	8,617.77	31.61	31.79	60.63	709.09	827.32	442.27	383.37	58.90	7.509		
9,000.00	8,936.02	8,800.00	8,649.67	31.96	31.91	55.89	747.58	827.45	496.04	438.66	57.38	8.645		
9,100.00	9,036.02	8,828.87	8,666.51	32.31	31.98	53.24	771.01	827.53	558.43	503.25	55.18	10.121		
9,200.00	9,136.02	8,850.00	8,678.09	32.65	32.03	51.35	788.69	827.60	627.87	574.92	52.96	11.856		
9,300.00	9,236.02	8,883.13	8,694.90	33.00	32.11	48.51	817.24	827.69	702.52	650.98	51.54	13.630		
9,400.00	9,336.02	8,900.00	8,702.82	33.35	32.15	47.12	832.13	827.75	781.51	731.65	49.87	15.671		
9,500.00	9,436.02	8,923.53	8,713.12	33.70	32.20	45.25	853.29	827.82	863.76	815.02	48.74	17.723		
9,600.00	9,536.02	8,950.00	8,723.66	34.05	32.26	43.24	877.56	827.90	948.80	900.86	47.94	19.791		
9,700.00	9,636.02	8,950.00	8,723.66	34.40	32.26	43.24	877.56	827.90	1,035.71	989.10	46.61	22.222		
9,800.00	9,736.02	8,967.37	8,729.97	34.75	32.30	41.98	893.74	827.96	1,124.41	1,078.44	45.97	24.459		
9,900.00	9,836.02	8,978.85	8,733.87	35.10	32.33	41.17	904.54	828.00	1,214.54	1,169.20	45.35	26.784		
10,000.00	9,936.02	9,000.00	8,740.47	35.45	32.38	39.73	924.63	828.07	1,305.98	1,260.90	45.08	28.973		
10,100.00	10,036.02	9,000.00	8,740.47	35.80	32.38	39.73	924.63	828.07	1,398.10	1,353.65	44.46	31.449		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - SB #7H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance								Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,200.00	10,136.02	9,000.00	8,740.47	36.15	32.38	39.73	924.63	828.07	1,491.24	1,447.28	43.96	33.919		
10,300.00	10,236.02	9,000.00	8,740.47	36.50	32.38	39.73	924.63	828.07	1,585.22	1,541.63	43.58	36.373		
10,400.00	10,336.02	9,021.50	8,746.43	36.85	32.42	38.34	945.29	828.14	1,679.35	1,635.70	43.65	38.470		
10,500.00	10,435.98	9,028.31	8,748.15	37.20	32.44	30.87	951.87	828.16	1,773.80	1,730.30	43.50	40.773		
10,600.00	10,534.51	9,050.00	8,753.12	37.56	32.49	21.13	972.99	828.23	1,864.17	1,820.69	43.48	42.876		
10,700.00	10,628.71	9,050.00	8,753.12	37.91	32.49	16.33	972.99	828.23	1,947.25	1,904.23	43.02	45.263		
10,800.00	10,715.72	9,050.00	8,753.12	38.25	32.49	13.43	972.99	828.23	2,022.05	1,979.53	42.52	47.554		
10,900.00	10,792.89	9,100.00	8,761.50	38.56	32.61	11.36	1,022.27	828.40	2,086.53	2,043.94	42.60	48.981		
11,000.00	10,857.88	9,100.00	8,761.50	38.86	32.61	10.20	1,022.27	828.40	2,139.20	2,097.14	42.05	50.870		
11,100.00	10,908.72	9,119.15	8,763.57	39.14	32.66	9.40	1,041.31	828.47	2,179.95	2,138.21	41.75	52.218		
11,200.00	10,943.86	9,150.00	8,765.55	39.40	32.73	8.90	1,072.08	828.57	2,207.88	2,166.30	41.59	53.090		
11,300.00	10,962.23	9,159.68	8,765.84	39.64	32.75	8.68	1,081.76	828.61	2,222.16	2,180.83	41.33	53.768		
11,400.00	10,964.96	9,214.18	8,765.96	39.86	32.88	8.64	1,136.26	828.80	2,224.27	2,182.80	41.47	53.640		
11,500.00	10,964.96	9,314.18	8,765.96	40.09	33.15	8.64	1,236.26	829.14	2,224.26	2,182.31	41.95	53.025		
11,600.00	10,964.96	9,414.18	8,765.96	40.35	33.44	8.64	1,336.26	829.49	2,224.25	2,181.77	42.48	52.358		
11,700.00	10,964.96	9,514.18	8,765.96	40.62	33.76	8.64	1,436.26	829.83	2,224.25	2,181.18	43.07	51.645		
11,800.00	10,964.96	9,614.18	8,765.96	40.92	34.10	8.64	1,536.26	830.18	2,224.24	2,180.54	43.70	50.894		
11,900.00	10,964.96	9,714.18	8,765.96	41.24	34.46	8.64	1,636.26	830.52	2,224.23	2,179.85	44.39	50.111		
12,000.00	10,964.96	9,814.18	8,765.96	41.58	34.85	8.64	1,736.26	830.87	2,224.23	2,179.11	45.11	49.302		
12,100.00	10,964.96	9,914.18	8,765.96	41.93	35.26	8.64	1,836.25	831.21	2,224.22	2,178.33	45.88	48.474		
12,200.00	10,964.96	10,014.18	8,765.96	42.31	35.70	8.64	1,936.25	831.56	2,224.21	2,177.52	46.70	47.632		
12,300.00	10,964.96	10,114.18	8,765.96	42.70	36.15	8.63	2,036.25	831.90	2,224.21	2,176.66	47.55	46.781		
12,400.00	10,964.96	10,214.18	8,765.96	43.12	36.62	8.63	2,136.25	832.25	2,224.20	2,175.77	48.43	45.925		
12,500.00	10,964.96	10,314.18	8,765.96	43.55	37.11	8.63	2,236.25	832.59	2,224.19	2,174.84	49.35	45.068		
12,600.00	10,964.96	10,414.18	8,765.96	43.99	37.62	8.63	2,336.25	832.94	2,224.19	2,173.88	50.30	44.215		
12,700.00	10,964.96	10,514.18	8,765.96	44.46	38.15	8.63	2,436.25	833.29	2,224.18	2,172.89	51.29	43.367		
12,800.00	10,964.96	10,614.18	8,765.96	44.94	38.70	8.63	2,536.25	833.63	2,224.17	2,171.87	52.30	42.528		
12,900.00	10,964.96	10,714.18	8,765.96	45.43	39.26	8.63	2,636.25	833.98	2,224.17	2,170.83	53.34	41.699		
13,000.00	10,964.97	10,814.18	8,765.96	45.94	39.83	8.63	2,736.25	834.32	2,224.16	2,169.76	54.40	40.882		
13,100.00	10,964.97	10,914.18	8,765.97	46.47	40.42	8.63	2,836.25	834.67	2,224.15	2,168.66	55.49	40.080		
13,200.00	10,964.97	11,014.18	8,765.97	47.00	41.03	8.62	2,936.25	835.01	2,224.15	2,167.54	56.61	39.292		
13,300.00	10,964.97	11,114.18	8,765.97	47.56	41.65	8.62	3,036.25	835.36	2,224.14	2,166.40	57.74	38.521		
13,400.00	10,964.97	11,214.18	8,765.97	48.12	42.28	8.62	3,136.25	835.70	2,224.13	2,165.24	58.89	37.766		
13,500.00	10,964.97	11,314.18	8,765.97	48.70	42.92	8.62	3,236.25	836.05	2,224.13	2,164.06	60.06	37.029		
13,600.00	10,964.97	11,414.18	8,765.97	49.29	43.58	8.62	3,336.25	836.39	2,224.12	2,162.87	61.26	36.309		
13,700.00	10,964.97	11,514.18	8,765.97	49.89	44.25	8.62	3,436.24	836.74	2,224.12	2,161.65	62.46	35.607		
13,800.00	10,964.97	11,614.18	8,765.97	50.50	44.93	8.62	3,536.24	837.08	2,224.11	2,160.42	63.69	34.923		
13,900.00	10,964.97	11,714.18	8,765.97	51.13	45.62	8.62	3,636.24	837.43	2,224.10	2,159.18	64.93	34.256		
14,000.00	10,964.97	11,814.18	8,765.97	51.76	46.31	8.62	3,736.24	837.77	2,224.10	2,157.92	66.18	33.608		
14,100.00	10,964.97	11,914.18	8,765.97	52.41	47.02	8.61	3,836.24	838.12	2,224.09	2,156.64	67.44	32.976		
14,200.00	10,964.97	12,014.18	8,765.97	53.06	47.74	8.61	3,936.24	838.47	2,224.08	2,155.36	68.72	32.362		
14,300.00	10,964.97	12,114.18	8,765.97	53.73	48.47	8.61	4,036.24	838.81	2,224.08	2,154.06	70.02	31.765		
14,400.00	10,964.97	12,214.18	8,765.97	54.40	49.20	8.61	4,136.24	839.16	2,224.07	2,152.75	71.32	31.185		
14,500.00	10,964.97	12,314.18	8,765.97	55.08	49.94	8.61	4,236.24	839.50	2,224.06	2,151.43	72.63	30.621		
14,600.00	10,964.97	12,414.18	8,765.97	55.77	50.69	8.61	4,336.24	839.85	2,224.06	2,150.10	73.96	30.073		
14,700.00	10,964.97	12,514.18	8,765.97	56.47	51.45	8.61	4,436.24	840.19	2,224.05	2,148.76	75.29	29.540		
14,800.00	10,964.97	12,614.18	8,765.97	57.17	52.21	8.61	4,536.24	840.54	2,224.04	2,147.41	76.63	29.022		
14,900.00	10,964.97	12,714.18	8,765.97	57.89	52.98	8.61	4,636.24	840.88	2,224.04	2,146.05	77.98	28.519		
15,000.00	10,964.97	12,814.18	8,765.97	58.61	53.76	8.60	4,736.24	841.23	2,224.03	2,144.69	79.34	28.031		
15,100.00	10,964.97	12,914.18	8,765.97	59.34	54.55	8.60	4,836.24	841.57	2,224.02	2,143.31	80.71	27.556		
15,200.00	10,964.97	13,014.18	8,765.97	60.07	55.33	8.60	4,936.24	841.92	2,224.02	2,141.93	82.09	27.094		
15,300.00	10,964.97	13,114.18	8,765.97	60.81	56.13	8.60	5,036.24	842.26	2,224.01	2,140.54	83.47	26.645		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - SB #7H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
15,400.00	10,964.98	13,214.18	8,765.98	61.56	56.93	8.60	5,136.23	842.61	2,224.00	2,139.15	84.86	26.209		
15,500.00	10,964.98	13,314.18	8,765.98	62.31	57.73	8.60	5,236.23	842.95	2,224.00	2,137.75	86.25	25.785		
15,600.00	10,964.98	13,414.18	8,765.98	63.07	58.54	8.60	5,336.23	843.30	2,223.99	2,136.34	87.65	25.372		
15,700.00	10,964.98	13,514.18	8,765.98	63.84	59.36	8.60	5,436.23	843.65	2,223.99	2,134.92	89.06	24.971		
15,800.00	10,964.98	13,614.18	8,765.98	64.61	60.18	8.60	5,536.23	843.99	2,223.98	2,133.50	90.47	24.581		
15,900.00	10,964.98	13,714.18	8,765.98	65.38	61.00	8.59	5,636.23	844.34	2,223.97	2,132.08	91.89	24.202		
16,000.00	10,964.98	13,814.18	8,765.98	66.17	61.83	8.59	5,736.23	844.68	2,223.97	2,130.65	93.32	23.833		
16,100.00	10,964.98	13,914.18	8,765.98	66.95	62.66	8.59	5,836.23	845.03	2,223.96	2,129.21	94.74	23.473		
16,200.00	10,964.98	14,014.18	8,765.98	67.74	63.50	8.59	5,936.23	845.37	2,223.95	2,127.77	96.18	23.123		
16,300.00	10,964.98	14,114.18	8,765.98	68.54	64.33	8.59	6,036.23	845.72	2,223.95	2,126.33	97.62	22.783		
16,400.00	10,964.98	14,214.18	8,765.98	69.34	65.18	8.59	6,136.23	846.06	2,223.94	2,124.88	99.06	22.451		
16,500.00	10,964.98	14,314.18	8,765.98	70.14	66.02	8.59	6,236.23	846.41	2,223.93	2,123.43	100.50	22.128		
16,600.00	10,964.98	14,414.18	8,765.98	70.95	66.87	8.59	6,336.23	846.75	2,223.93	2,121.97	101.95	21.813		
16,700.00	10,964.98	14,514.18	8,765.98	71.76	67.73	8.59	6,436.23	847.10	2,223.92	2,120.51	103.41	21.507		
16,800.00	10,964.98	14,614.18	8,765.98	72.57	68.58	8.58	6,536.23	847.44	2,223.91	2,119.05	104.86	21.208		
16,900.00	10,964.98	14,714.18	8,765.98	73.39	69.44	8.58	6,636.23	847.79	2,223.91	2,117.58	106.32	20.916		
17,000.00	10,964.98	14,814.18	8,765.98	74.21	70.30	8.58	6,736.22	848.13	2,223.90	2,116.11	107.79	20.632		
17,100.00	10,964.98	14,914.18	8,765.98	75.04	71.17	8.58	6,836.22	848.48	2,223.89	2,114.64	109.25	20.355		
17,200.00	10,964.98	15,014.18	8,765.98	75.87	72.03	8.58	6,936.22	848.83	2,223.89	2,113.16	110.72	20.085		
17,300.00	10,964.98	15,114.18	8,765.98	76.70	72.90	8.58	7,036.22	849.17	2,223.88	2,111.68	112.20	19.821		
17,400.00	10,964.98	15,214.18	8,765.98	77.54	73.77	8.58	7,136.22	849.52	2,223.87	2,110.20	113.67	19.564		
17,500.00	10,964.98	15,314.18	8,765.98	78.38	74.65	8.58	7,236.22	849.86	2,223.87	2,108.72	115.15	19.312		
17,600.00	10,964.98	15,414.18	8,765.98	79.22	75.52	8.58	7,336.22	850.21	2,223.86	2,107.23	116.63	19.067		
17,700.00	10,964.99	15,514.18	8,765.98	80.06	76.40	8.57	7,436.22	850.55	2,223.86	2,105.74	118.12	18.828		
17,800.00	10,964.99	15,614.18	8,765.99	80.91	77.28	8.57	7,536.22	850.90	2,223.85	2,104.25	119.60	18.594		
17,900.00	10,964.99	15,714.18	8,765.99	81.76	78.17	8.57	7,636.22	851.24	2,223.84	2,102.75	121.09	18.365		
18,000.00	10,964.99	15,814.18	8,765.99	82.61	79.05	8.57	7,736.22	851.59	2,223.84	2,101.25	122.58	18.142		
18,100.00	10,964.99	15,914.18	8,765.99	83.47	79.94	8.57	7,836.22	851.93	2,223.83	2,099.75	124.07	17.923		
18,200.00	10,964.99	16,014.18	8,765.99	84.33	80.83	8.57	7,936.22	852.28	2,223.82	2,098.25	125.57	17.710		
18,300.00	10,964.99	16,114.18	8,765.99	85.18	81.72	8.57	8,036.22	852.62	2,223.82	2,096.75	127.07	17.501		
18,400.00	10,964.99	16,214.18	8,765.99	86.05	82.61	8.57	8,136.22	852.97	2,223.81	2,095.24	128.56	17.297		
18,500.00	10,964.99	16,314.18	8,765.99	86.91	83.50	8.57	8,236.22	853.31	2,223.80	2,093.74	130.07	17.098		
18,600.00	10,964.99	16,414.18	8,765.99	87.78	84.40	8.56	8,336.22	853.66	2,223.80	2,092.23	131.57	16.902		
18,700.00	10,964.99	16,514.18	8,765.99	88.65	85.29	8.56	8,436.21	854.01	2,223.79	2,090.72	133.07	16.711		
18,800.00	10,964.99	16,614.18	8,765.99	89.52	86.19	8.56	8,536.21	854.35	2,223.78	2,089.21	134.58	16.524		
18,900.00	10,964.99	16,714.18	8,765.99	90.39	87.09	8.56	8,636.21	854.70	2,223.78	2,087.69	136.09	16.341		
19,000.00	10,964.99	16,814.18	8,765.99	91.26	87.99	8.56	8,736.21	855.04	2,223.77	2,086.18	137.60	16.162		
19,100.00	10,964.99	16,914.18	8,765.99	92.14	88.90	8.56	8,836.21	855.39	2,223.76	2,084.66	139.11	15.986		
19,200.00	10,964.99	17,014.18	8,765.99	93.02	89.80	8.56	8,936.21	855.73	2,223.76	2,083.14	140.62	15.814		
19,300.00	10,964.99	17,114.18	8,765.99	93.90	90.71	8.56	9,036.21	856.08	2,223.75	2,081.62	142.13	15.646		
19,400.00	10,964.99	17,214.18	8,765.99	94.78	91.61	8.56	9,136.21	856.42	2,223.75	2,080.10	143.65	15.481		
19,500.00	10,964.99	17,314.18	8,765.99	95.66	92.52	8.55	9,236.21	856.77	2,223.74	2,078.58	145.16	15.319		
19,600.00	10,964.99	17,414.18	8,765.99	96.55	93.43	8.55	9,336.21	857.11	2,223.73	2,077.05	146.68	15.160		
19,700.00	10,964.99	17,514.18	8,765.99	97.43	94.34	8.55	9,436.21	857.46	2,223.73	2,075.53	148.20	15.005		
19,800.00	10,964.99	17,614.18	8,765.99	98.32	95.25	8.55	9,536.21	857.80	2,223.72	2,074.00	149.72	14.853		
19,900.00	10,964.99	17,714.18	8,765.99	99.21	96.16	8.55	9,636.21	858.15	2,223.71	2,072.47	151.24	14.703		
20,000.00	10,964.99	17,814.18	8,765.99	100.10	97.08	8.55	9,736.21	858.50	2,223.71	2,070.94	152.76	14.557		
20,100.00	10,965.00	17,914.18	8,766.00	100.99	97.99	8.55	9,836.21	858.84	2,223.70	2,069.41	154.29	14.413		
20,200.00	10,965.00	18,014.18	8,766.00	101.89	98.91	8.55	9,936.21	859.19	2,223.69	2,067.88	155.81	14.272		
20,300.00	10,965.00	18,114.18	8,766.00	102.78	99.82	8.55	10,036.21	859.53	2,223.69	2,066.35	157.34	14.133		
20,400.00	10,965.00	18,214.18	8,766.00	103.68	100.74	8.54	10,136.20	859.88	2,223.68	2,064.82	158.86	13.997		
20,500.00	10,965.00	18,314.18	8,766.00	104.58	101.66	8.54	10,236.20	860.22	2,223.67	2,063.28	160.39	13.864		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - SB #7H - OH - Prelim Plan A												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
20,600.00	10,965.00	18,414.18	8,766.00	105.48	102.58	8.54	10,336.20	860.57	2,223.67	2,061.75	161.92	13.733	
20,700.00	10,965.00	18,514.18	8,766.00	106.38	103.50	8.54	10,436.20	860.91	2,223.66	2,060.21	163.45	13.605	
20,800.00	10,965.00	18,614.18	8,766.00	107.28	104.42	8.54	10,536.20	861.26	2,223.65	2,058.67	164.98	13.478	
20,900.00	10,965.00	18,714.18	8,766.00	108.18	105.34	8.54	10,636.20	861.60	2,223.65	2,057.14	166.51	13.354	
21,000.00	10,965.00	18,814.18	8,766.00	109.08	106.26	8.54	10,736.20	861.95	2,223.64	2,055.60	168.04	13.232	
21,100.00	10,965.00	18,914.18	8,766.00	109.99	107.19	8.54	10,836.20	862.29	2,223.64	2,054.06	169.58	13.113	
21,200.00	10,965.00	19,014.18	8,766.00	110.89	108.11	8.54	10,936.20	862.64	2,223.63	2,052.52	171.11	12.995	
21,273.23	10,965.00	19,087.41	8,766.00	111.56	108.79	8.53	11,009.43	862.89	2,223.62	2,051.39	172.24	12.910	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #23H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	89.87	0.21	89.91	89.91					
100.00	100.00	100.00	100.00	0.13	0.13	89.87	0.21	89.91	89.91	89.65	0.26	343.583		
200.00	200.00	200.00	200.00	0.49	0.49	89.87	0.21	89.91	89.91	88.93	0.98	91.874		
300.00	300.00	300.00	300.00	0.85	0.85	89.87	0.21	89.91	89.91	88.21	1.70	53.027		
400.00	400.00	400.00	400.00	1.21	1.21	89.87	0.21	89.91	89.91	87.50	2.41	37.268		
500.00	500.00	500.00	500.00	1.56	1.56	89.87	0.21	89.91	89.91	86.78	3.13	28.730		
600.00	600.00	600.00	600.00	1.92	1.92	89.87	0.21	89.91	89.91	86.06	3.85	23.375 CC		
601.73	601.73	601.73	601.73	1.93	1.93	-90.13	0.21	89.91	89.91	86.05	3.86	23.302		
700.00	699.99	700.01	699.99	2.26	2.28	-90.69	0.21	89.91	89.92	85.37	4.55	19.779		
800.00	799.96	800.04	799.96	2.60	2.64	-92.36	0.21	89.91	89.99	84.75	5.24	17.189		
900.00	899.90	900.10	899.90	2.93	3.00	-94.57	0.21	89.91	90.20	84.27	5.93	15.207		
1,000.00	999.84	1,000.16	999.84	3.28	3.36	-96.77	0.21	89.91	90.54	83.91	6.63	13.651		
1,100.00	1,099.78	1,100.22	1,099.78	3.62	3.72	-98.95	0.21	89.91	91.02	83.68	7.34	12.405		
1,200.00	1,199.72	1,199.72	1,199.72	3.97	4.07	-101.11	0.21	89.91	91.63	83.59	8.04	11.393 ES		
1,300.00	1,299.65	1,299.58	1,299.56	4.32	4.42	-103.38	0.92	91.37	94.00	85.27	8.73	10.765		
1,400.00	1,399.59	1,399.11	1,392.97	4.67	4.75	-105.88	3.05	95.76	99.85	90.44	9.41	10.611		
1,500.00	1,499.53	1,489.11	1,488.62	5.03	5.09	-108.31	6.58	103.02	109.19	99.11	10.08	10.836		
1,600.00	1,599.47	1,584.37	1,583.22	5.38	5.43	-110.50	11.46	113.07	122.01	111.28	10.73	11.369		
1,700.00	1,699.41	1,678.68	1,676.45	5.74	5.77	-112.35	17.65	125.79	138.25	126.88	11.37	12.155		
1,800.00	1,799.35	1,775.81	1,772.12	6.09	6.12	-113.88	24.99	140.89	156.87	144.82	12.05	13.014		
1,900.00	1,899.29	1,873.96	1,868.79	6.45	6.48	-115.11	32.44	156.22	175.67	162.91	12.76	13.770		
2,000.00	1,999.23	1,972.12	1,965.45	6.80	6.84	-116.10	39.89	171.55	194.53	181.07	13.46	14.451		
2,100.00	2,099.20	2,070.56	2,062.40	7.16	7.20	-44.66	47.36	186.93	211.95	197.79	14.16	14.964		
2,200.00	2,199.15	2,169.51	2,159.84	7.50	7.56	3.05	54.87	202.38	226.37	211.51	14.86	15.230		
2,300.00	2,298.95	2,268.85	2,257.67	7.85	7.93	14.48	62.41	217.90	237.77	222.20	15.57	15.276		
2,400.00	2,398.50	2,368.44	2,355.75	8.19	8.31	19.58	69.97	233.45	246.15	229.88	16.27	15.129		
2,500.00	2,497.66	2,468.18	2,453.98	8.54	8.68	22.97	77.54	249.03	251.56	234.58	16.98	14.817		
2,600.00	2,596.32	2,567.95	2,552.23	8.88	9.06	25.60	85.11	264.61	254.16	236.47	17.69	14.369		
2,700.00	2,694.80	2,667.70	2,650.46	9.23	9.43	27.14	92.68	280.19	255.96	237.56	18.40	13.909		
2,800.00	2,793.28	2,767.44	2,748.69	9.58	9.81	28.65	100.26	295.77	257.95	238.83	19.12	13.490		
2,900.00	2,891.76	2,867.19	2,846.92	9.93	10.19	30.14	107.83	311.35	260.12	240.28	19.84	13.109		
3,000.00	2,990.24	2,966.94	2,945.16	10.29	10.56	31.61	115.40	326.93	262.46	241.90	20.57	12.761		
3,100.00	3,088.72	3,066.69	3,043.39	10.64	10.94	33.05	122.97	342.51	264.97	243.68	21.29	12.443		
3,200.00	3,187.20	3,166.44	3,141.62	11.00	11.32	34.46	130.54	358.08	267.65	245.63	22.02	12.152		
3,300.00	3,285.68	3,266.19	3,239.86	11.36	11.70	35.84	138.11	373.66	270.48	247.73	22.76	11.886		
3,400.00	3,384.16	3,365.93	3,338.09	11.73	12.08	37.19	145.68	389.24	273.47	249.98	23.49	11.642		
3,500.00	3,482.64	3,465.68	3,436.32	12.09	12.46	38.51	153.25	404.82	276.61	252.39	24.23	11.418		
3,600.00	3,581.12	3,565.43	3,534.56	12.46	12.84	39.80	160.82	420.40	279.89	254.93	24.96	11.212		
3,700.00	3,679.60	3,665.18	3,632.79	12.82	13.22	41.07	168.40	435.98	283.32	257.61	25.70	11.022		
3,800.00	3,778.08	3,764.93	3,731.02	13.19	13.61	42.30	175.97	451.56	286.87	260.43	26.44	10.848		
3,900.00	3,876.56	3,864.68	3,829.25	13.56	13.99	43.50	183.54	467.14	290.56	263.37	27.19	10.687		
4,000.00	3,975.04	3,964.42	3,927.49	13.93	14.37	44.67	191.11	482.71	294.37	266.44	27.93	10.539		
4,100.00	4,073.52	4,064.17	4,025.72	14.29	14.75	45.81	198.68	498.29	298.30	269.63	28.68	10.403		
4,200.00	4,172.00	4,163.92	4,123.95	14.66	15.13	46.92	206.25	513.87	302.35	272.92	29.42	10.276		
4,300.00	4,270.49	4,263.67	4,222.19	15.04	15.52	48.00	213.82	529.45	306.50	276.33	30.17	10.159		
4,400.00	4,368.97	4,363.42	4,320.42	15.41	15.90	49.05	221.39	545.03	310.77	279.85	30.92	10.051		
4,500.00	4,467.45	4,463.17	4,418.65	15.78	16.28	50.07	228.96	560.61	315.13	283.46	31.67	9.951		
4,600.00	4,565.93	4,562.91	4,516.89	16.15	16.67	51.06	236.54	576.19	319.59	287.17	32.42	9.859		
4,700.00	4,664.41	4,662.66	4,615.12	16.53	17.05	52.03	244.11	591.77	324.15	290.98	33.17	9.773		
4,800.00	4,762.89	4,762.41	4,713.35	16.90	17.43	52.97	251.68	607.35	328.79	294.87	33.92	9.693		
4,900.00	4,861.37	4,862.16	4,811.58	17.27	17.82	53.88	259.25	622.92	333.53	298.85	34.67	9.619		
5,000.00	4,959.85	4,961.91	4,909.82	17.65	18.20	54.77	266.82	638.50	338.34	302.91	35.43	9.550		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #23H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,100.00	5,058.33	5,061.66	5,008.05	18.02	18.59	55.63	274.39	654.08	343.23	307.05	36.18	9.487		
5,200.00	5,156.81	5,161.40	5,106.28	18.40	18.97	56.47	281.96	669.66	348.20	311.26	36.94	9.427		
5,300.00	5,255.29	5,261.15	5,204.52	18.77	19.35	57.29	289.53	685.24	353.24	315.55	37.69	9.372		
5,400.00	5,353.77	5,360.90	5,302.75	19.15	19.74	58.08	297.10	700.82	358.35	319.90	38.45	9.321		
5,500.00	5,452.25	5,460.65	5,400.98	19.53	20.12	58.85	304.68	716.40	363.53	324.32	39.20	9.273		
5,600.00	5,550.73	5,560.40	5,499.22	19.90	20.51	59.59	312.25	731.98	368.77	328.81	39.96	9.228		
5,700.00	5,649.21	5,660.15	5,597.45	20.28	20.89	60.32	319.82	747.55	374.07	333.35	40.72	9.187		
5,800.00	5,747.69	5,759.89	5,695.68	20.66	21.28	61.03	327.39	763.13	379.43	337.95	41.48	9.148		
5,900.00	5,846.17	5,859.64	5,793.91	21.03	21.66	61.71	334.96	778.71	384.84	342.61	42.24	9.112		
6,000.00	5,944.65	5,959.39	5,892.15	21.41	22.05	62.38	342.53	794.29	390.31	347.32	42.99	9.078		
6,100.00	6,043.13	6,059.14	5,990.38	21.79	22.43	63.03	350.10	809.87	395.83	352.08	43.75	9.047		
6,200.00	6,141.61	6,158.89	6,088.61	22.17	22.82	63.66	357.67	825.45	401.40	356.89	44.51	9.018		
6,300.00	6,240.09	6,258.64	6,186.85	22.55	23.20	64.27	365.25	841.03	407.02	361.75	45.27	8.990		
6,400.00	6,338.57	6,358.38	6,285.08	22.92	23.59	64.87	372.82	856.61	412.68	366.65	46.03	8.965		
6,500.00	6,437.33	6,458.14	6,383.32	23.30	23.97	65.35	380.39	872.19	419.10	372.31	46.79	8.957		
6,600.00	6,536.57	6,557.82	6,481.48	23.67	24.36	65.43	387.95	887.75	426.98	379.45	47.53	8.983		
6,700.00	6,636.19	6,657.31	6,579.46	24.03	24.74	65.11	395.51	903.29	436.32	388.06	48.26	9.041		
6,800.00	6,736.04	6,756.49	6,677.13	24.38	25.12	64.44	403.03	918.78	447.19	398.21	48.98	9.130		
6,900.00	6,836.02	6,856.23	6,774.38	24.73	25.50	63.45	410.53	934.20	459.71	410.03	49.68	9.253		
7,000.00	6,936.02	6,953.71	6,871.36	25.07	25.89	102.62	418.00	949.59	473.25	422.87	50.38	9.394		
7,100.00	7,036.02	7,052.19	6,968.35	25.41	26.27	101.35	425.48	964.97	487.03	435.95	51.08	9.536		
7,200.00	7,136.02	7,150.67	7,065.33	25.75	26.65	100.16	432.95	980.35	501.03	449.26	51.77	9.678		
7,300.00	7,236.02	7,249.16	7,162.32	26.09	27.03	99.03	440.43	995.73	515.24	462.77	52.47	9.819		
7,400.00	7,336.02	7,347.64	7,259.30	26.43	27.41	97.96	447.90	1,011.11	529.64	476.47	53.17	9.961		
7,500.00	7,436.02	7,446.12	7,356.29	26.77	27.79	96.94	455.38	1,026.49	544.21	490.33	53.87	10.102		
7,600.00	7,536.02	7,544.60	7,453.27	27.12	28.17	95.98	462.85	1,041.87	558.94	504.36	54.57	10.242		
7,700.00	7,636.02	7,643.08	7,550.25	27.46	28.55	95.07	470.33	1,057.25	573.81	518.54	55.28	10.380		
7,800.00	7,736.02	7,741.56	7,647.24	27.81	28.93	94.20	477.80	1,072.63	588.83	532.84	55.98	10.518		
7,900.00	7,836.02	7,840.04	7,744.22	28.15	29.31	93.38	485.28	1,088.01	603.97	547.28	56.69	10.654		
8,000.00	7,936.02	7,938.52	7,841.21	28.49	29.69	92.59	492.75	1,103.39	619.22	561.83	57.39	10.789		
8,100.00	8,036.02	8,037.00	7,938.19	28.84	30.07	91.85	500.23	1,118.77	634.59	576.49	58.10	10.922		
8,200.00	8,136.02	8,155.06	8,054.73	29.18	30.52	91.06	508.48	1,135.76	648.89	589.95	58.94	11.009		
8,300.00	8,236.02	8,279.86	8,178.64	29.53	30.98	90.48	514.96	1,149.09	659.51	599.76	59.75	11.037		
8,400.00	8,336.02	8,405.73	8,304.14	29.88	31.43	90.12	519.09	1,157.60	666.26	605.77	60.49	11.014		
8,500.00	8,436.02	8,532.20	8,430.53	30.22	31.87	89.97	520.82	1,161.14	669.07	607.92	61.15	10.942		
8,600.00	8,536.02	8,637.69	8,536.02	30.57	32.22	89.96	520.87	1,161.25	669.15	607.34	61.81	10.825		
8,700.00	8,636.02	8,737.69	8,636.02	30.92	32.55	89.96	520.87	1,161.25	669.15	606.66	62.49	10.708		
8,800.00	8,736.02	8,837.69	8,736.02	31.26	32.88	89.96	520.87	1,161.25	669.15	605.98	63.17	10.592		
8,900.00	8,836.02	8,937.69	8,836.02	31.61	33.22	89.96	520.87	1,161.25	669.15	605.29	63.86	10.479		
9,000.00	8,936.02	9,037.69	8,936.02	31.96	33.55	89.96	520.87	1,161.25	669.15	604.61	64.54	10.368		
9,100.00	9,036.02	9,137.69	9,036.02	32.31	33.89	89.96	520.87	1,161.25	669.15	603.93	65.22	10.259		
9,200.00	9,136.02	9,237.69	9,136.02	32.65	34.22	89.96	520.87	1,161.25	669.15	603.24	65.91	10.153		
9,300.00	9,236.02	9,337.69	9,236.02	33.00	34.56	89.96	520.87	1,161.25	669.15	602.56	66.59	10.049		
9,400.00	9,336.02	9,437.69	9,336.02	33.35	34.89	89.96	520.87	1,161.25	669.15	601.87	67.28	9.946		
9,500.00	9,436.02	9,537.69	9,436.02	33.70	35.23	89.96	520.87	1,161.25	669.15	601.19	67.96	9.846		
9,600.00	9,536.02	9,637.69	9,536.02	34.05	35.57	89.96	520.87	1,161.25	669.15	600.50	68.65	9.747		
9,700.00	9,636.02	9,737.69	9,636.02	34.40	35.90	89.96	520.87	1,161.25	669.15	599.81	69.34	9.651		
9,800.00	9,736.02	9,837.69	9,736.02	34.75	36.24	89.96	520.87	1,161.25	669.15	599.12	70.03	9.556		
9,900.00	9,836.02	9,937.69	9,836.02	35.10	36.58	89.96	520.87	1,161.25	669.15	598.44	70.71	9.463		
10,000.00	9,936.02	10,037.69	9,936.02	35.45	36.92	89.96	520.87	1,161.25	669.15	597.75	71.40	9.371		
10,100.00	10,036.02	10,137.69	10,036.02	35.80	37.26	89.96	520.87	1,161.25	669.15	597.06	72.09	9.282		
10,200.00	10,136.02	10,237.69	10,136.02	36.15	37.60	89.96	520.87	1,161.25	669.15	596.37	72.78	9.194		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design		Blue Steel 21 Fee - WD #23H - OH - Prelim Plan A											Offset Site Error: 0.00 usft	
Survey Program: 0-MWD+IFR1													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,300.00	10,236.02	10,337.69	10,236.02	36.50	37.93	89.96	520.87	1,161.25	669.15	595.68	73.47	9.107		
10,309.12	10,245.14	10,346.80	10,245.14	36.53	37.97	89.96	520.87	1,161.25	669.15	595.61	73.54	9.099		
10,400.00	10,336.02	10,437.15	10,335.36	36.85	38.28	89.66	524.38	1,161.26	669.17	595.01	74.17	9.023		
10,500.00	10,435.98	10,533.17	10,429.45	37.20	38.61	87.96	542.93	1,161.32	669.57	594.70	74.87	8.943		
10,600.00	10,534.51	10,625.84	10,516.11	37.56	38.92	86.33	575.48	1,161.41	670.52	594.93	75.59	8.870		
10,700.00	10,628.71	10,716.00	10,594.32	37.91	39.20	84.81	620.13	1,161.55	671.89	595.58	76.31	8.805		
10,800.00	10,715.72	10,804.04	10,663.03	38.25	39.44	83.45	675.05	1,161.72	673.50	596.52	76.98	8.749		
10,900.00	10,792.89	10,890.37	10,721.46	38.56	39.65	82.28	738.49	1,161.91	675.17	597.59	77.58	8.703		
11,000.00	10,857.88	10,975.35	10,769.03	38.86	39.81	81.31	808.80	1,162.12	676.73	598.61	78.12	8.663		
11,100.00	10,908.72	11,059.29	10,805.32	39.14	39.95	80.57	884.42	1,162.35	678.02	599.42	78.60	8.626		
11,200.00	10,943.86	11,142.53	10,830.02	39.40	40.07	80.08	963.83	1,162.59	678.92	599.87	79.05	8.589		
11,300.00	10,962.23	11,225.35	10,842.92	39.64	40.19	79.84	1,045.56	1,162.83	679.33	599.87	79.46	8.549		
11,400.00	10,964.96	11,315.23	10,844.96	39.86	40.34	79.83	1,135.39	1,163.10	679.29	599.40	79.89	8.503		
11,500.00	10,964.96	11,415.23	10,844.96	40.09	40.53	79.82	1,235.39	1,163.41	679.21	598.84	80.36	8.452		
11,600.00	10,964.96	11,515.23	10,844.96	40.35	40.75	79.82	1,335.39	1,163.71	679.12	598.24	80.88	8.397		
11,700.00	10,964.96	11,615.23	10,844.96	40.62	41.00	79.82	1,435.38	1,164.01	679.04	597.59	81.44	8.338		
11,800.00	10,964.96	11,715.23	10,844.96	40.92	41.27	79.82	1,535.38	1,164.31	678.95	596.91	82.04	8.276		
11,900.00	10,964.96	11,815.23	10,844.96	41.24	41.57	79.82	1,635.38	1,164.61	678.86	596.18	82.68	8.210		
12,000.00	10,964.96	11,915.23	10,844.96	41.58	41.88	79.82	1,735.38	1,164.92	678.78	595.41	83.37	8.142		
12,100.00	10,964.96	12,015.23	10,844.96	41.93	42.22	79.82	1,835.38	1,165.22	678.69	594.61	84.09	8.071		
12,200.00	10,964.96	12,115.23	10,844.96	42.31	42.57	79.81	1,935.38	1,165.52	678.61	593.76	84.84	7.998		
12,300.00	10,964.96	12,215.23	10,844.96	42.70	42.95	79.81	2,035.38	1,165.82	678.52	592.88	85.64	7.923		
12,400.00	10,964.96	12,315.23	10,844.96	43.12	43.34	79.81	2,135.38	1,166.12	678.44	591.97	86.47	7.846		
12,500.00	10,964.96	12,415.23	10,844.96	43.55	43.75	79.81	2,235.38	1,166.43	678.35	591.02	87.33	7.767		
12,600.00	10,964.96	12,515.23	10,844.96	43.99	44.18	79.81	2,335.38	1,166.73	678.26	590.03	88.23	7.687		
12,700.00	10,964.96	12,615.23	10,844.96	44.46	44.62	79.81	2,435.38	1,167.03	678.18	589.02	89.16	7.606		
12,800.00	10,964.96	12,715.23	10,844.96	44.94	45.08	79.81	2,535.38	1,167.33	678.09	587.97	90.12	7.524		
12,900.00	10,964.96	12,815.23	10,844.96	45.43	45.56	79.81	2,635.38	1,167.63	678.01	586.89	91.11	7.441		
13,000.00	10,964.97	12,915.23	10,844.97	45.94	46.05	79.80	2,735.38	1,167.93	677.92	585.79	92.14	7.358		
13,100.00	10,964.97	13,015.23	10,844.97	46.47	46.56	79.80	2,835.38	1,168.24	677.84	584.65	93.19	7.274		
13,200.00	10,964.97	13,115.23	10,844.97	47.00	47.08	79.80	2,935.38	1,168.54	677.75	583.49	94.27	7.190		
13,300.00	10,964.97	13,215.23	10,844.97	47.56	47.62	79.80	3,035.38	1,168.84	677.67	582.29	95.37	7.106		
13,400.00	10,964.97	13,315.23	10,844.97	48.12	48.16	79.80	3,135.38	1,169.14	677.58	581.08	96.50	7.021		
13,500.00	10,964.97	13,415.23	10,844.97	48.70	48.73	79.80	3,235.38	1,169.44	677.49	579.84	97.66	6.937		
13,600.00	10,964.97	13,515.23	10,844.97	49.29	49.30	79.80	3,335.38	1,169.75	677.41	578.57	98.84	6.854		
13,700.00	10,964.97	13,615.23	10,844.97	49.89	49.89	79.80	3,435.37	1,170.05	677.32	577.28	100.04	6.771		
13,800.00	10,964.97	13,715.23	10,844.97	50.50	50.49	79.79	3,535.37	1,170.35	677.24	575.97	101.26	6.688		
13,900.00	10,964.97	13,815.23	10,844.97	51.13	51.09	79.79	3,635.37	1,170.65	677.15	574.64	102.51	6.606		
14,000.00	10,964.97	13,915.23	10,844.97	51.76	51.71	79.79	3,735.37	1,170.95	677.07	573.29	103.78	6.524		
14,100.00	10,964.97	14,015.23	10,844.97	52.41	52.35	79.79	3,835.37	1,171.25	676.98	571.92	105.07	6.443		
14,200.00	10,964.97	14,115.23	10,844.97	53.06	52.99	79.79	3,935.37	1,171.56	676.89	570.52	106.37	6.363		
14,300.00	10,964.97	14,215.23	10,844.97	53.73	53.64	79.79	4,035.37	1,171.86	676.81	569.11	107.70	6.284		
14,400.00	10,964.97	14,315.23	10,844.97	54.40	54.30	79.79	4,135.37	1,172.16	676.72	567.68	109.04	6.206		
14,500.00	10,964.97	14,415.23	10,844.97	55.08	54.97	79.78	4,235.37	1,172.46	676.64	566.24	110.40	6.129		
14,600.00	10,964.97	14,515.23	10,844.97	55.77	55.64	79.78	4,335.37	1,172.76	676.55	564.78	111.78	6.053		
14,700.00	10,964.97	14,615.23	10,844.97	56.47	56.33	79.78	4,435.37	1,173.07	676.47	563.30	113.17	5.977		
14,800.00	10,964.97	14,715.23	10,844.97	57.17	57.03	79.78	4,535.37	1,173.37	676.38	561.80	114.58	5.903		
14,900.00	10,964.97	14,815.23	10,844.97	57.89	57.73	79.78	4,635.37	1,173.67	676.30	560.29	116.00	5.830		
15,000.00	10,964.97	14,915.23	10,844.97	58.61	58.44	79.78	4,735.37	1,173.97	676.21	558.77	117.44	5.758		
15,100.00	10,964.97	15,015.23	10,844.97	59.34	59.16	79.78	4,835.37	1,174.27	676.12	557.23	118.89	5.687		
15,200.00	10,964.97	15,115.23	10,844.97	60.07	59.88	79.78	4,935.37	1,174.58	676.04	555.68	120.35	5.617		
15,300.00	10,964.97	15,215.23	10,844.97	60.81	60.61	79.77	5,035.37	1,174.88	675.95	554.12	121.83	5.548		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #23H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
15,400.00	10,964.98	15,315.23	10,844.98	61.56	61.35	79.77	5,135.37	1,175.18	675.87	552.55	123.32	5.481		
15,500.00	10,964.98	15,415.23	10,844.98	62.31	62.09	79.77	5,235.37	1,175.48	675.78	550.96	124.82	5.414		
15,600.00	10,964.98	15,515.23	10,844.98	63.07	62.84	79.77	5,335.37	1,175.78	675.70	549.36	126.34	5.348		
15,700.00	10,964.98	15,615.23	10,844.98	63.84	63.60	79.77	5,435.37	1,176.08	675.61	547.75	127.86	5.284		
15,800.00	10,964.98	15,715.23	10,844.98	64.61	64.36	79.77	5,535.36	1,176.39	675.52	546.13	129.39	5.221		
15,900.00	10,964.98	15,815.23	10,844.98	65.38	65.13	79.77	5,635.36	1,176.69	675.44	544.50	130.94	5.158		
16,000.00	10,964.98	15,915.23	10,844.98	66.17	65.90	79.77	5,735.36	1,176.99	675.35	542.86	132.49	5.097		
16,100.00	10,964.98	16,015.23	10,844.98	66.95	66.68	79.76	5,835.36	1,177.29	675.27	541.21	134.06	5.037		
16,200.00	10,964.98	16,115.23	10,844.98	67.74	67.46	79.76	5,935.36	1,177.59	675.18	539.55	135.63	4.978		
16,300.00	10,964.98	16,215.23	10,844.98	68.54	68.25	79.76	6,035.36	1,177.90	675.10	537.88	137.22	4.920		
16,400.00	10,964.98	16,315.23	10,844.98	69.34	69.04	79.76	6,135.36	1,178.20	675.01	536.20	138.81	4.863		
16,500.00	10,964.98	16,415.23	10,844.98	70.14	69.83	79.76	6,235.36	1,178.50	674.93	534.52	140.41	4.807		
16,600.00	10,964.98	16,515.23	10,844.98	70.95	70.63	79.76	6,335.36	1,178.80	674.84	532.82	142.02	4.752		
16,700.00	10,964.98	16,615.23	10,844.98	71.76	71.44	79.76	6,435.36	1,179.10	674.75	531.12	143.63	4.698		
16,800.00	10,964.98	16,715.23	10,844.98	72.57	72.25	79.75	6,535.36	1,179.40	674.67	529.41	145.25	4.645		
16,900.00	10,964.98	16,815.23	10,844.98	73.39	73.06	79.75	6,635.36	1,179.71	674.58	527.70	146.89	4.593		
17,000.00	10,964.98	16,915.23	10,844.98	74.21	73.87	79.75	6,735.36	1,180.01	674.50	525.97	148.52	4.541		
17,100.00	10,964.98	17,015.23	10,844.98	75.04	74.69	79.75	6,835.36	1,180.31	674.41	524.24	150.17	4.491		
17,200.00	10,964.98	17,115.23	10,844.98	75.87	75.52	79.75	6,935.36	1,180.61	674.33	522.51	151.82	4.442		
17,300.00	10,964.98	17,215.23	10,844.98	76.70	76.34	79.75	7,035.36	1,180.91	674.24	520.77	153.48	4.393		
17,400.00	10,964.98	17,315.23	10,844.98	77.54	77.17	79.75	7,135.36	1,181.22	674.16	519.02	155.14	4.345		
17,500.00	10,964.98	17,415.23	10,844.98	78.38	78.01	79.75	7,235.36	1,181.52	674.07	517.26	156.81	4.299		
17,600.00	10,964.98	17,515.23	10,844.98	79.22	78.84	79.74	7,335.36	1,181.82	673.98	515.50	158.48	4.253		
17,700.00	10,964.99	17,615.23	10,844.99	80.06	79.68	79.74	7,435.36	1,182.12	673.90	513.73	160.17	4.208		
17,800.00	10,964.99	17,715.23	10,844.99	80.91	80.52	79.74	7,535.35	1,182.42	673.81	511.96	161.85	4.163		
17,900.00	10,964.99	17,815.23	10,844.99	81.76	81.37	79.74	7,635.35	1,182.72	673.73	510.18	163.54	4.120		
18,000.00	10,964.99	17,915.23	10,844.99	82.61	82.22	79.74	7,735.35	1,183.03	673.64	508.40	165.24	4.077		
18,100.00	10,964.99	18,015.23	10,844.99	83.47	83.07	79.74	7,835.35	1,183.33	673.56	506.61	166.94	4.035		
18,200.00	10,964.99	18,115.23	10,844.99	84.33	83.92	79.74	7,935.35	1,183.63	673.47	504.82	168.65	3.993		
18,300.00	10,964.99	18,215.23	10,844.99	85.18	84.77	79.73	8,035.35	1,183.93	673.38	503.03	170.36	3.953		
18,400.00	10,964.99	18,315.23	10,844.99	86.05	85.63	79.73	8,135.35	1,184.23	673.30	501.22	172.08	3.913		
18,500.00	10,964.99	18,415.23	10,844.99	86.91	86.49	79.73	8,235.35	1,184.54	673.21	499.42	173.80	3.874		
18,600.00	10,964.99	18,515.23	10,844.99	87.78	87.35	79.73	8,335.35	1,184.84	673.13	497.61	175.52	3.835		
18,700.00	10,964.99	18,615.23	10,844.99	88.65	88.22	79.73	8,435.35	1,185.14	673.04	495.79	177.25	3.797		
18,800.00	10,964.99	18,715.23	10,844.99	89.52	89.08	79.73	8,535.35	1,185.44	672.96	493.98	178.98	3.760		
18,900.00	10,964.99	18,815.23	10,844.99	90.39	89.95	79.73	8,635.35	1,185.74	672.87	492.15	180.72	3.723		
19,000.00	10,964.99	18,915.23	10,844.99	91.26	90.82	79.73	8,735.35	1,186.05	672.79	490.33	182.46	3.687		
19,100.00	10,964.99	19,015.23	10,844.99	92.14	91.69	79.72	8,835.35	1,186.35	672.70	488.50	184.20	3.652		
19,200.00	10,964.99	19,115.23	10,844.99	93.02	92.57	79.72	8,935.35	1,186.65	672.61	486.67	185.95	3.617		
19,300.00	10,964.99	19,215.23	10,844.99	93.90	93.44	79.72	9,035.35	1,186.95	672.53	484.83	187.70	3.583		
19,400.00	10,964.99	19,315.23	10,844.99	94.78	94.32	79.72	9,135.35	1,187.25	672.44	482.99	189.45	3.549		
19,500.00	10,964.99	19,415.23	10,844.99	95.66	95.20	79.72	9,235.35	1,187.55	672.36	481.15	191.21	3.516		
19,600.00	10,964.99	19,515.23	10,844.99	96.55	96.08	79.72	9,335.35	1,187.86	672.27	479.30	192.97	3.484		
19,700.00	10,964.99	19,615.23	10,844.99	97.43	96.97	79.72	9,435.35	1,188.16	672.19	477.45	194.74	3.452		
19,800.00	10,964.99	19,715.23	10,844.99	98.32	97.85	79.71	9,535.34	1,188.46	672.10	475.60	196.50	3.420		
19,900.00	10,964.99	19,815.22	10,844.99	99.21	98.74	79.71	9,635.34	1,188.76	672.02	473.74	198.27	3.389		
20,000.00	10,964.99	19,915.22	10,844.99	100.10	99.62	79.71	9,735.34	1,189.06	671.93	471.89	200.04	3.359		
20,100.00	10,965.00	20,015.22	10,845.00	100.99	100.51	79.71	9,835.34	1,189.37	671.84	470.02	201.82	3.329		
20,200.00	10,965.00	20,115.22	10,845.00	101.89	101.40	79.71	9,935.34	1,189.67	671.76	468.16	203.60	3.299		
20,300.00	10,965.00	20,215.22	10,845.00	102.78	102.30	79.71	10,035.34	1,189.97	671.67	466.29	205.38	3.270		
20,400.00	10,965.00	20,315.22	10,845.00	103.68	103.19	79.71	10,135.34	1,190.27	671.59	464.43	207.16	3.242		
20,500.00	10,965.00	20,415.22	10,845.00	104.58	104.08	79.71	10,235.34	1,190.57	671.50	462.55	208.95	3.214		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #23H - OH - Prelim Plan A												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
20,600.00	10,965.00	20,515.22	10,845.00	105.48	104.98	79.70	10,335.34	1,190.87	671.42	460.68	210.74	3.186	
20,700.00	10,965.00	20,615.22	10,845.00	106.38	105.88	79.70	10,435.34	1,191.18	671.33	458.80	212.53	3.159	
20,800.00	10,965.00	20,715.22	10,845.00	107.28	106.78	79.70	10,535.34	1,191.48	671.24	456.92	214.32	3.132	
20,900.00	10,965.00	20,815.22	10,845.00	108.18	107.68	79.70	10,635.34	1,191.78	671.16	455.04	216.12	3.106	
21,000.00	10,965.00	20,915.22	10,845.00	109.08	108.58	79.70	10,735.34	1,192.08	671.07	453.16	217.91	3.080	
21,100.00	10,965.00	21,015.22	10,845.00	109.99	109.48	79.70	10,835.34	1,192.38	670.99	451.28	219.71	3.054	
21,200.00	10,965.00	21,115.22	10,845.00	110.89	110.38	79.70	10,935.34	1,192.69	670.90	449.39	221.51	3.029	
21,273.23	10,965.00	21,188.46	10,845.00	111.56	111.04	79.70	11,008.57	1,192.91	670.84	448.01	222.83	3.010 SF	



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #3H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	89.85	0.08	29.95	29.95					
100.00	100.00	100.00	100.00	0.13	0.13	89.85	0.08	29.95	29.95	29.69	0.26	114.451		
200.00	200.00	200.00	200.00	0.49	0.49	89.85	0.08	29.95	29.95	28.97	0.98	30.604		
300.00	300.00	300.00	300.00	0.85	0.85	89.85	0.08	29.95	29.95	28.25	1.70	17.664		
400.00	400.00	400.00	400.00	1.21	1.21	89.85	0.08	29.95	29.95	27.54	2.41	12.414		
500.00	500.00	500.00	500.00	1.56	1.56	89.85	0.08	29.95	29.95	26.82	3.13	9.570		
600.00	600.00	600.00	600.00	1.92	1.92	89.85	0.08	29.95	29.95	26.10	3.85	7.787 CC		
600.04	600.04	600.04	600.04	1.92	1.92	89.85	0.08	29.95	29.95	26.10	3.85	7.786		
700.00	699.99	699.97	699.96	2.26	2.28	-93.48	0.95	29.95	30.01	25.46	4.55	6.601 ES		
800.00	799.96	800.25	799.71	2.60	2.64	-103.23	3.56	29.95	30.77	25.53	5.24	5.878		
900.00	899.90	900.49	899.41	2.93	3.00	-115.05	7.04	29.95	33.07	27.14	5.93	5.576		
1,000.00	999.84	1,000.73	999.10	3.28	3.36	-124.98	10.52	29.95	36.58	29.95	6.63	5.515 SF		
1,100.00	1,099.78	1,100.98	1,098.80	3.62	3.72	-132.99	14.01	29.95	40.99	33.65	7.34	5.585		
1,200.00	1,199.72	1,201.22	1,198.50	3.97	4.08	-139.34	17.49	29.95	46.03	37.99	8.05	5.722		
1,300.00	1,299.65	1,298.54	1,298.19	4.32	4.43	-144.40	20.97	29.95	51.53	42.79	8.74	5.893		
1,400.00	1,399.59	1,398.60	1,398.16	4.67	4.79	-150.13	25.07	28.38	57.08	47.62	9.45	6.038		
1,500.00	1,499.53	1,498.26	1,497.55	5.03	5.14	-157.95	30.41	23.58	62.95	52.79	10.16	6.196		
1,600.00	1,599.47	1,597.26	1,596.01	5.38	5.50	-167.10	36.96	15.63	70.22	59.36	10.86	6.465		
1,700.00	1,699.41	1,695.39	1,693.21	5.74	5.85	-176.67	44.65	4.61	79.92	68.37	11.55	6.920		
1,800.00	1,799.35	1,807.03	1,789.41	6.09	6.25	174.26	53.39	-9.19	92.77	80.49	12.28	7.555		
1,900.00	1,899.29	1,908.93	1,886.02	6.45	6.62	167.16	62.41	-23.64	107.75	94.77	12.98	8.298		
2,000.00	1,999.23	1,989.17	1,982.63	6.80	6.92	161.84	71.42	-38.10	123.96	110.35	13.61	9.105		
2,100.00	2,099.20	2,087.29	2,079.26	7.16	7.28	-130.36	80.43	-52.55	140.04	125.74	14.31	9.788		
2,200.00	2,199.15	2,185.37	2,175.85	7.50	7.64	-86.98	89.44	-67.00	155.18	140.18	15.00	10.348		
2,300.00	2,298.95	2,283.28	2,272.27	7.85	8.01	-80.51	98.44	-81.43	169.78	154.10	15.68	10.828		
2,400.00	2,398.50	2,380.91	2,368.42	8.19	8.37	-80.93	107.41	-95.81	184.31	167.95	16.36	11.264		
2,500.00	2,497.66	2,478.14	2,464.18	8.54	8.74	-83.59	116.34	-110.14	199.28	182.23	17.05	11.689		
2,600.00	2,596.32	2,574.87	2,559.43	8.88	9.10	-87.54	125.23	-124.39	215.20	197.47	17.73	12.135		
2,700.00	2,694.80	2,671.40	2,654.50	9.23	9.46	-92.47	134.10	-138.61	232.73	214.31	18.43	12.631		
2,800.00	2,793.28	2,767.94	2,749.57	9.58	9.83	-96.71	142.97	-152.84	251.75	232.63	19.12	13.165		
2,900.00	2,891.76	2,864.47	2,844.64	9.93	10.20	-100.35	151.84	-167.06	271.94	252.12	19.82	13.719		
3,000.00	2,990.24	2,961.01	2,939.71	10.29	10.56	-103.49	160.70	-181.28	293.07	272.54	20.53	14.278		
3,100.00	3,088.72	3,057.54	3,034.77	10.64	10.93	-106.21	169.57	-195.51	314.94	293.71	21.23	14.833		
3,200.00	3,187.20	3,154.08	3,129.84	11.00	11.30	-108.58	178.44	-209.73	337.42	315.48	21.94	15.378		
3,300.00	3,285.68	3,250.62	3,224.91	11.36	11.67	-110.66	187.31	-223.95	360.38	337.73	22.65	15.910		
3,400.00	3,384.16	3,347.15	3,319.98	11.73	12.03	-112.49	196.18	-238.18	383.74	360.38	23.36	16.425		
3,500.00	3,482.64	3,443.69	3,415.05	12.09	12.40	-114.11	205.05	-252.40	407.44	383.36	24.08	16.922		
3,600.00	3,581.12	3,540.22	3,510.12	12.46	12.77	-115.55	213.92	-266.62	431.41	406.62	24.79	17.401		
3,700.00	3,679.60	3,636.76	3,605.19	12.82	13.14	-116.84	222.79	-280.85	455.62	430.11	25.51	17.862		
3,800.00	3,778.08	3,733.29	3,700.26	13.19	13.51	-118.01	231.66	-295.07	480.02	453.79	26.22	18.304		
3,900.00	3,876.56	3,829.83	3,795.33	13.56	13.88	-119.06	240.53	-309.29	504.59	477.65	26.94	18.728		
4,000.00	3,975.04	3,926.36	3,890.39	13.93	14.25	-120.01	249.40	-323.52	529.31	501.65	27.66	19.135		
4,100.00	4,073.52	4,022.90	3,985.46	14.29	14.62	-120.88	258.26	-337.74	554.15	525.77	28.38	19.525		
4,200.00	4,172.00	4,119.43	4,080.53	14.66	15.00	-121.67	267.13	-351.96	579.11	550.01	29.10	19.899		
4,300.00	4,270.49	4,215.97	4,175.60	15.04	15.37	-122.40	276.00	-366.19	604.16	574.33	29.82	20.258		
4,400.00	4,368.97	4,312.50	4,270.67	15.41	15.74	-123.07	284.87	-380.41	629.29	598.75	30.55	20.602		
4,500.00	4,467.45	4,409.04	4,365.74	15.78	16.11	-123.69	293.74	-394.63	654.51	623.24	31.27	20.932		
4,600.00	4,565.93	4,505.57	4,460.81	16.15	16.48	-124.27	302.61	-408.86	679.78	647.79	31.99	21.248		
4,700.00	4,664.41	4,602.11	4,555.88	16.53	16.85	-124.80	311.48	-423.08	705.12	672.40	32.72	21.553		
4,800.00	4,762.89	4,701.36	4,650.95	16.90	17.24	-125.30	320.35	-437.30	730.51	697.06	33.45	21.838		
4,900.00	4,861.37	4,795.18	4,746.02	17.27	17.60	-125.76	329.22	-451.53	755.95	721.78	34.17	22.126		
5,000.00	4,959.85	4,891.71	4,841.08	17.65	17.97	-126.19	338.09	-465.75	781.43	746.54	34.89	22.396		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #3H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,100.00	5,058.33	4,988.25	4,936.15	18.02	18.34	-126.60	346.96	-479.97	806.95	771.33	35.62	22.656		
5,200.00	5,156.81	5,084.79	5,031.22	18.40	18.72	-126.98	355.82	-494.20	832.51	796.16	36.34	22.906		
5,300.00	5,255.29	5,181.32	5,126.29	18.77	19.09	-127.34	364.69	-508.42	858.10	821.02	37.07	23.147		
5,400.00	5,353.77	5,277.86	5,221.36	19.15	19.46	-127.67	373.56	-522.64	883.71	845.92	37.80	23.379		
5,500.00	5,452.25	5,374.39	5,316.43	19.53	19.83	-127.99	382.43	-536.87	909.36	870.83	38.53	23.603		
5,600.00	5,550.73	5,470.93	5,411.50	19.90	20.21	-128.29	391.30	-551.09	935.03	895.78	39.26	23.819		
5,700.00	5,649.21	5,567.46	5,506.57	20.28	20.58	-128.58	400.17	-565.31	960.72	920.74	39.98	24.027		
5,800.00	5,747.69	5,664.00	5,601.64	20.66	20.95	-128.85	409.04	-579.54	986.44	945.72	40.71	24.229		
5,900.00	5,846.17	5,760.53	5,696.70	21.03	21.33	-129.10	417.91	-593.76	1,012.17	970.73	41.44	24.423		
6,000.00	5,944.65	5,857.07	5,791.77	21.41	21.70	-129.35	426.78	-607.98	1,037.92	995.75	42.17	24.611		
6,100.00	6,043.13	5,953.60	5,886.84	21.79	22.07	-129.58	435.65	-622.21	1,063.69	1,020.79	42.90	24.793		
6,200.00	6,141.61	6,050.14	5,981.91	22.17	22.45	-129.80	444.52	-636.43	1,089.48	1,045.84	43.63	24.969		
6,300.00	6,240.09	6,146.67	6,076.98	22.55	22.82	-130.01	453.38	-650.65	1,115.28	1,070.91	44.36	25.139		
6,400.00	6,338.57	6,243.21	6,172.05	22.92	23.19	-130.21	462.25	-664.88	1,141.09	1,095.99	45.10	25.304		
6,500.00	6,437.33	6,340.06	6,267.43	23.30	23.57	-130.72	471.15	-679.15	1,165.83	1,120.01	45.82	25.441		
6,600.00	6,536.57	6,437.48	6,363.37	23.67	23.95	-131.06	480.10	-693.50	1,188.37	1,141.82	46.55	25.528		
6,700.00	6,636.19	6,535.36	6,459.76	24.03	24.33	-131.24	489.09	-707.92	1,208.67	1,161.40	47.28	25.566		
6,800.00	6,736.04	6,633.56	6,556.47	24.38	24.71	-131.26	498.12	-722.39	1,226.73	1,178.74	48.00	25.559		
6,900.00	6,836.02	6,731.97	6,653.39	24.73	25.09	-131.13	507.16	-736.89	1,242.56	1,193.85	48.71	25.510		
7,000.00	6,936.02	6,830.45	6,750.37	25.07	25.47	-90.19	516.21	-751.40	1,257.29	1,207.87	49.42	25.442		
7,100.00	7,036.02	6,928.93	6,847.36	25.41	25.85	-89.78	525.25	-765.91	1,272.09	1,221.96	50.13	25.377		
7,200.00	7,136.02	7,027.42	6,944.34	25.75	26.23	-89.38	534.30	-780.42	1,286.95	1,236.11	50.84	25.314		
7,300.00	7,236.02	7,125.90	7,041.33	26.09	26.61	-88.98	543.35	-794.93	1,301.88	1,250.33	51.55	25.255		
7,400.00	7,336.02	7,266.36	7,179.97	26.43	27.15	-88.47	555.24	-813.99	1,315.84	1,263.28	52.56	25.035		
7,500.00	7,436.02	7,431.77	7,344.38	26.77	27.76	-88.08	564.74	-829.23	1,325.24	1,271.60	53.64	24.704		
7,600.00	7,536.02	7,598.72	7,511.10	27.12	28.34	-87.90	569.22	-836.41	1,329.64	1,275.03	54.61	24.349		
7,700.00	7,636.02	7,723.65	7,636.02	27.46	28.76	-87.88	569.57	-836.98	1,329.99	1,274.63	55.36	24.026		
7,800.00	7,736.02	7,823.65	7,736.02	27.81	29.10	-87.88	569.57	-836.98	1,329.99	1,273.95	56.04	23.734		
7,900.00	7,836.02	7,923.65	7,836.02	28.15	29.43	-87.88	569.57	-836.98	1,329.99	1,273.27	56.72	23.449		
8,000.00	7,936.02	8,023.65	7,936.02	28.49	29.77	-87.88	569.57	-836.98	1,329.99	1,272.59	57.40	23.171		
8,100.00	8,036.02	8,123.65	8,036.02	28.84	30.10	-87.88	569.57	-836.98	1,329.99	1,271.91	58.08	22.899		
8,200.00	8,136.02	8,223.65	8,136.02	29.18	30.44	-87.88	569.57	-836.98	1,329.99	1,271.22	58.77	22.632		
8,300.00	8,236.02	8,323.65	8,236.02	29.53	30.78	-87.88	569.57	-836.98	1,329.99	1,270.54	59.45	22.372		
8,400.00	8,336.02	8,423.65	8,336.02	29.88	31.12	-87.88	569.57	-836.98	1,329.99	1,269.85	60.13	22.117		
8,500.00	8,436.02	8,523.65	8,436.02	30.22	31.45	-87.88	569.57	-836.98	1,329.99	1,269.17	60.82	21.868		
8,600.00	8,536.02	8,623.65	8,536.02	30.57	31.79	-87.88	569.57	-836.98	1,329.99	1,268.48	61.51	21.624		
8,700.00	8,636.02	8,723.65	8,636.02	30.92	32.13	-87.88	569.57	-836.98	1,329.99	1,267.80	62.19	21.385		
8,800.00	8,736.02	8,823.65	8,736.02	31.26	32.47	-87.88	569.57	-836.98	1,329.99	1,267.11	62.88	21.151		
8,900.00	8,836.02	8,923.65	8,836.02	31.61	32.81	-87.88	569.57	-836.98	1,329.99	1,266.42	63.57	20.922		
9,000.00	8,936.02	9,023.65	8,936.02	31.96	33.15	-87.88	569.57	-836.98	1,329.99	1,265.73	64.26	20.698		
9,100.00	9,036.02	9,123.65	9,036.02	32.31	33.49	-87.88	569.57	-836.98	1,329.99	1,265.04	64.95	20.478		
9,200.00	9,136.02	9,223.65	9,136.02	32.65	33.83	-87.88	569.57	-836.98	1,329.99	1,264.35	65.64	20.263		
9,300.00	9,236.02	9,323.65	9,236.02	33.00	34.17	-87.88	569.57	-836.98	1,329.99	1,263.66	66.33	20.052		
9,400.00	9,336.02	9,423.65	9,336.02	33.35	34.52	-87.88	569.57	-836.98	1,329.99	1,262.97	67.02	19.845		
9,500.00	9,436.02	9,523.65	9,436.02	33.70	34.86	-87.88	569.57	-836.98	1,329.99	1,262.28	67.71	19.642		
9,600.00	9,536.02	9,623.65	9,536.02	34.05	35.20	-87.88	569.57	-836.98	1,329.99	1,261.58	68.40	19.443		
9,700.00	9,636.02	9,723.65	9,636.02	34.40	35.54	-87.88	569.57	-836.98	1,329.99	1,260.89	69.10	19.248		
9,800.00	9,736.02	9,823.65	9,736.02	34.75	35.88	-87.88	569.57	-836.98	1,329.99	1,260.20	69.79	19.057		
9,900.00	9,836.02	9,923.65	9,836.02	35.10	36.23	-87.88	569.57	-836.98	1,329.99	1,259.51	70.48	18.870		
10,000.00	9,936.02	10,023.65	9,936.02	35.45	36.57	-87.88	569.57	-836.98	1,329.99	1,258.81	71.18	18.686		
10,100.00	10,036.02	10,123.65	10,036.02	35.80	36.92	-87.88	569.57	-836.98	1,329.99	1,258.12	71.87	18.505		
10,200.00	10,136.02	10,223.65	10,136.02	36.15	37.26	-87.88	569.57	-836.98	1,329.99	1,257.42	72.57	18.328		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #3H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,300.00	10,236.02	10,323.65	10,236.02	36.50	37.60	-87.88	569.57	-836.98	1,329.99	1,256.73	73.26	18.154		
10,400.00	10,336.02	10,423.65	10,336.02	36.85	37.95	-87.88	569.57	-836.98	1,329.99	1,256.03	73.96	17.983		
10,500.00	10,435.98	10,518.31	10,430.52	37.20	38.28	-87.99	573.68	-836.96	1,330.08	1,255.43	74.64	17.819		
10,600.00	10,534.51	10,610.59	10,520.85	37.56	38.60	-87.83	592.03	-836.87	1,330.19	1,254.86	75.33	17.657		
10,700.00	10,628.71	10,702.46	10,606.70	37.91	38.92	-87.74	624.45	-836.72	1,330.25	1,254.23	76.02	17.498		
10,800.00	10,715.72	10,794.12	10,686.11	38.25	39.22	-87.71	670.05	-836.51	1,330.25	1,253.55	76.69	17.345		
10,900.00	10,792.89	10,885.78	10,757.23	38.56	39.48	-87.74	727.71	-836.24	1,330.17	1,252.83	77.34	17.199		
11,000.00	10,857.88	10,977.62	10,818.37	38.86	39.71	-87.84	796.11	-835.92	1,330.03	1,252.07	77.95	17.062		
11,100.00	10,908.72	11,069.84	10,867.99	39.14	39.92	-87.99	873.72	-835.55	1,329.83	1,251.30	78.53	16.934		
11,200.00	10,943.86	11,162.62	10,904.71	39.40	40.11	-88.21	958.82	-835.15	1,329.60	1,250.54	79.06	16.818		
11,300.00	10,962.23	11,256.17	10,927.35	39.64	40.30	-88.48	1,049.48	-834.73	1,329.35	1,249.81	79.54	16.713		
11,400.00	10,964.96	11,350.75	10,934.96	39.86	40.48	-88.71	1,143.65	-834.28	1,329.14	1,249.17	79.97	16.621		
11,500.00	10,964.96	11,450.75	10,934.96	40.09	40.69	-88.71	1,243.64	-833.81	1,329.05	1,248.64	80.42	16.527		
11,600.00	10,964.96	11,550.75	10,934.96	40.35	40.92	-88.71	1,343.64	-833.34	1,328.97	1,248.06	80.91	16.425		
11,700.00	10,964.96	11,650.75	10,934.96	40.62	41.18	-88.71	1,443.64	-832.87	1,328.89	1,247.45	81.45	16.316		
11,800.00	10,964.96	11,750.75	10,934.96	40.92	41.46	-88.71	1,543.64	-832.40	1,328.81	1,246.79	82.02	16.200		
11,900.00	10,964.96	11,850.75	10,934.96	41.24	41.76	-88.71	1,643.64	-831.93	1,328.73	1,246.09	82.64	16.078		
12,000.00	10,964.96	11,950.75	10,934.96	41.58	42.08	-88.71	1,743.64	-831.47	1,328.65	1,245.35	83.30	15.949		
12,100.00	10,964.96	12,050.75	10,934.96	41.93	42.42	-88.71	1,843.64	-831.00	1,328.57	1,244.57	84.00	15.816		
12,200.00	10,964.96	12,150.75	10,934.96	42.31	42.78	-88.71	1,943.64	-830.53	1,328.49	1,243.75	84.74	15.677		
12,300.00	10,964.96	12,250.75	10,934.96	42.70	43.16	-88.71	2,043.64	-830.06	1,328.41	1,242.89	85.52	15.534		
12,400.00	10,964.96	12,350.75	10,934.96	43.12	43.56	-88.71	2,143.63	-829.59	1,328.33	1,242.00	86.33	15.387		
12,500.00	10,964.96	12,450.75	10,934.96	43.55	43.97	-88.71	2,243.63	-829.12	1,328.25	1,241.07	87.17	15.237		
12,600.00	10,964.96	12,550.75	10,934.96	43.99	44.40	-88.71	2,343.63	-828.65	1,328.17	1,240.11	88.05	15.083		
12,700.00	10,964.96	12,650.75	10,934.96	44.46	44.85	-88.71	2,443.63	-828.18	1,328.08	1,239.12	88.97	14.928		
12,800.00	10,964.96	12,750.75	10,934.96	44.94	45.32	-88.71	2,543.63	-827.71	1,328.00	1,238.09	89.92	14.770		
12,900.00	10,964.96	12,850.75	10,934.96	45.43	45.80	-88.71	2,643.63	-827.24	1,327.92	1,237.03	90.89	14.610		
13,000.00	10,964.97	12,950.75	10,934.97	45.94	46.29	-88.71	2,743.63	-826.77	1,327.84	1,235.94	91.90	14.449		
13,100.00	10,964.97	13,050.75	10,934.97	46.47	46.80	-88.71	2,843.63	-826.30	1,327.76	1,234.82	92.94	14.286		
13,200.00	10,964.97	13,150.75	10,934.97	47.00	47.33	-88.71	2,943.63	-825.83	1,327.68	1,233.68	94.00	14.124		
13,300.00	10,964.97	13,250.75	10,934.97	47.56	47.86	-88.71	3,043.62	-825.36	1,327.60	1,232.50	95.10	13.960		
13,400.00	10,964.97	13,350.75	10,934.97	48.12	48.42	-88.71	3,143.62	-824.89	1,327.52	1,231.30	96.22	13.797		
13,500.00	10,964.97	13,450.75	10,934.97	48.70	48.98	-88.71	3,243.62	-824.42	1,327.44	1,230.07	97.36	13.634		
13,600.00	10,964.97	13,550.75	10,934.97	49.29	49.56	-88.70	3,343.62	-823.95	1,327.36	1,228.82	98.53	13.471		
13,700.00	10,964.97	13,650.75	10,934.97	49.89	50.15	-88.70	3,443.62	-823.48	1,327.28	1,227.55	99.73	13.309		
13,800.00	10,964.97	13,750.75	10,934.97	50.50	50.75	-88.70	3,543.62	-823.01	1,327.20	1,226.25	100.94	13.148		
13,900.00	10,964.97	13,850.75	10,934.97	51.13	51.36	-88.70	3,643.62	-822.54	1,327.11	1,224.93	102.18	12.988		
14,000.00	10,964.97	13,950.75	10,934.97	51.76	51.98	-88.70	3,743.62	-822.07	1,327.03	1,223.59	103.44	12.829		
14,100.00	10,964.97	14,050.75	10,934.97	52.41	52.61	-88.70	3,843.61	-821.60	1,326.95	1,222.23	104.72	12.671		
14,200.00	10,964.97	14,150.75	10,934.97	53.06	53.26	-88.70	3,943.61	-821.13	1,326.87	1,220.85	106.02	12.515		
14,300.00	10,964.97	14,250.75	10,934.97	53.73	53.91	-88.70	4,043.61	-820.66	1,326.79	1,219.45	107.34	12.360		
14,400.00	10,964.97	14,350.75	10,934.97	54.40	54.57	-88.70	4,143.61	-820.19	1,326.71	1,218.03	108.68	12.207		
14,500.00	10,964.97	14,450.75	10,934.97	55.08	55.24	-88.70	4,243.61	-819.72	1,326.63	1,216.59	110.04	12.056		
14,600.00	10,964.97	14,550.75	10,934.97	55.77	55.92	-88.70	4,343.61	-819.25	1,326.55	1,215.14	111.41	11.907		
14,700.00	10,964.97	14,650.75	10,934.97	56.47	56.61	-88.70	4,443.61	-818.78	1,326.47	1,213.67	112.80	11.759		
14,800.00	10,964.97	14,750.75	10,934.97	57.17	57.30	-88.70	4,543.61	-818.31	1,326.39	1,212.18	114.21	11.614		
14,900.00	10,964.97	14,850.75	10,934.97	57.89	58.01	-88.70	4,643.61	-817.84	1,326.31	1,210.68	115.63	11.471		
15,000.00	10,964.97	14,950.75	10,934.97	58.61	58.72	-88.70	4,743.60	-817.37	1,326.23	1,209.16	117.06	11.329		
15,100.00	10,964.97	15,050.75	10,934.97	59.34	59.44	-88.70	4,843.60	-816.90	1,326.14	1,207.63	118.51	11.190		
15,200.00	10,964.97	15,150.75	10,934.97	60.07	60.16	-88.70	4,943.60	-816.43	1,326.06	1,206.09	119.97	11.053		
15,300.00	10,964.97	15,250.75	10,934.98	60.81	60.89	-88.70	5,043.60	-815.96	1,325.98	1,204.53	121.45	10.918		
15,400.00	10,964.98	15,350.75	10,934.98	61.56	61.63	-88.70	5,143.60	-815.50	1,325.90	1,202.96	122.94	10.785		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #3H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
15,500.00	10,964.98	15,450.75	10,934.98	62.31	62.38	-88.70	5,243.60	-815.03	1,325.82	1,201.38	124.44	10.654		
15,600.00	10,964.98	15,550.75	10,934.98	63.07	63.13	-88.70	5,343.60	-814.56	1,325.74	1,199.79	125.95	10.526		
15,700.00	10,964.98	15,650.75	10,934.98	63.84	63.88	-88.70	5,443.60	-814.09	1,325.66	1,198.18	127.48	10.399		
15,800.00	10,964.98	15,750.75	10,934.98	64.61	64.64	-88.70	5,543.60	-813.62	1,325.58	1,196.57	129.01	10.275		
15,900.00	10,964.98	15,850.75	10,934.98	65.38	65.41	-88.70	5,643.59	-813.15	1,325.50	1,194.94	130.56	10.153		
16,000.00	10,964.98	15,950.75	10,934.98	66.17	66.18	-88.70	5,743.59	-812.68	1,325.42	1,193.30	132.11	10.032		
16,100.00	10,964.98	16,050.75	10,934.98	66.95	66.96	-88.70	5,843.59	-812.21	1,325.34	1,191.66	133.68	9.914		
16,200.00	10,964.98	16,150.75	10,934.98	67.74	67.75	-88.70	5,943.59	-811.74	1,325.25	1,190.00	135.26	9.798		
16,300.00	10,964.98	16,250.75	10,934.98	68.54	68.53	-88.70	6,043.59	-811.27	1,325.17	1,188.33	136.84	9.684		
16,400.00	10,964.98	16,350.75	10,934.98	69.34	69.32	-88.70	6,143.59	-810.80	1,325.09	1,186.66	138.43	9.572		
16,500.00	10,964.98	16,450.75	10,934.98	70.14	70.12	-88.70	6,243.59	-810.33	1,325.01	1,184.98	140.04	9.462		
16,600.00	10,964.98	16,550.75	10,934.98	70.95	70.92	-88.70	6,343.59	-809.86	1,324.93	1,183.28	141.65	9.354		
16,700.00	10,964.98	16,650.75	10,934.98	71.76	71.73	-88.70	6,443.59	-809.39	1,324.85	1,181.58	143.27	9.247		
16,800.00	10,964.98	16,750.75	10,934.98	72.57	72.53	-88.70	6,543.58	-808.92	1,324.77	1,179.88	144.89	9.143		
16,900.00	10,964.98	16,850.75	10,934.98	73.39	73.35	-88.70	6,643.58	-808.45	1,324.69	1,178.16	146.53	9.041		
17,000.00	10,964.98	16,950.75	10,934.98	74.21	74.16	-88.70	6,743.58	-807.98	1,324.61	1,176.44	148.17	8.940		
17,100.00	10,964.98	17,050.75	10,934.98	75.04	74.98	-88.70	6,843.58	-807.51	1,324.53	1,174.71	149.82	8.841		
17,200.00	10,964.98	17,150.75	10,934.98	75.87	75.80	-88.70	6,943.58	-807.04	1,324.45	1,172.98	151.47	8.744		
17,300.00	10,964.98	17,250.75	10,934.98	76.70	76.63	-88.70	7,043.58	-806.57	1,324.37	1,171.23	153.13	8.649		
17,400.00	10,964.98	17,350.75	10,934.98	77.54	77.46	-88.70	7,143.58	-806.10	1,324.28	1,169.49	154.80	8.555		
17,500.00	10,964.98	17,450.75	10,934.98	78.38	78.29	-88.70	7,243.58	-805.63	1,324.20	1,167.73	156.47	8.463		
17,600.00	10,964.98	17,550.75	10,934.99	79.22	79.13	-88.70	7,343.58	-805.16	1,324.12	1,165.97	158.15	8.372		
17,700.00	10,964.99	17,650.75	10,934.99	80.06	79.97	-88.70	7,443.57	-804.69	1,324.04	1,164.20	159.84	8.284		
17,800.00	10,964.99	17,750.75	10,934.99	80.91	80.81	-88.70	7,543.57	-804.22	1,323.96	1,162.43	161.53	8.196		
17,900.00	10,964.99	17,850.75	10,934.99	81.76	81.65	-88.70	7,643.57	-803.75	1,323.88	1,160.66	163.23	8.111		
18,000.00	10,964.99	17,950.75	10,934.99	82.61	82.50	-88.70	7,743.57	-803.28	1,323.80	1,158.87	164.93	8.027		
18,100.00	10,964.99	18,050.75	10,934.99	83.47	83.35	-88.70	7,843.57	-802.81	1,323.72	1,157.08	166.63	7.944		
18,200.00	10,964.99	18,150.75	10,934.99	84.33	84.20	-88.70	7,943.57	-802.34	1,323.64	1,155.29	168.35	7.863		
18,300.00	10,964.99	18,250.75	10,934.99	85.18	85.06	-88.70	8,043.57	-801.87	1,323.56	1,153.50	170.06	7.783		
18,400.00	10,964.99	18,350.75	10,934.99	86.05	85.92	-88.70	8,143.57	-801.40	1,323.48	1,151.69	171.78	7.704		
18,500.00	10,964.99	18,450.75	10,934.99	86.91	86.78	-88.70	8,243.57	-800.93	1,323.40	1,149.89	173.51	7.627		
18,600.00	10,964.99	18,550.75	10,934.99	87.78	87.64	-88.70	8,343.56	-800.46	1,323.31	1,148.08	175.24	7.551		
18,700.00	10,964.99	18,650.75	10,934.99	88.65	88.50	-88.70	8,443.56	-799.99	1,323.23	1,146.26	176.97	7.477		
18,800.00	10,964.99	18,750.75	10,934.99	89.52	89.37	-88.70	8,543.56	-799.52	1,323.15	1,144.44	178.71	7.404		
18,900.00	10,964.99	18,850.75	10,934.99	90.39	90.23	-88.70	8,643.56	-799.06	1,323.07	1,142.62	180.45	7.332		
19,000.00	10,964.99	18,950.75	10,934.99	91.26	91.10	-88.70	8,743.56	-798.59	1,322.99	1,140.79	182.20	7.261		
19,100.00	10,964.99	19,050.75	10,934.99	92.14	91.98	-88.70	8,843.56	-798.12	1,322.91	1,138.96	183.95	7.192		
19,200.00	10,964.99	19,150.75	10,934.99	93.02	92.85	-88.70	8,943.56	-797.65	1,322.83	1,137.13	185.70	7.123		
19,300.00	10,964.99	19,250.75	10,934.99	93.90	93.73	-88.70	9,043.56	-797.18	1,322.75	1,135.29	187.46	7.056		
19,400.00	10,964.99	19,350.75	10,934.99	94.78	94.60	-88.70	9,143.55	-796.71	1,322.67	1,133.45	189.22	6.990		
19,500.00	10,964.99	19,450.75	10,934.99	95.66	95.48	-88.70	9,243.55	-796.24	1,322.59	1,131.60	190.98	6.925		
19,600.00	10,964.99	19,550.75	10,934.99	96.55	96.36	-88.70	9,343.55	-795.77	1,322.51	1,129.75	192.75	6.861		
19,700.00	10,964.99	19,650.75	10,934.99	97.43	97.25	-88.70	9,443.55	-795.30	1,322.43	1,127.90	194.52	6.798		
19,800.00	10,964.99	19,750.75	10,934.99	98.32	98.13	-88.70	9,543.55	-794.83	1,322.34	1,126.05	196.30	6.736		
19,900.00	10,964.99	19,850.75	10,935.00	99.21	99.02	-88.70	9,643.55	-794.36	1,322.26	1,124.19	198.07	6.676		
20,000.00	10,964.99	19,950.75	10,935.00	100.10	99.90	-88.70	9,743.55	-793.89	1,322.18	1,122.33	199.85	6.616		
20,100.00	10,965.00	20,050.75	10,935.00	100.99	100.79	-88.70	9,843.55	-793.42	1,322.10	1,120.47	201.63	6.557		
20,200.00	10,965.00	20,150.75	10,935.00	101.89	101.68	-88.70	9,943.55	-792.95	1,322.02	1,118.60	203.42	6.499		
20,300.00	10,965.00	20,250.75	10,935.00	102.78	102.57	-88.70	10,043.54	-792.48	1,321.94	1,116.73	205.21	6.442		
20,400.00	10,965.00	20,350.75	10,935.00	103.68	103.47	-88.70	10,143.54	-792.01	1,321.86	1,114.86	207.00	6.386		
20,500.00	10,965.00	20,450.75	10,935.00	104.58	104.36	-88.70	10,243.54	-791.54	1,321.78	1,112.99	208.79	6.331		
20,600.00	10,965.00	20,550.75	10,935.00	105.48	105.26	-88.70	10,343.54	-791.07	1,321.70	1,111.11	210.59	6.276		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #3H - OH - Prelim Plan A												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
20,700.00	10,965.00	20,650.75	10,935.00	106.38	106.15	-88.70	10,443.54	-790.60	1,321.62	1,109.23	212.38	6.223	
20,800.00	10,965.00	20,750.75	10,935.00	107.28	107.05	-88.70	10,543.54	-790.13	1,321.54	1,107.35	214.18	6.170	
20,900.00	10,965.00	20,850.75	10,935.00	108.18	107.95	-88.70	10,643.54	-789.66	1,321.45	1,105.47	215.99	6.118	
21,000.00	10,965.00	20,950.75	10,935.00	109.08	108.85	-88.70	10,743.54	-789.19	1,321.37	1,103.58	217.79	6.067	
21,035.20	10,965.00	20,985.95	10,935.00	109.40	109.17	-88.70	10,778.74	-789.03	1,321.35	1,102.92	218.43	6.049	
21,100.00	10,965.00	20,982.98	10,935.00	109.99	109.14	-88.70	10,775.76	-789.04	1,323.03	1,104.17	218.86	6.045	
21,200.00	10,965.00	20,982.98	10,935.00	110.89	109.14	-88.70	10,775.76	-789.04	1,331.82	1,113.11	218.71	6.089	
21,273.23	10,965.00	20,982.98	10,935.00	111.56	109.14	-88.70	10,775.76	-789.04	1,342.96	1,124.99	217.97	6.161	



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #5H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	1.00	0.00	0.00	0.00	-89.87	0.07	-30.06	30.06					
100.00	100.00	101.00	100.00	0.13	0.13	-89.87	0.07	-30.06	30.06	29.79	0.27	113.319		
200.00	200.00	201.00	200.00	0.49	0.49	-89.87	0.07	-30.06	30.06	29.08	0.98	30.604		
300.00	300.00	301.00	300.00	0.85	0.85	-89.87	0.07	-30.06	30.06	28.36	1.70	17.691		
400.00	400.00	401.00	400.00	1.21	1.21	-89.87	0.07	-30.06	30.06	27.64	2.42	12.442		
500.00	500.00	501.00	500.00	1.56	1.57	-89.87	0.07	-30.06	30.06	26.93	3.13	9.595		
600.00	600.00	601.00	600.00	1.92	1.93	-89.87	0.07	-30.06	30.06	26.21	3.85	7.808 CC		
700.00	699.99	700.83	699.83	2.26	2.28	93.40	0.93	-30.29	30.34	25.79	4.55	6.671 ES		
800.00	799.96	800.49	799.45	2.60	2.64	102.61	3.46	-30.96	31.73	26.50	5.24	6.062		
900.00	899.90	900.25	899.15	2.93	3.00	113.38	6.83	-31.85	34.72	28.79	5.93	5.856		
1,000.00	999.84	1,000.01	998.85	3.28	3.36	122.19	10.19	-32.74	38.73	32.10	6.63	5.843		
1,100.00	1,099.78	1,100.23	1,098.55	3.62	3.72	129.22	13.56	-33.64	43.47	36.14	7.33	5.928		
1,200.00	1,199.72	1,199.53	1,198.25	3.97	4.07	134.81	16.92	-34.53	48.74	40.70	8.04	6.065		
1,300.00	1,299.65	1,297.59	1,296.17	4.32	4.43	139.95	21.82	-35.83	55.90	47.17	8.73	6.403		
1,400.00	1,399.59	1,394.95	1,393.17	4.67	4.78	144.92	29.90	-37.97	66.59	57.18	9.41	7.074		
1,500.00	1,499.53	1,491.41	1,488.94	5.03	5.13	149.16	41.03	-40.92	80.87	70.79	10.08	8.021		
1,600.00	1,599.47	1,586.77	1,583.17	5.38	5.47	152.53	55.09	-44.65	98.70	87.96	10.74	9.193		
1,700.00	1,699.41	1,684.15	1,679.08	5.74	5.83	155.11	71.41	-48.97	118.80	107.37	11.43	10.394		
1,800.00	1,799.35	1,781.99	1,775.43	6.09	6.18	156.95	87.82	-53.33	139.09	126.96	12.13	11.464		
1,900.00	1,899.29	1,879.83	1,871.78	6.45	6.54	158.32	104.24	-57.68	159.49	146.65	12.84	12.423		
2,000.00	1,999.23	1,977.66	1,968.13	6.80	6.90	159.38	120.66	-62.03	179.95	166.40	13.55	13.284		
2,100.00	2,099.20	2,075.72	2,064.70	7.16	7.26	-127.67	137.12	-66.39	199.47	185.22	14.25	13.995		
2,200.00	2,199.15	2,174.16	2,161.65	7.50	7.63	-79.86	153.64	-70.77	216.99	202.03	14.96	14.509		
2,300.00	2,298.95	2,272.86	2,258.84	7.85	7.99	-69.46	170.21	-75.17	232.53	216.87	15.66	14.850		
2,400.00	2,398.50	2,371.69	2,356.18	8.19	8.36	-66.35	186.79	-79.56	246.22	229.85	16.36	15.046		
2,500.00	2,497.66	2,470.54	2,453.53	8.54	8.73	-65.84	203.38	-83.96	258.24	241.16	17.07	15.125		
2,600.00	2,596.32	2,569.30	2,550.78	8.88	9.10	-66.98	219.96	-88.36	268.88	251.09	17.78	15.119		
2,700.00	2,694.80	2,667.99	2,647.98	9.23	9.47	-69.50	236.52	-92.75	279.49	260.99	18.50	15.107		
2,800.00	2,793.28	2,766.69	2,745.18	9.58	9.84	-71.83	253.09	-97.14	290.60	271.38	19.22	15.119		
2,900.00	2,891.76	2,865.39	2,842.38	9.93	10.22	-74.00	269.65	-101.53	302.16	282.22	19.94	15.150		
3,000.00	2,990.24	2,964.09	2,939.58	10.29	10.59	-76.00	286.22	-105.92	314.12	293.45	20.67	15.196		
3,100.00	3,088.72	3,062.79	3,036.78	10.64	10.96	-77.85	302.78	-110.31	326.43	305.03	21.40	15.254		
3,200.00	3,187.20	3,161.49	3,133.98	11.00	11.33	-79.57	319.35	-114.70	339.06	316.93	22.13	15.322		
3,300.00	3,285.68	3,260.19	3,231.18	11.36	11.71	-81.17	335.91	-119.10	351.97	329.11	22.86	15.396		
3,400.00	3,384.16	3,358.89	3,328.38	11.73	12.08	-82.65	352.48	-123.49	365.13	341.54	23.60	15.475		
3,500.00	3,482.64	3,457.58	3,425.58	12.09	12.45	-84.03	369.04	-127.88	378.52	354.19	24.33	15.557		
3,600.00	3,581.12	3,556.28	3,522.77	12.46	12.83	-85.32	385.60	-132.27	392.11	367.05	25.07	15.643		
3,700.00	3,679.60	3,654.98	3,619.97	12.82	13.20	-86.52	402.17	-136.66	405.88	380.08	25.80	15.729		
3,800.00	3,778.08	3,753.68	3,717.17	13.19	13.58	-87.64	418.73	-141.05	419.82	393.28	26.54	15.817		
3,900.00	3,876.56	3,852.38	3,814.37	13.56	13.95	-88.69	435.30	-145.44	433.90	406.62	27.28	15.905		
4,000.00	3,975.04	3,951.08	3,911.57	13.93	14.32	-89.67	451.86	-149.84	448.12	420.10	28.02	15.992		
4,100.00	4,073.52	4,049.78	4,008.77	14.29	14.70	-90.59	468.43	-154.23	462.46	433.70	28.76	16.079		
4,200.00	4,172.00	4,154.90	4,112.37	14.66	15.10	-91.54	485.68	-158.80	476.63	447.08	29.56	16.126		
4,300.00	4,270.49	4,269.02	4,225.40	15.04	15.52	-92.78	500.82	-162.82	488.32	457.92	30.40	16.062		
4,400.00	4,368.97	4,383.30	4,339.13	15.41	15.94	-94.29	511.61	-165.68	497.13	465.91	31.22	15.925		
4,500.00	4,467.45	4,497.39	4,453.01	15.78	16.34	-96.07	518.00	-167.37	503.21	471.21	32.00	15.725		
4,600.00	4,565.93	4,610.91	4,566.51	16.15	16.74	-98.14	520.00	-167.90	506.76	474.01	32.75	15.473		
4,700.00	4,664.41	4,708.80	4,664.41	16.53	17.07	-100.03	520.00	-167.90	509.55	476.08	33.47	15.226		
4,800.00	4,762.89	4,807.28	4,762.89	16.90	17.41	-101.92	520.00	-167.90	512.90	478.72	34.18	15.005		
4,900.00	4,861.37	4,905.76	4,861.37	17.27	17.75	-103.77	520.00	-167.90	516.82	481.92	34.90	14.810		
5,000.00	4,959.85	5,004.24	4,959.85	17.65	18.09	-105.60	520.00	-167.90	521.29	485.67	35.61	14.637		
5,100.00	5,058.33	5,102.73	5,058.33	18.02	18.43	-107.40	520.00	-167.90	526.29	489.96	36.33	14.487		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #5H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,200.00	5,156.81	5,201.21	5,156.81	18.40	18.77	-109.16	520.00	-167.90	531.81	494.77	37.05	14.356		
5,300.00	5,255.29	5,300.31	5,255.29	18.77	19.11	-110.88	520.00	-167.90	537.84	500.08	37.76	14.243		
5,400.00	5,353.77	5,401.83	5,353.77	19.15	19.47	-112.57	520.00	-167.90	544.36	505.87	38.49	14.143		
5,500.00	5,452.25	5,503.35	5,452.25	19.53	19.82	-114.22	520.00	-167.90	551.34	512.13	39.21	14.060		
5,600.00	5,550.73	5,604.87	5,550.73	19.90	20.17	-115.82	520.00	-167.90	558.78	518.84	39.94	13.990		
5,700.00	5,649.21	5,706.39	5,649.21	20.28	20.52	-117.38	520.00	-167.90	566.66	525.99	40.67	13.935		
5,800.00	5,747.69	5,807.91	5,747.69	20.66	20.88	-118.90	520.00	-167.90	574.95	533.56	41.39	13.891		
5,900.00	5,846.17	5,909.43	5,846.17	21.03	21.23	-120.38	520.00	-167.90	583.64	541.52	42.12	13.858		
6,000.00	5,944.65	5,989.05	5,944.65	21.41	21.51	-121.81	520.00	-167.90	592.71	549.94	42.76	13.860		
6,100.00	6,043.13	6,087.53	6,043.13	21.79	21.85	-123.20	520.00	-167.90	602.14	558.66	43.48	13.849		
6,200.00	6,141.61	6,186.01	6,141.61	22.17	22.20	-124.55	520.00	-167.90	611.93	567.73	44.19	13.847		
6,300.00	6,240.09	6,284.49	6,240.09	22.55	22.54	-125.85	520.00	-167.90	622.04	577.13	44.91	13.852		
6,400.00	6,338.57	6,382.97	6,338.57	22.92	22.89	-127.11	520.00	-167.90	632.47	586.85	45.62	13.864		
6,500.00	6,437.33	6,481.73	6,437.33	23.30	23.23	-128.37	520.00	-167.90	642.14	595.81	46.33	13.859		
6,600.00	6,536.57	6,580.97	6,536.57	23.67	23.58	-129.33	520.00	-167.90	649.84	602.80	47.04	13.814		
6,700.00	6,636.19	6,680.58	6,636.19	24.03	23.93	-130.01	520.00	-167.90	655.44	607.69	47.75	13.727		
6,800.00	6,736.04	6,780.44	6,736.04	24.38	24.28	-130.41	520.00	-167.90	658.84	610.39	48.45	13.598		
6,900.00	6,836.02	6,880.42	6,836.02	24.73	24.63	-130.55	520.00	-167.90	660.00	610.85	49.15	13.429		
7,000.00	6,936.02	6,980.42	6,936.02	25.07	24.98	-90.04	520.00	-167.90	660.00	610.16	49.84	13.243		
7,100.00	7,036.02	7,080.42	7,036.02	25.41	25.33	-90.04	520.00	-167.90	660.00	609.47	50.53	13.062		
7,200.00	7,136.02	7,180.42	7,136.02	25.75	25.69	-90.04	520.00	-167.90	660.00	608.78	51.22	12.885		
7,300.00	7,236.02	7,280.42	7,236.02	26.09	26.04	-90.04	520.00	-167.90	660.00	608.09	51.92	12.713		
7,400.00	7,336.02	7,380.42	7,336.02	26.43	26.39	-90.04	520.00	-167.90	660.00	607.39	52.61	12.545		
7,500.00	7,436.02	7,480.42	7,436.02	26.77	26.74	-90.04	520.00	-167.90	660.00	606.70	53.30	12.382		
7,600.00	7,536.02	7,580.42	7,536.02	27.12	27.10	-90.04	520.00	-167.90	660.00	606.00	54.00	12.223		
7,700.00	7,636.02	7,680.42	7,636.02	27.46	27.45	-90.04	520.00	-167.90	660.00	605.31	54.69	12.067		
7,800.00	7,736.02	7,780.42	7,736.02	27.81	27.80	-90.04	520.00	-167.90	660.00	604.61	55.39	11.915		
7,900.00	7,836.02	7,880.42	7,836.02	28.15	28.15	-90.04	520.00	-167.90	660.00	603.91	56.09	11.767		
8,000.00	7,936.02	7,980.42	7,936.02	28.49	28.51	-90.04	520.00	-167.90	660.00	603.22	56.78	11.623		
8,100.00	8,036.02	8,080.42	8,036.02	28.84	28.86	-90.04	520.00	-167.90	660.00	602.52	57.48	11.482		
8,200.00	8,136.02	8,180.42	8,136.02	29.18	29.21	-90.04	520.00	-167.90	660.00	601.82	58.18	11.344		
8,300.00	8,236.02	8,280.42	8,236.02	29.53	29.57	-90.04	520.00	-167.90	660.00	601.12	58.88	11.210		
8,400.00	8,336.02	8,380.42	8,336.02	29.88	29.92	-90.04	520.00	-167.90	660.00	600.42	59.58	11.078		
8,500.00	8,436.02	8,480.42	8,436.02	30.22	30.28	-90.04	520.00	-167.90	660.00	599.72	60.28	10.949		
8,600.00	8,536.02	8,580.42	8,536.02	30.57	30.63	-90.04	520.00	-167.90	660.00	599.02	60.98	10.824		
8,700.00	8,636.02	8,680.42	8,636.02	30.92	30.98	-90.04	520.00	-167.90	660.00	598.32	61.68	10.701		
8,800.00	8,736.02	8,780.42	8,736.02	31.26	31.34	-90.04	520.00	-167.90	660.00	597.62	62.38	10.581		
8,900.00	8,836.02	8,880.42	8,836.02	31.61	31.69	-90.04	520.00	-167.90	660.00	596.92	63.08	10.463		
9,000.00	8,936.02	8,980.42	8,936.02	31.96	32.05	-90.04	520.00	-167.90	660.00	596.22	63.78	10.348		
9,100.00	9,036.02	9,080.42	9,036.02	32.31	32.40	-90.04	520.00	-167.90	660.00	595.52	64.48	10.235		
9,200.00	9,136.02	9,180.42	9,136.02	32.65	32.75	-90.04	520.00	-167.90	660.00	594.82	65.18	10.125		
9,300.00	9,236.02	9,280.42	9,236.02	33.00	33.11	-90.04	520.00	-167.90	660.00	594.11	65.89	10.017		
9,400.00	9,336.02	9,380.42	9,336.02	33.35	33.46	-90.04	520.00	-167.90	660.00	593.41	66.59	9.912		
9,500.00	9,436.02	9,480.42	9,436.02	33.70	33.82	-90.04	520.00	-167.90	660.00	592.71	67.29	9.808		
9,600.00	9,536.02	9,580.42	9,536.02	34.05	34.17	-90.04	520.00	-167.90	660.00	592.01	68.00	9.707		
9,700.00	9,636.02	9,680.42	9,636.02	34.40	34.53	-90.04	520.00	-167.90	660.00	591.30	68.70	9.607		
9,800.00	9,736.02	9,780.42	9,736.02	34.75	34.88	-90.04	520.00	-167.90	660.00	590.60	69.40	9.510		
9,900.00	9,836.02	9,880.42	9,836.02	35.10	35.24	-90.04	520.00	-167.90	660.00	589.89	70.11	9.414		
10,000.00	9,936.02	9,980.42	9,936.02	35.45	35.59	-90.04	520.00	-167.90	660.00	589.19	70.81	9.321		
10,100.00	10,036.02	10,080.42	10,036.02	35.80	35.95	-90.04	520.00	-167.90	660.00	588.48	71.52	9.229		
10,200.00	10,136.02	10,180.42	10,136.02	36.15	36.30	-90.04	520.00	-167.90	660.00	587.78	72.22	9.139		
10,300.00	10,236.02	10,280.42	10,236.02	36.50	36.66	-90.04	520.00	-167.90	660.00	587.07	72.93	9.050		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #5H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,363.19	10,299.21	10,343.71	10,299.21	36.72	36.89	-89.78	522.96	-167.89	659.99	586.62	73.37	8.995		
10,400.00	10,336.02	10,380.05	10,335.22	36.85	37.02	-89.36	527.80	-167.87	660.01	586.38	73.64	8.963		
10,500.00	10,435.98	10,474.77	10,426.94	37.20	37.36	-87.66	551.01	-167.78	660.58	586.26	74.32	8.888		
10,600.00	10,534.51	10,565.42	10,510.01	37.56	37.69	-85.61	587.08	-167.64	662.05	587.08	74.97	8.831		
10,700.00	10,628.71	10,653.12	10,584.00	37.91	37.99	-83.69	634.01	-167.46	664.21	588.66	75.54	8.792		
10,800.00	10,715.72	10,738.41	10,648.27	38.25	38.27	-81.96	689.95	-167.24	666.78	590.76	76.02	8.771		
10,900.00	10,792.89	10,821.76	10,702.38	38.56	38.53	-80.46	753.24	-166.99	669.50	593.10	76.39	8.764		
11,000.00	10,857.88	10,903.58	10,746.04	38.86	38.78	-79.21	822.36	-166.72	672.08	595.40	76.68	8.765		
11,100.00	10,908.72	10,984.25	10,779.01	39.14	39.00	-78.23	895.91	-166.44	674.30	597.38	76.91	8.767		
11,200.00	10,943.86	11,064.10	10,801.17	39.40	39.20	-77.55	972.56	-166.14	675.94	598.80	77.14	8.763		
11,300.00	10,962.23	11,143.45	10,812.42	39.64	39.39	-77.18	1,051.05	-165.84	676.87	599.48	77.39	8.746		
11,400.00	10,964.96	11,232.41	10,813.96	39.86	39.58	-77.11	1,139.97	-165.49	677.05	599.31	77.74	8.710		
11,500.00	10,964.96	11,332.41	10,813.96	40.09	39.80	-77.11	1,239.97	-165.10	677.05	598.87	78.18	8.660		
11,600.00	10,964.96	11,432.41	10,813.96	40.35	40.05	-77.11	1,339.97	-164.71	677.05	598.38	78.66	8.607		
11,700.00	10,964.96	11,532.41	10,813.96	40.62	40.32	-77.11	1,439.97	-164.32	677.05	597.85	79.19	8.549		
11,800.00	10,964.96	11,632.41	10,813.96	40.92	40.61	-77.11	1,539.97	-163.94	677.05	597.28	79.77	8.488		
11,900.00	10,964.96	11,732.41	10,813.96	41.24	40.92	-77.11	1,639.97	-163.55	677.05	596.67	80.38	8.423		
12,000.00	10,964.96	11,832.41	10,813.96	41.58	41.26	-77.11	1,739.96	-163.16	677.05	596.01	81.04	8.355		
12,100.00	10,964.96	11,932.41	10,813.96	41.93	41.61	-77.11	1,839.96	-162.77	677.05	595.32	81.73	8.284		
12,200.00	10,964.96	12,032.41	10,813.96	42.31	41.98	-77.11	1,939.96	-162.38	677.05	594.59	82.46	8.210		
12,300.00	10,964.96	12,132.41	10,813.96	42.70	42.37	-77.11	2,039.96	-161.99	677.05	593.81	83.24	8.134		
12,400.00	10,964.96	12,232.41	10,813.96	43.12	42.78	-77.11	2,139.96	-161.60	677.05	593.01	84.04	8.056		
12,500.00	10,964.96	12,332.41	10,813.96	43.55	43.21	-77.11	2,239.96	-161.22	677.05	592.16	84.89	7.976		
12,600.00	10,964.96	12,432.41	10,813.96	43.99	43.65	-77.11	2,339.96	-160.83	677.05	591.28	85.77	7.894		
12,700.00	10,964.96	12,532.41	10,813.96	44.46	44.11	-77.11	2,439.96	-160.44	677.05	590.37	86.68	7.811		
12,800.00	10,964.96	12,632.41	10,813.96	44.94	44.59	-77.11	2,539.96	-160.05	677.05	589.43	87.62	7.727		
12,900.00	10,964.96	12,732.41	10,813.96	45.43	45.08	-77.11	2,639.96	-159.66	677.05	588.45	88.60	7.642		
13,000.00	10,964.97	12,832.41	10,813.97	45.94	45.59	-77.11	2,739.96	-159.27	677.05	587.45	89.60	7.556		
13,100.00	10,964.97	12,932.41	10,813.97	46.47	46.11	-77.11	2,839.96	-158.88	677.05	586.41	90.64	7.470		
13,200.00	10,964.97	13,032.41	10,813.97	47.00	46.65	-77.11	2,939.96	-158.50	677.05	585.35	91.70	7.383		
13,300.00	10,964.97	13,132.41	10,813.97	47.56	47.20	-77.11	3,039.96	-158.11	677.05	584.26	92.79	7.296		
13,400.00	10,964.97	13,232.41	10,813.97	48.12	47.76	-77.11	3,139.95	-157.72	677.05	583.14	93.91	7.209		
13,500.00	10,964.97	13,332.41	10,813.97	48.70	48.34	-77.11	3,239.95	-157.33	677.05	582.00	95.05	7.123		
13,600.00	10,964.97	13,432.41	10,813.97	49.29	48.93	-77.11	3,339.95	-156.94	677.05	580.83	96.22	7.036		
13,700.00	10,964.97	13,532.41	10,813.97	49.89	49.53	-77.11	3,439.95	-156.55	677.05	579.64	97.41	6.950		
13,800.00	10,964.97	13,632.41	10,813.97	50.50	50.14	-77.11	3,539.95	-156.16	677.05	578.42	98.63	6.865		
13,900.00	10,964.97	13,732.41	10,813.97	51.13	50.76	-77.11	3,639.95	-155.77	677.05	577.19	99.87	6.780		
14,000.00	10,964.97	13,832.41	10,813.97	51.76	51.40	-77.11	3,739.95	-155.39	677.05	575.93	101.12	6.695		
14,100.00	10,964.97	13,932.41	10,813.97	52.41	52.04	-77.11	3,839.95	-155.00	677.05	574.65	102.40	6.612		
14,200.00	10,964.97	14,032.41	10,813.97	53.06	52.70	-77.11	3,939.95	-154.61	677.05	573.35	103.70	6.529		
14,300.00	10,964.97	14,132.41	10,813.97	53.73	53.36	-77.11	4,039.95	-154.22	677.05	572.04	105.02	6.447		
14,400.00	10,964.97	14,232.41	10,813.97	54.40	54.03	-77.11	4,139.95	-153.83	677.05	570.70	106.35	6.366		
14,500.00	10,964.97	14,332.41	10,813.97	55.08	54.71	-77.11	4,239.95	-153.44	677.05	569.35	107.71	6.286		
14,600.00	10,964.97	14,432.41	10,813.97	55.77	55.40	-77.11	4,339.95	-153.05	677.05	567.98	109.08	6.207		
14,700.00	10,964.97	14,532.41	10,813.97	56.47	56.10	-77.11	4,439.94	-152.67	677.05	566.59	110.46	6.129		
14,800.00	10,964.97	14,632.41	10,813.97	57.17	56.81	-77.11	4,539.94	-152.28	677.06	565.19	111.86	6.053		
14,900.00	10,964.97	14,732.41	10,813.97	57.89	57.52	-77.11	4,639.94	-151.89	677.06	563.77	113.28	5.977		
15,000.00	10,964.97	14,832.41	10,813.97	58.61	58.24	-77.11	4,739.94	-151.50	677.06	562.34	114.71	5.902		
15,100.00	10,964.97	14,932.41	10,813.97	59.34	58.97	-77.11	4,839.94	-151.11	677.06	560.90	116.16	5.829		
15,200.00	10,964.97	15,032.41	10,813.97	60.07	59.71	-77.11	4,939.94	-150.72	677.06	559.44	117.62	5.756		
15,300.00	10,964.97	15,132.41	10,813.97	60.81	60.45	-77.11	5,039.94	-150.33	677.06	557.97	119.09	5.685		
15,400.00	10,964.98	15,232.41	10,813.98	61.56	61.20	-77.11	5,139.94	-149.95	677.06	556.48	120.57	5.615		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #5H - OH - Prelim Plan A													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
15,500.00	10,964.98	15,332.41	10,813.98	62.31	61.95	-77.11	5,239.94	-149.56	677.06	554.99	122.07	5.546		
15,600.00	10,964.98	15,432.41	10,813.98	63.07	62.71	-77.11	5,339.94	-149.17	677.06	553.48	123.58	5.479		
15,700.00	10,964.98	15,532.41	10,813.98	63.84	63.47	-77.11	5,439.94	-148.78	677.06	551.96	125.10	5.412		
15,800.00	10,964.98	15,632.41	10,813.98	64.61	64.24	-77.11	5,539.94	-148.39	677.06	550.43	126.63	5.347		
15,900.00	10,964.98	15,732.41	10,813.98	65.38	65.02	-77.11	5,639.94	-148.00	677.06	548.89	128.17	5.283		
16,000.00	10,964.98	15,832.41	10,813.98	66.17	65.80	-77.11	5,739.93	-147.61	677.06	547.34	129.72	5.219		
16,100.00	10,964.98	15,932.41	10,813.98	66.95	66.59	-77.11	5,839.93	-147.23	677.06	545.78	131.28	5.157		
16,200.00	10,964.98	16,032.41	10,813.98	67.74	67.38	-77.11	5,939.93	-146.84	677.06	544.21	132.85	5.096		
16,300.00	10,964.98	16,132.41	10,813.98	68.54	68.17	-77.11	6,039.93	-146.45	677.06	542.63	134.43	5.037		
16,400.00	10,964.98	16,232.41	10,813.98	69.34	68.97	-77.11	6,139.93	-146.06	677.06	541.04	136.02	4.978		
16,500.00	10,964.98	16,332.41	10,813.98	70.14	69.78	-77.11	6,239.93	-145.67	677.06	539.45	137.61	4.920		
16,600.00	10,964.98	16,432.41	10,813.98	70.95	70.59	-77.11	6,339.93	-145.28	677.06	537.84	139.22	4.863		
16,700.00	10,964.98	16,532.41	10,813.98	71.76	71.40	-77.11	6,439.93	-144.89	677.06	536.23	140.83	4.808		
16,800.00	10,964.98	16,632.41	10,813.98	72.57	72.21	-77.11	6,539.93	-144.50	677.06	534.61	142.45	4.753		
16,900.00	10,964.98	16,732.41	10,813.98	73.39	73.03	-77.11	6,639.93	-144.12	677.06	532.98	144.07	4.699		
17,000.00	10,964.98	16,832.41	10,813.98	74.21	73.86	-77.11	6,739.93	-143.73	677.06	531.35	145.71	4.647		
17,100.00	10,964.98	16,932.41	10,813.98	75.04	74.68	-77.11	6,839.93	-143.34	677.06	529.71	147.35	4.595		
17,200.00	10,964.98	17,032.41	10,813.98	75.87	75.51	-77.11	6,939.93	-142.95	677.06	528.06	149.00	4.544		
17,300.00	10,964.98	17,132.41	10,813.98	76.70	76.35	-77.11	7,039.93	-142.56	677.06	526.41	150.65	4.494		
17,400.00	10,964.98	17,232.41	10,813.98	77.54	77.18	-77.11	7,139.92	-142.17	677.06	524.75	152.31	4.445		
17,500.00	10,964.98	17,332.41	10,813.98	78.38	78.02	-77.11	7,239.92	-141.78	677.06	523.08	153.98	4.397		
17,600.00	10,964.98	17,432.41	10,813.98	79.22	78.86	-77.11	7,339.92	-141.40	677.06	521.41	155.65	4.350		
17,700.00	10,964.98	17,532.41	10,813.98	80.06	79.71	-77.11	7,439.92	-141.01	677.06	519.74	157.33	4.304		
17,800.00	10,964.98	17,632.41	10,813.98	80.91	80.56	-77.11	7,539.92	-140.62	677.06	518.05	159.01	4.258		
17,900.00	10,964.98	17,732.41	10,813.98	81.76	81.41	-77.11	7,639.92	-140.23	677.06	516.37	160.70	4.213		
18,000.00	10,964.98	17,832.41	10,813.98	82.61	82.26	-77.11	7,739.92	-139.84	677.06	514.67	162.39	4.169		
18,100.00	10,964.98	17,932.41	10,813.98	83.47	83.12	-77.11	7,839.92	-139.45	677.06	512.97	164.09	4.126		
18,200.00	10,964.98	18,032.41	10,813.98	84.33	83.97	-77.11	7,939.92	-139.06	677.06	511.27	165.79	4.084		
18,300.00	10,964.98	18,132.41	10,813.98	85.18	84.83	-77.11	8,039.92	-138.68	677.06	509.56	167.50	4.042		
18,400.00	10,964.98	18,232.41	10,813.98	86.05	85.70	-77.11	8,139.92	-138.29	677.06	507.85	169.21	4.001		
18,500.00	10,964.98	18,332.41	10,813.98	86.91	86.56	-77.11	8,239.92	-137.90	677.06	506.14	170.93	3.961		
18,600.00	10,964.98	18,432.41	10,813.98	87.78	87.43	-77.11	8,339.92	-137.51	677.06	504.42	172.65	3.922		
18,700.00	10,964.98	18,532.41	10,813.98	88.65	88.30	-77.11	8,439.91	-137.12	677.06	502.69	174.37	3.883		
18,800.00	10,964.98	18,632.41	10,813.98	89.52	89.17	-77.11	8,539.91	-136.73	677.06	500.96	176.10	3.845		
18,900.00	10,964.98	18,732.41	10,813.98	90.39	90.04	-77.11	8,639.91	-136.34	677.06	499.23	177.83	3.807		
19,000.00	10,964.98	18,832.41	10,813.98	91.26	90.92	-77.11	8,739.91	-135.96	677.06	497.49	179.57	3.770		
19,100.00	10,964.98	18,932.41	10,813.98	92.14	91.79	-77.11	8,839.91	-135.57	677.06	495.75	181.31	3.734		
19,200.00	10,964.98	19,032.41	10,813.98	93.02	92.67	-77.11	8,939.91	-135.18	677.06	494.01	183.05	3.699		
19,300.00	10,964.98	19,132.41	10,813.98	93.90	93.55	-77.11	9,039.91	-134.79	677.06	492.26	184.80	3.664		
19,400.00	10,964.98	19,232.41	10,813.98	94.78	94.44	-77.11	9,139.91	-134.40	677.06	490.51	186.55	3.629		
19,500.00	10,964.98	19,332.41	10,813.98	95.66	95.32	-77.11	9,239.91	-134.01	677.06	488.76	188.30	3.596		
19,600.00	10,964.98	19,432.41	10,813.98	96.55	96.21	-77.11	9,339.91	-133.62	677.07	487.00	190.06	3.562		
19,700.00	10,964.98	19,532.41	10,813.98	97.43	97.09	-77.11	9,439.91	-133.23	677.07	485.24	191.82	3.530		
19,800.00	10,964.98	19,632.41	10,813.98	98.32	97.98	-77.11	9,539.91	-132.85	677.07	483.48	193.58	3.498		
19,900.00	10,964.98	19,732.41	10,813.98	99.21	98.87	-77.11	9,639.91	-132.46	677.07	481.72	195.35	3.466		
20,000.00	10,964.98	19,832.41	10,813.98	100.10	99.76	-77.11	9,739.90	-132.07	677.07	479.95	197.12	3.435		
20,100.00	10,965.00	19,932.41	10,814.00	100.99	100.65	-77.11	9,839.90	-131.68	677.07	478.18	198.89	3.404		
20,200.00	10,965.00	20,032.41	10,814.00	101.89	101.55	-77.11	9,939.90	-131.29	677.07	476.40	200.66	3.374		
20,300.00	10,965.00	20,132.41	10,814.00	102.78	102.44	-77.11	10,039.90	-130.90	677.07	474.63	202.44	3.345		
20,400.00	10,965.00	20,232.41	10,814.00	103.68	103.34	-77.11	10,139.90	-130.51	677.07	472.85	204.22	3.315		
20,500.00	10,965.00	20,332.41	10,814.00	104.58	104.24	-77.11	10,239.90	-130.13	677.07	471.07	206.00	3.287		
20,600.00	10,965.00	20,432.41	10,814.00	105.48	105.14	-77.11	10,339.90	-129.74	677.07	469.28	207.78	3.258		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Offset Design Blue Steel 21 Fee - WD #5H - OH - Prelim Plan A												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
20,700.00	10,965.00	20,532.41	10,814.00	106.38	106.04	-77.11	10,439.90	-129.35	677.07	467.50	209.57	3.231	
20,800.00	10,965.00	20,632.41	10,814.00	107.28	106.94	-77.11	10,539.90	-128.96	677.07	465.71	211.36	3.203	
20,900.00	10,965.00	20,732.41	10,814.00	108.18	107.84	-77.11	10,639.90	-128.57	677.07	463.92	213.15	3.176	
21,000.00	10,965.00	20,832.41	10,814.00	109.08	108.75	-77.11	10,739.90	-128.18	677.07	462.12	214.94	3.150	
21,100.00	10,965.00	20,932.41	10,814.00	109.99	109.65	-77.11	10,839.90	-127.79	677.07	460.33	216.74	3.124	
21,200.00	10,965.00	21,032.41	10,814.00	110.89	110.56	-77.11	10,939.90	-127.41	677.07	458.53	218.54	3.098	
21,273.23	10,965.00	21,105.65	10,814.00	111.56	111.22	-77.11	11,013.13	-127.12	677.07	457.21	219.85	3.080 SF	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Reference Depths are relative to well @ 3026.00usft

Offset Depths are relative to Offset Datum

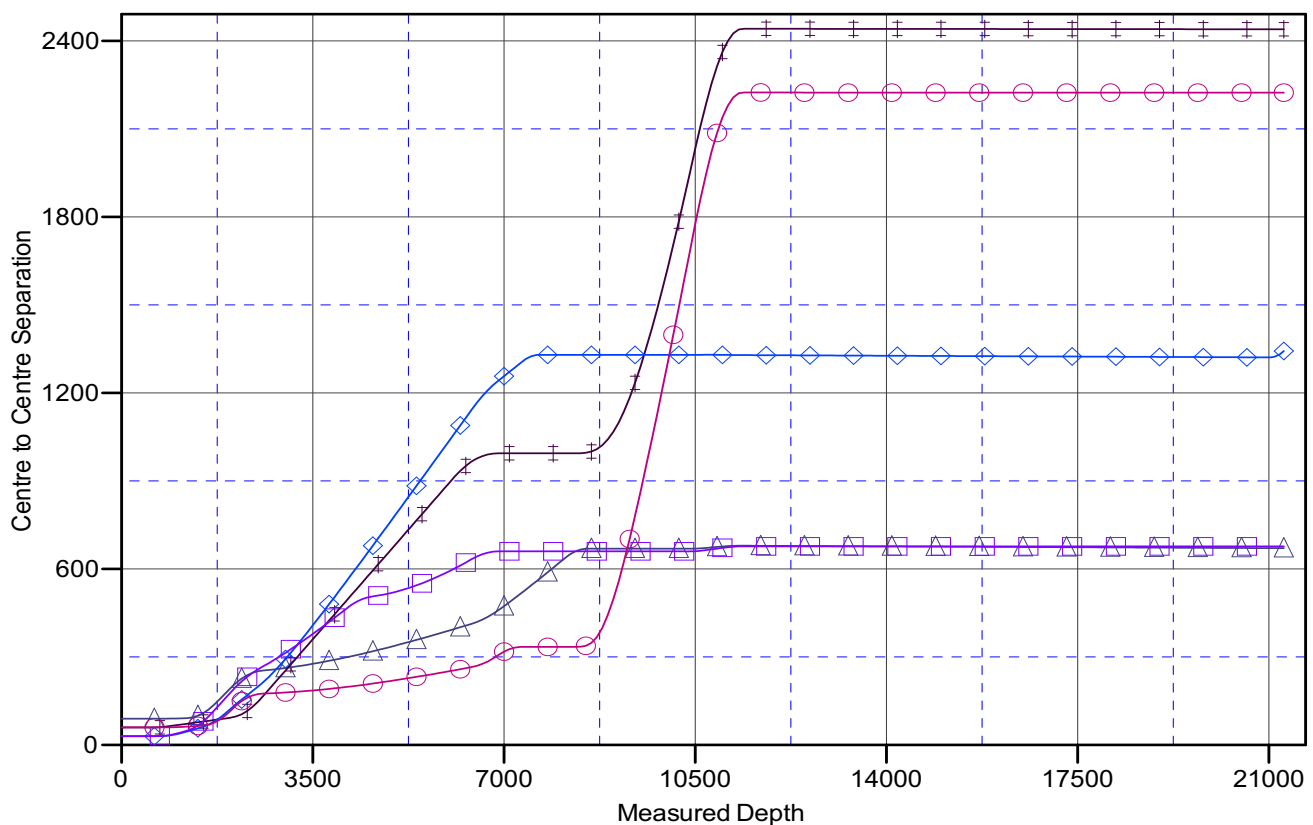
Central Meridian is -104.3333333

Coordinates are relative to: WD #10H

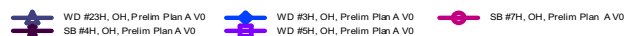
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30

Grid Convergence at Surface is: 0.18°

Ladder Plot



LEGEND



CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Anticollision Report

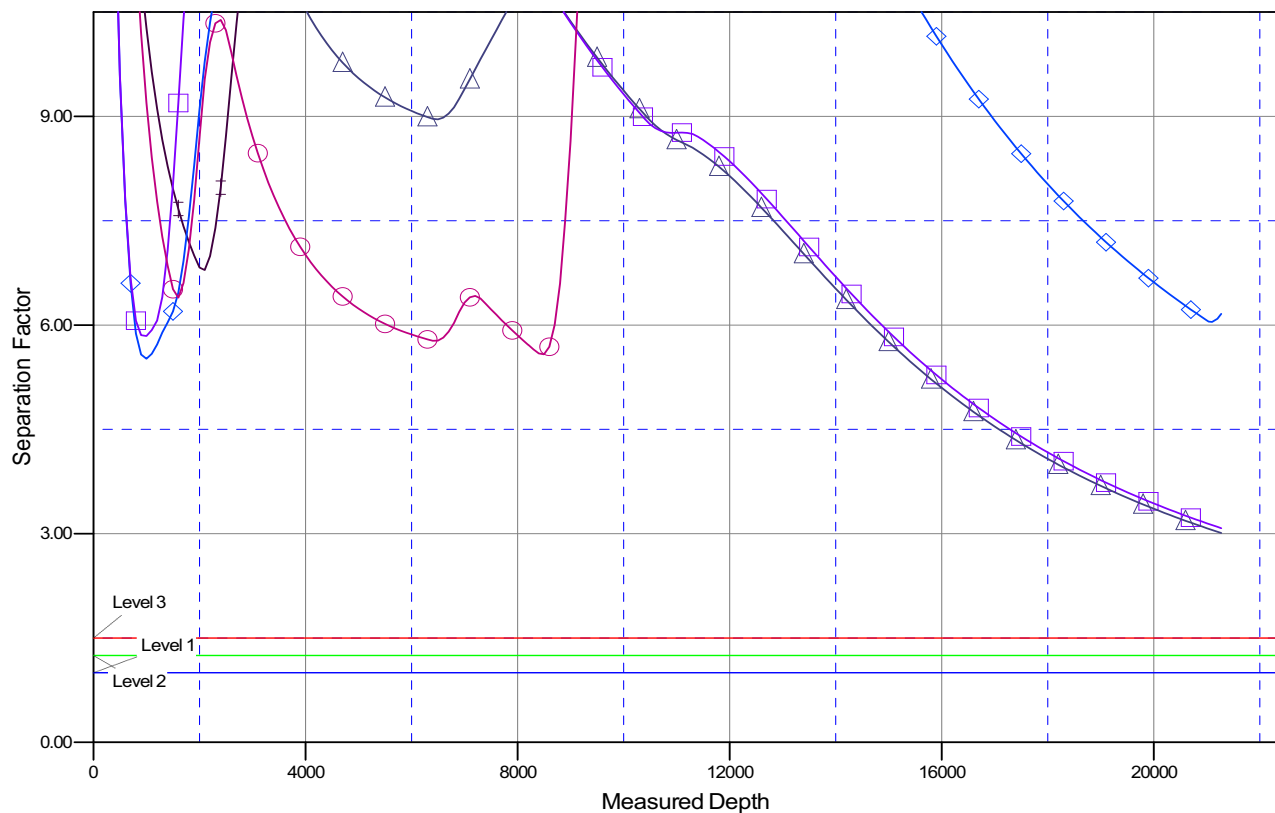


Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim Plan A	Offset TVD Reference:	Reference Datum

Reference Depths are relative to well @ 3026.00usft
Offset Depths are relative to Offset Datum
Central Meridian is -104.333333

Coordinates are relative to: WD #10H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.18°

Separation Factor Plot



LEGEND

WD #23H, OH, Prelim Plan A V0 WD #3H, OH, Prelim Plan A V0 SB #7H, OH, Prelim Plan A V0
SB #4H, OH, Prelim Plan A V0 WD #5H, OH, Prelim Plan A V0

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Well:	WD #10H	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	Blue Steel 21 Fee				
Site Position:		Northing:	466,604.25 usft	Latitude:	32.2823559
From:	Map	Easting:	604,860.40 usft	Longitude:	-103.9940251
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.18 °

Well	WD #10H					
Well Position	+N/-S	0.00 usft	Northing:	466,404.20 usft	Latitude:	32.2818065
	+E/-W	0.00 usft	Easting:	604,800.56 usft	Longitude:	-103.9942208
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	2,999.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	4/3/2020	6.93	60.00	47,832.20

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	0.22	

Survey Tool Program	Date	4/6/2020			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	21,273.23	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1	

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	
[BlueSteel21#10H]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	
700.00	1.00	180.00	699.99	-0.87	0.00	-0.87	1.00	1.00	0.00	
800.00	2.00	180.00	799.96	-3.49	0.00	-3.49	1.00	1.00	0.00	
900.00	2.00	180.00	899.90	-6.98	0.00	-6.98	0.00	0.00	0.00	



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Well:	WD #10H	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)
1,000.00	2.00	180.00	999.84	-10.47	0.00	-10.47	0.00	0.00	0.00
1,100.00	2.00	180.00	1,099.78	-13.96	0.00	-13.96	0.00	0.00	0.00
1,200.00	2.00	180.00	1,199.72	-17.45	0.00	-17.45	0.00	0.00	0.00
1,300.00	2.00	180.00	1,299.65	-20.94	0.00	-20.94	0.00	0.00	0.00
1,400.00	2.00	180.00	1,399.59	-24.43	0.00	-24.43	0.00	0.00	0.00
1,500.00	2.00	180.00	1,499.53	-27.92	0.00	-27.92	0.00	0.00	0.00
1,600.00	2.00	180.00	1,599.47	-31.41	0.00	-31.41	0.00	0.00	0.00
1,700.00	2.00	180.00	1,699.41	-34.90	0.00	-34.90	0.00	0.00	0.00
1,800.00	2.00	180.00	1,799.35	-38.39	0.00	-38.39	0.00	0.00	0.00
1,900.00	2.00	180.00	1,899.29	-41.88	0.00	-41.88	0.00	0.00	0.00
2,000.77	2.00	180.00	2,000.00	-45.40	0.00	-45.40	0.00	0.00	0.00
2,100.00	1.17	107.79	2,099.20	-47.44	0.96	-47.43	2.00	-0.84	-72.77
2,200.00	2.59	59.85	2,199.15	-46.62	3.89	-46.60	2.00	1.42	-47.94
2,300.00	4.47	48.64	2,298.95	-42.91	8.76	-42.87	2.00	1.89	-11.21
2,400.00	6.43	44.15	2,398.50	-36.31	15.59	-36.25	2.00	1.96	-4.49
2,500.00	8.40	41.75	2,497.66	-26.84	24.35	-26.75	2.00	1.98	-2.39
2,580.50	10.00	40.51	2,577.12	-17.14	32.81	-17.01	2.00	1.98	-1.54
2,600.00	10.00	40.51	2,596.32	-14.57	35.01	-14.43	0.00	0.00	0.00
2,700.00	10.00	40.51	2,694.80	-1.36	46.30	-1.18	0.00	0.00	0.00
2,800.00	10.00	40.51	2,793.28	11.84	57.58	12.06	0.00	0.00	0.00
2,900.00	10.00	40.51	2,891.76	25.05	68.86	25.31	0.00	0.00	0.00
3,000.00	10.00	40.51	2,990.24	38.25	80.14	38.56	0.00	0.00	0.00
3,100.00	10.00	40.51	3,088.72	51.46	91.42	51.81	0.00	0.00	0.00
3,200.00	10.00	40.51	3,187.20	64.66	102.70	65.06	0.00	0.00	0.00
3,300.00	10.00	40.51	3,285.68	77.87	113.99	78.30	0.00	0.00	0.00
3,400.00	10.00	40.51	3,384.16	91.07	125.27	91.55	0.00	0.00	0.00
3,500.00	10.00	40.51	3,482.64	104.28	136.55	104.80	0.00	0.00	0.00
3,600.00	10.00	40.51	3,581.12	117.48	147.83	118.05	0.00	0.00	0.00
3,700.00	10.00	40.51	3,679.60	130.69	159.11	131.30	0.00	0.00	0.00
3,800.00	10.00	40.51	3,778.08	143.89	170.39	144.54	0.00	0.00	0.00
3,900.00	10.00	40.51	3,876.56	157.09	181.68	157.79	0.00	0.00	0.00
4,000.00	10.00	40.51	3,975.04	170.30	192.96	171.04	0.00	0.00	0.00
4,100.00	10.00	40.51	4,073.52	183.50	204.24	184.29	0.00	0.00	0.00
4,200.00	10.00	40.51	4,172.00	196.71	215.52	197.53	0.00	0.00	0.00
4,300.00	10.00	40.51	4,270.49	209.91	226.80	210.78	0.00	0.00	0.00
4,400.00	10.00	40.51	4,368.97	223.12	238.08	224.03	0.00	0.00	0.00
4,500.00	10.00	40.51	4,467.45	236.32	249.37	237.28	0.00	0.00	0.00
4,600.00	10.00	40.51	4,565.93	249.53	260.65	250.53	0.00	0.00	0.00
4,700.00	10.00	40.51	4,664.41	262.73	271.93	263.77	0.00	0.00	0.00
4,800.00	10.00	40.51	4,762.89	275.94	283.21	277.02	0.00	0.00	0.00
4,900.00	10.00	40.51	4,861.37	289.14	294.49	290.27	0.00	0.00	0.00
5,000.00	10.00	40.51	4,959.85	302.35	305.77	303.52	0.00	0.00	0.00
5,100.00	10.00	40.51	5,058.33	315.55	317.06	316.77	0.00	0.00	0.00



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Well:	WD #10H	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)	
5,200.00	10.00	40.51	5,156.81	328.75	328.34	330.01	0.00	0.00	0.00	
5,300.00	10.00	40.51	5,255.29	341.96	339.62	343.26	0.00	0.00	0.00	
5,400.00	10.00	40.51	5,353.77	355.16	350.90	356.51	0.00	0.00	0.00	
5,500.00	10.00	40.51	5,452.25	368.37	362.18	369.76	0.00	0.00	0.00	
5,600.00	10.00	40.51	5,550.73	381.57	373.46	383.00	0.00	0.00	0.00	
5,700.00	10.00	40.51	5,649.21	394.78	384.75	396.25	0.00	0.00	0.00	
5,800.00	10.00	40.51	5,747.69	407.98	396.03	409.50	0.00	0.00	0.00	
5,900.00	10.00	40.51	5,846.17	421.19	407.31	422.75	0.00	0.00	0.00	
6,000.00	10.00	40.51	5,944.65	434.39	418.59	436.00	0.00	0.00	0.00	
6,100.00	10.00	40.51	6,043.13	447.60	429.87	449.24	0.00	0.00	0.00	
6,200.00	10.00	40.51	6,141.61	460.80	441.15	462.49	0.00	0.00	0.00	
6,300.00	10.00	40.51	6,240.09	474.01	452.44	475.74	0.00	0.00	0.00	
6,400.89	10.00	40.51	6,339.45	487.33	463.82	489.11	0.00	0.00	0.00	
6,500.00	8.02	40.51	6,437.33	499.13	473.90	500.95	2.00	-2.00	0.00	
6,600.00	6.02	40.51	6,536.57	508.42	481.84	510.27	2.00	-2.00	0.00	
6,700.00	4.02	40.51	6,636.19	515.07	487.52	516.94	2.00	-2.00	0.00	
6,800.00	2.02	40.51	6,736.04	519.08	490.94	520.96	2.00	-2.00	0.00	
6,900.98	0.00	0.00	6,837.00	520.43	492.10	522.32	2.00	-2.00	0.00	
7,000.00	0.00	0.00	6,936.02	520.43	492.10	522.32	0.00	0.00	0.00	
7,100.00	0.00	0.00	7,036.02	520.43	492.10	522.32	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,136.02	520.43	492.10	522.32	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,236.02	520.43	492.10	522.32	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,336.02	520.43	492.10	522.32	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,436.02	520.43	492.10	522.32	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,536.02	520.43	492.10	522.32	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,636.02	520.43	492.10	522.32	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,736.02	520.43	492.10	522.32	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,836.02	520.43	492.10	522.32	0.00	0.00	0.00	
8,000.00	0.00	0.00	7,936.02	520.43	492.10	522.32	0.00	0.00	0.00	
8,100.00	0.00	0.00	8,036.02	520.43	492.10	522.32	0.00	0.00	0.00	
8,200.00	0.00	0.00	8,136.02	520.43	492.10	522.32	0.00	0.00	0.00	
8,300.00	0.00	0.00	8,236.02	520.43	492.10	522.32	0.00	0.00	0.00	
8,400.00	0.00	0.00	8,336.02	520.43	492.10	522.32	0.00	0.00	0.00	
8,500.00	0.00	0.00	8,436.02	520.43	492.10	522.32	0.00	0.00	0.00	
8,600.00	0.00	0.00	8,536.02	520.43	492.10	522.32	0.00	0.00	0.00	
8,700.00	0.00	0.00	8,636.02	520.43	492.10	522.32	0.00	0.00	0.00	
8,800.00	0.00	0.00	8,736.02	520.43	492.10	522.32	0.00	0.00	0.00	
8,900.00	0.00	0.00	8,836.02	520.43	492.10	522.32	0.00	0.00	0.00	
9,000.00	0.00	0.00	8,936.02	520.43	492.10	522.32	0.00	0.00	0.00	
9,100.00	0.00	0.00	9,036.02	520.43	492.10	522.32	0.00	0.00	0.00	
9,200.00	0.00	0.00	9,136.02	520.43	492.10	522.32	0.00	0.00	0.00	
9,300.00	0.00	0.00	9,236.02	520.43	492.10	522.32	0.00	0.00	0.00	
9,400.00	0.00	0.00	9,336.02	520.43	492.10	522.32	0.00	0.00	0.00	



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Well:	WD #10H	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)
9,500.00	0.00	0.00	9,436.02	520.43	492.10	522.32	0.00	0.00	0.00
9,600.00	0.00	0.00	9,536.02	520.43	492.10	522.32	0.00	0.00	0.00
9,700.00	0.00	0.00	9,636.02	520.43	492.10	522.32	0.00	0.00	0.00
9,800.00	0.00	0.00	9,736.02	520.43	492.10	522.32	0.00	0.00	0.00
9,900.00	0.00	0.00	9,836.02	520.43	492.10	522.32	0.00	0.00	0.00
10,000.00	0.00	0.00	9,936.02	520.43	492.10	522.32	0.00	0.00	0.00
10,100.00	0.00	0.00	10,036.02	520.43	492.10	522.32	0.00	0.00	0.00
10,200.00	0.00	0.00	10,136.02	520.43	492.10	522.32	0.00	0.00	0.00
10,300.00	0.00	0.00	10,236.02	520.43	492.10	522.32	0.00	0.00	0.00
10,400.00	0.00	0.00	10,336.02	520.43	492.10	522.32	0.00	0.00	0.00
10,455.98	0.00	0.00	10,392.00	520.43	492.10	522.32	0.00	0.00	0.00
[BlueSteel21#10H]KOP									
10,500.00	4.40	0.22	10,435.98	522.12	492.11	524.01	10.00	10.00	0.00
10,550.00	9.40	0.22	10,485.60	528.13	492.13	530.01	10.00	10.00	0.00
10,600.00	14.40	0.22	10,534.51	538.44	492.17	540.32	10.00	10.00	0.00
10,650.00	19.40	0.22	10,582.33	552.97	492.23	554.85	10.00	10.00	0.00
10,700.00	24.40	0.22	10,628.71	571.61	492.30	573.50	10.00	10.00	0.00
10,750.00	29.40	0.22	10,673.29	594.23	492.39	596.11	10.00	10.00	0.00
10,800.00	34.40	0.22	10,715.72	620.64	492.49	622.53	10.00	10.00	0.00
10,850.00	39.40	0.22	10,755.69	650.66	492.61	652.54	10.00	10.00	0.00
10,900.00	44.40	0.22	10,792.89	684.04	492.74	685.93	10.00	10.00	0.00
10,950.00	49.40	0.22	10,827.04	720.54	492.88	722.42	10.00	10.00	0.00
11,000.00	54.40	0.22	10,857.88	759.87	493.03	761.76	10.00	10.00	0.00
11,050.00	59.40	0.22	10,885.18	801.74	493.19	803.63	10.00	10.00	0.00
11,100.00	64.40	0.22	10,908.72	845.84	493.37	847.73	10.00	10.00	0.00
11,150.00	69.40	0.22	10,928.33	891.81	493.54	893.70	10.00	10.00	0.00
11,200.00	74.40	0.22	10,943.86	939.32	493.73	941.21	10.00	10.00	0.00
11,250.00	79.40	0.22	10,955.18	988.01	493.92	989.90	10.00	10.00	0.00
11,300.00	84.40	0.22	10,962.23	1,037.49	494.11	1,039.38	10.00	10.00	0.00
11,350.00	89.40	0.22	10,964.93	1,087.40	494.30	1,089.29	10.00	10.00	0.00
11,355.98	90.00	0.22	10,964.96	1,093.38	494.33	1,095.27	10.00	10.00	0.00
11,400.00	90.00	0.22	10,964.96	1,137.40	494.50	1,139.29	0.00	0.00	0.00
11,500.00	90.00	0.22	10,964.96	1,237.40	494.89	1,239.29	0.00	0.00	0.00
11,600.00	90.00	0.22	10,964.96	1,337.40	495.28	1,339.29	0.00	0.00	0.00
11,700.00	90.00	0.22	10,964.96	1,437.40	495.67	1,439.29	0.00	0.00	0.00
11,800.00	90.00	0.22	10,964.96	1,537.40	496.05	1,539.29	0.00	0.00	0.00
11,900.00	90.00	0.22	10,964.96	1,637.40	496.44	1,639.29	0.00	0.00	0.00
12,000.00	90.00	0.22	10,964.96	1,737.40	496.83	1,739.29	0.00	0.00	0.00
12,100.00	90.00	0.22	10,964.96	1,837.40	497.22	1,839.29	0.00	0.00	0.00
12,200.00	90.00	0.22	10,964.96	1,937.40	497.61	1,939.29	0.00	0.00	0.00
12,300.00	90.00	0.22	10,964.96	2,037.40	498.00	2,039.29	0.00	0.00	0.00
12,400.00	90.00	0.22	10,964.96	2,137.40	498.39	2,139.29	0.00	0.00	0.00
12,500.00	90.00	0.22	10,964.96	2,237.40	498.78	2,239.29	0.00	0.00	0.00
12,600.00	90.00	0.22	10,964.96	2,337.39	499.17	2,339.29	0.00	0.00	0.00



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Well:	WD #10H	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)	
12,700.00	90.00	0.22	10,964.96	2,437.39	499.55	2,439.29	0.00	0.00	0.00	
12,800.00	90.00	0.22	10,964.96	2,537.39	499.94	2,539.29	0.00	0.00	0.00	
12,900.00	90.00	0.22	10,964.96	2,637.39	500.33	2,639.29	0.00	0.00	0.00	
13,000.00	90.00	0.22	10,964.97	2,737.39	500.72	2,739.29	0.00	0.00	0.00	
13,100.00	90.00	0.22	10,964.97	2,837.39	501.11	2,839.29	0.00	0.00	0.00	
13,200.00	90.00	0.22	10,964.97	2,937.39	501.50	2,939.29	0.00	0.00	0.00	
13,300.00	90.00	0.22	10,964.97	3,037.39	501.89	3,039.29	0.00	0.00	0.00	
13,400.00	90.00	0.22	10,964.97	3,137.39	502.28	3,139.29	0.00	0.00	0.00	
13,500.00	90.00	0.22	10,964.97	3,237.39	502.66	3,239.29	0.00	0.00	0.00	
13,600.00	90.00	0.22	10,964.97	3,337.39	503.05	3,339.29	0.00	0.00	0.00	
13,700.00	90.00	0.22	10,964.97	3,437.39	503.44	3,439.29	0.00	0.00	0.00	
13,800.00	90.00	0.22	10,964.97	3,537.39	503.83	3,539.29	0.00	0.00	0.00	
13,900.00	90.00	0.22	10,964.97	3,637.39	504.22	3,639.29	0.00	0.00	0.00	
14,000.00	90.00	0.22	10,964.97	3,737.38	504.61	3,739.29	0.00	0.00	0.00	
14,100.00	90.00	0.22	10,964.97	3,837.38	505.00	3,839.29	0.00	0.00	0.00	
14,200.00	90.00	0.22	10,964.97	3,937.38	505.39	3,939.29	0.00	0.00	0.00	
14,300.00	90.00	0.22	10,964.97	4,037.38	505.78	4,039.29	0.00	0.00	0.00	
14,400.00	90.00	0.22	10,964.97	4,137.38	506.16	4,139.29	0.00	0.00	0.00	
14,500.00	90.00	0.22	10,964.97	4,237.38	506.55	4,239.29	0.00	0.00	0.00	
14,600.00	90.00	0.22	10,964.97	4,337.38	506.94	4,339.29	0.00	0.00	0.00	
14,700.00	90.00	0.22	10,964.97	4,437.38	507.33	4,439.29	0.00	0.00	0.00	
14,800.00	90.00	0.22	10,964.97	4,537.38	507.72	4,539.29	0.00	0.00	0.00	
14,900.00	90.00	0.22	10,964.97	4,637.38	508.11	4,639.29	0.00	0.00	0.00	
15,000.00	90.00	0.22	10,964.97	4,737.38	508.50	4,739.29	0.00	0.00	0.00	
15,100.00	90.00	0.22	10,964.97	4,837.38	508.89	4,839.29	0.00	0.00	0.00	
15,200.00	90.00	0.22	10,964.97	4,937.38	509.27	4,939.29	0.00	0.00	0.00	
15,300.00	90.00	0.22	10,964.97	5,037.37	509.66	5,039.29	0.00	0.00	0.00	
15,400.00	90.00	0.22	10,964.98	5,137.37	510.05	5,139.29	0.00	0.00	0.00	
15,500.00	90.00	0.22	10,964.98	5,237.37	510.44	5,239.29	0.00	0.00	0.00	
15,600.00	90.00	0.22	10,964.98	5,337.37	510.83	5,339.29	0.00	0.00	0.00	
15,700.00	90.00	0.22	10,964.98	5,437.37	511.22	5,439.29	0.00	0.00	0.00	
15,800.00	90.00	0.22	10,964.98	5,537.37	511.61	5,539.29	0.00	0.00	0.00	
15,900.00	90.00	0.22	10,964.98	5,637.37	512.00	5,639.29	0.00	0.00	0.00	
16,000.00	90.00	0.22	10,964.98	5,737.37	512.39	5,739.29	0.00	0.00	0.00	
16,100.00	90.00	0.22	10,964.98	5,837.37	512.77	5,839.29	0.00	0.00	0.00	
16,200.00	90.00	0.22	10,964.98	5,937.37	513.16	5,939.29	0.00	0.00	0.00	
16,300.00	90.00	0.22	10,964.98	6,037.37	513.55	6,039.29	0.00	0.00	0.00	
16,400.00	90.00	0.22	10,964.98	6,137.37	513.94	6,139.29	0.00	0.00	0.00	
16,500.00	90.00	0.22	10,964.98	6,237.37	514.33	6,239.29	0.00	0.00	0.00	
16,600.00	90.00	0.22	10,964.98	6,337.36	514.72	6,339.29	0.00	0.00	0.00	
16,700.00	90.00	0.22	10,964.98	6,437.36	515.11	6,439.29	0.00	0.00	0.00	
16,800.00	90.00	0.22	10,964.98	6,537.36	515.50	6,539.29	0.00	0.00	0.00	
16,900.00	90.00	0.22	10,964.98	6,637.36	515.89	6,639.29	0.00	0.00	0.00	



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Well:	WD #10H	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)
17,000.00	90.00	0.22	10,964.98	6,737.36	516.27	6,739.29	0.00	0.00	0.00
17,100.00	90.00	0.22	10,964.98	6,837.36	516.66	6,839.29	0.00	0.00	0.00
17,200.00	90.00	0.22	10,964.98	6,937.36	517.05	6,939.29	0.00	0.00	0.00
17,300.00	90.00	0.22	10,964.98	7,037.36	517.44	7,039.29	0.00	0.00	0.00
17,400.00	90.00	0.22	10,964.98	7,137.36	517.83	7,139.29	0.00	0.00	0.00
17,500.00	90.00	0.22	10,964.98	7,237.36	518.22	7,239.29	0.00	0.00	0.00
17,600.00	90.00	0.22	10,964.98	7,337.36	518.61	7,339.29	0.00	0.00	0.00
17,700.00	90.00	0.22	10,964.99	7,437.36	519.00	7,439.29	0.00	0.00	0.00
17,800.00	90.00	0.22	10,964.99	7,537.36	519.38	7,539.29	0.00	0.00	0.00
17,900.00	90.00	0.22	10,964.99	7,637.35	519.77	7,639.29	0.00	0.00	0.00
18,000.00	90.00	0.22	10,964.99	7,737.35	520.16	7,739.29	0.00	0.00	0.00
18,100.00	90.00	0.22	10,964.99	7,837.35	520.55	7,839.29	0.00	0.00	0.00
18,200.00	90.00	0.22	10,964.99	7,937.35	520.94	7,939.29	0.00	0.00	0.00
18,300.00	90.00	0.22	10,964.99	8,037.35	521.33	8,039.29	0.00	0.00	0.00
18,400.00	90.00	0.22	10,964.99	8,137.35	521.72	8,139.29	0.00	0.00	0.00
18,500.00	90.00	0.22	10,964.99	8,237.35	522.11	8,239.29	0.00	0.00	0.00
18,600.00	90.00	0.22	10,964.99	8,337.35	522.50	8,339.29	0.00	0.00	0.00
18,700.00	90.00	0.22	10,964.99	8,437.35	522.88	8,439.29	0.00	0.00	0.00
18,800.00	90.00	0.22	10,964.99	8,537.35	523.27	8,539.29	0.00	0.00	0.00
18,900.00	90.00	0.22	10,964.99	8,637.35	523.66	8,639.29	0.00	0.00	0.00
19,000.00	90.00	0.22	10,964.99	8,737.35	524.05	8,739.29	0.00	0.00	0.00
19,100.00	90.00	0.22	10,964.99	8,837.35	524.44	8,839.29	0.00	0.00	0.00
19,200.00	90.00	0.22	10,964.99	8,937.35	524.83	8,939.29	0.00	0.00	0.00
19,300.00	90.00	0.22	10,964.99	9,037.34	525.22	9,039.29	0.00	0.00	0.00
19,400.00	90.00	0.22	10,964.99	9,137.34	525.61	9,139.29	0.00	0.00	0.00
19,500.00	90.00	0.22	10,964.99	9,237.34	526.00	9,239.29	0.00	0.00	0.00
19,600.00	90.00	0.22	10,964.99	9,337.34	526.38	9,339.29	0.00	0.00	0.00
19,700.00	90.00	0.22	10,964.99	9,437.34	526.77	9,439.29	0.00	0.00	0.00
19,800.00	90.00	0.22	10,964.99	9,537.34	527.16	9,539.29	0.00	0.00	0.00
19,900.00	90.00	0.22	10,964.99	9,637.34	527.55	9,639.29	0.00	0.00	0.00
20,000.00	90.00	0.22	10,964.99	9,737.34	527.94	9,739.29	0.00	0.00	0.00
20,100.00	90.00	0.22	10,965.00	9,837.34	528.33	9,839.29	0.00	0.00	0.00
20,200.00	90.00	0.22	10,965.00	9,937.34	528.72	9,939.29	0.00	0.00	0.00
20,300.00	90.00	0.22	10,965.00	10,037.34	529.11	10,039.29	0.00	0.00	0.00
20,400.00	90.00	0.22	10,965.00	10,137.34	529.49	10,139.29	0.00	0.00	0.00
20,500.00	90.00	0.22	10,965.00	10,237.34	529.88	10,239.29	0.00	0.00	0.00
20,600.00	90.00	0.22	10,965.00	10,337.33	530.27	10,339.29	0.00	0.00	0.00
20,700.00	90.00	0.22	10,965.00	10,437.33	530.66	10,439.29	0.00	0.00	0.00
20,800.00	90.00	0.22	10,965.00	10,537.33	531.05	10,539.29	0.00	0.00	0.00
20,900.00	90.00	0.22	10,965.00	10,637.33	531.44	10,639.29	0.00	0.00	0.00
21,000.00	90.00	0.22	10,965.00	10,737.33	531.83	10,739.29	0.00	0.00	0.00
21,100.00	90.00	0.22	10,965.00	10,837.33	532.22	10,839.29	0.00	0.00	0.00
21,200.00	90.00	0.22	10,965.00	10,937.33	532.61	10,939.29	0.00	0.00	0.00



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #10H
Project:	Eddy County, NM	TVD Reference:	well @ 3026.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3026.00usft
Well:	WD #10H	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)
21,273.23	90.00	0.22	10,965.00	11,010.56	532.89	11,012.53	0.00	0.00	0.00
[BlueSteel21#10H]LTP/BHL									

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
[BlueSteel21#10H]FTP - plan misses target center by 753.40usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	570.43	492.16	466,974.63	605,292.72	32.2833703	-103.9926224
[BlueSteel21#10H]KOP - plan hits target center - Point	0.00	0.00	10,392.00	520.43	492.10	466,924.63	605,292.66	32.2832329	-103.9926231
[BlueSteel21#10H]LTP/E - plan hits target center - Point	0.00	0.00	10,965.00	11,010.56	532.89	477,414.76	605,333.45	32.3120690	-103.9923832

Checked By: _____ Approved By: _____ Date: _____

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Marathon Oil
LEASE NO.:	NMNM119272
LOCATION:	Section 28, T.23 S., R.29 E., NMPM
COUNTY:	Eddy County, New Mexico

WELL NAME & NO.:	Blue Steel 21 WD Fee 10H
SURFACE HOLE FOOTAGE:	470'/N & 1164'/W
BOTTOM HOLE FOOTAGE:	100'/N & 1650'/W

COA

H2S	☒ Yes	☐ No	
Potash	☐ None	☐ Secretary	☒ R-111-P
Cave/Karst Potential	☐ Low	☒ Medium	☐ High
Cave/Karst Potential	☐ Critical		
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

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Cisco** formation. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **420** feet (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of

24 hours in the Potash Area or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
 - Cement to surface. If cement does not circulate see B.1.a, c-d above.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
 - ❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.
 - ❖ In R111 Potash Areas if cement does not circulate to surface on the first two salt protection casing strings, the cement on the 3rd casing string must come to surface.
3. The minimum required fill of cement behind the **7-5/8** inch production casing is:
 - Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Excess calculate to 14%. Additional cement maybe required.**
 4. The minimum required fill of cement behind the **5-1/2** inch production liner is:
 - Cement should tie-back **100 feet** into the previous casing. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. **Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).**
2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **10,000 (10M) psi. Variance is approved to use a 5000 (5M) Annular which shall be tested to 5000 (5M) psi.**

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

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

GENERAL REQUIREMENTS

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

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

☒ Eddy County

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

☒ Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)

689-5981

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
 - a. **Operator is approved to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).**
 - b. **Operator is approved to set surface casing with Spudder Rig**
 - **Notify the BLM when moving in and removing the Spudder Rig.**
 - **Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.**
 - **BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.**
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24

hours. WOC time will be recorded in the driller's log. The casing integrity 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 integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
 - e. 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.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
 - b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
 - c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to

Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

- 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 results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. 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 if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

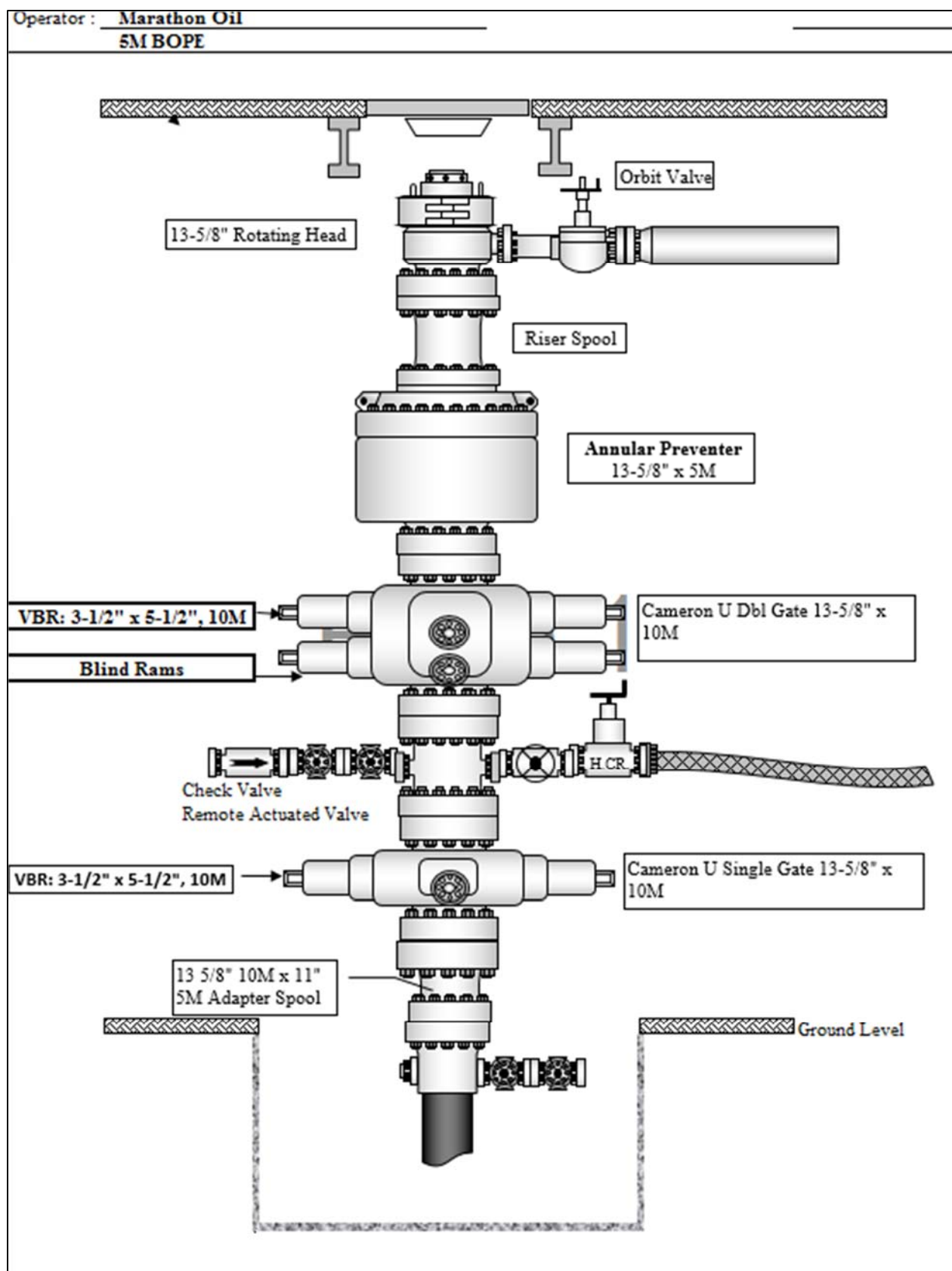
Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. WASTE MATERIAL AND FLUIDS

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

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

ZS 05162022



District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
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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

CONDITIONS

Action 233150

CONDITIONS

Operator: MARATHON OIL PERMIAN LLC 990 Town & Country Blvd. Houston, TX 77024	OGRID: 372098
	Action Number: 233150
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
ward.rikala	Notify OCD 24 hours prior to casing & cement	6/28/2023
ward.rikala	Will require a File As Drilled C-102 and a Directional Survey with the C-104	6/28/2023
ward.rikala	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string	6/28/2023
ward.rikala	Cement is required to circulate on both surface and intermediate1 strings of casing	6/28/2023
ward.rikala	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system	6/28/2023