

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. 30-015-53775
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 30-015-53775	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 5H
⁷ OGRID No. 372098	⁸ Operator Name MARATHON OIL PERMIAN LLC	⁹ Elevation 3000'

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	1134	WEST	EDDY

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	16	23S	29E		100	NORTH	990	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: 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: Certificate Number: LOYD 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'

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1220 S. St. Francis Dr., Santa Fe, NM 87505

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

Submit Original
to Appropriate
District Office

GAS CAPTURE PLAN

Date: April 29, 2020

☒ Original Operator & OGRID No.: MARATHON OIL PERMIAN, LLC 372098
☐ Amended - Reason for Amendment: _____

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomple to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Blue Steel 21 WD Fee 23H		D-28-23S-29E	470' FNL 1254' FWL	5200	Flared	
Blue Steel 21 WD Fee 3H		D-28-23S-29E	470' FNL 1194' FWL	5200	Flared	
Blue Steel 21 WD Fee 3H		D-28-23S-29E	470' FNL 1134' FWL	5200	Flared	
Blue Steel 21 WD Fee 10H		D-28-23S-29E	470' FNL 1164' FWL	5200	Flared	
Blue Steel 21 SB Fee 7H		D-28-23S-29E	470' FNL 1224' FWL	5200	Flared	
Blue Steel 21 SB Fee 4H		D-28-23S-29E	470' FNL 1104' FWL	5200	Flared	

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility has a split connection dedicated to Sendero and Lucid and will be connected to Sendero & Lucid's low pressure gathering systems located in Eddy County, New Mexico. It will require about 1 mile of pipeline to connect the facility to low pressure gathering system. Marathon provides (periodically) to Sendero and Lucid a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Marathon, Sendero, and Lucid have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Sendero's Processing Plant located in Section 31, Township 23S, Range 28E, Eddy County, NM and Lucid's Processing Plant Located in Section 32, Township 23S, Range 28E, Eddy County, NM. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on Sendero's and/or Lucid's system at that time. Based on current information, it is Marathon's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
 - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
 - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
 - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines



MARATHON OIL COMPANY

BLUE STEEL 21 FEE

WD Well # 3H

SB Well # 4H

WD Well # 5H

SB Well # 7H

WD Well # 10H

WD Well # 23H

SHL: 470' FNL & 1194' FWL of Unit Letter 'D', Section 28, T-23S, R-29E

BHL: 330' FNL & 330' FWL of Unit Letter 'D', Section 16, T-23S, R-29E

EDDY County, New Mexico

Rig: PRECISION 582

4/08/2020

**EMERGENCY MEDICAL PROCEDURES
DO NOT PANIC
REMAIN CALM-THINK**

1. HOLD YOUR BREATH. (DO NOT INHALE, STOP BREATHING)
2. PUT ON BREATHING APPARATUS. (NOTE: DO NOT ATTEMPT RESCUE UNTIL YOU HAVE PUT ON BREATHING APPARATUS.)
3. REMOVE VICTIM (S) TO FRESH AIR AS QUICKLY AS POSSIBLE.
4. BE SURE YOU HAVE MOVED VICTIM OUT OF CONTAMINATED AREA BEFORE REMOVING YOUR RESPIRATOR.
5. APPLY MOUTH-TO-MOUTH ARTIFICIAL RESPIRATION, WHICH IS MORE EFFECTIVE, WHILE SOMEONE ELSE GETS THE OXYGEN RESUSCITATOR. RENDER OXYGEN RESUSCITATION ONLY IF PORPERLY TRAINED IN ITS USE.
6. PROVIDE FOR PROMPT TRANSPORTATION TO HOSPITAL AND CONTUNUE GIVING ARTIFICIAL RESPIRATION IF NEEDED.
7. HOSPITAL (S) OR MEDICAL FACILITIES NEED TO BE INFORMED BEFOREHAND, OF THE POSSIBILITY OF H2S GAS POISONING, NO MATTER HOW REMOTE THE POSSIBLITY IS.

Lea Regional Medical Center	(575)492-5000
5419 N Lovington Hwy, Hobbs, NM 88240	
AMBULANCE	911
FIRE DEPARTMENT- HOBBS, NM	(575) 397-9308
POLICE - HOBBS, NM	(575) 397-9265

8. NOTIFY EMERGENCY-ROOM PERSONEL THAT THE VICTIM (S) HAVE POSSIBLY BEEN EXPOSED TO H2S GAS POISONING.

**TOTAL SAFETY INC
1420 East Greene St.
Carlsbad, NM 88220**

THIS H2S DRILLING OPERATIONS PLAN WAS
PREPARED BY: Sean Chamblee
Strategic Account Manager
Cell: 713-703-6295

TOTAL SAFETY INC
1420 East Greene St
Carlsbad, NM 88220
Phone: 432-561-5049

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INTRODUCTION

H2S DRILLING OPERATIONS PLAN

This Drilling Operations Plan was written specifically for:

MARATHON OIL COMPANY
4111 TIDWELL
CALRSBAD, NM 88220

Action Plan for Accidental Release of H2S

BLUE STEEL 21 FEE

WD Well # 3H

SB Well # 4H

WD Well # 5H

SB Well # 7H

WD Well # 10H

WD Well # 23H

EDDY COUNTY, NM

Information, provisions and practices, as set forth in this plan, may be subject to revision and/or updating.

4/08/2020

MARATHON OIL COMPANY
4111 TIDWELL
CARLSBAD, NM 88220

BLUE STEEL 21 FEE
WD Well # 3H
SB Well # 4H
WD Well # 5H
SB Well # 7H
WD Well # 10H
WD Well # 23H

EDDY COUNTY, NM

Directions:

From the Marathon Office at 4111 Tidwell, Carlsbad, NM head south on Tidwell Rd toward US Hwy 285N for 0.2 miles. Turn left onto US Hwy 285S, heading south for 5.1 miles to NM-Hwy 31. Turn left onto NM-Hwy 31, heading east, for 7.7 miles to NM-Hwy 128E. Turn right onto NM-Hwy 128E, heading east, for 4.5 miles to Rawhide Road. Turn right onto Rawhide Road, heading south, for 4.1 miles to a caliche road. Turn right onto caliche road, heading west, for 4.3 miles to a proposed lease road for the Blue Steel Fed 23-29-21WA#2H-FB#21H-SB#1JH-WXY#6H-FB#25H-WA#9H-WXY#8H well location pad.

GPS Coordinates: 32.28180648, -103.99412390
EDDY COUNTY, NEW MEXICO

PURPOSE OF PLAN: The purpose of this plan is to safeguard the lives of the public, contract personnel and company personnel in the event of equipment failure or disasters during drilling or completion operations in formations that may contain Hydrogen Sulfide Gas, H₂S.

As a precautionary measure, this Drilling Plan has been prepared to assure the safety of all concerned, should a disaster occur. However, the Oil Company Representative may have specified materials and practices for the drilling or completion of this well, which supercede the minimum requirements as outlined in this plan.

Definitions: For the purpose of this plan the following definitions are to be referred to:

Controlled Release – Any release that is planned and occurs during normal operations. A controlled release is managed per the procedures outlined in this section.

Uncontrolled Release – Any release that is unplanned and not immediately contained utilizing established shut-in procedures. An uncontrolled release is normally associated with a loss of well control.

SCBA – (Self Contained Breathing Apparatus) – A full-face mask respirator with a supplied positive pressure air source.

Donned SCBA – When it is required per this plan to “**don**” a SCBA, personnel will be 100% masked up and be on supplied breathing air.

SCBA On Person – When it is required per this plan to have SCBA “on person”, personnel will be required to wear the SCBA equipment - but not be masked up.

“Qualified Buddy” – Person who has been fit tested and is trained and is familiar with the requirements of donning an SCBA. This person will provide immediate assistance to another person who may be utilizing an SCBA or SkaPack in an IDLH atmosphere in the event of an emergency situation.

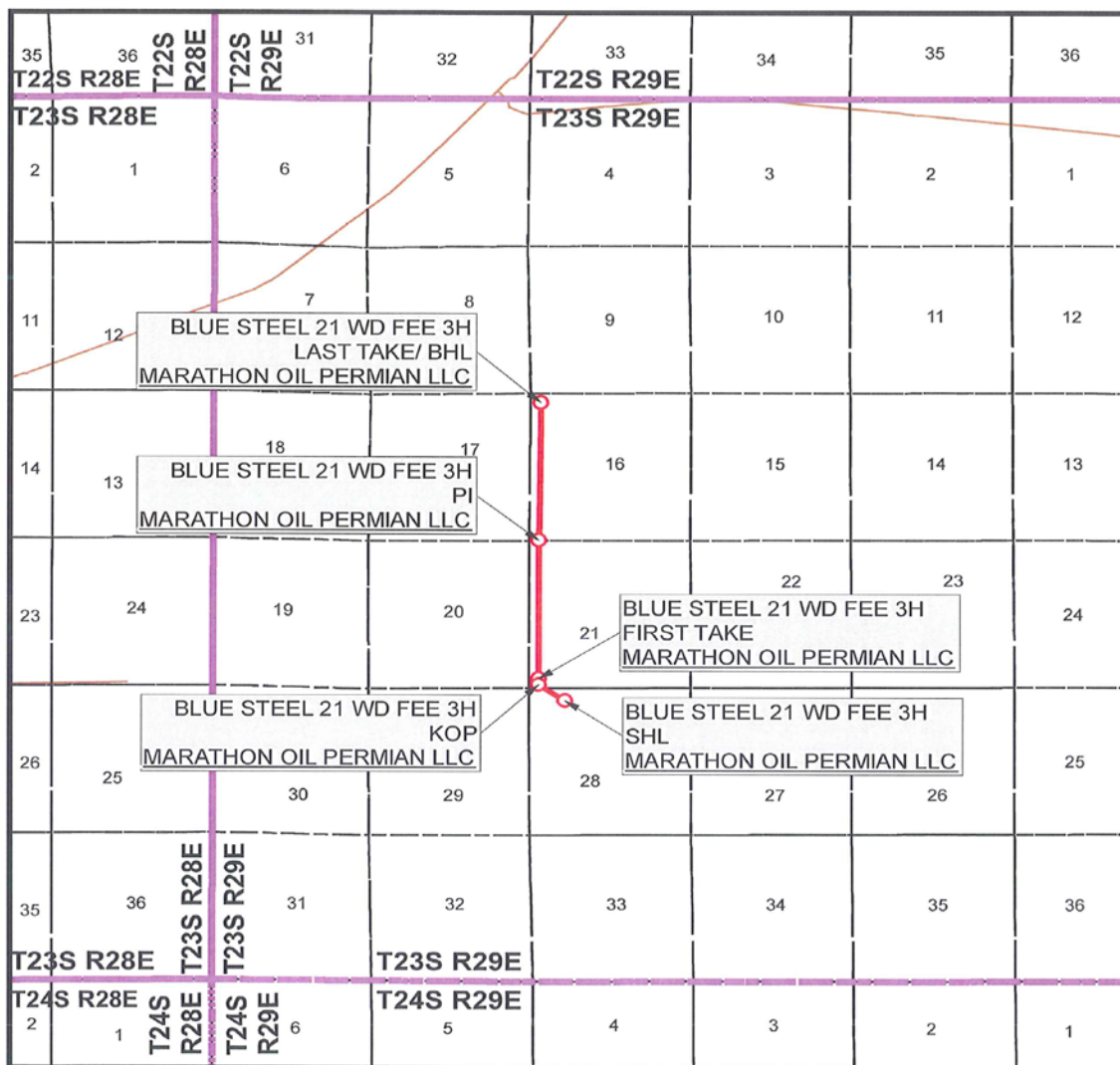
In Scope Personnel – Rig Personnel who will be working or otherwise present in potential H₂S release areas, including the rig floor, cellar, pits, and shaker areas. This would not include 3rd party contractors who do not have a function, besides evacuating the rig, during an emergency condition such as during a well control event or H₂S / LEL alarm. All qualified personnel that have a function to shut a well in during an emergency will be considered In-Scope per this plan

Out of Scope Personnel –. All personnel that are not in scope will be Out of Scope per the definition of this plan

H₂S Office – Onsite office trailer space or vehicle that will be designated as the H₂S office

Marathon H2S Plan Custodian – Marathon HES Advisor, Supervisor or Technician that has been specifically assigned per the authorization page of this plan to maintain this document.

VICINITY MAP



SEC. 28 TWP. 23-S RGE. 29-E
 SURVEY: N.M.P.M.
 COUNTY: EDDY
 OPERATOR: MARATHON OIL PERMIAN LLC
 DESCRIPTION: 470' FNL & 1194' FWL
 ELEVATION: 2999'
 LEASE: BLUE STEEL 21 FEE
 U.S.G.S. TOPOGRAPHIC MAP: REMUDA BASIN, NM.

1" = 1 MILE



SHEET 3 OF 3

PREPARED BY:
 R-SQUARED GLOBAL, LLC
 1309 LOUISVILLE AVENUE, MONROE, LA 71201
 318-323-6900 OFFICE
 JOB No. R3942_002

SAFETY EQUIPMENT

All H2S related Safety Equipment must be installed, tested and Operational at a depth of 500 feet above, or 3 days prior to penetrating the first zone expected to contain H2S.

SAFETY EQUIPMENT PROVIDED BY TOTAL SAFETY INC.

<u>QTY</u>	<u>EQUIPMENT</u>
6 each	30-minute self-contained breathing apparatus
6 each	ELSA Escape Packs
1 Lot	Sufficient low-pressure airline hose with quick connects
1	6 Channel fixed H2S monitor
4	H2S Sensors (Loc determined at rig up – General: Cellar, Shale Shaker, floor/driller area)
4	Explosion proof Alarm Station (1-Drill Floor, 1- Pits/Shakers, 1- Generators, 1 Quarters area)
10	Personal H2S Monitors
1	Gastec pump type gas detector
Set	Various range of H2s & SO2 detector tubes
2 each	Windsocks w/frames and poles
1 Set	H2S and briefing area signs
1 Set	Well condition signs and flags
1	Flare Gun & Flares

TYPE OF EQUIPMENT AND STORAGE LOCATIONS

1. There will be six 30-minute self-contained breathing apparatus on location. They will be positioned as follows: Two at Briefing Area #1 Two at Briefing Area #2, Two at rig dog house. SCBA Facepieces will be equipped with voice amplifiers for effective means of communication when using protective breathing apparatus.
2. There will be six Escape-type packs on location. One for the Derrickman. One on the Shaker. One at the bottom of rig dog house stairway and spares.
3. A Gastec, pump type, gas detector with low and high range detector tubes for H₂S and SO₂ will be located in the doghouse
4. Two Briefing Areas will be designated at opposite ends of the location.
5. The Briefing Area most upwind is designated as the Safety Briefing Area #1. In an emergency, personnel must assemble at this upwind area for instructions from their supervisor.
6. The H₂S 'Safety' trailer provided by Total Safety, Inc. will contain a cascade system of at least 5 each -300 C.F. air cylinders that will provide a continuous air supply to air lines located on the rig. Note: This trailer will **Only** be provided if H₂S conditions require the use of the Air Trailer. (If Required)
7. Two windsocks will be installed so as to be visible from all parts of the location.
8. A well condition warning sign will be displayed at the location entrance to advise of current operating conditions. The condition signs must be at least 200' from the entrance but not more than 500' away.
9. A list of emergency telephone numbers will be kept on rig floor, tool pusher's trailer, the Oil Company's trailer and in the "safety" trailer (if Provided).
10. The primary means of communication will be cell phones.

11. A barricade will be available to block the entrance to location should an emergency occur. In most cases the use of a vehicle is used to block the entrance.
12. A 6-channel H₂S monitor will be located in the doghouse. The 3 sensors will be installed: one on the shale shaker, one at the Cellar, one at the rig floor.
13. An undulating high and low pitch siren and light will be installed on the derrick "A" leg.
14. If H₂S concentration reach 10 ppm an explosion-proof bug blower (fan) will be installed under the rig floor to disperse possible accumulations of H₂S.
15. Any time it is necessary to flare gas containing H₂S, a Sulfur Dioxide monitor or Detector tubes will be used to determine SO₂ concentrations.
16. A flare gun with flares will also be provided in the event it is necessary to ignite the well from a safe distance.

OPERATING PROCEDURES

BLOWOUT PREVENTION MEASURES DURING DRILLING

1. Blowout Prevention Requirements:

All BOP equipment shall meet the American Petroleum Institute specifications as to materials acceptable for H₂S service and tested accordingly (or to BLM specifications).

2. Drilling String Requirements:

All drill string components are to be of material that meets the American Petroleum Institute's specifications for H₂S service. All drill string components should be inspected to IADC critical service specifications prior to running in well.

GAS MONITORING EQUIPMENT

1. A continuous H₂S detection system, consisting of three H₂S detectors and an audible/visual warning system will be in operating during all phases of this H₂S Drilling Operations Plan. The detection system will be adjusted and calibrated such that an H₂S exposure of 10 ppm or higher (at any sensor) will trigger the audible and visual portion (wailing or yelping siren) of the warning system (i.e. H₂S continually present at or above threshold levels) a trained operator or H₂S supervisor will monitor the H₂S detection system.

2. When approaching or completing H₂S formations, crewmembers may attach personnel H₂S monitors to their person.

3. Hand held H₂S sampling gas detectors will be used to check areas not covered by automatic monitoring equipment.

CREW TRAINING AND PROTECTION

1. All personnel working at the well site will be properly trained in accordance with the general training requirements outlined in the API Recommended Practices for Safe Drilling of Wells Containing H₂S. The training will cover, but will not be limited to, the following:

- a. General information of H₂S AND SO₂ GAS
- b. Hazards of these gases
- c. Safety equipment on location
- d. Proper use and care of personal protective equipment
- e. Operational procedures in dealing with H₂S gas
- f. Evacuation procedures
- g. First aid, reviving an H₂S victim, toxicity, etc.
- h. Designated Safe Briefing Areas
- i. Buddy System
- j. Regulations
- k. Review of Drilling Operations Plan

2. Initial training shall be completed when drilling reaches, a depth of 500' above or 3 days prior to penetrating (whichever comes first) the first zone containing or expected to contain H₂S. It must also include a review of the site specific Drilling Operations Plan and, if applicable, the Public Protections Plan.

3. Weekly H₂S and well control drills for all personnel on each working crew shall be conducted.

4. All training sessions and drills shall be recorded on the driller's log or its equivalent.

5. Safety Equipment:

As outlined in the Safety Equipment index, H₂S safety protection equipment will be available to/or assigned each person on location.

6. One person (by job title) shall be designated and identified to all on-site personnel as the person primarily responsible for the overall operation of the on-site safety and training programs. This will be the PIC

METALLURGICAL CONSIDERATIONS

1. Steel drill pipe used in H₂S environments should have yield strength of 95,000psi or less because of potential embrittlement problems. Must conform to the current National Association of Corrosion Engineers (NACE) Standard MR-0175-90, Material Requirement, Sulfide Stress Cracking Resistant Metallica Material for Oil Field Equipment. Drill stem joints near the top of the drill string are normally under the highest stress levels during drilling and do not have the protection of elevated down hole temperatures. These factors should be considered in design of the drill string. Precautions should be taken to minimize drill string stress caused by conditions such as excessive dogleg severity, improper torque, whip, abrasive wear or tool joints and joint imbalance. American Petroleum Institute, Bulletin RR 7G, will be used as a guideline for drill string precautions.
2. Corrosion inhibitors may be applied to the drill pipe or to the mud system as an additional safeguard.
3. Blowout preventors should meet or exceed the recommendations for H₂S service as set forth in the latest edition of API RI 53.

MUD PROGRAM AND TREATING

1. It is of utmost importance that the mud be closely monitored for detection of H₂S and reliability of the H₂S treating chemicals.
2. Identification and analysis of sulfides in the mud and mud filtrates will be carried out per operators prescribed procedures.
3. The mud system will be pre-treated with Zinc Carbonate, Ironite Sponge or similar chemicals of H₂S control prior to drilling into the H₂S bearing formation. Sufficient quantities of corrosion inhibitor should be on location to treat the drill string during Drill Stem Test Operations. Additionally, Aqua Ammonia should be on hand to treat the drill string for crew protection, should H₂S be encountered while tripping string following drill stem testing

WELL CONTROL EQUIPMENT

1. Flare System
 - a. A flare system shall be designed and installed to safely gather and burn H₂S Bearing gas.
 1. Flare lines shall be located as far from the operating site as feasible and in a manner to compensate for wind changes.
 2. The flare line mouth shall be located not less than 150' from wellbore.
 3. Flare lines shall be straight unless targeted with running tees.
 4. Flare Gun & Flares to ignite the well
2. Remote Controlled Choke
 - a. A remote controlled choke shall be installed for all H₂S drilling and where feasible for completion operations. A remote controlled valve may be used in lieu of this requirement for completions operations.
3. Mud-gas separators and rotating heads shall be installed and operable for all exploratory wells.

OPERATING CONDITIONS

A Well Condition Sign and Flag will be posted on all access roads to the location. The sign shall be legible and large enough to be read by all persons entering the well site and be placed a minimum of 200' but no more than 500' from the well site which allows vehicles to turn around at a safe distance prior to reaching the site.

DEFINITION OF WARNING FLAGS

1. Condition:
GREEN-NORMAL OPERATIONS
Any operation where the possibility of encountering H2S exists but no H2S has been detected.
2. Condition:
YELLOW-POTENTIAL DANGER, CAUTION
Any operation where the possibility of encountering H2S exists and in all situations where concentrations of H2S are detected in the air below the threshold level (10ppm)
 - a. Cause of condition:
 - *Circulating up drill breaks
 - *Trip gas after trip
 - *Circulating out gas on choke
 - *Poisonous gas present, but below threshold concentrations
 - *Drill stem test
 - b. Safety Action:
 - *Check safety equipment and keep it with you
 - *Be alert for a change in condition
 - *Follow instructions
3. Condition:
RED-EXTREME DANGER
Presence of H2S at or greater than 10ppm. Breathing apparatus must be worn.
 - a. Safety action:

*MASK UP. All personal will have protective breathing equipment with them. All nonessential personnel will move to the Safe Briefing Area and stay there until instructed to do otherwise. All essential Qualified Personnel, using the "Buddy System" (those necessary to maintain control of the well) will don breathing apparatus to perform operations related to well control.

The decision to ignite the well is the responsibility of the operator's on-site representative and should be made only as a last resort, when it is clear that:

- *human life is endangered
- *there is no hope of controlling the well under prevailing conditions

Order evacuation of local people within the danger zone. Request help from local authorities, State Police, Sheriff's Dept. and Service Representative.

CIRCULATING OUT KICK (WAIT AND WEIGHT METHOD)

If it is suspected that H₂S is present with the gas whenever a kick is taken, the wait and weight method of eliminating gas and raising the mud will be followed.

1. Wait and Weight Method:

a. The wait and Weight Method is:

- *increase density of mud in pits to 'kill' weight mud.
- *open choke and bring pump to initial circulating pressure by holding casing pressure at original valve until pump is up to predetermined speed.
- *when initial circulating pressure is obtained on drill pipe, zero pump stroke counter and record time.
- *reduce drill pipe pressure from initial circulating pressure to final circulating pressure by using pump strokes and/or time according to graph
- *when 'kill' weight mud is at the bit, hold final circulating pressure until kill weight mud is to surface.

b. If a kick has occurred, the standard blowout procedure will be followed and the wait and weight method will be used to kill the well. When the well has been put on the choke and circulation has been established, the following safety procedure must be established.

- *determine when gas is anticipated to reach surface.

- *all non-essential personnel must be moved to safe briefing area
- *all remaining personnel will check out and keep with them their protective breathing apparatus.
- *mud men will see that the proper amount of H₂S scavenging chemical is in the mud and record times checked
- *make sure ignition flare is burning and valves are open to designated flare stacks

CORING OPERATIONS IN H₂S BEARING ZONES

1. Personal protective breathing apparatus will be worn from 10 to 15 stands in advance of retrieving the core barrel. Cores to be transported should be sealed and marked to the presence of H₂S.
 - a. Yellow Caution Flag will be flown at the well condition sign.
 - b. The “NO SMOKING” rule will be enforced

DRILL STEM TESTING OF H₂S ZONES

1. The DST subsurface equipment will be suitable for H₂S service as recommended by the API
2. Drill stem testing of H₂S zone will be conducted in daylight hours
3. All non-essential personnel will be moved to an established safe area or off location
4. The “NO SMOKING” rule will be enforced
5. DST fluids will be circulated through a remote controlled choke and a separator to permit flaring of gas. A continuous pilot light will be used.
6. A yellow or red flag will be flown at entrance to location depending on present gas condition
7. If warranted, the use of Aqua Ammonia for neutralizing the toxicity of H₂S from drill string
 - a. During drill stem tests adequate Filming Amine for H₂S corrosion and Aqua Ammonia for neutralizing H₂S should be on location.
8. On completion of DST, if H₂S contaminated formation fluids or gases are present in drill string, floor workers will be masked up before test valve is removed from drill string and continue “mask

on” conditions until such time that readings in the work area do not exceed 10ppm of H₂S gas.

EMERGENCY PROCEDURES

SOUNDING ALARM

In case of an alarm the crews will muster up at the designated area. Total Safety will be dispatched with (2) HES Techs who are to go in under protective breathing air and check the alarm readings and sniff ambient air for the presence of H₂S.

By no means are the Co. Rep or HES Advisor to go in under air with the HES Tech. If there is another method in place where the Rig Manager is to go in with the Tech we need to ensure that the rig company has cleared them and that they are properly trained.

1. The fact is to be instilled in the minds of all rig personnel that the sounding alarm means only one thing: H₂S IS PRESENT. Everyone is to proceed to his assigned station and the contingency plan is put into effect.

DRILLING CREW ACTIONS

1. All personnel will don their protective breathing apparatus. The driller will take necessary precautions as indicated in operating procedures.
2. The Buddy system will be implemented. All personnel will act upon directions from the operator's on-site representative.
3. If there are non-essential personnel on location, they will move off location.
4. Entrance to the location will be patrolled, and the proper well condition flag will be displayed at the entrance to the location.

RESPONSIBILITIES OF PERSONNEL

In order to assure the proper execution of this plan, it is essential that one person be responsible for and in complete charge of implementing these procedures. The responsibility will be as follows:

1. The operator's on-site representative or his assistant
2. Contract Tool Pusher

STEPS TO BE TAKEN

In the event of an accidental release of a potentially hazardous volume of H₂S, the following steps will be taken:

1. Contact by the quickest means of communications: the main offices of Oil Company & Contractor as listed on the preceding page.
2. An assigned crewmember will blockade the entrance to the location. No unauthorized personnel will be allowed entry into the location.
3. The operator's on-site representative will remain on location and attempt to regain control of the well.
4. The drilling company's rig superintendent will begin evacuation of those persons in immediate danger. He will begin by telephoning residents in the danger zone. In the event of no contact by telephoning, the tool pusher will proceed at once to each dwelling for a person-to-person contact. In the event the tool pusher cannot leave the location, he will assign a responsible crewmember to proceed in the evacuation off local residents. Upon arrival, the Sheriff's Department and TOTAL SAFETY personnel will aid in further evacuation.

LEAK IGNITION

Leak Ignition procedure: (used to ignite a leak in the event it becomes necessary to protect the public)

1. Two men, the operator's on-site representative and the contractor's rig superintendent or TOTAL SAFETY's representative(s), wearing self-contained pressure demand air masks must determine the perimeter of the flammable area. This should be done with one man using an H₂S detector and the other one using a flammable gas detector. The flammable perimeter should be established at 30% to 40% of the lower flammable limits.
2. After the flammable perimeter has been established and all employees and citizens have been removed from the area, the ignition team should move to the up-wind area of the leak perimeter and fire a flare into the area if the leak isn't ignited on the first attempt, move in 20 to 30 feet and fire again. Continue moving in and firing until the leak is ignited or the flammable gas detector indicates the ignition

- team is moving into the hazardous area. If trouble is incurred in igniting the leak by firing toward the leak, try firing 40 degrees to 90 degrees to each side of the area where you have been firing. If still no ignition is accomplished ignite the copper line burner and push it into the leak area. This should accomplish ignition. If ignition is not possible due to the makeup of the gas, the toxic leak perimeter must be established and maintained to insure evacuation is completed and continue until the emergency is secure.
3. The following equipment and man-power will be required to support the ignition team:
 - a. one flare gun with flares
 - b. four pressure demand air packs
 - c. two nylon ropes tied to the ignition team
 - d. two men in a clear area equipped with air packs
 - e. portable propane bottle with copper line
 4. The person with the final authority to ignite the well.

GENERAL EQUIPMENT

1. Two areas on the location will be designated as Briefing Areas. The one that is upwind from the well will be designated a the "Safe Briefing Area"
2. In the case of an emergency, personnel will assemble in the upwind area as per prior instructions from the operator's representative.
3. The H2S "Safety" trailer provide by TOTAL SAFETY will contain 10 air cylinders, a resuscitator, one 30-minute air pack and will have a windsock.
4. Two other windsocks will be installed.
5. A condition warning sign will be displayed at the location entrance.
6. A list of emergency telephone numbers will be kept on the rig floor, tool pusher's trailer and the Oil Company's trailer.
7. Two barricades will be available to block the entrance to location.
8. An undulating high and low pitch siren will be installed.
9. A telephone line or mobile phone will be available at the well site for incoming and outgoing communications.

CRITICAL OPERATIONS

These guidelines will be implemented during H2S alarms on drilling locations with the intent of minimizing catastrophic damage of “**critical tasks**” ONLY and exposure of field personnel (e.g. cement in the stack).

We will wait on Total Safety (or H2S Safety Company) for all other alarm events that aren't defined as “critical”.

- 1.) H2S alarm sounds, crews secure well, and muster based off of wind direction. MOC Operation, MOC Safety, and H2S service company notification will be made and representative from the H2S Service Company is in route to location.
- 2.) Two qualified in scope personnel will don SCBA, utilizing the "buddy system", and respond to area of H2S alarm location to verify the presence of H2S utilizing hand held four gas analyzer or other approved and provided method.
- 3.) If no H2S is found, the “all clear” will be authorized by the Marathon Oil Drilling Superintendent and HES to resume operations. H2S service company will still be required to respond.

Note: Personnel will return to muster area awaiting H2S service company and additional equipment if H2S is verified.

Note: Personnel will be trained annually on H2S and the elements of this guideline. The MOC HES Advisor and Co Man will receive hands on training from a H2S service company field tech, on how to properly identify the location of the alarming sensor, and the proper method for checking the alarmed area.

APPENDICES

EMERGENCY & MEDICAL FACILITIES:

Marathon Oil Corporation Emergency Numbers

Matt Rugaard	Drilling Manager	mprugaard@marathonoil.com	281-513-5163
Mark Bly	Drilling Superintendent	permiansuper@marathonoil.com	281-840-0467
Chris Shields	Drilling Superintendent	permiansuper@marathonoil.com	281-840-0467
Don Eynon	Drilling Engineer	deenyon@marathonoil.com	713-296-3265
Paul Allen	Drilling Engineer	pallen@marathonoil.com	713-296-3262
Chris Montan	Drilling Engineer	cmontan@marathoil.com	713-296-4367
Robert Amaya	Drilling Engineer	RAmaya1@marathonoil.com	713-296-2371
Jeremy Wilson	Lead HES Advisor	permianndches@marathonoil.com	281-659-3734
Scott Doughty	Lead HES Advisor	permianndches@marathonoil.com	281-659-3734
Precision 101	Company Man	Prec101@marathonoil.com	
Precision 582	Company Man	Prec582@marathonoil.com	
Precision 594	Company Man	Prec594@marathonoil.com	
Precision 601	Company Man	Prec601@marathonoil.com	
Precision 101	HES Advisor	Prec101hes@marathonoil.com	
Precision 582	HES Advisor	Prec582hes@marathonoil.com	
Precision 594	HES Advisor	Prec594hes@marathonoil.com	
Precision 601	HES Advisor	Prec601hes@marathonoil.com	

Emergency Services Area Numbers: Or Call 911

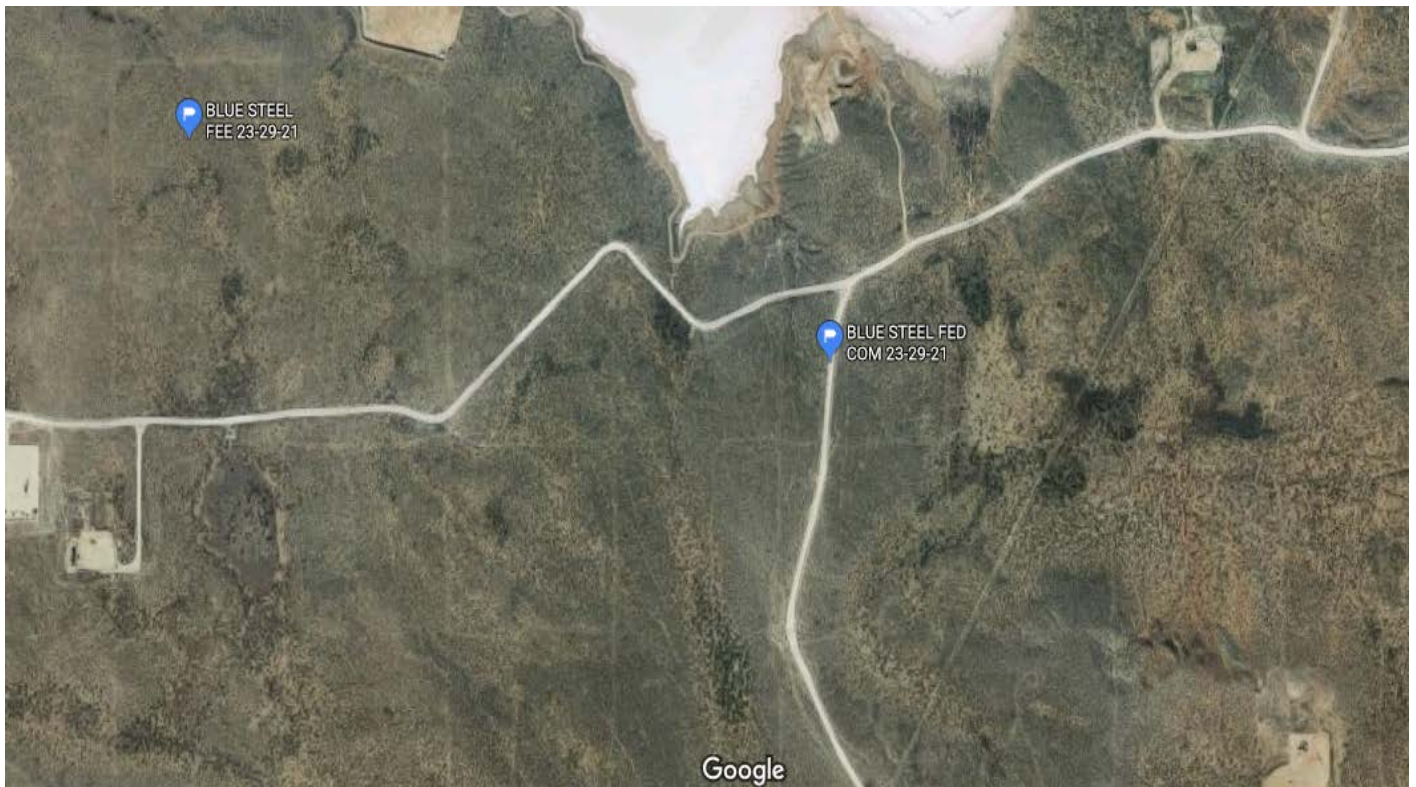
Sheriff (Eddy County, NM)	575-887-7551	New Mexico Poison Control	800-222-1222
Sheriff (Lea County, NM)	575-396-3611	Border Patrol (Las Cruces, NM)	575-528-6600
New Mexico State Police	575-392-5580/5588	Energy Minerals & Natural Resources Dept.	575-748-1283
Carlsbad Medical Center	575-887-4100	Environmental Health Dept.	505-476-8600
Lea Regional Medical Center	575-492-5000	OSHA (Santa Fe, NM)	505-827-2855
Police (Carlsbad, NM)	575-885-2111		
Police (Hobbs, NM)	575-392-9265		
Fire (Carlsbad, NM)	575-885-3124		
Fire (Hobbs, NM)	575-397-9308		
Ambulance Service	911	TOTAL SAFETY H2S – SAFETY SERVICES	432-561-5049

1. For Life Flight, 1st dial “911” They will determine nearest helicopter and confirm the need for helicopter.

RESIDENTS AND LANDOWNERS

RESIDENCE

THERE ARE NO RESIDENCE WITHIN ANY RADIUS OF EXPOSURE.



ADDITIONAL INFORMATION

A. HYDROGEN SULFIDE ESSAY

A deadly enemy of those people employed in the petroleum industry, this gas can paralyze or kill quickly. At least part of the answer lies in education in the hazards, symptoms, characteristics, safe practices, treatment, and the proper use of personal protective equipment.

B. HYDROGEN SULFIDE HAZARDS

The principal hazard to personnel is asphyxiation or poisoning by inhalation. Hydrogen Sulfide is a colorless, flammable gas having an offensive odor and a sweetish taste. It is highly toxic and doubly hazardous because it is heavier than air (specific gravity = 1.19). Its offensive odor, like that of a rotten egg, has been used as an indicator by many old timers in the oil field, but is not a reliable warning of the presence of gas in a dangerous concentration because people differ greatly in their ability to detect smells. Where high concentrations are encountered, the olfactory nerves are rapidly paralyzed, diluting the sense of smell as a warning indicator. A concentration of a few hundredths of one percent higher than that causing irritation can cause asphyxia and death—in other words there is a very narrow margin between consciousness and unconsciousness, and between unconsciousness and death.

Where high concentrations cause respiratory paralysis, spontaneous breathing does not return unless artificial respiration is applied. Although breathing is paralyzed the heart may continue beating for ten minutes after the attack.

C. PHYSIOLOGICAL SYSTEMS

ACUTE: results in almost instantaneous asphyxia, with seeming respiratory paralysis acute poisoning, or strangulation, may occur after even a few seconds inhalation of high concentration and results in panting respiration, pallor, cramps, paralysis and almost immediate loss of consciousness with extreme rapidity from respiratory and cardiac paralysis. One breath of a sufficiently high concentration may have this result.

SUBACUTE: RESULTS IN IRRITATION, PRINCIPALLY OF THE EYES, PERSISTENT COUGH, TIGHTENING OR BURNING IN THE CHEST AND SKIN IRRITATION FOLLOWS BY DEPRESSION OF THE CENTRAL NERVOUS SYSTEM. The eye irritation ranges in severity from mild conjunctivitis to swelling and bulging of the conjunctiva photophobia (abnormal intolerance of light) and temporary blindness.

D. TREATMENT

1. Victim should be removed to fresh air immediately by rescuers wearing respiratory protective equipment. Protect yourself while rescuing.
2. If the victim is not breathing, begin immediately to apply artificial respiration. (See other chart for the chances for life after breathing has stopped.) If a resuscitator is available let another employee get it and prepare for use.
3. Treat for shock, keep victim warm and comfortable
4. Call a doctor, in all cases, victims of poisoning should be attended by a physician.

E. CHARACTERISTICS OF H₂S

1. Extremely Toxic (refer to chart for toxicity of Hydrogen Sulfide).
2. Heavier than air. Specific gravity= 1.19.
3. Colorless, has odor of rotten eggs.
4. Burns with a blue flame and produces sulfur Dioxide (SO₂) gas, which is very irritating to eyes and lungs. The SO₂ is also toxic and can cause serious injury.
5. H₂S is almost as toxic as hydrogen cyanide.
6. H₂S forms explosive mixture, with air between 4.3% and 46% by volume.
7. Between 5 and 6 times as toxic as carbon monoxide.
8. Produces irritation to eyes, throat, and respiratory tract.
9. Threshold Limit Value (TLV) maximum of eight hours exposure without protective respiratory equipment-10ppm.

F. SAFE PRACTICES

If you are faced with an H₂S problem in your operations, the following safe practices are recommended:

1. Be absolutely sure all concerned are familiar with the hazards concerning H₂S and how to avoid it.
2. All employees should know how to operate and maintain respiration equipment.
3. Be able to give and demonstrate artificial respiration.
4. Post areas where there is poisonous gas with suitable warning signs.
5. Be sure all new employees are thoroughly schooled before they are sent to the field-tomorrow may be too late.
6. Teach men to avoid gas whenever possible-work on the windward side, have fresh air mask available.
7. Never let bad judgment guide you-wear respiratory equipment when gauging tanks, etc. Never try to hold your breath in order to enter a contaminated atmosphere.
8. In areas of high concentration, a two-man operation is preferred.
9. Never enter a tank, cellar or other enclosed place where gas can accumulate without proper respiratory protective equipment and a safety belt secured to a lifeline held by another person outside.
10. Always check out danger areas first with H₂S detectors before allowing anyone to enter. DO NOT TRY TO DETERMINE THE PRESENCE OF GAS BY its ODOR.
11. Wear proper respiratory equipment for the job at hand. Never take a chance with equipment with which you are unfamiliar. If in doubt, consult your supervisor.
12. Carry out practice drills every month with emergency and maintenance breathing air equipment. Telling or showing a group how to operate equipment is not enough-make them show you.
13. Maximum care should be taken to prevent the escape of fumes into the air of working places by leaks, etc.
14. Communication such as radio and telephones should be provided for those people employed where H₂S may be present.

TOXICITY OF HYDROGEN SULFIDE TO MEN

H ₂ S Per Cent (PPM)**	0 - 2 Minutes	0 - 15 Minutes	15 - 30 Minutes	30 Minutes to 1 hour	1 - 4 Hours	4 - 8 Hours	4 - 48 Hours
0.005 (50)				Mild Conjunctiv- ities; respiratory tract irritation			
0.010 (100)				Throat			
0.010 (100)		Coughing; irritation of eyes; loss of sense of smell	Disturbed respiration; pain in eyes; sleepiness		Salivation & mucous dis- charge; sharp pain in eyes; coughing	Increased symptoms*	Hemorrhage & death*
0.015 (150)					Difficult breathing; blurred vision; light & shy	Serious irritating effects	Hemorrhage & death*
0.020 (200)		Loss of sense of smell	Throat & eye irritation	Throat & eye irritation	Difficult breathing; blurred vision; light & shy	Serious irritating effects	Hemorrhage & death*
0.025 (250)					Hemorrhage & death		
0.035 (350)	Irritation of eyes; loss of sense of smell	Irritation of eyes	Painful secretion of tears; weariness	Light & shy; nasal catarrh; pain in eyes; difficult breathing			
0.035 (350)		Irritation of eyes; loss of sense of smell	Difficult respiration coughing; irritation of eyes	Increased irritation of eyes and nasal tract; dull pain head; weariness; light shy	Dizziness weak- ness; increased irritation; death	Death*	
0.050 (500)	Coughing collapse & unconscious- ness	Respiratory disturbances; irritation of eyes; collapse	Serious eye irritation; palpitation of heart; few cases of death*	Severe pain in eyes and head dizziness; trem- bling of extre- mities; great weakness & death*			
0.060 (600)	Collapse *	Collapse*					
0.070 (700)	unconscious-	unconscious-					
0.808 (800)	ness; death*	ness; death*					
0.100 (1000)							
0.150 (1500)							

*Data secured from experiments of dogs which have susceptibility similar to men. **PPM - parts per million



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

Drilling Plan Data Report

05/01/2023

APD ID: 10400063501

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: 5H

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
912910	RUSTLER	3000	0	0	ANHYDRITE	OTHER : BRINE	N
7703481	SALADO	2644	356	356	ANHYDRITE, SALT	OTHER : BRINE	N
7703482	CASTILE	2014	986	986	ANHYDRITE, SALT	OTHER : BRINE	N
912912	BASE OF SALT	34	2966	2966	ANHYDRITE, SALT	OTHER : BRINE	N
912915	LAMAR	34	2966	2966	SANDSTONE, SHALE	NONE	N
912919	BELL CANYON	-18	3018	3018	SANDSTONE	OIL	N
912916	CHERRY CANYON	-856	3856	3856	SANDSTONE	OIL	N
912920	BRUSHY CANYON	-1999	4999	4999	SANDSTONE	OIL	N
912921	BONE SPRING LIME	-3645	6645	6645	LIMESTONE	NONE	N
7703493	UPPER AVALON SHALE	-3720	6720	6720	SHALE	OIL	N
7703494	BONE SPRING 1ST	-4682	7682	7682	SANDSTONE	OIL	N
7703495	BONE SPRING 2ND	-5461	8461	8461	SANDSTONE	OIL	N
7703496	BONE SPRING 3RD	-6611	9611	9611	SANDSTONE	OIL	N
912922	WOLFCAMP	-6942	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:** 5H**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	3000	2580	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	3070	0	3044	2901	-44	3070	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	10056	3049	-7056	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: 5H

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	21100	0	10815	2999	-7815	21100	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: 5H

Casing Attachments

Casing ID: 3StringINTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

DRILL_3_3H5H10H23H_Red_Hills_WC_Intermediate_II_20201015121324.pdf

Casing ID: 4StringPRODUCTION

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_20211019102752.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	2070	513	2.21	12.8	1135	75	CLASS C	EXTENDER, ACCELERATOR.
INTERMEDIATE	Tail		2070	3070	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: 5H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Lead		2770	9100	337	3.21	11	1081	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	21100	979	1.22	14.5	1194	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	21100	OIL-BASED MUD	13	14							
0	420	WATER-BASED MUD	8.4	8.8							
420	3070	OTHER : Brine	8.8	9.8							

Operator Name: MARATHON OIL PERMIAN LLC**Well Name:** BLUE STEEL 21 WD FEE**Well Number:** 5H

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
3070	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: 7310

Anticipated Surface Pressure: 4930

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:** 5H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Marathon_BlueSteel21WD_5H_PrelimA_WPReport_20201015123305.pdf

Marathon_BlueSteel21WD5H_PrelimA_ACRReport_20201015123306.pdf

Marathon_BlueSteel21WD_5H_PrelimA_36x48WM_20201015123306.PDF

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_PLAN_Blue_Steel_21_WD_Fee_5H_rev_10.19.21_20211019102938.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:

1. DRILLING WELL CONTROL PLAN

1.1 WELL CONTROL - CERTIFICATIONS

Required IADC/IWCF Well Control Certifications Supervisor Level:

Any personnel who supervises or operates the BOP must possess a valid current IADC training certification and photo identification. This would include the onsite drilling supervisor, tool pusher/rig manager, driller, and any personnel that will be acting in these capacities. Another example of this may be a wireline or snubbing crew rigged up on the rig to assist the rig, the operator of each system must also have a valid control certification for their level of operation.

BLM recognizes IADC training as the industry approved accredited training. Online self-certifications will not be acceptable. Enforcement actions for the lack of a valid Supervisory Level certificate shall be prompt action to correct the deficiency. **Enforcement actions include but are not limited to immediate replacement of personnel lacking certifications, drilling operations being shut down or installment of a 10M annular.**

IADC Driller Level for all Drillers and general knowledge for the Assistant Driller, Derrick Hands, Floor Hands and Motor Hands is recognized by the BLM; however, a Driller Level certification will need to be presented only if acting in a temporary Driller Level certification capacity.

Well Control-Position/Roles

IADC Well control training and certification is targeted toward each role, e.g., Supervisor Level toward those who direct, Driller Level to those who act, Introductory to those who need to know.

- **Supervisor Level**
 - Specifies and has oversight that the correct actions are carried out
 - Role is to supervise well control equipment, training, testing, and well control events
 - Directs the testing of BOP and other well control equipment
 - Regularly direct well control crew drills
 - Land based rigs – usually runs the choke during a well kill operation
 - Due to role on the rig, training and certification is targeted more toward management of well control and managing an influx out of the well
- **Driller Level**
 - Performs an action to prevent or respond to well control accident
 - Role is to monitor the well via electronic devices while drilling and detect unplanned influxes
 - Assist with the testing of BOP and other well control equipment
 - Regularly assist with well control crew drills
 - When influx is detected, responsible to close the BOP
 - Due to role on the rig, training and certification is targeted more toward monitoring and shutting the well in (closing the BOP) when an influx is detected

(Well Control-Positions/Roles Continued)

- **Derrick Hand, Assistant Driller Introductory Level**
 - Role is to assist Driller with kick detection by physically monitoring the well at the mixing pits/tanks
 - Regularly record mud weights/viscosity for analysis by the Supervisor level and mud engineer so pre-influx signs can be detected
 - Mix required kill fluids as directed by Supervisor or Driller
 - Due to role on the rig, training and certification is targeted more toward monitoring for influxes, either via mud samples or visual signs on the pits/tanks
- **Motorman, Floor Hand Introductory Level**
 - Role is to assist the Supervisor, Driller, or Derrick Hand with detecting influxes
 - Be certain all valves are aligned for proper well control as directed by Supervisor
 - Perform Supervisor or Driller assigned tasks during a well control event
 - Due to role on the rig, training and certification is targeted more toward monitoring for influxes

1.2 WELL CONTROL-COMPONENT AND PREVENTER COMPATIBILITY CHECKLIST

The table below, which covers the drilling and casing of the 10M Stack portion of the well, outlines the tubulars and the compatible preventers in use. This table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the rating of the annular preventer.

○ **Example 8-3/4" Production hole section, 10M requirement**

Component	OD	Preventer	RWP
Drill pipe	5"	Fixed lower 5" Upper 4.5-7" VBR	10M
HWDP	5"	Fixed lower 5" Upper 4.5-7" VBR	10M
Drill collars and MWD tools	6.25-6.75"	Upper 4.5-7" VBR	10M
Mud Motor	6.75"	Upper 4.5-7" VBR	10M
Production casing	5.5"	Upper 4.5-7" VBR	10M
ALL	0-13-5/8"	Annular	5M
Open-hole	-	Blind Rams	10M

○ VBR = Variable Bore Ram. Compatible range listed in chart.

1.3 WELL CONTROL-BOP TESTING

BOP Test will be completed per Onshore Oil and Gas Order #2 Well Control requirements. The 5M Annular Preventer on a required 10M BOP stack will be tested to 70 % of rated working pressure including a 10 minute low pressure test. Pressure shall be maintained at least 10 minutes.

1.4 WELL CONTROL - DRILLS

The following drills are conducted and recorded in the Daily Drilling Report and the Contractor's reporting system while engaged in drilling operations:

Type	Frequency	Objective	Comments
Shallow gas kick drill - drilling	Once per well with crew on tour	Response training to a shallow gas influx	To be done prior to drilling surface hole if shallow gas is noted
Kick drill - drilling	Once per week per crew	Response training to an influx while drilling (bit on bottom)	Only one kick drill per week per crew is required, alternating between drilling and tripping.
Kick drill - tripping	Once per week per crew	Response training to an influx while tripping (bit off bottom). Practice stabbing TIW valve	
Choke drill	Once per well with crew on tour	Practice in operating the remotely operated choke with pressure in the well	Before drilling out of the last casing set above a prospective reservoir Include the scenario of flowing well with gas on drill floor as a table top
H ₂ S drill	Prior to drilling into a potential H ₂ S zone/reservoir	Practice in use of respiratory equipment	

1.5 WELL CONTROL – MONITORING

- Drilling operations which utilize static fluid levels in the wellbore as the active barrier element, a means of accurately monitoring fill-up and displacement volumes during trips are available to the driller and operator. A recirculating trip tank is installed and equipped with a volume indicator easily read from the driller's / operator's position. This data is recorded on a calibrated chart recorder or digitally. The actual volumes are compared to the calculated volumes.
- The On-Site Supervisor ensures hole-filling and pit monitoring procedures are established and documented for every rig operation.
- The well is kept full of fluid with a known density and monitored at all times even when out of the hole.
- Flow checks are a minimum of 15 minutes.
- A flow check is made:
 - In the event of a drilling break.
 - After indications of down hole gains or losses.
 - Prior to all trips out of the hole.
 - After pulling into the casing shoe.
 - Before the BHA enters the BOP stack.
 - If trip displacement is incorrect.

Well Control-Monitoring (Continued)

- Prior to dropping a survey instrument.
- Prior to dropping a core ball.
- After a well kill operation.
- When the mud density is reduced in the well.
- Flow checks may be made at any time at the sole discretion of the driller or his designate. The Onsite Supervisor ensures that personnel are aware of this authority and the authority to close the well in immediately without further consultation.
- Record slow circulating rates (SCR) after each crew change, bit trip, and 500' of new hole drilled and after any variance greater than 0.2 ppg in MW. Slow pump rate recordings should include return flow percent, TVD, MD & pressure. SCR's will be done on all pumps at 30, 40 & 50 SPM. Pressures will be recorded at the choke panel. SCR will be recorded in the IADC daily report and MRO Wellview daily report
- Drilling blind (i.e. without returns) is permissible only in known lithology where the absence of hydrocarbons has been predetermined and written approval of the Drilling Manager.
- All open hole logs to be run with pack-off, lubricator or Drilling Manager approved alternative means.
- The Drilling Contractor has a fully working pit level totalizer / monitoring system with read out for the driller and an audible alarm set to 10 BBL gain / loss volume. Systems are selectable to enable monitoring of all pits in use. Pit volumes are monitored at all times, especially when transferring fluids. Both systems data is recorded on a calibrated chart recorder or electronically.
- The Drilling Contractor has a fully working return mud flow indicator with drillers display and an audible alarm, and is adjustable to record any variance in return volumes.

1.6 WELL CONTROL – SHUT IN

- The “hard shut in” method (i.e. against a closed choke using either an annular or ram type preventer) is the Company standard.
- The HCR(s) or failsafe valves are left closed during drilling to prevent any erosion and buildup of solids. The adjustable choke should also be left closed.
- The rig specific shut in procedure, the BOP configuration along with space-out position for the tool joints is posted in the Driller's control cabin or doghouse.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Manager.
- During a well kill by circulation, constant bottom hole pressure is maintained throughout.
- Kill sheets are maintained by the Driller and posted in the Driller's control cabin or doghouse. The sheet is updated at a minimum every 500 feet.

2. SHUT-IN PROCEDURES:

2.1 PROCEDURE WHILE DRILLING

- Sound alarm (alert crew)
- Space out drill string – Stop rotating, pick the drill string up off bottom, and space out to ensure no tool joint is located in the BOP element selected for initial closure.
- Shut down pumps (stop pumps and observe well.)
- Shut-in Well - If flow is suspected or confirmed, close uppermost applicable BOP element. (HCR and choke will already be in the closed position.)
 - **Note:** Either the uppermost pipe ram or annular preventer can be used.
- Confirm shut-in
- Notify toolpusher/company representative
- Gather all relevant data required:
 - SIDPP and SICP
 - Hole Depth and Hole TVD
 - Pit gain
 - Time
 - Kick Volume
 - Pipe depth
 - MW in, MW out
 - SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit
- If pressure has built or is anticipated during the kill to reach 2,500 psi or greater, the annular preventer CANNOT be used as per Oil Company Well Control Policy, swap to the upper BOP pipe ram.

2.2 PROCEDURE WHILE TRIPPING

- Sound alarm (alert crew)
- Stab full opening safety valve in the drill string and close.
- Space out drill string (ensure no tool joint is located in the BOP element selected for initial closure).
- Shut down pumps (stop pumps and observe well.)
- Shut-in Well - If flow is suspected or confirmed, close uppermost applicable BOP element. (HCR and choke will already be in the closed position.)
 - **Note:** Either the uppermost pipe ram or annular preventer can be used.
- Confirm shut-in
- Notify tool pusher/company representative
- Gather all relevant data required:
 - SIDPP and SICP
 - Hole Depth and Hole TVD
 - Pit gain

Procedure While Tripping (Continued)

- o Time
 - o Kick Volume
 - o Pipe depth
 - o MW in, MW out
 - o SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit
If pressure has built or is anticipated during the kill to reach X,XXX psi or greater, the annular preventer CANNOT be used as per Company Well Control Policy, swap to the upper BOP pipe ram.

2.3 PROCEDURE WHILE RUNNING CASING

- Sound alarm (alert crew)
- Stab crossover and full opening safety valve and close
- Space out casing (ensure no coupling is located in the BOP element selected for initial closure).
- Shut down pumps (stop pumps and observe well.)
- Shut-in Well - If flow is suspected or confirmed, close uppermost applicable BOP element. (HCR and choke will already be in the closed position.)
 - o **Note:** Either the uppermost pipe ram or annular preventer can be used.
- Confirm shut-in
- Notify tool pusher/company representative
- Gather all relevant data required:
 - o SIDPP and SICP
 - o Hole Depth and Hole TVD
 - o Pit gain
 - o Time
 - o Kick Volume
 - o Pipe depth
 - o MW in, MW out
 - o SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit
If pressure has built or is anticipated during the kill to reach 2,500 psi or greater, the annular preventer CANNOT be used, swap to the upper BOP pipe ram.

2.4 PROCEDURE WITH NO PIPE IN HOLE (OPEN HOLE)

- Sound alarm (alert crew)
- Shut-in with blind rams or BSR. (HCR and choke will already be in the closed position.)
- Confirm shut-in
- Notify toolpusher/company representative
- Gather all relevant data required:
 - Shut-In Pressure
 - Hole Depth and Hole TVD
 - Pit gain
 - Time
 - Kick Volume
 - MW in, MW out
 - SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit.

2.5 PROCEDURE WHILE PULLING BHA THRU STACK

- PRIOR to pulling last joint of drill pipe thru the stack.
- Perform flow check, if flowing.
- Sound alarm (alert crew).
- Stab full opening safety valve and close
- Space out drill string with tool joint just beneath the upper pipe ram.
- Shut-in using upper pipe ram. (HCR and choke will already be in the closed position).
- Confirm shut-in.
- Notify toolpusher/company representative
- Read and record the following:
 - SIDPP and SICP
 - Pit gain
 - Time
- Regroup and identify forward plan
- **With BHA in the stack and compatible ram preventer and pipe combo immediately available.**
 - Sound alarm (alert crew)
 - Stab crossover and full opening safety valve and close
 - Space out drill string with upset just beneath the compatible pipe ram.
 - Shut-in using compatible pipe ram. (HCR and choke will already be in the closed position.)
 - Confirm shut-in
 - Notify toolpusher/company representative
 - Read and record the following:
 - SIDPP and SICP
 - Pit gain

Procedures While Pulling BHA thru Stack (Continued)

- o Time
 - Regroup and identify forward plan
- **With BHA in the stack and NO compatible ram preventer and pipe combo immediately available.**
 - Sound alarm (alert crew)
 - If possible to pick up high enough, pull string clear of the stack and follow “Open Hole” scenario.
 - If impossible to pick up high enough to pull the string clear of the stack:
 - Stab crossover, make up one joint/stand of drill pipe, and full opening safety valve and close
 - Space out drill string with tool joint just beneath the upper pipe ram.
 - Shut-in using upper pipe ram. (HCR and choke will already be in the closed position.)
 - Confirm shut-in
 - Notify toolpusher/company representative
 - Read and record the following:
 - o SIDPP and SICP
 - o Pit gain
 - o Time

MARATHON OIL PERMIAN LLC
DRILLING AND OPERATIONS PLAN

BLUE STEEL 21 WD FEE 5H

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

EDDY COUNTY, NEW MEXICO

1. GEOLOGICAL FORMATIONS

Formation at Surface	Elevation
Permian	3000

Formation	TVD	MD	Elevation	Lithology	Mineral Resources	Producing Formation
Rustler	0	0	3000	Anhydrite	Brine	No
Salado	356	356	2644	Salt/Anhydrite	Brine	No
Castile	986	986	2014	Salt/Anhydrite	Brine	No
Base of Salt (BX)	2966	2966	34	Salt/Anhydrite	Brine	No
Lamar	2966	2966	34	Sandstone/Shale	None	No
Bell Canyon	3018	3018	-18	Sandstone	Oil	No
Cherry Canyon	3856	3856	-856	Sandstone	Oil	No
Brushy Canyon	4999	4999	-1999	Sandstone	Oil	No
Bone Spring Lime	6645	6645	-3645	Limestone	None	No
Upper Avalon Shale	6720	6720	-3720	Shale	Oil	Yes
1st Bone Spring Sand	7682	7682	-4682	Sandstone	Oil	Yes
2nd Bone Spring Carbonate	7963	7963	-4963	Limestone	None	No
2nd Bone Spring Sand	8461	8461	-5461	Sandstone	Oil	Yes
3rd Bone Spring Carbonate	8804	8804	-5804	Limestone	Oil	No
3rd Bone Spring Sand	9611	9611	-6611	Sandstone	Oil	Yes
Wolfcamp	9942	9942	-6942	Sandstone/Shale/Carbonates	Natural Gas/Oil	Yes
Wolfcamp A	10081	10081	-7081	Sandstone/Shale/Carbonates	Natural Gas/Oil	Yes
Wolfcamp B	10321	10321	-7321	Sandstone/Shale/Carbonates	Natural Gas/Oil	No
Wolfcamp C	10670	10670	-7670	Sandstone/Shale/Carbonates	Natural Gas/Oil	No
Wolfcamp D	11040	11040	-8040	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	3070	0	3045	36	J55	LTC	1.39	1.42	1.8
Intermediate II	8 3/4	7 5/8	0	10100	0	10057	29.7	P110	Wedge 523	3.12	1.16	2.37
Production	6 3/4	5 1/2	0	21100	0	10815	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	2070	513	2.21	12.8	1135	75	Class C	Extender, Accelerator
Intermediate I	Tail	--	2070	3070	353	1.33	14.8	470	50	Class C	Retarder
Intermediate II	Lead	--	2770	9100	337	3.21	11	1081	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	21100	979	1.22	14.5	1194	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	3070	Brine	8.8	9.8
3070	10100	Brine or Oil Based Mud	8.8	9.8
10100	20983	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: 7310 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.

Batch Drilling Plan

- Marathon Oil Permian LLC. respectfully requests the option to “batch” drill sections of a well with intentions of returning to the well for later completion.
- When it is determined that the use of a “batch” drilling process to increase overall efficiency and reduce rig time on location, the following steps will be utilized to ensure compliant well control before releasing drilling rig during the batch process.
- Succeeding a successful cement job, fluid levels will be monitored in both the annulus and casing string to be verified static.
- A mandrel hanger packoff will be ran and installed in the multi-bowl wellhead isolating and creating a barrier on the annulus. This packoff will be tested to 5,000 PSI validating the seals.
- At this point the well is secure and the drilling adapter will be removed from the wellhead.
- A 13-5/8” 5M temporary abandonment cap will be installed on the wellhead by stud and nut flange. The seals of the TA cap will then be pressure tested to 5,000 PSI.
- The drilling rig will skid to the next well on the pad to continue the batch drilling process.
- When returning to the well with the TA cap, the TA cap will be removed and the BOP will be nipped up on the wellhead.
- A BOP test will then be conducted according to Onshore Order #2 and drilling operations will resume on the subject well.

Request for Surface Rig

- Marathon Oil Permian LLC. Requests the option to contract a surface rig to drill, set surface casing and cement on the subject well. If the timing between rigs is such that Marathon Oil Permian LLC. would not be able to preset the surface section, the primary drilling rig will drill the well in its entirety per the APD.

(Closed Loop System)

Page 59 of 102

775'

775'



Access Road

500'

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 @ 3027.00usft

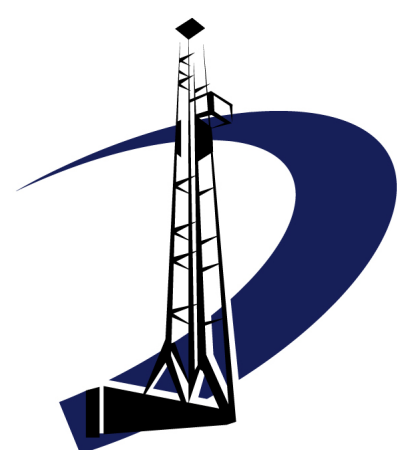
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	466404.27	604770.50	32.2818070	-103.9943181	

SECTION DETAILS

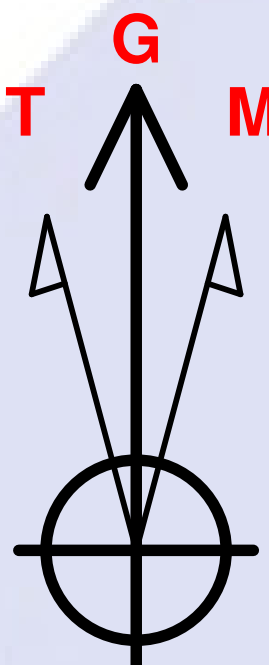
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00
3	800.00	2.00	345.15	799.96	3.37	-0.89	1.00	3.37
4	1200.28	2.00	345.15	1200.00	16.88	-4.47	0.00	16.86
5	1600.23	10.00	345.15	1597.43	57.25	-15.18	2.00	57.19
6	4106.46	10.00	345.15	4065.59	477.87	-126.69	0.00	477.38
7	4606.40	0.00	0.00	4563.00	519.93	-137.84	2.00	519.40
8	10285.40	0.00	0.00	10242.00	519.93	-137.84	0.00	519.40
9	11185.40	90.00	0.22	10814.96	1092.88	-135.61	10.00	1092.35
10	21100.68	90.00	0.22	10815.00	11008.09	-97.08	0.00	11007.64

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[BlueSteel21#5H]FTP	0.00	569.93	-137.78	466974.20	604632.72
[BlueSteel21#5H]KOP	10242.00	519.93	-137.84	466924.20	604632.66
[BlueSteel21#5H]LTP/BHL	10815.00	11008.09	-97.08	477412.36	604673.42



PRODIRECTIONAL



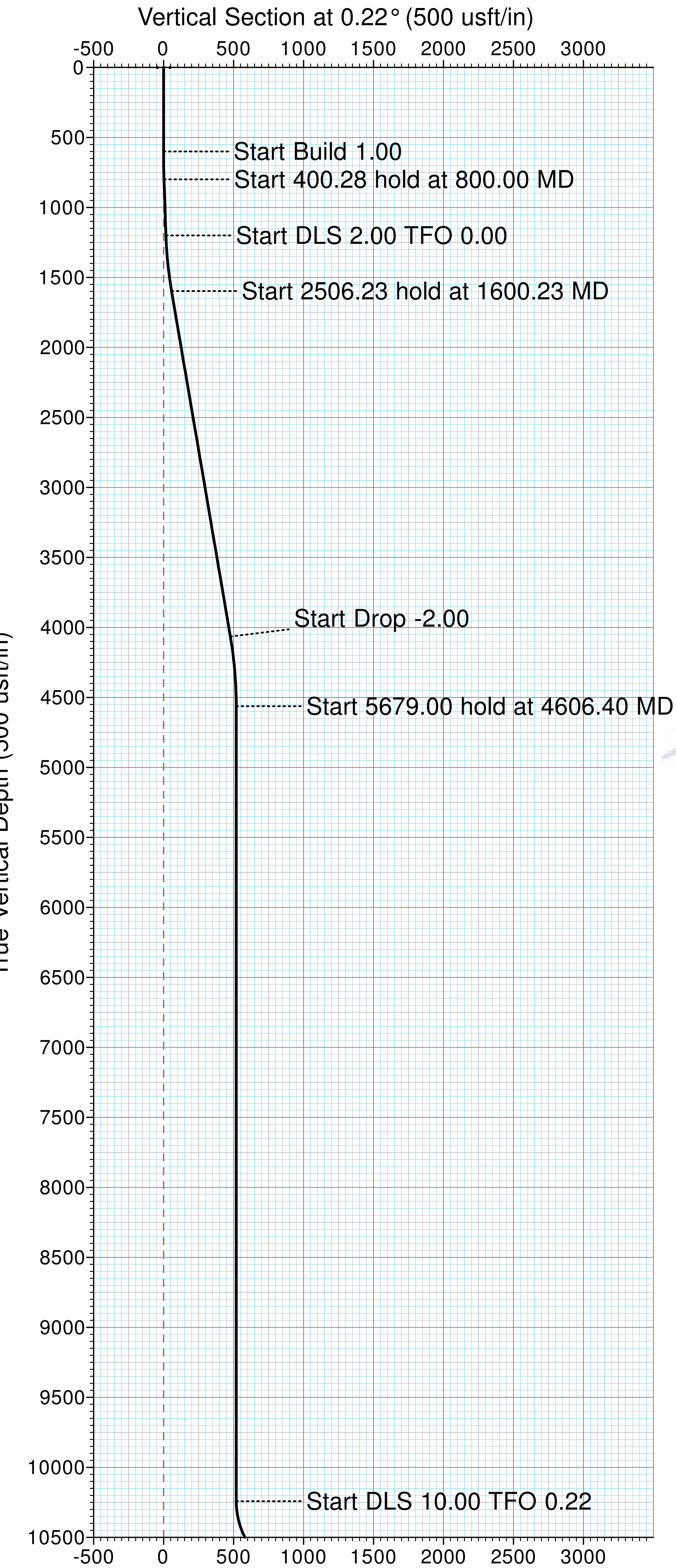
Azimuths to Grid North
True North: -0.18°
Magnetic North: 6.75°

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

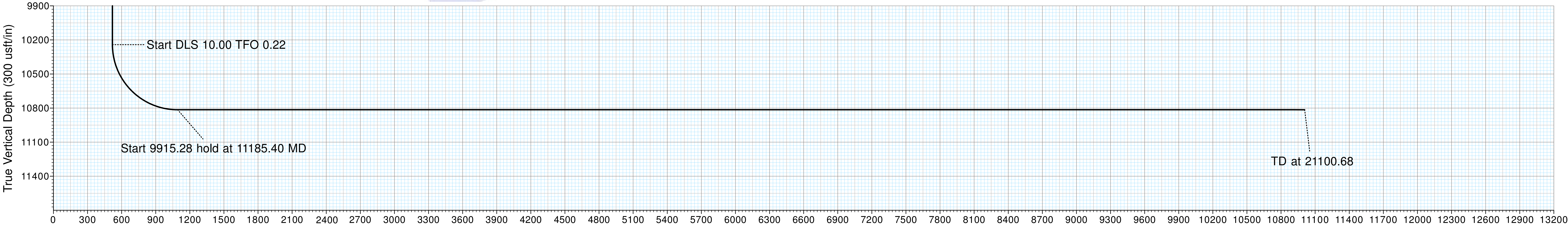
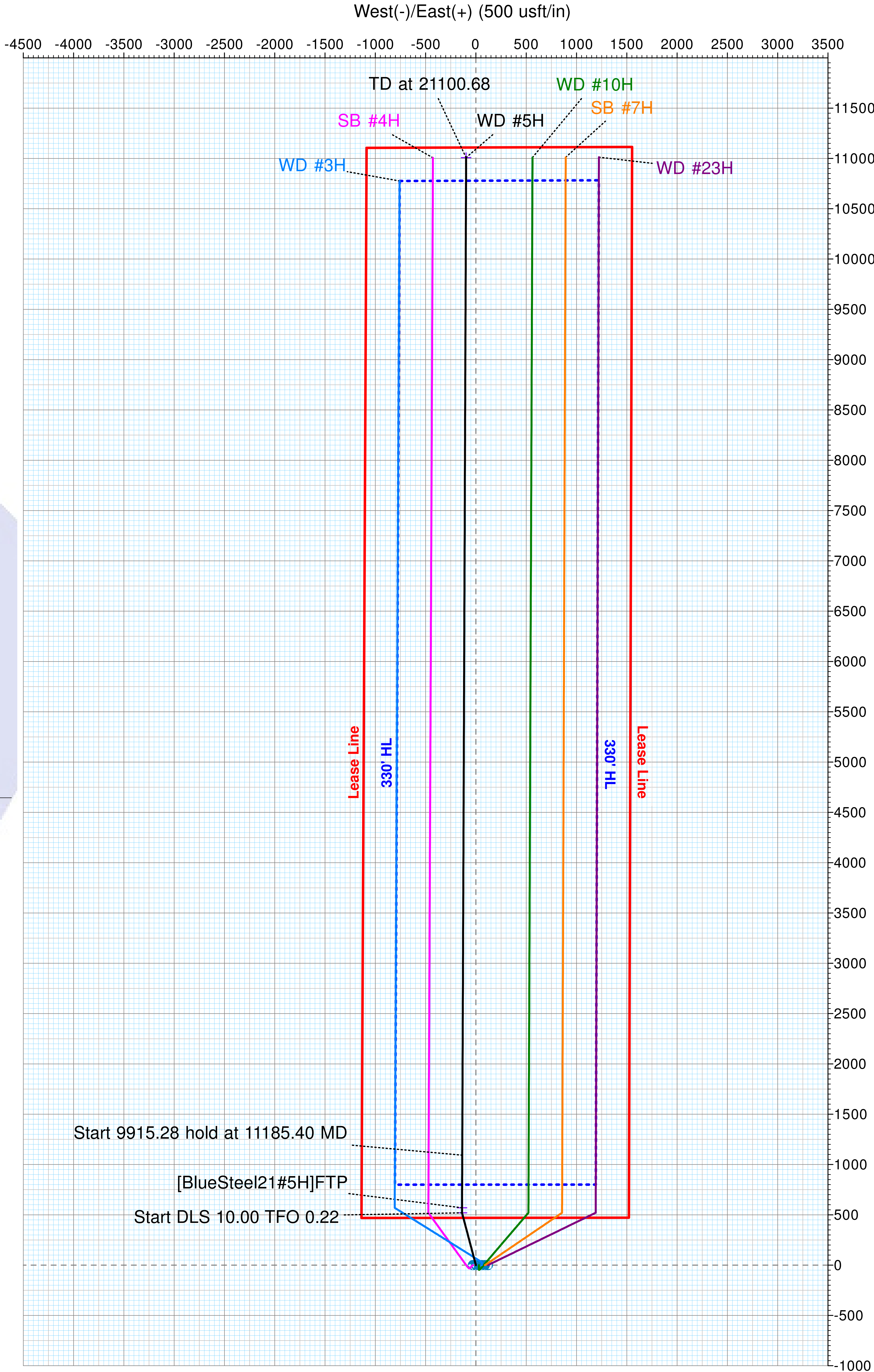
Azimuth Corrections

Total Magnetic Corr. (M to G): 6.75°

Declination (M to T): 6.93° East



Target Line: 10815' TVD @ 0' VS: 90° INC



36" x 48"



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Well:	WD #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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

Site		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 #5H					
Well Position	+N/-S	0.00 usft	Northing:	466,404.27 usft	Latitude:	32.2818070
	+E/-W	0.00 usft	Easting:	604,770.50 usft	Longitude:	-103.9943181
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,000.00 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	21,100.68	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#5H]FTP										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	1.00	345.15	699.99	0.84	-0.22	0.84	1.00	1.00	0.00	
800.00	2.00	345.15	799.96	3.37	-0.89	3.37	1.00	1.00	0.00	
900.00	2.00	345.15	899.90	6.75	-1.79	6.74	0.00	0.00	0.00	



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Well:	WD #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.00	2.00	345.15	999.84	10.12	-2.68	10.11	0.00	0.00	0.00
1,100.00	2.00	345.15	1,099.78	13.49	-3.58	13.48	0.00	0.00	0.00
1,200.28	2.00	345.15	1,200.00	16.88	-4.47	16.86	0.00	0.00	0.00
1,300.00	3.99	345.15	1,299.57	21.92	-5.81	21.89	2.00	2.00	0.00
1,400.00	5.99	345.15	1,399.19	30.33	-8.04	30.30	2.00	2.00	0.00
1,500.00	7.99	345.15	1,498.44	42.10	-11.16	42.06	2.00	2.00	0.00
1,600.23	10.00	345.15	1,597.43	57.25	-15.18	57.19	2.00	2.00	0.00
1,700.00	10.00	345.15	1,695.69	73.99	-19.62	73.92	0.00	0.00	0.00
1,800.00	10.00	345.15	1,794.17	90.78	-24.07	90.68	0.00	0.00	0.00
1,900.00	10.00	345.15	1,892.65	107.56	-28.52	107.45	0.00	0.00	0.00
2,000.00	10.00	345.15	1,991.13	124.34	-32.97	124.22	0.00	0.00	0.00
2,100.00	10.00	345.15	2,089.61	141.13	-37.42	140.98	0.00	0.00	0.00
2,200.00	10.00	345.15	2,188.09	157.91	-41.86	157.75	0.00	0.00	0.00
2,300.00	10.00	345.15	2,286.57	174.69	-46.31	174.51	0.00	0.00	0.00
2,400.00	10.00	345.15	2,385.05	191.48	-50.76	191.28	0.00	0.00	0.00
2,500.00	10.00	345.15	2,483.54	208.26	-55.21	208.05	0.00	0.00	0.00
2,600.00	10.00	345.15	2,582.02	225.04	-59.66	224.81	0.00	0.00	0.00
2,700.00	10.00	345.15	2,680.50	241.82	-64.11	241.58	0.00	0.00	0.00
2,800.00	10.00	345.15	2,778.98	258.61	-68.56	258.34	0.00	0.00	0.00
2,900.00	10.00	345.15	2,877.46	275.39	-73.01	275.11	0.00	0.00	0.00
3,000.00	10.00	345.15	2,975.94	292.17	-77.46	291.87	0.00	0.00	0.00
3,100.00	10.00	345.15	3,074.42	308.96	-81.91	308.64	0.00	0.00	0.00
3,200.00	10.00	345.15	3,172.90	325.74	-86.36	325.41	0.00	0.00	0.00
3,300.00	10.00	345.15	3,271.38	342.52	-90.81	342.17	0.00	0.00	0.00
3,400.00	10.00	345.15	3,369.87	359.31	-95.26	358.94	0.00	0.00	0.00
3,500.00	10.00	345.15	3,468.35	376.09	-99.71	375.70	0.00	0.00	0.00
3,600.00	10.00	345.15	3,566.83	392.87	-104.16	392.47	0.00	0.00	0.00
3,700.00	10.00	345.15	3,665.31	409.65	-108.60	409.23	0.00	0.00	0.00
3,800.00	10.00	345.15	3,763.79	426.44	-113.05	426.00	0.00	0.00	0.00
3,900.00	10.00	345.15	3,862.27	443.22	-117.50	442.77	0.00	0.00	0.00
4,000.00	10.00	345.15	3,960.75	460.00	-121.95	459.53	0.00	0.00	0.00
4,106.46	10.00	345.15	4,065.59	477.87	-126.69	477.38	0.00	0.00	0.00
4,200.00	8.13	345.15	4,157.96	492.11	-130.47	491.61	2.00	-2.00	0.00
4,300.00	6.13	345.15	4,257.19	504.11	-133.65	503.59	2.00	-2.00	0.00
4,400.00	4.13	345.15	4,356.78	512.75	-135.94	512.22	2.00	-2.00	0.00
4,500.00	2.13	345.15	4,456.63	518.02	-137.33	517.49	2.00	-2.00	0.00
4,606.40	0.00	0.00	4,563.00	519.93	-137.84	519.40	2.00	-2.00	0.00
4,700.00	0.00	0.00	4,656.60	519.93	-137.84	519.40	0.00	0.00	0.00
4,800.00	0.00	0.00	4,756.60	519.93	-137.84	519.40	0.00	0.00	0.00
4,900.00	0.00	0.00	4,856.60	519.93	-137.84	519.40	0.00	0.00	0.00
5,000.00	0.00	0.00	4,956.60	519.93	-137.84	519.40	0.00	0.00	0.00
5,100.00	0.00	0.00	5,056.60	519.93	-137.84	519.40	0.00	0.00	0.00
5,200.00	0.00	0.00	5,156.60	519.93	-137.84	519.40	0.00	0.00	0.00



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Well:	WD #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,300.00	0.00	0.00	5,256.60	519.93	-137.84	519.40	0.00	0.00	0.00	
5,400.00	0.00	0.00	5,356.60	519.93	-137.84	519.40	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,456.60	519.93	-137.84	519.40	0.00	0.00	0.00	
5,600.00	0.00	0.00	5,556.60	519.93	-137.84	519.40	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,656.60	519.93	-137.84	519.40	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,756.60	519.93	-137.84	519.40	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,856.60	519.93	-137.84	519.40	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,956.60	519.93	-137.84	519.40	0.00	0.00	0.00	
6,100.00	0.00	0.00	6,056.60	519.93	-137.84	519.40	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,156.60	519.93	-137.84	519.40	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,256.60	519.93	-137.84	519.40	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,356.60	519.93	-137.84	519.40	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,456.60	519.93	-137.84	519.40	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,556.60	519.93	-137.84	519.40	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,656.60	519.93	-137.84	519.40	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,756.60	519.93	-137.84	519.40	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,856.60	519.93	-137.84	519.40	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,956.60	519.93	-137.84	519.40	0.00	0.00	0.00	
7,100.00	0.00	0.00	7,056.60	519.93	-137.84	519.40	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,156.60	519.93	-137.84	519.40	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,256.60	519.93	-137.84	519.40	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,356.60	519.93	-137.84	519.40	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,456.60	519.93	-137.84	519.40	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,556.60	519.93	-137.84	519.40	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,656.60	519.93	-137.84	519.40	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,756.60	519.93	-137.84	519.40	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,856.60	519.93	-137.84	519.40	0.00	0.00	0.00	
8,000.00	0.00	0.00	7,956.60	519.93	-137.84	519.40	0.00	0.00	0.00	
8,100.00	0.00	0.00	8,056.60	519.93	-137.84	519.40	0.00	0.00	0.00	
8,200.00	0.00	0.00	8,156.60	519.93	-137.84	519.40	0.00	0.00	0.00	
8,300.00	0.00	0.00	8,256.60	519.93	-137.84	519.40	0.00	0.00	0.00	
8,400.00	0.00	0.00	8,356.60	519.93	-137.84	519.40	0.00	0.00	0.00	
8,500.00	0.00	0.00	8,456.60	519.93	-137.84	519.40	0.00	0.00	0.00	
8,600.00	0.00	0.00	8,556.60	519.93	-137.84	519.40	0.00	0.00	0.00	
8,700.00	0.00	0.00	8,656.60	519.93	-137.84	519.40	0.00	0.00	0.00	
8,800.00	0.00	0.00	8,756.60	519.93	-137.84	519.40	0.00	0.00	0.00	
8,900.00	0.00	0.00	8,856.60	519.93	-137.84	519.40	0.00	0.00	0.00	
9,000.00	0.00	0.00	8,956.60	519.93	-137.84	519.40	0.00	0.00	0.00	
9,100.00	0.00	0.00	9,056.60	519.93	-137.84	519.40	0.00	0.00	0.00	
9,200.00	0.00	0.00	9,156.60	519.93	-137.84	519.40	0.00	0.00	0.00	
9,300.00	0.00	0.00	9,256.60	519.93	-137.84	519.40	0.00	0.00	0.00	
9,400.00	0.00	0.00	9,356.60	519.93	-137.84	519.40	0.00	0.00	0.00	
9,500.00	0.00	0.00	9,456.60	519.93	-137.84	519.40	0.00	0.00	0.00	



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Well:	WD #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,600.00	0.00	0.00	9,556.60	519.93	-137.84	519.40	0.00	0.00	0.00
9,700.00	0.00	0.00	9,656.60	519.93	-137.84	519.40	0.00	0.00	0.00
9,800.00	0.00	0.00	9,756.60	519.93	-137.84	519.40	0.00	0.00	0.00
9,900.00	0.00	0.00	9,856.60	519.93	-137.84	519.40	0.00	0.00	0.00
10,000.00	0.00	0.00	9,956.60	519.93	-137.84	519.40	0.00	0.00	0.00
10,100.00	0.00	0.00	10,056.60	519.93	-137.84	519.40	0.00	0.00	0.00
10,200.00	0.00	0.00	10,156.60	519.93	-137.84	519.40	0.00	0.00	0.00
10,285.40	0.00	0.00	10,242.00	519.93	-137.84	519.40	0.00	0.00	0.00
[BlueSteel21#5H]KOP									
10,300.00	1.46	0.22	10,256.60	520.12	-137.84	519.58	10.00	10.00	0.00
10,350.00	6.46	0.22	10,306.47	523.57	-137.83	523.04	10.00	10.00	0.00
10,400.00	11.46	0.22	10,355.84	531.35	-137.80	530.82	10.00	10.00	0.00
10,450.00	16.46	0.22	10,404.35	543.41	-137.75	542.88	10.00	10.00	0.00
10,500.00	21.46	0.22	10,451.62	559.65	-137.69	559.12	10.00	10.00	0.00
10,550.00	26.46	0.22	10,497.30	579.95	-137.61	579.42	10.00	10.00	0.00
10,600.00	31.46	0.22	10,541.03	604.15	-137.51	603.62	10.00	10.00	0.00
10,650.00	36.46	0.22	10,582.49	632.07	-137.40	631.54	10.00	10.00	0.00
10,700.00	41.46	0.22	10,621.36	663.50	-137.28	662.97	10.00	10.00	0.00
10,750.00	46.46	0.22	10,657.34	698.20	-137.15	697.67	10.00	10.00	0.00
10,800.00	51.46	0.22	10,690.15	735.90	-137.00	735.37	10.00	10.00	0.00
10,850.00	56.46	0.22	10,719.56	776.32	-136.84	775.79	10.00	10.00	0.00
10,900.00	61.46	0.22	10,745.34	819.14	-136.68	818.61	10.00	10.00	0.00
10,950.00	66.46	0.22	10,767.28	864.05	-136.50	863.52	10.00	10.00	0.00
11,000.00	71.46	0.22	10,785.22	910.71	-136.32	910.18	10.00	10.00	0.00
11,050.00	76.46	0.22	10,799.03	958.74	-136.13	958.21	10.00	10.00	0.00
11,100.00	81.46	0.22	10,808.61	1,007.80	-135.94	1,007.27	10.00	10.00	0.00
11,150.00	86.46	0.22	10,813.86	1,057.51	-135.75	1,056.98	10.00	10.00	0.00
11,185.40	90.00	0.22	10,814.96	1,092.88	-135.61	1,092.35	10.00	10.00	0.00
11,200.00	90.00	0.22	10,814.96	1,107.49	-135.56	1,106.96	0.00	0.00	0.00
11,300.00	90.00	0.22	10,814.96	1,207.48	-135.17	1,206.96	0.00	0.00	0.00
11,400.00	90.00	0.22	10,814.96	1,307.48	-134.78	1,306.96	0.00	0.00	0.00
11,500.00	90.00	0.22	10,814.96	1,407.48	-134.39	1,406.96	0.00	0.00	0.00
11,600.00	90.00	0.22	10,814.96	1,507.48	-134.00	1,506.96	0.00	0.00	0.00
11,700.00	90.00	0.22	10,814.96	1,607.48	-133.61	1,606.96	0.00	0.00	0.00
11,800.00	90.00	0.22	10,814.96	1,707.48	-133.22	1,706.96	0.00	0.00	0.00
11,900.00	90.00	0.22	10,814.96	1,807.48	-132.84	1,806.96	0.00	0.00	0.00
12,000.00	90.00	0.22	10,814.96	1,907.48	-132.45	1,906.96	0.00	0.00	0.00
12,100.00	90.00	0.22	10,814.96	2,007.48	-132.06	2,006.96	0.00	0.00	0.00
12,200.00	90.00	0.22	10,814.96	2,107.48	-131.67	2,106.96	0.00	0.00	0.00
12,300.00	90.00	0.22	10,814.96	2,207.48	-131.28	2,206.96	0.00	0.00	0.00
12,400.00	90.00	0.22	10,814.96	2,307.48	-130.89	2,306.96	0.00	0.00	0.00
12,500.00	90.00	0.22	10,814.96	2,407.48	-130.50	2,406.96	0.00	0.00	0.00
12,600.00	90.00	0.22	10,814.96	2,507.47	-130.12	2,506.96	0.00	0.00	0.00
12,700.00	90.00	0.22	10,814.96	2,607.47	-129.73	2,606.96	0.00	0.00	0.00



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Well:	WD #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
12,800.00	90.00	0.22	10,814.96	2,707.47	-129.34	2,706.96	0.00	0.00	0.00	
12,900.00	90.00	0.22	10,814.97	2,807.47	-128.95	2,806.96	0.00	0.00	0.00	
13,000.00	90.00	0.22	10,814.97	2,907.47	-128.56	2,906.96	0.00	0.00	0.00	
13,100.00	90.00	0.22	10,814.97	3,007.47	-128.17	3,006.96	0.00	0.00	0.00	
13,200.00	90.00	0.22	10,814.97	3,107.47	-127.78	3,106.96	0.00	0.00	0.00	
13,300.00	90.00	0.22	10,814.97	3,207.47	-127.40	3,206.96	0.00	0.00	0.00	
13,400.00	90.00	0.22	10,814.97	3,307.47	-127.01	3,306.96	0.00	0.00	0.00	
13,500.00	90.00	0.22	10,814.97	3,407.47	-126.62	3,406.96	0.00	0.00	0.00	
13,600.00	90.00	0.22	10,814.97	3,507.47	-126.23	3,506.96	0.00	0.00	0.00	
13,700.00	90.00	0.22	10,814.97	3,607.47	-125.84	3,606.96	0.00	0.00	0.00	
13,800.00	90.00	0.22	10,814.97	3,707.47	-125.45	3,706.96	0.00	0.00	0.00	
13,900.00	90.00	0.22	10,814.97	3,807.47	-125.06	3,806.96	0.00	0.00	0.00	
14,000.00	90.00	0.22	10,814.97	3,907.46	-124.68	3,906.96	0.00	0.00	0.00	
14,100.00	90.00	0.22	10,814.97	4,007.46	-124.29	4,006.96	0.00	0.00	0.00	
14,200.00	90.00	0.22	10,814.97	4,107.46	-123.90	4,106.96	0.00	0.00	0.00	
14,300.00	90.00	0.22	10,814.97	4,207.46	-123.51	4,206.96	0.00	0.00	0.00	
14,400.00	90.00	0.22	10,814.97	4,307.46	-123.12	4,306.96	0.00	0.00	0.00	
14,500.00	90.00	0.22	10,814.97	4,407.46	-122.73	4,406.96	0.00	0.00	0.00	
14,600.00	90.00	0.22	10,814.97	4,507.46	-122.34	4,506.96	0.00	0.00	0.00	
14,700.00	90.00	0.22	10,814.97	4,607.46	-121.95	4,606.96	0.00	0.00	0.00	
14,800.00	90.00	0.22	10,814.97	4,707.46	-121.57	4,706.96	0.00	0.00	0.00	
14,900.00	90.00	0.22	10,814.97	4,807.46	-121.18	4,806.96	0.00	0.00	0.00	
15,000.00	90.00	0.22	10,814.97	4,907.46	-120.79	4,906.96	0.00	0.00	0.00	
15,100.00	90.00	0.22	10,814.97	5,007.46	-120.40	5,006.96	0.00	0.00	0.00	
15,200.00	90.00	0.22	10,814.98	5,107.46	-120.01	5,106.96	0.00	0.00	0.00	
15,300.00	90.00	0.22	10,814.98	5,207.45	-119.62	5,206.96	0.00	0.00	0.00	
15,400.00	90.00	0.22	10,814.98	5,307.45	-119.23	5,306.96	0.00	0.00	0.00	
15,500.00	90.00	0.22	10,814.98	5,407.45	-118.85	5,406.96	0.00	0.00	0.00	
15,600.00	90.00	0.22	10,814.98	5,507.45	-118.46	5,506.96	0.00	0.00	0.00	
15,700.00	90.00	0.22	10,814.98	5,607.45	-118.07	5,606.96	0.00	0.00	0.00	
15,800.00	90.00	0.22	10,814.98	5,707.45	-117.68	5,706.96	0.00	0.00	0.00	
15,900.00	90.00	0.22	10,814.98	5,807.45	-117.29	5,806.96	0.00	0.00	0.00	
16,000.00	90.00	0.22	10,814.98	5,907.45	-116.90	5,906.96	0.00	0.00	0.00	
16,100.00	90.00	0.22	10,814.98	6,007.45	-116.51	6,006.96	0.00	0.00	0.00	
16,200.00	90.00	0.22	10,814.98	6,107.45	-116.13	6,106.96	0.00	0.00	0.00	
16,300.00	90.00	0.22	10,814.98	6,207.45	-115.74	6,206.96	0.00	0.00	0.00	
16,400.00	90.00	0.22	10,814.98	6,307.45	-115.35	6,306.96	0.00	0.00	0.00	
16,500.00	90.00	0.22	10,814.98	6,407.45	-114.96	6,406.96	0.00	0.00	0.00	
16,600.00	90.00	0.22	10,814.98	6,507.44	-114.57	6,506.96	0.00	0.00	0.00	
16,700.00	90.00	0.22	10,814.98	6,607.44	-114.18	6,606.96	0.00	0.00	0.00	
16,800.00	90.00	0.22	10,814.98	6,707.44	-113.79	6,706.96	0.00	0.00	0.00	
16,900.00	90.00	0.22	10,814.98	6,807.44	-113.40	6,806.96	0.00	0.00	0.00	
17,000.00	90.00	0.22	10,814.98	6,907.44	-113.02	6,906.96	0.00	0.00	0.00	



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Well:	WD #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
17,100.00	90.00	0.22	10,814.98	7,007.44	-112.63	7,006.96	0.00	0.00	0.00
17,200.00	90.00	0.22	10,814.98	7,107.44	-112.24	7,106.96	0.00	0.00	0.00
17,300.00	90.00	0.22	10,814.98	7,207.44	-111.85	7,206.96	0.00	0.00	0.00
17,400.00	90.00	0.22	10,814.98	7,307.44	-111.46	7,306.96	0.00	0.00	0.00
17,500.00	90.00	0.22	10,814.98	7,407.44	-111.07	7,406.96	0.00	0.00	0.00
17,600.00	90.00	0.22	10,814.99	7,507.44	-110.68	7,506.96	0.00	0.00	0.00
17,700.00	90.00	0.22	10,814.99	7,607.44	-110.30	7,606.96	0.00	0.00	0.00
17,800.00	90.00	0.22	10,814.99	7,707.44	-109.91	7,706.96	0.00	0.00	0.00
17,900.00	90.00	0.22	10,814.99	7,807.43	-109.52	7,806.96	0.00	0.00	0.00
18,000.00	90.00	0.22	10,814.99	7,907.43	-109.13	7,906.96	0.00	0.00	0.00
18,100.00	90.00	0.22	10,814.99	8,007.43	-108.74	8,006.96	0.00	0.00	0.00
18,200.00	90.00	0.22	10,814.99	8,107.43	-108.35	8,106.96	0.00	0.00	0.00
18,300.00	90.00	0.22	10,814.99	8,207.43	-107.96	8,206.96	0.00	0.00	0.00
18,400.00	90.00	0.22	10,814.99	8,307.43	-107.58	8,306.96	0.00	0.00	0.00
18,500.00	90.00	0.22	10,814.99	8,407.43	-107.19	8,406.96	0.00	0.00	0.00
18,600.00	90.00	0.22	10,814.99	8,507.43	-106.80	8,506.96	0.00	0.00	0.00
18,700.00	90.00	0.22	10,814.99	8,607.43	-106.41	8,606.96	0.00	0.00	0.00
18,800.00	90.00	0.22	10,814.99	8,707.43	-106.02	8,706.96	0.00	0.00	0.00
18,900.00	90.00	0.22	10,814.99	8,807.43	-105.63	8,806.96	0.00	0.00	0.00
19,000.00	90.00	0.22	10,814.99	8,907.43	-105.24	8,906.96	0.00	0.00	0.00
19,100.00	90.00	0.22	10,814.99	9,007.43	-104.86	9,006.96	0.00	0.00	0.00
19,200.00	90.00	0.22	10,814.99	9,107.43	-104.47	9,106.96	0.00	0.00	0.00
19,300.00	90.00	0.22	10,814.99	9,207.42	-104.08	9,206.96	0.00	0.00	0.00
19,400.00	90.00	0.22	10,814.99	9,307.42	-103.69	9,306.96	0.00	0.00	0.00
19,500.00	90.00	0.22	10,814.99	9,407.42	-103.30	9,406.96	0.00	0.00	0.00
19,600.00	90.00	0.22	10,814.99	9,507.42	-102.91	9,506.96	0.00	0.00	0.00
19,700.00	90.00	0.22	10,814.99	9,607.42	-102.52	9,606.96	0.00	0.00	0.00
19,800.00	90.00	0.22	10,814.99	9,707.42	-102.13	9,706.96	0.00	0.00	0.00
19,900.00	90.00	0.22	10,815.00	9,807.42	-101.75	9,806.96	0.00	0.00	0.00
20,000.00	90.00	0.22	10,815.00	9,907.42	-101.36	9,906.96	0.00	0.00	0.00
20,100.00	90.00	0.22	10,815.00	10,007.42	-100.97	10,006.96	0.00	0.00	0.00
20,200.00	90.00	0.22	10,815.00	10,107.42	-100.58	10,106.96	0.00	0.00	0.00
20,300.00	90.00	0.22	10,815.00	10,207.42	-100.19	10,206.96	0.00	0.00	0.00
20,400.00	90.00	0.22	10,815.00	10,307.42	-99.80	10,306.96	0.00	0.00	0.00
20,500.00	90.00	0.22	10,815.00	10,407.42	-99.41	10,406.96	0.00	0.00	0.00
20,600.00	90.00	0.22	10,815.00	10,507.41	-99.03	10,506.96	0.00	0.00	0.00
20,700.00	90.00	0.22	10,815.00	10,607.41	-98.64	10,606.96	0.00	0.00	0.00
20,800.00	90.00	0.22	10,815.00	10,707.41	-98.25	10,706.96	0.00	0.00	0.00
20,900.00	90.00	0.22	10,815.00	10,807.41	-97.86	10,806.96	0.00	0.00	0.00
21,000.00	90.00	0.22	10,815.00	10,907.41	-97.47	10,906.96	0.00	0.00	0.00
21,100.68	90.00	0.22	10,815.00	11,008.09	-97.08	11,007.64	0.00	0.00	0.00
[BlueSteel21#5H]LTP/BHL									



Pro Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Well:	WD #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
[BlueSteel21#5H]FTP	0.00	0.00	0.00	569.93	-137.78	466,974.20	604,632.72	32.2833749	-103.9947581
- plan misses target center by 586.35usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									
[BlueSteel21#5H]KOP	0.00	0.00	10,242.0 0	519.93	-137.84	466,924.20	604,632.66	32.2832374	-103.9947588
- plan hits target center									
- Point									
[BlueSteel21#5H]LTP/Bt	0.00	0.00	10,815.0 0	11,008.09	-97.08	477,412.36	604,673.42	32.3120681	-103.9945197
- plan hits target center									
- Point									

Checked By: _____ Approved By: _____ Date: _____



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	21,100.68	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	600.00	29.89	26.04	7.771	CC
SB #4H - OH - Prelim Plan A	700.00	699.61	30.31	25.77	6.667	ES
SB #4H - OH - Prelim Plan A	8,400.00	8,408.67	335.93	276.16	5.620	SF
SB #7H - OH - Prelim Plan A	600.00	601.00	90.13	86.28	23.410	CC
SB #7H - OH - Prelim Plan A	700.00	701.01	90.36	85.79	19.787	ES
SB #7H - OH - Prelim Plan A	1,500.00	1,497.44	109.69	99.41	10.663	SF
WD #10H - OH - Prelim Plan A	600.00	599.00	30.06	26.22	7.822	CC
WD #10H - OH - Prelim Plan A	700.00	698.97	30.34	25.79	6.679	ES
WD #10H - OH - Prelim Plan A	21,100.68	21,268.26	677.07	457.30	3.081	SF
WD #23H - OH - Prelim Plan A	600.00	601.00	119.97	116.12	31.161	CC
WD #23H - OH - Prelim Plan A	800.00	801.04	120.91	115.63	22.889	ES
WD #23H - OH - Prelim Plan A	21,100.68	21,184.06	1,320.40	1,098.53	5.951	SF
WD #3H - OH - Prelim Plan A	1,902.24	1,908.13	55.47	42.34	4.224	CC, ES
WD #3H - OH - Prelim Plan A	20,873.46	20,991.26	671.97	456.40	3.117	SF

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										
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	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	-89.90	0.05	-29.89	29.89					
100.00	100.00	100.00	100.00	0.13	0.13	-89.90	0.05	-29.89	29.89	29.63	0.26	114.222		
200.00	200.00	200.00	200.00	0.49	0.49	-89.90	0.05	-29.89	29.89	28.91	0.98	30.543		
300.00	300.00	300.00	300.00	0.85	0.85	-89.90	0.05	-29.89	29.89	28.19	1.70	17.628		
400.00	400.00	400.00	400.00	1.21	1.21	-89.90	0.05	-29.89	29.89	27.48	2.41	12.390		
500.00	500.00	500.00	500.00	1.56	1.56	-89.90	0.05	-29.89	29.89	26.76	3.13	9.551		
600.00	600.00	600.00	600.00	1.92	1.92	-89.90	0.05	-29.89	29.89	26.04	3.85	7.771	CC	
700.00	699.99	699.61	699.61	2.28	2.27	-77.80	-0.56	-30.50	30.31	25.77	4.55	6.667	ES	
800.00	799.96	800.92	799.04	2.64	2.61	-85.49	-2.40	-32.34	31.98	26.74	5.24	6.100		
900.00	899.90	901.10	898.80	3.00	2.95	-94.46	-4.86	-34.80	35.01	29.07	5.94	5.892		
1,000.00	999.84	1,001.29	998.55	3.36	3.29	-101.85	-7.32	-37.26	38.75	32.11	6.64	5.832		
1,100.00	1,099.78	1,101.47	1,098.31	3.72	3.64	-107.86	-9.79	-39.73	43.02	35.67	7.35	5.853		
1,200.00	1,199.72	1,201.65	1,198.07	4.07	3.99	-112.74	-12.25	-42.19	47.68	39.62	8.06	5.916		
1,300.00	1,299.57	1,301.95	1,297.71	4.43	4.35	-118.29	-14.71	-44.65	53.42	44.65	8.77	6.091		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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						
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	Warning
1,400.00	1,399.19	1,402.54	1,397.05	4.80	4.70	-125.40	-17.16	-47.10	61.53	52.04	9.49	6.487	
1,500.00	1,498.44	1,503.57	1,495.97	5.16	5.06	-132.79	-19.60	-49.54	72.71	62.51	10.21	7.125	
1,600.00	1,597.21	1,605.14	1,594.34	5.52	5.42	-139.59	-22.03	-51.97	87.42	76.49	10.93	7.999	
1,700.00	1,695.69	1,707.02	1,692.40	5.88	5.78	-145.11	-24.45	-54.39	104.46	92.81	11.65	8.964	
1,800.00	1,794.17	1,808.90	1,790.45	6.25	6.15	-149.06	-26.88	-56.82	122.18	109.81	12.38	9.871	
1,900.00	1,892.65	1,889.22	1,888.51	6.61	6.43	-152.00	-29.30	-59.24	140.32	127.30	13.03	10.773	
2,000.00	1,991.13	1,987.33	1,986.57	6.98	6.78	-154.27	-31.72	-61.66	158.74	145.01	13.74	11.555	
2,100.00	2,089.61	2,090.01	2,089.19	7.35	7.15	-155.88	-32.99	-64.78	176.26	161.78	14.48	12.174	
2,200.00	2,188.09	2,194.48	2,193.52	7.72	7.52	-156.60	-30.90	-69.55	190.91	175.69	15.22	12.546	
2,300.00	2,286.57	2,299.85	2,298.54	8.09	7.89	-156.63	-25.30	-75.99	202.54	186.59	15.95	12.700	
2,400.00	2,385.05	2,405.84	2,403.81	8.47	8.26	-156.06	-16.14	-84.11	211.11	194.44	16.67	12.664	
2,500.00	2,483.54	2,512.17	2,508.91	8.84	8.63	-154.96	-3.41	-93.91	216.66	199.28	17.39	12.462	
2,600.00	2,582.02	2,612.81	2,608.03	9.22	8.98	-153.61	10.72	-104.14	220.43	202.32	18.11	12.171	
2,700.00	2,680.50	2,712.61	2,706.32	9.59	9.33	-152.31	24.76	-114.29	224.28	205.44	18.84	11.904	
2,800.00	2,778.98	2,812.41	2,804.60	9.97	9.68	-151.06	38.80	-124.45	228.24	208.67	19.57	11.661	
2,900.00	2,877.46	2,912.21	2,902.88	10.35	10.04	-149.85	52.84	-134.61	232.31	212.01	20.31	11.439	
3,000.00	2,975.94	3,012.01	3,001.17	10.72	10.40	-148.69	66.88	-144.77	236.48	215.44	21.05	11.236	
3,100.00	3,074.42	3,111.81	3,099.45	11.10	10.76	-147.56	80.92	-154.92	240.75	218.96	21.79	11.050	
3,200.00	3,172.90	3,211.61	3,197.73	11.48	11.12	-146.48	94.95	-165.08	245.10	222.57	22.53	10.880	
3,300.00	3,271.38	3,311.40	3,296.02	11.86	11.48	-145.43	108.99	-175.24	249.54	226.27	23.27	10.723	
3,400.00	3,369.87	3,411.20	3,394.30	12.23	11.85	-144.42	123.03	-185.40	254.06	230.04	24.02	10.578	
3,500.00	3,468.35	3,511.00	3,492.58	12.61	12.21	-143.44	137.07	-195.55	258.66	233.89	24.76	10.445	
3,600.00	3,566.83	3,610.80	3,590.87	12.99	12.58	-142.50	151.11	-205.71	263.33	237.81	25.51	10.322	
3,700.00	3,665.31	3,710.60	3,689.15	13.37	12.95	-141.59	165.15	-215.87	268.06	241.80	26.26	10.208	
3,800.00	3,763.79	3,810.40	3,787.43	13.75	13.32	-140.72	179.19	-226.03	272.86	245.85	27.01	10.102	
3,900.00	3,862.27	3,910.20	3,888.72	14.13	13.69	-139.87	193.23	-236.18	277.73	249.97	27.76	10.004	
4,000.00	3,960.75	4,010.00	3,984.00	14.51	14.06	-139.06	207.26	-246.34	282.65	254.14	28.51	9.913	
4,100.00	4,059.23	4,109.80	4,082.28	14.89	14.43	-138.27	221.30	-256.50	287.63	258.36	29.27	9.828	
4,200.00	4,157.96	4,209.60	4,180.57	15.27	14.80	-137.35	235.34	-266.66	291.53	261.51	30.02	9.712	
4,300.00	4,257.19	4,309.32	4,278.78	15.64	15.18	-135.97	249.37	-276.81	293.01	262.24	30.76	9.524	
4,400.00	4,356.78	4,408.85	4,376.80	16.00	15.55	-134.09	263.37	-286.94	292.22	260.71	31.51	9.275	
4,500.00	4,456.63	4,508.07	4,474.50	16.35	15.92	-131.67	277.33	-297.04	289.41	257.17	32.24	8.977	
4,600.00	4,556.60	4,606.84	4,571.78	16.70	16.29	-128.65	291.22	-307.09	284.92	251.96	32.97	8.643	
4,700.00	4,656.60	4,705.32	4,668.76	17.04	16.66	-140.16	305.08	-317.11	280.09	246.40	33.69	8.314	
4,800.00	4,756.60	4,803.81	4,765.75	17.39	17.03	-136.72	318.93	-327.14	276.26	241.85	34.41	8.029	
4,900.00	4,856.60	4,902.29	4,862.73	17.73	17.40	-133.20	332.78	-337.16	273.48	238.35	35.13	7.785	
5,000.00	4,956.60	5,000.77	4,959.72	18.08	17.77	-129.62	346.64	-347.18	271.78	235.94	35.84	7.582	
5,100.00	5,056.60	5,100.75	5,056.70	18.42	18.15	-126.01	360.49	-357.21	271.19	234.62	36.57	7.416	
5,103.41	5,060.01	5,102.61	5,060.01	18.43	18.16	-125.89	360.96	-357.55	271.19	234.60	36.58	7.413	
5,200.00	5,156.60	5,202.27	5,153.69	18.77	18.53	-122.40	374.34	-367.23	271.71	234.42	37.29	7.286	
5,300.00	5,256.60	5,303.79	5,250.68	19.11	18.92	-118.82	388.20	-377.25	273.33	235.31	38.01	7.190	
5,400.00	5,356.60	5,405.31	5,347.66	19.46	19.30	-115.29	402.05	-387.28	276.03	237.30	38.73	7.126	
5,500.00	5,456.60	5,506.83	5,444.65	19.81	19.68	-111.85	415.90	-397.30	279.79	240.34	39.45	7.092	
5,600.00	5,556.60	5,608.35	5,541.63	20.15	20.07	-108.50	429.76	-407.32	284.57	244.40	40.17	7.084	
5,700.00	5,656.60	5,709.86	5,638.62	20.50	20.45	-105.27	443.61	-417.35	290.30	249.41	40.88	7.100	
5,800.00	5,756.60	5,788.62	5,735.60	20.85	20.75	-102.18	457.46	-427.37	296.94	255.42	41.51	7.153	
5,900.00	5,856.60	5,887.10	5,832.59	21.20	21.13	-99.22	471.32	-437.39	304.42	262.21	42.22	7.211	
6,000.00	5,956.60	5,985.87	5,929.86	21.55	21.50	-96.40	485.21	-447.44	312.69	269.77	42.92	7.285	
6,100.00	6,056.60	6,090.66	6,033.40	21.90	21.89	-93.89	498.26	-456.89	320.62	276.95	43.67	7.342	
6,200.00	6,156.60	6,196.51	6,138.52	22.25	22.28	-92.04	508.32	-464.17	327.03	282.62	44.41	7.363	
6,300.00	6,256.60	6,303.15	6,244.80	22.60	22.67	-90.81	515.27	-469.19	331.60	286.46	45.14	7.346	
6,400.00	6,356.60	6,410.28	6,351.82	22.95	23.05	-90.16	519.01	-471.91	334.10	288.25	45.85	7.287	

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	6,456.60	6,515.07	6,456.60	23.30	23.41	-90.04	519.71	-472.41	334.57	288.04	46.53	7.190		
6,600.00	6,556.60	6,615.07	6,556.60	23.65	23.75	-90.04	519.71	-472.41	334.57	287.34	47.23	7.084		
6,700.00	6,656.60	6,715.07	6,656.60	24.00	24.09	-90.04	519.71	-472.41	334.57	286.65	47.92	6.982		
6,800.00	6,756.60	6,815.07	6,756.60	24.35	24.43	-90.04	519.71	-472.41	334.57	285.96	48.61	6.883		
6,900.00	6,856.60	6,915.07	6,856.60	24.70	24.78	-90.04	519.71	-472.41	334.57	285.27	49.30	6.786		
7,000.00	6,956.60	7,015.07	6,956.60	25.05	25.12	-90.04	519.71	-472.41	334.57	284.57	50.00	6.692		
7,100.00	7,056.60	7,115.07	7,056.60	25.40	25.46	-90.04	519.71	-472.41	334.57	283.88	50.69	6.600		
7,200.00	7,156.60	7,215.07	7,156.60	25.76	25.81	-90.04	519.71	-472.41	334.57	283.18	51.39	6.511		
7,300.00	7,256.60	7,315.07	7,256.60	26.11	26.15	-90.04	519.71	-472.41	334.57	282.49	52.08	6.424		
7,400.00	7,356.60	7,415.07	7,356.60	26.46	26.50	-90.04	519.71	-472.41	334.57	281.79	52.78	6.339		
7,500.00	7,456.60	7,515.07	7,456.60	26.81	26.84	-90.04	519.71	-472.41	334.57	281.09	53.48	6.257		
7,600.00	7,556.60	7,615.07	7,556.60	27.17	27.19	-90.04	519.71	-472.41	334.57	280.40	54.17	6.176		
7,700.00	7,656.60	7,715.07	7,656.60	27.52	27.53	-90.04	519.71	-472.41	334.57	279.70	54.87	6.097		
7,800.00	7,756.60	7,815.07	7,756.60	27.87	27.88	-90.04	519.71	-472.41	334.57	279.00	55.57	6.021		
7,900.00	7,856.60	7,915.07	7,856.60	28.22	28.23	-90.04	519.71	-472.41	334.57	278.30	56.27	5.946		
8,000.00	7,956.60	8,015.07	7,956.60	28.58	28.57	-90.04	519.71	-472.41	334.57	277.60	56.97	5.873		
8,100.00	8,056.60	8,115.07	8,056.60	28.93	28.92	-90.04	519.71	-472.41	334.57	276.90	57.67	5.802		
8,200.00	8,156.60	8,215.07	8,156.60	29.28	29.27	-90.04	519.71	-472.41	334.57	276.20	58.37	5.732		
8,250.06	8,206.66	8,265.17	8,206.66	29.46	29.44	-89.75	521.38	-472.40	334.57	275.85	58.72	5.698		
8,300.00	8,256.60	8,314.51	8,255.64	29.64	29.62	-88.75	527.25	-472.38	334.62	275.55	59.07	5.665		
8,400.00	8,356.60	8,408.67	8,346.89	29.99	29.96	-84.86	550.02	-472.28	335.93	276.16	59.77	5.620 SF		
8,500.00	8,456.60	8,493.46	8,424.90	30.34	30.27	-79.30	583.07	-472.14	341.68	281.31	60.37	5.660		
8,600.00	8,556.60	8,567.12	8,488.07	30.70	30.53	-73.19	620.85	-471.97	355.71	295.13	60.57	5.872		
8,700.00	8,656.60	8,629.74	8,537.59	31.05	30.74	-67.37	659.12	-471.81	380.88	320.83	60.05	6.343		
8,800.00	8,756.60	8,682.44	8,575.83	31.41	30.92	-62.28	695.36	-471.65	418.19	359.44	58.75	7.118		
8,900.00	8,856.60	8,726.69	8,605.26	31.76	31.07	-58.00	728.40	-471.51	466.87	409.95	56.92	8.202		
9,000.00	8,956.60	8,763.97	8,628.00	32.12	31.19	-54.49	757.92	-471.38	525.23	470.36	54.87	9.572		
9,100.00	9,056.60	8,800.00	8,648.12	32.47	31.31	-51.22	787.80	-471.25	591.42	538.39	53.03	11.152		
9,200.00	9,156.60	8,822.49	8,659.71	32.82	31.38	-49.26	807.07	-471.17	663.67	612.66	51.01	13.011		
9,300.00	9,256.60	8,850.00	8,672.84	33.18	31.47	-46.95	831.24	-471.06	740.76	691.21	49.55	14.950		
9,400.00	9,356.60	8,865.69	8,679.81	33.53	31.52	-45.68	845.30	-471.00	821.53	773.52	48.01	17.112		
9,500.00	9,456.60	8,883.19	8,687.12	33.89	31.58	-44.31	861.20	-470.93	905.27	858.43	46.84	19.326		
9,600.00	9,556.60	8,900.00	8,693.69	34.24	31.63	-43.03	876.67	-470.87	991.36	945.45	45.91	21.593		
9,700.00	9,656.60	8,900.00	8,693.69	34.60	31.63	-43.03	876.67	-470.87	1,079.53	1,034.78	44.74	24.127		
9,800.00	9,756.60	8,924.24	8,702.35	34.95	31.71	-41.27	899.31	-470.77	1,168.86	1,124.45	44.41	26.321		
9,900.00	9,856.60	8,950.00	8,710.49	35.31	31.79	-39.50	923.75	-470.66	1,259.92	1,215.70	44.22	28.493		
10,000.00	9,956.60	8,950.00	8,710.49	35.66	31.79	-39.50	923.75	-470.66	1,351.53	1,307.97	43.56	31.029		
10,100.00	10,056.60	8,950.00	8,710.49	36.02	31.79	-39.50	923.75	-470.66	1,444.25	1,401.21	43.04	33.560		
10,200.00	10,156.60	8,950.00	8,710.49	36.37	31.79	-39.50	923.75	-470.66	1,537.88	1,495.25	42.63	36.075		
10,300.00	10,256.60	8,968.88	8,715.76	36.73	31.85	-36.04	941.88	-470.59	1,631.81	1,589.16	42.65	38.261		
10,400.00	10,355.84	8,978.24	8,718.15	37.09	31.87	-24.45	950.92	-470.55	1,723.02	1,680.60	42.42	40.621		
10,500.00	10,451.62	9,000.00	8,723.13	37.45	31.94	-18.23	972.11	-470.45	1,807.91	1,765.65	42.26	42.784		
10,600.00	10,541.03	9,000.00	8,723.13	37.81	31.94	-14.84	972.11	-470.45	1,884.41	1,842.73	41.68	45.211		
10,700.00	10,621.36	9,022.77	8,727.48	38.14	32.01	-12.56	994.45	-470.36	1,951.21	1,909.84	41.38	47.158		
10,800.00	10,690.15	9,050.00	8,731.51	38.46	32.09	-11.07	1,021.38	-470.24	2,007.20	1,966.11	41.08	48.855		
10,900.00	10,745.34	9,050.00	8,731.51	38.76	32.09	-10.16	1,021.38	-470.24	2,051.26	2,010.76	40.50	50.651		
11,000.00	10,785.22	9,100.00	8,735.56	39.04	32.23	-9.52	1,071.20	-470.03	2,082.85	2,042.39	40.45	51.488		
11,100.00	10,808.61	9,100.00	8,735.56	39.29	32.23	-9.22	1,071.20	-470.03	2,100.75	2,060.73	40.02	52.493		
11,200.00	10,814.96	9,137.74	8,735.96	39.50	32.34	-9.14	1,108.94	-469.86	2,105.71	2,065.72	39.98	52.663		
11,300.00	10,814.96	9,237.74	8,735.96	39.72	32.63	-9.13	1,208.94	-469.43	2,105.70	2,065.28	40.42	52.101		
11,400.00	10,814.96	9,337.74	8,735.96	39.97	32.95	-9.13	1,308.94	-469.00	2,105.69	2,064.79	40.90	51.481		
11,500.00	10,814.96	9,437.74	8,735.96	40.23	33.29	-9.13	1,408.94	-468.57	2,105.69	2,064.24	41.44	50.808		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	10,814.96	9,537.74	8,735.96	40.51	33.66	-9.13	1,508.94	-468.14	2,105.68	2,063.64	42.04	50.089		
11,700.00	10,814.96	9,637.74	8,735.96	40.82	34.05	-9.13	1,608.93	-467.70	2,105.67	2,062.99	42.68	49.333		
11,800.00	10,814.96	9,737.74	8,735.96	41.14	34.46	-9.13	1,708.93	-467.27	2,105.67	2,062.29	43.38	48.545		
11,900.00	10,814.96	9,837.74	8,735.96	41.49	34.89	-9.13	1,808.93	-466.84	2,105.66	2,061.55	44.11	47.732		
12,000.00	10,814.96	9,937.74	8,735.96	41.86	35.35	-9.13	1,908.93	-466.41	2,105.65	2,060.76	44.90	46.901		
12,100.00	10,814.96	10,037.74	8,735.96	42.24	35.83	-9.12	2,008.93	-465.97	2,105.65	2,059.93	45.72	46.057		
12,200.00	10,814.96	10,137.74	8,735.96	42.64	36.32	-9.12	2,108.93	-465.54	2,105.64	2,059.06	46.58	45.206		
12,300.00	10,814.96	10,237.74	8,735.96	43.06	36.83	-9.12	2,208.93	-465.11	2,105.63	2,058.15	47.48	44.351		
12,400.00	10,814.96	10,337.74	8,735.96	43.50	37.36	-9.12	2,308.93	-464.68	2,105.62	2,057.22	48.41	43.496		
12,500.00	10,814.96	10,437.74	8,735.96	43.96	37.91	-9.12	2,408.93	-464.25	2,105.62	2,056.24	49.37	42.646		
12,600.00	10,814.96	10,537.74	8,735.96	44.43	38.48	-9.12	2,508.93	-463.81	2,105.61	2,055.24	50.37	41.803		
12,700.00	10,814.96	10,637.74	8,735.96	44.92	39.06	-9.12	2,608.92	-463.38	2,105.60	2,054.21	51.39	40.969		
12,800.00	10,814.96	10,737.74	8,735.96	45.42	39.65	-9.12	2,708.92	-462.95	2,105.60	2,053.15	52.45	40.148		
12,900.00	10,814.97	10,837.74	8,735.97	45.94	40.26	-9.12	2,808.92	-462.52	2,105.59	2,052.07	53.52	39.339		
13,000.00	10,814.97	10,937.74	8,735.97	46.47	40.89	-9.11	2,908.92	-462.09	2,105.58	2,050.96	54.63	38.546		
13,100.00	10,814.97	11,037.74	8,735.97	47.02	41.53	-9.11	3,008.92	-461.65	2,105.58	2,049.83	55.75	37.769		
13,200.00	10,814.97	11,137.74	8,735.97	47.58	42.17	-9.11	3,108.92	-461.22	2,105.57	2,048.67	56.89	37.008		
13,300.00	10,814.97	11,237.74	8,735.97	48.15	42.84	-9.11	3,208.92	-460.79	2,105.56	2,047.50	58.06	36.265		
13,400.00	10,814.97	11,337.74	8,735.97	48.73	43.51	-9.11	3,308.92	-460.36	2,105.56	2,046.31	59.24	35.540		
13,500.00	10,814.97	11,437.74	8,735.97	49.33	44.19	-9.11	3,408.92	-459.92	2,105.55	2,045.10	60.45	34.833		
13,600.00	10,814.97	11,537.74	8,735.97	49.94	44.89	-9.11	3,508.92	-459.49	2,105.54	2,043.88	61.67	34.145		
13,700.00	10,814.97	11,637.74	8,735.97	50.56	45.59	-9.11	3,608.92	-459.06	2,105.54	2,042.63	62.90	33.474		
13,800.00	10,814.97	11,737.74	8,735.97	51.19	46.30	-9.10	3,708.91	-458.63	2,105.53	2,041.38	64.15	32.822		
13,900.00	10,814.97	11,837.74	8,735.97	51.83	47.03	-9.10	3,808.91	-458.20	2,105.52	2,040.11	65.41	32.188		
14,000.00	10,814.97	11,937.74	8,735.97	52.48	47.76	-9.10	3,908.91	-457.76	2,105.51	2,038.82	66.69	31.572		
14,100.00	10,814.97	12,037.74	8,735.97	53.14	48.50	-9.10	4,008.91	-457.33	2,105.51	2,037.53	67.98	30.973		
14,200.00	10,814.97	12,137.74	8,735.97	53.81	49.25	-9.10	4,108.91	-456.90	2,105.50	2,036.22	69.28	30.391		
14,300.00	10,814.97	12,237.74	8,735.97	54.49	50.00	-9.10	4,208.91	-456.47	2,105.49	2,034.90	70.59	29.826		
14,400.00	10,814.97	12,337.74	8,735.97	55.18	50.76	-9.10	4,308.91	-456.04	2,105.49	2,033.57	71.92	29.277		
14,500.00	10,814.97	12,437.74	8,735.97	55.87	51.53	-9.10	4,408.91	-455.60	2,105.48	2,032.23	73.25	28.744		
14,600.00	10,814.97	12,537.74	8,735.97	56.58	52.31	-9.10	4,508.91	-455.17	2,105.47	2,030.88	74.59	28.227		
14,700.00	10,814.97	12,637.74	8,735.97	57.29	53.09	-9.09	4,608.91	-454.74	2,105.47	2,029.52	75.94	27.724		
14,800.00	10,814.97	12,737.74	8,735.97	58.01	53.88	-9.09	4,708.91	-454.31	2,105.46	2,028.16	77.30	27.236		
14,900.00	10,814.97	12,837.74	8,735.97	58.73	54.67	-9.09	4,808.90	-453.87	2,105.45	2,026.78	78.67	26.763		
15,000.00	10,814.97	12,937.74	8,735.97	59.47	55.47	-9.09	4,908.90	-453.44	2,105.45	2,025.40	80.05	26.303		
15,100.00	10,814.97	13,037.74	8,735.97	60.21	56.27	-9.09	5,008.90	-453.01	2,105.44	2,024.01	81.43	25.856		
15,200.00	10,814.98	13,137.74	8,735.98	60.95	57.08	-9.09	5,108.90	-452.58	2,105.43	2,022.61	82.82	25.422		
15,300.00	10,814.98	13,237.74	8,735.98	61.70	57.90	-9.09	5,208.90	-452.15	2,105.43	2,021.21	84.22	25.000		
15,400.00	10,814.98	13,337.74	8,735.98	62.46	58.72	-9.09	5,308.90	-451.71	2,105.42	2,019.80	85.62	24.590		
15,500.00	10,814.98	13,437.74	8,735.98	63.22	59.54	-9.08	5,408.90	-451.28	2,105.41	2,018.38	87.03	24.192		
15,600.00	10,814.98	13,537.74	8,735.98	63.99	60.37	-9.08	5,508.90	-450.85	2,105.40	2,016.96	88.44	23.805		
15,700.00	10,814.98	13,637.74	8,735.98	64.77	61.20	-9.08	5,608.90	-450.42	2,105.40	2,015.53	89.86	23.429		
15,800.00	10,814.98	13,737.74	8,735.98	65.55	62.03	-9.08	5,708.90	-449.99	2,105.39	2,014.10	91.29	23.063		
15,900.00	10,814.98	13,837.74	8,735.98	66.33	62.87	-9.08	5,808.89	-449.55	2,105.38	2,012.67	92.72	22.707		
16,000.00	10,814.98	13,937.74	8,735.98	67.12	63.72	-9.08	5,908.89	-449.12	2,105.38	2,011.22	94.15	22.361		
16,100.00	10,814.98	14,037.74	8,735.98	67.92	64.56	-9.08	6,008.89	-448.69	2,105.37	2,009.78	95.59	22.025		
16,200.00	10,814.98	14,137.74	8,735.98	68.71	65.41	-9.08	6,108.89	-448.26	2,105.36	2,008.33	97.04	21.697		
16,300.00	10,814.98	14,237.74	8,735.98	69.52	66.27	-9.08	6,208.89	-447.82	2,105.36	2,006.87	98.48	21.378		
16,400.00	10,814.98	14,337.74	8,735.98	70.32	67.12	-9.07	6,308.89	-447.39	2,105.35	2,005.41	99.93	21.067		
16,500.00	10,814.98	14,437.74	8,735.98	71.13	67.98	-9.07	6,408.89	-446.96	2,105.34	2,003.95	101.39	20.765		
16,600.00	10,814.98	14,537.74	8,735.98	71.95	68.84	-9.07	6,508.89	-446.53	2,105.34	2,002.49	102.85	20.470		
16,700.00	10,814.98	14,637.74	8,735.98	72.77	69.71	-9.07	6,608.89	-446.10	2,105.33	2,001.02	104.31	20.183		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	10,814.98	14,737.74	8,735.98	73.59	70.58	-9.07	6,708.89	-445.66	2,105.32	1,999.54	105.78	19.903		
16,900.00	10,814.98	14,837.74	8,735.98	74.41	71.45	-9.07	6,808.89	-445.23	2,105.32	1,998.07	107.25	19.631		
17,000.00	10,814.98	14,937.74	8,735.98	75.24	72.32	-9.07	6,908.88	-444.80	2,105.31	1,996.59	108.72	19.365		
17,100.00	10,814.98	15,037.74	8,735.98	76.08	73.19	-9.07	7,008.88	-444.37	2,105.30	1,995.11	110.19	19.106		
17,200.00	10,814.98	15,137.74	8,735.98	76.91	74.07	-9.06	7,108.88	-443.94	2,105.29	1,993.62	111.67	18.853		
17,300.00	10,814.98	15,237.74	8,735.98	77.75	74.95	-9.06	7,208.88	-443.50	2,105.29	1,992.14	113.15	18.606		
17,400.00	10,814.98	15,337.74	8,735.98	78.59	75.83	-9.06	7,308.88	-443.07	2,105.28	1,990.65	114.63	18.365		
17,500.00	10,814.98	15,437.74	8,735.98	79.43	76.71	-9.06	7,408.88	-442.64	2,105.27	1,989.15	116.12	18.130		
17,600.00	10,814.99	15,537.74	8,735.99	80.28	77.60	-9.06	7,508.88	-442.21	2,105.27	1,987.66	117.61	17.901		
17,700.00	10,814.99	15,637.74	8,735.99	81.13	78.49	-9.06	7,608.88	-441.77	2,105.26	1,986.16	119.10	17.677		
17,800.00	10,814.99	15,737.74	8,735.99	81.98	79.38	-9.06	7,708.88	-441.34	2,105.25	1,984.66	120.59	17.458		
17,900.00	10,814.99	15,837.74	8,735.99	82.84	80.27	-9.06	7,808.88	-440.91	2,105.25	1,983.16	122.09	17.244		
18,000.00	10,814.99	15,937.74	8,735.99	83.70	81.16	-9.06	7,908.87	-440.48	2,105.24	1,981.66	123.58	17.035		
18,100.00	10,814.99	16,037.74	8,735.99	84.56	82.06	-9.05	8,008.87	-440.05	2,105.23	1,980.15	125.08	16.831		
18,200.00	10,814.99	16,137.74	8,735.99	85.42	82.95	-9.05	8,108.87	-439.61	2,105.23	1,978.64	126.58	16.631		
18,300.00	10,814.99	16,237.74	8,735.99	86.28	83.85	-9.05	8,208.87	-439.18	2,105.22	1,977.13	128.08	16.436		
18,400.00	10,814.99	16,337.74	8,735.99	87.15	84.75	-9.05	8,308.87	-438.75	2,105.21	1,975.62	129.59	16.245		
18,500.00	10,814.99	16,437.74	8,735.99	88.02	85.65	-9.05	8,408.87	-438.32	2,105.21	1,974.11	131.10	16.059		
18,600.00	10,814.99	16,537.74	8,735.99	88.89	86.55	-9.05	8,508.87	-437.89	2,105.20	1,972.60	132.60	15.876		
18,700.00	10,814.99	16,637.74	8,735.99	89.76	87.46	-9.05	8,608.87	-437.45	2,105.19	1,971.08	134.11	15.697		
18,800.00	10,814.99	16,737.74	8,735.99	90.63	88.36	-9.05	8,708.87	-437.02	2,105.19	1,969.56	135.62	15.522		
18,900.00	10,814.99	16,837.74	8,735.99	91.51	89.27	-9.05	8,808.87	-436.59	2,105.18	1,968.04	137.14	15.351		
19,000.00	10,814.99	16,937.74	8,735.99	92.39	90.17	-9.04	8,908.87	-436.16	2,105.17	1,966.52	138.65	15.183		
19,100.00	10,814.99	17,037.74	8,735.99	93.27	91.08	-9.04	9,008.86	-435.72	2,105.16	1,965.00	140.17	15.019		
19,200.00	10,814.99	17,137.74	8,735.99	94.15	91.99	-9.04	9,108.86	-435.29	2,105.16	1,963.48	141.68	14.858		
19,300.00	10,814.99	17,237.74	8,735.99	95.03	92.90	-9.04	9,208.86	-434.86	2,105.15	1,961.95	143.20	14.701		
19,400.00	10,814.99	17,337.74	8,735.99	95.92	93.82	-9.04	9,308.86	-434.43	2,105.14	1,960.42	144.72	14.546		
19,500.00	10,814.99	17,437.74	8,735.99	96.80	94.73	-9.04	9,408.86	-434.00	2,105.14	1,958.90	146.24	14.395		
19,600.00	10,814.99	17,537.74	8,735.99	97.69	95.64	-9.04	9,508.86	-433.56	2,105.13	1,957.37	147.76	14.247		
19,700.00	10,814.99	17,637.74	8,735.99	98.58	96.56	-9.04	9,608.86	-433.13	2,105.12	1,955.84	149.29	14.101		
19,800.00	10,814.99	17,737.74	8,735.99	99.47	97.47	-9.03	9,708.86	-432.70	2,105.12	1,954.31	150.81	13.959		
19,900.00	10,815.00	17,837.74	8,736.00	100.36	98.39	-9.03	9,808.86	-432.27	2,105.11	1,952.78	152.33	13.819		
20,000.00	10,815.00	17,937.74	8,736.00	101.26	99.31	-9.03	9,908.86	-431.84	2,105.10	1,951.24	153.86	13.682		
20,100.00	10,815.00	18,037.74	8,736.00	102.15	100.23	-9.03	10,008.86	-431.40	2,105.10	1,949.71	155.39	13.547		
20,200.00	10,815.00	18,137.74	8,736.00	103.05	101.15	-9.03	10,108.85	-430.97	2,105.09	1,948.17	156.92	13.415		
20,300.00	10,815.00	18,237.74	8,736.00	103.95	102.07	-9.03	10,208.85	-430.54	2,105.08	1,946.64	158.45	13.286		
20,400.00	10,815.00	18,337.74	8,736.00	104.85	102.99	-9.03	10,308.85	-430.11	2,105.08	1,945.10	159.98	13.159		
20,500.00	10,815.00	18,437.74	8,736.00	105.75	103.92	-9.03	10,408.85	-429.67	2,105.07	1,943.56	161.51	13.034		
20,600.00	10,815.00	18,537.74	8,736.00	106.65	104.84	-9.03	10,508.85	-429.24	2,105.06	1,942.02	163.04	12.911		
20,700.00	10,815.00	18,637.74	8,736.00	107.55	105.76	-9.02	10,608.85	-428.81	2,105.06	1,940.48	164.57	12.791		
20,800.00	10,815.00	18,737.74	8,736.00	108.45	106.69	-9.02	10,708.85	-428.38	2,105.05	1,938.94	166.11	12.673		
20,900.00	10,815.00	18,837.74	8,736.00	109.36	107.61	-9.02	10,808.85	-427.95	2,105.04	1,937.40	167.64	12.557		
21,000.00	10,815.00	18,937.74	8,736.00	110.26	108.54	-9.02	10,908.85	-427.51	2,105.03	1,935.86	169.18	12.443		
21,100.00	10,815.00	19,037.74	8,736.00	111.17	109.47	-9.02	11,008.85	-427.08	2,105.03	1,934.32	170.71	12.331		
21,100.68	10,815.00	19,038.42	8,736.00	111.18	109.47	-9.02	11,009.53	-427.08	2,105.03	1,934.30	170.72	12.330		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	1.00	0.00	0.00	0.00	90.00	0.00	90.13	90.13					
100.00	100.00	101.00	100.00	0.13	0.13	90.00	0.00	90.13	90.13	89.86	0.27	339.768		
200.00	200.00	201.00	200.00	0.49	0.49	90.00	0.00	90.13	90.13	89.15	0.98	91.762		
300.00	300.00	301.00	300.00	0.85	0.85	90.00	0.00	90.13	90.13	88.43	1.70	53.044		
400.00	400.00	401.00	400.00	1.21	1.21	90.00	0.00	90.13	90.13	87.71	2.42	37.304		
500.00	500.00	501.00	500.00	1.56	1.57	90.00	0.00	90.13	90.13	87.00	3.13	28.768		
600.00	600.00	601.00	600.00	1.92	1.93	90.00	0.00	90.13	90.13	86.28	3.85	23.410 CC		
700.00	699.99	701.01	699.99	2.28	2.29	105.38	0.00	90.13	90.36	85.79	4.57	19.787 ES		
800.00	799.96	801.04	799.96	2.64	2.64	106.96	0.00	90.13	91.09	85.80	5.28	17.244		
900.00	899.90	901.10	899.90	3.00	3.00	109.04	0.00	90.13	92.17	86.17	6.00	15.365		
1,000.00	999.84	1,001.16	999.84	3.36	3.36	111.06	0.00	90.13	93.36	86.65	6.71	13.904		
1,100.00	1,099.78	1,101.22	1,099.78	3.72	3.72	113.03	0.00	90.13	94.67	87.24	7.43	12.740		
1,200.00	1,199.72	1,201.28	1,199.72	4.07	4.08	114.95	0.00	90.13	96.09	87.95	8.15	11.794		
1,300.00	1,299.57	1,301.43	1,299.57	4.43	4.44	117.66	0.00	90.13	98.41	89.55	8.87	11.101		
1,400.00	1,399.19	1,401.81	1,399.19	4.80	4.80	121.88	0.00	90.13	102.75	93.17	9.58	10.721		
1,500.00	1,498.44	1,497.44	1,498.44	5.16	5.14	127.15	0.00	90.13	109.69	99.41	10.29	10.663 SF		
1,600.00	1,597.21	1,594.36	1,595.34	5.52	5.48	132.16	0.87	91.42	120.57	109.58	10.99	10.970		
1,700.00	1,695.69	1,691.11	1,691.97	5.88	5.83	135.69	3.58	95.40	134.91	123.22	11.69	11.542		
1,800.00	1,794.17	1,787.81	1,788.33	6.25	6.17	137.39	8.12	102.08	150.93	138.55	12.38	12.188		
1,900.00	1,892.65	1,884.24	1,884.09	6.61	6.51	137.71	14.45	111.42	168.29	155.22	13.08	12.870		
2,000.00	1,991.13	1,980.17	1,978.93	6.98	6.85	137.04	22.55	123.34	186.93	173.16	13.77	13.579		
2,100.00	2,089.61	2,077.65	2,074.93	7.35	7.20	135.90	32.03	137.29	206.50	192.03	14.47	14.271		
2,200.00	2,188.09	2,175.63	2,171.43	7.72	7.56	134.93	41.58	151.37	226.16	210.98	15.18	14.897		
2,300.00	2,286.57	2,273.61	2,267.92	8.09	7.91	134.12	51.14	165.44	245.87	229.98	15.90	15.467		
2,400.00	2,385.05	2,371.60	2,364.42	8.47	8.27	133.43	60.70	179.52	265.63	249.01	16.61	15.988		
2,500.00	2,483.54	2,469.58	2,460.91	8.84	8.63	132.84	70.26	193.59	285.41	268.08	17.33	16.465		
2,600.00	2,582.02	2,567.56	2,557.41	9.22	8.99	132.32	79.82	207.67	305.22	287.17	18.06	16.903		
2,700.00	2,680.50	2,665.55	2,653.90	9.59	9.35	131.87	89.38	221.75	325.06	306.27	18.78	17.307		
2,800.00	2,778.98	2,763.53	2,750.40	9.97	9.72	131.47	98.94	235.82	344.91	325.40	19.51	17.680		
2,900.00	2,877.46	2,861.51	2,846.89	10.35	10.08	131.11	108.49	249.90	364.77	344.53	20.24	18.025		
3,000.00	2,975.94	2,959.50	2,943.38	10.72	10.45	130.79	118.05	263.97	384.65	363.68	20.97	18.346		
3,100.00	3,074.42	3,057.48	3,039.88	11.10	10.82	130.50	127.61	278.05	404.54	382.84	21.70	18.645		
3,200.00	3,172.90	3,155.46	3,136.37	11.48	11.19	130.24	137.17	292.12	424.43	402.00	22.43	18.923		
3,300.00	3,271.38	3,253.44	3,232.87	11.86	11.55	130.00	146.73	306.20	444.34	421.17	23.16	19.184		
3,400.00	3,369.87	3,351.43	3,329.36	12.23	11.92	129.78	156.29	320.28	464.25	440.35	23.90	19.428		
3,500.00	3,468.35	3,449.41	3,425.86	12.61	12.29	129.58	165.85	334.35	484.16	459.53	24.63	19.657		
3,600.00	3,566.83	3,547.39	3,522.35	12.99	12.66	129.39	175.40	348.43	504.09	478.72	25.37	19.872		
3,700.00	3,665.31	3,645.38	3,618.85	13.37	13.03	129.22	184.96	362.50	524.01	497.91	26.10	20.075		
3,800.00	3,763.79	3,743.36	3,715.34	13.75	13.40	129.07	194.52	376.58	543.94	517.10	26.84	20.266		
3,900.00	3,862.27	3,841.34	3,811.83	14.13	13.78	128.92	204.08	390.66	563.88	536.30	27.58	20.447		
4,000.00	3,960.75	3,939.33	3,908.33	14.51	14.15	128.78	213.64	404.73	583.82	555.50	28.32	20.618		
4,100.00	4,059.23	4,037.31	4,004.82	14.89	14.52	128.65	223.20	418.81	603.76	574.70	29.05	20.780		
4,200.00	4,157.96	4,135.45	4,101.47	15.27	14.89	128.70	232.77	432.91	622.77	592.97	29.79	20.905		
4,300.00	4,257.19	4,233.88	4,198.41	15.64	15.27	128.51	242.37	447.05	639.66	609.13	30.52	20.957		
4,400.00	4,356.78	4,332.47	4,295.50	16.00	15.64	128.06	251.99	461.21	654.47	623.22	31.25	20.944		
4,500.00	4,456.63	4,431.12	4,392.65	16.35	16.02	127.37	261.61	475.38	667.27	635.31	31.97	20.873		
4,600.00	4,556.60	4,529.69	4,489.72	16.70	16.40	126.46	271.23	489.54	678.18	645.50	32.68	20.753		
4,700.00	4,656.60	4,628.17	4,586.71	17.04	16.77	110.44	280.84	503.69	688.19	654.81	33.39	20.613		
4,800.00	4,756.60	4,726.65	4,683.69	17.39	17.15	109.29	290.44	517.83	698.49	664.40	34.10	20.486		
4,900.00	4,856.60	4,825.13	4,780.67	17.73	17.52	108.17	300.05	531.98	709.07	674.26	34.80	20.373		
5,000.00	4,956.60	4,923.61	4,877.66	18.08	17.90	107.09	309.66	546.13	719.90	684.39	35.51	20.271		
5,100.00	5,056.60	5,022.09	4,974.64	18.42	18.28	106.04	319.27	560.28	730.99	694.77	36.23	20.179		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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		
5,200.00	5,156.60	5,120.57	5,071.63	18.77	18.65	105.02	328.87	574.42	742.32	705.39	36.94	20.098		
5,300.00	5,256.60	5,219.05	5,168.61	19.11	19.03	104.02	338.48	588.57	753.88	716.24	37.65	20.025		
5,400.00	5,356.60	5,317.53	5,265.60	19.46	19.41	103.06	348.09	602.72	765.66	727.30	38.36	19.960		
5,500.00	5,456.60	5,416.01	5,362.58	19.81	19.78	102.13	357.69	616.87	777.65	738.58	39.07	19.903		
5,600.00	5,556.60	5,514.49	5,459.57	20.15	20.16	101.23	367.30	631.01	789.84	750.05	39.79	19.853		
5,700.00	5,656.60	5,612.98	5,556.55	20.50	20.54	100.35	376.91	645.16	802.22	761.72	40.50	19.808		
5,800.00	5,756.60	5,711.46	5,653.54	20.85	20.92	99.50	386.52	659.31	814.78	773.57	41.21	19.770		
5,900.00	5,856.60	5,809.94	5,750.52	21.20	21.29	98.68	396.12	673.46	827.52	785.59	41.93	19.737		
6,000.00	5,956.60	5,908.42	5,847.51	21.55	21.67	97.88	405.73	687.60	840.42	797.77	42.64	19.709		
6,100.00	6,056.60	6,006.90	5,944.49	21.90	22.05	97.10	415.34	701.75	853.48	810.12	43.36	19.685		
6,200.00	6,156.60	6,105.38	6,041.47	22.25	22.43	96.35	424.94	715.90	866.69	822.61	44.07	19.665		
6,300.00	6,256.60	6,203.86	6,138.46	22.60	22.81	95.62	434.55	730.04	880.04	835.25	44.79	19.649		
6,400.00	6,356.60	6,302.34	6,235.44	22.95	23.18	94.91	444.16	744.19	893.53	848.03	45.51	19.636		
6,500.00	6,456.60	6,400.82	6,332.43	23.30	23.56	94.22	453.77	758.34	907.16	860.94	46.22	19.626		
6,600.00	6,556.60	6,500.70	6,429.41	23.65	23.94	93.56	463.37	772.49	920.91	873.96	46.94	19.617		
6,700.00	6,656.60	6,602.22	6,526.40	24.00	24.33	92.91	472.98	786.63	934.78	887.10	47.67	19.608		
6,800.00	6,756.60	6,703.74	6,623.38	24.35	24.72	92.28	482.59	800.78	948.76	900.36	48.40	19.602		
6,900.00	6,856.60	6,794.74	6,720.37	24.70	25.07	91.67	492.19	814.93	962.86	913.77	49.09	19.613		
7,000.00	6,956.60	6,915.80	6,839.77	25.05	25.54	90.98	503.37	831.39	976.39	926.41	49.98	19.537		
7,100.00	7,056.60	7,054.01	6,976.93	25.40	26.05	90.41	512.84	845.33	986.42	935.50	50.92	19.370		
7,200.00	7,156.60	7,193.54	7,116.07	25.76	26.55	90.08	518.62	853.84	992.51	940.70	51.80	19.160		
7,300.00	7,256.60	7,333.74	7,256.21	26.11	27.03	89.96	520.58	856.73	994.57	941.97	52.60	18.908		
7,400.00	7,356.60	7,434.13	7,356.60	26.46	27.37	89.96	520.58	856.73	994.57	941.28	53.29	18.663		
7,500.00	7,456.60	7,534.13	7,456.60	26.81	27.71	89.96	520.58	856.73	994.57	940.59	53.98	18.424		
7,600.00	7,556.60	7,634.13	7,556.60	27.17	28.05	89.96	520.58	856.73	994.57	939.90	54.67	18.191		
7,700.00	7,656.60	7,734.13	7,656.60	27.52	28.39	89.96	520.58	856.73	994.57	939.20	55.37	17.964		
7,800.00	7,756.60	7,834.13	7,756.60	27.87	28.73	89.96	520.58	856.73	994.57	938.51	56.06	17.742		
7,900.00	7,856.60	7,934.13	7,856.60	28.22	29.07	89.96	520.58	856.73	994.57	937.82	56.75	17.525		
8,000.00	7,956.60	8,034.13	7,956.60	28.58	29.41	89.96	520.58	856.73	994.57	937.12	57.45	17.313		
8,100.00	8,056.60	8,134.13	8,056.60	28.93	29.75	89.96	520.58	856.73	994.57	936.43	58.14	17.106		
8,200.00	8,156.60	8,234.13	8,156.60	29.28	30.09	89.96	520.58	856.73	994.57	935.73	58.84	16.904		
8,300.00	8,256.60	8,334.44	8,256.80	29.64	30.43	89.77	523.92	856.74	994.59	935.06	59.53	16.706		
8,400.00	8,356.60	8,428.90	8,349.40	29.99	30.77	88.73	542.06	856.80	994.92	934.69	60.23	16.518		
8,500.00	8,456.60	8,516.22	8,431.32	30.34	31.07	87.00	572.04	856.91	996.43	935.52	60.91	16.359		
8,600.00	8,556.60	8,592.97	8,498.85	30.70	31.33	84.92	608.41	857.03	1,000.47	938.93	61.54	16.258		
8,700.00	8,656.60	8,658.71	8,552.38	31.05	31.53	82.75	646.50	857.16	1,008.42	946.37	62.05	16.252		
8,800.00	8,756.60	8,714.27	8,593.98	31.41	31.69	80.68	683.29	857.29	1,021.48	959.10	62.38	16.374		
8,900.00	8,856.60	8,761.01	8,626.08	31.76	31.81	78.79	717.25	857.41	1,040.48	977.99	62.49	16.650		
9,000.00	8,956.60	8,800.00	8,650.67	32.12	31.91	77.12	747.51	857.51	1,065.89	1,003.54	62.34	17.097		
9,100.00	9,056.60	8,833.72	8,670.23	32.47	31.99	75.63	774.96	857.61	1,097.84	1,035.88	61.96	17.719		
9,200.00	9,156.60	8,862.11	8,685.42	32.82	32.06	74.34	798.95	857.69	1,136.20	1,074.84	61.36	18.518		
9,300.00	9,256.60	8,886.49	8,697.51	33.18	32.12	73.22	820.11	857.76	1,180.65	1,120.06	60.58	19.487		
9,400.00	9,356.60	8,900.00	8,703.82	33.53	32.15	72.59	832.06	857.81	1,230.80	1,171.21	59.59	20.655		
9,500.00	9,456.60	8,925.91	8,715.11	33.89	32.21	71.38	855.37	857.89	1,286.00	1,227.27	58.73	21.896		
9,600.00	9,556.60	8,950.00	8,724.66	34.24	32.26	70.25	877.49	857.96	1,345.95	1,288.10	57.85	23.265		
9,700.00	9,656.60	8,950.00	8,724.66	34.60	32.26	70.25	877.49	857.96	1,409.96	1,353.29	56.66	24.883		
9,800.00	9,756.60	8,968.84	8,731.48	34.95	32.30	69.36	895.05	858.02	1,477.61	1,421.82	55.79	26.484		
9,900.00	9,856.60	8,980.12	8,735.28	35.31	32.33	68.83	905.67	858.06	1,548.54	1,493.66	54.88	28.217		
10,000.00	9,956.60	9,000.00	8,741.47	35.66	32.38	67.89	924.56	858.13	1,622.41	1,568.25	54.16	29.956		
10,100.00	10,056.60	9,000.00	8,741.47	36.02	32.38	67.89	924.56	858.13	1,698.60	1,645.35	53.25	31.900		
10,200.00	10,156.60	9,000.00	8,741.47	36.37	32.38	67.89	924.56	858.13	1,777.15	1,724.73	52.42	33.901		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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)						
10,300.00	10,256.60	9,000.00	8,741.47	36.73	32.38	65.81	924.56	858.13	1,857.72	1,806.04	51.68	35.948		
10,400.00	10,355.84	9,024.90	8,748.30	37.09	32.43	53.64	948.51	858.21	1,936.55	1,885.30	51.25	37.783		
10,500.00	10,451.62	9,050.00	8,754.12	37.45	32.49	44.57	972.92	858.29	2,011.04	1,960.23	50.80	39.584		
10,600.00	10,541.03	9,050.00	8,754.12	37.81	32.49	38.49	972.92	858.29	2,078.62	2,028.56	50.07	41.517		
10,700.00	10,621.36	9,070.28	8,758.04	38.14	32.54	33.83	992.81	858.36	2,138.16	2,088.58	49.57	43.130		
10,800.00	10,690.15	9,100.00	8,762.50	38.46	32.61	30.49	1,022.20	858.46	2,188.32	2,139.12	49.21	44.472		
10,900.00	10,745.34	9,100.00	8,762.50	38.76	32.61	28.38	1,022.20	858.46	2,227.82	2,179.19	48.63	45.814		
11,000.00	10,785.22	9,130.41	8,765.48	39.04	32.68	26.88	1,052.45	858.57	2,255.94	2,207.53	48.40	46.610		
11,100.00	10,808.61	9,150.00	8,766.55	39.29	32.73	26.10	1,072.01	858.63	2,272.29	2,224.09	48.20	47.147		
11,200.00	10,814.96	9,182.05	8,766.96	39.50	32.80	25.90	1,104.06	858.75	2,276.61	2,228.41	48.20	47.236		
11,300.00	10,814.96	9,282.05	8,766.96	39.72	33.06	25.90	1,204.06	859.09	2,276.59	2,227.93	48.67	46.780		
11,400.00	10,814.96	9,382.05	8,766.96	39.97	33.34	25.89	1,304.06	859.44	2,276.57	2,227.39	49.18	46.288		
11,500.00	10,814.96	9,482.05	8,766.96	40.23	33.65	25.89	1,404.06	859.78	2,276.55	2,226.80	49.75	45.760		
11,600.00	10,814.96	9,582.05	8,766.96	40.51	33.99	25.89	1,504.06	860.13	2,276.53	2,226.17	50.36	45.203		
11,700.00	10,814.96	9,682.05	8,766.96	40.82	34.35	25.89	1,604.06	860.47	2,276.52	2,225.49	51.02	44.619		
11,800.00	10,814.96	9,782.05	8,766.96	41.14	34.73	25.89	1,704.06	860.82	2,276.50	2,224.77	51.72	44.012		
11,900.00	10,814.96	9,882.05	8,766.96	41.49	35.13	25.89	1,804.06	861.16	2,276.48	2,224.01	52.47	43.388		
12,000.00	10,814.96	9,982.05	8,766.96	41.86	35.56	25.89	1,904.06	861.51	2,276.46	2,223.21	53.25	42.748		
12,100.00	10,814.96	10,082.05	8,766.96	42.24	36.00	25.89	2,004.05	861.85	2,276.44	2,222.36	54.08	42.097		
12,200.00	10,814.96	10,182.05	8,766.96	42.64	36.47	25.89	2,104.05	862.20	2,276.42	2,221.49	54.94	41.438		
12,300.00	10,814.96	10,282.05	8,766.96	43.06	36.95	25.89	2,204.05	862.54	2,276.40	2,220.57	55.83	40.774		
12,400.00	10,814.96	10,382.05	8,766.96	43.50	37.46	25.88	2,304.05	862.89	2,276.38	2,219.63	56.76	40.108		
12,500.00	10,814.96	10,482.05	8,766.96	43.96	37.98	25.88	2,404.05	863.23	2,276.36	2,218.65	57.72	39.441		
12,600.00	10,814.96	10,582.05	8,766.96	44.43	38.52	25.88	2,504.05	863.58	2,276.35	2,217.64	58.71	38.775		
12,700.00	10,814.96	10,682.05	8,766.96	44.92	39.07	25.88	2,604.05	863.93	2,276.33	2,216.60	59.72	38.114		
12,800.00	10,814.96	10,782.05	8,766.96	45.42	39.65	25.88	2,704.05	864.27	2,276.31	2,215.54	60.77	37.458		
12,900.00	10,814.97	10,882.05	8,766.97	45.94	40.23	25.88	2,804.05	864.62	2,276.29	2,214.45	61.84	36.809		
13,000.00	10,814.97	10,982.05	8,766.97	46.47	40.83	25.88	2,904.05	864.96	2,276.27	2,213.33	62.94	36.168		
13,100.00	10,814.97	11,082.05	8,766.97	47.02	41.45	25.88	3,004.05	865.31	2,276.25	2,212.19	64.06	35.536		
13,200.00	10,814.97	11,182.05	8,766.97	47.58	42.08	25.88	3,104.05	865.65	2,276.23	2,211.03	65.20	34.913		
13,300.00	10,814.97	11,282.05	8,766.97	48.15	42.72	25.88	3,204.05	866.00	2,276.21	2,209.85	66.36	34.301		
13,400.00	10,814.97	11,382.05	8,766.97	48.73	43.37	25.88	3,304.05	866.34	2,276.19	2,208.65	67.54	33.701		
13,500.00	10,814.97	11,482.05	8,766.97	49.33	44.03	25.87	3,404.05	866.69	2,276.18	2,207.43	68.74	33.111		
13,600.00	10,814.97	11,582.05	8,766.97	49.94	44.71	25.87	3,504.05	867.03	2,276.16	2,206.19	69.96	32.534		
13,700.00	10,814.97	11,682.05	8,766.97	50.56	45.39	25.87	3,604.05	867.38	2,276.14	2,204.94	71.20	31.969		
13,800.00	10,814.97	11,782.05	8,766.97	51.19	46.09	25.87	3,704.04	867.72	2,276.12	2,203.67	72.45	31.416		
13,900.00	10,814.97	11,882.05	8,766.97	51.83	46.79	25.87	3,804.04	868.07	2,276.10	2,202.38	73.72	30.876		
14,000.00	10,814.97	11,982.05	8,766.97	52.48	47.51	25.87	3,904.04	868.41	2,276.08	2,201.08	75.00	30.347		
14,100.00	10,814.97	12,082.05	8,766.97	53.14	48.23	25.87	4,004.04	868.76	2,276.06	2,199.76	76.30	29.832		
14,200.00	10,814.97	12,182.05	8,766.97	53.81	48.96	25.87	4,104.04	869.11	2,276.04	2,198.44	77.61	29.328		
14,300.00	10,814.97	12,282.05	8,766.97	54.49	49.70	25.87	4,204.04	869.45	2,276.02	2,197.10	78.93	28.837		
14,400.00	10,814.97	12,382.05	8,766.97	55.18	50.45	25.87	4,304.04	869.80	2,276.01	2,195.74	80.26	28.357		
14,500.00	10,814.97	12,482.05	8,766.97	55.87	51.21	25.86	4,404.04	870.14	2,275.99	2,194.38	81.61	27.889		
14,600.00	10,814.97	12,582.05	8,766.97	56.58	51.97	25.86	4,504.04	870.49	2,275.97	2,193.00	82.96	27.433		
14,700.00	10,814.97	12,682.05	8,766.97	57.29	52.74	25.86	4,604.04	870.83	2,275.95	2,191.62	84.33	26.989		
14,800.00	10,814.97	12,782.05	8,766.97	58.01	53.51	25.86	4,704.04	871.18	2,275.93	2,190.22	85.71	26.555		
14,900.00	10,814.97	12,882.05	8,766.97	58.73	54.29	25.86	4,804.04	871.52	2,275.91	2,188.82	87.09	26.133		
15,000.00	10,814.97	12,982.05	8,766.97	59.47	55.08	25.86	4,904.04	871.87	2,275.89	2,187.41	88.49	25.721		
15,100.00	10,814.97	13,082.05	8,766.97	60.21	55.87	25.86	5,004.04	872.21	2,275.87	2,185.98	89.89	25.319		
15,200.00	10,814.98	13,182.05	8,766.98	60.95	56.67	25.86	5,104.04	872.56	2,275.85	2,184.56	91.30	24.927		
15,300.00	10,814.98	13,282.05	8,766.98	61.70	57.47	25.86	5,204.04	872.90	2,275.84	2,183.12	92.72	24.546		
15,400.00	10,814.98	13,382.05	8,766.98	62.46	58.28	25.86	5,304.04	873.25	2,275.82	2,181.67	94.14	24.174		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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		
15,500.00	10,814.98	13,482.05	8,766.98	63.22	59.10	25.85	5,404.03	873.59	2,275.80	2,180.22	95.58	23.811		
15,600.00	10,814.98	13,582.05	8,766.98	63.99	59.91	25.85	5,504.03	873.94	2,275.78	2,178.76	97.02	23.458		
15,700.00	10,814.98	13,682.05	8,766.98	64.77	60.74	25.85	5,604.03	874.29	2,275.76	2,177.30	98.46	23.113		
15,800.00	10,814.98	13,782.05	8,766.98	65.55	61.56	25.85	5,704.03	874.63	2,275.74	2,175.83	99.91	22.777		
15,900.00	10,814.98	13,882.05	8,766.98	66.33	62.39	25.85	5,804.03	874.98	2,275.72	2,174.35	101.37	22.449		
16,000.00	10,814.98	13,982.05	8,766.98	67.12	63.23	25.85	5,904.03	875.32	2,275.70	2,172.87	102.84	22.129		
16,100.00	10,814.98	14,082.05	8,766.98	67.92	64.06	25.85	6,004.03	875.67	2,275.68	2,171.38	104.31	21.817		
16,200.00	10,814.98	14,182.05	8,766.98	68.71	64.91	25.85	6,104.03	876.01	2,275.67	2,169.88	105.78	21.513		
16,300.00	10,814.98	14,282.05	8,766.98	69.52	65.75	25.85	6,204.03	876.36	2,275.65	2,168.39	107.26	21.216		
16,400.00	10,814.98	14,382.05	8,766.98	70.32	66.60	25.85	6,304.03	876.70	2,275.63	2,166.88	108.74	20.926		
16,500.00	10,814.98	14,482.05	8,766.98	71.13	67.45	25.84	6,404.03	877.05	2,275.61	2,165.38	110.23	20.644		
16,600.00	10,814.98	14,582.05	8,766.98	71.95	68.31	25.84	6,504.03	877.39	2,275.59	2,163.86	111.73	20.367		
16,700.00	10,814.98	14,682.05	8,766.98	72.77	69.16	25.84	6,604.03	877.74	2,275.57	2,162.35	113.22	20.098		
16,800.00	10,814.98	14,782.05	8,766.98	73.59	70.02	25.84	6,704.03	878.08	2,275.55	2,160.83	114.73	19.835		
16,900.00	10,814.98	14,882.05	8,766.98	74.41	70.89	25.84	6,804.03	878.43	2,275.53	2,159.30	116.23	19.578		
17,000.00	10,814.98	14,982.05	8,766.98	75.24	71.75	25.84	6,904.03	878.77	2,275.51	2,157.77	117.74	19.327		
17,100.00	10,814.98	15,082.05	8,766.98	76.08	72.62	25.84	7,004.02	879.12	2,275.50	2,156.24	119.25	19.081		
17,200.00	10,814.98	15,182.05	8,766.98	76.91	73.49	25.84	7,104.02	879.47	2,275.48	2,154.71	120.77	18.842		
17,300.00	10,814.98	15,282.05	8,766.98	77.75	74.37	25.84	7,204.02	879.81	2,275.46	2,153.17	122.29	18.607		
17,400.00	10,814.98	15,382.05	8,766.98	78.59	75.24	25.84	7,304.02	880.16	2,275.44	2,151.63	123.81	18.378		
17,500.00	10,814.98	15,482.05	8,766.98	79.43	76.12	25.83	7,404.02	880.50	2,275.42	2,150.08	125.34	18.154		
17,600.00	10,814.99	15,582.05	8,766.99	80.28	77.00	25.83	7,504.02	880.85	2,275.40	2,148.53	126.87	17.935		
17,700.00	10,814.99	15,682.05	8,766.99	81.13	77.88	25.83	7,604.02	881.19	2,275.38	2,146.98	128.40	17.721		
17,800.00	10,814.99	15,782.05	8,766.99	81.98	78.77	25.83	7,704.02	881.54	2,275.36	2,145.43	129.93	17.512		
17,900.00	10,814.99	15,882.05	8,766.99	82.84	79.65	25.83	7,804.02	881.88	2,275.34	2,143.87	131.47	17.307		
18,000.00	10,814.99	15,982.05	8,766.99	83.70	80.54	25.83	7,904.02	882.23	2,275.33	2,142.32	133.01	17.106		
18,100.00	10,814.99	16,082.05	8,766.99	84.56	81.43	25.83	8,004.02	882.57	2,275.31	2,140.75	134.55	16.910		
18,200.00	10,814.99	16,182.05	8,766.99	85.42	82.32	25.83	8,104.02	882.92	2,275.29	2,139.19	136.10	16.718		
18,300.00	10,814.99	16,282.05	8,766.99	86.28	83.21	25.83	8,204.02	883.26	2,275.27	2,137.62	137.64	16.530		
18,400.00	10,814.99	16,382.05	8,766.99	87.15	84.11	25.83	8,304.02	883.61	2,275.25	2,136.06	139.19	16.346		
18,500.00	10,814.99	16,482.05	8,766.99	88.02	85.01	25.83	8,404.02	883.95	2,275.23	2,134.49	140.75	16.166		
18,600.00	10,814.99	16,582.05	8,766.99	88.89	85.90	25.82	8,504.02	884.30	2,275.21	2,132.91	142.30	15.989		
18,700.00	10,814.99	16,682.05	8,766.99	89.76	86.80	25.82	8,604.02	884.65	2,275.19	2,131.34	143.85	15.816		
18,800.00	10,814.99	16,782.05	8,766.99	90.63	87.70	25.82	8,704.01	884.99	2,275.17	2,129.76	145.41	15.646		
18,900.00	10,814.99	16,882.05	8,766.99	91.51	88.61	25.82	8,804.01	885.34	2,275.16	2,128.18	146.97	15.480		
19,000.00	10,814.99	16,982.05	8,766.99	92.39	89.51	25.82	8,904.01	885.68	2,275.14	2,126.60	148.53	15.317		
19,100.00	10,814.99	17,082.05	8,766.99	93.27	90.41	25.82	9,004.01	886.03	2,275.12	2,125.02	150.10	15.158		
19,200.00	10,814.99	17,182.05	8,766.99	94.15	91.32	25.82	9,104.01	886.37	2,275.10	2,123.44	151.66	15.001		
19,300.00	10,814.99	17,282.05	8,766.99	95.03	92.23	25.82	9,204.01	886.72	2,275.08	2,121.85	153.23	14.848		
19,400.00	10,814.99	17,382.05	8,766.99	95.92	93.14	25.82	9,304.01	887.06	2,275.06	2,120.27	154.80	14.697		
19,500.00	10,814.99	17,482.05	8,766.99	96.80	94.05	25.82	9,404.01	887.41	2,275.04	2,118.68	156.37	14.549		
19,600.00	10,814.99	17,582.05	8,766.99	97.69	94.96	25.81	9,504.01	887.75	2,275.02	2,117.09	157.94	14.405		
19,700.00	10,814.99	17,682.05	8,766.99	98.58	95.87	25.81	9,604.01	888.10	2,275.01	2,115.49	159.51	14.262		
19,800.00	10,814.99	17,782.05	8,766.99	99.47	96.78	25.81	9,704.01	888.44	2,274.99	2,113.90	161.09	14.123		
19,900.00	10,815.00	17,882.05	8,767.00	100.36	97.70	25.81	9,804.01	888.79	2,274.97	2,112.31	162.66	13.986		
20,000.00	10,815.00	17,982.05	8,767.00	101.26	98.61	25.81	9,904.01	889.13	2,274.95	2,110.71	164.24	13.852		
20,100.00	10,815.00	18,082.05	8,767.00	102.15	99.53	25.81	10,004.01	889.48	2,274.93	2,109.11	165.82	13.720		
20,200.00	10,815.00	18,182.05	8,767.00	103.05	100.45	25.81	10,104.01	889.83	2,274.91	2,107.51	167.40	13.590		
20,300.00	10,815.00	18,282.05	8,767.00	103.95	101.36	25.81	10,204.01	890.17	2,274.89	2,105.91	168.98	13.463		
20,400.00	10,815.00	18,382.05	8,767.00	104.85	102.28	25.81	10,304.00	890.52	2,274.87	2,104.31	170.56	13.338		
20,500.00	10,815.00	18,482.05	8,767.00	105.75	103.20	25.81	10,404.00	890.86	2,274.85	2,102.71	172.14	13.215		
20,600.00	10,815.00	18,582.05	8,767.00	106.65	104.12	25.80	10,504.00	891.21	2,274.84	2,101.11	173.73	13.094		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	
20,700.00	10,815.00	18,682.05	8,767.00	107.55	105.05	25.80	10,604.00	891.55	2,274.82	2,099.50	175.31	12.976	
20,800.00	10,815.00	18,782.05	8,767.00	108.45	105.97	25.80	10,704.00	891.90	2,274.80	2,097.90	176.90	12.859	
20,900.00	10,815.00	18,882.05	8,767.00	109.36	106.89	25.80	10,804.00	892.24	2,274.78	2,096.29	178.49	12.745	
21,000.00	10,815.00	18,982.05	8,767.00	110.26	107.82	25.80	10,904.00	892.59	2,274.76	2,094.68	180.08	12.632	
21,100.00	10,815.00	19,082.05	8,767.00	111.17	108.74	25.80	11,004.00	892.93	2,274.74	2,093.08	181.67	12.522	
21,100.68	10,815.00	19,082.73	8,767.00	111.18	108.75	25.80	11,004.68	892.94	2,274.74	2,093.06	181.68	12.521	



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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 #10H - 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	90.13	-0.07	30.06	30.06				
100.00	100.00	101.00	100.00	0.13	0.13	90.13	-0.07	30.06	30.06	29.79	0.27	113.319	
200.00	200.00	201.00	200.00	0.49	0.49	90.13	-0.07	30.06	30.06	29.08	0.98	30.604	
300.00	300.00	301.00	300.00	0.85	0.85	90.13	-0.07	30.06	30.06	28.36	1.70	17.691	
400.00	400.00	401.00	400.00	1.21	1.21	90.13	-0.07	30.06	30.06	27.64	2.42	12.442	
500.00	500.00	501.00	500.00	1.56	1.57	90.13	-0.07	30.06	30.06	26.93	3.13	9.595	
600.00	600.00	599.00	600.00	1.92	1.92	90.13	-0.07	30.06	30.06	26.22	3.84	7.822 CC	
700.00	699.99	698.97	699.96	2.28	2.26	108.19	-0.92	30.06	30.34	25.79	4.54	6.679 ES	
800.00	799.96	801.24	799.72	2.64	2.60	117.37	-3.52	30.06	31.71	26.48	5.24	6.055	
900.00	899.90	901.48	899.42	3.00	2.94	128.16	-7.00	30.06	34.69	28.76	5.93	5.846	
1,000.00	999.84	1,001.72	999.12	3.36	3.28	136.98	-10.48	30.06	38.69	32.06	6.64	5.831	
1,100.00	1,099.78	1,101.96	1,098.82	3.72	3.63	144.03	-13.96	30.06	43.43	36.09	7.34	5.917	
1,200.00	1,199.72	1,202.20	1,198.52	4.07	3.98	149.63	-17.44	30.06	48.69	40.65	8.05	6.051	
1,300.00	1,299.57	1,302.58	1,298.08	4.43	4.33	154.81	-20.92	30.06	55.89	47.13	8.76	6.382	
1,400.00	1,399.19	1,403.32	1,397.28	4.80	4.68	159.84	-24.38	30.06	66.70	57.23	9.47	7.042	
1,500.00	1,498.44	1,504.54	1,496.00	5.16	5.04	164.12	-27.83	30.06	81.21	71.02	10.19	7.969	
1,600.00	1,597.21	1,606.36	1,594.12	5.52	5.40	167.52	-31.26	30.06	99.41	88.50	10.91	9.110	
1,700.00	1,695.69	1,708.52	1,691.89	5.88	5.77	170.08	-34.67	30.06	119.54	107.91	11.63	10.276	
1,800.00	1,794.17	1,789.31	1,789.67	6.25	6.05	171.90	-38.09	30.06	139.84	127.56	12.28	11.390	
1,900.00	1,892.65	1,887.15	1,887.44	6.61	6.40	173.26	-41.50	30.06	160.24	147.26	12.98	12.341	
2,000.00	1,991.13	1,984.98	1,985.22	6.98	6.75	174.31	-44.92	30.06	180.71	167.02	13.69	13.197	
2,100.00	2,089.61	2,086.35	2,086.55	7.35	7.11	174.87	-47.40	30.78	200.50	186.08	14.42	13.903	
2,200.00	2,188.09	2,189.16	2,189.31	7.72	7.47	174.56	-46.92	33.54	218.27	203.12	15.15	14.408	
2,300.00	2,286.57	2,292.55	2,292.52	8.09	7.82	173.55	-43.35	38.39	234.00	218.12	15.87	14.742	
2,400.00	2,385.05	2,396.26	2,395.78	8.47	8.18	171.94	-36.68	45.36	247.81	231.22	16.59	14.934	
2,500.00	2,483.54	2,500.02	2,498.67	8.84	8.54	169.81	-26.91	54.42	259.91	242.60	17.31	15.011	
2,600.00	2,582.02	2,602.51	2,599.79	9.22	8.89	167.23	-14.31	65.36	270.61	252.58	18.04	15.005	
2,700.00	2,680.50	2,701.20	2,696.99	9.59	9.23	164.74	-1.27	76.49	281.31	262.56	18.75	15.002	
2,800.00	2,778.98	2,800.10	2,794.19	9.97	9.58	162.43	11.76	87.63	292.50	273.03	19.47	15.022	
2,900.00	2,877.46	2,901.40	2,891.38	10.35	9.94	160.30	24.79	98.76	304.14	283.93	20.20	15.054	
3,000.00	2,975.94	3,002.70	2,988.58	10.72	10.30	158.32	37.83	109.90	316.16	295.22	20.94	15.101	
3,100.00	3,074.42	3,104.00	3,085.78	11.10	10.66	156.49	50.86	121.03	328.52	306.85	21.67	15.160	
3,200.00	3,172.90	3,205.30	3,182.98	11.48	11.02	154.79	63.89	132.17	341.20	318.79	22.41	15.227	
3,300.00	3,271.38	3,293.40	3,280.18	11.86	11.34	153.21	76.92	143.30	354.16	331.06	23.10	15.333	
3,400.00	3,369.87	3,407.91	3,377.38	12.23	11.76	151.75	89.96	154.44	367.36	343.47	23.89	15.380	
3,500.00	3,468.35	3,509.21	3,474.58	12.61	12.12	150.39	102.99	165.57	380.78	356.15	24.63	15.462	
3,600.00	3,566.83	3,589.49	3,571.77	12.99	12.42	149.12	116.02	176.71	394.40	369.11	25.29	15.594	
3,700.00	3,665.31	3,688.19	3,668.97	13.37	12.78	147.93	129.06	187.84	408.20	382.18	26.03	15.684	
3,800.00	3,763.79	3,786.89	3,766.17	13.75	13.14	146.82	142.09	198.97	422.16	395.40	26.76	15.775	
3,900.00	3,862.27	3,885.59	3,863.37	14.13	13.50	145.78	155.12	210.11	436.27	408.78	27.50	15.866	
4,000.00	3,960.75	3,984.29	3,960.57	14.51	13.87	144.81	168.15	221.24	450.51	422.28	28.23	15.957	
4,100.00	4,059.23	4,082.98	4,057.77	14.89	14.23	143.90	181.19	232.38	464.87	435.90	28.97	16.046	
4,200.00	4,157.96	4,181.78	4,155.06	15.27	14.60	143.08	194.23	243.53	478.13	448.43	29.71	16.095	
4,300.00	4,257.19	4,280.72	4,252.50	15.64	14.96	142.04	207.30	254.69	488.79	458.36	30.44	16.059	
4,400.00	4,356.78	4,379.68	4,349.96	16.00	15.33	140.78	220.36	265.85	496.96	465.79	31.16	15.946	
4,500.00	4,456.63	4,478.55	4,447.32	16.35	15.70	139.29	233.42	277.01	502.75	470.87	31.88	15.768	
4,600.00	4,556.60	4,577.20	4,544.47	16.70	16.07	137.55	246.45	288.14	506.35	473.75	32.60	15.534	
4,700.00	4,656.60	4,675.68	4,641.46	17.04	16.43	120.79	259.45	299.25	509.04	475.74	33.30	15.285	
4,800.00	4,756.60	4,774.16	4,738.44	17.39	16.80	118.91	272.45	310.36	512.30	478.29	34.01	15.063	
4,900.00	4,856.60	4,872.64	4,835.42	17.73	17.17	117.04	285.46	321.47	516.13	481.41	34.72	14.865	
5,000.00	4,956.60	4,971.12	4,932.41	18.08	17.54	115.21	298.46	332.58	520.50	485.08	35.43	14.692	
5,100.00	5,056.60	5,069.60	5,029.39	18.42	17.91	113.41	311.47	343.69	525.42	489.28	36.14	14.540	

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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 #10H - 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)						
5,200.00	5,156.60	5,168.08	5,126.37	18.77	18.28	111.64	324.47	354.80	530.86	494.01	36.85	14.408		
5,300.00	5,256.60	5,266.56	5,223.36	19.11	18.65	109.91	337.47	365.91	536.80	499.25	37.55	14.294		
5,400.00	5,356.60	5,365.04	5,320.34	19.46	19.02	108.22	350.48	377.02	543.24	504.97	38.26	14.197		
5,500.00	5,456.60	5,463.52	5,417.33	19.81	19.39	106.56	363.48	388.13	550.15	511.17	38.97	14.116		
5,600.00	5,556.60	5,562.00	5,514.31	20.15	19.76	104.95	376.49	399.24	557.51	517.83	39.68	14.049		
5,700.00	5,656.60	5,660.48	5,611.29	20.50	20.13	103.38	389.49	410.35	565.31	524.92	40.39	13.995		
5,800.00	5,756.60	5,758.96	5,708.28	20.85	20.50	101.86	402.49	421.46	573.53	532.43	41.10	13.954		
5,900.00	5,856.60	5,857.44	5,805.26	21.20	20.87	100.37	415.50	432.57	582.16	540.35	41.81	13.923		
6,000.00	5,956.60	5,955.92	5,902.24	21.55	21.25	98.94	428.50	443.68	591.17	548.64	42.52	13.902		
6,100.00	6,056.60	6,054.40	5,999.23	21.90	21.62	97.54	441.51	454.79	600.54	557.31	43.23	13.890		
6,200.00	6,156.60	6,152.88	6,096.21	22.25	21.99	96.18	454.51	465.90	610.27	566.32	43.95	13.887		
6,300.00	6,256.60	6,251.37	6,193.19	22.60	22.36	94.87	467.51	477.01	620.33	575.67	44.66	13.891		
6,400.00	6,356.60	6,349.85	6,290.18	22.95	22.73	93.60	480.52	488.12	630.71	585.34	45.37	13.902		
6,500.00	6,456.60	6,456.01	6,394.82	23.30	23.13	92.32	494.14	499.76	641.10	594.96	46.14	13.894		
6,600.00	6,556.60	6,571.47	6,509.22	23.65	23.56	91.23	505.97	509.86	649.59	602.61	46.97	13.829		
6,700.00	6,656.60	6,688.02	6,625.24	24.00	23.98	90.49	514.34	517.02	655.64	607.86	47.78	13.722		
6,800.00	6,756.60	6,805.28	6,742.32	24.35	24.40	90.07	519.14	521.12	659.12	610.57	48.55	13.576		
6,900.00	6,856.60	6,919.58	6,856.60	24.70	24.79	89.96	520.36	522.16	660.00	610.72	49.28	13.392		
7,000.00	6,956.60	7,019.58	6,956.60	25.05	25.13	89.96	520.36	522.16	660.00	610.03	49.97	13.207		
7,100.00	7,056.60	7,119.58	7,056.60	25.40	25.47	89.96	520.36	522.16	660.00	609.34	50.66	13.027		
7,200.00	7,156.60	7,219.58	7,156.60	25.76	25.82	89.96	520.36	522.16	660.00	608.64	51.36	12.851		
7,300.00	7,256.60	7,319.58	7,256.60	26.11	26.16	89.96	520.36	522.16	660.00	607.95	52.05	12.680		
7,400.00	7,356.60	7,419.58	7,356.60	26.46	26.50	89.96	520.36	522.16	660.00	607.26	52.74	12.513		
7,500.00	7,456.60	7,519.58	7,456.60	26.81	26.84	89.96	520.36	522.16	660.00	606.56	53.44	12.350		
7,600.00	7,556.60	7,619.58	7,556.60	27.17	27.19	89.96	520.36	522.16	660.00	605.87	54.13	12.192		
7,700.00	7,656.60	7,719.58	7,656.60	27.52	27.53	89.96	520.36	522.16	660.00	605.17	54.83	12.037		
7,800.00	7,756.60	7,819.58	7,756.60	27.87	27.87	89.96	520.36	522.16	660.00	604.47	55.53	11.886		
7,900.00	7,856.60	7,919.58	7,856.60	28.22	28.22	89.96	520.36	522.16	660.00	603.78	56.22	11.739		
8,000.00	7,956.60	8,019.58	7,956.60	28.58	28.56	89.96	520.36	522.16	660.00	603.08	56.92	11.595		
8,100.00	8,056.60	8,119.58	8,056.60	28.93	28.91	89.96	520.36	522.16	660.00	602.38	57.62	11.455		
8,200.00	8,156.60	8,219.58	8,156.60	29.28	29.25	89.96	520.36	522.16	660.00	601.68	58.32	11.318		
8,300.00	8,256.60	8,319.58	8,256.60	29.64	29.60	89.96	520.36	522.16	660.00	600.98	59.02	11.184		
8,400.00	8,356.60	8,419.58	8,356.60	29.99	29.94	89.96	520.36	522.16	660.00	600.29	59.71	11.053		
8,500.00	8,456.60	8,519.58	8,456.60	30.34	30.29	89.96	520.36	522.16	660.00	599.59	60.41	10.925		
8,600.00	8,556.60	8,619.58	8,556.60	30.70	30.64	89.96	520.36	522.16	660.00	598.89	61.11	10.800		
8,700.00	8,656.60	8,719.58	8,656.60	31.05	30.98	89.96	520.36	522.16	660.00	598.19	61.81	10.677		
8,800.00	8,756.60	8,819.58	8,756.60	31.41	31.33	89.96	520.36	522.16	660.00	597.49	62.51	10.557		
8,900.00	8,856.60	8,919.58	8,856.60	31.76	31.68	89.96	520.36	522.16	660.00	596.78	63.22	10.440		
9,000.00	8,956.60	9,019.58	8,956.60	32.12	32.03	89.96	520.36	522.16	660.00	596.08	63.92	10.326		
9,100.00	9,056.60	9,119.58	9,056.60	32.47	32.37	89.96	520.36	522.16	660.00	595.38	64.62	10.214		
9,200.00	9,156.60	9,219.58	9,156.60	32.82	32.72	89.96	520.36	522.16	660.00	594.68	65.32	10.104		
9,300.00	9,256.60	9,319.58	9,256.60	33.18	33.07	89.96	520.36	522.16	660.00	593.98	66.02	9.996		
9,400.00	9,356.60	9,419.58	9,356.60	33.53	33.42	89.96	520.36	522.16	660.00	593.27	66.73	9.891		
9,500.00	9,456.60	9,519.58	9,456.60	33.89	33.77	89.96	520.36	522.16	660.00	592.57	67.43	9.788		
9,600.00	9,556.60	9,619.58	9,556.60	34.24	34.12	89.96	520.36	522.16	660.00	591.87	68.13	9.687		
9,700.00	9,656.60	9,719.58	9,656.60	34.60	34.47	89.96	520.36	522.16	660.00	591.16	68.84	9.588		
9,800.00	9,756.60	9,819.58	9,756.60	34.95	34.81	89.96	520.36	522.16	660.00	590.46	69.54	9.491		
9,900.00	9,856.60	9,919.58	9,856.60	35.31	35.16	89.96	520.36	522.16	660.00	589.76	70.24	9.396		
10,000.00	9,956.60	10,019.58	9,956.60	35.66	35.51	89.96	520.36	522.16	660.00	589.05	70.95	9.302		
10,100.00	10,056.60	10,119.58	10,056.60	36.02	35.86	89.96	520.36	522.16	660.00	588.35	71.65	9.211		
10,200.00	10,156.60	10,219.58	10,156.60	36.37	36.21	89.96	520.36	522.16	660.00	587.64	72.36	9.121		
10,300.00	10,256.60	10,319.58	10,256.60	36.73	36.56	89.76	520.36	522.16	660.00	586.94	73.06	9.033		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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 #10H - 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		
10,344.01	10,300.51	10,363.49	10,300.51	36.89	36.72	90.00	520.36	522.16	659.99	586.62	73.38	8.995		
10,400.00	10,355.84	10,418.82	10,355.84	37.09	36.91	90.72	520.36	522.16	660.05	586.27	73.78	8.947		
10,500.00	10,451.62	10,518.37	10,455.26	37.45	37.26	92.81	523.75	522.17	660.84	586.35	74.49	8.871		
10,600.00	10,541.03	10,623.52	10,558.16	37.81	37.64	94.98	544.68	522.25	662.66	587.45	75.21	8.811		
10,700.00	10,621.36	10,734.38	10,660.57	38.14	38.03	97.05	586.68	522.42	665.32	589.45	75.87	8.769		
10,800.00	10,690.15	10,851.36	10,757.74	38.46	38.41	98.95	651.45	522.67	668.48	592.07	76.41	8.749		
10,900.00	10,745.34	10,974.50	10,843.59	38.76	38.78	100.57	739.41	523.01	671.71	594.93	76.79	8.748		
11,000.00	10,785.22	11,103.25	10,911.12	39.04	39.15	101.83	848.70	523.44	674.52	597.47	77.04	8.755		
11,100.00	10,808.61	11,236.32	10,953.51	39.29	39.49	102.63	974.53	523.93	676.41	599.14	77.27	8.754		
11,200.00	10,814.96	11,367.58	10,965.96	39.50	39.79	102.89	1,104.92	524.43	677.05	599.45	77.60	8.725		
11,300.00	10,814.96	11,467.58	10,965.96	39.72	40.02	102.89	1,204.92	524.82	677.05	599.02	78.03	8.677		
11,400.00	10,814.96	11,567.58	10,965.96	39.97	40.27	102.89	1,304.92	525.21	677.05	598.55	78.50	8.625		
11,500.00	10,814.96	11,667.58	10,965.96	40.23	40.54	102.89	1,404.92	525.60	677.05	598.03	79.02	8.568		
11,600.00	10,814.96	11,767.58	10,965.96	40.51	40.83	102.89	1,504.92	525.99	677.05	597.47	79.58	8.508		
11,700.00	10,814.96	11,867.58	10,965.96	40.82	41.14	102.89	1,604.91	526.38	677.05	596.87	80.18	8.444		
11,800.00	10,814.96	11,967.58	10,965.96	41.14	41.47	102.89	1,704.91	526.77	677.05	596.23	80.82	8.377		
11,900.00	10,814.96	12,067.58	10,965.96	41.49	41.82	102.89	1,804.91	527.15	677.05	595.55	81.50	8.307		
12,000.00	10,814.96	12,167.58	10,965.96	41.86	42.19	102.89	1,904.91	527.54	677.05	594.83	82.22	8.234		
12,100.00	10,814.96	12,267.58	10,965.96	42.24	42.58	102.89	2,004.91	527.93	677.05	594.07	82.98	8.159		
12,200.00	10,814.96	12,367.58	10,965.96	42.64	42.98	102.89	2,104.91	528.32	677.05	593.27	83.78	8.081		
12,300.00	10,814.96	12,467.58	10,965.96	43.06	43.41	102.89	2,204.91	528.71	677.05	592.44	84.61	8.002		
12,400.00	10,814.96	12,567.58	10,965.96	43.50	43.85	102.89	2,304.91	529.10	677.05	591.57	85.48	7.921		
12,500.00	10,814.96	12,667.58	10,965.96	43.96	44.31	102.89	2,404.91	529.49	677.05	590.67	86.38	7.838		
12,600.00	10,814.96	12,767.58	10,965.96	44.43	44.78	102.89	2,504.91	529.88	677.05	589.74	87.31	7.754		
12,700.00	10,814.96	12,867.58	10,965.96	44.92	45.27	102.89	2,604.91	530.27	677.05	588.77	88.28	7.670		
12,800.00	10,814.96	12,967.58	10,965.96	45.42	45.78	102.89	2,704.91	530.65	677.05	587.78	89.27	7.584		
12,900.00	10,814.97	13,067.58	10,965.97	45.94	46.30	102.89	2,804.91	531.04	677.05	586.75	90.30	7.498		
13,000.00	10,814.97	13,167.58	10,965.97	46.47	46.83	102.89	2,904.90	531.43	677.05	585.70	91.35	7.411		
13,100.00	10,814.97	13,267.58	10,965.97	47.02	47.38	102.89	3,004.90	531.82	677.05	584.61	92.44	7.324		
13,200.00	10,814.97	13,367.58	10,965.97	47.58	47.94	102.89	3,104.90	532.21	677.05	583.51	93.55	7.238		
13,300.00	10,814.97	13,467.58	10,965.97	48.15	48.51	102.89	3,204.90	532.60	677.05	582.37	94.68	7.151		
13,400.00	10,814.97	13,567.58	10,965.97	48.73	49.10	102.89	3,304.90	532.99	677.05	581.21	95.84	7.064		
13,500.00	10,814.97	13,667.58	10,965.97	49.33	49.70	102.89	3,404.90	533.38	677.05	580.03	97.03	6.978		
13,600.00	10,814.97	13,767.58	10,965.97	49.94	50.31	102.89	3,504.90	533.77	677.05	578.82	98.23	6.892		
13,700.00	10,814.97	13,867.58	10,965.97	50.56	50.93	102.89	3,604.90	534.15	677.05	577.59	99.46	6.807		
13,800.00	10,814.97	13,967.58	10,965.97	51.19	51.56	102.89	3,704.90	534.54	677.05	576.34	100.71	6.723		
13,900.00	10,814.97	14,067.58	10,965.97	51.83	52.20	102.89	3,804.90	534.93	677.05	575.07	101.99	6.639		
14,000.00	10,814.97	14,167.58	10,965.97	52.48	52.85	102.89	3,904.90	535.32	677.05	573.78	103.28	6.556		
14,100.00	10,814.97	14,267.58	10,965.97	53.14	53.51	102.89	4,004.90	535.71	677.05	572.47	104.59	6.474		
14,200.00	10,814.97	14,367.58	10,965.97	53.81	54.18	102.89	4,104.90	536.10	677.05	571.14	105.92	6.392		
14,300.00	10,814.97	14,467.58	10,965.97	54.49	54.86	102.89	4,204.90	536.49	677.05	569.79	107.27	6.312		
14,400.00	10,814.97	14,567.58	10,965.97	55.18	55.55	102.89	4,304.89	536.88	677.05	568.42	108.63	6.233		
14,500.00	10,814.97	14,667.58	10,965.97	55.87	56.24	102.89	4,404.89	537.26	677.05	567.04	110.01	6.154		
14,600.00	10,814.97	14,767.58	10,965.97	56.58	56.95	102.89	4,504.89	537.65	677.05	565.65	111.41	6.077		
14,700.00	10,814.97	14,867.58	10,965.97	57.29	57.66	102.89	4,604.89	538.04	677.06	564.24	112.82	6.001		
14,800.00	10,814.97	14,967.58	10,965.97	58.01	58.38	102.89	4,704.89	538.43	677.06	562.81	114.25	5.926		
14,900.00	10,814.97	15,067.58	10,965.97	58.73	59.10	102.89	4,804.89	538.82	677.06	561.37	115.69	5.852		
15,000.00	10,814.97	15,167.58	10,965.97	59.47	59.83	102.89	4,904.89	539.21	677.06	559.91	117.14	5.780		
15,100.00	10,814.97	15,267.58	10,965.97	60.21	60.57	102.89	5,004.89	539.60	677.06	558.45	118.61	5.708		
15,200.00	10,814.98	15,367.58	10,965.98	60.95	61.32	102.89	5,104.89	539.99	677.06	556.97	120.09	5.638		
15,300.00	10,814.98	15,467.58	10,965.98	61.70	62.07	102.89	5,204.89	540.38	677.06	555.47	121.58	5.569		
15,400.00	10,814.98	15,567.58	10,965.98	62.46	62.83	102.89	5,304.89	540.76	677.06	553.97	123.09	5.501		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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 #10H - 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	10,814.98	15,667.58	10,965.98	63.22	63.59	102.89	5,404.89	541.15	677.06	552.45	124.60	5.434		
15,600.00	10,814.98	15,767.58	10,965.98	63.99	64.36	102.89	5,504.89	541.54	677.06	550.93	126.13	5.368		
15,700.00	10,814.98	15,867.58	10,965.98	64.77	65.13	102.89	5,604.88	541.93	677.06	549.39	127.67	5.303		
15,800.00	10,814.98	15,967.58	10,965.98	65.55	65.91	102.89	5,704.88	542.32	677.06	547.84	129.22	5.240		
15,900.00	10,814.98	16,067.58	10,965.98	66.33	66.70	102.89	5,804.88	542.71	677.06	546.28	130.77	5.177		
16,000.00	10,814.98	16,167.58	10,965.98	67.12	67.49	102.89	5,904.88	543.10	677.06	544.72	132.34	5.116		
16,100.00	10,814.98	16,267.58	10,965.98	67.92	68.28	102.89	6,004.88	543.49	677.06	543.14	133.92	5.056		
16,200.00	10,814.98	16,367.58	10,965.98	68.71	69.08	102.89	6,104.88	543.87	677.06	541.56	135.50	4.997		
16,300.00	10,814.98	16,467.58	10,965.98	69.52	69.88	102.89	6,204.88	544.26	677.06	539.96	137.09	4.939		
16,400.00	10,814.98	16,567.58	10,965.98	70.32	70.68	102.89	6,304.88	544.65	677.06	538.36	138.70	4.882		
16,500.00	10,814.98	16,667.58	10,965.98	71.13	71.49	102.89	6,404.88	545.04	677.06	536.75	140.30	4.826		
16,600.00	10,814.98	16,767.58	10,965.98	71.95	72.31	102.89	6,504.88	545.43	677.06	535.14	141.92	4.771		
16,700.00	10,814.98	16,867.58	10,965.98	72.77	73.13	102.89	6,604.88	545.82	677.06	533.51	143.55	4.717		
16,800.00	10,814.98	16,967.58	10,965.98	73.59	73.95	102.89	6,704.88	546.21	677.06	531.88	145.18	4.664		
16,900.00	10,814.98	17,067.58	10,965.98	74.41	74.77	102.89	6,804.88	546.60	677.06	530.24	146.82	4.612		
17,000.00	10,814.98	17,167.58	10,965.98	75.24	75.60	102.89	6,904.87	546.99	677.06	528.60	148.46	4.560		
17,100.00	10,814.98	17,267.58	10,965.98	76.08	76.43	102.89	7,004.87	547.37	677.06	526.95	150.11	4.510		
17,200.00	10,814.98	17,367.58	10,965.98	76.91	77.27	102.89	7,104.87	547.76	677.06	525.29	151.77	4.461		
17,300.00	10,814.98	17,467.58	10,965.98	77.75	78.10	102.89	7,204.87	548.15	677.06	523.62	153.44	4.413		
17,400.00	10,814.98	17,567.58	10,965.98	78.59	78.95	102.89	7,304.87	548.54	677.06	521.96	155.11	4.365		
17,500.00	10,814.98	17,667.58	10,965.98	79.43	79.79	102.89	7,404.87	548.93	677.06	520.28	156.78	4.319		
17,600.00	10,814.99	17,767.58	10,965.99	80.28	80.64	102.89	7,504.87	549.32	677.06	518.60	158.46	4.273		
17,700.00	10,814.99	17,867.58	10,965.99	81.13	81.48	102.89	7,604.87	549.71	677.06	516.91	160.15	4.228		
17,800.00	10,814.99	17,967.58	10,965.99	81.98	82.34	102.89	7,704.87	550.10	677.06	515.22	161.84	4.184		
17,900.00	10,814.99	18,067.58	10,965.99	82.84	83.19	102.89	7,804.87	550.49	677.06	513.53	163.54	4.140		
18,000.00	10,814.99	18,167.58	10,965.99	83.70	84.05	102.89	7,904.87	550.87	677.06	511.82	165.24	4.098		
18,100.00	10,814.99	18,267.58	10,965.99	84.56	84.91	102.89	8,004.87	551.26	677.06	510.12	166.94	4.056		
18,200.00	10,814.99	18,367.58	10,965.99	85.42	85.77	102.89	8,104.87	551.65	677.06	508.41	168.65	4.014		
18,300.00	10,814.99	18,467.58	10,965.99	86.28	86.63	102.89	8,204.86	552.04	677.06	506.69	170.37	3.974		
18,400.00	10,814.99	18,567.58	10,965.99	87.15	87.50	102.89	8,304.86	552.43	677.06	504.97	172.09	3.934		
18,500.00	10,814.99	18,667.58	10,965.99	88.02	88.36	102.89	8,404.86	552.82	677.06	503.25	173.81	3.895		
18,600.00	10,814.99	18,767.58	10,965.99	88.89	89.23	102.89	8,504.86	553.21	677.06	501.52	175.54	3.857		
18,700.00	10,814.99	18,867.58	10,965.99	89.76	90.11	102.89	8,604.86	553.60	677.06	499.79	177.27	3.819		
18,800.00	10,814.99	18,967.58	10,965.99	90.63	90.98	102.89	8,704.86	553.98	677.06	498.06	179.01	3.782		
18,900.00	10,814.99	19,067.58	10,965.99	91.51	91.86	102.89	8,804.86	554.37	677.06	496.32	180.74	3.746		
19,000.00	10,814.99	19,167.58	10,965.99	92.39	92.73	102.89	8,904.86	554.76	677.06	494.58	182.49	3.710		
19,100.00	10,814.99	19,267.58	10,965.99	93.27	93.61	102.89	9,004.86	555.15	677.06	492.83	184.23	3.675		
19,200.00	10,814.99	19,367.58	10,965.99	94.15	94.49	102.89	9,104.86	555.54	677.06	491.08	185.98	3.640		
19,300.00	10,814.99	19,467.58	10,965.99	95.03	95.38	102.89	9,204.86	555.93	677.06	489.33	187.73	3.606		
19,400.00	10,814.99	19,567.58	10,965.99	95.92	96.26	102.89	9,304.86	556.32	677.06	487.57	189.49	3.573		
19,500.00	10,814.99	19,667.58	10,965.99	96.80	97.15	102.89	9,404.86	556.71	677.07	485.82	191.25	3.540		
19,600.00	10,814.99	19,767.58	10,965.99	97.69	98.03	102.89	9,504.86	557.10	677.07	484.05	193.01	3.508		
19,700.00	10,814.99	19,867.58	10,965.99	98.58	98.92	102.89	9,604.85	557.48	677.07	482.29	194.78	3.476		
19,800.00	10,814.99	19,967.58	10,965.99	99.47	99.81	102.89	9,704.85	557.87	677.07	480.52	196.54	3.445		
19,900.00	10,815.00	20,067.58	10,966.00	100.36	100.71	102.89	9,804.85	558.26	677.07	478.75	198.31	3.414		
20,000.00	10,815.00	20,167.58	10,966.00	101.26	101.60	102.89	9,904.85	558.65	677.07	476.98	200.09	3.384		
20,100.00	10,815.00	20,267.58	10,966.00	102.15	102.49	102.89	10,004.85	559.04	677.07	475.20	201.86	3.354		
20,200.00	10,815.00	20,367.58	10,966.00	103.05	103.39	102.89	10,104.85	559.43	677.07	473.42	203.64	3.325		
20,300.00	10,815.00	20,467.58	10,966.00	103.95	104.29	102.89	10,204.85	559.82	677.07	471.64	205.42	3.296		
20,400.00	10,815.00	20,567.58	10,966.00	104.85	105.18	102.89	10,304.85	560.21	677.07	469.86	207.21	3.268		
20,500.00	10,815.00	20,667.58	10,966.00	105.75	106.08	102.89	10,404.85	560.60	677.07	468.08	208.99	3.240		
20,600.00	10,815.00	20,767.58	10,966.00	106.65	106.98	102.89	10,504.85	560.98	677.07	466.29	210.78	3.212		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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 #10H - 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				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)	Minimum Separation (usft)	Separation Factor	
20,700.00	10,815.00	20,867.58	10,966.00	107.55	107.89	102.89	10,604.85	561.37	677.07	464.50	212.57	3.185	
20,800.00	10,815.00	20,967.58	10,966.00	108.45	108.79	102.89	10,704.85	561.76	677.07	462.70	214.36	3.159	
20,900.00	10,815.00	21,067.58	10,966.00	109.36	109.69	102.89	10,804.85	562.15	677.07	460.91	216.16	3.132	
21,000.00	10,815.00	21,167.58	10,966.00	110.26	110.60	102.89	10,904.84	562.54	677.07	459.11	217.95	3.106	
21,100.00	10,815.00	21,267.58	10,966.00	111.17	111.51	102.89	11,004.84	562.93	677.07	457.32	219.75	3.081	
21,100.68	10,815.00	21,268.26	10,966.00	111.18	111.51	102.89	11,005.52	562.93	677.07	457.30	219.77	3.081 SF	



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	1.00	0.00	0.00	0.00	89.93	0.14	119.97	119.97					
100.00	100.00	101.00	100.00	0.13	0.13	89.93	0.14	119.97	119.97	119.70	0.27	452.258		
200.00	200.00	201.00	200.00	0.49	0.49	89.93	0.14	119.97	119.97	118.99	0.98	122.143		
300.00	300.00	301.00	300.00	0.85	0.85	89.93	0.14	119.97	119.97	118.27	1.70	70.606		
400.00	400.00	401.00	400.00	1.21	1.21	89.93	0.14	119.97	119.97	117.55	2.42	49.654		
500.00	500.00	501.00	500.00	1.56	1.57	89.93	0.14	119.97	119.97	116.84	3.13	38.292		
600.00	600.00	601.00	600.00	1.92	1.93	89.93	0.14	119.97	119.97	116.12	3.85	31.161 CC		
700.00	699.99	701.01	699.99	2.28	2.29	105.18	0.14	119.97	120.20	115.63	4.57	26.322		
800.00	799.96	801.04	799.96	2.64	2.64	106.37	0.14	119.97	120.91	115.63	5.28	22.889 ES		
900.00	899.90	901.10	899.90	3.00	3.00	107.95	0.14	119.97	121.94	115.94	6.00	20.328		
1,000.00	999.84	1,001.16	999.84	3.36	3.36	109.49	0.14	119.97	123.06	116.34	6.71	18.326		
1,100.00	1,099.78	1,101.22	1,099.78	3.72	3.72	111.01	0.14	119.97	124.27	116.84	7.43	16.722		
1,200.00	1,199.72	1,198.72	1,199.72	4.07	4.07	112.49	0.14	119.97	125.56	117.42	8.14	15.428		
1,300.00	1,299.57	1,295.10	1,296.08	4.43	4.41	114.11	0.83	121.39	128.98	120.15	8.84	14.599		
1,400.00	1,399.19	1,391.10	1,391.95	4.80	4.75	116.02	2.92	125.70	136.71	127.19	9.52	14.358		
1,500.00	1,498.44	1,486.49	1,487.01	5.16	5.08	117.99	6.40	132.84	148.81	138.60	10.20	14.585		
1,600.00	1,597.21	1,581.02	1,580.90	5.52	5.42	119.85	11.20	142.73	165.27	154.39	10.88	15.194		
1,700.00	1,695.69	1,674.70	1,673.53	5.88	5.76	121.39	17.29	155.26	185.17	173.63	11.54	16.040		
1,800.00	1,794.17	1,771.07	1,768.46	6.25	6.10	122.21	24.56	170.22	206.86	194.62	12.24	16.906		
1,900.00	1,892.65	1,868.64	1,864.54	6.61	6.46	122.86	31.96	185.45	228.66	215.72	12.95	17.664		
2,000.00	1,991.13	1,966.20	1,960.62	6.98	6.81	123.40	39.37	200.69	250.49	236.83	13.66	18.341		
2,100.00	2,089.61	2,063.77	2,056.71	7.35	7.17	123.85	46.77	215.93	272.34	257.96	14.37	18.947		
2,200.00	2,188.09	2,161.33	2,152.79	7.72	7.53	124.24	54.18	231.17	294.20	279.11	15.09	19.494		
2,300.00	2,286.57	2,258.89	2,248.87	8.09	7.90	124.57	61.59	246.40	316.07	300.25	15.81	19.989		
2,400.00	2,385.05	2,356.46	2,344.95	8.47	8.26	124.86	68.99	261.64	337.95	321.41	16.53	20.439		
2,500.00	2,483.54	2,454.02	2,441.03	8.84	8.63	125.11	76.40	276.88	359.83	342.57	17.26	20.849		
2,600.00	2,582.02	2,551.59	2,537.11	9.22	8.99	125.34	83.80	292.12	381.72	363.74	17.99	21.224		
2,700.00	2,680.50	2,649.15	2,633.20	9.59	9.36	125.54	91.21	307.35	403.62	384.91	18.71	21.569		
2,800.00	2,778.98	2,746.71	2,729.28	9.97	9.73	125.72	98.61	322.59	425.52	406.08	19.44	21.887		
2,900.00	2,877.46	2,844.28	2,825.36	10.35	10.10	125.88	106.02	337.83	447.43	427.26	20.17	22.181		
3,000.00	2,975.94	2,941.84	2,921.44	10.72	10.47	126.03	113.42	353.07	469.33	448.43	20.90	22.453		
3,100.00	3,074.42	3,039.41	3,017.52	11.10	10.84	126.16	120.83	368.30	491.25	469.61	21.63	22.707		
3,200.00	3,172.90	3,136.97	3,113.60	11.48	11.21	126.28	128.23	383.54	513.16	490.79	22.37	22.942		
3,300.00	3,271.38	3,234.53	3,209.69	11.86	11.58	126.40	135.64	398.78	535.07	511.97	23.10	23.162		
3,400.00	3,369.87	3,332.10	3,305.77	12.23	11.95	126.50	143.04	414.02	556.99	533.15	23.84	23.368		
3,500.00	3,468.35	3,429.66	3,401.85	12.61	12.32	126.60	150.45	429.26	578.91	554.34	24.57	23.562		
3,600.00	3,566.83	3,527.23	3,497.93	12.99	12.70	126.69	157.85	444.49	600.83	575.52	25.31	23.743		
3,700.00	3,665.31	3,624.79	3,594.01	13.37	13.07	126.77	165.26	459.73	622.75	596.71	26.04	23.914		
3,800.00	3,763.79	3,722.35	3,690.09	13.75	13.44	126.84	172.67	474.97	644.67	617.89	26.78	24.075		
3,900.00	3,862.27	3,819.92	3,786.18	14.13	13.82	126.92	180.07	490.21	666.60	639.08	27.52	24.226		
4,000.00	3,960.75	3,917.48	3,882.26	14.51	14.19	126.98	187.48	505.44	688.52	660.27	28.25	24.370		
4,100.00	4,059.23	4,015.05	3,978.34	14.89	14.56	127.05	194.88	520.68	710.44	681.45	28.99	24.506		
4,200.00	4,157.96	4,112.80	4,074.61	15.27	14.94	127.33	202.30	535.95	731.47	701.74	29.73	24.607		
4,300.00	4,257.19	4,210.93	4,171.25	15.64	15.32	127.38	209.75	551.27	750.43	719.97	30.46	24.639		
4,400.00	4,356.78	4,309.31	4,268.14	16.00	15.69	127.21	217.22	566.64	767.34	736.15	31.18	24.607		
4,500.00	4,456.63	4,407.82	4,365.15	16.35	16.07	126.81	224.69	582.03	782.23	750.33	31.90	24.519		
4,600.00	4,556.60	4,506.35	4,462.18	16.70	16.45	126.21	232.17	597.41	795.18	762.56	32.62	24.380		
4,700.00	4,656.60	4,604.83	4,559.16	17.04	16.83	110.48	239.65	612.79	807.16	773.83	33.33	24.220		
4,800.00	4,756.60	4,703.31	4,656.15	17.39	17.21	109.60	247.12	628.17	819.33	785.29	34.04	24.072		
4,900.00	4,856.60	4,801.79	4,753.13	17.73	17.59	108.76	254.60	643.56	831.68	796.93	34.75	23.935		
5,000.00	4,956.60	4,900.27	4,850.12	18.08	17.96	107.93	262.07	658.94	844.21	808.75	35.46	23.808		
5,100.00	5,056.60	5,001.25	4,947.10	18.42	18.35	107.13	269.55	674.32	856.90	820.72	36.18	23.684		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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		
5,200.00	5,156.60	5,102.77	5,044.08	18.77	18.74	106.36	277.02	689.70	869.76	832.86	36.90	23.568		
5,300.00	5,256.60	5,195.71	5,141.07	19.11	19.10	105.61	284.50	705.08	882.77	845.18	37.60	23.480		
5,400.00	5,356.60	5,305.81	5,238.05	19.46	19.53	104.87	291.97	720.46	895.93	857.58	38.35	23.360		
5,500.00	5,456.60	5,407.33	5,335.04	19.81	19.92	104.16	299.45	735.84	909.23	870.16	39.08	23.266		
5,600.00	5,556.60	5,508.85	5,432.02	20.15	20.31	103.47	306.92	751.22	922.67	882.87	39.81	23.180		
5,700.00	5,656.60	5,589.63	5,529.01	20.50	20.62	102.80	314.40	766.60	936.24	895.78	40.45	23.144		
5,800.00	5,756.60	5,688.12	5,625.99	20.85	21.00	102.15	321.87	781.98	949.93	908.76	41.17	23.074		
5,900.00	5,856.60	5,786.60	5,722.98	21.20	21.38	101.52	329.35	797.36	963.73	921.85	41.88	23.009		
6,000.00	5,956.60	5,885.08	5,819.96	21.55	21.76	100.90	336.82	812.74	977.66	935.05	42.60	22.949		
6,100.00	6,056.60	5,983.56	5,916.95	21.90	22.14	100.31	344.30	828.13	991.69	948.37	43.32	22.894		
6,200.00	6,156.60	6,082.04	6,013.93	22.25	22.52	99.72	351.77	843.51	1,005.82	961.79	44.03	22.842		
6,300.00	6,256.60	6,180.52	6,110.92	22.60	22.90	99.16	359.25	858.89	1,020.05	975.30	44.75	22.794		
6,400.00	6,356.60	6,279.00	6,207.90	22.95	23.28	98.61	366.72	874.27	1,034.38	988.91	45.47	22.749		
6,500.00	6,456.60	6,377.48	6,304.88	23.30	23.66	98.07	374.20	889.65	1,048.80	1,002.62	46.19	22.708		
6,600.00	6,556.60	6,475.96	6,401.87	23.65	24.04	97.55	381.67	905.03	1,063.31	1,016.41	46.90	22.670		
6,700.00	6,656.60	6,574.44	6,498.85	24.00	24.42	97.05	389.15	920.41	1,077.91	1,030.28	47.62	22.634		
6,800.00	6,756.60	6,672.92	6,595.84	24.35	24.80	96.55	396.62	935.79	1,092.58	1,044.24	48.34	22.601		
6,900.00	6,856.60	6,771.40	6,692.82	24.70	25.18	96.07	404.10	951.17	1,107.33	1,058.27	49.06	22.571		
7,000.00	6,956.60	6,869.88	6,789.81	25.05	25.56	95.60	411.57	966.55	1,122.16	1,072.38	49.78	22.542		
7,100.00	7,056.60	6,968.37	6,886.79	25.40	25.94	95.15	419.05	981.93	1,137.06	1,086.56	50.50	22.516		
7,200.00	7,156.60	7,066.85	6,983.78	25.76	26.32	94.70	426.52	997.31	1,152.03	1,100.81	51.22	22.492		
7,300.00	7,256.60	7,165.33	7,080.76	26.11	26.70	94.27	434.00	1,012.70	1,167.06	1,115.12	51.94	22.470		
7,400.00	7,356.60	7,263.81	7,177.75	26.46	27.08	93.85	441.47	1,028.08	1,182.16	1,129.50	52.66	22.449		
7,500.00	7,456.60	7,362.29	7,274.73	26.81	27.46	93.44	448.94	1,043.46	1,197.32	1,143.94	53.38	22.430		
7,600.00	7,556.60	7,460.77	7,371.72	27.17	27.84	93.04	456.42	1,058.84	1,212.54	1,158.44	54.10	22.412		
7,700.00	7,656.60	7,559.25	7,468.70	27.52	28.23	92.65	463.89	1,074.22	1,227.82	1,172.99	54.82	22.396		
7,800.00	7,756.60	7,657.73	7,565.68	27.87	28.61	92.27	471.37	1,089.60	1,243.15	1,187.60	55.54	22.381		
7,900.00	7,856.60	7,756.21	7,662.67	28.22	28.99	91.89	478.84	1,104.98	1,258.53	1,202.27	56.27	22.368		
8,000.00	7,956.60	7,854.69	7,759.65	28.58	29.37	91.53	486.32	1,120.36	1,273.97	1,216.98	56.99	22.355		
8,100.00	8,056.60	7,953.17	7,856.64	28.93	29.75	91.18	493.79	1,135.74	1,289.45	1,231.74	57.71	22.344		
8,200.00	8,156.60	8,051.65	7,953.62	29.28	30.13	90.83	501.27	1,151.12	1,304.98	1,246.55	58.43	22.334		
8,300.00	8,256.60	8,149.86	8,115.02	29.64	30.75	90.35	511.81	1,172.81	1,318.30	1,258.74	59.56	22.134		
8,400.00	8,356.60	8,385.07	8,284.51	29.99	31.36	90.06	518.51	1,186.60	1,326.40	1,265.82	60.58	21.894		
8,500.00	8,456.60	8,556.51	8,455.84	30.34	31.95	89.96	520.80	1,191.31	1,329.15	1,267.69	61.46	21.628		
8,600.00	8,556.60	8,657.27	8,556.60	30.70	32.28	89.96	520.80	1,191.31	1,329.15	1,267.01	62.14	21.388		
8,700.00	8,656.60	8,757.27	8,656.60	31.05	32.62	89.96	520.80	1,191.31	1,329.15	1,266.32	62.83	21.154		
8,800.00	8,756.60	8,857.27	8,756.60	31.41	32.95	89.96	520.80	1,191.31	1,329.15	1,265.63	63.52	20.925		
8,900.00	8,856.60	8,957.27	8,856.60	31.76	33.28	89.96	520.80	1,191.31	1,329.15	1,264.94	64.21	20.700		
9,000.00	8,956.60	9,057.27	8,956.60	32.12	33.62	89.96	520.80	1,191.31	1,329.15	1,264.25	64.90	20.480		
9,100.00	9,056.60	9,157.27	9,056.60	32.47	33.95	89.96	520.80	1,191.31	1,329.15	1,263.56	65.59	20.265		
9,200.00	9,156.60	9,257.27	9,156.60	32.82	34.29	89.96	520.80	1,191.31	1,329.15	1,262.87	66.28	20.053		
9,300.00	9,256.60	9,357.27	9,256.60	33.18	34.62	89.96	520.80	1,191.31	1,329.15	1,262.18	66.97	19.846		
9,400.00	9,356.60	9,457.27	9,356.60	33.53	34.96	89.96	520.80	1,191.31	1,329.15	1,261.49	67.66	19.643		
9,500.00	9,456.60	9,557.27	9,456.60	33.89	35.30	89.96	520.80	1,191.31	1,329.15	1,260.79	68.36	19.444		
9,600.00	9,556.60	9,657.27	9,556.60	34.24	35.63	89.96	520.80	1,191.31	1,329.15	1,260.10	69.05	19.249		
9,700.00	9,656.60	9,757.27	9,656.60	34.60	35.97	89.96	520.80	1,191.31	1,329.15	1,259.41	69.74	19.058		
9,800.00	9,756.60	9,857.27	9,756.60	34.95	36.31	89.96	520.80	1,191.31	1,329.15	1,258.71	70.44	18.870		
9,900.00	9,856.60	9,957.27	9,856.60	35.31	36.65	89.96	520.80	1,191.31	1,329.15	1,258.02	71.13	18.686		
10,000.00	9,956.60	10,057.27	9,956.60	35.66	36.98	89.96	520.80	1,191.31	1,329.15	1,257.32	71.83	18.505		
10,100.00	10,056.60	10,157.27	10,056.60	36.02	37.32	89.96	520.80	1,191.31	1,329.15	1,256.63	72.52	18.328		
10,200.00	10,156.60	10,257.27	10,156.60	36.37	37.66	89.96	520.80	1,191.31	1,329.15	1,255.93	73.22	18.154		
10,300.00	10,256.60	10,357.27	10,256.60	36.73	38.00	89.75	520.80	1,191.31	1,329.15	1,255.24	73.91	17.983		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	
10,400.00	10,355.84	10,456.87	10,355.91	37.09	38.34	89.97	526.83	1,191.33	1,329.13	1,254.51	74.62	17.812		
10,500.00	10,451.62	10,557.29	10,453.50	37.45	38.69	90.21	549.97	1,191.40	1,329.12	1,253.79	75.33	17.644		
10,600.00	10,541.03	10,658.68	10,546.41	37.81	39.02	90.44	590.24	1,191.52	1,329.12	1,253.09	76.03	17.482		
10,644.69	10,578.20	10,704.30	10,585.59	37.96	39.16	90.54	613.58	1,191.59	1,329.12	1,252.78	76.33	17.412		
10,700.00	10,621.36	10,761.02	10,631.52	38.14	39.33	90.66	646.83	1,191.69	1,329.12	1,252.41	76.70	17.328		
10,800.00	10,690.15	10,864.26	10,705.81	38.46	39.59	90.86	718.31	1,191.91	1,329.12	1,251.78	77.34	17.186		
10,900.00	10,745.34	10,968.31	10,766.50	38.76	39.80	91.03	802.65	1,192.16	1,329.11	1,251.18	77.93	17.056		
11,000.00	10,785.22	11,073.05	10,811.19	39.04	39.97	91.18	897.21	1,192.45	1,329.09	1,250.62	78.47	16.938		
11,100.00	10,808.61	11,178.32	10,838.04	39.29	40.12	91.28	998.85	1,192.75	1,329.05	1,250.11	78.95	16.835		
11,200.00	10,814.96	11,283.39	10,845.96	39.50	40.29	91.34	1,103.47	1,193.07	1,328.99	1,249.63	79.37	16.745		
11,300.00	10,814.96	11,383.39	10,845.96	39.72	40.47	91.34	1,203.47	1,193.37	1,328.91	1,249.12	79.79	16.656		
11,400.00	10,814.96	11,483.39	10,845.96	39.97	40.68	91.34	1,303.47	1,193.67	1,328.82	1,248.57	80.25	16.558		
11,500.00	10,814.96	11,583.39	10,845.96	40.23	40.92	91.34	1,403.47	1,193.97	1,328.73	1,247.98	80.76	16.453		
11,600.00	10,814.96	11,683.39	10,845.96	40.51	41.18	91.34	1,503.47	1,194.28	1,328.65	1,247.34	81.31	16.341		
11,700.00	10,814.96	11,783.39	10,845.96	40.82	41.47	91.34	1,603.47	1,194.58	1,328.56	1,246.66	81.90	16.222		
11,800.00	10,814.96	11,883.39	10,845.96	41.14	41.78	91.34	1,703.47	1,194.88	1,328.47	1,245.94	82.53	16.096		
11,900.00	10,814.96	11,983.39	10,845.96	41.49	42.11	91.34	1,803.47	1,195.18	1,328.39	1,245.18	83.21	15.965		
12,000.00	10,814.96	12,083.39	10,845.96	41.86	42.46	91.34	1,903.47	1,195.48	1,328.30	1,244.38	83.92	15.828		
12,100.00	10,814.96	12,183.39	10,845.96	42.24	42.82	91.34	2,003.47	1,195.79	1,328.21	1,243.54	84.67	15.687		
12,200.00	10,814.96	12,283.39	10,845.96	42.64	43.21	91.34	2,103.47	1,196.09	1,328.13	1,242.67	85.46	15.541		
12,300.00	10,814.96	12,383.39	10,845.96	43.06	43.62	91.34	2,203.47	1,196.39	1,328.04	1,241.76	86.28	15.392		
12,400.00	10,814.96	12,483.39	10,845.96	43.50	44.04	91.34	2,303.47	1,196.69	1,327.95	1,240.81	87.14	15.239		
12,500.00	10,814.96	12,583.39	10,845.96	43.96	44.48	91.34	2,403.47	1,196.99	1,327.87	1,239.83	88.04	15.083		
12,600.00	10,814.96	12,683.39	10,845.96	44.43	44.93	91.34	2,503.47	1,197.29	1,327.78	1,238.82	88.96	14.925		
12,700.00	10,814.96	12,783.39	10,845.96	44.92	45.41	91.34	2,603.47	1,197.60	1,327.69	1,237.77	89.92	14.765		
12,800.00	10,814.96	12,883.39	10,845.96	45.42	45.89	91.34	2,703.47	1,197.90	1,327.60	1,236.69	90.91	14.603		
12,900.00	10,814.97	12,983.39	10,845.97	45.94	46.40	91.34	2,803.47	1,198.20	1,327.52	1,235.59	91.93	14.440		
13,000.00	10,814.97	13,083.39	10,845.97	46.47	46.91	91.34	2,903.47	1,198.50	1,327.43	1,234.45	92.98	14.277		
13,100.00	10,814.97	13,183.39	10,845.97	47.02	47.44	91.34	3,003.47	1,198.80	1,327.34	1,233.29	94.06	14.112		
13,200.00	10,814.97	13,283.39	10,845.97	47.58	47.99	91.34	3,103.47	1,199.11	1,327.26	1,232.10	95.16	13.948		
13,300.00	10,814.97	13,383.39	10,845.97	48.15	48.55	91.34	3,203.46	1,199.41	1,327.17	1,230.88	96.29	13.783		
13,400.00	10,814.97	13,483.39	10,845.97	48.73	49.12	91.34	3,303.46	1,199.71	1,327.08	1,229.64	97.45	13.619		
13,500.00	10,814.97	13,583.39	10,845.97	49.33	49.70	91.34	3,403.46	1,200.01	1,327.00	1,228.37	98.63	13.455		
13,600.00	10,814.97	13,683.39	10,845.97	49.94	50.29	91.34	3,503.46	1,200.31	1,326.91	1,227.08	99.83	13.292		
13,700.00	10,814.97	13,783.39	10,845.97	50.56	50.90	91.34	3,603.46	1,200.61	1,326.82	1,225.77	101.06	13.129		
13,800.00	10,814.97	13,883.39	10,845.97	51.19	51.52	91.34	3,703.46	1,200.92	1,326.74	1,224.43	102.31	12.968		
13,900.00	10,814.97	13,983.39	10,845.97	51.83	52.14	91.34	3,803.46	1,201.22	1,326.65	1,223.08	103.58	12.809		
14,000.00	10,814.97	14,083.39	10,845.97	52.48	52.78	91.34	3,903.46	1,201.52	1,326.56	1,221.70	104.87	12.650		
14,100.00	10,814.97	14,183.39	10,845.97	53.14	53.43	91.34	4,003.46	1,201.82	1,326.48	1,220.30	106.17	12.493		
14,200.00	10,814.97	14,283.39	10,845.97	53.81	54.09	91.34	4,103.46	1,202.12	1,326.39	1,218.89	107.50	12.338		
14,300.00	10,814.97	14,383.39	10,845.97	54.49	54.75	91.34	4,203.46	1,202.43	1,326.30	1,217.45	108.85	12.185		
14,400.00	10,814.97	14,483.39	10,845.97	55.18	55.43	91.34	4,303.46	1,202.73	1,326.22	1,216.00	110.21	12.033		
14,500.00	10,814.97	14,583.39	10,845.97	55.87	56.11	91.34	4,403.46	1,203.03	1,326.13	1,214.54	111.59	11.884		
14,600.00	10,814.97	14,683.39	10,845.97	56.58	56.80	91.34	4,503.46	1,203.33	1,326.04	1,213.05	112.99	11.736		
14,700.00	10,814.97	14,783.39	10,845.97	57.29	57.50	91.34	4,603.46	1,203.63	1,325.96	1,211.55	114.40	11.590		
14,800.00	10,814.97	14,883.39	10,845.97	58.01	58.21	91.34	4,703.46	1,203.94	1,325.87	1,210.04	115.83	11.447		
14,900.00	10,814.97	14,983.39	10,845.97	58.73	58.93	91.34	4,803.46	1,204.24	1,325.78	1,208.51	117.27	11.305		
15,000.00	10,814.97	15,083.39	10,845.97	59.47	59.65	91.34	4,903.46	1,204.54	1,325.70	1,206.97	118.73	11.166		
15,100.00	10,814.97	15,183.39	10,845.97	60.21	60.38	91.34	5,003.46	1,204.84	1,325.61	1,205.41	120.20	11.028		
15,200.00	10,814.98	15,283.39	10,845.98	60.95	61.11	91.34	5,103.46	1,205.14	1,325.52	1,203.84	121.68	10.893		
15,300.00	10,814.98	15,383.39	10,845.98	61.70	61.85	91.34	5,203.45	1,205.44	1,325.44	1,202.26	123.18	10.760		
15,400.00	10,814.98	15,483.38	10,845.98	62.46	62.60	91.34	5,303.45	1,205.75	1,325.35	1,200.66	124.69	10.629		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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		
15,500.00	10,814.98	15,583.38	10,845.98	63.22	63.36	91.34	5,403.45	1,206.05	1,325.26	1,199.06	126.21	10.501		
15,600.00	10,814.98	15,683.38	10,845.98	63.99	64.12	91.34	5,503.45	1,206.35	1,325.18	1,197.44	127.74	10.374		
15,700.00	10,814.98	15,783.38	10,845.98	64.77	64.88	91.34	5,603.45	1,206.65	1,325.09	1,195.81	129.28	10.250		
15,800.00	10,814.98	15,883.38	10,845.98	65.55	65.65	91.34	5,703.45	1,206.95	1,325.00	1,194.17	130.83	10.128		
15,900.00	10,814.98	15,983.38	10,845.98	66.33	66.43	91.34	5,803.45	1,207.26	1,324.92	1,192.53	132.39	10.008		
16,000.00	10,814.98	16,083.38	10,845.98	67.12	67.21	91.34	5,903.45	1,207.56	1,324.83	1,190.87	133.96	9.890		
16,100.00	10,814.98	16,183.38	10,845.98	67.92	67.99	91.34	6,003.45	1,207.86	1,324.74	1,189.20	135.54	9.774		
16,200.00	10,814.98	16,283.38	10,845.98	68.71	68.78	91.34	6,103.45	1,208.16	1,324.66	1,187.52	137.13	9.660		
16,300.00	10,814.98	16,383.38	10,845.98	69.52	69.58	91.34	6,203.45	1,208.46	1,324.57	1,185.84	138.73	9.548		
16,400.00	10,814.98	16,483.38	10,845.98	70.32	70.38	91.34	6,303.45	1,208.76	1,324.48	1,184.14	140.34	9.438		
16,500.00	10,814.98	16,583.38	10,845.98	71.13	71.18	91.34	6,403.45	1,209.07	1,324.39	1,182.44	141.95	9.330		
16,600.00	10,814.98	16,683.38	10,845.98	71.95	71.99	91.34	6,503.45	1,209.37	1,324.31	1,180.73	143.58	9.224		
16,700.00	10,814.98	16,783.38	10,845.98	72.77	72.80	91.34	6,603.45	1,209.67	1,324.22	1,179.01	145.21	9.119		
16,800.00	10,814.98	16,883.38	10,845.98	73.59	73.61	91.34	6,703.45	1,209.97	1,324.13	1,177.29	146.85	9.017		
16,900.00	10,814.98	16,983.38	10,845.98	74.41	74.43	91.34	6,803.45	1,210.27	1,324.05	1,175.56	148.49	8.917		
17,000.00	10,814.98	17,083.38	10,845.98	75.24	75.25	91.34	6,903.45	1,210.58	1,323.96	1,173.82	150.14	8.818		
17,100.00	10,814.98	17,183.38	10,845.98	76.08	76.08	91.34	7,003.45	1,210.88	1,323.87	1,172.07	151.80	8.721		
17,200.00	10,814.98	17,283.38	10,845.98	76.91	76.91	91.34	7,103.45	1,211.18	1,323.79	1,170.32	153.47	8.626		
17,300.00	10,814.98	17,383.38	10,845.98	77.75	77.74	91.34	7,203.44	1,211.48	1,323.70	1,168.56	155.14	8.532		
17,400.00	10,814.98	17,483.38	10,845.98	78.59	78.58	91.34	7,303.44	1,211.78	1,323.61	1,166.80	156.82	8.440		
17,500.00	10,814.98	17,583.38	10,845.98	79.43	79.41	91.34	7,403.44	1,212.09	1,323.53	1,165.02	158.50	8.350		
17,600.00	10,814.99	17,683.38	10,845.99	80.28	80.25	91.34	7,503.44	1,212.39	1,323.44	1,163.25	160.19	8.262		
17,700.00	10,814.99	17,783.38	10,845.99	81.13	81.10	91.34	7,603.44	1,212.69	1,323.35	1,161.47	161.89	8.175		
17,800.00	10,814.99	17,883.38	10,845.99	81.98	81.95	91.34	7,703.44	1,212.99	1,323.27	1,159.68	163.59	8.089		
17,900.00	10,814.99	17,983.38	10,845.99	82.84	82.79	91.34	7,803.44	1,213.29	1,323.18	1,157.89	165.29	8.005		
18,000.00	10,814.99	18,083.38	10,845.99	83.70	83.65	91.34	7,903.44	1,213.59	1,323.09	1,156.09	167.00	7.923		
18,100.00	10,814.99	18,183.38	10,845.99	84.56	84.50	91.34	8,003.44	1,213.90	1,323.01	1,154.29	168.72	7.842		
18,200.00	10,814.99	18,283.38	10,845.99	85.42	85.36	91.34	8,103.44	1,214.20	1,322.92	1,152.48	170.44	7.762		
18,300.00	10,814.99	18,383.38	10,845.99	86.28	86.22	91.34	8,203.44	1,214.50	1,322.83	1,150.67	172.16	7.684		
18,400.00	10,814.99	18,483.38	10,845.99	87.15	87.08	91.34	8,303.44	1,214.80	1,322.75	1,148.86	173.89	7.607		
18,500.00	10,814.99	18,583.38	10,845.99	88.02	87.94	91.34	8,403.44	1,215.10	1,322.66	1,147.04	175.62	7.531		
18,600.00	10,814.99	18,683.38	10,845.99	88.89	88.81	91.34	8,503.44	1,215.41	1,322.57	1,145.21	177.36	7.457		
18,700.00	10,814.99	18,783.38	10,845.99	89.76	89.67	91.34	8,603.44	1,215.71	1,322.49	1,143.38	179.10	7.384		
18,800.00	10,814.99	18,883.38	10,845.99	90.63	90.54	91.34	8,703.44	1,216.01	1,322.40	1,141.55	180.85	7.312		
18,900.00	10,814.99	18,983.38	10,845.99	91.51	91.42	91.34	8,803.44	1,216.31	1,322.31	1,139.72	182.60	7.242		
19,000.00	10,814.99	19,083.38	10,845.99	92.39	92.29	91.34	8,903.44	1,216.61	1,322.23	1,137.88	184.35	7.172		
19,100.00	10,814.99	19,183.38	10,845.99	93.27	93.17	91.34	9,003.44	1,216.91	1,322.14	1,136.03	186.11	7.104		
19,200.00	10,814.99	19,283.38	10,845.99	94.15	94.04	91.34	9,103.44	1,217.22	1,322.05	1,134.19	187.87	7.037		
19,300.00	10,814.99	19,383.38	10,845.99	95.03	94.92	91.34	9,203.44	1,217.52	1,321.97	1,132.34	189.63	6.971		
19,400.00	10,814.99	19,483.38	10,845.99	95.92	95.80	91.34	9,303.43	1,217.82	1,321.88	1,130.48	191.40	6.906		
19,500.00	10,814.99	19,583.38	10,845.99	96.80	96.68	91.34	9,403.43	1,218.12	1,321.79	1,128.63	193.17	6.843		
19,600.00	10,814.99	19,683.38	10,845.99	97.69	97.57	91.34	9,503.43	1,218.42	1,321.71	1,126.77	194.94	6.780		
19,700.00	10,814.99	19,783.38	10,845.99	98.58	98.45	91.34	9,603.43	1,218.73	1,321.62	1,124.90	196.72	6.718		
19,800.00	10,814.99	19,883.38	10,845.99	99.47	99.34	91.34	9,703.43	1,219.03	1,321.53	1,123.04	198.50	6.658		
19,900.00	10,815.00	19,983.38	10,846.00	100.36	100.23	91.34	9,803.43	1,219.33	1,321.45	1,121.17	200.28	6.598		
20,000.00	10,815.00	20,083.38	10,846.00	101.26	101.12	91.34	9,903.43	1,219.63	1,321.36	1,119.30	202.06	6.539		
20,100.00	10,815.00	20,183.38	10,846.00	102.15	102.01	91.34	10,003.43	1,219.93	1,321.27	1,117.42	203.85	6.482		
20,200.00	10,815.00	20,283.38	10,846.00	103.05	102.90	91.34	10,103.43	1,220.23	1,321.18	1,115.55	205.64	6.425		
20,300.00	10,815.00	20,383.38	10,846.00	103.95	103.80	91.34	10,203.43	1,220.54	1,321.10	1,113.67	207.43	6.369		
20,400.00	10,815.00	20,483.38	10,846.00	104.85	104.69	91.34	10,303.43	1,220.84	1,321.01	1,111.78	209.23	6.314		
20,500.00	10,815.00	20,583.38	10,846.00	105.75	105.59	91.34	10,403.43	1,221.14	1,320.92	1,109.90	211.03	6.260		
20,600.00	10,815.00	20,683.38	10,846.00	106.65	106.49	91.34	10,503.43	1,221.44	1,320.84	1,108.01	212.83	6.206		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	
20,700.00	10,815.00	20,783.38	10,846.00	107.55	107.39	91.34	10,603.43	1,221.74	1,320.75	1,106.12	214.63	6.154	
20,800.00	10,815.00	20,883.38	10,846.00	108.45	108.29	91.35	10,703.43	1,222.05	1,320.66	1,104.23	216.43	6.102	
20,900.00	10,815.00	20,983.38	10,846.00	109.36	109.19	91.35	10,803.43	1,222.35	1,320.58	1,102.34	218.24	6.051	
21,000.00	10,815.00	21,083.38	10,846.00	110.26	110.09	91.35	10,903.43	1,222.65	1,320.49	1,100.44	220.05	6.001	
21,100.00	10,815.00	21,183.38	10,846.00	111.17	111.00	91.35	11,003.43	1,222.95	1,320.40	1,098.54	221.86	5.952	
21,100.68	10,815.00	21,184.06	10,846.00	111.18	111.00	91.35	11,004.11	1,222.95	1,320.40	1,098.53	221.87	5.951 SF	



Pro Directional Anticollision Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WD #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	1.00	0.00	0.00	0.00	89.99	0.01	60.01	60.01					
100.00	100.00	101.00	100.00	0.13	0.13	89.99	0.01	60.01	60.01	59.74	0.27	226.223		
200.00	200.00	201.00	200.00	0.49	0.49	89.99	0.01	60.01	60.01	59.03	0.98	61.097		
300.00	300.00	301.00	300.00	0.85	0.85	89.99	0.01	60.01	60.01	58.31	1.70	35.318		
400.00	400.00	401.00	400.00	1.21	1.21	89.99	0.01	60.01	60.01	57.59	2.42	24.838		
500.00	500.00	501.00	500.00	1.56	1.57	89.99	0.01	60.01	60.01	56.88	3.13	19.154		
600.00	600.00	599.00	600.00	1.92	1.92	89.99	0.01	60.01	60.01	56.17	3.84	15.616		
700.00	699.99	699.00	699.99	2.28	2.28	104.83	0.87	60.01	60.23	55.67	4.56	13.212		
800.00	799.96	801.00	799.96	2.64	2.64	104.76	3.47	60.01	60.90	55.62	5.28	11.532		
900.00	899.90	901.01	899.89	3.00	3.00	104.65	6.96	60.01	61.80	55.80	6.00	10.306		
1,000.00	999.84	1,001.01	999.83	3.36	3.36	104.54	10.44	60.01	62.69	55.98	6.71	9.341		
1,100.00	1,099.78	1,101.02	1,099.76	3.72	3.72	104.44	13.93	60.01	63.59	56.16	7.43	8.561		
1,200.00	1,199.72	1,201.02	1,199.70	4.07	4.08	104.35	17.42	60.01	64.48	56.34	8.14	7.918		
1,300.00	1,299.57	1,298.95	1,299.61	4.43	4.43	105.69	20.91	60.01	65.83	56.98	8.85	7.436		
1,400.00	1,399.19	1,401.07	1,401.62	4.80	4.80	109.44	25.12	58.36	66.65	57.08	9.57	6.964		
1,500.00	1,498.44	1,503.13	1,503.40	5.16	5.16	115.26	30.64	53.33	65.69	55.41	10.28	6.392		
1,600.00	1,597.21	1,604.96	1,604.65	5.52	5.52	123.63	37.45	44.94	63.71	52.74	10.97	5.808		
1,700.00	1,695.69	1,706.52	1,705.21	5.88	5.89	133.87	45.53	33.23	60.78	49.12	11.65	5.216		
1,800.00	1,794.17	1,806.73	1,803.96	6.25	6.25	145.57	54.59	18.85	56.98	44.62	12.36	4.609		
1,900.00	1,892.65	1,905.92	1,901.64	6.61	6.61	158.41	63.70	4.23	55.47	42.36	13.11	4.230		
1,902.24	1,894.85	1,908.13	1,903.82	6.62	6.62	158.70	63.90	3.90	55.47	42.34	13.13	4.224 CC, ES		
2,000.00	1,991.13	2,005.10	1,999.32	6.98	6.97	171.27	72.81	-10.38	56.86	42.98	13.88	4.097		
2,100.00	2,089.61	2,104.28	2,096.99	7.35	7.34	-177.02	81.92	-25.00	60.94	46.30	14.65	4.161		
2,200.00	2,188.09	2,203.46	2,194.67	7.72	7.71	-167.11	91.04	-39.61	67.23	51.83	15.41	4.364		
2,300.00	2,286.57	2,302.65	2,292.34	8.09	8.08	-159.08	100.15	-54.22	75.18	59.02	16.16	4.652		
2,400.00	2,385.05	2,401.83	2,390.02	8.47	8.45	-152.67	109.26	-68.84	84.32	67.41	16.91	4.986		
2,500.00	2,483.54	2,501.01	2,487.70	8.84	8.82	-147.55	118.37	-83.45	94.31	76.65	17.66	5.340		
2,600.00	2,582.02	2,600.20	2,585.37	9.22	9.20	-143.44	127.49	-98.06	104.90	86.49	18.41	5.699		
2,700.00	2,680.50	2,700.62	2,683.05	9.59	9.58	-140.09	136.60	-112.68	115.92	96.77	19.16	6.051		
2,800.00	2,778.98	2,801.44	2,780.73	9.97	9.96	-137.33	145.71	-127.29	127.27	107.36	19.91	6.393		
2,900.00	2,877.46	2,902.26	2,878.40	10.35	10.34	-135.02	154.82	-141.90	138.87	118.21	20.66	6.721		
3,000.00	2,975.94	3,003.07	2,976.08	10.72	10.72	-133.07	163.93	-156.52	150.65	129.23	21.41	7.035		
3,100.00	3,074.42	3,103.89	3,073.75	11.10	11.11	-131.40	173.05	-171.13	162.58	140.41	22.17	7.334		
3,200.00	3,172.90	3,204.71	3,171.43	11.48	11.49	-129.96	182.16	-185.74	174.63	151.70	22.92	7.617		
3,300.00	3,271.38	3,305.53	3,269.11	11.86	11.88	-128.71	191.27	-200.36	186.77	163.09	23.68	7.887		
3,400.00	3,369.87	3,406.34	3,366.78	12.23	12.26	-127.61	200.38	-214.97	198.99	174.55	24.44	8.143		
3,500.00	3,468.35	3,507.16	3,464.46	12.61	12.65	-126.64	209.50	-229.58	211.27	186.08	25.20	8.385		
3,600.00	3,566.83	3,607.98	3,562.13	12.99	13.03	-125.78	218.61	-244.20	223.61	197.66	25.95	8.616		
3,700.00	3,665.31	3,708.80	3,659.81	13.37	13.42	-125.00	227.72	-258.81	235.99	209.28	26.71	8.835		
3,800.00	3,763.79	3,809.61	3,757.49	13.75	13.81	-124.31	236.83	-273.42	248.41	220.94	27.47	9.043		
3,900.00	3,862.27	3,889.57	3,855.16	14.13	14.11	-123.68	245.95	-288.04	260.86	232.71	28.15	9.266		
4,000.00	3,960.75	3,988.75	3,952.84	14.51	14.49	-123.10	255.06	-302.65	273.34	244.44	28.91	9.456		
4,100.00	4,059.23	4,087.94	4,050.51	14.89	14.87	-122.58	264.17	-317.26	285.85	256.19	29.66	9.638		
4,200.00	4,157.96	4,187.17	4,148.24	15.27	15.26	-122.04	273.29	-331.88	297.57	267.16	30.41	9.785		
4,300.00	4,257.19	4,286.46	4,246.02	15.64	15.64	-120.98	282.41	-346.51	307.55	276.40	31.15	9.872		
4,400.00	4,356.78	4,385.67	4,343.73	16.00	16.02	-119.43	291.52	-361.13	315.95	284.06	31.88	9.909		
4,500.00	4,456.63	4,484.69	4,441.24	16.35	16.40	-117.41	300.62	-375.72	323.00	290.39	32.61	9.906		
4,600.00	4,556.60	4,583.40	4,538.45	16.70	16.78	-114.93	309.69	-390.26	329.01	295.70	33.31	9.876		
4,700.00	4,656.60	4,681.88	4,635.44	17.04	17.16	-127.01	318.74	-404.77	334.93	300.92	34.01	9.847		
4,800.00	4,756.60	4,780.36	4,732.42	17.39	17.54	-124.32	327.79	-419.28	341.64	306.92	34.71	9.842		
4,900.00	4,856.60	4,878.84	4,829.41	17.73	17.92	-121.74	336.83	-433.79	349.07	313.66	35.41	9.858		
5,000.00	4,956.60	4,977.32	4,926.39	18.08	18.30	-119.28	345.88	-448.30	357.20	321.09	36.11	9.892		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	5,056.60	5,075.80	5,023.38	18.42	18.68	-116.92	354.93	-462.81	365.97	329.17	36.81	9.943		
5,200.00	5,156.60	5,174.28	5,120.36	18.77	19.06	-114.67	363.98	-477.32	375.35	337.84	37.51	10.007		
5,300.00	5,256.60	5,272.76	5,217.35	19.11	19.44	-112.54	373.03	-491.83	385.27	347.06	38.21	10.083		
5,400.00	5,356.60	5,371.25	5,314.33	19.46	19.82	-110.51	382.07	-506.34	395.71	356.80	38.91	10.170		
5,500.00	5,456.60	5,469.73	5,411.32	19.81	20.20	-108.59	391.12	-520.85	406.62	367.01	39.61	10.265		
5,600.00	5,556.60	5,568.21	5,508.30	20.15	20.58	-106.77	400.17	-535.36	417.97	377.66	40.31	10.368		
5,700.00	5,656.60	5,666.69	5,605.29	20.50	20.96	-105.04	409.22	-549.87	429.72	388.71	41.02	10.477		
5,800.00	5,756.60	5,765.17	5,702.27	20.85	21.35	-103.41	418.26	-564.38	441.85	400.12	41.72	10.590		
5,900.00	5,856.60	5,863.65	5,799.26	21.20	21.73	-101.86	427.31	-578.89	454.31	411.88	42.43	10.708		
6,000.00	5,956.60	5,962.13	5,896.24	21.55	22.11	-100.39	436.36	-593.40	467.08	423.95	43.13	10.829		
6,100.00	6,056.60	6,060.61	5,993.23	21.90	22.49	-99.01	445.41	-607.91	480.15	436.30	43.84	10.952		
6,200.00	6,156.60	6,159.09	6,090.21	22.25	22.87	-97.69	454.46	-622.42	493.47	448.92	44.55	11.077		
6,300.00	6,256.60	6,257.57	6,187.20	22.60	23.25	-96.45	463.50	-636.93	507.05	461.79	45.26	11.203		
6,400.00	6,356.60	6,356.06	6,284.18	22.95	23.63	-95.27	472.55	-651.44	520.84	474.88	45.97	11.330		
6,500.00	6,456.60	6,454.54	6,381.17	23.30	24.01	-94.15	481.60	-665.95	534.85	488.17	46.68	11.458		
6,600.00	6,556.60	6,553.02	6,478.15	23.65	24.39	-93.09	490.65	-680.46	549.05	501.66	47.39	11.585		
6,700.00	6,656.60	6,651.50	6,575.14	24.00	24.78	-92.08	499.70	-694.97	563.42	515.32	48.10	11.713		
6,800.00	6,756.60	6,749.98	6,672.12	24.35	25.16	-91.12	508.74	-709.48	577.96	529.14	48.82	11.839		
6,900.00	6,856.60	6,848.46	6,769.11	24.70	25.54	-90.21	517.79	-723.99	592.65	543.12	49.53	11.965		
7,000.00	6,956.60	6,946.94	6,866.09	25.05	25.92	-89.34	526.84	-738.50	607.48	557.24	50.25	12.090		
7,100.00	7,056.60	7,045.42	6,963.08	25.40	26.30	-88.51	535.89	-753.01	622.45	571.49	50.96	12.214		
7,200.00	7,156.60	7,143.90	7,060.06	25.76	26.68	-87.73	544.93	-767.52	637.53	585.86	51.68	12.337		
7,300.00	7,256.60	7,262.79	7,177.44	26.11	27.14	-86.90	554.91	-783.52	651.45	598.90	52.55	12.397		
7,400.00	7,356.60	7,387.20	7,300.99	26.46	27.60	-86.29	562.60	-795.86	661.74	608.34	53.40	12.392		
7,500.00	7,456.60	7,512.66	7,426.09	26.81	28.05	-85.92	567.48	-803.68	668.23	614.05	54.18	12.333		
7,600.00	7,556.60	7,638.68	7,552.05	27.17	28.48	-85.77	569.46	-806.85	670.85	615.97	54.89	12.222		
7,700.00	7,656.60	7,743.23	7,656.60	27.52	28.83	-85.76	569.50	-806.92	670.91	615.34	55.57	12.073		
7,800.00	7,756.60	7,843.23	7,756.60	27.87	29.16	-85.76	569.50	-806.92	670.91	614.65	56.26	11.925		
7,900.00	7,856.60	7,943.23	7,856.60	28.22	29.50	-85.76	569.50	-806.92	670.91	613.96	56.95	11.780		
8,000.00	7,956.60	8,043.23	7,956.60	28.58	29.83	-85.76	569.50	-806.92	670.91	613.27	57.64	11.639		
8,100.00	8,056.60	8,143.23	8,056.60	28.93	30.17	-85.76	569.50	-806.92	670.91	612.58	58.33	11.501		
8,200.00	8,156.60	8,243.23	8,156.60	29.28	30.51	-85.76	569.50	-806.92	670.91	611.89	59.03	11.366		
8,300.00	8,256.60	8,343.23	8,256.60	29.64	30.84	-85.76	569.50	-806.92	670.91	611.20	59.72	11.235		
8,400.00	8,356.60	8,443.23	8,356.60	29.99	31.18	-85.76	569.50	-806.92	670.91	610.50	60.41	11.106		
8,500.00	8,456.60	8,543.23	8,456.60	30.34	31.52	-85.76	569.50	-806.92	670.91	609.81	61.11	10.980		
8,600.00	8,556.60	8,643.23	8,556.60	30.70	31.86	-85.76	569.50	-806.92	670.91	609.11	61.80	10.856		
8,700.00	8,656.60	8,743.23	8,656.60	31.05	32.20	-85.76	569.50	-806.92	670.91	608.42	62.49	10.736		
8,800.00	8,756.60	8,843.23	8,756.60	31.41	32.54	-85.76	569.50	-806.92	670.91	607.72	63.19	10.618		
8,900.00	8,856.60	8,943.23	8,856.60	31.76	32.88	-85.76	569.50	-806.92	670.91	607.03	63.88	10.502		
9,000.00	8,956.60	9,043.23	8,956.60	32.12	33.22	-85.76	569.50	-806.92	670.91	606.33	64.58	10.389		
9,100.00	9,056.60	9,143.23	9,056.60	32.47	33.56	-85.76	569.50	-806.92	670.91	605.64	65.28	10.278		
9,200.00	9,156.60	9,243.23	9,156.60	32.82	33.90	-85.76	569.50	-806.92	670.91	604.94	65.97	10.169		
9,300.00	9,256.60	9,343.23	9,256.60	33.18	34.24	-85.76	569.50	-806.92	670.91	604.24	66.67	10.063		
9,400.00	9,356.60	9,443.23	9,356.60	33.53	34.58	-85.76	569.50	-806.92	670.91	603.54	67.37	9.959		
9,500.00	9,456.60	9,543.23	9,456.60	33.89	34.92	-85.76	569.50	-806.92	670.91	602.85	68.07	9.857		
9,600.00	9,556.60	9,643.23	9,556.60	34.24	35.27	-85.76	569.50	-806.92	670.91	602.15	68.77	9.756		
9,700.00	9,656.60	9,743.23	9,656.60	34.60	35.61	-85.76	569.50	-806.92	670.91	601.45	69.47	9.658		
9,800.00	9,756.60	9,843.23	9,756.60	34.95	35.95	-85.76	569.50	-806.92	670.91	600.75	70.16	9.562		
9,900.00	9,856.60	9,943.23	9,856.60	35.31	36.30	-85.76	569.50	-806.92	670.91	600.05	70.86	9.468		
10,000.00	9,956.60	10,043.23	9,956.60	35.66	36.64	-85.76	569.50	-806.92	670.91	599.35	71.56	9.375		
10,100.00	10,056.60	10,143.23	10,056.60	36.02	36.98	-85.76	569.50	-806.92	670.91	598.65	72.26	9.284		
10,200.00	10,156.60	10,243.23	10,156.60	36.37	37.33	-85.76	569.50	-806.92	670.91	597.95	72.97	9.195		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	10,256.60	10,343.23	10,256.60	36.73	37.67	-86.00	569.50	-806.92	670.90	597.23	73.67	9.107		
10,400.00	10,355.84	10,442.47	10,355.84	37.09	38.01	-87.02	569.50	-806.92	670.21	595.83	74.38	9.011		
10,500.00	10,451.62	10,536.55	10,449.59	37.45	38.34	-88.83	576.08	-806.89	669.41	594.31	75.10	8.914		
10,565.29	10,510.89	10,599.52	10,511.18	37.68	38.57	-90.05	588.99	-806.83	669.25	593.69	75.56	8.857		
10,600.00	10,541.03	10,633.64	10,543.86	37.81	38.68	-90.71	598.79	-806.78	669.30	593.50	75.80	8.830		
10,700.00	10,621.36	10,734.64	10,636.40	38.14	39.03	-92.59	638.94	-806.59	669.93	593.47	76.46	8.762		
10,800.00	10,690.15	10,840.04	10,723.89	38.46	39.35	-94.44	697.44	-806.32	671.27	594.24	77.03	8.714		
10,900.00	10,745.34	10,950.20	10,802.28	38.76	39.65	-96.19	774.60	-805.96	673.17	595.69	77.49	8.687		
11,000.00	10,785.22	11,065.30	10,866.85	39.04	39.91	-97.77	869.65	-805.51	675.40	597.60	77.80	8.681		
11,100.00	10,808.61	11,185.20	10,912.53	39.29	40.15	-99.11	980.27	-804.99	677.63	599.63	78.00	8.688		
11,200.00	10,814.96	11,309.35	10,934.54	39.50	40.40	-100.14	1,102.21	-804.42	679.49	601.33	78.16	8.694		
11,300.00	10,814.96	11,417.81	10,935.96	39.72	40.62	-100.26	1,210.63	-803.91	679.61	601.08	78.53	8.654		
11,400.00	10,814.96	11,517.81	10,935.96	39.97	40.84	-100.26	1,310.62	-803.44	679.53	600.55	78.98	8.604		
11,500.00	10,814.96	11,617.81	10,935.96	40.23	41.09	-100.26	1,410.62	-802.97	679.45	599.98	79.47	8.550		
11,600.00	10,814.96	11,717.81	10,935.96	40.51	41.36	-100.26	1,510.62	-802.50	679.37	599.37	80.00	8.492		
11,700.00	10,814.96	11,817.81	10,935.96	40.82	41.65	-100.26	1,610.62	-802.03	679.29	598.71	80.58	8.430		
11,800.00	10,814.96	11,917.81	10,935.96	41.14	41.97	-100.26	1,710.62	-801.56	679.21	598.01	81.20	8.365		
11,900.00	10,814.96	12,017.81	10,935.96	41.49	42.30	-100.26	1,810.62	-801.09	679.13	597.27	81.85	8.297		
12,000.00	10,814.96	12,117.81	10,935.96	41.86	42.66	-100.26	1,910.62	-800.62	679.05	596.50	82.55	8.226		
12,100.00	10,814.96	12,217.80	10,935.96	42.24	43.03	-100.27	2,010.62	-800.15	678.97	595.68	83.29	8.152		
12,200.00	10,814.96	12,317.80	10,935.96	42.64	43.42	-100.27	2,110.62	-799.68	678.89	594.83	84.06	8.076		
12,300.00	10,814.96	12,417.80	10,935.96	43.06	43.83	-100.27	2,210.61	-799.21	678.81	593.94	84.87	7.998		
12,400.00	10,814.96	12,517.80	10,935.96	43.50	44.26	-100.27	2,310.61	-798.74	678.73	593.01	85.72	7.918		
12,500.00	10,814.96	12,617.80	10,935.96	43.96	44.70	-100.27	2,410.61	-798.27	678.65	592.05	86.60	7.837		
12,600.00	10,814.96	12,717.80	10,935.96	44.43	45.16	-100.27	2,510.61	-797.80	678.57	591.05	87.51	7.754		
12,700.00	10,814.96	12,817.80	10,935.96	44.92	45.64	-100.27	2,610.61	-797.33	678.49	590.03	88.46	7.670		
12,800.00	10,814.96	12,917.80	10,935.96	45.42	46.13	-100.27	2,710.61	-796.86	678.41	588.97	89.44	7.585		
12,900.00	10,814.97	13,017.80	10,935.97	45.94	46.63	-100.28	2,810.61	-796.39	678.33	587.88	90.45	7.500		
13,000.00	10,814.97	13,117.80	10,935.97	46.47	47.15	-100.28	2,910.61	-795.92	678.25	586.76	91.49	7.414		
13,100.00	10,814.97	13,217.80	10,935.97	47.02	47.69	-100.28	3,010.60	-795.45	678.17	585.62	92.55	7.327		
13,200.00	10,814.97	13,317.80	10,935.97	47.58	48.23	-100.28	3,110.60	-794.98	678.09	584.45	93.65	7.241		
13,300.00	10,814.97	13,417.80	10,935.97	48.15	48.79	-100.28	3,210.60	-794.51	678.01	583.25	94.76	7.155		
13,400.00	10,814.97	13,517.80	10,935.97	48.73	49.37	-100.28	3,310.60	-794.04	677.93	582.02	95.91	7.068		
13,500.00	10,814.97	13,617.80	10,935.97	49.33	49.95	-100.28	3,410.60	-793.57	677.85	580.77	97.08	6.982		
13,600.00	10,814.97	13,717.80	10,935.97	49.94	50.55	-100.28	3,510.60	-793.11	677.77	579.50	98.27	6.897		
13,700.00	10,814.97	13,817.80	10,935.97	50.56	51.16	-100.29	3,610.60	-792.64	677.69	578.20	99.49	6.812		
13,800.00	10,814.97	13,917.80	10,935.97	51.19	51.77	-100.29	3,710.60	-792.17	677.61	576.88	100.73	6.727		
13,900.00	10,814.97	14,017.80	10,935.97	51.83	52.40	-100.29	3,810.60	-791.70	677.53	575.54	101.99	6.643		
14,000.00	10,814.97	14,117.80	10,935.97	52.48	53.04	-100.29	3,910.59	-791.23	677.45	574.18	103.27	6.560		
14,100.00	10,814.97	14,217.80	10,935.97	53.14	53.69	-100.29	4,010.59	-790.76	677.37	572.80	104.57	6.478		
14,200.00	10,814.97	14,317.80	10,935.97	53.81	54.35	-100.29	4,110.59	-790.29	677.29	571.40	105.89	6.396		
14,300.00	10,814.97	14,417.80	10,935.97	54.49	55.02	-100.29	4,210.59	-789.82	677.21	569.99	107.23	6.316		
14,400.00	10,814.97	14,517.80	10,935.97	55.18	55.69	-100.29	4,310.59	-789.35	677.13	568.55	108.58	6.236		
14,500.00	10,814.97	14,617.80	10,935.97	55.87	56.38	-100.29	4,410.59	-788.88	677.05	567.10	109.95	6.158		
14,600.00	10,814.97	14,717.80	10,935.97	56.58	57.07	-100.30	4,510.59	-788.41	676.97	565.63	111.34	6.080		
14,700.00	10,814.97	14,817.80	10,935.97	57.29	57.77	-100.30	4,610.59	-787.94	676.89	564.15	112.75	6.004		
14,800.00	10,814.97	14,917.80	10,935.97	58.01	58.48	-100.30	4,710.59	-787.47	676.81	562.65	114.17	5.928		
14,900.00	10,814.97	15,017.80	10,935.97	58.73	59.20	-100.30	4,810.58	-787.00	676.73	561.13	115.60	5.854		
15,000.00	10,814.97	15,117.80	10,935.97	59.47	59.92	-100.30	4,910.58	-786.53	676.65	559.61	117.05	5.781		
15,100.00	10,814.97	15,217.80	10,935.97	60.21	60.65	-100.30	5,010.58	-786.06	676.57	558.07	118.51	5.709		
15,200.00	10,814.98	15,317.80	10,935.98	60.95	61.39	-100.30	5,110.58	-785.59	676.49	556.51	119.98	5.638		
15,300.00	10,814.98	15,417.80	10,935.98	61.70	62.13	-100.30	5,210.58	-785.12	676.42	554.94	121.47	5.569		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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		
15,400.00	10,814.98	15,517.80	10,935.98	62.46	62.88	-100.31	5,310.58	-784.65	676.34	553.36	122.97	5.500		
15,500.00	10,814.98	15,617.80	10,935.98	63.22	63.63	-100.31	5,410.58	-784.18	676.26	551.77	124.48	5.433		
15,600.00	10,814.98	15,717.80	10,935.98	63.99	64.39	-100.31	5,510.58	-783.71	676.18	550.17	126.00	5.366		
15,700.00	10,814.98	15,817.80	10,935.98	64.77	65.16	-100.31	5,610.58	-783.24	676.10	548.56	127.54	5.301		
15,800.00	10,814.98	15,917.80	10,935.98	65.55	65.93	-100.31	5,710.57	-782.77	676.02	546.94	129.08	5.237		
15,900.00	10,814.98	16,017.80	10,935.98	66.33	66.71	-100.31	5,810.57	-782.30	675.94	545.30	130.63	5.174		
16,000.00	10,814.98	16,117.80	10,935.98	67.12	67.49	-100.31	5,910.57	-781.83	675.86	543.66	132.20	5.112		
16,100.00	10,814.98	16,217.80	10,935.98	67.92	68.27	-100.31	6,010.57	-781.36	675.78	542.01	133.77	5.052		
16,200.00	10,814.98	16,317.80	10,935.98	68.71	69.06	-100.32	6,110.57	-780.89	675.70	540.35	135.35	4.992		
16,300.00	10,814.98	16,417.80	10,935.98	69.52	69.86	-100.32	6,210.57	-780.42	675.62	538.68	136.94	4.934		
16,400.00	10,814.98	16,517.80	10,935.98	70.32	70.66	-100.32	6,310.57	-779.95	675.54	537.00	138.54	4.876		
16,500.00	10,814.98	16,617.80	10,935.98	71.13	71.46	-100.32	6,410.57	-779.48	675.46	535.31	140.15	4.820		
16,600.00	10,814.98	16,717.80	10,935.98	71.95	72.27	-100.32	6,510.57	-779.01	675.38	533.61	141.76	4.764		
16,700.00	10,814.98	16,817.80	10,935.98	72.77	73.08	-100.32	6,610.56	-778.54	675.30	531.91	143.39	4.710		
16,800.00	10,814.98	16,917.80	10,935.98	73.59	73.89	-100.32	6,710.56	-778.07	675.22	530.20	145.02	4.656		
16,900.00	10,814.98	17,017.80	10,935.98	74.41	74.71	-100.32	6,810.56	-777.60	675.14	528.49	146.65	4.604		
17,000.00	10,814.98	17,117.80	10,935.98	75.24	75.53	-100.33	6,910.56	-777.14	675.06	526.76	148.30	4.552		
17,100.00	10,814.98	17,217.80	10,935.98	76.08	76.36	-100.33	7,010.56	-776.67	674.98	525.03	149.95	4.501		
17,200.00	10,814.98	17,317.80	10,935.98	76.91	77.19	-100.33	7,110.56	-776.20	674.90	523.29	151.61	4.452		
17,300.00	10,814.98	17,417.80	10,935.98	77.75	78.02	-100.33	7,210.56	-775.73	674.82	521.55	153.27	4.403		
17,400.00	10,814.98	17,517.80	10,935.99	78.59	78.85	-100.33	7,310.56	-775.26	674.74	519.80	154.94	4.355		
17,500.00	10,814.98	17,617.80	10,935.99	79.43	79.69	-100.33	7,410.55	-774.79	674.66	518.05	156.61	4.308		
17,600.00	10,814.99	17,717.80	10,935.99	80.28	80.53	-100.33	7,510.55	-774.32	674.58	516.29	158.29	4.262		
17,700.00	10,814.99	17,817.80	10,935.99	81.13	81.38	-100.33	7,610.55	-773.85	674.50	514.52	159.98	4.216		
17,800.00	10,814.99	17,917.80	10,935.99	81.98	82.22	-100.34	7,710.55	-773.38	674.42	512.75	161.67	4.172		
17,900.00	10,814.99	18,017.80	10,935.99	82.84	83.07	-100.34	7,810.55	-772.91	674.34	510.97	163.37	4.128		
18,000.00	10,814.99	18,117.80	10,935.99	83.70	83.92	-100.34	7,910.55	-772.44	674.26	509.19	165.07	4.085		
18,100.00	10,814.99	18,217.80	10,935.99	84.56	84.78	-100.34	8,010.55	-771.97	674.18	507.40	166.78	4.042		
18,200.00	10,814.99	18,317.80	10,935.99	85.42	85.63	-100.34	8,110.55	-771.50	674.10	505.61	168.49	4.001		
18,300.00	10,814.99	18,417.80	10,935.99	86.28	86.49	-100.34	8,210.55	-771.03	674.02	503.82	170.20	3.960		
18,400.00	10,814.99	18,517.80	10,935.99	87.15	87.35	-100.34	8,310.54	-770.56	673.94	502.02	171.93	3.920		
18,500.00	10,814.99	18,617.80	10,935.99	88.02	88.22	-100.34	8,410.54	-770.09	673.86	500.21	173.65	3.881		
18,600.00	10,814.99	18,717.80	10,935.99	88.89	89.08	-100.35	8,510.54	-769.62	673.78	498.40	175.38	3.842		
18,700.00	10,814.99	18,817.80	10,935.99	89.76	89.95	-100.35	8,610.54	-769.15	673.70	496.59	177.11	3.804		
18,800.00	10,814.99	18,917.80	10,935.99	90.63	90.82	-100.35	8,710.54	-768.68	673.62	494.78	178.85	3.766		
18,900.00	10,814.99	19,017.80	10,935.99	91.51	91.69	-100.35	8,810.54	-768.21	673.54	492.96	180.59	3.730		
19,000.00	10,814.99	19,117.80	10,935.99	92.39	92.56	-100.35	8,910.54	-767.74	673.46	491.13	182.33	3.694		
19,100.00	10,814.99	19,217.80	10,935.99	93.27	93.44	-100.35	9,010.54	-767.27	673.38	489.30	184.08	3.658		
19,200.00	10,814.99	19,317.80	10,935.99	94.15	94.31	-100.35	9,110.54	-766.80	673.30	487.47	185.83	3.623		
19,300.00	10,814.99	19,417.80	10,935.99	95.03	95.19	-100.35	9,210.53	-766.33	673.22	485.64	187.59	3.589		
19,400.00	10,814.99	19,517.80	10,935.99	95.92	96.07	-100.36	9,310.53	-765.86	673.14	483.80	189.34	3.555		
19,500.00	10,814.99	19,617.80	10,935.99	96.80	96.96	-100.36	9,410.53	-765.39	673.06	481.96	191.10	3.522		
19,600.00	10,814.99	19,717.80	10,935.99	97.69	97.84	-100.36	9,510.53	-764.92	672.99	480.12	192.87	3.489		
19,700.00	10,814.99	19,817.80	10,936.00	98.58	98.72	-100.36	9,610.53	-764.45	672.91	478.27	194.64	3.457		
19,800.00	10,814.99	19,917.80	10,936.00	99.47	99.61	-100.36	9,710.53	-763.98	672.83	476.42	196.41	3.426		
19,900.00	10,815.00	20,017.80	10,936.00	100.36	100.50	-100.36	9,810.53	-763.51	672.75	474.57	198.18	3.395		
20,000.00	10,815.00	20,117.80	10,936.00	101.26	101.39	-100.36	9,910.53	-763.04	672.67	472.71	199.95	3.364		
20,100.00	10,815.00	20,217.80	10,936.00	102.15	102.28	-100.36	10,010.53	-762.57	672.59	470.85	201.73	3.334		
20,200.00	10,815.00	20,317.80	10,936.00	103.05	103.17	-100.37	10,110.52	-762.10	672.51	468.99	203.51	3.304		
20,300.00	10,815.00	20,417.80	10,936.00	103.95	104.07	-100.37	10,210.52	-761.63	672.43	467.13	205.30	3.275		
20,400.00	10,815.00	20,517.80	10,936.00	104.85	104.96	-100.37	10,310.52	-761.16	672.35	465.26	207.08	3.247		
20,500.00	10,815.00	20,617.80	10,936.00	105.75	105.86	-100.37	10,410.52	-760.70	672.27	463.40	208.87	3.219		

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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	
20,600.00	10,815.00	20,717.80	10,936.00	106.65	106.75	-100.37	10,510.52	-760.23	672.19	461.53	210.66	3.191	
20,700.00	10,815.00	20,817.80	10,936.00	107.55	107.65	-100.37	10,610.52	-759.76	672.11	459.65	212.46	3.164	
20,800.00	10,815.00	20,917.80	10,936.00	108.45	108.55	-100.37	10,710.52	-759.29	672.03	457.78	214.25	3.137	
20,873.46	10,815.00	20,991.26	10,936.00	109.12	109.21	-100.37	10,783.98	-758.94	671.97	456.40	215.57	3.117 SF	
20,900.00	10,815.00	20,982.98	10,936.00	109.36	109.14	-100.37	10,775.69	-758.98	672.85	457.02	215.83	3.118	
21,000.00	10,815.00	20,982.98	10,936.00	110.26	109.14	-100.37	10,775.69	-758.98	685.26	470.88	214.39	3.196	
21,100.00	10,815.00	20,982.98	10,936.00	111.17	109.14	-100.37	10,775.69	-758.98	711.65	502.08	209.56	3.396	
21,100.68	10,815.00	20,982.98	10,936.00	111.18	109.14	-100.37	10,775.69	-758.98	711.87	502.35	209.52	3.398	

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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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 @ 3027.00usft

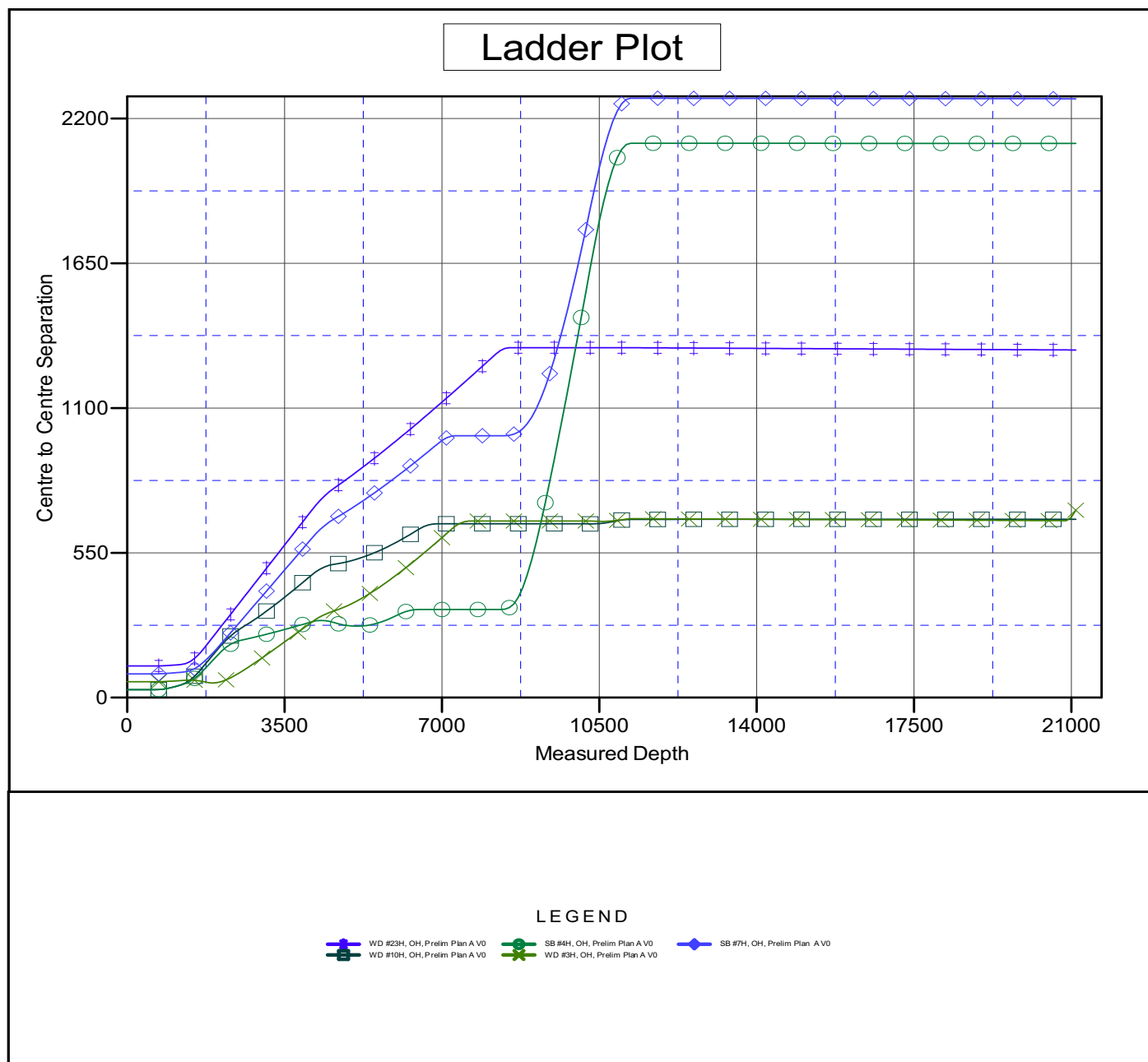
Offset Depths are relative to Offset Datum

Central Meridian is -104.3333333

Coordinates are relative to: WD #5H

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

Grid Convergence at Surface is: 0.18°



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 #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3027.00usft
Reference Site:	Blue Steel 21 Fee	MD Reference:	well @ 3027.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WD #5H	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 @ 3027.00usft

Offset Depths are relative to Offset Datum

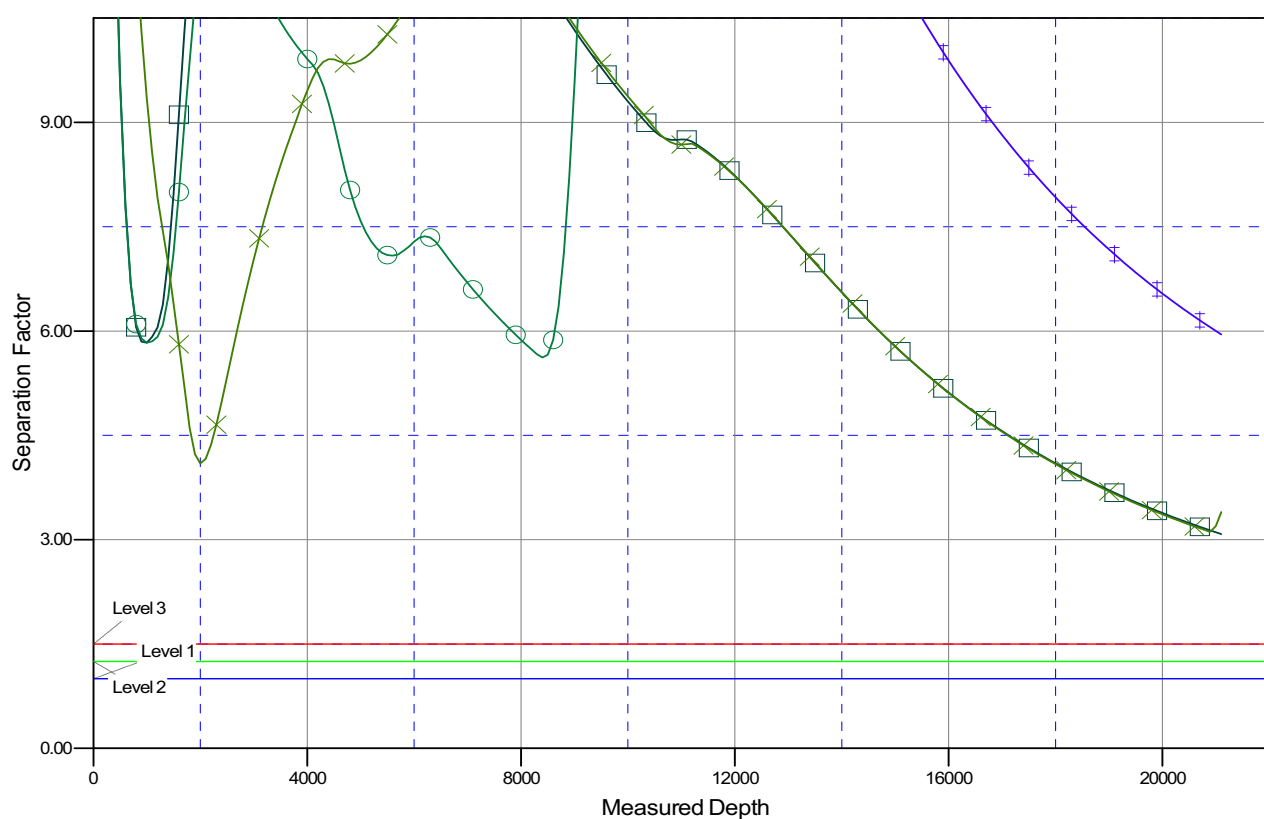
Central Meridian is -104.333333

Coordinates are relative to: WD #5H

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	SB #4H, OH, Prelim Plan A V0	SB #7H, OH, Prelim Plan A V0
WD #10H, OH, Prelim Plan A V0	WD #3H, OH, Prelim Plan A V0	

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

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 5H
SURFACE HOLE FOOTAGE:	470'/N & 1134'/W
BOTTOM HOLE FOOTAGE:	100'/N & 990'/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 **Wolfcamp** 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 15%. 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

811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720

District III

1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170

District IV

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

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

CONDITIONS

Action 214480

CONDITIONS

Operator: MARATHON OIL PERMIAN LLC 990 Town & Country Blvd. Houston, TX 77024	OGRID:
	372098
	Action Number:
	214480
Action Type:	
[C-101] BLM - Federal/Indian Land Lease (Form 3160-3)	

CONDITIONS

Created By	Condition	Condition Date
john.harrison	Notify OCD 24 hours prior to casing & cement	5/10/2023
john.harrison	Will require a File As Drilled C-102 and a Directional Survey with the C-104	5/10/2023
john.harrison	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	5/10/2023
john.harrison	Cement is required to circulate on both surface and intermediate1 strings of casing	5/10/2023
john.harrison	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	5/10/2023