Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☐ DRILL ☐ REENTER

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

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

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

8. Lease Name and Well No.

2. Name of Operator

9. API Well No. 30-015-53939

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.

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 04/28/2023

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	[2] Pool Code	[3] Pool Name
30-015-53939	98220	PURPLE SAGE (WOLFCAMP)

[4] Property Code	[5] Property Name	[6] Well Number
334030	BLUE STEEL 21 WD FED COM	16H

[7] OGRID No.	[8] Operator Name	[9] Elevation
372098	MARATHON OIL PERMIAN LLC	2995'

[10] Surface Location

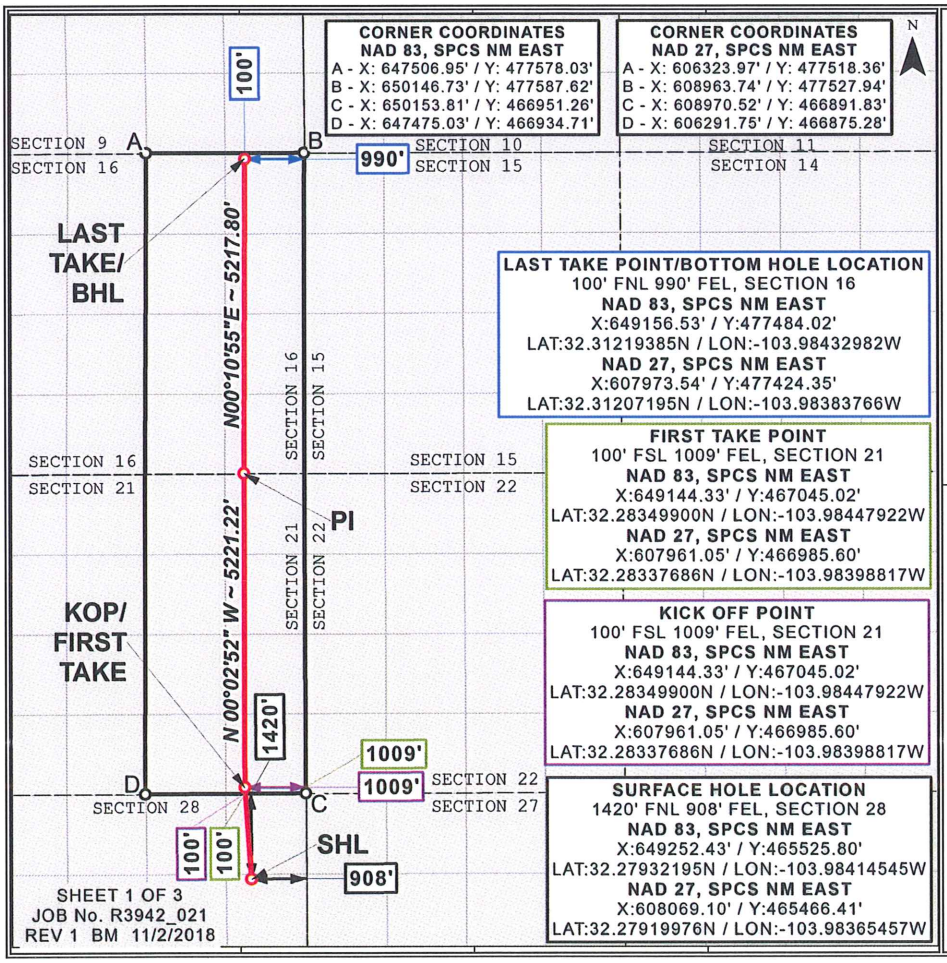
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	28	23S	29E		1420	NORTH	908	EAST	EDDY

[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
A	16	23S	29E		100	NORTH	990	EAST	EDDY

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
640.0			

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: 04/22/2020

Melissa Szudera
Printed Name

mszudera@marathonoil.com
E-mail Address

[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.

NOVEMBER 7, 2018
Date of Survey

Signature and Seal of Professional Surveyor:

LLOYD P. SHORT NEW MEXICO 21653 PROFESSIONAL SURVEYOR

Certificate Number
LLOYD P. SHORT 21653

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

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

NATURAL GAS MANAGEMENT PLAN

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

Section 1 – Plan Description

Effective May 25, 2021

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

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

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

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Blue Steel 21 WD Fed Com 16H		H-28-23S-29E	1420 FNL 1164 FNL	2700	5200	4900
Blue Steel 21 WD Fed Com 17H		H-28-23S-29E	1420 FNL 908 FNL	2700	5200	4900

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

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

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Blue Steel 21 WD Fed 16H		01/20/2025	02/20/2025	08/20/2025	09/25/2025	09/25/2025
Blue Steel 21 WD Fed 17H		02/20/2025	03/20/2025	09/20/2025	10/25/2025	10252025

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

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

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

Section 2 – Enhanced Plan
EFFECTIVE APRIL 1, 2022

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

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

IX. Anticipated Natural Gas Production:

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

X. Natural Gas Gathering System (NGGS):

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

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

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

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

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

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

Section 3 - Certifications

Effective May 25, 2021

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

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

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

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

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

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

Section 4 - Notices

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

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

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

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

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

Signature:	Thomas Moore
Printed Name:	Thomas Moore
Title:	Regulatory and Land Technician
E-mail Address:	tmoore@marathonoil.com
Date:	6/13/2023
Phone:	

OIL CONSERVATION DIVISION **(Only applicable when submitted as a standalone form)**	
Approved By:	
Title:	
Approval Date:	
Conditions of Approval:	

APPENDIX

Section 1 - Parts VI, VII, and VIII

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

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

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

- **19.15.27.8 (A) – Venting and Flaring Of Natural Gas**
  - Marathon Oil Permian's field operations are designed with the goal of minimizing flaring and preventing venting of natural gas. If capturing the gas is not possible then the gas is combusted/flared using properly sized flares or combustors in accordance with state air permit rules.
- **19.15.27.8 (B) – Venting and Flaring During Drilling Operations**
  - A properly-sized flare stack will be located at a minimum 100' from the nearest surface hole location on the pad.
  - All natural gas produced during drilling operations will be flared. Venting will only occur if there is an equipment malfunction and/or to avoid risk of an immediate and substantial adverse impact on safety, public health, or the environment.
- **19.15.27.8 (C) – Venting and Flaring During Completion or Recompletion Operations**
  - During all phases of flowback, wells will flow through a sand separator, or other appropriate flowback separation equipment, and the well stream will be directed to a central tank battery (CTB) through properly sized flowlines.
  - The CTB will have properly sized separation equipment for maximum anticipated flow rates.
  - Multiple stages of separation will be used to separate gas from liquids. All gas will be routed to a sales outlet. Fluids will be routed to tanks equipped with a closed loop system that will recover any residual gas from the tanks and route such gas to a sales outlet.
- **19.15.27.8 (D) – Venting and Flaring During Production Operations**
  - During production, the well stream will be routed to the CTB where multiple stages of separation will separate gas from liquids. All gas will be routed to a sales outlet. Fluids will be routed to tanks equipped with a closed loop system that will recover any residual gas from the tanks and route such gas to a sales outlet, minimizing tank emissions.
  - Flares are equipped with auto-ignition systems and continuous pilot operations.
  - Automatic gauging equipment is installed on all tanks.
- **19.15.27.8 (E) – Performance Standards**
  - Production equipment will be designed to handle maximum anticipated rates and pressure.
  - Automatic gauging equipment is installed on all tanks to minimize venting.
  - All flared gas will be combusted in a flare stack that is properly sized and designed to ensure proper combustion.
  - Flares are equipped with continuous pilots and auto-ignitors along with remote monitoring of the pilot status.
  - Weekly AVOs and monthly LDAR inspections will be performed on all wells and facilities that produce more than 60 MCFD.
  - Gas/H2S detectors will be installed throughout the facilities and wellheads to detect leaks and enable timely repairs.

- **19.15.27.8 (F) – Measurement or Estimation of Vented and Flared Natural Gas**
  - All high pressure flared gas is measured by equipment conforming to API 14.10.
  - No meter bypasses are installed.
  - When metering is not practical due to low pressure/low rate, the vented or flared volume will be estimated through flare flow curves with the assistance of air emissions consultants, as necessary.

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

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

AFMSS

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

Drilling Plan Data Report
06/12/2023

APD ID: 10400064110 **Submission Date:** 10/23/2020

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: BLUE STEEL 21 WD FED COM **Well Number:** 16H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical	Measured Depth	Lithologies	Mineral Resources	Producing Formatio
1071734	RUSTLER	2995	0	0	ANHYDRITE	OTHER : BRINE	N
7704399	SALADO	2600	395	395	ANHYDRITE, SALT	OTHER : BRINE	N
7704400	CASTILE	1970	1025	1025	ANHYDRITE, SALT	OTHER : BRINE	N
1071736	BASE OF SALT	-10	3005	3005	ANHYDRITE, SALT	OTHER : BRINE	N
1071739	LAMAR	-10	3005	3005	SANDSTONE, SHALE	NONE	N
1071743	BELL CANYON	-62	3057	3057	SANDSTONE	OIL	N
1071740	CHERRY CANYON	-900	3895	3895	SANDSTONE	OIL	N
1071744	BRUSHY CANYON	-2043	5038	5038	SANDSTONE	OIL	N
1071745	BONE SPRING LIME	-3689	6684	6684	LIMESTONE	NONE	N
7704401	UPPER AVALON SHALE	-3764	6759	6759	SHALE	OIL	N
7704402	BONE SPRING 1ST	-4726	7721	7721	SANDSTONE	OIL	N
7704403	BONE SPRING 2ND	-5505	8500	8500	SANDSTONE	OIL	N
7704404	BONE SPRING 3RD	-6655	9650	9650	SANDSTONE	OIL	N
1071746	WOLFCAMP	-6986	9981	9981	OTHER, SANDSTONE, SHALE : CARBONTES	OIL	Y

Section 2 - Blowout Prevention

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: BLUE STEEL 21 WD FED COM **Well Number:** 16H

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_20201016082904.pdf

DRILL_2_CHOKE___Contitech_Hose_SN_663393_20201016082905.pdf

DRILL_2_CHOKE___Choke_Line_Test_Chart_SN_63393_20201016082905.pdf

DRILL_2_CHOKE_5M_10M.TWO_CHOKE_MANIFOLD.BLM.r1_20201015084618.pdf

BOP Diagram Attachment:

DRILL_2_BOP___10_5M_Flex.BOPE.BLM_20201016083107.pdf

DRILL_2_BOP___Well_Control_Plan___Permian_20201016083107.pdf

DRILL_2_BOP___WH_TH_4_String_20201016083107.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	2995	2575	420	J-55	54.5	ST&C	5.52	2.5	BUOY	2.5	BUOY	2.5
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	3050	0	3048	2901	-53	3050	J-55	36	LT&C	1.39	1.42	BUOY	1.8	BUOY	1.8
3	INTERMEDIATE	8.75	7.625	NEW	API	N	0	10200	0	10025	3049	-7030	10200	P-110	33.7	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 FED COM **Well Number:** 16H

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	PRODUCTION	6.75	5.5	NEW	API	N	0	21415	0	10995	2999	-8000	21415	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___Red_Hills_WC_Surface_Casing_plot_20201016083406.pdf

Casing ID: 2 **String** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

DRILL_3___Red_Hills_WC_Intermediate_I_Casing_plot_20201016083448.pdf

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: BLUE STEEL 21 WD FED COM **Well Number:** 16H

Casing Attachments

Casing ID: 3 **String** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

DRILL_3___Red_Hills_WC_Intermediate_II_Casing_plot_20201023064455.pdf

Casing ID: 4 **String** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

DRILL_3___Red_Hills_WC_Production_Casing_Plot_20201016083329.pdf

5.500_20.00_BEN_P110_CY_TLW_SC_5.875__20211019115648.pdf

Section 4 - Cement

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

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: BLUE STEEL 21 WD FED COM **Well Number:** 16H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Lead		2750	9200	343	3.21	11	1102	70	Class C	Viscosifier, Retarder.
INTERMEDIATE	Tail		9200	10200	114	1.15	13.8	131	30	CLASS H	Extender, Fluid Loss, Dispersant
PRODUCTION	Lead		8200	10200	68	3.21	11	217	30	CLASS H	EXTENDER, RETARDER, DEFOAMER, VISCOSIFIER, FLUID LOSS
PRODUCTION	Tail		10200	21415	998	1.22	14.5	1218	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
10200	21415	OIL-BASED MUD	13.5	14							
0	420	WATER-BASED MUD	8.4	8.8							
420	3050	OTHER : Brine	8.8	9.8							

Operator Name: MARATHON OIL PERMIAN LLC

Well Name: BLUE STEEL 21 WD FED COM **Well Number:** 16H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
3050	10200	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: 7341 **Anticipated Surface Pressure:** 4922

Anticipated Bottom Hole Temperature(F): 195

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations

DRILL_7___GCP_BLUE_STEEL_FED__11H16H17H24H____04_29_2020_20201016084739.pdf
DRILL_7_update_BLUE_STEEL_21_FED_COM_Rig_Layout_20201023141110.pdf
DRILL_7_update_BLUE_STEEL_21_FED_COM_H2S_Layout_20201023141110.pdf
DRILL_7_update_Blue_Steel_21_Fed_Com_11H16H17H24H_H2S_Contingency_Plan_092618_20201023141121.pdf

MARATHON OIL PERMIAN LLC

DRILLING AND OPERATIONS PLAN

BLUE STEEL 21 WD FED COM 16H

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

EDDY COUNTY, NEW MEXICO

1. GEOLOGICAL FORMATIONS

Formation at Surface	Elevation
Permian	2995

Formation	TVD	MD	Elevation	Lithology	Mineral Resources	Producing Formation
Rustler	0	0	2995	Anhydrite	Brine	No
Salado	395	395	2600	Salt/Anhydrite	Brine	No
Castile	1025	1025	1970	Salt/Anhydrite	Brine	No
Base of Salt (BX)	3005	3005	-10	Salt/Anhydrite	Brine	No
Lamar	3005	3005	-10	Sandstone/Shale	None	No
Bell Canyon	3057	3057	-62	Sandstone	Oil	No
Cherry Canyon	3895	3895	-900	Sandstone	Oil	No
Brushy Canyon	5038	5038	-2043	Sandstone	Oil	No
Bone Spring Lime	6684	6684	-3689	Limestone	None	No
Upper Avalon Shale	6759	6759	-3764	Shale	Oil	Yes
1st Bone Spring Sand	7721	7721	-4726	Sandstone	Oil	Yes
2nd Bone Spring Carbonate	8002	8002	-5007	Limestone	None	No
2nd Bone Spring Sand	8500	8500	-5505	Sandstone	Oil	Yes
3rd Bone Spring Carbonate	8843	8843	-5848	Limestone	Oil	No
3rd Bone Spring Sand	9650	9650	-6655	Sandstone	Oil	Yes
Wolfcamp	9981	9981	-6986	Sandstone/Shale/Carbonates	Natural Gas/Oil	Yes
Wolfcamp A	10120	10120	-7125	Sandstone/Shale/Carbonates	Natural Gas/Oil	Yes
Wolfcamp B	10360	10360	-7365	Sandstone/Shale/Carbonates	Natural Gas/Oil	No
Wolfcamp C	10709	10709	-7714	Sandstone/Shale/Carbonates	Natural Gas/Oil	No
Wolfcamp D	11079	11079	-8084	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	70% of working pressure
			Blind Ram	x	5000
			Pipe Ram		
			Double Ram	x	
			Other*		
8 3/4	13 5/8	5000	Annular	x	70% of working pressure
			Blind Ram	x	5000
			Pipe Ram		
			Double Ram	x	
			Other*		
6 3/4	13 5/8	5000	Annular	x	70% of working pressure
			Blind Ram	x	5000
			Pipe Ram		
			Double Ram	x	
			Other*		

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

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

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

3. CASING PROGRAM

String Type	Hole Size	Csg Size	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Weight (lbs/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
Surface	17 1/2	13 3/8	0	420	0	420	54.5	J55	STC	5.52	2.5	2.5
Intermediate I	12 1/4	9 5/8	0	3050	0	3048	36	J55	LTC	1.39	1.42	1.8
Intermediate II	8 3/4	7 5/8	0	10200	0	10026	33.7	P110	Wedge 523	3.12	1.16	2.37
Production	6 3/4	5 1/2	0	21415	0	10995	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 3rd 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 2nd string set 100' to 600' below the base of salt?	
	Y or N
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
	Y or N
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

4. CEMENT PROGRAM

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity (sx)	Yield (ft3/sx)	Density (ppg)	Slurry Volume (ft3)	Excess (%)	Cement Type	Additives
Surface	Lead	--	0	220	177	1.73	13.5	306	100	Class C	LCM
Surface	Tail	--	220	420	209	1.33	14.8	278	100	Class C	N/A
Intermediate I	Lead	--	0	2050	508	2.21	12.8	1124	75	Class C	Extender, Accelerator
Intermediate I	Tail	--	2050	3050	353	1.33	14.8	470	50	Class C	Retarder
Intermediate II	Lead	--	2750	9200	343	3.21	11	1102	70	Class C	Viscosifier, Retarder
Intermediate II	Tail	--	9200	10200	114	1.15	13.8	131	30	Class H	Extender, Fluid Loss, Dispersant
Production	Lead	--	8200	10200	68	3.21	11	217	30	Class H	Extender, Retarder, Defoamer, Viscosifier, Fluid Loss
Production	Tail	--	10200	21415	998	1.22	14.5	1218	30	Class H	Retarder, Extender, Fluid Loss, Dispersant

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

Pilot Hole Depth: N/A TVD/MD
KOP: N/A TVD/MD

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

Attach plugging procedure for pilot hole: N/A

5. CIRCULATING MEDIUM

Top Depth	Bottom Depth	Mud Type	Min. Weight (ppg)	Max. Weight (ppg)
0	420	Water Based Mud	8.4	8.8
420	3050	Brine	8.8	9.8
3050	10200	Brine or Oil Based Mud	8.8	9.8
10200	21415	Oil Based Mud	13.5	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:	7432 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.

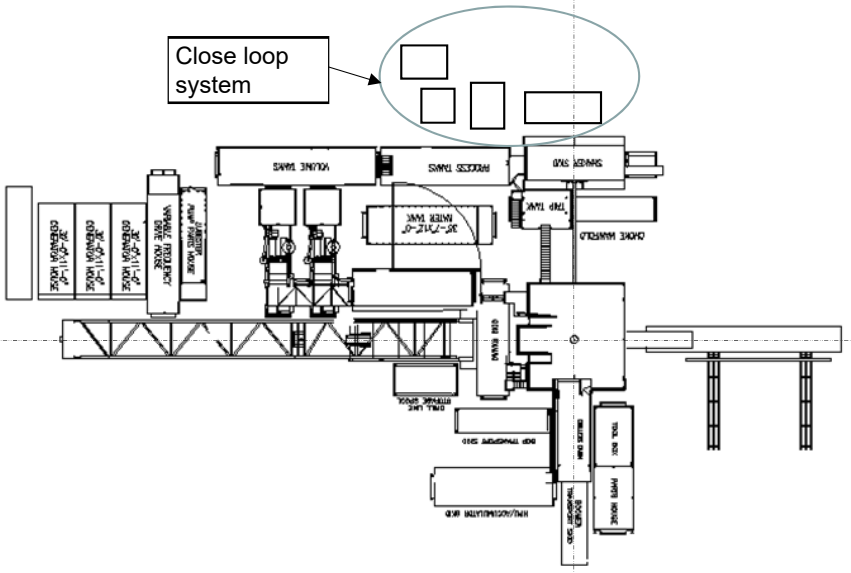
F. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

MARATHON OIL **DRILLING RIG LAYOUT**
(Closed Loop System)

550'

775'

775'



Access Road

500'

N

BLUE STEEL 21 FED COM

WD 11H, WD 16H, WD 17H, WD 24H

Marathon Oil

Marathon Oil Permian LLC

RKB (PD 582) 27' + GL @ 3022.00usft

2995.00

Project: Eddy County, New Mexico (NAD27)
Site: Blue Steel Pad (Grid)
Well: Blue Steel 21 WD Fed Com 16H
Wellbore: Wellbore #1
Design: Plan 1
Rig: PD 582

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

Azimuths to Grid North
True North: -0.19°
Magnetic North: 6.78°

Magnetic Field
Strength: 47774.0nT
Dip Angle: 60.04°
Date: 4/6/2020
Model: BGGM2019

WELL DETAILS
2995.00

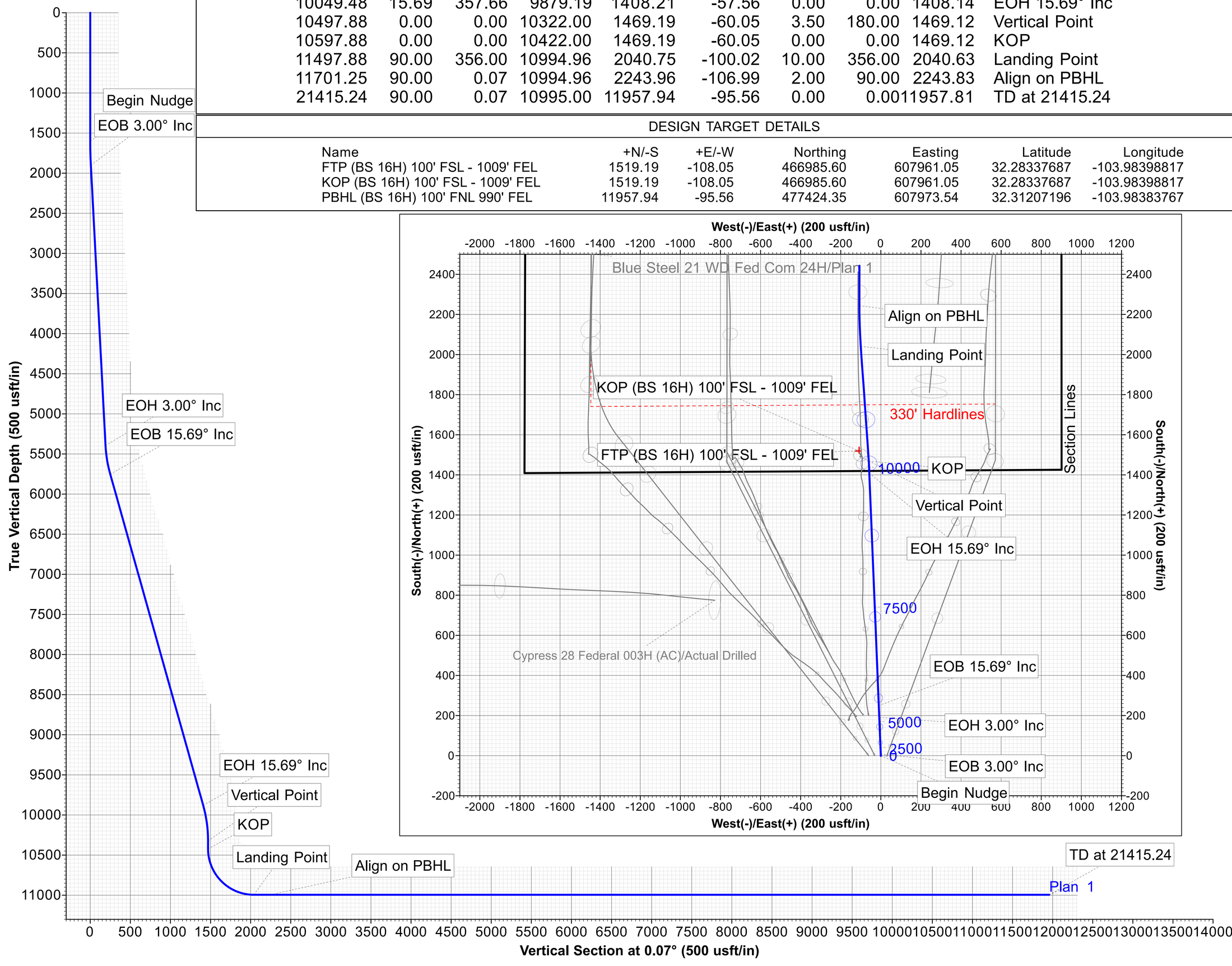
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	465466.41	608069.10	32.27919977	-103.98365457

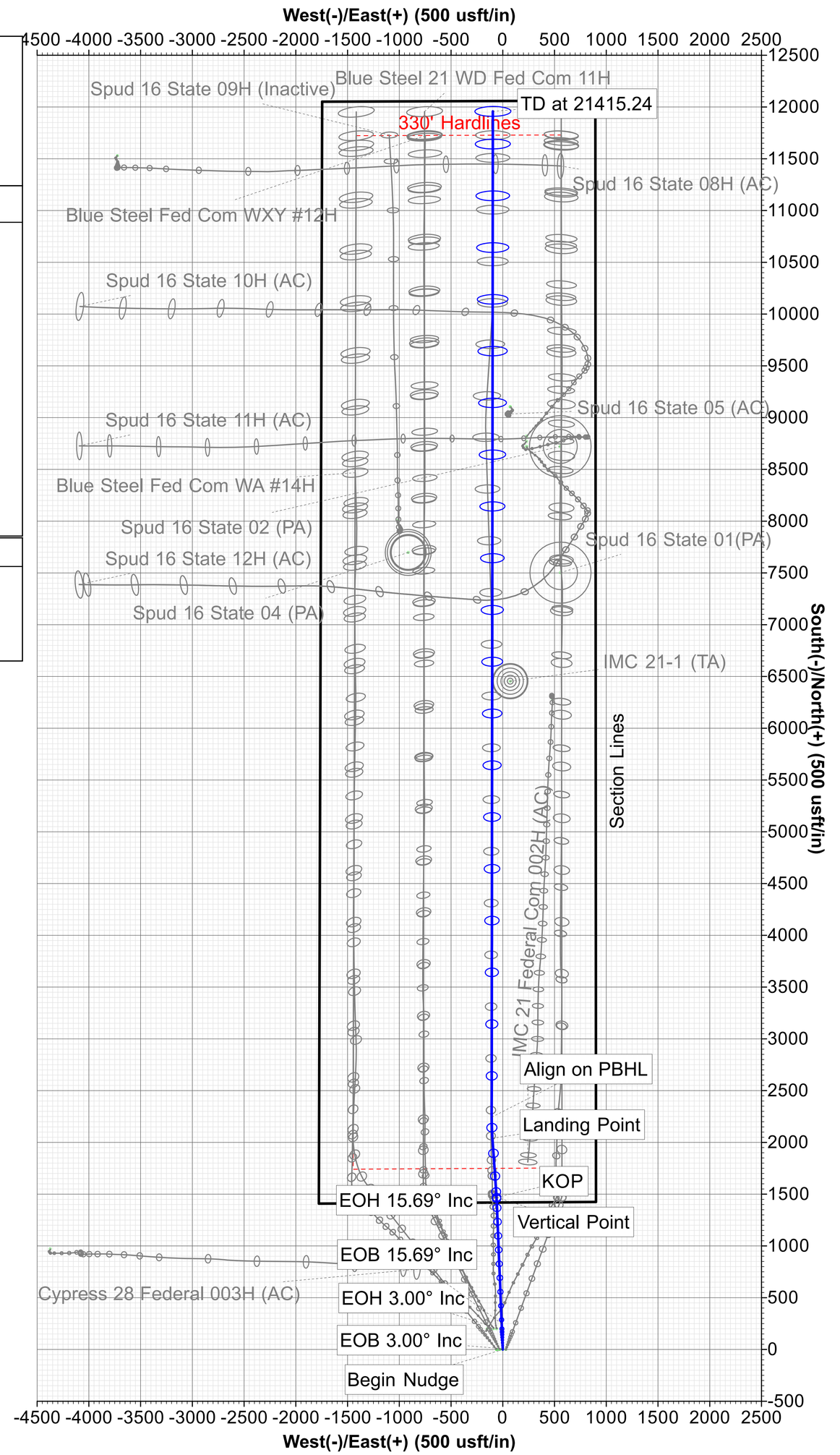
SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1600.00	0.00	0.00	1600.00	0.00	0.00	0.00	0.00	0.00	Begin Nudge
1900.00	3.00	357.66	1899.86	7.85	-0.32	1.00	357.66	7.85	EOB 3.00° Inc
5400.00	3.00	357.66	5395.07	190.87	-7.80	0.00	0.00	190.86	EOH 3.00° Inc
5762.69	15.69	357.66	5752.21	249.60	-10.20	3.50	0.00	249.59	EOB 15.69° Inc
10049.48	15.69	357.66	9879.19	1408.21	-57.56	0.00	0.00	1408.14	EOH 15.69° Inc
10497.88	0.00	0.00	10322.00	1469.19	-60.05	3.50	180.00	1469.12	Vertical Point
10597.88	0.00	0.00	10422.00	1469.19	-60.05	0.00	0.00	1469.12	KOP
11497.88	90.00	356.00	10994.96	2040.75	-100.02	10.00	356.00	2040.63	Landing Point
11701.25	90.00	0.07	10994.96	2243.96	-106.99	2.00	90.00	2243.83	Align on PBHL
21415.24	90.00	0.07	10995.00	11957.94	-95.56	0.00	0.00	11957.81	TD at 21415.24

DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
FTP (BS 16H) 100' FSL - 1009' FEL	1519.19	-108.05	466985.60	607961.05	32.28337687	-103.98398817
KOP (BS 16H) 100' FSL - 1009' FEL	1519.19	-108.05	466985.60	607961.05	32.28337687	-103.98398817
PBHL (BS 16H) 100' FNL 990' FEL	11957.94	-95.56	477424.35	607973.54	32.31207196	-103.98383767





HALLIBURTON | Sperry Drilling

Marathon Oil Permian LLC

Eddy County, New Mexico (NAD27) Blue Steel Pad (Grid)

API#

Blue Steel 21 WD Fed Com 16H

1420' FNL - 908' FEL

Wellbore #1

Plan: Plan 1

Sperry Drilling Services

Combo Report

07 April, 2020

Well Coordinates:	32.27919977 -103.98365457	NAD 1927 (NADCON CONUS) New Mexico East 3001 465,466.41 N 608,069.10 E

Ground Level: 2,995.00 usft

Local Coordinate Origin:	Centered on Well Blue Steel 21 WD Fed Com 16H
Viewing Datum:	RKB (PD 582) 27' + GL @ 3022.00usft
TVDs to System:	N
North Reference:	**Grid**
Unit System:	Midcon (2 decimal)

Version: 5000.15 Build: 91E

Report Version: Midcon Combo v1.15

HALLIBURTON

Marathon Oil Permian LLC

HALLIBURTON

Eddy County, New Mexico (NAD27)

Plan Report for Blue Steel 21 WD Fed Com 16H - Plan 1

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
0.00	0.00	0.00	0.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
309.00	0.00	0.00	309.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	13 3/8"
400.00	0.00	0.00	400.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
1,000.00	0.00	0.00	1,000.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
1,100.00	0.00	0.00	1,100.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
1,300.00	0.00	0.00	1,300.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
1,400.00	0.00	0.00	1,400.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
1,500.00	0.00	0.00	1,500.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	
1,600.00	0.00	0.00	1,600.00	0.00 N	0.00 E	465,466.41	608,069.10	0.00	0.00	0.00	Begin Nudge
1,700.00	1.00	357.66	1,699.99	0.87 N	0.04 W	465,467.28	608,069.06	1.00	0.87	357.66	
1,800.00	2.00	357.66	1,799.96	3.49 N	0.14 W	465,469.90	608,068.96	1.00	3.49	0.00	
1,900.00	3.00	357.66	1,899.86	7.85 N	0.32 W	465,474.26	608,068.78	1.00	7.85	0.00	EOB 3.00° Inc
2,000.00	3.00	357.66	1,999.73	13.07 N	0.53 W	465,479.48	608,068.57	0.00	13.07	0.00	
2,100.00	3.00	357.66	2,099.59	18.30 N	0.75 W	465,484.71	608,068.35	0.00	18.30	0.00	
2,200.00	3.00	357.66	2,199.45	23.53 N	0.96 W	465,489.94	608,068.14	0.00	23.53	0.00	
2,300.00	3.00	357.66	2,299.31	28.76 N	1.18 W	465,495.17	608,067.92	0.00	28.76	0.00	
2,400.00	3.00	357.66	2,399.18	33.99 N	1.39 W	465,500.40	608,067.71	0.00	33.99	0.00	
2,500.00	3.00	357.66	2,499.04	39.22 N	1.60 W	465,505.63	608,067.50	0.00	39.22	0.00	
2,600.00	3.00	357.66	2,598.90	44.45 N	1.82 W	465,510.86	608,067.28	0.00	44.45	0.00	
2,700.00	3.00	357.66	2,698.77	49.68 N	2.03 W	465,516.09	608,067.07	0.00	49.68	0.00	
2,800.00	3.00	357.66	2,798.63	54.91 N	2.24 W	465,521.32	608,066.86	0.00	54.91	0.00	
2,900.00	3.00	357.66	2,898.49	60.14 N	2.46 W	465,526.55	608,066.64	0.00	60.13	0.00	
3,000.00	3.00	357.66	2,998.36	65.37 N	2.67 W	465,531.78	608,066.43	0.00	65.36	0.00	
3,030.00	3.00	357.66	3,028.31	66.94 N	2.74 W	465,533.35	608,066.36	0.00	66.93	0.00	9 5/8"
3,100.00	3.00	357.66	3,098.22	70.60 N	2.88 W	465,537.01	608,066.22	0.00	70.59	0.00	
3,200.00	3.00	357.66	3,198.08	75.83 N	3.10 W	465,542.24	608,066.00	0.00	75.82	0.00	
3,300.00	3.00	357.66	3,297.94	81.05 N	3.31 W	465,547.46	608,065.79	0.00	81.05	0.00	

Marathon Oil Permian LLC

HALLIBURTON

Eddy County, New Mexico (NAD27)

Plan Report for Blue Steel 21 WD Fed Com 16H - Plan 1

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
3,400.00	3.00	357.66	3,397.81	86.28 N	3.53 W	465,552.69	608,065.57	0.00	86.28	0.00	
3,500.00	3.00	357.66	3,497.67	91.51 N	3.74 W	465,557.92	608,065.36	0.00	91.51	0.00	
3,600.00	3.00	357.66	3,597.53	96.74 N	3.95 W	465,563.15	608,065.15	0.00	96.74	0.00	
3,700.00	3.00	357.66	3,697.40	101.97 N	4.17 W	465,568.38	608,064.93	0.00	101.97	0.00	
3,800.00	3.00	357.66	3,797.26	107.20 N	4.38 W	465,573.61	608,064.72	0.00	107.20	0.00	
3,900.00	3.00	357.66	3,897.12	112.43 N	4.59 W	465,578.84	608,064.51	0.00	112.42	0.00	
4,000.00	3.00	357.66	3,996.98	117.66 N	4.81 W	465,584.07	608,064.29	0.00	117.65	0.00	
4,100.00	3.00	357.66	4,096.85	122.89 N	5.02 W	465,589.30	608,064.08	0.00	122.88	0.00	
4,200.00	3.00	357.66	4,196.71	128.12 N	5.24 W	465,594.53	608,063.86	0.00	128.11	0.00	
4,300.00	3.00	357.66	4,296.57	133.35 N	5.45 W	465,599.76	608,063.65	0.00	133.34	0.00	
4,400.00	3.00	357.66	4,396.44	138.58 N	5.66 W	465,604.99	608,063.44	0.00	138.57	0.00	
4,500.00	3.00	357.66	4,496.30	143.81 N	5.88 W	465,610.22	608,063.22	0.00	143.80	0.00	
4,600.00	3.00	357.66	4,596.16	149.03 N	6.09 W	465,615.44	608,063.01	0.00	149.03	0.00	
4,700.00	3.00	357.66	4,696.03	154.26 N	6.30 W	465,620.67	608,062.80	0.00	154.26	0.00	
4,800.00	3.00	357.66	4,795.89	159.49 N	6.52 W	465,625.90	608,062.58	0.00	159.49	0.00	
4,900.00	3.00	357.66	4,895.75	164.72 N	6.73 W	465,631.13	608,062.37	0.00	164.71	0.00	
5,000.00	3.00	357.66	4,995.61	169.95 N	6.94 W	465,636.36	608,062.16	0.00	169.94	0.00	
5,100.00	3.00	357.66	5,095.48	175.18 N	7.16 W	465,641.59	608,061.94	0.00	175.17	0.00	
5,200.00	3.00	357.66	5,195.34	180.41 N	7.37 W	465,646.82	608,061.73	0.00	180.40	0.00	
5,300.00	3.00	357.66	5,295.20	185.64 N	7.59 W	465,652.05	608,061.51	0.00	185.63	0.00	
5,400.00	3.00	357.66	5,395.07	190.87 N	7.80 W	465,657.28	608,061.30	0.00	190.86	0.00	EOH 3.00° Inc
5,500.00	6.50	357.66	5,494.71	199.14 N	8.14 W	465,665.55	608,060.96	3.50	199.13	0.00	
5,600.00	10.00	357.66	5,593.66	213.48 N	8.72 W	465,679.89	608,060.38	3.50	213.47	0.00	
5,700.00	13.50	357.66	5,691.55	233.82 N	9.56 W	465,700.23	608,059.54	3.50	233.81	0.00	
5,762.69	15.69	357.66	5,752.21	249.60 N	10.20 W	465,716.01	608,058.90	3.50	249.59	0.00	EOB 15.69° Inc
5,800.00	15.69	357.66	5,788.13	259.69 N	10.61 W	465,726.10	608,058.49	0.00	259.68	0.00	
5,900.00	15.69	357.66	5,884.40	286.72 N	11.72 W	465,753.13	608,057.38	0.00	286.70	0.00	
6,000.00	15.69	357.66	5,980.67	313.74 N	12.82 W	465,780.15	608,056.28	0.00	313.73	0.00	
6,100.00	15.69	357.66	6,076.94	340.77 N	13.93 W	465,807.18	608,055.17	0.00	340.75	0.00	
6,200.00	15.69	357.66	6,173.22	367.80 N	15.03 W	465,834.21	608,054.07	0.00	367.78	0.00	
6,300.00	15.69	357.66	6,269.49	394.83 N	16.14 W	465,861.24	608,052.96	0.00	394.81	0.00	
6,400.00	15.69	357.66	6,365.76	421.85 N	17.24 W	465,888.26	608,051.86	0.00	421.83	0.00	
6,500.00	15.69	357.66	6,462.03	448.88 N	18.35 W	465,915.29	608,050.75	0.00	448.86	0.00	
6,600.00	15.69	357.66	6,558.30	475.91 N	19.45 W	465,942.32	608,049.65	0.00	475.88	0.00	
6,700.00	15.69	357.66	6,654.58	502.94 N	20.55 W	465,969.35	608,048.55	0.00	502.91	0.00	
6,800.00	15.69	357.66	6,750.85	529.96 N	21.66 W	465,996.37	608,047.44	0.00	529.94	0.00	
6,900.00	15.69	357.66	6,847.12	556.99 N	22.76 W	466,023.40	608,046.34	0.00	556.96	0.00	

Marathon Oil Permian LLC

HALLIBURTON

Eddy County, New Mexico (NAD27)

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Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
7,000.00	15.69	357.66	6,943.39	584.02 N	23.87 W	466,050.43	608,045.23	0.00	583.99	0.00	
7,100.00	15.69	357.66	7,039.66	611.05 N	24.97 W	466,077.46	608,044.13	0.00	611.01	0.00	
7,200.00	15.69	357.66	7,135.94	638.07 N	26.08 W	466,104.48	608,043.02	0.00	638.04	0.00	
7,300.00	15.69	357.66	7,232.21	665.10 N	27.18 W	466,131.51	608,041.92	0.00	665.07	0.00	
7,400.00	15.69	357.66	7,328.48	692.13 N	28.29 W	466,158.54	608,040.81	0.00	692.09	0.00	
7,500.00	15.69	357.66	7,424.75	719.16 N	29.39 W	466,185.57	608,039.71	0.00	719.12	0.00	
7,600.00	15.69	357.66	7,521.02	746.18 N	30.50 W	466,212.59	608,038.60	0.00	746.14	0.00	
7,700.00	15.69	357.66	7,617.30	773.21 N	31.60 W	466,239.62	608,037.50	0.00	773.17	0.00	
7,800.00	15.69	357.66	7,713.57	800.24 N	32.71 W	466,266.65	608,036.39	0.00	800.20	0.00	
7,900.00	15.69	357.66	7,809.84	827.26 N	33.81 W	466,293.67	608,035.29	0.00	827.22	0.00	
8,000.00	15.69	357.66	7,906.11	854.29 N	34.92 W	466,320.70	608,034.18	0.00	854.25	0.00	
8,100.00	15.69	357.66	8,002.38	881.32 N	36.02 W	466,347.73	608,033.08	0.00	881.27	0.00	
8,200.00	15.69	357.66	8,098.66	908.35 N	37.13 W	466,374.76	608,031.97	0.00	908.30	0.00	
8,300.00	15.69	357.66	8,194.93	935.37 N	38.23 W	466,401.78	608,030.87	0.00	935.33	0.00	
8,400.00	15.69	357.66	8,291.20	962.40 N	39.34 W	466,428.81	608,029.76	0.00	962.35	0.00	
8,500.00	15.69	357.66	8,387.47	989.43 N	40.44 W	466,455.84	608,028.66	0.00	989.38	0.00	
8,600.00	15.69	357.66	8,483.74	1,016.46 N	41.54 W	466,482.87	608,027.56	0.00	1,016.41	0.00	
8,700.00	15.69	357.66	8,580.02	1,043.48 N	42.65 W	466,509.89	608,026.45	0.00	1,043.43	0.00	
8,800.00	15.69	357.66	8,676.29	1,070.51 N	43.75 W	466,536.92	608,025.35	0.00	1,070.46	0.00	
8,900.00	15.69	357.66	8,772.56	1,097.54 N	44.86 W	466,563.95	608,024.24	0.00	1,097.48	0.00	
9,000.00	15.69	357.66	8,868.83	1,124.57 N	45.96 W	466,590.98	608,023.14	0.00	1,124.51	0.00	
9,100.00	15.69	357.66	8,965.10	1,151.59 N	47.07 W	466,618.00	608,022.03	0.00	1,151.54	0.00	
9,200.00	15.69	357.66	9,061.38	1,178.62 N	48.17 W	466,645.03	608,020.93	0.00	1,178.56	0.00	
9,300.00	15.69	357.66	9,157.65	1,205.65 N	49.28 W	466,672.06	608,019.82	0.00	1,205.59	0.00	
9,400.00	15.69	357.66	9,253.92	1,232.68 N	50.38 W	466,699.09	608,018.72	0.00	1,232.61	0.00	
9,500.00	15.69	357.66	9,350.19	1,259.70 N	51.49 W	466,726.11	608,017.61	0.00	1,259.64	0.00	
9,600.00	15.69	357.66	9,446.46	1,286.73 N	52.59 W	466,753.14	608,016.51	0.00	1,286.67	0.00	
9,700.00	15.69	357.66	9,542.74	1,313.76 N	53.70 W	466,780.17	608,015.40	0.00	1,313.69	0.00	
9,800.00	15.69	357.66	9,639.01	1,340.79 N	54.80 W	466,807.20	608,014.30	0.00	1,340.72	0.00	
9,900.00	15.69	357.66	9,735.28	1,367.81 N	55.91 W	466,834.22	608,013.19	0.00	1,367.74	0.00	
10,000.00	15.69	357.66	9,831.55	1,394.84 N	57.01 W	466,861.25	608,012.09	0.00	1,394.77	0.00	
10,049.48	15.69	357.66	9,879.19	1,408.21 N	57.56 W	466,874.62	608,011.54	0.00	1,408.14	0.00	EOH 15.69° Inc
10,100.00	13.93	357.66	9,928.03	1,421.12 N	58.08 W	466,887.53	608,011.02	3.50	1,421.04	180.00	
10,200.00	10.43	357.66	10,025.76	1,442.19 N	58.95 W	466,908.60	608,010.15	3.50	1,442.11	180.00	
10,300.00	6.93	357.66	10,124.60	1,457.26 N	59.56 W	466,923.67	608,009.54	3.50	1,457.18	180.00	
10,400.00	3.43	357.66	10,224.18	1,466.27 N	59.93 W	466,932.68	608,009.17	3.50	1,466.19	180.00	
10,497.88	0.00	0.00	10,322.00	1,469.19 N	60.05 W	466,935.60	608,009.05	3.50	1,469.12	180.00	Vertical Point

Marathon Oil Permian LLC

HALLIBURTON

Eddy County, New Mexico (NAD27)

Plan Report for Blue Steel 21 WD Fed Com 16H - Plan 1

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
10,500.00	0.00	0.00	10,324.12	1,469.19 N	60.05 W	466,935.60	608,009.05	0.00	1,469.12	0.00	
10,563.06	0.00	0.00	10,387.18	1,469.19 N	60.05 W	466,935.60	608,009.05	0.00	1,469.12	0.00	7"
10,597.88	0.00	0.00	10,422.00	1,469.19 N	60.05 W	466,935.60	608,009.05	0.00	1,469.12	0.00	KOP
10,600.00	0.21	356.00	10,424.12	1,469.19 N	60.05 W	466,935.60	608,009.05	10.00	1,469.12	356.00	
10,700.00	10.21	356.00	10,523.58	1,478.24 N	60.68 W	466,944.65	608,008.42	10.00	1,478.17	0.00	
10,800.00	20.21	356.00	10,619.96	1,504.39 N	62.51 W	466,970.80	608,006.59	10.00	1,504.31	0.00	
10,900.00	30.21	356.00	10,710.31	1,546.83 N	65.48 W	467,013.24	608,003.62	10.00	1,546.75	0.00	
11,000.00	40.21	356.00	10,791.91	1,604.27 N	69.50 W	467,070.68	607,999.60	10.00	1,604.19	0.00	
11,100.00	50.21	356.00	10,862.27	1,674.98 N	74.44 W	467,141.39	607,994.66	10.00	1,674.89	0.00	
11,200.00	60.21	356.00	10,919.25	1,756.81 N	80.16 W	467,223.22	607,988.94	10.00	1,756.71	0.00	
11,300.00	70.21	356.00	10,961.13	1,847.26 N	86.49 W	467,313.67	607,982.61	10.00	1,847.15	0.00	
11,400.00	80.21	356.00	10,986.62	1,943.59 N	93.22 W	467,410.00	607,975.88	10.00	1,943.47	0.00	
11,497.88	90.00	356.00	10,994.96	2,040.75 N	100.02 W	467,507.16	607,969.08	10.00	2,040.63	0.00	Landing Point
11,500.00	90.00	356.04	10,994.96	2,042.87 N	100.16 W	467,509.28	607,968.94	2.00	2,042.75	90.00	
11,600.00	90.00	358.04	10,994.96	2,142.73 N	105.32 W	467,609.14	607,963.78	2.00	2,142.60	90.00	
11,700.00	90.00	0.04	10,994.96	2,242.71 N	107.00 W	467,709.12	607,962.10	2.00	2,242.58	90.00	
11,701.25	90.00	0.07	10,994.96	2,243.96 N	106.99 W	467,710.37	607,962.11	2.00	2,243.83	90.00	Align on PBHL
11,800.00	90.00	0.07	10,994.96	2,342.71 N	106.88 W	467,809.12	607,962.22	0.00	2,342.58	111.08	
11,900.00	90.00	0.07	10,994.96	2,442.71 N	106.76 W	467,909.12	607,962.34	0.00	2,442.58	0.00	
12,000.00	90.00	0.07	10,994.96	2,542.71 N	106.64 W	468,009.12	607,962.46	0.00	2,542.58	0.00	
12,100.00	90.00	0.07	10,994.96	2,642.71 N	106.52 W	468,109.12	607,962.58	0.00	2,642.58	0.00	
12,200.00	90.00	0.07	10,994.96	2,742.71 N	106.41 W	468,209.12	607,962.69	0.00	2,742.58	0.00	
12,300.00	90.00	0.07	10,994.96	2,842.71 N	106.29 W	468,309.12	607,962.81	0.00	2,842.58	0.00	
12,400.00	90.00	0.07	10,994.96	2,942.71 N	106.17 W	468,409.12	607,962.93	0.00	2,942.58	0.00	
12,500.00	90.00	0.07	10,994.96	3,042.71 N	106.05 W	468,509.12	607,963.05	0.00	3,042.58	0.00	
12,600.00	90.00	0.07	10,994.96	3,142.71 N	105.94 W	468,609.12	607,963.16	0.00	3,142.58	0.00	
12,700.00	90.00	0.07	10,994.96	3,242.71 N	105.82 W	468,709.12	607,963.28	0.00	3,242.58	0.00	
12,800.00	90.00	0.07	10,994.96	3,342.71 N	105.70 W	468,809.12	607,963.40	0.00	3,342.58	0.00	
12,900.00	90.00	0.07	10,994.96	3,442.71 N	105.58 W	468,909.12	607,963.52	0.00	3,442.58	0.00	
13,000.00	90.00	0.07	10,994.96	3,542.71 N	105.47 W	469,009.12	607,963.63	0.00	3,542.58	0.00	
13,100.00	90.00	0.07	10,994.96	3,642.71 N	105.35 W	469,109.12	607,963.75	0.00	3,642.58	0.00	
13,200.00	90.00	0.07	10,994.96	3,742.71 N	105.23 W	469,209.12	607,963.87	0.00	3,742.58	0.00	
13,300.00	90.00	0.07	10,994.97	3,842.71 N	105.11 W	469,309.12	607,963.99	0.00	3,842.58	0.00	
13,400.00	90.00	0.07	10,994.97	3,942.71 N	104.99 W	469,409.12	607,964.11	0.00	3,942.58	0.00	
13,500.00	90.00	0.07	10,994.97	4,042.71 N	104.88 W	469,509.12	607,964.22	0.00	4,042.58	0.00	
13,600.00	90.00	0.07	10,994.97	4,142.71 N	104.76 W	469,609.12	607,964.34	0.00	4,142.58	0.00	

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13,700.00	90.00	0.07	10,994.97	4,242.71 N	104.64 W	469,709.12	607,964.46	0.00	4,242.58	0.00	
13,800.00	90.00	0.07	10,994.97	4,342.71 N	104.52 W	469,809.12	607,964.58	0.00	4,342.58	0.00	
13,900.00	90.00	0.07	10,994.97	4,442.71 N	104.41 W	469,909.12	607,964.69	0.00	4,442.58	0.00	
14,000.00	90.00	0.07	10,994.97	4,542.71 N	104.29 W	470,009.12	607,964.81	0.00	4,542.58	0.00	
14,100.00	90.00	0.07	10,994.97	4,642.71 N	104.17 W	470,109.12	607,964.93	0.00	4,642.58	0.00	
14,200.00	90.00	0.07	10,994.97	4,742.71 N	104.05 W	470,209.12	607,965.05	0.00	4,742.58	0.00	
14,300.00	90.00	0.07	10,994.97	4,842.71 N	103.94 W	470,309.12	607,965.16	0.00	4,842.58	0.00	
14,400.00	90.00	0.07	10,994.97	4,942.71 N	103.82 W	470,409.12	607,965.28	0.00	4,942.58	0.00	
14,500.00	90.00	0.07	10,994.97	5,042.71 N	103.70 W	470,509.12	607,965.40	0.00	5,042.58	0.00	
14,600.00	90.00	0.07	10,994.97	5,142.71 N	103.58 W	470,609.12	607,965.52	0.00	5,142.58	0.00	
14,700.00	90.00	0.07	10,994.97	5,242.71 N	103.46 W	470,709.12	607,965.64	0.00	5,242.58	0.00	
14,800.00	90.00	0.07	10,994.97	5,342.71 N	103.35 W	470,809.12	607,965.75	0.00	5,342.58	0.00	
14,900.00	90.00	0.07	10,994.97	5,442.71 N	103.23 W	470,909.12	607,965.87	0.00	5,442.58	0.00	
15,000.00	90.00	0.07	10,994.97	5,542.71 N	103.11 W	471,009.12	607,965.99	0.00	5,542.58	0.00	
15,100.00	90.00	0.07	10,994.97	5,642.71 N	102.99 W	471,109.12	607,966.11	0.00	5,642.58	0.00	
15,200.00	90.00	0.07	10,994.97	5,742.71 N	102.88 W	471,209.12	607,966.22	0.00	5,742.58	0.00	
15,300.00	90.00	0.07	10,994.97	5,842.71 N	102.76 W	471,309.12	607,966.34	0.00	5,842.58	0.00	
15,400.00	90.00	0.07	10,994.97	5,942.71 N	102.64 W	471,409.12	607,966.46	0.00	5,942.58	0.00	
15,500.00	90.00	0.07	10,994.97	6,042.71 N	102.52 W	471,509.12	607,966.58	0.00	6,042.58	0.00	
15,600.00	90.00	0.07	10,994.97	6,142.71 N	102.40 W	471,609.12	607,966.70	0.00	6,142.58	0.00	
15,700.00	90.00	0.07	10,994.98	6,242.71 N	102.29 W	471,709.12	607,966.81	0.00	6,242.58	0.00	
15,800.00	90.00	0.07	10,994.98	6,342.71 N	102.17 W	471,809.12	607,966.93	0.00	6,342.58	0.00	
15,900.00	90.00	0.07	10,994.98	6,442.71 N	102.05 W	471,909.12	607,967.05	0.00	6,442.58	0.00	
16,000.00	90.00	0.07	10,994.98	6,542.71 N	101.93 W	472,009.12	607,967.17	0.00	6,542.58	0.00	
16,100.00	90.00	0.07	10,994.98	6,642.71 N	101.82 W	472,109.12	607,967.28	0.00	6,642.58	0.00	
16,200.00	90.00	0.07	10,994.98	6,742.71 N	101.70 W	472,209.12	607,967.40	0.00	6,742.58	0.00	
16,300.00	90.00	0.07	10,994.98	6,842.71 N	101.58 W	472,309.12	607,967.52	0.00	6,842.58	0.00	
16,400.00	90.00	0.07	10,994.98	6,942.71 N	101.46 W	472,409.12	607,967.64	0.00	6,942.58	0.00	
16,500.00	90.00	0.07	10,994.98	7,042.71 N	101.35 W	472,509.12	607,967.75	0.00	7,042.58	0.00	
16,600.00	90.00	0.07	10,994.98	7,142.71 N	101.23 W	472,609.12	607,967.87	0.00	7,142.58	0.00	
16,700.00	90.00	0.07	10,994.98	7,242.71 N	101.11 W	472,709.12	607,967.99	0.00	7,242.58	0.00	
16,800.00	90.00	0.07	10,994.98	7,342.71 N	100.99 W	472,809.12	607,968.11	0.00	7,342.58	0.00	
16,900.00	90.00	0.07	10,994.98	7,442.71 N	100.87 W	472,909.12	607,968.23	0.00	7,442.58	0.00	
17,000.00	90.00	0.07	10,994.98	7,542.71 N	100.76 W	473,009.12	607,968.34	0.00	7,542.58	0.00	
17,100.00	90.00	0.07	10,994.98	7,642.71 N	100.64 W	473,109.12	607,968.46	0.00	7,642.58	0.00	
17,200.00	90.00	0.07	10,994.98	7,742.71 N	100.52 W	473,209.12	607,968.58	0.00	7,742.58	0.00	
17,300.00	90.00	0.07	10,994.98	7,842.71 N	100.40 W	473,309.12	607,968.70	0.00	7,842.58	0.00	

Marathon Oil Permian LLC

HALLIBURTON

Eddy County, New Mexico (NAD27)

Plan Report for Blue Steel 21 WD Fed Com 16H - Plan 1

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
17,400.00	90.00	0.07	10,994.98	7,942.71 N	100.29 W	473,409.12	607,968.81	0.00	7,942.58	0.00	
17,500.00	90.00	0.07	10,994.98	8,042.71 N	100.17 W	473,509.12	607,968.93	0.00	8,042.58	0.00	
17,600.00	90.00	0.07	10,994.98	8,142.71 N	100.05 W	473,609.12	607,969.05	0.00	8,142.58	0.00	
17,700.00	90.00	0.07	10,994.98	8,242.71 N	99.93 W	473,709.12	607,969.17	0.00	8,242.58	0.00	
17,800.00	90.00	0.07	10,994.98	8,342.71 N	99.82 W	473,809.12	607,969.28	0.00	8,342.58	0.00	
17,900.00	90.00	0.07	10,994.98	8,442.71 N	99.70 W	473,909.12	607,969.40	0.00	8,442.58	0.00	
18,000.00	90.00	0.07	10,994.99	8,542.71 N	99.58 W	474,009.12	607,969.52	0.00	8,542.58	0.00	
18,100.00	90.00	0.07	10,994.99	8,642.71 N	99.46 W	474,109.12	607,969.64	0.00	8,642.58	0.00	
18,200.00	90.00	0.07	10,994.99	8,742.71 N	99.34 W	474,209.12	607,969.76	0.00	8,742.58	0.00	
18,300.00	90.00	0.07	10,994.99	8,842.71 N	99.23 W	474,309.12	607,969.87	0.00	8,842.58	0.00	
18,400.00	90.00	0.07	10,994.99	8,942.71 N	99.11 W	474,409.12	607,969.99	0.00	8,942.58	0.00	
18,500.00	90.00	0.07	10,994.99	9,042.71 N	98.99 W	474,509.12	607,970.11	0.00	9,042.58	0.00	
18,600.00	90.00	0.07	10,994.99	9,142.71 N	98.87 W	474,609.12	607,970.23	0.00	9,142.58	0.00	
18,700.00	90.00	0.07	10,994.99	9,242.71 N	98.76 W	474,709.12	607,970.34	0.00	9,242.58	0.00	
18,800.00	90.00	0.07	10,994.99	9,342.71 N	98.64 W	474,809.12	607,970.46	0.00	9,342.58	0.00	
18,900.00	90.00	0.07	10,994.99	9,442.71 N	98.52 W	474,909.12	607,970.58	0.00	9,442.58	0.00	
19,000.00	90.00	0.07	10,994.99	9,542.71 N	98.40 W	475,009.12	607,970.70	0.00	9,542.58	0.00	
19,100.00	90.00	0.07	10,994.99	9,642.71 N	98.29 W	475,109.12	607,970.81	0.00	9,642.58	0.00	
19,200.00	90.00	0.07	10,994.99	9,742.71 N	98.17 W	475,209.12	607,970.93	0.00	9,742.58	0.00	
19,300.00	90.00	0.07	10,994.99	9,842.71 N	98.05 W	475,309.12	607,971.05	0.00	9,842.58	0.00	
19,400.00	90.00	0.07	10,994.99	9,942.71 N	97.93 W	475,409.12	607,971.17	0.00	9,942.58	0.00	
19,500.00	90.00	0.07	10,994.99	10,042.71 N	97.81 W	475,509.12	607,971.29	0.00	10,042.58	0.00	
19,600.00	90.00	0.07	10,994.99	10,142.71 N	97.70 W	475,609.12	607,971.40	0.00	10,142.58	0.00	
19,700.00	90.00	0.07	10,994.99	10,242.71 N	97.58 W	475,709.12	607,971.52	0.00	10,242.58	0.00	
19,800.00	90.00	0.07	10,994.99	10,342.71 N	97.46 W	475,809.12	607,971.64	0.00	10,342.58	0.00	
19,900.00	90.00	0.07	10,994.99	10,442.71 N	97.34 W	475,909.12	607,971.76	0.00	10,442.58	0.00	
20,000.00	90.00	0.07	10,994.99	10,542.71 N	97.23 W	476,009.12	607,971.87	0.00	10,542.58	0.00	
20,100.00	90.00	0.07	10,994.99	10,642.71 N	97.11 W	476,109.12	607,971.99	0.00	10,642.58	0.00	
20,200.00	90.00	0.07	10,994.99	10,742.71 N	96.99 W	476,209.12	607,972.11	0.00	10,742.58	0.00	
20,300.00	90.00	0.07	10,995.00	10,842.71 N	96.87 W	476,309.12	607,972.23	0.00	10,842.58	0.00	
20,400.00	90.00	0.07	10,995.00	10,942.71 N	96.75 W	476,409.12	607,972.35	0.00	10,942.58	0.00	
20,500.00	90.00	0.07	10,995.00	11,042.71 N	96.64 W	476,509.12	607,972.46	0.00	11,042.58	0.00	
20,600.00	90.00	0.07	10,995.00	11,142.71 N	96.52 W	476,609.12	607,972.58	0.00	11,142.58	0.00	
20,700.00	90.00	0.07	10,995.00	11,242.71 N	96.40 W	476,709.12	607,972.70	0.00	11,242.58	0.00	
20,800.00	90.00	0.07	10,995.00	11,342.71 N	96.28 W	476,809.12	607,972.82	0.00	11,342.58	0.00	
20,900.00	90.00	0.07	10,995.00	11,442.71 N	96.17 W	476,909.12	607,972.93	0.00	11,442.58	0.00	
21,000.00	90.00	0.07	10,995.00	11,542.71 N	96.05 W	477,009.12	607,973.05	0.00	11,542.58	0.00	

Marathon Oil Permian LLC

HALLIBURTON

Eddy County, New Mexico (NAD27)

Plan Report for Blue Steel 21 WD Fed Com 16H - Plan 1

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates Northing (usft)	Local Coordinates Easting (usft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
21,100.00	90.00	0.07	10,995.00	11,642.71 N	95.93 W	477,109.12	607,973.17	0.00	11,642.58	0.00	
21,200.00	90.00	0.07	10,995.00	11,742.71 N	95.81 W	477,209.12	607,973.29	0.00	11,742.58	0.00	
21,300.00	90.00	0.07	10,995.00	11,842.70 N	95.70 W	477,309.11	607,973.40	0.00	11,842.58	0.00	
21,400.00	90.00	0.07	10,995.00	11,942.70 N	95.58 W	477,409.11	607,973.52	0.00	11,942.58	0.00	
21,415.00	90.00	0.07	10,995.00	11,957.70 N	95.56 W	477,424.11	607,973.54	0.00	11,957.58	0.00	4 1/2"
21,415.24	90.00	0.07	10,995.00	11,957.94 N	95.56 W	477,424.35	607,973.54	0.00	11,957.81	0.00	TD at 21415.24

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,600.00	1,600.00	0.00	0.00	Begin Nudge
1,900.00	1,899.86	7.85	-0.32	EOB 3.00° Inc
5,400.00	5,395.07	190.87	-7.80	EOH 3.00° Inc
5,762.69	5,752.21	249.60	-10.20	EOB 15.69° Inc
10,049.48	9,879.19	1,408.21	-57.56	EOH 15.69° Inc
10,497.88	10,322.00	1,469.19	-60.05	Vertical Point
10,597.88	10,422.00	1,469.19	-60.05	KOP
11,497.88	10,994.96	2,040.75	-100.02	Landing Point
11,701.25	10,994.96	2,243.96	-106.99	Align on PBHL
21,415.24	10,995.00	11,957.94	-95.56	TD at 21415.24

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.07	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	21,415.24	Plan 1	3_MWD+HRGM+AX

Plan Report for Blue Steel 21 WD Fed Com 16H - Plan 1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
309.00	309.00	13 3/8"	13-3/8	17-1/2
3,030.00	3,028.31	9 5/8"	9-5/8	12-1/4
10,563.06	10,387.18	7"	7	8-3/4
21,415.00	10,995.00	4 1/2"	4-1/2	6-1/8

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL (BS 16H) 100' FNL 990' FEL ()	0.00	0.00	0.00	11,957.94	-95.56	477,424.35	607,973.54	32.31207196	-103.98383767
- plan misses target center by 10995.00usft at 21415.19usft MD (10995.00 TVD, 11957.89 N, -95.56 E)									
- Point									
FTP (BS 16H) 100' FSL - 1009' FEL ()	0.00	0.00	0.00	1,519.19	-108.05	466,985.60	607,961.05	32.28337687	-103.98398817
- plan misses target center by 1523.03usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									
KOP (BS 16H) 100' FSL - 1009' FEL ()	0.00	0.00	0.00	1,519.19	-108.05	466,985.60	607,961.05	32.28337687	-103.98398817
- plan misses target center by 1523.03usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	0.59 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 11,497.88 usft
Net Tortousity applicable to Plans:	0.59 °/100usft	Directional Difficulty Index:	6.713

Audit Info

Marathon Oil Permian LLC

HALLIBURTON

Eddy County, New Mexico (NAD27)

North Reference Sheet for Blue Steel Pad (Grid) - Blue Steel 21 WD Fed Com 16H - Wellbore #1

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to RKB (PD 582) 27' + GL @ 3022.00usft. Northing and Easting are relative to Blue Steel 21 WD Fed Com 16H

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 3001 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -104.33333333°, Longitude Origin:0.00000000°, Latitude Origin:0.00000000°

False Easting: 500,000.00usft, False Northing: 0.00usft, Scale Reduction: 0.99992247

Grid Coordinates of Well: 465,466.41 usft N, 608,069.10 usft E

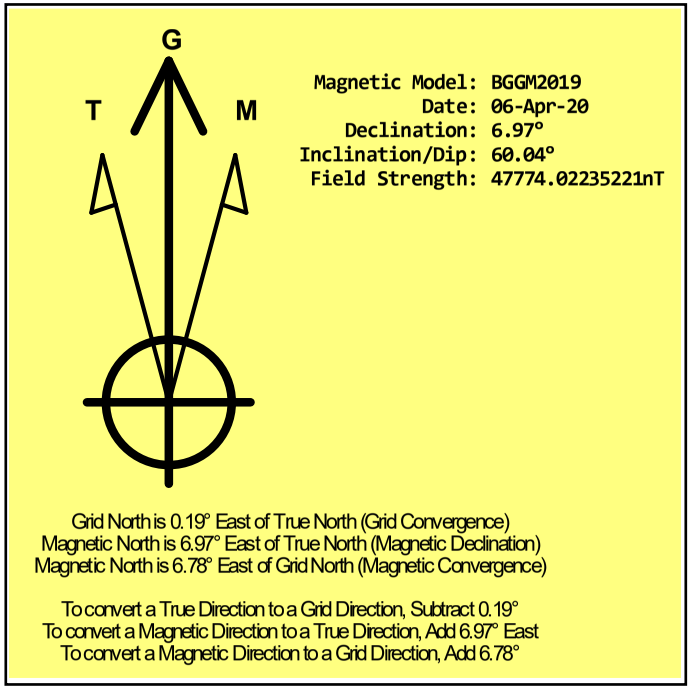
Geographical Coordinates of Well: 32.27919977, -103.98365457

Grid Convergence at Surface is: 0.19°

Based upon Minimum Curvature type calculations, at a Measured Depth of 21,415.24usft

the Bottom Hole Displacement is 11,958.32usft in the Direction of 359.54° (Grid).

Magnetic Convergence at surface is: -6.78° (6 April 2020, , BGGM2019)



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 Fed Com 16H
SURFACE HOLE FOOTAGE:	1420'/N & 908'/E
BOTTOM HOLE FOOTAGE	100'/N & 990'/E

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

Approval Date: 04/28/2023

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.

Intermediate casing must be kept 1/3rd fluid filled to meet BLM minimum collapse requirement.

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.

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

Approval Date: 04/28/2023

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 intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

6. On 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.

 Approval Date: 04/28/2023

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.

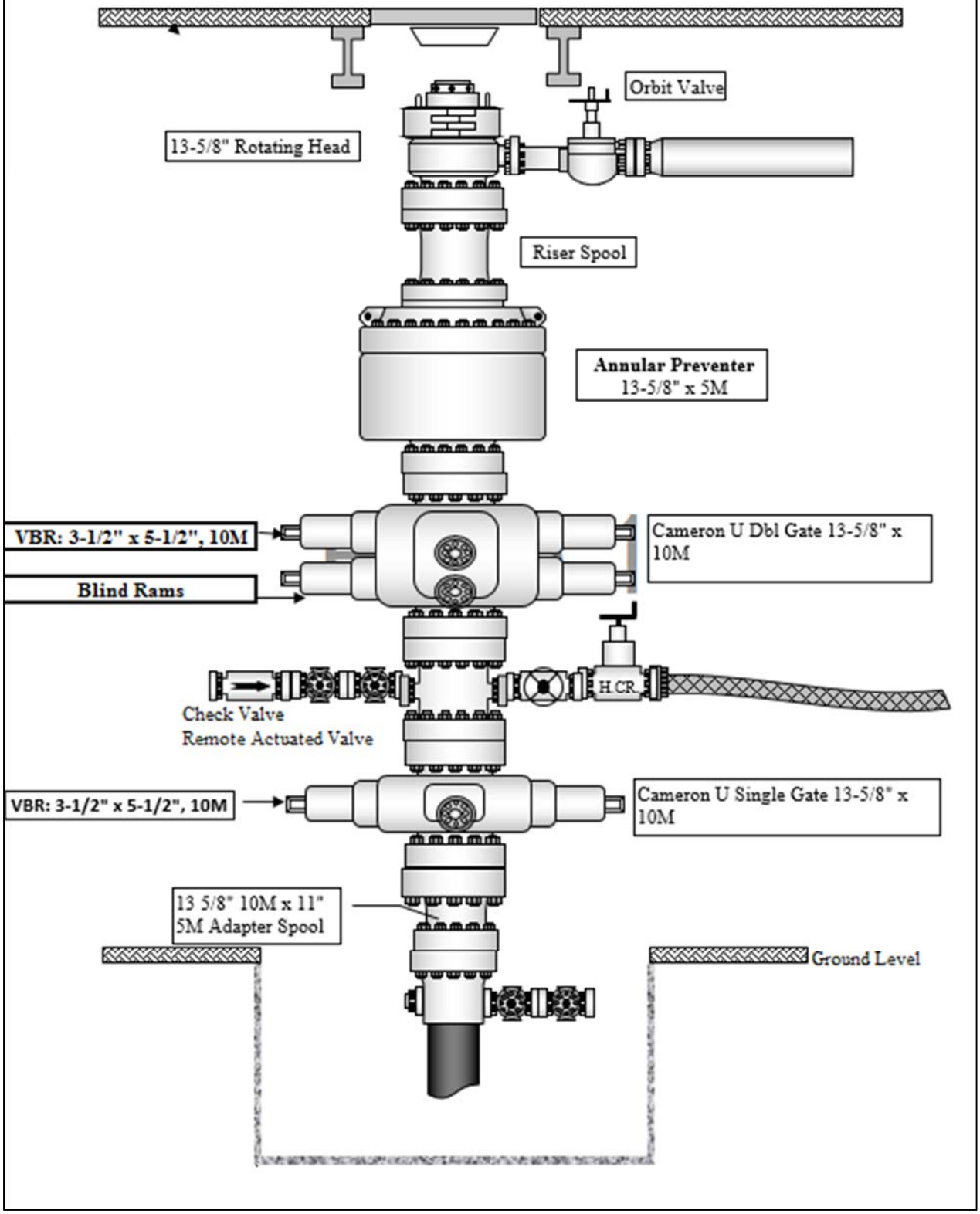
D. WASTE MATERIAL AND FLUIDS

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 05112022

Operator : **Marathon Oil**

5M BOPE



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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 233106

CONDITIONS

Operator: MARATHON OIL PERMIAN LLC 990 Town & Country Blvd. Houston, TX 77024	OGRID: 372098
	Action Number: 233106
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

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