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.: NMNM19597

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.: CARDIGAN FED COM 134H

2. Name of Operator: FLAT CREEK RESOURCES LLC

9. API Well No.:

3a. Address: 777 MAIN STREET, SUITE 3600, FORT WORTH, TX 761

3b. Phone No. *(include area code)*: (817) 310-8570

10. Field and Pool, or Exploratory: WINCHESTER/BONE SPRING, WEST

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface: NESW / 2023 FSL / 1765 FWL / LAT 32.6586308 / LONG -104.2351447

At proposed prod. zone: SWSE / 385 FSL / 2638 FEL / LAT 32.6544415 / LONG -104.2664368

11. Sec., T. R. M. or Blk. and Survey or Area: SEC 13/T19S/R27E/NMP

14. Distance in miles and direction from nearest town or post office*: 14 miles

12. County or Parish: EDDY

13. State: NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any): 445 feet

16. No of acres in lease:

17. Spacing Unit dedicated to this well: 320.0

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.: 30 feet

19. Proposed Depth: 7814 feet / 18734 feet

20. BLM/BIA Bond No. in file: FED: NMB001675

21. Elevations (Show whether DF, KDB, RT, GL, etc.): 3480 feet

22. Approximate date work will start*: 02/01/2025

23. Estimated duration: 60 days

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
(Electronic Submission)	BRIAN WOOD / Ph: (817) 310-8570	07/12/2024

Title: Permitting Agent

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	CODY LAYTON / Ph: (575) 234-5959	12/19/2024

Title	Office
Assistant Field Manager Lands & Minerals	Carlsbad Field 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: 12/19/2024

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-	97569	WINCHESTER; BONE SPRING, WEST

[4]Property Code	[5]Property Name	[6]Well Number
	CARDIGAN FED COM	134H

[7]OGRID No.	[8]Operator Name	[9]Elevation
374034	FLAT CREEK RESOURCES, LLC.	3480'

[10]Surface Location

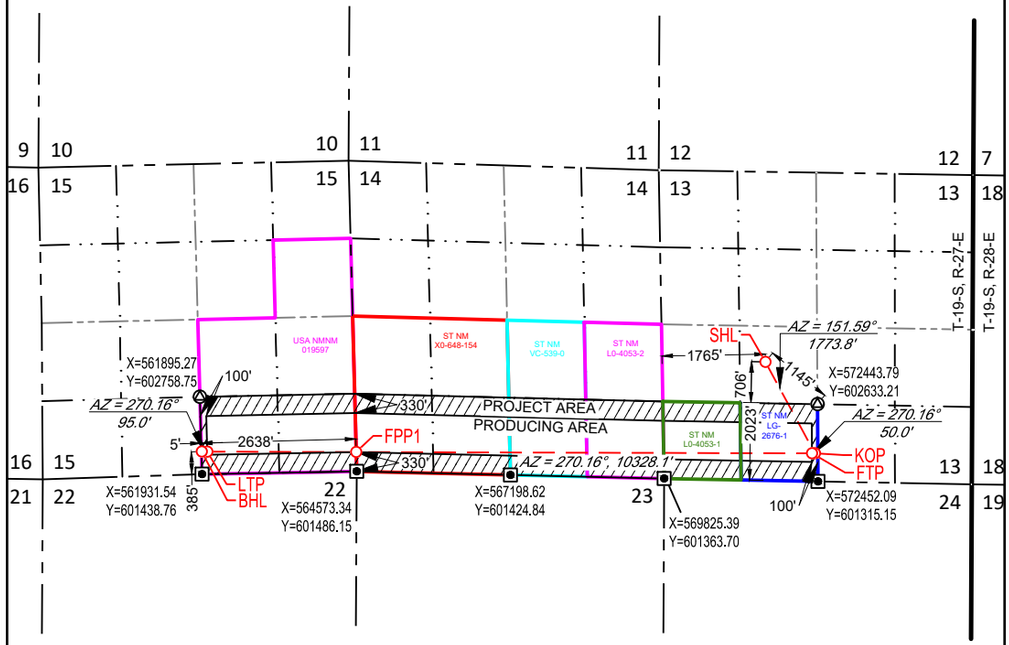
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
K	13	19-S	27-E	-	2023'	SOUTH	1765'	WEST	EDDY

[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
O	15	19-S	27-E	-	385'	SOUTH	2638'	EAST	EDDY

[12]Dedicated Acres	[13]Joint or Infill	[14]Consolidation Code	[15]Order No.
320			

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.



NEW MEXICO EAST
NAD 1983

SURFACE LOCATION (SHL)	KICK OFF POINT (KOP)	FIRST TAKE POINT (FTP)	FED PERF. POINT (FPP1)
2023' FSL - SEC. 13 1765' FWL - SEC. 13 X=571555 Y=603355 LAT.: N 32.6586308 LONG.: W 104.2351447	478' FSL - SEC. 13 2581' FWL - SEC. 13 X=572399 Y=601795 LAT.: N 32.6543399 LONG.: W 104.2324075	478' FSL - SEC. 13 2531' FWL - SEC. 13 X=572349 Y=601795 LAT.: N 32.6543404 LONG.: W 104.2325700	330' FSL - SEC. 14 ±0' FWL - SEC. 14 X=564565 Y=601816 LAT.: N 32.6544168 LONG.: W 104.2578628

LAST TAKE POINT (LTP)	BOTTOM HOLE LOCATION (BHL)
383' FSL - SEC. 15 2543' FEL - SEC. 15 X=562021 Y=601823 LAT.: N 32.6544406 LONG.: W 104.2661280	385' FSL - SEC. 15 2638' FEL - SEC. 15 X=561926 Y=601823 LAT.: N 32.6544415 LONG.: W 104.2664368

[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.

Rodney Littleton — June 19, 2024
Signature — Date

Rodney Littleton
Printed Name

rodney.littleton@flatcreekresources.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 to the best of my belief.

02/01/2024
Date of Survey
Signature and Seal of Professional Surveyor

RAMON DOMINGUEZ
NEW MEXICO
24508
PROFESSIONAL SURVEYOR

6/10/2024 7:21:38 AM
Certificate Number

N

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: Flat Creek Resources, LLC **OGRID:** 374034 **Date:** 12 / 20 / 2024

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
Cardigan Fed Com 132H		K-13-19S-27E	2083' FSL 1766' FWL	525	1800	6300
Cardigan Fed Com 133H		K-13-19S-27E	2053' FSL 1766' FWL	525	1800	6300
Cardigan Fed Com 134H		K-13-19S-27E	2020' FSL 1765' FWL	525	1800	6300

IV. Central Delivery Point Name: Cardigan Central Tank Battery [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
Cardigan Fed Com 132H		April 1, 2025	April 15, 2025	June 1, 2025	July 15, 2025	July 20, 2025
Cardigan Fed Com 133H		April 2, 2025	April 30, 2025	June 1, 2025	July 15, 2025	July 20, 2025
Cardigan Fed Com 134H		April 3, 2025	May 15, 2025	June 1, 2025	July 15, 2025	July 20, 2025

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

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

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

Section 2 – Enhanced Plan
EFFECTIVE APRIL 1, 2022

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

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

IX. Anticipated Natural Gas Production:

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

X. Natural Gas Gathering System (NGGS):

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

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

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

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

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

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

Section 3 - Certifications

Effective May 25, 2021

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

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

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

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

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

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

Section 4 - Notices

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

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

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

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

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

Signature:	Rodney Littleton
Printed Name:	Rodney Littleton
Title:	VP of Drilling
E-mail Address:	rlittleton@freedomenergy.com
Date:	02/12/2024
Phone:	817-310-8578

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

Approved By:	
Title:	
Approval Date:	
Conditions of Approval:	

VI. SEPARATION EQUIPMENT

Flat Creek Resources, LLC, will install:

- four 48” OD x 15’, 500#, 3 phase separators
- one 96” OD x 20’, 250# heater treater
- four 750 BBL water tanks
- three 750 BBL oil tanks
- one 15’6” x 30’, 1000 BBL gun barrel
- one 72” OD x 15’ gas scrubber
- one vapor recovery tower
- one vapor recovery unit
- vapor recovery piping for oil and water tanks

System is designed to capture 120% of the expected gas volume from separation all the way through the vapor recovery equipment.

VII. OPERATIONAL PRACTICES

NMAC 19.15.27.8 (A) Venting & Flaring of Natural Gas

1. Flat Creek Resources will comply with NMAC 19.15.27.8 – venting and flaring of gas during drilling, completion, or production that constitutes waste as defined in 19.15.2 is banned.

NMAC 19.15.27.8 (B) Venting & Flaring During Drilling

1. Flat Creek will combust gas if technically feasible during drilling operations using best industry practices.
2. A flare stack with a 100% capacity for expected volume will be set on the pad greater than 100 feet from the nearest well head and storage tank.
3. In an emergency, Flat Creek will vent the gas in order to avoid substantial impact. Flat Creek will report vented or flared gas to the NMOCD.

NMAC 19.15.27.8 (C) Venting & Flaring During Completion or Recompletion

1. Facilities will be built and ready from the first day of flowback.
2. Test separator will properly separate gas and liquids. Temporary test separator will be used initially to process volumes. In addition, separator will be tied into flowback tanks which will be tied into the gas processing equipment for sale down a pipeline.
3. Should the facility not be ready to process gas or the gas does not meet quality standards then the flowback will be delayed until the facility and pipeline are ready.

NMAC 19.15.27.8 (D) Venting & Flaring During Production

Flat Creek will not vent or flare natural gas except:

1. During and emergency or malfunction.
2. To unload or clean-up liquid holdup in a well to atmospheric pressure, provided
    a. Flat Creek does not vent after the well achieves a stabilized rate and pressure
    b. Flat Creek will be on-site while unloading liquids by manual purging and take all reasonable actions to achieve a stabilized rate and pressure as soon as possible
    c. Flat Creek will optimize the system to minimize gas venting if the well is equipped with a plunger lift or auto control system
    d. Best management practices will be used during downhole well maintenance
3. During the following activities unless prohibited
    a. Gauging or sampling a storage tank or low-pressure production vessel
    b. Loading out liquids from a storage tank
    c. Repair and maintenance
    d. Normal operations of a gas-activated pneumatic controller or pump
    e. Normal operation of a storage tank but not including venting from a thief hatch
    f. Normal operation of a dehydration units
    g. Normal operations of compressors, engines, turbines, valves, flanges, & connectors
    h. During bradenhead, packer leakage test, or production test lasting less than 24 hours
    i. When natural gas does not meet the gathering line specifications

j. Commissioning of pipelines, equipment, or facilities only for as long as necessary to purge introduced impurities

NMAC 19.15.27.8 (E) Performance Standards

1. Flat Creek used a safety factor to design the separation and storage equipment. The equipment will be routed toa vapor recovery system and uses a flare as back up to startup, shutdown, maintenance, or malfunction of the VRU system.
2. Flat Creek will install a flare that will handle the full volume of vapors from the facility in case of VRU failure. It will have an auto-ignition system.
3. Flare stacks will be appropriately sized and designed to ensure proper combustion efficiency
    a. Flare stacks installed or replaced will be equipped with an automatic ignitor or continuous pilot.
    b. Flare stacks will be located greater than 100 feet from well head and storage tanks and securely anchored
4. Flat Creek will conduct an AVO inspection on all components for leaks and defects every week.
5. Flat Creek will make and keep records of AVO inspection available to the NMOCD for at least 5 years.
6. Flat Creek may use a remote or automated monitoring technology to detect leaks and releases in lieu of AVO inspections with prior NMOCD approval.
7. Facilities will be designed to minimize waste.
8. Flat Creek will resolve emergencies as promptly as possible.

NMAC 19.15.27.8 (F) Measuring or Estimating Vented and Flared Natural Gas

1. Flat Creek will have meters on both the low pressure and high-pressure sides of the flares. Volumes will be recorded in the SCADA system.
2. Flat Creek will install equipment to measure the volume of flared natural gas that has an average production of greater than 60 MCFD.
3. Flat Creek's measuring equipment will conform to industry standards.
4. Measurement system will be designed such that it cannot be bypassed except for inspections and servicing the meters.
5. Flat Creek will estimate the volume of vented or flared gas using a methodology that can be independently verified if metering is not practicable due to low flow rate or pressure.
6. Flat Creek will estimate the volume of vented and/or flared gas based on the results of an annual GOR test for wells that do not require measuring equipment reported on form C-116.
7. Flat Creek will install measuring equipment whenever the NMOCD determines that metering is necessary.

VIII. BEST MANAGEMENT PRACTICES

Flat Creek Resources, LLC, will minimize venting during maintenance by:

1. System will be designed and operated to route storage tank and process equipment emissions to the VRU. If the VRU is not operable, then the vapors will be routed to the flare.
2. Scheduling maintenance for multiple tasks to minimize the need for blowdowns.
3. After completion of maintenance, gas will be flared until it meets pipeline specifications.

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

Drilling Plan Data Report
12/20/2024

APD ID: 10400099648
Submission Date: 07/12/2024
Operator Name: FLAT CREEK RESOURCES LLC
Well Name: CARDIGAN FED COM
Well Number: 134H
Well Type: OIL 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
14720024	UNKNOWN	3480	0	0	OTHER : ALLUVIUM	USEABLE WATER	N
14720025	TANSILL	3381	99	99	LIMESTONE	NONE	N
14720026	YATES	3129	351	351	SANDSTONE	NONE	N
14720027	SEVEN RIVERS	2790	690	690	OTHER : Carbonate	NONE	N
14720028	QUEEN	2218	1262	1262	OTHER : Carbonate	NATURAL GAS, OIL	N
14720029	GRAYBURG	1887	1593	1593	OTHER : Carbonate	NATURAL GAS, OIL	N
14720030	SAN ANDRES	1387	2093	2093	OTHER : Carbonate	NATURAL GAS, OIL	N
14720031	BONE SPRING LIME	217	3263	3316	LIMESTONE	NATURAL GAS	N
14720032	BONE SPRING 1ST	-1518	4998	5168	SANDSTONE	NATURAL GAS, OIL	N
14720033	BONE SPRING 2ND	-1659	5139	5318	OTHER : Carbonate	NATURAL GAS, OIL	N
14720034	BONE SPRING 2ND	-3312	6792	7080	SANDSTONE	NATURAL GAS, OIL	N
14720035	BONE SPRING 3RD	-3419	6899	7190	OTHER : Carbonate	NATURAL GAS, OIL	N
14720036	BONE SPRING 3RD	-4473	7953	8268	SANDSTONE	NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Operator Name: FLAT CREEK RESOURCES LLC

Well Name: CARDIGAN FED COM **Well Number:** 134H

Pressure Rating (PSI): 10M **Rating Depth:** 20000

Equipment: A 20,000', 10,000 psi BOP stack will consist of a single ram, mud cross and double ram type (10,000 psi WP) preventer, and an annular preventer (5000-psi WP). Both units will be hydraulically operated, and the ram-type will be equipped with blind rams on bottom and drill pipe rams on top. All BOPE will be tested in accordance with 43 CFR 3172.

Requesting Variance? YES

Variance request: Variance is requested to use a co-flex line between the BOP and choke manifold instead of using a 4" OD steel line.
Testing Procedure: 1. Use water to test BOPs. 2. Make up test assembly (test plug) and set in the wellhead profile. Ensure the casing valve is left open. Monitor the casing valve outlet while testing for potential leak past the test plug. 3. Circulate through the choke/kill lines, choke manifold, standpipe manifold, and valves to ensure that all lines are full of water. This will prevent pressure drop (compression) while testing. 4. Line up test unit and test rams, valves and lines as per the chart below. 5. Pressure tests must be low and high, respectively, and the pressure should stabilize with minimum bleed off within 10 minutes. If a test plug is utilized, no bleed-off of pressure is acceptable. For a test not utilizing a test plug, if a decline in pressure of more than 10 percent in 30 minutes occurs, the test shall be considered to have failed. Pressure should be recorded on a chart recorder (add scale to be use) 6. Any equipment that does not pass the pressure test must be reported to the drilling supervisor. Equipment must be repaired and retested. 7. Continue with pressure testing until all equipment has been tested as per the specific rig requirements. 8. Rig down test assembly. 9. All tests and drills to be recorded in the drilling log.

Choke Diagram Attachment:

Choke_Rev_20240808094834.pdf

BOP Diagram Attachment:

BOP_Wellhead_Testing_v2_20240709080829.pdf

10M_BOP_5M_Annular_Diagram_20240709080306.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	400	0	400	3480	3080	400	J-55	54.5	ST&C	6	14.6	DRY	31.7	DRY	31.7
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	3000	0	2967	3480	513	3000	N-80	40	BUTT	2	3.7	DRY	10.3	DRY	10.3
3	PRODUCTION	8.75	5.5	NEW	NON API	N	0	18734	0	7814	3480	-4334	18734	P-110	20	OTHER - TCBD-HT	2.9	3.2	DRY	3.9	DRY	3.9

Casing Attachments

Operator Name: FLAT CREEK RESOURCES LLC

Well Name: CARDIGAN FED COM **Well Number:** 134H

Casing Attachments

Casing ID: 1 **String** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cardigan_134H_Casing_Design_Assumptions_20240709080342.pdf

Casing ID: 2 **String** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cardigan_134H_Casing_Design_Assumptions_20240709080404.pdf

Casing ID: 3 **String** PRODUCTION

Inspection Document:

Spec Document:

5.5in_Casing_Spec_20lb_TCBC_HT_20240709080429.pdf

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Cardigan_134H_Casing_Design_Assumptions_20240709080444.pdf

Section 4 - Cement

Operator Name: FLAT CREEK RESOURCES LLC

Well Name: CARDIGAN FED COM **Well Number:** 134H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	200	170	1.68	12.8	286	100	35/65 Poz Premium C	5% bwow Sodium chloride + 6% bentonite gel + 0.4% CPT-503P + 0.125 lbs/sk Dura fiber
SURFACE	Tail		200	400	210	1.34	14.8	281	100	Class C	1% Calcium chloride + 0.25 lb/sk cellophane flake
INTERMEDIATE	Lead		0	1500	700	1.68	12.8	1176	50	35/65 Poz Premium C	5% bwow Sodium chloride + 6% bentonite gel + 0.4% CPT-503P + 0.125 lbs/sk Dura fiber
INTERMEDIATE	Tail		1500	3000	135	1.74	13.5	235	50	Class C	1% calcium chloride + 4% bentonite gel + 0.4% CPT-503P + 0.125 lbs/sk Dura fiber
PRODUCTION	Lead		0	7000	725	2.82	10.4	2045	15	Class H	10% bwoc light weight bead + 5% silica fume alternative + 0.2% suspension aid + 0.3% fluid loss additive + 0.3% dispersant + 0.2% cement retarder
PRODUCTION	Tail		7000	18734	2400	1.42	13.2	3408	15	35/65 PozPremium H	0.2% CPT-23

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: Sufficient mud materials (e. g., barite, bentonite, LCM) to maintain mud properties and meet minimum lost circulation and weight increase requirements will always be kept on site.
Describe the mud monitoring system utilized: An electronic pit volume totalizer (PVT) mud system will monitor pit volumes for gains or losses, flow rate, pump pressures, and stroke rate.

Circulating Medium Table

Operator Name: FLAT CREEK RESOURCES LLC

Well Name: CARDIGAN FED COM **Well Number:** 134H

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
0	400	OTHER : Fresh Water Spud Mud	8.8	8.8							
400	3000	OTHER : Cut Brine	10	10							
3000	18734	OTHER : High Performance WB	9.4	9.4							

Section 6 - Test, Logging, Coring

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

Production tests include Gama Ray log and resistivity log. No open and cased hole logs are planned at this time.

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

GAMMA RAY LOG,DUAL INDUCTION/MICRO-RESISTIVITY,

Coring operation description for the well:

No coring operation is planned.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 3742 **Anticipated Surface Pressure:** 2004

Anticipated Bottom Hole Temperature(F): 136

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

Cardigan_H2S_Plan_20240709080639.pdf

Operator Name: FLAT CREEK RESOURCES LLC

Well Name: CARDIGAN FED COM **Well Number:** 134H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Cardigan_134H_Directional_Plan_20240709080651.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

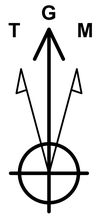
Cardigan_134H_Drill_Plan_20240709080717.pdf
Cardigan_134H_Anticollision_Report_20240709080726.pdf
Wellhead_Diagram_20240709080758.pdf
CoFlex_Certs_Rev_20240808094855.pdf
Cardigan_Waste_Minimization_Plan_Rev_20240813160358.pdf

Other Variance attachment:

Freedom Energy

Company: Freedom Energy
Field: Eddy County, NM
Location: Cardigan Fed Com
Well: Cardigan Fed Com 134H
Wellbore: OH
Plan: Plan 1
GL: 3480' GL + 26.5' KB @ 3506.50usft

Rig: H&P 370



Azimuths to Grid North
True North: -0.05°
Magnetic North: 6.49°

Magnetic Field
Strength: 47372.5nT
Dip Angle: 60.10°
Date: 6/6/2024
Model: IGRF2020

To convert a Magnetic Direction to a Grid Direction, Add 6.49°

LEGACY DIRECTIONAL

WELL DETAILS: Cardigan Fed Com 134H

3480' GL + 26.5' KB @ 3506.50usft 3480.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	603293.00	530375.00	32.65851485	-104.23463593	

PROJECT DETAILS: Eddy County, NM

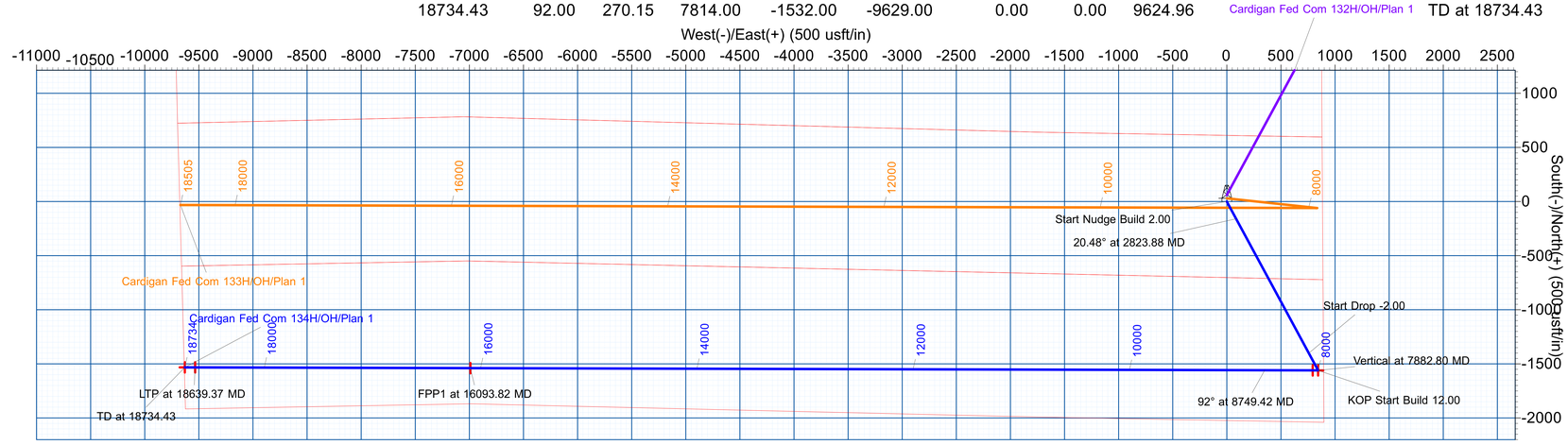
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

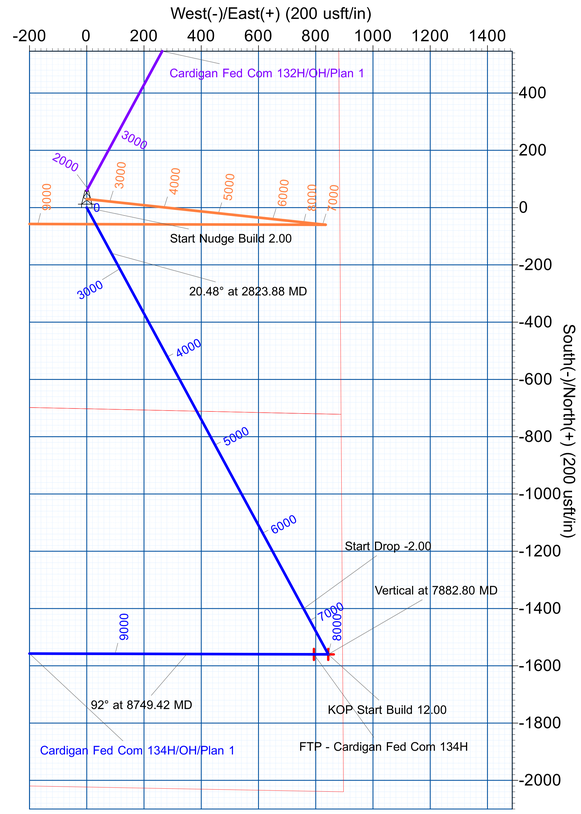
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
KOP - Cardigan Fed Com 134H	7684.50	-1560.00	844.00	601733.00	531219.00	32.65422453	-104.23189836
BHL - Cardigan Fed Com 134H	7814.00	-1532.00	-9629.00	601761.00	520746.00	32.65432439	-104.26592655
LTP - Cardigan Fed Com 134H	7817.31	-1532.00	-9534.00	601761.00	520841.00	32.65432422	-104.26561788
FTP - Cardigan Fed Com 134H	7897.21	-1560.00	794.00	601733.00	531169.00	32.65422467	-104.23206082
FPP1 - Cardigan Fed Com 134H	7905.95	-1539.00	-6990.00	601754.00	523385.00	32.65430025	-104.25735207

SECTION DETAILS: OH

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	
1800.00	0.00	0.00	1800.00	0.00	0.00	0.00	0.00	0.00	Start Nudge Build 2.00
2823.88	20.48	151.59	2802.22	-159.22	86.14	2.00	151.59	-86.56	20.48° at 2823.88 MD
6858.92	20.48	151.59	6582.28	-1400.78	757.86	0.00	0.00	-761.52	Start Drop -2.00
7882.80	0.00	0.00	7584.50	-1560.00	844.00	2.00	180.00	-848.08	Vertical at 7882.80 MD
7982.80	0.00	0.00	7684.50	-1560.00	844.00	0.00	0.00	-848.08	KOP Start Build 12.00
8749.42	92.00	270.15	8161.68	-1558.68	349.91	12.00	270.15	-353.99	92° at 8749.42 MD
16093.82	92.00	270.15	7905.95	-1539.06	-6990.00	0.00	0.00	6985.95	FPP1 at 16093.82 MD
18639.37	92.00	270.15	7817.31	-1532.25	-9534.00	0.00	0.00	9529.96	LTP at 18639.37 MD
18734.43	92.00	270.15	7814.00	-1532.00	-9629.00	0.00	0.00	9624.96	TD at 18734.43





Plan: Plan 1 (Cardigan Fed Com 134H/OH)
Created By: Jenise Kirkpatrick Date: 12:23, June 10 2024

Freedom Energy

Eddy County, NM
Cardigan Fed Com
Cardigan Fed Com 134H

OH

Plan: Plan 1

Standard Planning Report

10 June, 2024

Legacy Directional Drilling

Planning Report

Database:	EDM_WA	**Local Co-ordinate Reference:**	Well Cardigan Fed Com 134H
Company:	Freedom Energy	**TVD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Project:	Eddy County, NM	**MD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Site:	Cardigan Fed Com	**North Reference:**	Grid
Well:	Cardigan Fed Com 134H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1		

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	Cardigan Fed Com				
Site Position:		**Northing:**	603,353.00 usft	**Latitude:**	32.65867978
From:	Map	**Easting:**	530,375.00 usft	**Longitude:**	-104.23463575
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "		

Well	Cardigan Fed Com 134H					
Well Position	**+N/-S**	0.00 usft	**Northing:**	603,293.00 usft	**Latitude:**	32.65851485
	+E/-W	0.00 usft	**Easting:**	530,375.00 usft	**Longitude:**	-104.23463593
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,480.00 usft
Grid Convergence:		0.05 °				

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2020	6/6/2024	6.54	60.10	47,372.45463954

Design	Plan 1			
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	270.15

Plan Survey Tool Program **Date** 6/10/2024

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	18,734.43	Plan 1 (OH)	MWD	
				OWSG MWD - Standard	

Legacy Directional Drilling

Planning Report

Database:	EDM_WA	**Local Co-ordinate Reference:**	Well Cardigan Fed Com 134H
Company:	Freedom Energy	**TVD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Project:	Eddy County, NM	**MD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Site:	Cardigan Fed Com	**North Reference:**	Grid
Well:	Cardigan Fed Com 134H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1		

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,823.88	20.48	151.59	2,802.22	-159.22	86.14	2.00	2.00	0.00	151.59	
6,858.92	20.48	151.59	6,582.28	-1,400.78	757.86	0.00	0.00	0.00	0.00	
7,882.80	0.00	0.00	7,584.50	-1,560.00	844.00	2.00	-2.00	0.00	180.00	
7,982.80	0.00	0.00	7,684.50	-1,560.00	844.00	0.00	0.00	0.00	0.00	KOP - Cardigan Fed (
8,749.42	92.00	270.15	8,161.68	-1,558.68	349.91	12.00	12.00	0.00	270.15	
16,093.82	92.00	270.15	7,905.95	-1,539.06	-6,990.00	0.00	0.00	0.00	0.00	FPP1 - Cardigan Fed
18,639.37	92.00	270.15	7,817.31	-1,532.25	-9,534.00	0.00	0.00	0.00	0.00	LTP - Cardigan Fed C
18,734.43	92.00	270.15	7,814.00	-1,532.00	-9,629.00	0.00	0.00	0.00	0.00	BHL - Cardigan Fed C

Legacy Directional Drilling

Planning Report

Database:	EDM_WA	**Local Co-ordinate Reference:**	Well Cardigan Fed Com 134H
Company:	Freedom Energy	**TVD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Project:	Eddy County, NM	**MD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Site:	Cardigan Fed Com	**North Reference:**	Grid
Well:	Cardigan Fed Com 134H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26.50	0.00	0.00	26.50	0.00	0.00	0.00	0.00	0.00	0.00
ALLUVIUM									
99.00	0.00	0.00	99.00	0.00	0.00	0.00	0.00	0.00	0.00
TANSILL									
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
351.00	0.00	0.00	351.00	0.00	0.00	0.00	0.00	0.00	0.00
YATES									
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
690.00	0.00	0.00	690.00	0.00	0.00	0.00	0.00	0.00	0.00
SEVEN RIVERS									
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,262.00	0.00	0.00	1,262.00	0.00	0.00	0.00	0.00	0.00	0.00
QUEEN									
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,593.00	0.00	0.00	1,593.00	0.00	0.00	0.00	0.00	0.00	0.00
GRAYBURG									
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Nudge Build 2.00									
1,900.00	2.00	151.59	1,899.98	-1.53	0.83	-0.83	2.00	2.00	0.00
2,000.00	4.00	151.59	1,999.84	-6.14	3.32	-3.34	2.00	2.00	0.00
2,093.77	5.88	151.59	2,093.25	-13.24	7.16	-7.20	2.00	2.00	0.00
SAN ANDRES									
2,100.00	6.00	151.59	2,099.45	-13.80	7.47	-7.50	2.00	2.00	0.00
2,200.00	8.00	151.59	2,198.70	-24.52	13.27	-13.33	2.00	2.00	0.00
2,300.00	10.00	151.59	2,297.47	-38.28	20.71	-20.81	2.00	2.00	0.00
2,400.00	12.00	151.59	2,395.62	-55.06	29.79	-29.93	2.00	2.00	0.00
2,500.00	14.00	151.59	2,493.06	-74.84	40.49	-40.69	2.00	2.00	0.00
2,600.00	16.00	151.59	2,589.64	-97.61	52.81	-53.06	2.00	2.00	0.00
2,700.00	18.00	151.59	2,685.27	-123.32	66.72	-67.04	2.00	2.00	0.00
2,800.00	20.00	151.59	2,779.82	-151.95	82.21	-82.61	2.00	2.00	0.00
2,823.88	20.48	151.59	2,802.22	-159.22	86.14	-86.56	2.00	2.00	0.00
20.48° at 2823.88 MD									
2,900.00	20.48	151.59	2,873.53	-182.64	98.81	-99.29	0.00	0.00	0.00
3,000.00	20.48	151.59	2,967.21	-213.41	115.46	-116.02	0.00	0.00	0.00
3,100.00	20.48	151.59	3,060.89	-244.18	132.11	-132.75	0.00	0.00	0.00
3,200.00	20.48	151.59	3,154.57	-274.95	148.76	-149.47	0.00	0.00	0.00
3,300.00	20.48	151.59	3,248.25	-305.72	165.40	-166.20	0.00	0.00	0.00
3,322.07	20.48	151.59	3,268.93	-312.51	169.08	-169.89	0.00	0.00	0.00
BONE SPRING LIME									

Legacy Directional Drilling

Planning Report

Database:	EDM_WA	**Local Co-ordinate Reference:**	Well Cardigan Fed Com 134H
Company:	Freedom Energy	**TVD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Project:	Eddy County, NM	**MD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Site:	Cardigan Fed Com	**North Reference:**	Grid
Well:	Cardigan Fed Com 134H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,400.00	20.48	151.59	3,341.94	-336.49	182.05	-182.93	0.00	0.00	0.00
3,500.00	20.48	151.59	3,435.62	-367.26	198.70	-199.66	0.00	0.00	0.00
3,600.00	20.48	151.59	3,529.30	-398.03	215.34	-216.38	0.00	0.00	0.00
3,700.00	20.48	151.59	3,622.98	-428.80	231.99	-233.11	0.00	0.00	0.00
3,800.00	20.48	151.59	3,716.66	-459.57	248.64	-249.84	0.00	0.00	0.00
3,900.00	20.48	151.59	3,810.34	-490.34	265.28	-266.57	0.00	0.00	0.00
4,000.00	20.48	151.59	3,904.02	-521.11	281.93	-283.30	0.00	0.00	0.00
4,100.00	20.48	151.59	3,997.70	-551.88	298.58	-300.02	0.00	0.00	0.00
4,200.00	20.48	151.59	4,091.38	-582.65	315.23	-316.75	0.00	0.00	0.00
4,300.00	20.48	151.59	4,185.06	-613.41	331.87	-333.48	0.00	0.00	0.00
4,400.00	20.48	151.59	4,278.74	-644.18	348.52	-350.21	0.00	0.00	0.00
4,500.00	20.48	151.59	4,372.43	-674.95	365.17	-366.93	0.00	0.00	0.00
4,600.00	20.48	151.59	4,466.11	-705.72	381.81	-383.66	0.00	0.00	0.00
4,700.00	20.48	151.59	4,559.79	-736.49	398.46	-400.39	0.00	0.00	0.00
4,800.00	20.48	151.59	4,653.47	-767.26	415.11	-417.12	0.00	0.00	0.00
4,900.00	20.48	151.59	4,747.15	-798.03	431.76	-433.84	0.00	0.00	0.00
5,000.00	20.48	151.59	4,840.83	-828.80	448.40	-450.57	0.00	0.00	0.00
5,100.00	20.48	151.59	4,934.51	-859.57	465.05	-467.30	0.00	0.00	0.00
5,185.73	20.48	151.59	5,014.82	-885.95	479.32	-481.64	0.00	0.00	0.00
1ST BONE SPRING SAND									
5,200.00	20.48	151.59	5,028.19	-890.34	481.70	-484.03	0.00	0.00	0.00
5,300.00	20.48	151.59	5,121.87	-921.11	498.34	-500.75	0.00	0.00	0.00
5,337.18	20.48	151.59	5,156.70	-932.55	504.53	-506.97	0.00	0.00	0.00
2ND BONE SPRING CARBONATE									
5,400.00	20.48	151.59	5,215.55	-951.88	514.99	-517.48	0.00	0.00	0.00
5,500.00	20.48	151.59	5,309.23	-982.65	531.64	-534.21	0.00	0.00	0.00
5,600.00	20.48	151.59	5,402.92	-1,013.42	548.29	-550.94	0.00	0.00	0.00
5,700.00	20.48	151.59	5,496.60	-1,044.19	564.93	-567.66	0.00	0.00	0.00
5,800.00	20.48	151.59	5,590.28	-1,074.96	581.58	-584.39	0.00	0.00	0.00
5,900.00	20.48	151.59	5,683.96	-1,105.73	598.23	-601.12	0.00	0.00	0.00
6,000.00	20.48	151.59	5,777.64	-1,136.50	614.87	-617.85	0.00	0.00	0.00
6,100.00	20.48	151.59	5,871.32	-1,167.27	631.52	-634.57	0.00	0.00	0.00
6,200.00	20.48	151.59	5,965.00	-1,198.04	648.17	-651.30	0.00	0.00	0.00
6,300.00	20.48	151.59	6,058.68	-1,228.80	664.81	-668.03	0.00	0.00	0.00
6,400.00	20.48	151.59	6,152.36	-1,259.57	681.46	-684.76	0.00	0.00	0.00
6,500.00	20.48	151.59	6,246.04	-1,290.34	698.11	-701.48	0.00	0.00	0.00
6,600.00	20.48	151.59	6,339.72	-1,321.11	714.76	-718.21	0.00	0.00	0.00
6,700.00	20.48	151.59	6,433.41	-1,351.88	731.40	-734.94	0.00	0.00	0.00
6,800.00	20.48	151.59	6,527.09	-1,382.65	748.05	-751.67	0.00	0.00	0.00
6,858.92	20.48	151.59	6,582.28	-1,400.78	757.86	-761.52	0.00	0.00	0.00
Start Drop -2.00									
6,900.00	19.66	151.59	6,620.87	-1,413.18	764.57	-768.26	2.00	-2.00	0.00
7,000.00	17.66	151.59	6,715.61	-1,441.31	779.79	-783.56	2.00	-2.00	0.00
7,100.00	15.66	151.59	6,811.41	-1,466.52	793.42	-797.26	2.00	-2.00	0.00
7,108.79	15.48	151.59	6,819.88	-1,468.60	794.55	-798.39	2.00	-2.00	0.00
2ND BONE SPRING SAND									
7,200.00	13.66	151.59	6,908.15	-1,488.77	805.46	-809.36	2.00	-2.00	0.00
7,219.73	13.26	151.59	6,927.34	-1,492.81	807.65	-811.55	2.00	-2.00	0.00
3RD BONE SPRING CARBONATE									
7,300.00	11.66	151.59	7,005.72	-1,508.04	815.89	-819.83	2.00	-2.00	0.00
7,400.00	9.66	151.59	7,103.99	-1,524.30	824.69	-828.68	2.00	-2.00	0.00
7,500.00	7.66	151.59	7,202.84	-1,537.54	831.85	-835.87	2.00	-2.00	0.00
7,600.00	5.66	151.59	7,302.16	-1,547.73	837.36	-841.41	2.00	-2.00	0.00

Legacy Directional Drilling

Planning Report

Database:	EDM_WA	**Local Co-ordinate Reference:**	Well Cardigan Fed Com 134H
Company:	Freedom Energy	**TVD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Project:	Eddy County, NM	**MD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Site:	Cardigan Fed Com	**North Reference:**	Grid
Well:	Cardigan Fed Com 134H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,700.00	3.66	151.59	7,401.83	-1,554.87	841.23	-845.29	2.00	-2.00	0.00
7,800.00	1.66	151.59	7,501.72	-1,558.95	843.43	-847.51	2.00	-2.00	0.00
7,882.80	0.00	0.00	7,584.50	-1,560.00	844.00	-848.08	2.00	-2.00	0.00
Vertical at 7882.80 MD									
7,900.00	0.00	0.00	7,601.70	-1,560.00	844.00	-848.08	0.00	0.00	0.00
7,982.80	0.00	0.00	7,684.50	-1,560.00	844.00	-848.08	0.00	0.00	0.00
KOP Start Build 12.00									
8,000.00	2.06	270.15	7,701.70	-1,560.00	843.69	-847.77	12.00	12.00	0.00
8,025.00	5.06	270.15	7,726.65	-1,560.00	842.14	-846.22	12.00	12.00	0.00
8,050.00	8.06	270.15	7,751.48	-1,559.99	839.28	-843.36	12.00	12.00	0.00
8,075.00	11.06	270.15	7,776.13	-1,559.98	835.12	-839.21	12.00	12.00	0.00
8,100.00	14.06	270.15	7,800.53	-1,559.96	829.69	-833.77	12.00	12.00	0.00
8,125.00	17.06	270.15	7,824.61	-1,559.94	822.98	-827.06	12.00	12.00	0.00
8,150.00	20.06	270.15	7,848.31	-1,559.92	815.02	-819.10	12.00	12.00	0.00
8,175.00	23.06	270.15	7,871.56	-1,559.90	805.83	-809.91	12.00	12.00	0.00
8,200.00	26.06	270.15	7,894.29	-1,559.87	795.44	-799.52	12.00	12.00	0.00
8,225.00	29.06	270.15	7,916.45	-1,559.84	783.87	-787.96	12.00	12.00	0.00
8,250.00	32.06	270.15	7,937.97	-1,559.81	771.16	-775.24	12.00	12.00	0.00
8,275.00	35.06	270.15	7,958.80	-1,559.77	757.34	-761.42	12.00	12.00	0.00
8,300.00	38.06	270.15	7,978.88	-1,559.73	742.45	-746.53	12.00	12.00	0.00
8,300.23	38.06	270.15	7,979.06	-1,559.73	742.31	-746.39	0.00	0.00	0.00
3RD BONE SPRING SAND									
8,325.00	41.06	270.15	7,998.15	-1,559.69	726.53	-730.61	12.11	12.11	0.00
8,350.00	44.06	270.15	8,016.56	-1,559.64	709.62	-713.70	12.00	12.00	0.00
8,375.00	47.06	270.15	8,034.06	-1,559.59	691.77	-695.85	12.00	12.00	0.00
8,400.00	50.06	270.15	8,050.60	-1,559.54	673.03	-677.11	12.00	12.00	0.00
8,425.00	53.06	270.15	8,066.14	-1,559.49	653.45	-657.53	12.00	12.00	0.00
8,450.00	56.06	270.15	8,080.64	-1,559.44	633.08	-637.17	12.00	12.00	0.00
8,475.00	59.06	270.15	8,094.04	-1,559.38	611.99	-616.07	12.00	12.00	0.00
8,500.00	62.06	270.15	8,106.33	-1,559.32	590.22	-594.30	12.00	12.00	0.00
8,525.00	65.06	270.15	8,117.46	-1,559.26	567.83	-571.91	12.00	12.00	0.00
8,550.00	68.06	270.15	8,127.40	-1,559.20	544.90	-548.98	12.00	12.00	0.00
8,575.00	71.06	270.15	8,136.13	-1,559.14	521.48	-525.56	12.00	12.00	0.00
8,600.00	74.06	270.15	8,143.62	-1,559.07	497.63	-501.71	12.00	12.00	0.00
8,625.00	77.06	270.15	8,149.85	-1,559.01	473.42	-477.50	12.00	12.00	0.00
8,650.00	80.06	270.15	8,154.80	-1,558.94	448.92	-453.00	12.00	12.00	0.00
8,675.00	83.06	270.15	8,158.47	-1,558.88	424.19	-428.27	12.00	12.00	0.00
8,700.00	86.06	270.15	8,160.84	-1,558.81	399.31	-403.39	12.00	12.00	0.00
8,725.00	89.06	270.15	8,161.90	-1,558.74	374.33	-378.41	12.00	12.00	0.00
8,749.42	92.00	270.15	8,161.68	-1,558.68	349.91	-353.99	12.00	12.00	0.00
92° at 8749.42 MD									
8,800.00	92.00	270.15	8,159.91	-1,558.54	299.37	-303.45	0.00	0.00	0.00
8,900.00	92.00	270.15	8,156.43	-1,558.28	199.43	-203.51	0.00	0.00	0.00
9,000.00	92.00	270.15	8,152.95	-1,558.01	99.49	-103.57	0.00	0.00	0.00
9,100.00	92.00	270.15	8,149.47	-1,557.74	-0.45	-3.63	0.00	0.00	0.00
9,200.00	92.00	270.15	8,145.99	-1,557.48	-100.39	96.31	0.00	0.00	0.00
9,300.00	92.00	270.15	8,142.50	-1,557.21	-200.33	196.25	0.00	0.00	0.00
9,400.00	92.00	270.15	8,139.02	-1,556.94	-300.27	296.19	0.00	0.00	0.00
9,500.00	92.00	270.15	8,135.54	-1,556.67	-400.21	396.13	0.00	0.00	0.00
9,600.00	92.00	270.15	8,132.06	-1,556.41	-500.15	496.07	0.00	0.00	0.00
9,700.00	92.00	270.15	8,128.58	-1,556.14	-600.08	596.01	0.00	0.00	0.00
9,800.00	92.00	270.15	8,125.09	-1,555.87	-700.02	695.95	0.00	0.00	0.00
9,900.00	92.00	270.15	8,121.61	-1,555.60	-799.96	795.89	0.00	0.00	0.00

Legacy Directional Drilling

Planning Report

Database:	EDM_WA	**Local Co-ordinate Reference:**	Well Cardigan Fed Com 134H
Company:	Freedom Energy	**TVD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Project:	Eddy County, NM	**MD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Site:	Cardigan Fed Com	**North Reference:**	Grid
Well:	Cardigan Fed Com 134H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,000.00	92.00	270.15	8,118.13	-1,555.34	-899.90	895.83	0.00	0.00	0.00
10,100.00	92.00	270.15	8,114.65	-1,555.07	-999.84	995.77	0.00	0.00	0.00
10,200.00	92.00	270.15	8,111.17	-1,554.80	-1,099.78	1,095.71	0.00	0.00	0.00
10,300.00	92.00	270.15	8,107.68	-1,554.54	-1,199.72	1,195.64	0.00	0.00	0.00
10,400.00	92.00	270.15	8,104.20	-1,554.27	-1,299.66	1,295.58	0.00	0.00	0.00
10,500.00	92.00	270.15	8,100.72	-1,554.00	-1,399.60	1,395.52	0.00	0.00	0.00
10,600.00	92.00	270.15	8,097.24	-1,553.73	-1,499.54	1,495.46	0.00	0.00	0.00
10,700.00	92.00	270.15	8,093.76	-1,553.47	-1,599.47	1,595.40	0.00	0.00	0.00
10,800.00	92.00	270.15	8,090.27	-1,553.20	-1,699.41	1,695.34	0.00	0.00	0.00
10,900.00	92.00	270.15	8,086.79	-1,552.93	-1,799.35	1,795.28	0.00	0.00	0.00
11,000.00	92.00	270.15	8,083.31	-1,552.67	-1,899.29	1,895.22	0.00	0.00	0.00
11,100.00	92.00	270.15	8,079.83	-1,552.40	-1,999.23	1,995.16	0.00	0.00	0.00
11,200.00	92.00	270.15	8,076.35	-1,552.13	-2,099.17	2,095.10	0.00	0.00	0.00
11,300.00	92.00	270.15	8,072.87	-1,551.86	-2,199.11	2,195.04	0.00	0.00	0.00
11,400.00	92.00	270.15	8,069.38	-1,551.60	-2,299.05	2,294.98	0.00	0.00	0.00
11,500.00	92.00	270.15	8,065.90	-1,551.33	-2,398.99	2,394.92	0.00	0.00	0.00
11,600.00	92.00	270.15	8,062.42	-1,551.06	-2,498.93	2,494.86	0.00	0.00	0.00
11,700.00	92.00	270.15	8,058.94	-1,550.80	-2,598.86	2,594.80	0.00	0.00	0.00
11,800.00	92.00	270.15	8,055.46	-1,550.53	-2,698.80	2,694.73	0.00	0.00	0.00
11,900.00	92.00	270.15	8,051.97	-1,550.26	-2,798.74	2,794.67	0.00	0.00	0.00
12,000.00	92.00	270.15	8,048.49	-1,549.99	-2,898.68	2,894.61	0.00	0.00	0.00
12,100.00	92.00	270.15	8,045.01	-1,549.73	-2,998.62	2,994.55	0.00	0.00	0.00
12,200.00	92.00	270.15	8,041.53	-1,549.46	-3,098.56	3,094.49	0.00	0.00	0.00
12,300.00	92.00	270.15	8,038.05	-1,549.19	-3,198.50	3,194.43	0.00	0.00	0.00
12,400.00	92.00	270.15	8,034.56	-1,548.93	-3,298.44	3,294.37	0.00	0.00	0.00
12,500.00	92.00	270.15	8,031.08	-1,548.66	-3,398.38	3,394.31	0.00	0.00	0.00
12,600.00	92.00	270.15	8,027.60	-1,548.39	-3,498.32	3,494.25	0.00	0.00	0.00
12,700.00	92.00	270.15	8,024.12	-1,548.12	-3,598.25	3,594.19	0.00	0.00	0.00
12,800.00	92.00	270.15	8,020.64	-1,547.86	-3,698.19	3,694.13	0.00	0.00	0.00
12,900.00	92.00	270.15	8,017.15	-1,547.59	-3,798.13	3,794.07	0.00	0.00	0.00
13,000.00	92.00	270.15	8,013.67	-1,547.32	-3,898.07	3,894.01	0.00	0.00	0.00
13,100.00	92.00	270.15	8,010.19	-1,547.05	-3,998.01	3,993.95	0.00	0.00	0.00
13,200.00	92.00	270.15	8,006.71	-1,546.79	-4,097.95	4,093.89	0.00	0.00	0.00
13,300.00	92.00	270.15	8,003.23	-1,546.52	-4,197.89	4,193.83	0.00	0.00	0.00
13,400.00	92.00	270.15	7,999.74	-1,546.25	-4,297.83	4,293.76	0.00	0.00	0.00
13,500.00	92.00	270.15	7,996.26	-1,545.99	-4,397.77	4,393.70	0.00	0.00	0.00
13,600.00	92.00	270.15	7,992.78	-1,545.72	-4,497.71	4,493.64	0.00	0.00	0.00
13,700.00	92.00	270.15	7,989.30	-1,545.45	-4,597.64	4,593.58	0.00	0.00	0.00
13,800.00	92.00	270.15	7,985.82	-1,545.18	-4,697.58	4,693.52	0.00	0.00	0.00
13,900.00	92.00	270.15	7,982.33	-1,544.92	-4,797.52	4,793.46	0.00	0.00	0.00
14,000.00	92.00	270.15	7,978.85	-1,544.65	-4,897.46	4,893.40	0.00	0.00	0.00
14,100.00	92.00	270.15	7,975.37	-1,544.38	-4,997.40	4,993.34	0.00	0.00	0.00
14,200.00	92.00	270.15	7,971.89	-1,544.12	-5,097.34	5,093.28	0.00	0.00	0.00
14,300.00	92.00	270.15	7,968.41	-1,543.85	-5,197.28	5,193.22	0.00	0.00	0.00
14,400.00	92.00	270.15	7,964.92	-1,543.58	-5,297.22	5,293.16	0.00	0.00	0.00
14,500.00	92.00	270.15	7,961.44	-1,543.31	-5,397.16	5,393.10	0.00	0.00	0.00
14,600.00	92.00	270.15	7,957.96	-1,543.05	-5,497.10	5,493.04	0.00	0.00	0.00
14,700.00	92.00	270.15	7,954.48	-1,542.78	-5,597.03	5,592.98	0.00	0.00	0.00
14,800.00	92.00	270.15	7,951.00	-1,542.51	-5,696.97	5,692.92	0.00	0.00	0.00
14,900.00	92.00	270.15	7,947.51	-1,542.25	-5,796.91	5,792.86	0.00	0.00	0.00
15,000.00	92.00	270.15	7,944.03	-1,541.98	-5,896.85	5,892.79	0.00	0.00	0.00
15,100.00	92.00	270.15	7,940.55	-1,541.71	-5,996.79	5,992.73	0.00	0.00	0.00
15,200.00	92.00	270.15	7,937.07	-1,541.44	-6,096.73	6,092.67	0.00	0.00	0.00
15,300.00	92.00	270.15	7,933.59	-1,541.18	-6,196.67	6,192.61	0.00	0.00	0.00

Legacy Directional Drilling

Planning Report

Database:	EDM_WA	**Local Co-ordinate Reference:**	Well Cardigan Fed Com 134H
Company:	Freedom Energy	**TVD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Project:	Eddy County, NM	**MD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Site:	Cardigan Fed Com	**North Reference:**	Grid
Well:	Cardigan Fed Com 134H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,400.00	92.00	270.15	7,930.10	-1,540.91	-6,296.61	6,292.55	0.00	0.00	0.00
15,500.00	92.00	270.15	7,926.62	-1,540.64	-6,396.55	6,392.49	0.00	0.00	0.00
15,600.00	92.00	270.15	7,923.14	-1,540.37	-6,496.49	6,492.43	0.00	0.00	0.00
15,700.00	92.00	270.15	7,919.66	-1,540.11	-6,596.42	6,592.37	0.00	0.00	0.00
15,800.00	92.00	270.15	7,916.18	-1,539.84	-6,696.36	6,692.31	0.00	0.00	0.00
15,900.00	92.00	270.15	7,912.69	-1,539.57	-6,796.30	6,792.25	0.00	0.00	0.00
16,000.00	92.00	270.15	7,909.21	-1,539.31	-6,896.24	6,892.19	0.00	0.00	0.00
16,093.82	92.00	270.15	7,905.95	-1,539.06	-6,990.00	6,985.95	0.00	0.00	0.00
FPP1 at 16093.82 MD									
16,100.00	92.00	270.15	7,905.73	-1,539.04	-6,996.18	6,992.13	0.00	0.00	0.00
16,200.00	92.00	270.15	7,902.25	-1,538.77	-7,096.12	7,092.07	0.00	0.00	0.00
16,300.00	92.00	270.15	7,898.77	-1,538.50	-7,196.06	7,192.01	0.00	0.00	0.00
16,400.00	92.00	270.15	7,895.28	-1,538.24	-7,296.00	7,291.95	0.00	0.00	0.00
16,500.00	92.00	270.15	7,891.80	-1,537.97	-7,395.94	7,391.89	0.00	0.00	0.00
16,600.00	92.00	270.15	7,888.32	-1,537.70	-7,495.88	7,491.82	0.00	0.00	0.00
16,700.00	92.00	270.15	7,884.84	-1,537.44	-7,595.81	7,591.76	0.00	0.00	0.00
16,800.00	92.00	270.15	7,881.36	-1,537.17	-7,695.75	7,691.70	0.00	0.00	0.00
16,900.00	92.00	270.15	7,877.87	-1,536.90	-7,795.69	7,791.64	0.00	0.00	0.00
17,000.00	92.00	270.15	7,874.39	-1,536.63	-7,895.63	7,891.58	0.00	0.00	0.00
17,100.00	92.00	270.15	7,870.91	-1,536.37	-7,995.57	7,991.52	0.00	0.00	0.00
17,200.00	92.00	270.15	7,867.43	-1,536.10	-8,095.51	8,091.46	0.00	0.00	0.00
17,300.00	92.00	270.15	7,863.95	-1,535.83	-8,195.45	8,191.40	0.00	0.00	0.00
17,400.00	92.00	270.15	7,860.46	-1,535.57	-8,295.39	8,291.34	0.00	0.00	0.00
17,500.00	92.00	270.15	7,856.98	-1,535.30	-8,395.33	8,391.28	0.00	0.00	0.00
17,600.00	92.00	270.15	7,853.50	-1,535.03	-8,495.27	8,491.22	0.00	0.00	0.00
17,700.00	92.00	270.15	7,850.02	-1,534.76	-8,595.20	8,591.16	0.00	0.00	0.00
17,800.00	92.00	270.15	7,846.54	-1,534.50	-8,695.14	8,691.10	0.00	0.00	0.00
17,900.00	92.00	270.15	7,843.05	-1,534.23	-8,795.08	8,791.04	0.00	0.00	0.00
18,000.00	92.00	270.15	7,839.57	-1,533.96	-8,895.02	8,890.98	0.00	0.00	0.00
18,100.00	92.00	270.15	7,836.09	-1,533.70	-8,994.96	8,990.91	0.00	0.00	0.00
18,200.00	92.00	270.15	7,832.61	-1,533.43	-9,094.90	9,090.85	0.00	0.00	0.00
18,300.00	92.00	270.15	7,829.13	-1,533.16	-9,194.84	9,190.79	0.00	0.00	0.00
18,400.00	92.00	270.15	7,825.64	-1,532.89	-9,294.78	9,290.73	0.00	0.00	0.00
18,500.00	92.00	270.15	7,822.16	-1,532.63	-9,394.72	9,390.67	0.00	0.00	0.00
18,600.00	92.00	270.15	7,818.68	-1,532.36	-9,494.66	9,490.61	0.00	0.00	0.00
18,639.37	92.00	270.15	7,817.31	-1,532.25	-9,534.00	9,529.96	0.00	0.00	0.00
LTP at 18639.37 MD									
18,700.00	92.00	270.15	7,815.20	-1,532.09	-9,594.59	9,590.55	0.00	0.00	0.00
18,734.43	92.00	270.15	7,814.00	-1,532.00	-9,629.00	9,624.96	0.00	0.00	0.00
TD at 18734.43									

Legacy Directional Drilling

Planning Report

Database:	EDM_WA	**Local Co-ordinate Reference:**	Well Cardigan Fed Com 134H
Company:	Freedom Energy	**TVD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Project:	Eddy County, NM	**MD Reference:**	3480' GL + 26.5' KB @ 3506.50usft
Site:	Cardigan Fed Com	**North Reference:**	Grid
Well:	Cardigan Fed Com 134H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1		

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
KOP - Cardigan Fed Cor - plan hits target center - Point	0.00	0.00	7,684.50	-1,560.00	844.00	601,733.00	531,219.00	32.65422453	-104.23189837
BHL - Cardigan Fed Cor - plan hits target center - Point	0.00	0.00	7,814.00	-1,532.00	-9,629.00	601,761.00	520,746.00	32.65432439	-104.26592655
LTP - Cardigan Fed Cor - plan misses target center by 0.25usft at 18639.37usft MD (7817.31 TVD, -1532.25 N, -9534.00 E) - Point	0.00	0.00	7,817.31	-1,532.00	-9,534.00	601,761.00	520,841.00	32.65432422	-104.26561788
FTP - Cardigan Fed Cor - plan misses target center by 0.13usft at 8203.26usft MD (7897.21 TVD, -1559.87 N, 794.00 E) - Point	0.00	0.00	7,897.21	-1,560.00	794.00	601,733.00	531,169.00	32.65422466	-104.23206082
FPP1 - Cardigan Fed Cc - plan misses target center by 0.06usft at 16093.82usft MD (7905.95 TVD, -1539.06 N, -6990.00 E) - Point	0.00	0.00	7,905.95	-1,539.00	-6,990.00	601,754.00	523,385.00	32.65430025	-104.25735208

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
26.50	26.50	ALLUVIUM		-2.00	270.15
99.00	99.00	TANSILL		-2.00	270.15
351.00	351.00	YATES		-2.00	270.15
690.00	690.00	SEVEN RIVERS		-2.00	270.15
1,262.00	1,262.00	QUEEN		-2.00	270.15
1,593.00	1,593.00	GRAYBURG		-2.00	270.15
2,093.77	2,093.25	SAN ANDRES		-2.00	270.15
3,322.07	3,268.93	BONE SPRING LIME		-2.00	270.15
5,185.73	5,014.82	1ST BONE SPRING SAND		-2.00	270.15
5,337.18	5,156.70	2ND BONE SPRING CARBONATE		-2.00	270.15
7,108.79	6,819.88	2ND BONE SPRING SAND		-2.00	270.15
7,219.73	6,927.34	3RD BONE SPRING CARBONATE		-2.00	270.15
8,300.23	7,979.06	3RD BONE SPRING SAND		-2.00	270.15

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,800.00	1,800.00	0.00	0.00	Start Nudge Build 2.00
2,823.88	2,802.22	-159.22	86.14	20.48° at 2823.88 MD
6,858.92	6,582.28	-1,400.78	757.86	Start Drop -2.00
7,882.80	7,584.50	-1,560.00	844.00	Vertical at 7882.80 MD
7,982.80	7,684.50	-1,560.00	844.00	KOP Start Build 12.00
8,749.42	8,161.68	-1,558.68	349.91	92° at 8749.42 MD
16,093.82	7,905.95	-1,539.06	-6,990.00	FPP1 at 16093.82 MD
18,639.37	7,817.31	-1,532.25	-9,534.00	LTP at 18639.37 MD
18,734.43	7,814.00	-1,532.00	-9,629.00	TD at 18734.43

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Flat Creek Resources LLC**
LEASE NO.:	**NMNM19597**
LOCATION:	Section 13, T.19 S., R.27 E., NMPM
COUNTY:	Eddy County, New Mexico

WELL NAME & NO.:	**Cardigan Fed Com 132H**
BOTTOM HOLE FOOTAGE	1728'/N & 2642'/E
ATS/API ID:	**ATS-24-2209**
APD ID:	**10400099578**
Sundry ID:	**N/A**

WELL NAME & NO.:	**Cardigan Fed Com 133H**
BOTTOM HOLE FOOTAGE	1885'/S & 2640'/E
ATS/API ID:	**ATS-24-2208**
APD ID:	**10400099639**
Sundry ID:	**N/A**

WELL NAME & NO.:	**Cardigan Fed Com 134H**
BOTTOM HOLE FOOTAGE	385'/S & 2638'/E
ATS/API ID:	**ATS-24-2207**
APD ID:	**10400099648**
Sundry ID:	**N/A**

Approval Date: 12/19/2024

COA

H2S	No		
Potash	None	None	
Cave/Karst Potential	Medium		
Cave/Karst Potential	☐ Critical		
Variance	☐ None	☒ Flex Hose	☐ Other
Wellhead	Conventional and Multibowl		
Other	☐ 4 String	Capitan Reef None	☐ WIPP
Other	Pilot Hole None	☐ Open Annulus	
Cementing	Contingency Squeeze None	Echo-Meter None	Primary Cement Squeeze None
Special Requirements	☐ Water Disposal/Injection	☑ COM	☐ Unit
Special Requirements	☐ Batch Sundry	Waste Prevention Waste MP	
Special Requirements Variance	☐ Break Testing	☐ Offline Cementing	☐ Casing Clearance

Approval Date: 12/19/2024

A. HYDROGEN SULFIDE

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet **43 CFR part 3170 Subpart 3176**, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **400 feet** (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt when present, and below usable fresh water) and cemented to the surface. The surface hole shall be **17 1/2** inch in diameter.

    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 **8 hours** 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.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

    - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

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.

Option 1:

a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.

b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** inch intermediate casing shoe shall be **5000 (5M)** psi.

Option 2:

Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the **13-3/8** inch surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **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 43 CFR 3172.6(b)(9) 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.

- The operator will submit an as-drilled survey well plat of the well completion, but are not limited to, those specified in **43 CFR part 3170 Subpart 3171**
- 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
EMAIL or call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,
BLM_NM_CFO_DrillingNotifications@BLM.GOV
(575) 361-2822

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. In the event the operator has proposed 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. When the operator proposes 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 **43 CFR part 3170 Subpart 3172** 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.

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 of both lead and tail cement, 2) until cement has been in place at least 8 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 **43 CFR part 3170 Subpart 3172** and **API STD 53 Sec. 5.3**.

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 43 CFR 3172.6(b)(9) 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 cement), 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 cement plug. The BOPE test can be initiated after bumping the cement plug with the casing valve open. (only applies to single stage cement jobs, prior to the cement setting up.)

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer and can be initiated immediately with the casing valve open. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to **43 CFR part 3170 Subpart 3172** 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 8 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 **43 CFR part 3170 Subpart 3172**.

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.

Long Vo (LVO) 8/29/2024

Approval Date: 12/19/2024

Hydrogen Sulfide Drilling

Operations Plan

Flat Creek Resources

1 H2S safety instructions to the following:

- Characteristics of H2S
- Physical effects and hazards
- Principal and operation of H2S detectors, warning system and briefing areas
- Evacuation procedures, routes and first aid
- Proper use of safety equipment & life support systems
- Essential personnel meeting medical evaluation criteria will receive additional training on the proper use of 30min pressure demand air packs

2 H2S Detection and Alarm Systems:

- H2S sensor/detectors to be located on the drilling rig floor, in the base of the sub structure / cellar area, on the mud pits in the shale shaker area. Additional H2S detectors may be placed as deemed necessary
- An audio alarm system will be installed on the derrick floor and in the doghouse

3 Windsocks and / Wind Streamers:

- Windsocks at mud pit area should be high enough to be visible
- Windsock on the rig floor and / top of doghouse should be high enough to be visible

4 Condition Flags and Signs:

- Warning sign on access road to location
- Flags to be displayed on sign at entrance to location
    - Green Flag – Normal Safe Operation Condition
    - Yellow Flag – Potential Pressure and Danger
    - Red Flag – Danger (H2S present in dangerous concentrations) Only H2S trained personnel admitted on location

5 Well Control Equipment:

- See Drilling Operations Plan Schematics

6 Communication:

- While working under masks chalkboards will be used for communications
- Hand signals will be used where chalk board is inappropriate
- Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.

7 Drilling Stem Testing:

- No DST cores are planned at this time

8 Drilling contractor supervisor will be required to be familiar with the effects H2S has on tubulars good and other mechanical equipment

9 If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavengers if necessary

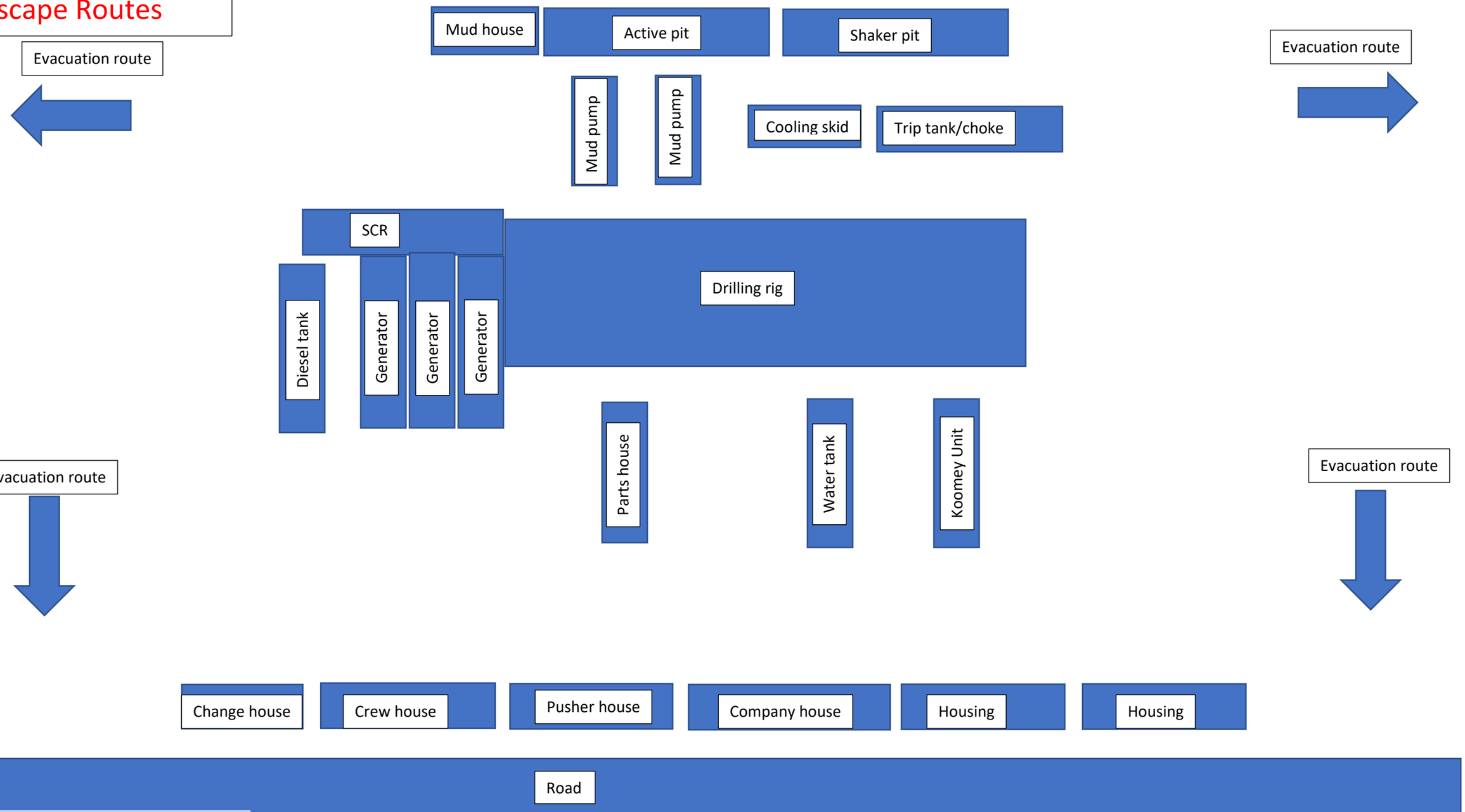
11 Emergency Contacts

Emergency Contacts		
Carlsbad Police Department	575.887.7551	911
Carlsbad Medical Center	575.887.4100	911
Eddy County Fire Service	575.628.5450	911
Eddy County Sherriff	575.887.7551	911
Lea County Fire Service	575.391.2983	911
Lea County Sherriff	575.396.3611	911
Jal Police Department	575.395.2121	911
Jal Fire Department	575.395.2221	911
Flat Creek Resources	817.731.4100	

Wellsite Layout

Escape Routes

Evacuation routes will depend on current wind direction



H2S Radius Map
1 & 2 Mile

18S

18S 28E

19S 27E

19S 28E

20S 27E

Eddy

27	26	25	30	29	
34			31	32	
3	2	1	6	5	
10	11	12	7	8	
15	14	13	18	17	
22	23	24	19	20	
27	26	25	30	29	
34	35	36			
2		1			

Cardigan Fed Com 132H SHL

Cardigan Pad

Township

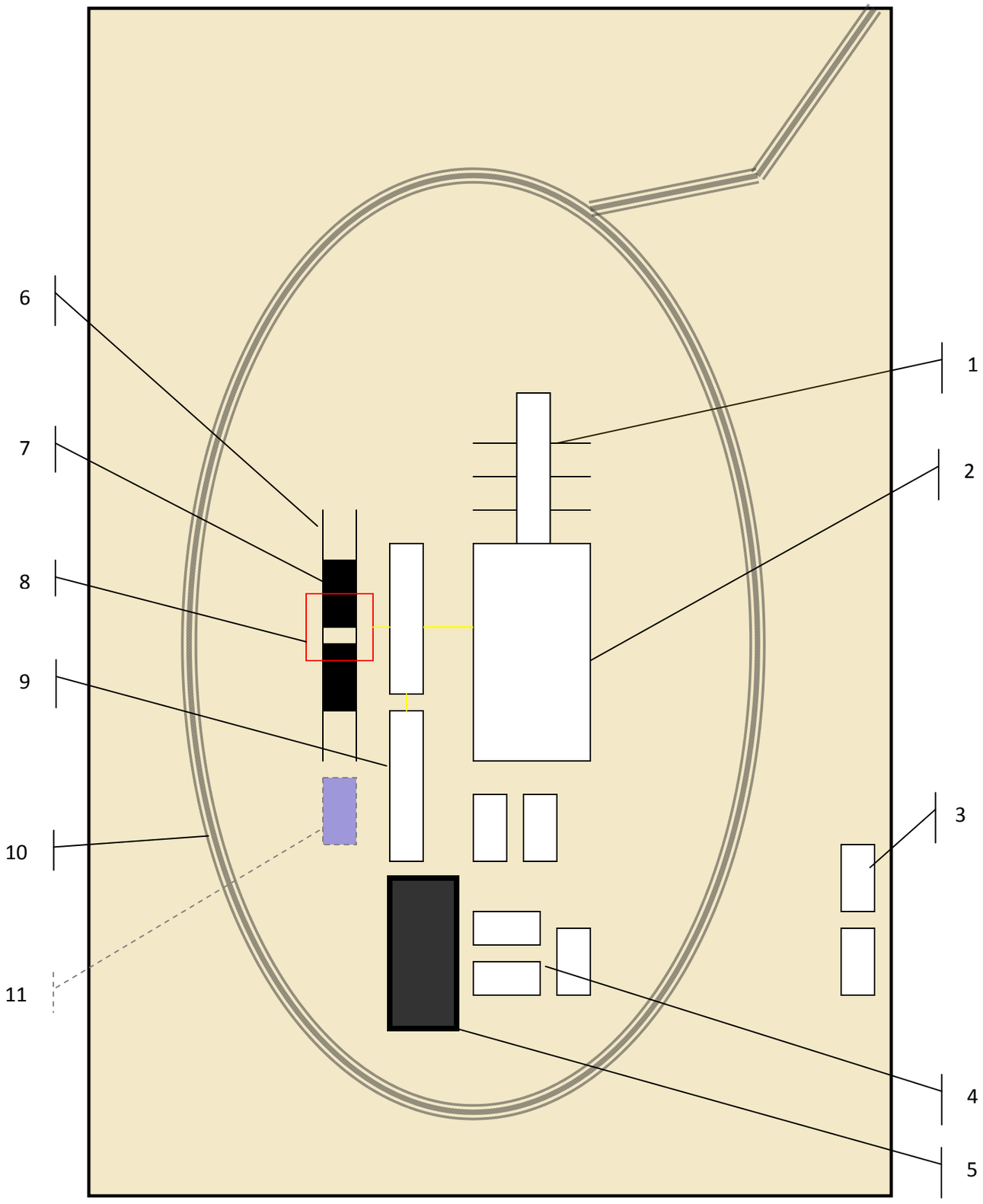
Section

Buffers

1 mile

2 mile

FLAT CREEK RESOURCES



Schematic Closed Loop Drilling Rig*

1. **Pipe Rack**
2. **Drill Rig**
3. **House Trailers/ Offices**
4. **Generator/Fuel/Storage**
5. **Overflow-Frac Tank**
6. **Skids**
7. **Roll Offs**
8. **Hopper or Centrifuge**
9. **Mud Tanks**
10. **Loop Drive**
11. **Generator (only for use with centrifuge)**

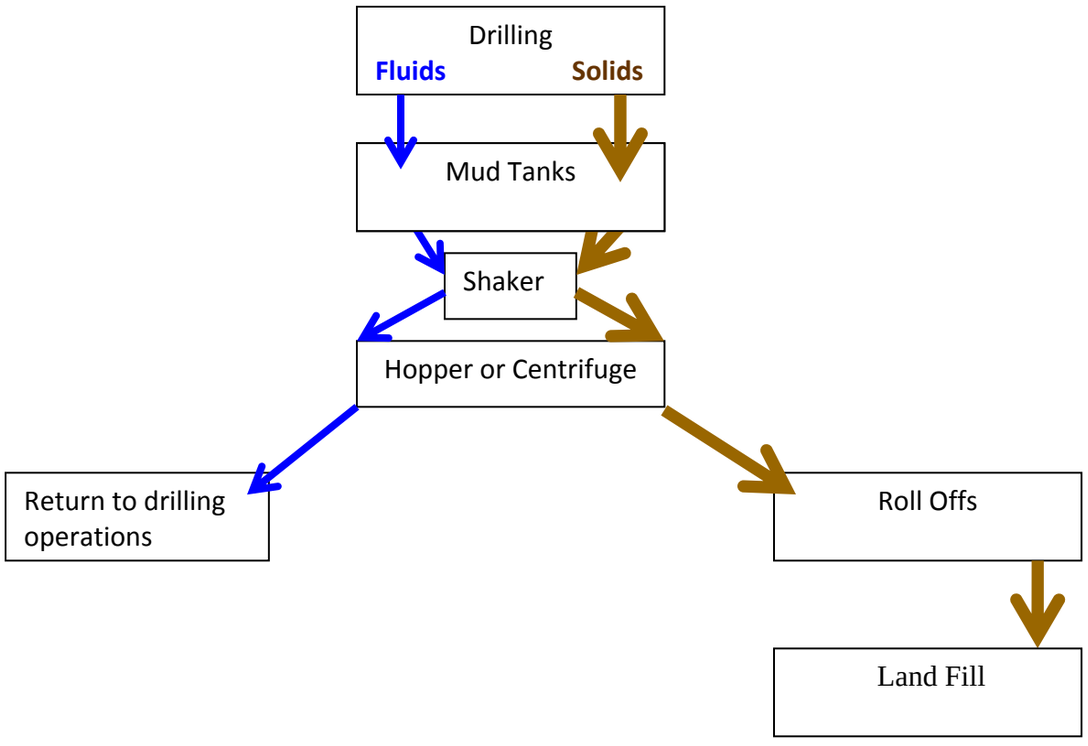
***Not drawn to scale: Closed loop system requires at least 30 feet beyond mud tanks. Ideally 60 feet would be available**

Above: Centrifugal Closed Loop System

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

Closed Loop Drilling System: Mud tanks to right (1)
Hopper in air to settle out solids (2)
Water return pipe (3)
Shaker between hopper and mud tanks (4)
Roll offs on skids (5)

Flow Chart for Drilling Fluids and Solids



Photos Courtesy of Gandy Corporation Oil Field Service

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
https://www.emnrd.nm.gov/ocd/contact-us

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

CONDITIONS

Operator: Flat Creek Resources, LLC 777 Main St. Fort Worth, TX 76102	OGRID: 374034
	Action Number: 414529
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
bwood	Cement is required to circulate on both surface and intermediate1 strings of casing.	12/22/2024
bwood	If cement does not circulate on any string, a Cement Bond Log (CBL) is required for that string of casing.	12/22/2024
ward.rikala	Notify the OCD 24 hours prior to casing & cement.	1/17/2025
ward.rikala	File As Drilled C-102 and a directional Survey with C-104 completion packet.	1/17/2025
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.	1/17/2025
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.	1/17/2025