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.
[333740]

2. Name of Operator
[240974]

9. API Well No. **30-025-51000**

3a. Address

3b. Phone No. *(include area code)*

10. Field and Pool, or Exploratory **[27230]**

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.

NGMP Rec 01/25/2023

KZ
01/27/2023

SL

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 10/06/2022

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
30-025-51000	27230	Gem; Bone Spring, East

4 Property Code	5 Property Name	6 Well Number
333740	SAPPHIRE FEDERAL Com	502H

7 OGRID No.	8 Operator Name	9 Elevation
240974	LEGACY RESERVES OPERATING	3690.4'

10 Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	14	19S	33E		265	NORTH	1310	WEST	LEA

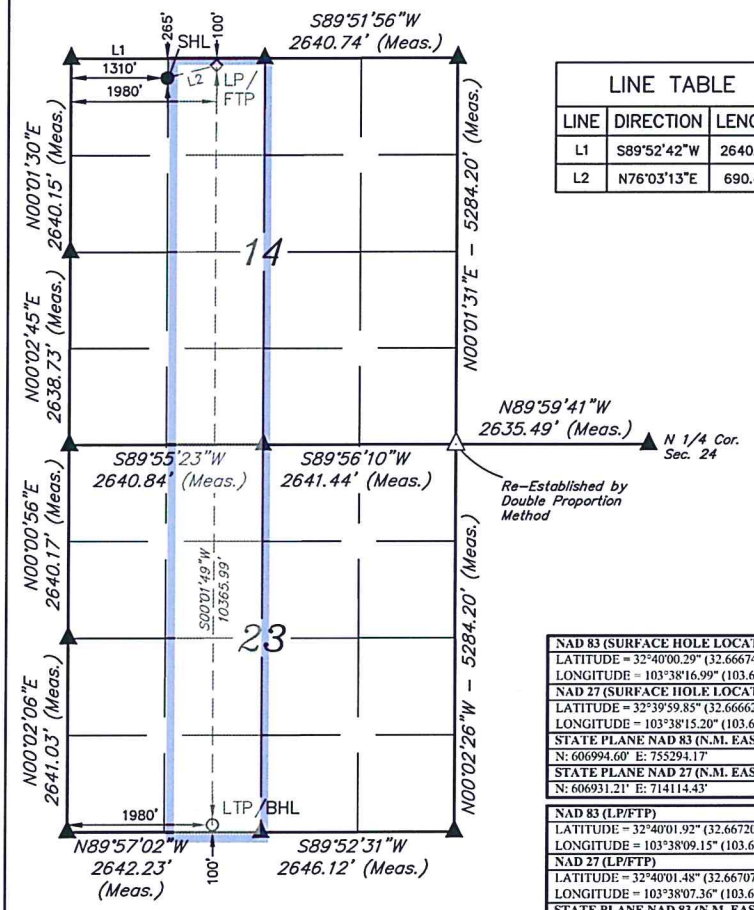
11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	23	19S	33E		100	SOUTH	1980	WEST	LEA

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.

16



LINE TABLE		
LINE	DIRECTION	LENGTH
L1	S89°52'42"W	2640.63'
L2	N76°03'13"E	690.43'

● = SURFACE HOLE LOCATION
◇ = FIRST TAKE POINT
O = LAST TAKE POINT/ BOTTOM HOLE LOCATION
▲ = SECTION CORNER LOCATED
△ = SECTION CORNER RE-ESTABLISHED. (Not Set on Ground.)

NAD 83 (SURFACE HOLE LOCATION)
LATITUDE = 32°40'00.29" (32.666748°)
LONGITUDE = 103°38'16.99" (103.638053°)
NAD 27 (SURFACE HOLE LOCATION)
LATITUDE = 32°39'59.85" (32.666625°)
LONGITUDE = 103°38'15.20" (103.637556°)
STATE PLANE NAD 83 (N.M. EAST)
N: 606994.60' E: 755294.17'
STATE PLANE NAD 27 (N.M. EAST)
N: 606931.21' E: 714114.43'

NAD 83 (LP/FTP)
LATITUDE = 32°40'01.92" (32.667201°)
LONGITUDE = 103°38'09.15" (103.635874°)
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LATITUDE = 32°40'01.48" (32.667078°)
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STATE PLANE NAD 83 (N.M. EAST)
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STATE PLANE NAD 27 (N.M. EAST)
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LATITUDE = 32°38'19.37" (32.638714°)
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LONGITUDE = 103°38'07.71" (103.635475°)
STATE PLANE NAD 83 (N.M. EAST)
N: 596799.73' E: 756001.85'
STATE PLANE NAD 27 (N.M. EAST)
N: 596736.62' E: 714821.81'

2000' 1000' 0' 2000'
SCALE
DRAWN BY: S.T.O. 09-20-21
REV: 1 S.T.O. 09-24-21 (SHL MOVE)

NOTE:
- Distances referenced on plat to section lines are perpendicular.
- Basis of Bearings is a Transverse Mercator Projection with a Central Meridian of W103°53'00" (NAD 83)

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 10/12/2021 Date

Terri Stathem
Printed Name

tstathem@legacyreserves.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.

September 15, 2021
Date of Survey

Signature and Seal of Professional Surveyor:

PAUL BUCHELE
NEW MEXICO
23782
09-24-21
PROFESSIONAL SURVEYOR

Certificate Number:

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
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811 S. First St., Artesia, NM 88210
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LEASE PLAT

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[4] Property Code	[5] Property Name	[6] Well Number
	SAPPHIRE FEDERAL Com	502H

[7] OGRID No.	[8] Operator Name	[9] Elevation
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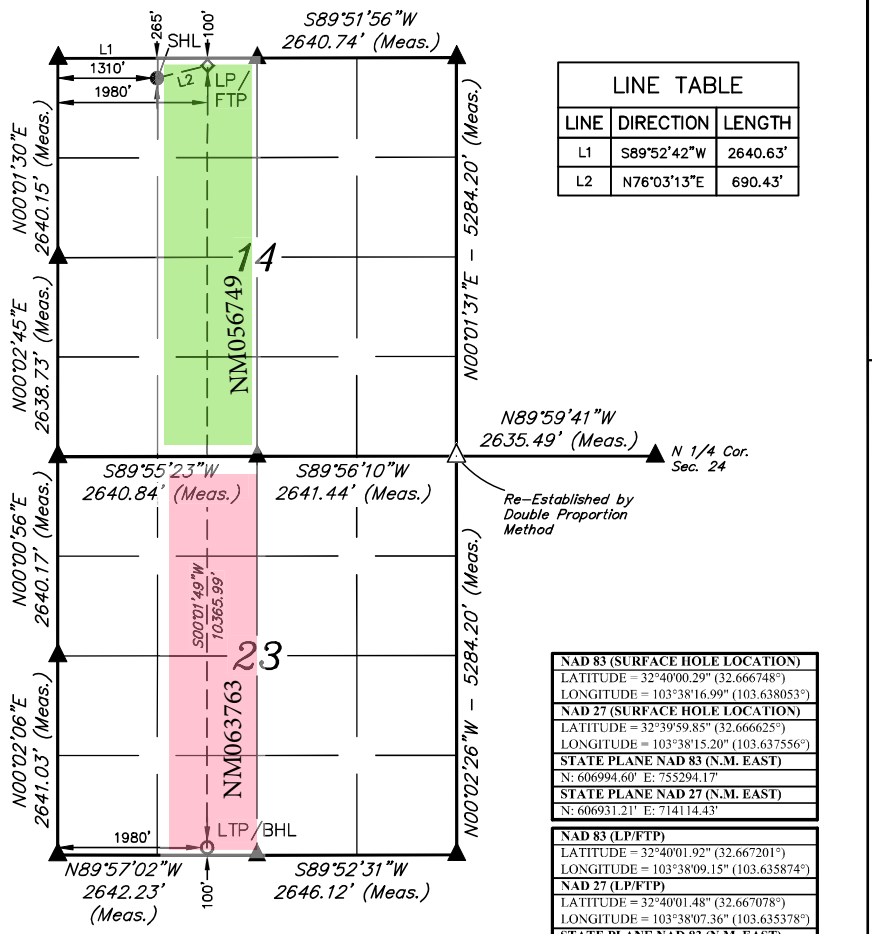

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Signature Date

Printed Name

E-mail Address

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September 15, 2021
Date of Survey
Signature and Seal of Professional Surveyor:

Certificate Number:

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: _Legacy Reserves Operating LP_____ **OGRID:** _____240974_____ **Date:** _11_/_30_/_2021_

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
Sapphire Fed Com 502H	N/A	D 14 19S 33E	265 FNL 1310 FWL	500	1000	600
	30-025-51000					

IV. Central Delivery Point Name: _____ [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
Sapphire Fed Com 502H	N/A	10/17/2023	12/1/2023	3/17/2024	5/27/2024	6/3/2024
	30-025-51000					

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:
Printed Name: Terri Stathem
Title: Regulatory
E-mail Address: tstathem@legacyreserves.com
Date: 11/30/2021
Phone: 432-221-6332

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

Legacy Reserves Operating LP Natural Gas

Management Plan Attachment

VI. Separation Equipment

How Operator will size separation equipment to optimize gas capture:

All Legacy Reserves production facility equipment will be sized per industry standards (API 12J) with adequate retention time to effectively separate all phases of production. Each project will take into consideration the number of wells and type curves for each formation pool to ensure adequate facility capacity. Design considerations will also include review of all piping, tanks, VRU's and associated equipment to ensure optimized gas capture minimized risk of release.

VII. Operational Practices

Actions Operator will take to comply with the requirements below:

B. Drilling Operations

- During drilling, flare stacks will be located a minimum of 100 feet from the nearest surface hole location. All gas is captured or combusted. If an emergency or malfunction occurs, gas will be flared or vented for public health, safety, and the environment and be properly reported to the NMOCD pursuant to 19.15.27.8.G.
- Measure or estimate the volume of natural gas that is vented, flared or beneficially used during drilling, completion and production operations, regardless of the reason or authorization for such venting or flaring.

C. Completion Operations

- During completion operations, operator does not produce oil or gas but maintains adequate well control through completion operations.
- Individual well test separators will be set to properly separate gas and liquids. A temporary test separator will be utilized initially to process volumes. In addition, separators will be tied into flow back tanks which will be tied into the gas processing equipment for sales down a pipeline.

D. Venting and Flaring during Production Operations

- During each phase of well life (drilling, completion and production) of a Legacy Reserves well, Legacy personnel will follow all necessary procedures to ensure both the operation and the equipment are within the NMAC 19.15.27.8 Subsection D guidelines.
- During well operations that require unloading of the well to atmospheric pressure, all reasonable actions will be taken to minimize vented gas
- Through the life of the well all flaring shall be measured, and venting events quantified using the data available and industry best practice.

E. Performance Standards for Separation, Storage Tank and Flare Equipment

- All storage tanks and separation equipment are designed to minimize risk of liquid or vapor release and optimize gas capture. This includes automation for automatic gauging and pressure monitoring.
- All flare stacks are equipped with auto ignition devices and/or continuous pilots and are designed to operate at maximum combustion efficiency pursuant NMAC 19.15.27.8 Subsection E. Flares will follow Legacy spacing guidelines to ensure they are a safe distance from combustibles and operations equipment.
- Legacy personnel will conduct routine AVO inspections on a regular basis per NMAC 19.15.27.8 Subsection E guidelines.

F. Measurement of Vented and Flared Natural Gas

- Measurement equipment will be installed to quantify gas flared during drilling, completion and production of the well.
- All measurement devices installed will meet accuracy ratings per AGA and API standards.
- Measurement devices will be installed without manifolds that allow diversion of gas around the metering element, except for the sole purpose of inspection of servicing the measurement device.

VIII. Best Management Practices

- Operator will curtail or shut in production, within reasonable limits, during upset conditions to minimize venting and flaring.
- When feasible, Operator will use equipment to capture gas that would otherwise be vented or flared.
- During completions and production operations, Operator will minimize blowdowns to atmosphere.
- When feasible, Operator will use electric or air actuated equipment to reduce bleed emissions.

AFMSS

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

Drilling Plan Data Report
10/12/2022

APD ID: 10400082026 **Submission Date:** 12/09/2021

Operator Name: LEGACY RESERVES OPERATING LP

Well Name: SAPPHIRE FEDERAL COM **Well Number:** 502H

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
7862485	RUSTLER	3690	1420	1420	LIMESTONE, MARL, SANDSTONE	USEABLE WATER	N
7862487	BASE OF SALT	554	3136	3136	SALT	NONE	N
7862481	YATES	407	3283	3283	DOLOMITE, SANDSTONE	NONE	N
7862480	QUEEN	-588	4278	4278	SANDSTONE	NONE	N
7862482	DELAWARE	-2331	6021	6021	SANDSTONE	NONE	N
7862483	BONE SPRINGS	-4231	7921	7921	LIMESTONE, SANDSTONE	NATURAL GAS, OIL	N
7862484	BONE SPRING 1ST	-5461	9151	9151	LIMESTONE, SANDSTONE	NATURAL GAS, OIL	N
7862488	BONE SPRING 2ND	-5766	9456	9456	LIMESTONE, SANDSTONE	NATURAL GAS, OIL	N
7862489	BONE SPRING 3RD	-6561	10251	10251	LIMESTONE, SANDSTONE	NATURAL GAS, OIL	N

Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M **Rating Depth:** 11000

Equipment: A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.
Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only. Legacy requests a 5M annular variance for the 10M BOP system. See attached procedure

Testing Procedure: BOPs will be tested by an independent service company. The ram preventers, choke manifold, and safety valves will be tested as follows: Prior to drilling out the surface casing, BOPE pressure tests will be 250 psi low and 5000 psi high. Prior to drilling out the intermediate casing, BOPE pressure tests will be 250 psi low and 10,000 psi high. The Annular Preventer will be tested to 250 psi low and 2500 psi high

Operator Name: LEGACY RESERVES OPERATING LP

Well Name: SAPPHIRE FEDERAL COM **Well Number:** 502H

prior to drilling out the surface casing, 250 psi low and 5000 psi high prior to drilling out the production casing. The System may be upgraded to a higher pressure but still tested to the working pressures listed. If the system is upgraded all the components installed will be functional and tested

Choke Diagram Attachment:

Sapphire_Fed_Com_502H_Choke_Manifold_20211202071035.pdf

BOP Diagram Attachment:

Sapphire_Fed_Com_502H_BOP_20211202071041.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	1500	0	1500	3690	2190	1500	J-55	54.5	ST&C	1.42	3.86	DRY	4.3	DRY	4.3
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	6083	0	6070	3690	-2380	6083	J-55	40	LT&C	1.25	1.27	DRY	1.94	DRY	1.94
3	PRODUCTION	8.75	5.5	NEW	API	N	0	20241	0	10045	3690	-6355	20241	P-110	20	BUTT	2.27	1.28	DRY	1.76	DRY	1.76

Casing Attachments

Casing ID: 1 **String** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Sapphire_Fed_Com_502H_Csg_Assumptions_20211202071856.pdf

Operator Name: LEGACY RESERVES OPERATING LP

Well Name: SAPPHIRE FEDERAL COM **Well Number:** 502H

Casing Attachments

Casing ID: 2 **String** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Sapphire_Fed_Com_502H_Csg_Assumptions_20211202071841.pdf

Casing ID: 3 **String** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Sapphire_Fed_Com_502H_Csg_Assumptions_20211202071744.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	1500	970	1.72	13.5	1670	100	Class C Cement	CLASS C + BENTONITE
SURFACE	Tail		1550	1500	260	1.32	14.8	264	100	Class C Neat	CLASS C
INTERMEDIATE	Lead		0	6083	2115	1.94	12.6	4100	180	CLASS C	35:65 POZ C
INTERMEDIATE	Tail		0	6083	380	1.18	15.6	450	140	CLASS H NEAT	none
PRODUCTION	Lead		0	20241	1300	1.62	11.9	2100	80	CLASS H	POZ 50:50

Operator Name: LEGACY RESERVES OPERATING LP

Well Name: SAPPHIRE FEDERAL COM **Well Number:** 502H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Tail		0	20241	2650	1.34	14.2	3540	30	CLASS H	POZ 50:50

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 will be kept on location at all times in order to combat lost circulation or unexpected kicks. An electronic PVT system will be rigged up prior to spudding this well. A volume monitoring system that measures, calculates, and displays readings from the mud system on the rig to alert the crew of impending gas kicks and lost circulation. **In order to effectively run open hole logs and casing, the mud viscosity and fluid loss properties may be adjusted.

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

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
6083	20235	OTHER : Fresh Water / CUT Brine Water	8.8	9.3							
1600	6083	OTHER : Brine water	9.8	10.3							
0	1600	SPUD MUD	8.4	8.6							

Operator Name: LEGACY RESERVES OPERATING LP

Well Name: SAPPHIRE FEDERAL COM **Well Number:** 502H

Section 6 - Test, Logging, Coring

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

No DST planned

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

MUD LOG/GEOLOGIC LITHOLOGY LOG,GAMMA RAY LOG,DIRECTIONAL SURVEY,

Coring operation description for the well:

NA

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 4420 **Anticipated Surface Pressure:** 2210

Anticipated Bottom Hole Temperature(F): 170

Anticipated abnormal pressures, temperatures, or potential geologic hazards? YES

Describe:

Lost circulation may be encountered in the Delaware mountain group.

Contingency Plans geoharzards description:

Lost circulation material will be available, as well as additional drilling fluid along with the fluid volume in the drilling rig pit system. Drilling fluid can be mixed on location or mixed in vendor mud plant and trucked to location if needed.

Contingency Plans geohazards

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations

Sapphire_Fed_Com_502_H_H2S_Plan_20211202072331.pdf

Sapphire_Fed_Com_502H_Rig_Layout_Diagram_20211202072341.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Sapphire_Fed_Com_502H_Dir_Plan_20211202072406.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Sapphire_Fed_Com_502H_Rig_Layout_Diagram_20211202072418.pdf

Sapphire_Fed_Com_502H_Well_Control_Plan_20211202072444.pdf

Sapphire_Fed_Com_502H_NGMP_20211202072453.pdf

Sapphire_Fed_Com_Water_Source___Construction_Material_Map_20211202072521.pdf

Sapphire_Fed_Com_502H_Multibowl_WH_20211202072543.pdf

Sapphire_Fed_Com_H2S_Plan_20211209072904.pdf

Operator Name: LEGACY RESERVES OPERATING LP

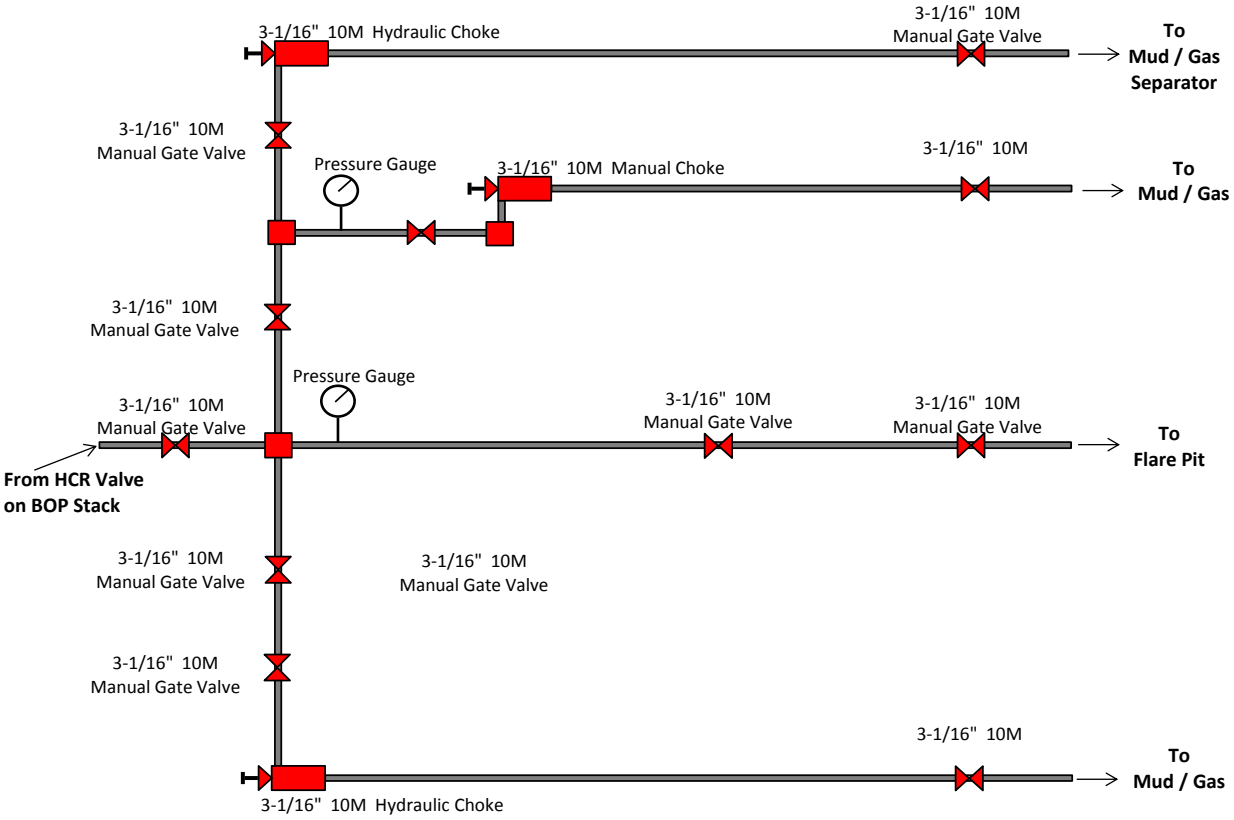
Well Name: SAPPHIRE FEDERAL COM **Well Number:** 502H

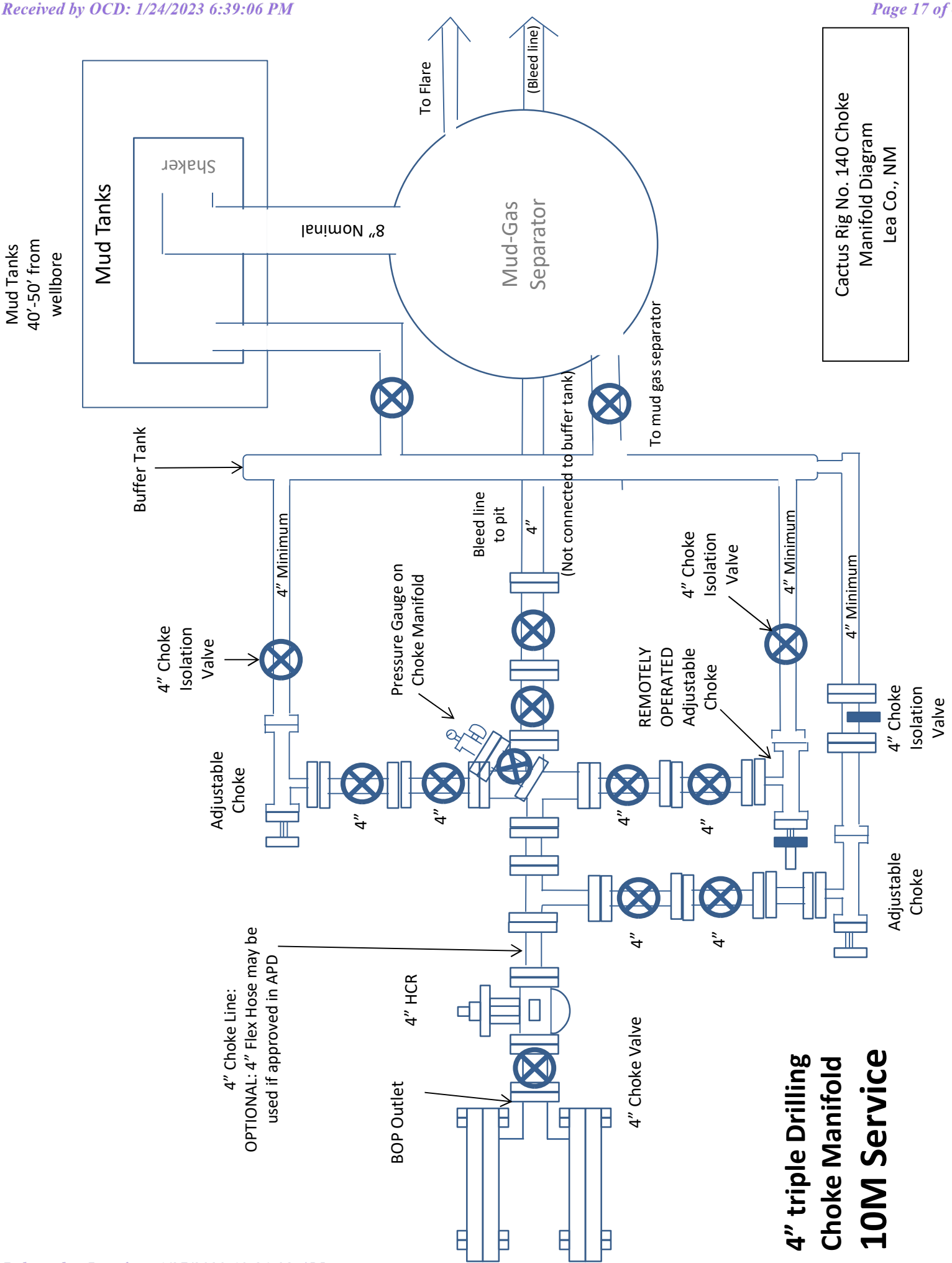
Sapphire_Fed_Com_502H_Drilling_Plan_080322_20220803104152.pdf

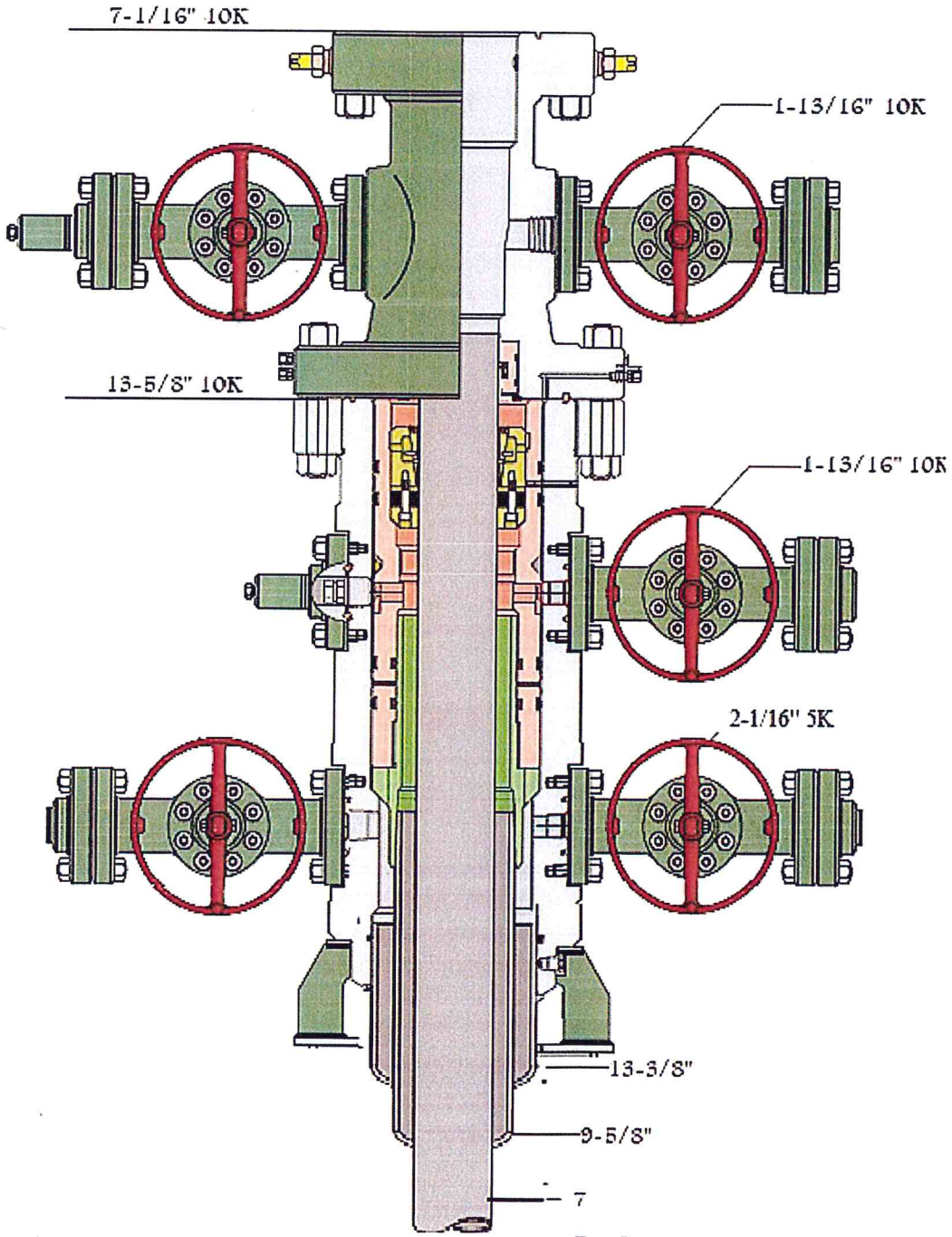
Other Variance attachment:

Sapphire_Fed_Com_Flex_Hose_Test_20211202072554.pdf

Choke Manifold (10M)




Mud Tanks
40'-50' from wellbore
Mud Tanks
Shaker
8" Nominal
Mud-Gas Separator
To Flare
(Bleed line)
Cactus Rig No. 140 Choke Manifold Diagram Lea Co., NM
To mud gas separator
Buffer Tank
(Not connected to buffer tank)
4" Minimum
4" Choke Isolation Valve
Pressure Gauge on Choke Manifold
Bleed line to pit
4"
4" Choke Isolation Valve
4" Minimum
4" Minimum
REMOTELY OPERATED Adjustable Choke
4" Choke Isolation Valve
Adjustable Choke
Adjustable Choke
4"
4"
4"
4"
4"
4"
4" Choke Line:
OPTIONAL: 4" Flex Hose may be used if approved in APD
4" HCR
4" Choke Valve
BOP Outlet
4" triple Drilling Choke Manifold
10M Service

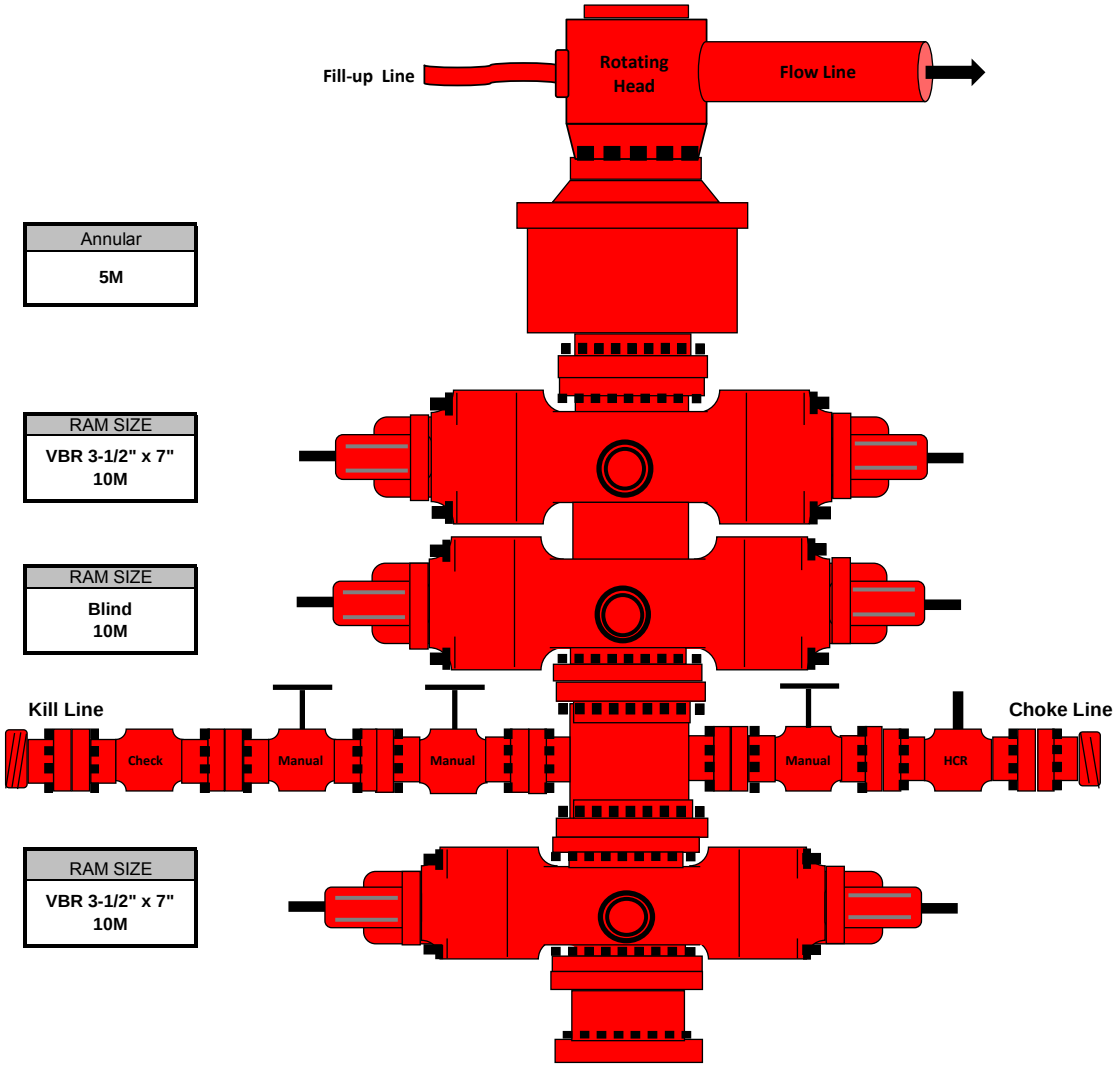


LEGACY RESERVES
Matt Dickson
Well: Lea Unit 65h

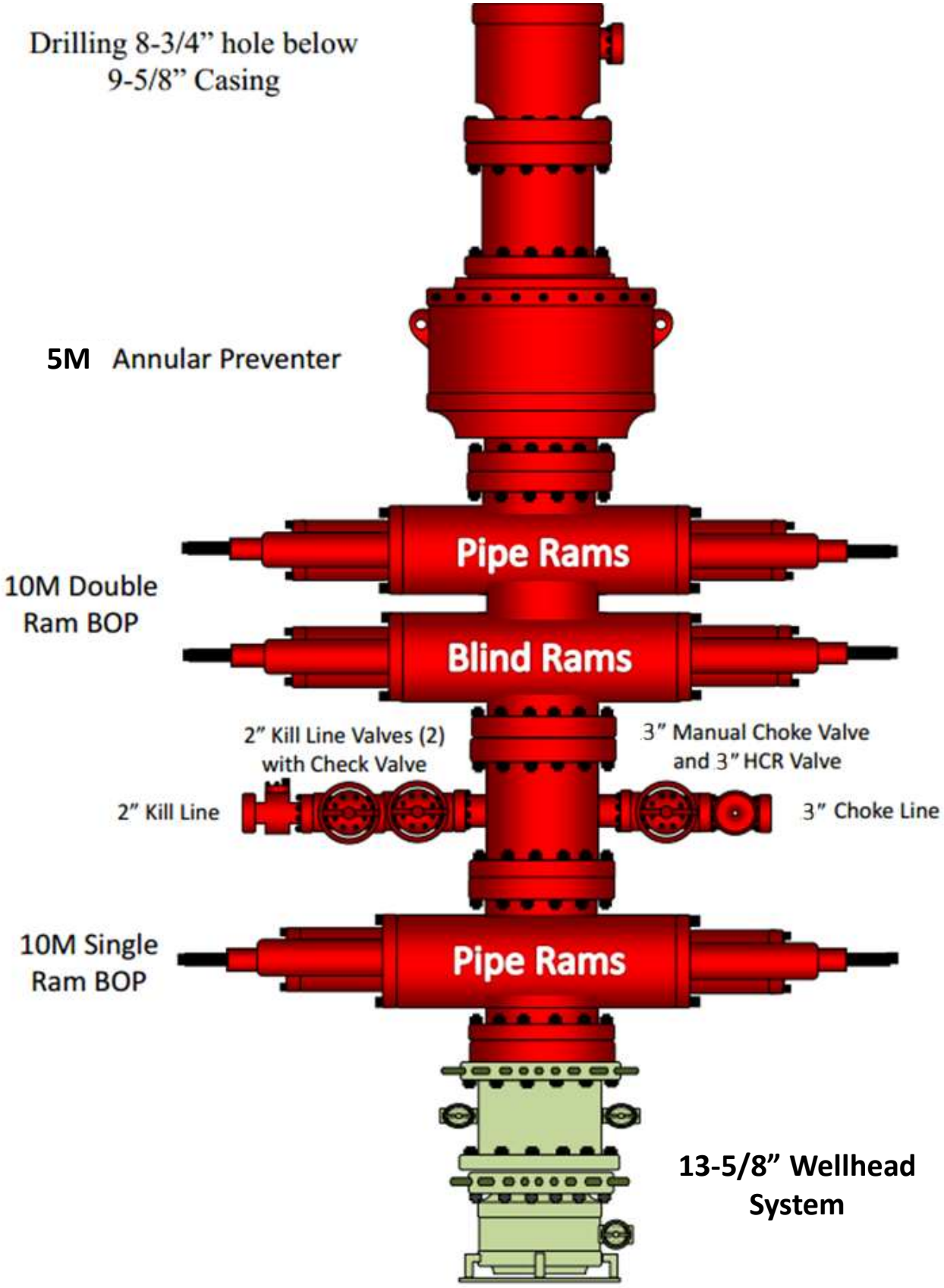
CAMERON
A Schlumberger Company

			#	1598854

13-5/8" BOP Stack (10M)



13-5/8” 10M/5M BOP



Casing Assumptions: Emerald 502H

2. Casing Program

Hole Size	Casing Top Depth	Casing Set Depth	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17-1/2”	0	1500	1500	13-3/8"	54.50	J-55	STC	1.42	3.86	4.3
12-¼”	0	6080	5921	9-5/8"	40.00	J-55	LTC	1.25	1.27	1.94
8-¾”	0	19904	9700	5-1/2"	20.00	P-110	BTC	2.27	1.28	1.76
							BLM Minimum Safety Factor	1.125	1.0	1.6 dry 1.8 wet

TVD was used on all calculations.

LEGACY RESOURCES OPERATING

Lea County, NM (NAD83) NMEZ Grid
Sapphire Federal Com
502H

Lateral

Plan: Plan #1

Standard Planning Report

04 November, 2021

Planning Report

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 502H
Company:	LEGACY RESOURCES OPERATING	**TVD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Project:	Lea County, NM (NAD83) NMEZ Grid	**MD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Site:	Sapphire Federal Com	**North Reference:**	Grid
Well:	502H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Project Lea County, NM (NAD83) NMEZ Grid

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Sapphire Federal Com

Site Position:		**Northing:**	650,845.49 ft	**Latitude:**	32.7829639
From:	Map	**Easting:**	925,546.97 ft	**Longitude:**	-103.0832073
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.20 in	**Grid Convergence:**	0.68 °

Well 502H

Well Position	**+N/-S**	-43,850.89 ft	**Northing:**	606,994.60 ft	**Latitude:**	32.6667445
	+E/-W	-170,252.81 ft	**Easting:**	755,294.17 ft	**Longitude:**	-103.6380576
Position Uncertainty		0.00 ft	**Wellhead Elevation:**		**Ground Level:**	3,690.40 ft

Wellbore Lateral

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	10/19/21	6.57	60.28	47,710.74741369

Design Plan #1

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	179.79

Plan Survey Tool Program **Date** 11/04/21

	Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	20,240.98	Plan #1 (Lateral)		

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,866.43	5.50	70.92	2,865.86	5.74	16.60	1.50	1.50	0.00	70.92	
9,487.73	5.50	70.92	9,456.73	213.05	615.97	0.00	0.00	0.00	0.00	
10,405.48	90.00	179.79	10,045.00	-359.44	671.63	10.00	9.21	11.86	108.79	
20,240.98	90.00	179.79	10,045.00	-10,194.87	707.68	0.00	0.00	0.00	0.00	SF Com 502H LTP/BH

Planning Report

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 502H
Company:	LEGACY RESOURCES OPERATING	**TVD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Project:	Lea County, NM (NAD83) NMEZ Grid	**MD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Site:	Sapphire Federal Com	**North Reference:**	Grid
Well:	502H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF Com 502H SHL_265FNL_1310FWL SEC14									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	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
1,300.00	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
1,420.00	0.00	0.00	1,420.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
13 3/8"									
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
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	1.50	70.92	2,599.99	0.43	1.24	-0.42	1.50	1.50	0.00
2,700.00	3.00	70.92	2,699.91	1.71	4.95	-1.69	1.50	1.50	0.00
2,800.00	4.50	70.92	2,799.69	3.85	11.13	-3.81	1.50	1.50	0.00
2,866.43	5.50	70.92	2,865.86	5.74	16.60	-5.68	1.50	1.50	0.00
2,900.00	5.50	70.92	2,899.28	6.79	19.64	-6.72	0.00	0.00	0.00
3,000.00	5.50	70.92	2,998.82	9.92	28.69	-9.82	0.00	0.00	0.00
3,100.00	5.50	70.92	3,098.36	13.05	37.74	-12.92	0.00	0.00	0.00
3,137.81	5.50	70.92	3,136.00	14.24	41.16	-14.09	0.00	0.00	0.00
Base of Salt									
3,200.00	5.50	70.92	3,197.90	16.18	46.79	-16.01	0.00	0.00	0.00
3,285.49	5.50	70.92	3,283.00	18.86	54.53	-18.66	0.00	0.00	0.00
Yates									
3,300.00	5.50	70.92	3,297.44	19.32	55.85	-19.11	0.00	0.00	0.00
3,400.00	5.50	70.92	3,396.99	22.45	64.90	-22.21	0.00	0.00	0.00
3,500.00	5.50	70.92	3,496.53	25.58	73.95	-25.31	0.00	0.00	0.00
3,600.00	5.50	70.92	3,596.07	28.71	83.00	-28.40	0.00	0.00	0.00
3,700.00	5.50	70.92	3,695.61	31.84	92.05	-31.50	0.00	0.00	0.00
3,800.00	5.50	70.92	3,795.15	34.97	101.11	-34.60	0.00	0.00	0.00
3,900.00	5.50	70.92	3,894.69	38.10	110.16	-37.70	0.00	0.00	0.00
4,000.00	5.50	70.92	3,994.23	41.23	119.21	-40.79	0.00	0.00	0.00
4,100.00	5.50	70.92	4,093.77	44.36	128.26	-43.89	0.00	0.00	0.00
4,200.00	5.50	70.92	4,193.31	47.49	137.31	-46.99	0.00	0.00	0.00
4,285.08	5.50	70.92	4,278.00	50.16	145.02	-49.63	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 502H
Company:	LEGACY RESOURCES OPERATING	**TVD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Project:	Lea County, NM (NAD83) NMEZ Grid	**MD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Site:	Sapphire Federal Com	**North Reference:**	Grid
Well:	502H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
Queen									
4,300.00	5.50	70.92	4,292.85	50.62	146.37	-50.09	0.00	0.00	0.00
4,400.00	5.50	70.92	4,392.39	53.76	155.42	-53.19	0.00	0.00	0.00
4,500.00	5.50	70.92	4,491.93	56.89	164.47	-56.28	0.00	0.00	0.00
4,600.00	5.50	70.92	4,591.47	60.02	173.52	-59.38	0.00	0.00	0.00
4,700.00	5.50	70.92	4,691.01	63.15	182.58	-62.48	0.00	0.00	0.00
4,800.00	5.50	70.92	4,790.55	66.28	191.63	-65.58	0.00	0.00	0.00
4,900.00	5.50	70.92	4,890.09	69.41	200.68	-68.67	0.00	0.00	0.00
5,000.00	5.50	70.92	4,989.63	72.54	209.73	-71.77	0.00	0.00	0.00
5,100.00	5.50	70.92	5,089.17	75.67	218.78	-74.87	0.00	0.00	0.00
5,200.00	5.50	70.92	5,188.71	78.80	227.84	-77.97	0.00	0.00	0.00
5,300.00	5.50	70.92	5,288.25	81.93	236.89	-81.06	0.00	0.00	0.00
5,400.00	5.50	70.92	5,387.79	85.06	245.94	-84.16	0.00	0.00	0.00
5,500.00	5.50	70.92	5,487.33	88.19	254.99	-87.26	0.00	0.00	0.00
5,600.00	5.50	70.92	5,586.87	91.33	264.04	-90.36	0.00	0.00	0.00
5,700.00	5.50	70.92	5,686.41	94.46	273.10	-93.46	0.00	0.00	0.00
5,800.00	5.50	70.92	5,785.95	97.59	282.15	-96.55	0.00	0.00	0.00
5,900.00	5.50	70.92	5,885.49	100.72	291.20	-99.65	0.00	0.00	0.00
6,000.00	5.50	70.92	5,985.03	103.85	300.25	-102.75	0.00	0.00	0.00
6,036.14	5.50	70.92	6,021.00	104.98	303.52	-103.87	0.00	0.00	0.00
Delaware									
6,085.36	5.50	70.92	6,070.00	106.52	307.98	-105.39	0.00	0.00	0.00
9 5/8"									
6,100.00	5.50	70.92	6,084.57	106.98	309.31	-105.85	0.00	0.00	0.00
6,200.00	5.50	70.92	6,184.11	110.11	318.36	-108.94	0.00	0.00	0.00
6,300.00	5.50	70.92	6,283.65	113.24	327.41	-112.04	0.00	0.00	0.00
6,400.00	5.50	70.92	6,383.19	116.37	336.46	-115.14	0.00	0.00	0.00
6,500.00	5.50	70.92	6,482.73	119.50	345.51	-118.24	0.00	0.00	0.00
6,600.00	5.50	70.92	6,582.27	122.63	354.57	-121.33	0.00	0.00	0.00
6,700.00	5.50	70.92	6,681.81	125.77	363.62	-124.43	0.00	0.00	0.00
6,800.00	5.50	70.92	6,781.35	128.90	372.67	-127.53	0.00	0.00	0.00
6,900.00	5.50	70.92	6,880.89	132.03	381.72	-130.63	0.00	0.00	0.00
7,000.00	5.50	70.92	6,980.43	135.16	390.77	-133.73	0.00	0.00	0.00
7,100.00	5.50	70.92	7,079.97	138.29	399.83	-136.82	0.00	0.00	0.00
7,200.00	5.50	70.92	7,179.51	141.42	408.88	-139.92	0.00	0.00	0.00
7,300.00	5.50	70.92	7,279.05	144.55	417.93	-143.02	0.00	0.00	0.00
7,400.00	5.50	70.92	7,378.59	147.68	426.98	-146.12	0.00	0.00	0.00
7,500.00	5.50	70.92	7,478.13	150.81	436.04	-149.21	0.00	0.00	0.00
7,600.00	5.50	70.92	7,577.67	153.94	445.09	-152.31	0.00	0.00	0.00
7,700.00	5.50	70.92	7,677.21	157.07	454.14	-155.41	0.00	0.00	0.00
7,800.00	5.50	70.92	7,776.76	160.21	463.19	-158.51	0.00	0.00	0.00
7,900.00	5.50	70.92	7,876.30	163.34	472.24	-161.60	0.00	0.00	0.00
7,944.91	5.50	70.92	7,921.00	164.74	476.31	-163.00	0.00	0.00	0.00
Bone Spring									
8,000.00	5.50	70.92	7,975.84	166.47	481.30	-164.70	0.00	0.00	0.00
8,100.00	5.50	70.92	8,075.38	169.60	490.35	-167.80	0.00	0.00	0.00
8,200.00	5.50	70.92	8,174.92	172.73	499.40	-170.90	0.00	0.00	0.00
8,300.00	5.50	70.92	8,274.46	175.86	508.45	-174.00	0.00	0.00	0.00
8,400.00	5.50	70.92	8,374.00	178.99	517.50	-177.09	0.00	0.00	0.00
8,500.00	5.50	70.92	8,473.54	182.12	526.56	-180.19	0.00	0.00	0.00
8,600.00	5.50	70.92	8,573.08	185.25	535.61	-183.29	0.00	0.00	0.00
8,700.00	5.50	70.92	8,672.62	188.38	544.66	-186.39	0.00	0.00	0.00
8,800.00	5.50	70.92	8,772.16	191.51	553.71	-189.48	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 502H
Company:	LEGACY RESOURCES OPERATING	**TVD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Project:	Lea County, NM (NAD83) NMEZ Grid	**MD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Site:	Sapphire Federal Com	**North Reference:**	Grid
Well:	502H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,900.00	5.50	70.92	8,871.70	194.65	562.77	-192.58	0.00	0.00	0.00
9,000.00	5.50	70.92	8,971.24	197.78	571.82	-195.68	0.00	0.00	0.00
9,100.00	5.50	70.92	9,070.78	200.91	580.87	-198.78	0.00	0.00	0.00
9,180.59	5.50	70.92	9,151.00	203.43	588.17	-201.27	0.00	0.00	0.00
1st Bone Spring Sand									
9,200.00	5.50	70.92	9,170.32	204.04	589.92	-201.87	0.00	0.00	0.00
9,300.00	5.50	70.92	9,269.86	207.17	598.97	-204.97	0.00	0.00	0.00
9,400.00	5.50	70.92	9,369.40	210.30	608.03	-208.07	0.00	0.00	0.00
9,487.00	5.50	70.92	9,456.00	213.02	615.90	-210.76	0.00	0.00	0.00
2nd Bone Spring Carb									
9,487.74	5.50	70.92	9,456.73	213.05	615.97	-210.79	0.00	0.00	0.00
SF Com 502H KOP_56FNL_1927FWL SEC14									
9,500.00	5.23	83.76	9,468.94	213.30	617.08	-211.04	10.00	-2.16	104.72
9,550.00	6.84	130.44	9,518.69	211.61	621.62	-209.33	10.00	3.22	93.35
9,600.00	10.78	151.21	9,568.10	205.58	626.14	-203.28	10.00	7.87	41.55
9,650.00	15.34	160.41	9,616.80	195.25	630.61	-192.93	10.00	9.13	18.38
9,700.00	20.11	165.39	9,664.42	180.69	635.00	-178.36	10.00	9.54	9.97
9,732.65	23.27	167.57	9,694.75	168.95	637.80	-166.62	10.00	9.69	6.67
SF Com 502H FTP_100FNL_1948FWL SEC14									
9,743.85	24.37	168.19	9,705.00	164.53	638.75	-162.19	10.00	9.74	5.56
2nd Bone Spring Sand									
9,750.00	24.97	168.51	9,710.59	162.02	639.27	-159.67	10.00	9.76	5.21
9,800.00	29.87	170.67	9,754.96	139.38	643.39	-137.02	10.00	9.80	4.31
9,850.00	34.79	172.26	9,797.20	112.94	647.34	-110.57	10.00	9.85	3.19
9,900.00	39.74	173.50	9,836.98	82.91	651.07	-80.52	10.00	9.89	2.48
9,950.00	44.69	174.51	9,874.00	49.51	654.56	-47.11	10.00	9.91	2.01
10,000.00	49.65	175.35	9,907.98	12.99	657.79	-10.58	10.00	9.92	1.69
10,050.00	54.62	176.08	9,938.66	-26.36	660.73	28.78	10.00	9.93	1.46
10,100.00	59.59	176.73	9,965.80	-68.25	663.35	70.68	10.00	9.94	1.29
10,150.00	64.56	177.31	9,989.21	-112.36	665.65	114.79	10.00	9.95	1.16
10,200.00	69.54	177.84	10,008.70	-158.34	667.59	160.79	10.00	9.95	1.07
10,231.85	72.71	178.17	10,019.00	-188.46	668.64	190.91	10.00	9.95	1.01
2nd Bone Spring Target Top									
10,250.00	74.52	178.34	10,024.12	-205.86	669.17	208.31	10.00	9.96	0.99
10,300.00	79.50	178.82	10,035.36	-254.55	670.37	257.01	10.00	9.96	0.96
10,350.00	84.47	179.29	10,042.33	-304.04	671.18	306.50	10.00	9.96	0.93
10,400.00	89.45	179.74	10,044.97	-353.95	671.61	356.41	10.00	9.96	0.91
10,405.48	90.00	179.79	10,045.00	-359.44	671.63	361.90	10.00	9.96	0.91
10,500.00	90.00	179.79	10,045.00	-453.95	671.98	456.41	0.00	0.00	0.00
10,600.00	90.00	179.79	10,045.00	-553.95	672.34	556.41	0.00	0.00	0.00
10,700.00	90.00	179.79	10,045.00	-653.95	672.71	656.41	0.00	0.00	0.00
10,800.00	90.00	179.79	10,045.00	-753.95	673.08	756.41	0.00	0.00	0.00
10,900.00	90.00	179.79	10,045.00	-853.95	673.44	856.41	0.00	0.00	0.00
11,000.00	90.00	179.79	10,045.00	-953.95	673.81	956.41	0.00	0.00	0.00
11,100.00	90.00	179.79	10,045.00	-1,053.95	674.18	1,056.41	0.00	0.00	0.00
11,200.00	90.00	179.79	10,045.00	-1,153.95	674.54	1,156.41	0.00	0.00	0.00
11,300.00	90.00	179.79	10,045.00	-1,253.95	674.91	1,256.41	0.00	0.00	0.00
11,400.00	90.00	179.79	10,045.00	-1,353.95	675.28	1,356.41	0.00	0.00	0.00
11,500.00	90.00	179.79	10,045.00	-1,453.95	675.64	1,456.41	0.00	0.00	0.00
11,600.00	90.00	179.79	10,045.00	-1,553.94	676.01	1,556.41	0.00	0.00	0.00
11,700.00	90.00	179.79	10,045.00	-1,653.94	676.38	1,656.41	0.00	0.00	0.00
11,800.00	90.00	179.79	10,045.00	-1,753.94	676.74	1,756.41	0.00	0.00	0.00
11,900.00	90.00	179.79	10,045.00	-1,853.94	677.11	1,856.41	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 502H
Company:	LEGACY RESOURCES OPERATING	**TVD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Project:	Lea County, NM (NAD83) NMEZ Grid	**MD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Site:	Sapphire Federal Com	**North Reference:**	Grid
Well:	502H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,000.00	90.00	179.79	10,045.00	-1,953.94	677.48	1,956.41	0.00	0.00	0.00
12,100.00	90.00	179.79	10,045.00	-2,053.94	677.84	2,056.41	0.00	0.00	0.00
12,200.00	90.00	179.79	10,045.00	-2,153.94	678.21	2,156.41	0.00	0.00	0.00
12,300.00	90.00	179.79	10,045.00	-2,253.94	678.57	2,256.41	0.00	0.00	0.00
12,400.00	90.00	179.79	10,045.00	-2,353.94	678.94	2,356.41	0.00	0.00	0.00
12,500.00	90.00	179.79	10,045.00	-2,453.94	679.31	2,456.41	0.00	0.00	0.00
12,600.00	90.00	179.79	10,045.00	-2,553.94	679.67	2,556.41	0.00	0.00	0.00
12,700.00	90.00	179.79	10,045.00	-2,653.94	680.04	2,656.41	0.00	0.00	0.00
12,800.00	90.00	179.79	10,045.00	-2,753.94	680.41	2,756.41	0.00	0.00	0.00
12,900.00	90.00	179.79	10,045.00	-2,853.94	680.77	2,856.41	0.00	0.00	0.00
13,000.00	90.00	179.79	10,045.00	-2,953.94	681.14	2,956.41	0.00	0.00	0.00
13,100.00	90.00	179.79	10,045.00	-3,053.93	681.51	3,056.41	0.00	0.00	0.00
13,200.00	90.00	179.79	10,045.00	-3,153.93	681.87	3,156.41	0.00	0.00	0.00
13,300.00	90.00	179.79	10,045.00	-3,253.93	682.24	3,256.41	0.00	0.00	0.00
13,400.00	90.00	179.79	10,045.00	-3,353.93	682.61	3,356.41	0.00	0.00	0.00
13,500.00	90.00	179.79	10,045.00	-3,453.93	682.97	3,456.41	0.00	0.00	0.00
13,600.00	90.00	179.79	10,045.00	-3,553.93	683.34	3,556.41	0.00	0.00	0.00
13,700.00	90.00	179.79	10,045.00	-3,653.93	683.71	3,656.41	0.00	0.00	0.00
13,800.00	90.00	179.79	10,045.00	-3,753.93	684.07	3,756.41	0.00	0.00	0.00
13,900.00	90.00	179.79	10,045.00	-3,853.93	684.44	3,856.41	0.00	0.00	0.00
14,000.00	90.00	179.79	10,045.00	-3,953.93	684.81	3,956.41	0.00	0.00	0.00
14,100.00	90.00	179.79	10,045.00	-4,053.93	685.17	4,056.41	0.00	0.00	0.00
14,200.00	90.00	179.79	10,045.00	-4,153.93	685.54	4,156.41	0.00	0.00	0.00
14,300.00	90.00	179.79	10,045.00	-4,253.93	685.91	4,256.41	0.00	0.00	0.00
14,400.00	90.00	179.79	10,045.00	-4,353.93	686.27	4,356.41	0.00	0.00	0.00
14,500.00	90.00	179.79	10,045.00	-4,453.93	686.64	4,456.41	0.00	0.00	0.00
14,600.00	90.00	179.79	10,045.00	-4,553.92	687.00	4,556.41	0.00	0.00	0.00
14,700.00	90.00	179.79	10,045.00	-4,653.92	687.37	4,656.41	0.00	0.00	0.00
14,800.00	90.00	179.79	10,045.00	-4,753.92	687.74	4,756.41	0.00	0.00	0.00
14,900.00	90.00	179.79	10,045.00	-4,853.92	688.10	4,856.41	0.00	0.00	0.00
15,000.00	90.00	179.79	10,045.00	-4,953.92	688.47	4,956.41	0.00	0.00	0.00
15,056.30	90.00	179.79	10,045.00	-5,010.22	688.68	5,012.71	0.00	0.00	0.00
SF Com 502H L2 0'FNL_1980FWL SEC23									
15,100.00	90.00	179.79	10,045.00	-5,053.92	688.84	5,056.41	0.00	0.00	0.00
15,200.00	90.00	179.79	10,045.00	-5,153.92	689.20	5,156.41	0.00	0.00	0.00
15,300.00	90.00	179.79	10,045.00	-5,253.92	689.57	5,256.41	0.00	0.00	0.00
15,400.00	90.00	179.79	10,045.00	-5,353.92	689.94	5,356.41	0.00	0.00	0.00
15,500.00	90.00	179.79	10,045.00	-5,453.92	690.30	5,456.41	0.00	0.00	0.00
15,600.00	90.00	179.79	10,045.00	-5,553.92	690.67	5,556.41	0.00	0.00	0.00
15,700.00	90.00	179.79	10,045.00	-5,653.92	691.04	5,656.41	0.00	0.00	0.00
15,800.00	90.00	179.79	10,045.00	-5,753.92	691.40	5,756.41	0.00	0.00	0.00
15,900.00	90.00	179.79	10,045.00	-5,853.92	691.77	5,856.41	0.00	0.00	0.00
16,000.00	90.00	179.79	10,045.00	-5,953.92	692.14	5,956.41	0.00	0.00	0.00
16,100.00	90.00	179.79	10,045.00	-6,053.91	692.50	6,056.41	0.00	0.00	0.00
16,200.00	90.00	179.79	10,045.00	-6,153.91	692.87	6,156.41	0.00	0.00	0.00
16,300.00	90.00	179.79	10,045.00	-6,253.91	693.24	6,256.41	0.00	0.00	0.00
16,400.00	90.00	179.79	10,045.00	-6,353.91	693.60	6,356.41	0.00	0.00	0.00
16,500.00	90.00	179.79	10,045.00	-6,453.91	693.97	6,456.41	0.00	0.00	0.00
16,600.00	90.00	179.79	10,045.00	-6,553.91	694.34	6,556.41	0.00	0.00	0.00
16,700.00	90.00	179.79	10,045.00	-6,653.91	694.70	6,656.41	0.00	0.00	0.00
16,800.00	90.00	179.79	10,045.00	-6,753.91	695.07	6,756.41	0.00	0.00	0.00
16,900.00	90.00	179.79	10,045.00	-6,853.91	695.43	6,856.41	0.00	0.00	0.00
17,000.00	90.00	179.79	10,045.00	-6,953.91	695.80	6,956.41	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 502H
Company:	LEGACY RESOURCES OPERATING	**TVD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Project:	Lea County, NM (NAD83) NMEZ Grid	**MD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Site:	Sapphire Federal Com	**North Reference:**	Grid
Well:	502H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
17,100.00	90.00	179.79	10,045.00	-7,053.91	696.17	7,056.41	0.00	0.00	0.00
17,200.00	90.00	179.79	10,045.00	-7,153.91	696.53	7,156.41	0.00	0.00	0.00
17,300.00	90.00	179.79	10,045.00	-7,253.91	696.90	7,256.41	0.00	0.00	0.00
17,400.00	90.00	179.79	10,045.00	-7,353.91	697.27	7,356.41	0.00	0.00	0.00
17,500.00	90.00	179.79	10,045.00	-7,453.90	697.63	7,456.41	0.00	0.00	0.00
17,600.00	90.00	179.79	10,045.00	-7,553.90	698.00	7,556.41	0.00	0.00	0.00
17,700.00	90.00	179.79	10,045.00	-7,653.90	698.37	7,656.41	0.00	0.00	0.00
17,800.00	90.00	179.79	10,045.00	-7,753.90	698.73	7,756.41	0.00	0.00	0.00
17,900.00	90.00	179.79	10,045.00	-7,853.90	699.10	7,856.41	0.00	0.00	0.00
18,000.00	90.00	179.79	10,045.00	-7,953.90	699.47	7,956.41	0.00	0.00	0.00
18,100.00	90.00	179.79	10,045.00	-8,053.90	699.83	8,056.41	0.00	0.00	0.00
18,200.00	90.00	179.79	10,045.00	-8,153.90	700.20	8,156.41	0.00	0.00	0.00
18,300.00	90.00	179.79	10,045.00	-8,253.90	700.57	8,256.41	0.00	0.00	0.00
18,400.00	90.00	179.79	10,045.00	-8,353.90	700.93	8,356.41	0.00	0.00	0.00
18,500.00	90.00	179.79	10,045.00	-8,453.90	701.30	8,456.41	0.00	0.00	0.00
18,600.00	90.00	179.79	10,045.00	-8,553.90	701.67	8,556.41	0.00	0.00	0.00
18,700.00	90.00	179.79	10,045.00	-8,653.90	702.03	8,656.41	0.00	0.00	0.00
18,800.00	90.00	179.79	10,045.00	-8,753.90	702.40	8,756.41	0.00	0.00	0.00
18,900.00	90.00	179.79	10,045.00	-8,853.90	702.77	8,856.41	0.00	0.00	0.00
19,000.00	90.00	179.79	10,045.00	-8,953.89	703.13	8,956.41	0.00	0.00	0.00
19,100.00	90.00	179.79	10,045.00	-9,053.89	703.50	9,056.41	0.00	0.00	0.00
19,200.00	90.00	179.79	10,045.00	-9,153.89	703.86	9,156.41	0.00	0.00	0.00
19,300.00	90.00	179.79	10,045.00	-9,253.89	704.23	9,256.41	0.00	0.00	0.00
19,400.00	90.00	179.79	10,045.00	-9,353.89	704.60	9,356.41	0.00	0.00	0.00
19,500.00	90.00	179.79	10,045.00	-9,453.89	704.96	9,456.41	0.00	0.00	0.00
19,600.00	90.00	179.79	10,045.00	-9,553.89	705.33	9,556.41	0.00	0.00	0.00
19,700.00	90.00	179.79	10,045.00	-9,653.89	705.70	9,656.41	0.00	0.00	0.00
19,800.00	90.00	179.79	10,045.00	-9,753.89	706.06	9,756.41	0.00	0.00	0.00
19,900.00	90.00	179.79	10,045.00	-9,853.89	706.43	9,856.41	0.00	0.00	0.00
20,000.00	90.00	179.79	10,045.00	-9,953.89	706.80	9,956.41	0.00	0.00	0.00
20,100.00	90.00	179.79	10,045.00	-10,053.89	707.16	10,056.41	0.00	0.00	0.00
20,200.00	90.00	179.79	10,045.00	-10,153.89	707.53	10,156.41	0.00	0.00	0.00
20,240.98	90.00	179.79	10,045.00	-10,194.87	707.68	10,197.40	0.00	0.00	0.00
SF Com 502H LTP/BHL_100FSL_1980FWL SEC23									

Planning Report

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 502H
Company:	LEGACY RESOURCES OPERATING	**TVD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Project:	Lea County, NM (NAD83) NMEZ Grid	**MD Reference:**	3690.4+23 @ 3713.40ft (GL+KBcr14)
Site:	Sapphire Federal Com	**North Reference:**	Grid
Well:	502H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
SF Com 502H SHL_265 - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	606,994.60	755,294.17	32.6667445	-103.6380576
SF Com 502H KOP_56F - plan hits target center - Point	0.00	0.00	9,456.73	213.05	615.97	607,207.65	755,910.14	32.6673189	-103.6360515
SF Com 502H FTP_100 - plan misses target center by 0.01ft at 9732.65ft MD (9694.75 TVD, 168.95 N, 637.80 E) - Point	0.00	0.00	9,694.75	168.95	637.80	607,163.55	755,931.97	32.6671973	-103.6359815
SF Com 502H LTP/BHL_ - plan hits target center - Point	0.00	0.00	10,045.00	-10,194.87	707.68	596,799.73	756,001.85	32.6387110	-103.6359756
SF Com 502H L2 0'FNL_ - plan hits target center - Point	0.00	0.00	10,045.00	-5,010.22	688.68	601,984.38	755,982.85	32.6529614	-103.6359267

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,500.00	1,500.00	13 3/8"	13.37	17.50
6,085.36	6,070.00	9 5/8"	9.62	12.25

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,420.00	1,420.00	Rustler			
3,137.81	3,136.00	Base of Salt			
3,285.49	3,283.00	Yates			
4,285.08	4,278.00	Queen			
6,036.14	6,021.00	Delaware			
7,944.91	7,921.00	Bone Spring			
9,180.59	9,151.00	1st Bone Spring Sand			
9,487.00	9,456.00	2nd Bone Spring Carb			
9,743.85	9,705.00	2nd Bone Spring Sand			
10,231.85	10,019.00	2nd Bone Spring Target Top			

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Devon Energy Production Company LP**
LEASE NO.:	**NMNM056749**
LOCATION:	Section 14, T.19 S., R.33 E., NMPM
COUNTY:	Lea County, New Mexico

WELL NAME & NO.:	**Sapphire Federal Com 502H**
SURFACE HOLE FOOTAGE:	265'/N & 1310'/W
BOTTOM HOLE FOOTAGE	100'/S & 1980'/W
ATS/API ID:	**ATS-22-441**
Sundry ID:	**N/A**

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
Wellhead Variance	○ Diverter		
Other	☐ 4 String	☐ Capitan Reef	☐ WIPP
Other	☑ Fluid Filled	☐ Pilot Hole	☐ Open Annulus
Cementing	☐ Cement Squeeze	☐ EchoMeter	
Special Requirements	☐ Water Disposal	☑ COM	☐ Unit
Special Requirements Variance	☐ Break Testing	☐ Offline Cementing	

A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Delaware** 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 **1599 feet** (a minimum of **25 feet (Lea County)** into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface.

Approval Date: 10/06/2022

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.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing shall be set at approximately **6070 feet** is:

- Cement to surface. If cement does not circulate see B.1.a, c-d above.

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.

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 OOGO2.III.A.2.i must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

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

GENERAL REQUIREMENTS

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

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

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

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 689-5981

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

   a. 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 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.

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.

LVO 8/22/2022

 Approval Date: 10/06/2022

LEGACY RESERVES OPERATING, L. P.
HYDROGEN SULFIDE (H2S) CONTINGENCY PLAN
Sapphire Federal Com 502H
Assumed 100 ppm ROE = 3000'

100 ppm H2S concentration shall trigger activation of this plan.

This is an open drilling site. H_2S monitoring equipment and emergency response equipment will be rigged up and in use when the company drills out from under surface casing. H_2S monitors, warning signs, wind indicators and flags will be in use.

A. All personnel shall receive proper H2S training in accordance with Onshore Order 6 III.C.3.a
B. Briefing Area: Two perpendicular areas will be designated by signs and readily accessible.
C. Required Emergency Equipment:
   - Well control equipment
     a. Flare line 150' from wellhead to be ignited by flare gun.
     b. Choke manifold with a remotely operated choke.
     c. Mud/Gas Separator.
   - Protective Equipment for essential personnel.
     Breathing apparatus:
     a. Rescue Packs (SCBA) – 1 unit shall be placed at each briefing area. 2 units shall be stored in the safety trailer.
     b. Work/Escape packs – 4 packs shall be stored on the rig floor with sufficient air hose not to restrict work activity.
     c. Emergency Escape Packs – 4 packs shall be stored in the doghouse for emergency evacuation.

     Auxiliary Rescue Equipment:
     a. Stretcher
     b. Two OSHA full body harness
     c. 100 ft. 5/8" OSHA approved rope
     d. One 20# class ABC fire extinguisher
   - H2S detection and monitoring Equipment:
     The stationary detector with three sensors will be placed in the upper doghouse, set to visually alarm @ 10 ppm and audible @ 14 ppm. Calibrate a minimum of every 30 days or as needed. The sensors will be placed in the following places: Rig floor, Bell nipple, end of flare line or where well bore fluid is being discharged (Gas sample tubes will be stored in the safety trailer).

- Visual warning systems.
  a. One color code condition sign will be placed at the entrance to the site reflecting the possible conditions at the site.
  b. A colored condition flag will be on display, reflecting the current condition, at the drilling site.
  c. Two wind socks will be placed in strategic locations being visible from all angles.
- Mud Program:
  The mud program has been designated to minimize the volume of H2S circulated to surface. The operator will have the necessary mud products to minimize hazards while drilling in H2S bearing zones.
- Metallurgy:
  a. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, shall be suitable for H2S service.
  b. All elastomers used for packing and seals shall be H2S trim.
- Communication:
  Communication will be via two way radio in emergency and company vehicles. Cell phones and land lines where available.

H_2S Operations

Though no H_2S is anticipated during the drilling operation, this contingency plan will provide for methods to ensure the well is kept under control in the event an H_2S reading of 100 ppm or more are encountered. Once personnel are safe and the proper protective gear is in place and on personnel, the operator and rig crew essential personnel will ensure the well is under control, suspend drilling operations and shut-in the well (unless pressure build up or other operational situations dictate suspending operations will prevent well control), increase the mud weight and circulate all gas from the hole utilizing the mud/gas separator downstream of the choke, the choke manifold and the emergency flare system located 150' from the well. Bring the mud system into compliance and the H_2S level below 10 ppm, then notify all emergency officers that drilling ahead is practical and safe.

Proceed with drilling ahead only after all provisions of Onshore Order 6, Section III.C. have been satisfied.

Ignition of Gas source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO_2). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever this is an ignition of the gas.

Characteristics of H_2S and SO_2

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H_2S	1.189 Air = I	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO_2	2.21 Air = I	2 ppm	N/A	1000 ppm

Contacting Authorities

Legacy Reserves Operating's personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including directions to site. The following call list of essential and potential responders has been prepared for use during a release. Legacy's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER).

Emergency Assistance Telephone List

PUBLIC SAFETY:	***911 or***
Lea County Sheriff or Police	**(575) 396-3611**
Fire Department	**(575) 397-9308**
Hospital	**(575) 492-5000**
Ambulance	**911**
Department of Public Safety	**(392) 392-5588**
Oil Conservation Division	**(575) 748-1823**
New Mexico Energy, Minerals & Natural Resources Department	**(575) 748-1283**

LEGACY RESERVES OPERATING LP	
Legacy Reserves Operating LP	**Office: (432) 689-5200**
Drilling Manager: **Ron Welch**	**Office: (432) 689-5200**
Drilling Engineer: **Ryan Broglie**	**Office: (432) 689-5200** **Cell: (512) 913-0276**
Operations Manager: **Mark Conrad**	**Office: (432) 689-5200**

LEGACY SAFETY	***Hobbs (575) 393-7233***
EHS Coordinator:	
Field Operations Manager:	**Office: (432) 689-5200**
Randy Williams	**Cell: (432) 260-5566**

Evacuee Description:
Residents: THERE ARE NO RESIDENTS WITHIN 3000' ROE.

LEGACY RESERVES

Sapphire Federal Com #502H

BOPE Preventer Utilization

The table below displays all BHA components, drill pipe, casing, or open hole that could be present during a required shut in and the associated preventer component that would provide a barrier to flow. It is specific to the hole section that requires a 10M system. The mud system being utilized in the hole will always assumed to be the first barrier to flow. The below table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the rating of the annular preventer.

Drill String Element	OD	Preventer	RWP
4" Drillpipe	4"	Lower Ram 3 1/2" - 5 ½" VBR* Upper Ram 3 1/2" - 5 ½" VBR*	10M
4.5" Drillpipe	4.5"	Lower Ram 3 1/2" - 5 ½" VBR* Upper Ram 3 1/2" - 5 ½" VBR*	10M
4" HWDP Drillpipe	4"	Lower Ram 3 1/2" - 5 ½" VBR* Upper Ram 3 1/2" - 5 ½" VBR*	10M
4.5" HWDP Drillpipe	4.5"	Lower Ram 3 1/2" - 5 ½" VBR* Upper Ram 3 1/2" - 5 ½" VBR*	10M
Drill Collars (including non-magnetic)	4.75-5.25"	Lower Ram 3 1/2" - 5 ½" VBR* Upper Ram 3 1/2" - 5 ½" VBR*	10M
Production Casing	5.5"	Lower Ram 3 1/2" - 5 ½" VBR* Upper Ram 3 1/2" - 5 ½" VBR*	10M
Production Casing	5"	Lower Ram 3 1/2" - 5 ½" VBR* Upper Ram 3 1/2" - 5 ½" VBR*	10M
Production Casing	4.5"	Lower Ram 3 1/2" - 5 ½" VBR* Upper Ram 3 1/2" - 5 ½" VBR*	10M
ALL	0-13 5/8"	Annular	5M
Open Hole		Blind Rams	10M

*VBR – Variable Bore Ram

Page 2- Sapphire Federal Com #502H

Well Control Procedures

Proper well control response is highly specific to current well conditions and must be adapted based on environment as needed. The procedures below are given in “common” operating conditions to cover the basic and most necessary operations required during the wellbore construction. These include drilling ahead, tripping pipe, tripping BHA, running casing, and pipe out of the hole/open hole. In some of the procedures below, there will be a switch of control from the lesser RWP annular to the appropriate 10M RWP ram. The pressure at which this is done is variable based on overall well conditions that must be evaluated situationally. The pressure that control is switched may be equal to or less than the RWP but at no time will the pressure on the annular preventer exceed the RWP of the annular. The annular will be tested to 5,000 psi. This will be the RWP of the annular preventer.

Shutting In While Drilling

1. Sound alarm to alert crew
2. Space out drill string
3. Shut down pumps
4. Shut in uppermost BOPE preventer (typically the annular preventer) and open HCR.
5. Verify well is shut-in and flow has stopped
6. Notify supervisory personnel
7. Record data (SIDP, SICP, Pit Gain, and Time)
8. Hold pre-job safety meeting and discuss kill procedure
9. If pressure is anticipated to climb to the RWP of the annular preventer during kill procedure, swap control of the well to the upper pipe ram

Shutting In While Tripping

1. Sound alarm and alert crew
2. Install open, full open safety valve and close valve
3. Shut in uppermost BOPE preventer (typically the annular preventer) and open HCR.
4. Verify well is shut-in and flow has stopped
5. Notify supervisory personnel
6. Record data (SIDP, SICP, Pit Gain, and Time)
7. Hold pre-job safety meeting and discuss kill procedure
8. If pressure is anticipated to climb to the RWP of the annular preventer during kill procedure, swap control of the well to the upper pipe ram

Shutting In While Running Casing

1. Sound alarm and alert crew
2. Install circulating swedge. Close high pressure, low torque valves.
3. Shut in uppermost BOPE preventer (typically the annular preventer) and open HCR.
4. Verify well is shut-in and flow has stopped
5. Notify supervisory personnel
6. Record data (SIDP, SICP, Pit Gain, and Time)
7. Hold Pre-job safety meeting and discuss kill procedure
8. If pressure is anticipated to climb to the RWP of the annular preventer during kill procedure, swap control of the well to the upper pipe ram

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Shutting in while out of hole

1. Sound alarm
2. Shut-in well: close blind rams
3. Verify well is shut-in and monitor pressures
4. Notify supervisory personnel
5. Record data (SIDP, SICP, Pit Gain, and Time)
6. Hold Pre-job safety meeting and discuss kill procedure

Shutting in prior to pulling BHA through stack

1. Prior to pulling last joint of drill pipe thru the stack space out and check flow. If flowing see steps below.
2. Sound alarm and alert crew
3. Install open, full open safety valve and close valve
4. Shut in upper pipe ram and open HCR.
5. Verify well is shut-in and flow has stopped
6. Notify supervisory personnel
7. Record data (SIDP, SICP, Pit Gain, and Time)
8. Hold pre-job safety meeting and discuss kill procedure

Shutting in while BHA is in the stack and ram preventer and combo immediately available

1. Sound alarm and alert crew
2. Stab Crossover and install open, full open safety valve and close valve
3. Space out drill string with upset just beneath the compatible pipe ram.
4. Shut in upper compatible pipe ram and open HCR.
5. Verify well is shut-in and flow has stopped
6. Notify supervisory personnel
7. Record data (SIDP, SICP, Pit Gain, and Time)
8. Hold pre-job safety meeting and discuss kill procedure

Shutting in while BHA is in the stack and no ram preventer or combo immediately available

1. Sound alarm and alert crew
2. If possible pick up high enough, to pull string clear and follow “Open Hole” scenario
3. If not possible to pick up high enough:
1. Stab Crossover, make up one joint/stand of drill pipe, and install open, full open safety valve and close valve
4. Space out drill string with upset just beneath the compatible pipe ram.
5. Shut in upper compatible pipe ram and open HCR.
6. Verify well is shut-in and flow has stopped
7. Notify supervisory personnel
8. Record data (SIDP, SICP, Pit Gain, and Time)
9. Hold pre-job safety meeting and discuss kill procedure

EMERGENCY ASSISTANCE CONTACT LIST

PUBLIC SAFETY:	***911 or***
Lea County Sheriff or Police	(575) 396-3611
Fire Department	(575) 397-9308
Hospital	(575) 492-5000
Ambulance	911
Department of Public Safety	(392) 392-5588
Oil Conservation Division	(575) 748-1823
New Mexico Energy, Minerals & Natural Resources Department	(575) 748-1283

LEGACY RESERVES OPERATING LP	
Legacy Reserves Operating LP	Office: (432) 689-5200
Drilling Manager: Ron Welch	Office: (432) 689-5200
Drilling Engineer: Ryan Broglie	Office: (432) 689-5200 Cell: (512) 913-0276
Operations Manager: Mark Conrad	Office: (432) 689-5200

DRILLING CONTRACTOR – CACTUS DRILLING	
Rig Managers:	
Kevin Whisnet	Cell: (318) 413-0198
Daniel Moore	Cell: (580) 606-7260
Drilling Superintendent: Ryan Stuart	Cell: (580) 641-1870

LEGACY SAFETY	
EHS Coordinator (Hobbs):	Office: (575) 393-7233
Field Operations Manager: Randy Williams	Office: (432) 689-5200 Cell: (432) 260-5566

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 179252

CONDITIONS

Operator:	OGRID:
LEGACY RESERVES OPERATING, LP 15 Smith Road Midland, TX 79705	240974
	Action Number: 179252
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
pkautz	Will require a File As Drilled C-102 and a Directional Survey with the C-104	1/27/2023
pkautz	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	1/27/2023
pkautz	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	1/27/2023
pkautz	Cement is required to circulate on both surface and intermediate1 strings of casing	1/27/2023