



Rich 2-32H

SHL: 750' FSL 2,340' FEL (SW/4 SE/4)
 Sec. 32 T7N R80W
 BHL: ±610' FSL ±1,960' FWL (SE/4 SW/4)
 Sec. 5 T6N R80W
 Jackson County, Colorado
 Surface: Fee
 Surface Hole Mineral Lease: Fee
 Bottom-Hole Mineral Lease: Fee

Drilling Plan

1. ESTIMATED TOPS OF IMPORTANT GEOLOGIC MARKERS & ANTICIPATED WATER, OIL, GAS OR MINERAL FORMATIONS:

Vertical Hole Section

Formation	TVD (ft.)	Hydrocarbon/Water Bearing Zones
Tertiary		
Midcoal	2300	Gas
Suddeth Coal	3100	Gas
Sussex	5600	
Shannon	5900	
Niobrara	7200	Gas / Oil
Carlisle Shale	7301	

Horizontal Hole Section

Formation	TVD (ft.)	MD (ft.)	Hydrocarbon/Water Bearing Zones
Shannon	5900	5900	
Kick-off point – build curve	7100	7100	
Niobrara	7199	7200	Oil / Gas
Landing Point (90°)	7546	7900	Oil / Gas
TD	7248	13198	Oil / Gas

NOTE Kick-off & Landing point may change based upon results of correlations in the vertical hole

All shows of fresh water and minerals will be adequately protected and reported
 Gas detection to be operational prior to drilling the Niobrara

2. PRESSURE CONTROL EQUIPMENT:

All well control equipment shall be in accordance with Onshore Order #2 for 5M systems.

The minimum specifications for pressure control equipment that will be provided are included on the attached schematic diagram showing size and pressure ratings

3000# BOP with 4" or 4-1/2" Pipe Rams
3000# BOP with Blind Rams
3000# Annular

Auxiliary equipment to be used

- Upper kelly cock the handle available
- Stabbing Valve

The choke manifold will include appropriate valves and adjustable chokes The kill line will have one check valve.

Ram type preventers will be pressure tested to full working pressure (utilizing a tester and a test plug) at:

- Initial installation
- Whenever any seal subject to test pressure is broken
- Following related repairs
- 30 day intervals

The annular preventer will be pressure tested to 50 percent of the rated working pressure.

All pressure tests shall be maintained at least 10 minutes or until provisions of test are met, whichever is longer.

Annular preventers shall be functionally operated at least weekly.

Pipe and blind rams shall be activated each trip.

A BOPE pit level drill will be conducted weekly for each drilling crew.

All test and drills will be recorded in the drilling log.

The accumulator will have sufficient capacity to open the HCR valve, close all rams plus the annular preventer, and retain 200 psi above pre-charged pressure without the use of closing unit pumps. The system will have two independent power sources to close the preventers in accordance with 5M system requirements outlined in Onshore Order #2.

Remote controls shall be readily accessible to the driller Master controls shall be at the accumulator.

3. CASING & CEMENTING PROGRAM:

A. The proposed casing program will be as follows

Section	Measured Depth (ft.)	Hole Size	Size	Grade	Weight	Thread	Condition
Surface	0 – 1,400'	12-1/4"	9-5/8"	J – 55	36#	STC	New
Production*	0 – 13,198'	8-3/4"	5-1/2"	HC – P110	26#	LTC	New

All casing strings below the conductor shall be pressure tested to 0 22 psi/ft. of casing string length or 1500 psi, whichever is greater, but not to exceed 70% minimum internal yield.

B. The proposed cementing program will be as follows

Surface String: Top of cement – surface
Estimated volume gauge hole + 100% excess

640 sx Class G + additives @ 1 16 ft³/sx

Top Out (if needed)
100 sx Class G + additives @ 1 16 ft³/sx

Production String: Top of cement – 200' above Niobrara top
Estimated volume gauge hole + 20% excess
(if open hole logs are run, caliper + 5% excess will be used)

460 sx 50/50 Poz/G + additives @ 1 29 ft³/sx

After cementing, but before commencing any test, the casing string will stand cemented until cement has reached a compressive strength of 500 psi at the shoe WOC times will be recorded in the driller's log.

4. DRILLING FLUIDS PROGRAM:

Interval (ft.)	Type	Weight (ppg)	Viscosity	Ph	Water Loss (cc)	Remarks
Surface	Spud	8 4-9 0	40 – 60	8 – 10	NC	WBM – gel & lime
Production	LSND	9 0-9 8	40 – 50	8 – 10	<6	WBM – polymer system

NC = no control

Sufficient quantities of mud material will be maintained on site or be readily accessible for the purpose of assuring well control SPR will be recorded on daily drilling report after mudding up Electronic/mechanical mud monitoring equipment will be utilized and will include a pit volume totalizer (PVT), stroke counter, and flow sensor as a minimum.

5. EVALUATION PROGRAM:

Logs (while drilling)	MWD-GR	Kick-off point to TD
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OH Logs:	Vertical Hole Section: MWD GR
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Cores:	None anticipated
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DST's	None anticipated
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6. ABNORMAL CONDITIONS:

No anticipated abnormal pressures or temperatures expected to be encountered No hydrogen sulfide expected.

Anticipated bottom-hole pressure is approximately 3,900 psi (9.5 ppg EMW).

7. OTHER INFORMATION:

The anticipated starting date and duration of the drilling and completion operations will be as follows

Start Date	Upon Approval
Duration	60 Days

The well will be drilled from surface location to bottom-hole location per attached directional plan. The proposed well path should not pose any collision or interference concerns with any existing wells along its proposed path.

Footage at top of productive zone 610' FNL & 2,537' FEL, Sec 5 T6N R80W
(Intermediate casing shoe)

A completion rig will be used for completion operations. All conditions of this approved plan will be applicable during all operations conducted with the completion rig.

To ensure maximum operational flexibility, EE3 LLC respectfully requests that the Commission approve a window around the SHL with a tolerance of 200' in all directions.



3000 psig BOPE Diagram

