COGCC Doc. No. 2056182
Received 12/17/2015

GREGORY 05-09H

SHL 202’ FSL & 71’ FWL Section 9-T7N-R80W
BHL 300’ FNL & 350’ FWL Section 9-T7N-R80W
Jackson County, Colorado

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	0	
Midcoal	2268	Gas
Suddeth Coal	3048	Gas
Sussex	5548	
Shannon	5848	
Niobrara	7218	Gas / Oil
Carlisle Shale	7668	

Horizontal Hole Section

Formation	TVD (ft.)	MD (ft.)	Hydrocarbon/Water Bearing Zones
Shannon	5848	5848	
Kick-off point – build curve	7012	7019	
Niobrara	7218	7240	Oil / Gas
Landing Point (90°)	7600	8045	Oil / Gas
TD	7600	12315	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

5000# BOP with 4" or 4-1/2" Pipe Rams
5000# BOP with Blind Rams
5000# 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 – 1500	17 ½"	13-3/8"	J55	54.5#	BTC	New
Intermediate	0 – 5550	12-1/4"	9-5/8"	N80	40#	LTC	New
Production*	0 – 12315	8 ¾"	5- ½"	P110	20#	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

Lead: 790 sx Class G + additives @ 2.11 ft^3/sx
Tail: 293 sx Class G + additives @ 1.42 ft^3/sx

Top Out (if needed)
100 sx Class G + additives @ 1.42 ft^3/sx

Intermediate String: Top of cement – Surface
Estimated volume gauge hole + 20% excess
(if open hole logs are run, caliper + 5% excess will be used)

1320 sx 50/50 Poz/G + additives @ 1.58 ft^3/sx

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

1336 sx 50/50 Poz/G + additives @ 1.58 ft^3/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
Int & Prod	LSND	10.5 – 10.6	40 – 50	8 – 9	<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

OH Logs: Triple Combo TD – Surface Casing

Cores: None anticipated

DST's None anticipated

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 Niobrara - 312' FSL & 149' FWL, Sec 9 T7N R80W.
Footage at Landing Point – 544' FSL & 291' FWL, Sec 9 T7N R80W.

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, Sandridge respectfully requests that the Commission approve a window around the SHL with a tolerance of 200’ in all directions