Surprise 4-6H
SHL: Section 6-T6N-R80W
BHL: Section 7-T6N-R80W
Jackson County, Colorado

DRILLING PLAN

1. *Estimated Tops of Important Geologic Markers & Anticipated Water, Oil, Gas or Mineral Formations:*

Formation	TVD (ft)	MD (ft)	Hydrocarbon/Water Bearing Zones
Tertiary	0	0	
Midcoal	1342	1342	Gas
Suddeth Coal	2322	2323	Gas
Tertiary Base Unconformity	3272	3273	
Sussex Marker	4342	4344	
Sussex	4556	4558	
Shannon	5132	5135	
KOP (start build curve)	5937	5940	
Niobrara	6572	6664	Gas / Oil
Landing Point (90^{o})	6788	7294	
TD	6884	11446	
Carlisle Shale	7000	N/A	

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

2. PRESSURE CONTROL EQUIPMENT:

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

Well control equipment will be rigged up after setting surface casing.

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 with 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 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 tests 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-charge 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 – 800	12 ¼	9 5/8	J-55	36.0	STC	New
Intermediate	0 – 7294	8 ¾	7	P110	23.0	LTC	New
Production*	5940 - 11446	6 ¼	4 ½	HC-P110	11.6	LTC	New

*4 ½" production string will be a liner, utilizing a liner hanger with pack-off assembly.

Size	Grade	Weight	Thread	Collapse	Burst	Pressure Gradient Collapse	Pressure Gradient Burst
9 5/8	J-55	36.0	STC	2020	3520	0.43	0.50
7	P110	23.0	LTC	5650	8720	0.50	0.50
4 ½	HC-P110	11.6	LTC	8650	10690	0.50	0.50

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 + 50% excess

325 sx Class G + additives @ 1.16 ft^3/sx

Top Out (if needed)
100 sx Class G + additives @ 1.16 ft^3/sx

Intermediate String: Top of cement - 200' above the Midcoal formation.
Estimated volume: gauge hole + 30% excess

Lead: 300 sx 35/65 Poz/G + additives @ 2.93 ft^3/sx
Tail: 270 sx 50/50 Poz/G + additives @ 1.29 ft^3/sx

Production Liner: Top of cement – liner top
Estimated volume: gauge hole + 20% excess
(if open hole logs are run; caliper + 5% excess will be used)

530 sx 50/50 Poz/G + additives @ 1.29 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 drillers 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
Intermediate	LSND	8.8-9.6	35-45	8-10	<10	WBM - polymer system
Production	LSND	9.0-9.6	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) LWD-GR Surface casing to TD

OH Logs: None anticipated

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 3300 psi (9.6 ppg EMW)

7. OTHER INFORMATION:

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

Starting 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: 616’ FNL & 2016’ FWL, Sec 7 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, EOG Resources, Inc. respectfully requests that the Commission approve a window around the BHL with a tolerance of 200’ in all directions.

Production will pass through leases COC-65600 and EOG #76705-000.