

GRMR Oil & Gas, LLC
Hamill 19-16D
 SHL: 163' FSL 230' FEL (SE/4SE/4)
 Sec. 19 T5N R90W
 BHL: ±242' FNL ±309' FEL (NE/4NE/4) Lot 5
 Sec. 30 T5N R90W
 Moffat County, Colorado
 Surface: Fee
 Mineral Lease: Fee

Drilling Program

Please contact Mike Griffis with GRMR Oil & Gas, LLC at 720-235-5071 if there are any questions or concerns regarding this Drilling Program.

SURFACE ELEVATION – 6,454.3' (Ungraded ground elevation)

SURFACE FORMATION – Mancos – Fresh water possible

1. Formation Tops

The estimated depths at which the top and bottom of the anticipated water, oil, gas or other mineral bearing formations are expected to be encountered are as follows:

Formation	TVD	MD	Lithology
Mancos	Surface	Surface	Fresh Water/Gas
Base Morapos	530'	530'	Gas/ Fresh Water
Buck Peak	2,833'	2,843'	Gas/ Fresh Water
Toe Creek Bench	3,127'	3,139'	Gas/Water
Carlile	4,157'	4,175'	None
Dakota	4,756'	4,778'	Gas/Water
Shinarump	6,1080'	6,132'	Gas
Weber	6,647'	6,671'	Gas/Oil/Water
Total Depth	6,956'	6,980'	

2. Anticipated Depths of Oil, Gas, Water and Other Mineral Bearing Zones

The estimated depths at which the top and bottom of the anticipated water, oil, gas or other mineral bearing formations are expected to be encountered are as follows:

Formation	MD	Lithology
Morapos	530' (Base)	Water
Buck Peak	2,843'	Oil/Gas
Toe Creek Bench	3,139'	Oil/Gas
Carlile	4,175'	Unknown
Dakota	4,778'	Unknown
Shinarump	6,132'	Unknown
Weber	6,671'	Unknown
Total Depth	6,980'	

All fresh water and prospectively valuable minerals encountered during drilling will be recorded by depth and adequately protected. All hydrocarbon shows will be tested to determine commercial potential.

3. Operator's Minimum Specifications for Pressure Control Equipment

- A. A 13-5/8" BOP with a minimum pressure rating of 5,000 psi will be configured and tested according to COGCC regulations. Maximum anticipated surface pressure is 3,011 psi.
- B. All BOP connections subject to pressure shall be flanged, welded, or clamped.
- C. Associated Equipment:
1. Pipe ram (5M)
 2. Blind ram (5M)
 3. Annular Preventer (3M or 5M, as available)
 4. Rotating head (1500 psi operating pressure)
 5. Kelly cock (or IBOP if a top drive is used)
 6. Stab in valve (s) with appropriate tool joint configuration (s)
 7. 5M choke manifold with one (1) remote operated choke control valve and one (1) manual choke valve. All valves and connections (exc choke valves) will be tested to 5M. All tees will be targeted.
 8. Hard or flexible choke line (as available). If a flexible choke line is used, it will be inspected and free damage.

4. Casing and Cementing Program**Casing Program:**

Interval (ft)	Hole Size (in)	Csg Sz (in)	Csg Wt (ppf)	Grade	CXN	Length (ft)	Cmt Vol (bbl)	TOC (ft)	Condition
0-700'	12-1/4"	9-5/8"	36	J-55	ST&C	700	131	Surface	New
0-7,000	7-7/8"	5-1/2"	17	N-80	LT&C	7000	245	700'	New

Cementing Program:

		Surface	Production
Hole Geometry	Csg OD	9.625	5.5
	Csg ID	8.921	4.892
	Hole Size	12.25	7.875
	Csg Depth	700	7,000
Lead Cement	Top (ft)	0	700
	Hole XS	100%	25%
	Vol (ft^3)	281.9	1148.1
	Wgt (ppg)	11.5	11.5
	Yld (ft^3/sk)	2.74	2.982
	Lead SX	110	390
	Cmnt Type	Varicem	Econocem
	Add:	0.125 lbm Poly-E-Flake	0.25 lbm Poly-E-Flake
Add:	0.25 lbm Kwik Seal	1% Granulite TR ¼	

Tail Cement	Top (ft)	450	6000
	Hole XS	100%	25%
	Vol (ft ³)	176.2	222.5
	Wgt (ppg)	13.5	14.0
	Yld (ft ³ /sk)	1.68	1.349
	Tail SX	110	170
	Cmnt Type	Varicem	Expandacem
	Add:	0.125 lbm Poly-E-Flake	0.25 lbm Poly-E-Flake
	Add:	0.25 lbm Kwik Seal	

Miscellaneous Casing Information (where applicable):

- A. All casing is designed to meet or exceed the following safety factor criteria; Collapse: 1.10, Burst: 1.10, Tension: 1.60
- B. Any change in the casing and cement design will be approved by the COGCC prior to running and cementing the casing string.

5. Mud Program**Summary of anticipated drilling fluids by hole section.**

Interval (MD)	Hole Size (in)	Type	MW	VIS	FL	pH
Surface 0-700'	12.25	FW/Gel	9	28	NC	9-10.5
Prod 700-7,000'	7.875	2% KCL/PHPA	9	40	<10	9-10.5

6. Testing, Coring, and Logging

Mud Logging: Gas detection and mud return monitoring equipment shall be utilized throughout the drilling of each horizontal lateral. Cuttings samples will be collected every 30'.

Coring: Depending on drilling conditiona, rotary sidewall cores may be taken in the Carlile, Dakota, Shinerump, or Weber.

Drillstem Tests: No DSTs planned.

Electric Logging: Surface Section (0' – 700'):
Triple combo – AIT – SP-GR-TLD-CNL + BHCS
MDT at various depths, depending on initial log run.

Directional Surveys: Every 100' (minimum) with MWD.

7. Abnormal Pressures and Hydrogen Sulfide

- A. Normal to subnormal pressure gradients expected throughout the well. Max BHP @ TD is expected to be ≤ 3011 psi.
- B. Maximum expected BHT @ TD: ~150 deg F.
- C. No H₂S gas is anticipated.

Directional Plans: Attached

BOP Schematic:

13-5/8" 5M BOP and Choke Manifold Configuration

