

**Montana Board of Oil and Gas Conservation
Environmental Assessment**

Operator: Crusader Energy Group LLC
Well Name/Number: Maple Leafs 1H-20
Location: NE NW Section 29 T21N R60E
County: Richland, **MT;** **Field (or Wildcat)** W/C

Air Quality

(possible concerns)

Long drilling time: 30-40 days drilling time.

Unusually deep drilling (high horsepower rig): No, triple drilling rig for 14,891'

MD/10,525'TVD single lateral horizontal Bakken Formation test, but well will be drilled vertical first to 11,125' to the Duperow Formation and then plugged back with cement to + 9750' and kicked off for a horizontal Bakken Formation lateral.

Possible H2S gas production: Yes

In/near Class I air quality area: No

Air quality permit for flaring/venting (if productive): Yes, DEQ air quality permit required under 75-2-211.

Mitigation:

Air quality permit (AQB review)

Gas plants/pipelines available for sour gas

Special equipment/procedures requirements

Other: _____

Comments: No special concerns, adequate surface casing 1900' to be set and cemented back to surface with proper BOP stack should mitigate any concerns. Triple rig to drill to a14,891' MD/10,525'TVD single lateral horizontal well test.

Water Quality

(possible concerns)

Salt/oil based mud: Use freshwater and freshwater mud system on surface and oil based invert mud system from base of surface casing to intermediate casing depth.

Brine polymer will be used to drill horizontal lateral.

High water table: No

Surface drainage leads to live water: No, closest drainage is an ephemeral drainage to the O'Brien Creek, about 1/16 of a mile northwest of this location.

Water well contamination: No, closest stock water well is 1/16 mile to the northeast, depth of well is 200'. All other wells are 3/8 of a mile to the northeast from this location.

Deepest water well close by within 1 mile is only 395' in depth and is about 3/8 of a mile to the northeast of this location. Surface hole will be drilled with freshwater. Surface casing will be set to 1900' and cemented back to surface.

Porous/permeable soils: No, sandy clay soils.

Class I stream drainage: None

Mitigation:

Lined reserve pit

Adequate surface casing

Berms/dykes, re-routed drainage

Closed mud system

Off-site disposal of solids/liquids (in approved facility)

Other: _____

Comments: 1900' of surface casing cemented to surface adequate to protect freshwater zones. Also, fresh water mud systems to be used on surface hole.

Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: None.

High erosion potential: No, moderate cut, up to 10.8' and small fill, up to 8.9', required.

Loss of soil productivity: No, location will be restored after drilling, if nonproductive. If productive unused portion of drillsite will be reclaimed.

Unusually large wellsite: Large, 430'X300' location size required.

Damage to improvements: Slight, surface use is grassland.

Conflict with existing land use/values: Slight

Mitigation

Avoid improvements (topographic tolerance)

Exception location requested

Stockpile topsoil

Stream Crossing Permit (other agency review)

Reclaim unused part of wellsite if productive

Special construction methods to enhance reclamation

Other _____

Comments: Access will be over existing county roads, #116 and two track ranch trails. About 1.6 miles of new access will be built off the existing county road #116 into this location. Reserve pit liquids to be disposed at a commercial Class II disposal (Land Tech). Solids will be allowed to dry, pit liner folded over the top of the solids, spoil dirt to fill pit, top soil spread over pit area, and seeded to land owners specification. No special concerns

Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Residences about 1.25 miles to the southwest of this wellsite.

Possibility of H2S: Yes

Size of rig/length of drilling time: Triple drilling rig 30 to 40 days drilling time

Mitigation:

Proper BOP equipment

Topographic sound barriers

H2S contingency and/or evacuation plan

Special equipment/procedures requirements

Other: _____

Comments: No concerns, closest residences about 1.25 miles away from wellsite. H2S safety company to setup alarms and train rig employees. Proper BOP stack and surface casing should be able to control any problems that occurs.

Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): Little Missouri National Grasslands, about 3/8 of a mile to the east of this location.

Proximity to recreation sites: Yellowstone River, 9.5 miles to the west.

Creation of new access to wildlife habitat: No
Conflict with game range/refuge management: No
Threatened or endangered Species : None identified.

Mitigation:

- Avoidance (topographic tolerance/exception)
- Other agency review (DFWP, federal agencies, DSL)
- Screening/fencing of pits, drillsite
- Other: _____

Comments: Private surface lands. No concerns.

Historical/Cultural/Paleontological

(possible concerns)

Proximity to known sites None identified

Mitigation

- avoidance (topographic tolerance, location exception)
- other agency review (SHPO, DSL, federal agencies)
- Other: _____

Comments: On private surface lands. No concerns.

Social/Economic

(possible concerns)

- Substantial effect on tax base
- Create demand for new governmental services
- Population increase or relocation

Comments: No concerns

Remarks or Special Concerns for this site

Well is a 14,891' MD/10,525'TVD single lateral horizontal Bakken Formation Test. Well will be drilled vertically to 11,125' and plugged back to 9750' and kicked off horizontally.

Summary: Evaluation of Impacts and Cumulative effects

No long term impacts expected. Some short term impacts will occur.

I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): Steven Sasaki 
(title:) Chief Field Inspector

Date: May 13, 2008 _____

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website

(Name and Agency)

Richland County water wells

(subject discussed)

May 13, 2008

(date)

If location was inspected before permit approval:

Inspection date: _____

Inspector: _____

Others present during inspection: _____