

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

Operator: Marathon Oil Company.
Well Name/Number: Bryon Hendrickson 21-18H
Location: NE NW Section 18 T31N R59E
County: Sheridan, MT; Field (or Wildcat) Wildcat

Air Quality

(possible concerns)

Long drilling time: No, 25-35 days drilling time.

Unusually deep drilling (high horsepower rig): Triple derrick drilling rig, to drill to 18,913'MD/9,628'TVD single lateral Bakken Formation test well.

Possible H₂S gas production: Yes, slight chance of H₂S gas, Mississippian Formations.

In/near Class I air quality area: No Class I air quality area.

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: Drill a 18,913'MD/9,628'TVD single lateral Bakken Formation test well.

If no gas gathering system exists nearby sweet gas and/or H₂S gas can be flared under Board Rule 36.22.1220. No concerns.

Water Quality

(possible concerns)

Salt/oil based mud: Yes to intermediate casing string hole will be drilled with oil based invert drilling fluids. Horizontal lateral will be drilled with brine water. Surface casing hole will be drilled with freshwater and freshwater mud system.

High water table: No high water table anticipated, in the area of review.

Surface drainage leads to live water: No, closest drainage is an unnamed ephemeral tributary to Brush Mountain Creek, about 1/16 of a mile to the south and ¼ of a mile to the east from this location.

Water well contamination: None, closest water well is about 1/2 of a mile to the west from this location. Surface hole will be drilled with freshwater to 1750'. Surface casing will be run and cemented to surface.

Porous/permeable soils: No, silty sandy clay soils.

Class I stream drainage: No, Class I stream drainages.

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: Semi closed loop mud system to be used. Oil based invert drilling fluids will be recycled. Cuttings will be mixed with fly ash and buried in the lined cuttings pit.

Comments: 1750' of surface casing will be necessary to cover the base of the Fox Hills aquifer.

Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: None anticipated.

High erosion potential: No, location requires a small cut, up to 8.5' and a small fill, up to 6.8', required.

Loss of soil productivity: Slight.

Unusually large wellsite: No, a very large well site 400'X500', single well location pad.

Damage to improvements: No, location to be restored after drilling, if nonproductive. If productive unused portion of the drilling pad will be reclaimed.

Conflict with existing land use/values: Slight, surface use is cultivated land.

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 gravel road, Choke Cherry Road. An access road off the existing county road into this location will be built. Estimated new road length is about 0.1 of a mile into the location. Cuttings will be mixed with fly ash and dumped in the lined cuttings pit. Cuttings pit will be backfilled when drilling is completed. Oil based invert drilling fluids will be recycled or hauled to a Class II disposal. Completion fluids will be hauled to a commercial Class II disposal.

Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Closest residences are about 3/8 of a mile to the east, about 5/8 of a mile to the south, about 1 mile to the southwest and about 1.125 miles to the northwest from this location. The town of Medicine Lake, Montana lies about 19 miles to the west northwest and Dagmar, Montana lies 9.5 miles to the northwest from this location.

Possibility of H2S: Slight chance of H2S, Mississippian Formations.

Size of rig/length of drilling time: Triple drilling rig 25 to 35 days drilling time.

Mitigation:

Proper BOP equipment

Topographic sound barriers

H2S contingency and/or evacuation plan

Special equipment/procedures requirements

Other: _____

Comments: Adequate surface casing cemented to surface with working BOP stack should mitigate any problems.

Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): Medicine Lake National Wildlife Refuge is about 9.5 miles to the west from this location.

Proximity to recreation sites: Medicine Lake National Wildlife Refuge is about 9.5 miles to the west from this location.

Creation of new access to wildlife habitat: No

Conflict with game range/refuge management: No

Threatened or endangered Species: Threatened or endangered species listed on the Region 6 USFW website are the Piping Plover and Whooping Crane. Candidate species is the Sprague's Pipit. NH Tracker website lists two (2) species of concern as follows: Burrowing Owl, and Whooping Crane

Mitigation:

Avoidance (topographic tolerance/exception)

Other agency review (DFWP, federal agencies, DSL)

Screening/fencing of pits, drillsite

Other: _____

Comments: Private surface cultivated land. There may be species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern is discovered at this location. The Board of Oil & Gas has no jurisdiction over private surface lands.

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: Private surface cultivated land. There may be possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite. The Board of Oil & Gas has no jurisdiction over private surface lands.

Social/Economic

(possible concerns)

Substantial effect on tax base

Create demand for new governmental services

Population increase or relocation

Comments: Wildcat well. No concerns _____

Remarks or Special Concerns for this site

This will be an 18,913'MD/9,628'TVD single lateral Bakken Formation test well. _____

Summary: Evaluation of Impacts and Cumulative effects

No long term impacts expected from the drilling of this well. Some short term impacts will occur, but will be mitigated in time.

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): /s/Steven Sasaki
(title:) Chief Field Inspector
Date: May 24, 2012
Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website
(Name and Agency)
Water wells in Sheridan County
(subject discussed)
May 24, 2012
(date)

US Fish and Wildlife, Region 6 website
(Name and Agency)
ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES MONTANA COUNTIES, Sheridan County, Montana
(subject discussed)
May 24, 2012

Montana Natural Heritage Program Website
(Name and Agency)
Heritage State Rank= S1, S2, S3, Location T31N R59E
(subject discussed)
May 24, 2012
(date)

If location was inspected before permit approval:
Inspection date: _____
Inspector: _____
Others present during inspection: _____