

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

Operator: Whiting Oil and Gas Corporation
Well Name/Number: Cavanaugh 24-35-1H
Location: SE SW Section 35 T26N R58E
County: Richland, **MT;** **Field (or Wildcat)** W/C (Bakken Horizontal)

Air Quality

(possible concerns)

Long drilling time: No, 30 to 40 days drilling time.

Unusually deep drilling (high horsepower rig): No, triple derrick drilling rig to drill a single lateral Bakken Formation horizontal well test to 20,354'MD/10,134'TVD.

Possible H2S gas production: H2S gas production possibility is slight (Mississippian Formations).

In/near Class I air quality area: No Class I air quality area in the area of review.

Air quality permit for flaring/venting (if productive): Yes, DEQ air quality permit required under rule 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 – using triple derrick drilling rig to drill a single lateral Bakken Formation horizontal well test to 20,354'MD/10,134'TVD. If existing pipeline for gas in the area, gas can be gathered or if no gathering system nearby, gas can be flared under Board Rule 36.22.1220.

Water Quality

(possible concerns)

Salt/oil based mud: Yes, oil based invert drilling fluids will be used on the mainhole. The horizontal lateral will be drilled with brine water. The surface hole will be drilled with freshwater and freshwater drilling fluids.

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

Surface drainage leads to live water: No, nearest drainage is Buckley Creek, about 1/16 of a mile to the northeast from this location.

Water well contamination: None, closest water wells are about 1/2 of a mile to the southwest, about 1/2 of a mile to the southeast, about 7/8 of a mile to the northwest and all other water wells are 1 mile and further from this location. Depth of these domestic and stock water wells range from 61' to 300'. Surface casing hole will be drilled with freshwater and freshwater drilling fluids. Surface casing will be run and cemented to surface from 2000'.

Porous/permeable soils: No, sandy clay soils.

Class I stream drainage: No Class I stream drainages in the area of review.

Mitigation:

- Lined reserve pit
- Adequate surface casing
- Berms/dykes, re-routed drainage
- Closed mud system
- Off-site disposal of solids/liquids (in approved facility)

X Other: Semi-closed loop mud system, utilizing a lined cuttings pit for burial of drill cuttings on the wellsite.

Comments: 2000' of surface casing cemented to surface adequate to protect freshwater zones and to cover the base of the Fox Hills Formation.

Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: No, stream crossings anticipated.

High erosion potential: Yes, small cut, up to 2.8' and small fill, up to 2.1', required.

Loss of soil productivity: None, location to be restored after drilling well, if well is nonproductive. If productive unused portion of drillsite will be reclaimed.

Unusually large wellsite: No, a very large wellsite, 510'X425' location size required to accommodate four (4) locations, Cavanaugh 24-35-1H, Cavanaugh 24-35-2H, Cavanaugh 24-35-3H and Cavanaugh 24-35-4H

Damage to improvements: No surface use is cultivated land.

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 to location will be over existing county road, #338. An access of 3518' will be built off the county road into this location. Oil based invert drilling fluids will be recycled. Completion fluids will be hauled to an authorized Class II Disposal. Drilling cuttings and mud solids will be fly ashed in the lined pit and buried with subsoil cover. No special concerns.

Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Nearest residences are about 1 mile to the south, about 1 mile to the southeast and about 1.125 miles to the northwest from the location.

Possibility of H2S: H2S potential is slight (Mississippian Formations).

Size of rig/length of drilling time: Triple drilling rig/short 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: Adequate surface casing and operational BOP should mitigate any problems. No concerns.

Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): None identified.
Proximity to recreation sites: None identified.
Creation of new access to wildlife habitat: None
Conflict with game range/refuge management: None
Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Lease Tern, Whooping Crane and Piping Plover. Candidate species are the Greater Sage Grouse and the Sprague's Pipit. MTFWP Natural Heritage Tracker website lists two (2) species of concern. They are the Whooping Crane and the Eastern Red Bat. NH Tracker website lists three (3) Potential Species of Concern: Chimney Swift, Eastern-Screech Owl and the Tennessee Warbler

Mitigation:

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

Comments: The surface ownership is private 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: On private cultivated surface 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 desire 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: No concerns.

Remarks or Special Concerns for this site

A single lateral Bakken Formation horizontal well test to 20,354'MD/10,134'TVD. No concerns.

Summary: Evaluation of Impacts and Cumulative effects

No significant 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): \s\ Steven Sasaki _____
(title:) Chief Field Inspector _____
Date: April 21, 2012 _____

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website _____
(Name and Agency)
Water wells in Richland County _____
(subject discussed)
April 21, 2012 _____
(date)

US Fish and Wildlife, Region 6 website _____
(Name and Agency)
ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES _____
MONTANA COUNTIES, Richland County _____
(subject discussed)

April 21, 2012 _____
(date)

Montana Natural Heritage Program Website (FWP) _____
(Name and Agency)
Heritage State Rank= S1, S2, S3, T26N R56E _____
(subject discussed)

April 21, 2012 _____
(date)

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