

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

**Operator:** Whiting Oil and Gas Corporation  
**Well Name/Number:** Sundheim 31-17-1H  
**Location:** NW NE Section 17 T25N 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 well, 21,438'MD/10,421'TVD.

Possible H2S gas production: Yes possible H2S gas, slight chance from 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 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 horizontal Bakken Formation well, 21,438'MD/10,421'TVD. If existing pipeline for gas in the area, associated gas can be gathered or if no gathering system nearby, associated gas can be flared under Board Rule 36.22.1220.

**Water Quality**

(possible concerns)

Salt/oil based mud: Yes, oil based invert mud system will be used for drilling the mainhole (80/20 invert mud) and saltwater for drilling the horizontal lateral. Freshwater and freshwater mud system will be used for drilling the surface hole, Rule 36.22.1001.

High water table: No, no high water table anticipated at this wellsite.

Surface drainage leads to live water: Yes, nearest drainages are unnamed ephemeral tributary drainage to Fourmile Creek, about ¼ of a mile to the west and about ¼ of a mile to the east from this location. A large stock pond is within Fournile Creek, about ¾ of a mile to the northwest from this location.

Water well contamination: None, closest water wells are about 5/8 of a mile to the north, about 5/8 of a mile to the south, about 5/8 of a mile to the southeast, about 7/8 of a mile to the west and about ¾ of a mile to the south from this location. Depth of these stock water wells range from 50' to 290'. Surface hole will be drilled with freshwater and freshwater mud to 2000', Rule 36.22.1001. Steel surface casing will be run and cemented from 2000' to surface.

Porous/permeable soils: No, variable 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)**
- Other: Lined cuttings pit will be utilized for cuttings solidification and burial

on the wellsite.

Comments: 2000' of surface casing cemented to surface adequate to protect freshwater zones and will cover the base of the Fox Hills Formation, Rule 36.22.1001.

### Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: No, stream crossings anticipated.

High erosion potential: Yes possible high erosion on cut and fill slopes, moderate cut, up to 28.9' and moderate fill, up to 23.8', 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 location, 625'X510' location size required for a 5 well location, Sundheim 31-17-1H, Sundheim 44-8-3H, Sundheim 44-8-4H, Sundheim 31-17-2H, Sundheim 31-17-3H and Sundheim 31-17-4H.

Damage to improvements: Slight, surface use is grazing land.

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 to location will be over existing county road, #140. A short access of 262' will be built off the county road into this location. Oil based invert drilling fluids will be recycled. Completion fluids will be hauled to North Dakota to be used on other wells or hauled to a Class II Disposal. Drilling cuttings and mud solids will be fly ashed in the lined cuttings pit and buried with subsoil cover. No special concerns.

### Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: No residences within a 1 mile radius from this location

Possibility of H2S: Slight possibility of H2S from 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 equipment should mitigate any problems. (BOP's 5,000 psig annular, pipe and blind rams) rule 36.22.1014. 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: No  
Conflict with game range/refuge management: No  
Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Least Tern, Whooping Crane and Piping Plover. Candidate species are the Greater Sage Grouse and the Sprague's Pipit. MTFWP Natural Heritage Tracker website indicates three (3) species of concern is Whooping Crane, Northern Redbelly Dace and Iowa Darter.

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

Comments: Private surface grazing lands. There maybe 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 grazing lands. 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.

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**Remarks or Special Concerns for this site**

To drill a wildcat single lateral horizontal Bakken Formation well, 21,438'MD/10,421'TVD.

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**Summary: Evaluation of Impacts and Cumulative effects**

No significant long term impacts expected, some short term impacts will occur.

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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: December 6, 2012

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website  
(Name and Agency)  
Water wells in Richland County  
(subject discussed)  
December 6, 2012  
(date)

US Fish and Wildlife, Region 6 website  
(Name and Agency)  
ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES  
MONTANA COUNTIES, Richland County  
(subject discussed)  
December 6, 2012  
(date)

Montana Natural Heritage Program Website (FWP)  
(Name and Agency)  
Heritage State Rank= S1, S2, S3, T25N R58E  
(subject discussed)  
December 6, 2012  
(date)

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