

## CHECKLIST ENVIRONMENTAL ASSESMENT

**Proposed Action:** Approve Drilling Permit (Form 22)

**Project/Well Name:** Elroy 32-31 #1H

**Operator:** Kraken Operating LLC

**Location:** SW SW Section 33 T26N R59E

**County:** Richland **MT;** **Field (or Wildcat):** Wildcat

**Proposed Project Date:** 10/27/2017

### I. DESCRIPTION OF ACTION

Kraken Operating LLC plans to drill a horizontal oil well in the Bakken Formation 21,280' MD, 10,381' TVD. Two other oil wells will be drilled on this pad, the Elroy 32-31 #1H and the Eagle 4-9 #2H.

### II. PROJECT DEVELOPMENT

#### 1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED

Montana Bureau of Mines and Geology, GWIC website (Richland County Wells).

US Fish and Wildlife, Region 6 website  
ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES MONTANA  
COUNTIES, Richland County

Montana Natural Heritage Program Website (FWP)  
Heritage State Rank= S1, S2, S3, T26N R59E

Montana Cadastral Website  
Surface Ownership and surface use Section 33 T26N R59E

Montana Department of Natural Resources MEPA Submittal

#### 2. ALTERNATIVES CONSIDERED

No Action Alternative: The proposed well would not be drilled.

Action Alternative: Kraken Operating LLC would have permission to drill the well.

### III. IMPACTS ON THE PHYSICAL ENVIRONMENT

#### 3. AIR QUALITY

Long drilling time: 25-35 days drilling time.

Unusually deep drilling (high horsepower rig): Triple derrick drilling rig to drill a single lateral horizontal Bakken Formation test, 21,280' MD/10,381' TVD.

Possible H<sub>2</sub>S gas production: Yes, slight H<sub>2</sub>S possible from Mississippian Formations.

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

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

Comments: No special concerns – using triple derrick rig to drill to 21,280' MD/10,381' TVD. If there isn't any gas gathering systems nearby, associated gas can be flared under Board Rule 36.22.1220.

#### 4. WATER QUALITY

Salt/oil based mud: Yes, will drill with oil based invert drilling fluids for the intermediate casing hole. Horizontal hole will be drilled with saltwater. Surface casing hole will be drilled with freshwater and freshwater mud system, Rule 36.22.1001.

High water table: No high water table anticipated at this surface location.

Surface drainage leads to live water: No, closest drainage is an unnamed ephemeral drainage to Fourmile Creek, about 1/2 of a mile to the west from this drilling location. The Missouri River is about 3.25 miles to the northeast from this location.

Water well contamination: None, surface hole will be drilled with freshwater and freshwater drilling fluids to 1,800', steel surface casing will be run and cemented to surface from 1,800' to protect any ground and surface waters. Closest water wells from this location are about 1/10 of a mile to the south, 3/5 of a mile to the southwest, 7/10 of a mile to the southwest, 9/10 of a mile to the south, and 1 mile to the southwest. Depths of these wells range from 110'-260'. This proposed oil well will be drilled with freshwater and freshwater mud to 1,800' and steel surface casing will be run and cemented to surface to protect groundwater.

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

Class I stream drainage: Closest Class I stream drainage is the Missouri River, about 3.25 miles to the north from this location.

Groundwater vulnerability area: NA.

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: Steel surface casing will be run and cemented to surface to protect ground water. (Rule 36.22.1001).

## 5. SOILS/VEGETATION/LAND USE

Vegetation: Grassland.

Stream crossings: No stream crossings anticipated. Crossing only ephemeral drainages over existing county roads.

High erosion potential: Possible high erosion potential on moderate cut and small fill slopes, a large cut of up to 27.4' and a moderate fill of up to 11.5', required.

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

Unusually large wellsite (Describe dimensions): A large well site 500'X400' required for a three well pad, The Eagle 4-9 #2H, Fletch 5-8 #1H, and the Elroy 32-31 #1H.

Damage to improvements: Slight surface use appears to be mix of cultivated and grass lands.

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

Access Road: Access will be over existing county road, #142. A new access of 528' will be built into location.

Drilling fluids/solids: A closed loop system will be used for this well. The liquids will be hauled to a commercial disposal site and disposed. The cuttings will also be hauled to a commercial disposal site and disposed.

## 6. HEALTH HAZARDS/NOISE

Proximity to public facilities/residences: No residences within a 1 mile radius.

Possibility of H2S: Yes, slight from Mississippian Formations.

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

Mitigation:

Proper BOP equipment (Adequate surface casing cemented to surface, Rule 36.22.1001, with working BOP stack should mitigate any problems, (5,000 psig annular and double ram), Rule 36.22.1014.)

- Topographic sound barriers
- H2S contingency and/or evacuation plan

- Special equipment/procedures requirements
- Other:

## 7. WILDLIFE/RECREATION

Sage Grouse: NA

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, Piping Plover, and the Northern Long-eared Bat. The Montana Natural Heritage Program lists fifteen (15) species of concern: Great Blue Heron, Piping Plover, Black-billed Cuckoo, Whooping Crane, Red-headed Woodpecker, Least Tern, Northern Redbelly Dace, Blue Sucker, Iowa Darter, Shortnose Gar, Sturgeon Chub, Sicklefin Chub, Paddlefish, Sauger, Pallid Sturgeon.

Mitigation:

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

Comments: Private cultivated surface lands. 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. No concerns.

## IV. IMPACTS ON THE HUMAN POPULATION

### 8. HISTORICAL/CULTURAL/PALEONTOLOGICAL

Proximity to known sites: None identified.

Mitigation

- avoidance (topographic tolerance, location exception)
- other agency review (SHPO, DNRC Trust Lands, federal agencies)

Other:

**9. SOCIAL/ECONOMIC**

Substantial effect on tax base

Create demand for new governmental services

Population increase or relocation

Comments: No concerns.

**IV. SUMMARY**

No long term impacts expected. Some short term impacts will occur, but can be mitigated.

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.

**EA Checklist  
Prepared By:**

**Name:** John Gizicki

**Date:** 06/29/17

**Title:** Compliance Specialist