Montana Board of Oil and Gas Conservation
Environmental Assessment

Proposed Action: Approve Drilling Permit (Form 22)
Operator: VECTA Oil and Gas
Well Name/Number: Bow Echo 44-30
Location: SE SE Section 30 T8N R31E
County: Musselshell**, MT; Field (or Wildcat)** Wildcat

Air Quality

(possible concerns)
Long drilling time: No, 12 to 15 days drilling time.
Unusually deep drilling (high horsepower rig): No, a double or small triple drilling rig to drill to a 6996' TD vertical Amsden Formation well test.
Possible H2S gas production: Slight H2S possible.
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 75-2-211.

Mitigation:
X Air quality permit (AQB review)
__ Gas plants/pipelines available for sour gas
__ Special equipment/procedures requirements
__ Other:_____

Comments: No special concerns – using a double or small triple drilling rig to drill a vertical Amsden Formation well test. No gas gathering system exists in this area. Associated sweet gas and H2S gas in limited volumes can be flared under Board Rule 36.22.1220, if no gathering systems are in close proximity to this well.

Water Quality

(possible concerns)

Salt/oil based mud: No, surface hole will be drilled with freshwater. Main hole will be drilled with freshwater and freshwater drilling mud system.
High water table: No high water table in the area of review.
Surface drainage leads to live water: Yes, closest drainage is an unnamed ephemeral tributary drainage to Weed Creek, about 270' to the north. Weed Creek is located about 3/10 of a mile to the north.
Water well contamination: No. Closest water wells are 9/10 of a mile to the northeast, 4/5 of a mile to the northeast, 7/10 of a mile to the northwest, about ½ of a mile to the southwest, two wells 9/10 of a mile to the southeast, and 9/10 of a mile to the south. Depths of these wells range from 85' to 530'. This well will drill and set 8 5/8" surface casing to 600' and cement to surface. Well will be drill with freshwater based drilling fluids from base of surface casing to TD. If productive, 5 ½" production casing will be run and cemented.
Porous/permeable soils: No, silty "Gumbo" clay soils.
Class I stream drainage: No Class I stream drainages.

Mitigation:
_ Lined reserve pit

_X_ Adequate surface casing
__ Berms/dykes, re-routed drainage
_X_ Closed mud system
_X_ Off-site disposal of solids/**liquids** (in approved facility)
_X_ Other: _Drill cuttings will be solidified and buried in the lined cuttings pit. Cuttings pit will be closed when dry.
Comments: _Freshwater mud system to be used on surface hole. freshwater mud system will be used out from under surface casing to 6996' TD. Fluids in the lined reserve pit will be trucked to a permitted Class II Disposal. The cuttings pit will be allowed to dry and then it will be buried.

Soils/Vegetation/Land Use

(possible concerns)
Steam crossings: _No live water stream crossings. Crossing only ephemeral drainages.
High erosion potential: _No, small cut up to 5.1 and moderate fill up to 12.0' 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: _No, a average location, 250X250' size required.
Damage to improvements: _Slight, surface use is grass and sagebrush grazing land.
Conflict with existing land use/values: _Slight
Mitigation
__ Avoid improvements (topographic tolerance)
__ Exception location requested
_X_ Stockpile topsoil
__ Stream Crossing Permit (other agency review)
_X_ Reclaim unused part of wellsite if productive
__ Special construction methods to enhance reclamation
__ Other:
Comments: _Access will be from existing county road, S Musselshell Rd. About 8,599' feet of new road will be constructed into this location. Freshwater drill cuttings and solids will be buried in the lined cuttings pit.

Health Hazards/Noise

(possible concerns)
Proximity to public facilities/residences: _Closest residence is about 1 mile to the south-southeast from this location. The town of Musselshell, Montana is about 12 miles to the northwest from this location.
Possibility of H2S: slight chance of H2S.
Size of rig/length of drilling time: Triple derrick drilling rig, about 10 to 15 days drilling time.
Mitigation:
_X_Proper BOP equipment
__ Topographic sound barriers
__ H2S contingency and/or evacuation plan
__ Special equipment/procedures requirements
__ Other:_____
Comments: _Operational BOP and adequate surface casing should mitigate any problems. (BOP's 3,000 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: Threatened or endangered species identified in this county is the Black-Footed Ferret. Candidate species are the Greater Sage-Grouse and Sprague's Pipit. NH tracker website lists three (3) "Species of Concern." They are The Black-tailed Prairie Dog, Hoary Bat and Little Brown Myotis.

Mitigation:

__ Avoidance (topographic tolerance/exception)

__ Other agency review (DFWP, federal agencies, DSL)

__ Screening/fencing of pits, drillsite

__ Other:_____

Comments: Private surface grazing land. There may be species of concern that could be 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 management authority 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 land. There could 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: Well is a wildcat, unless/until production is established, no social or economic impact is likely.

Remarks or Special Concerns for this site

Well is a 6996' TD vertical Amsden Formation well test.

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): /s/ John Gizicki
(title:) Compliance Specialist
Date: December 18, 2014

Other Persons Contacted:

Montana Bureau of Mines and Geology GWIC website
(Name and Agency)
Musselshell County water wells
(subject discussed)
December 18, 2014
(date)

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

December 18, 2014
(date)

Montana Natural Heritage Program Website (FWP)
(Name and Agency)
T8N R31E
(subject discussed)

December 18, 2014
(date)

Montana Cadastral Website
(Name and Agency)
Surface Ownership and surface use Section 30 T8N R31E
(subject discussed)

December 18, 2014 (date)

If location was inspected before permit approval:
Inspection date: _____

Inspector: __ _____
Others present during inspection: __ _____