

Sensitive Area Determination Checklist

WPX Energy Rocky Mountain, LLC		
Person(s) conducting inspection	Jennifer Belcastro	01/22/13
	<i>Environmental Scientist</i>	
Site Information		
Location:	Beaver Creek 11-7-793 Frac Pad	Time: 13:15
Type of Facility:	Proposed Frac Pad	
Environmental Conditions	Sunny; ground covered with 2 feet of snow	
in some areas.		
Temperature (°F)	37°F	

Has the proposed, new or existing location been designated as a sensitive area?

Yes No

SURFACE WATER

1. Are there any surface water features or SWSAs adjacent to or within ¼ mile of the proposed/new or existing facility?

Yes No

If yes, list type of surface water feature(s), i.e. rivers, creeks, streams, seeps, springs, wetlands: There are two USGS identified unnamed intermittent drainages and the Beaver Creek SWSA.

If yes, describe location relative to facility: One of the unnamed USGS identified intermittent drainages is located 872 feet to the northeast and the second is located 1,137 feet to the west of the proposed facility. The proposed facility also lies within the External Buffer Zone of the Beaver Creek SWSA.

2. Could a potential release from the facility reach surface water features?

Yes No

If yes, describe the pathway a release from the facility would likely follow to determine if the potential to impact surface water is high or low.

3. Is the potential to impact surface water from a facility release high or low?

High Low

GROUNDWATER

1. Will the proposed/new or existing facility have any pits which will contain hydrocarbons and chlorides or other E&P wastes?
 Yes No
 If yes, List the pit type(s): Multi-Well Pit

2. Is the site of the proposed facility underlain by an unconfined aquifer or recharge zone?
 Yes No

3. Is the hydraulic conductivity of the underlying soil or geologic material $\leq 1.0 \times 10^{-7}$ cm/sec?
 Yes No

4. Is the proposed facility located within 1/8 mile of a domestic water well or 1/4 mile of a public water supply well which would use the same aquifer?
 Yes No

5. Is the proposed facility located within a 100 year floodplain?
 Yes (*Sensitive Area*) No (*If no, proceed to question #6.*)

6. Is the depth to groundwater known?
 Yes (*If yes, follow instructions provided in 5(a) of this section.*)
 No (*If no, follow instructions provided in 5(b) of this section.*)
 - (a) If yes, could a potential release from the proposed facility reach groundwater?
 Yes No
 If yes, explain:

 - (b) If no:
 - (i) Evaluate surrounding soils, topography, and vegetation which may suggest the presence of shallow groundwater.
 - (ii) Gather information from surrounding well data in order to determine a depth to groundwater, i.e. State Engineers Office.
 - (iii) Drill a soil boring to determine depth to groundwater or
 - (iv) Model hydro geologic conditions to determine if the potential to impact groundwater is high or low.

7. Is the potential to impact ground water from the facility in the event of a release high or low?
 High Low

Additional Comments:

As stated in the surface water section of this sensitive area determination, there are two USGS identified unnamed intermittent drainages located 872 feet northeast and 1,137 feet northwest of the proposed facility. The facility, as it is currently proposed, limits the direction of a potential release to primarily the northwestern side. If a potential release were to migrate off the facility, flow would be to the northwest following the natural contours of the area directly towards the RU 11-7 well pad and then the heavily vegetated area to the northwest of the pad. Due to the existing RU 11-7 pad, the heavily vegetated area between the pad and the main access road, and pipeline ROW, it is not anticipated a potential release would impact the unnamed intermittent drainages to the west of the proposed facility. It is not anticipated the drainage located to the northeast of the facility would be impacted due to the fact flow would be parallel to the drainage and any flow would most likely infiltrate into the underlying soil before it could reach the drainage due to the conditions noted above. During construction, it is recommended that Best Management Practices (BMPs) be installed in the form of an earthen perimeter berm along the graded edge and diversion ditch along the toe of the fill slope sides of the facility. The BMPs should be monitored and maintained to ensure site containment in the event of a release. In addition, consideration should be given in regards to upgrading the stormwater BMPs on the RU 11-7 pad further lessening any potential impacts to the unnamed intermittent drainage.

The State Engineer's Office and USGS records were reviewed and records were revealed which would provide additional information pertaining to the depth to groundwater. The vegetative cover in the immediate vicinity of the facility, Piñon-juniper woodland and sage brush steppe, does not suggest the presence of shallow groundwater. Therefore, the potential to impact groundwater has been deemed low. Although it can be presumed the depth to groundwater is greater than 40 feet, the greatest potential for impacts to groundwater would be from a release which occurred over a longer period of time such as a leaking pit which the proposed facility will have. It would be recommended the multi-well pit be lined per COGCC Rule 904 and hydrostatically tested with fresh water prior to the placement of any completion fluids in it. This will ensure there are no potential impacts to groundwater.

Based on the information collected during the site visit and desk top review, the potential to impact any flowing surface water has been deemed low. The potential to impact groundwater has been deemed low as well. However, the facility is located within the external buffer zone of the Beaver Creek SWSA. By rule, SWSAs are considered to be in sensitive areas even of the potential for impacts to both surface water and groundwater are low. With the proposed facility being located within the SWSA, it should be classified as being in a sensitive area.

Inspector Signature(s): Mark E. Mumby Date: 1/29/2013

Mark E. Mumby, *Project Manager/RPG*
HRL Compliance Solutions, Inc.

Jennifer Belcastro Date: 01/22/2013

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