

Sensitive Area Determination Checklist

WPX Energy Rocky Mountain, LLC (WPX)		
Person(s) Conducting Field Inspection	Finn Whiting	03/21/2014
	Geologist	
Site Information		
Location:	RMV 20-35	Time: 10:00
Type of Facility:	Existing Well Pad Expansion	
Environmental Conditions	Sunny, dry ground conditions, light southern breeze.	
Temperature (°F)	~50°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: One (1) unnamed USGS identified intermittent drainage and Porcupine Creek, a USGS identified perennial stream.

If yes, describe location relative to facility: The unnamed USGS identified intermittent drainage is located approximately 422 feet to the northeast of the existing facility center. Porcupine Creek is located 540 feet to the southwest of the existing facility.

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. If a potential release were to migrate off the northeast side, flow would be to the northeast following the natural topography of the area towards the unnamed USGS identified intermittent drainage. If a potential release were to migrate off of the northwest or southwest sides of the facility it would follow natural topography to the southwest towards Porcupine Creek.

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

☒ High to actual surface water features ☒ Moderate to actual flowing surface water

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): Cuttings Trench

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 6(a) of this section.*)
☒ No (*If no, follow instructions provided in 6(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.

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 is one (1) unnamed USGS identified intermittent drainage located 422 feet to the northeast and Porcupine Creek, a USGS identified perennial stream located 540 feet to the southwest of the existing facility. The facility, as it is proposed to be expanded, limits the direction of a potential release to the northeastern, northwestern, and southwestern sides of the facility. If a potential release were to migrate off of the northeastern side, flow would be to the northeast following the natural contours of the area towards the unnamed intermittent drainage. If a potential release were to migrate of the northwestern or southwestern sides, flow would be to the southwest into a relatively flat lying area. The release would then have to migrate approximately 450 feet prior to encountering a steep, heavily vegetated hillside where it would have to flow an additional 250 feet to impact Porcupine Creek. In order to reduce the potential for impacts to both drainages, Best Management Practices (BMPs) should be installed, during facility expansion, in the form of an earthen perimeter berm on the graded edge of the fills slope sides (northeastern, northwestern and southwestern sides). If feasible a diversion ditch should be constructed along the toe of the fill slope sides as well. Consideration should also be given to constructing a bar ditch along the access road to prevent a potential release from crossing the access road thus preventing flow from reaching Porcupine creek. All installed BMPs should be monitored and maintained to ensure site containment in the event of a release.


The State Engineer's Office and USGS records were reviewed and it was revealed that there is one permitted monitoring well within a quarter mile of the facility. The depth to groundwater is 85 feet. Although the depth to water is noted to be 85 feet the screened interval of the well is greater than 100 feet suggesting the water bearing zone of the well is in excess of 100 feet. Therefore it could be assumed that the depth to groundwater in the immediate vicinity of the facility is in excess of 100 feet. In addition, the vegetative cover in the immediate vicinity of the facility, sage, juniper, rabbit brush, and bunch grass, does not suggest the presence of shallow groundwater above 100 feet. Although the depth to groundwater is noted to be 85 feet or greater, the cuttings trench should be closely monitored to ensure no other materials, especially liquids, are placed into it to eliminate any potential impact to groundwater.

Based on the information collected during the site investigation and desktop review, the greatest potential for impacts would be to Porcupine Creek. As noted above, Porcupine Creek is located 540 feet to the southwest of the facility. It is a perennial stream and was flowing during the time of inspection. If a large sustained release were to migrate off the facility, it could potentially reach and impact Porcupine Creek. If the above recommended BMP's are installed during facility expansion, the potential to impact Porcupine Creek would be substantially reduced. The same would apply to the unnamed intermittent drainage to the northeast of the existing facility. Although the potential for impacts to this drainage feature would be deemed to be high it is not anticipated that a potential release, if it were to impact this drainage, would ever reach any flowing surface water. The drainage in the immediate vicinity of the facility exhibits ephemeral

characteristics such as no ordinary high water mark and a vegetated bottom indicating flow does not occur a majority of the time. In addition, the distance a release would have to migrate in order to impact any flowing surface water (> 2 miles) and the fact it would tend to infiltrate into the channel bottom soils which have a moderate to high infiltration rate and would prevent a potential release from migrating a large distance. Based on the topographic setting of the location, the information obtained from the State Engineer's office, and the vegetative cover, the potential to impact groundwater would be deemed to be low. However, with the potential to impact actual flowing surface water and surface water features being deemed moderate to high, the facility should be designated as being in a sensitive area.

Inspector Signature(s):  Date: 4/3/2014

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

 Date: 03/21/2014

Finn Whiting, *Geologist*
HRL Compliance Solutions, Inc.