

Sensitive Area Determination Checklist

WPX Energy Rocky Mountain, LLC (WPX)		
Person(s) Conducting Field Inspection	Alexander Nees	Drafted: 07-22-13 Revised: 03-26-14
	<i>Environmental Scientist</i>	
Site Information		
Location:	MV 34-5	Time: 12:40 PM
Type of Facility:	Proposed well pad expansion	
Environmental Conditions	Sunny, scattered clouds, gentle breeze.	
	Dry surface; heavy localized rains in area 4-5 days prior	
Temperature (°F)	90	

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

Yes No

SURFACE WATER

- 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, one (1) unnamed non-USGS intermittent drainage identified during the site visit, and Riley Gulch, a USGS identified intermittent drainage.

If yes, describe location relative to facility: One (1) unnamed USGS identified intermittent drainage is located 842 feet to the northeast; One (1) unnamed non-USGS intermittent drainage is located 470 feet to the northeast; Riley Gulch a USGS identified intermittent drainage is located 412 feet to the southeast of the existing facility.

- 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 facility, flow would be to the south down the access road or southeast down the pad fill slope towards Riley Gulch. A release could potentially migrate northeast off the pad and enter the unnamed non-USGS intermittent drainage, then travel down channel to Riley Gulch.

3. Is the potential to impact surface water from a facility release high or low?
- High to surface water features
 - High 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 Cuttings will be managed on the pad surface.
 If yes, List the pit type(s):

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 portion of this sensitive area determination, there is one (1) unnamed USGS identified intermittent drainage, one (1) unnamed non-USGS identified intermittent drainage, and Riley Gulch a USGS identified intermittent drainage all within a ¼ mile of the proposed facility. The facility, as it is currently constructed and proposed to be expanded, limits the direction of a potential release to the southern and northeastern sides and the southwestern corner. If a potential release were to migrate off the facility, flow would be to the southeast down the access road or the pad fill slope directly towards Riley Gulch. A release, if it were to migrate off the northeastern side, could potentially flow towards and enter the unnamed non-USGS ephemeral drainage, then travel down channel to Riley Gulch. Topographical barriers prevent any potential release from reaching the unnamed USGS identified intermittent drainage 842 feet to the northeast. During facility expansion, Best Management Practices (BMPs) should be installed in the form of an earthen perimeter berm along the graded edge of all fill slope sides. If feasible, a diversion ditch should be constructed along the toe of all fill slope sides as well. All BMPs on this facility should be designed with the intent to retain any release on the pad surface to the extent possible, rather than allowing it to drain downslope towards Riley Gulch. 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 revealed no water wells are located within a ¼ mile of the proposed facility. The nearest permitted water well (permit number 26068) is located 9,147 feet (1.73 miles) northeast of the facility. The depth to groundwater is noted to be 14 feet. It is located in the Parachute Creek alluvial deposits and is approximately 580 feet lower in elevation than that of the existing facility. There are no other wells in sufficient proximity to the location which would provide a more accurate estimation of the depth to groundwater. The channel of Riley Gulch is also approximately 160 feet below the facility surface. Therefore it could be assumed that groundwater, if present, in the immediate vicinity of the proposed facility expansion would be greater than 160 feet. The seeps at the Green River/Wasatch contact suggest that the majority of subsurface water generated by the surrounding uplands is discharged to the surface at an elevation higher than that of the existing facility. This is reinforced by the lack of any hydrophytic vegetation beyond the seeps and the channel of Riley Gulch. The slopes surrounding the pad location display pinyon-juniper woodland vegetation typical of the mesic uplands in this region, and the steep topography will encourage surface runoff of any release, rather than pooling and soil infiltration. All these factors suggest that the potential for impacts to groundwater are low.

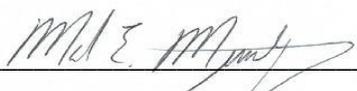
However, topography and vegetation suggest that groundwater is likely to be more than 100 feet below the pad surface.

Based on the information collected during the site visit and desktop review, the greatest potential for impacts would be to Riley Gulch and the unnamed non-USGS identified intermittent

drainage located to the northeast of the facility. By COGCC decision the close proximity of both drainages would classify the facility as being in a sensitive area. In addition, due to the steep topography in the immediate vicinity of the facility, a release if it were to migrate off the above mentioned sides has the potential to quickly flow down the steep slope to enter Riley Gulch. If a release were to impact Riley Gulch, it would be highly likely to encounter surface water upon reaching Riley Gulch. Riley Gulch is identified by USGS hydrographic surveys as an intermittent drainage; however the upper reaches adjacent to this location display vegetation more typical of a perennial water course, with significant in-channel flow present in mid-summer at the time of this site visit and riparian vegetation dominated by narrow leaf cottonwood (*Populus angustifolia*).

The unnamed non-USGS identified intermittent drainage to the northeast of the pad also displays characteristics of seasonal surface water flow, the source for which appears to be a collection of seeps that occur at the contact between the Green River and Wasatch formations. This geologic contact is located upslope from the facility. The seep discharge collects in the unnamed non-USGS identified drainage and is diverted around the north edge of the pad by the bermed cut slope. Immediately north of the pad there are pooling areas that were dry at the time of this inspection, but contained significant riparian vegetation, including Fremont cottonwood (*Populus fremontii*), box elder (*Acer negundo* var. *interius*), tamarisk (*Tamarix* spp.) and willows (*Salix* spp.). If a release were to impact this drainage during periods of flow, it would discharge directly into Riley Gulch.

Due to the steep topography surrounding the facility, the close proximity of Riley Gulch and the unnamed intermittent drainage there is a significant potential for impacts to surface waters from any release at this location. With the high potential for impacts to actual flowing surface water, the facility should be designated as being in a sensitive area.

Inspector Signature(s):  Date: 4/5/2014

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

 Date: 3/26/2014

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