

Sensitive Area Determination Checklist

WPX Energy Rocky Mountain, LLC (WPX)		
Person(s) Conducting Field Inspection	Finn Whiting Geologist	10/16/2013
Site Information		
Location:	PA 11-35 Frac Pad	Time: 0800
Type of Facility:	Existing Well Pad/Proposed Frac Pad	
Environmental Conditions	Clear Skies, Sunny, Dry soil conditions	
Temperature (°F)	50°	

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: Two (2) unnamed USGS identified intermittent drainages. Two (2) unnamed non-USGS identified ephemeral drainages.

If yes, describe location relative to facility: One (1) unnamed USGS identified intermittent drainage is located 969 feet to the east; one (1) unnamed USGS identified intermittent drainage is located 853 feet to the northwest; one (1) unnamed non-USGS identified ephemeral drainage is located 420ft east of the pad center; and one (1) unnamed non-USGS identified ephemeral drainage located adjacent to the southwest corner of the existing/proposed 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. A potential release, if it were to migrate off the facility would tend to flow to the southwest into a relatively flat lying area or enter the non-USGS identified ephemeral drainage adjacent to the southwestern corner of the facility.

3. Is the potential to impact surface water features from a facility release high or low?
- ☒ High to actual surface water features ☒ Low 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, fluids will be managed on the 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 are two (2) unnamed USGS identified intermittent drainages and two unnamed non-USGS identified ephemeral drainages within a ¼ mile of the existing/proposed facility. The facility as it is currently constructed and proposed to be expanded, limits the direction of a potential release to the southwestern side and corner. If a potential release were to migrate off of the facility on the southwestern side, flow would be to the southwest into a flat lying area. If a potential release were to migrate off the southwest corner flow would be directly towards the unnamed intermittent drainage. It is not anticipated that a potential release would impact the USGS identified intermittent drainage located 969 feet to the east as it is separated from the facility by the non-USGS identified ephemeral drainage located 420 feet to the east. In addition, it is not anticipated that the non-USGS identified ephemeral drainage would be impacted by a potential release as it is separated from the facility by a slight rise in the topography which would prevent flow from reaching this drainage feature. During facility expansion, it is recommended that Best Management Practices (BMPs) be installed along the graded edge of the fill slope sides (southwestern side and corner) in the form of an earthen perimeter berm. In addition a diversion ditch should be constructed along the toe of the same fill slope sides. Construction of the diversion ditch would greatly aid in reducing any potential impacts to the unnamed ephemeral drainage located adjacent to the southwestern corner. All BMPs should be monitored and maintained to ensure site containment the event of a potential release.

The State Engineer's Office and USGS records were reviewed and no records were revealed which indicate a depth to ground water in close proximity to the facility. The topography of the area slopes to the south and southwest and is dominated by typical upland xeric vegetation (sage brush, oak brush, & bunch grasses). The facility is situated on a small flat lying mesa at an elevation approximately 200 feet above the Colorado River terrace located to the south. Therefore it could be assumed that the depth to groundwater is most likely greater than 200 feet if present at all as the underlying bedrock (Wasatch Fm.) appears to be devoid of any groundwater due to the lack of any seeps or springs on the hillside located to the south of the facility.

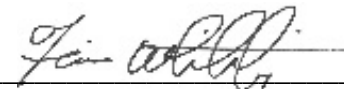
Based on the information collected during the site visit and desktop review, the greatest potential for impacts from a potential release would be to the non-USGS identified ephemeral drainage located adjacent to the southwestern corner of the existing/proposed facility. A potential release, if it were to impact this drainage, would migrate to the southwest where it would encounter several straw bale check dams and most likely infiltrate into the channel bottom soils before flowing off the edge of the mesa. If a potential release were large enough to migrate through all of the check dams and flow off the edge of the mesa, it would then flow into the unnamed USGS identified intermittent drainage located approximately 853 feet to the west of the facility. From there, flow would migrate down the unnamed intermittent drainage into a large catchment basin located at the bottom of the mesa. Flow from a potential release of the southwestern side of the

facility would tend to infiltrate into the relatively flat lying area to the southwest. Even if flow migrated over the edge of the mesa edge it would dissipate and infiltrate into the flat lying soils at the base of the mesa.

Based on the topographical setting of the existing/proposed facility the potential to impact groundwater has been deemed to be low. Although the potential to impact actual surface water features has been deemed to be high, the potential to impact any actual flowing surface water (Colorado River) would be deemed to be very low due to the man-made modifications to the land surface beneath the mesa on which the facility is located. With the potential for impacts to groundwater and actual flowing surface water being deemed as low, the existing/proposed facility can be designated as being on a non-sensitive area.

Inspector Signature(s):  Date: 10/18/2013

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

Inspector Signature(s):  Date: 10/16/2013

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