Sensitive Area Determination Checklist

WPX Energy Rocky Mountain, LLC (WPX)			
Person(s) Conducting Field Inspection		Finn Whiting	05/22/14
		Geologist	
Site Information			
Location:	MV 11-11		Time: 11:15
Type of Facility:	Existing Facility w/ Proposed Expansion		
Environmental Conditions	Sunny, Dry ground conditions.		
Temperature (°F)	71		

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: Three (3) unnamed USGS identified intermittent drainages and one (1) non-USGS identified ephemeral drainage identified during the site visit.

   If yes, describe location relative to facility: One (1) USGS identified intermittent drainage is located 390 feet to the east; one (1) USGS identified intermittent drainage is located 895 feet to the northwest; one (1) USGS identified intermittent drainage is located 925 feet southeast, and the non-USGS identified ephemeral drainage is located 270 feet to the 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. A potential release, if it were to migrate off site, would flow to the north northwest into the unnamed non-USGS identified ephemeral drainage or to the east into the USGS identified intermittent drainage located 390 feet to the southeast.

3. Is the potential to impact surface water from a facility release high or low?
   4. ☒ High to surface water features ☒ Low to actual flowing surface water

WPXENERGY

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 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 $\leq 1.0x10^{-7}$ 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 three (3) unnamed USGS identified intermittent drainages and one (1) non-USGS identified ephemeral drainage located within ¼ mile of the proposed facility. The facility as it is currently constructed and proposed to be expanded is situated on top of a fairly narrow ridgeline which limits the direction of a potential release to the northern, eastern and western sides. If a potential release were to migrate off of the facility, flow would follow the natural topography down the sides of the ridgeline where it would impact either the unnamed non-USGS identified ephemeral drainage to the west or the unnamed USGS identified intermittent drainage 390 feet to the east of the existing facility. All stormwater which enters the pad from the southern cut slope side is diverted by a ditch to the northwest and southeast sides where catchment basins have been constructed with enclosed pipe outflows. The piping diverts all stormwater to the drainage bottoms without causing erosion on the facility sides. The two USGS identified intermittent drainages located 925 feet to the east and 895 feet to the west would not be impacted by any potential release as they are separated from the facility by natural topographic highs.

During facility expansion, Best Management Practices (BMPs) should be installed in the form of an earthen perimeter berm along the graded edge on all fill slope sides. An elevated water bar should be constructed across the facility entrance as well. If feasible, the diversion ditch should be expanded to encompass the entire perimeter of the pad with the exception of the access road to prevent stormwater run-on/erosion and to further contain a potential release. In addition, they will greatly aid in slowing/mitigating the migration of any potential release, if it were to migrate off the facility, from reaching the drainages on the western and eastern sides of the facility. 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 no records were revealed which provide additional information pertaining to the depth to groundwater. The topography of the general area slopes generally to the northeast, although there is significant topographical variation on a local scale. The vegetation is dominated by xeric species typical of the elevation and location, including sagebrush, juniper, and cheatgrass. There are no occurrences of hydrophytic vegetation that would suggest the presence of shallow groundwater or anything other than occasional ephemeral surface flow. The channels of all the above noted drainages displayed similar vegetation to the upland areas, indicating that they only carry surface water originating from elevated topography to the southwest during precipitation events and none appear to have any connection to more permanent sources of groundwater. In addition, the geologic setting of the facility suggests that the depth to bedrock (Wasatch Fm.) is very shallow. Due to the high shale content of the Wasatch, in the immediate area, it tends to be devoid of groundwater. Therefore it could be assumed that groundwater, if present, would be at a depth greater than 100 feet, making the potential for impacts to groundwater very low.

Based on the information collected during the site visit and desktop review, the potential to impact groundwater has been deemed as being low as noted above. The greatest potential for impacts is to the drainages located to the east and west of the facility. By COGCC decision the close proximity to these drainages would classify the pad as being in a sensitive area. However both drainages exhibit more ephemeral characteristics including xeric vegetation in the drainage bottoms and woody debris as noted above. It is not anticipated that a potential release, if it were to impact these drainage features would migrate any great distance due to the high infiltration rates of the channel bottom soils. In addition, the distance a potential release would have to migrate to impact any flowing surface water is in excess of 3,000 feet. Although impacts to these drainages may be considered high it is unlikely that a potential release if it were to migrate offsite would ever reach actual flowing surface water. With the potential for impacts to groundwater and actual flowing surface water being deemed as low, the facility can be designated as being in a non-sensitive area.

Inspector Signature(s): _____ Date:

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

Inspector Signature(s): _____ Date: 05/23/2014

Finn Whiting, *Geologist / Environmental Inspector*
HRL Compliance Solutions, Inc.