Sensitive Area Determination Checklist

Williams Production RMT Company			
Person(s) Conducting Field Inspection	Ashlee Lane *Biologist*	10/6/10	
Site Information			
Location:	BCU 12-31-198	Time: 1200	
Type of Facility:	Proposed Well Pad		
Environmental Conditions	Clear and calm		
Temperature (°F)	80°		

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: Two USGS identified unnamed intermittent drainages tributary to Barcus Creek, and one unnamed ephemeral drainage.

   If yes, describe location relative to facility: The first USGS identified unnamed intermittent drainage is located 542 feet to the west and the second USGS identified intermittent drainage is located 1,157 feet to the east of the proposed facility. The third unnamed ephemeral drainage is located approximately 360 feet to the east of the proposed 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 the facility would tend to flow to the east or west following the natural topographical contours of the area.

3. Is the potential to impact surface water from a facility release high or low?
   ☒ High to actual surface water features ☒ Low to any 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): Drilling 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 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 are two USGS indentified unnamed intermittent drainages, and one unnamed ephemeral drainage that was identified during the site investigation. The facility, as it is currently proposed, would limit flow direction primarily to the east and west. The unnamed intermittent drainage to the west could potentially be impacted by a release off the west side of the proposed facility due to the relative close proximity of the facility, the lack of a thick vegetative cover, and the relative steepness of the hillside above the drainage. Although identified on the USGS topographic maps as intermittent; the drainage to the west exhibits ephemeral characteristics in the immediate vicinity of the proposed facility. The lack of a well defined ordinary high water mark (OHMW) and a vegetated bottom suggests that the drainage does not flow a majority of the time. The USGS identified unnamed intermittent drainage to the east would not be impacted by a potential release from the facility due to the presence of ridge located between the drainage itself and the proposed facility. The unnamed ephemeral identified during the site investigation is located approximately 360 feet to the east of the proposed facility and could be impacted by a potential release if it were to migrate off the east side of the proposed facility. By COGCC decision this would classify the proposed facility as being in a sensitive area. However no OHWM was identified during the site investigation and the drainage had a vegetated bottom indicating flow does not occur in this drainage a majority of the time as well. Although this drainage is tributary to the unnamed USGS indentified intermittent drainage to the east of the facility; it is not anticipated that a release, if it were to impact this drainage, would reach the unnamed USGS drainage due to the distance the release would have to flow (over 1,800 feet), the vegetated bottom, and high infiltration rates of the soils in the bottom of the drainage itself. When constructed, Best Management Practices (BMP's) should be installed along the entire perimeter of the facility in the form of a perimeter berm on the facility itself and a diversion ditch along any fill slopes of the facility, especially on the east and west sides. These should be monitored and maintained to ensure site containment. With the installation of the recommended BMP's, the potential to impact the above noted drainages would be considerably lower.

The State Engineer's Office and USGS records were reviewed and no records were revealed that 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 does not suggest the presence of shallow groundwater. The facility resides in the Uintah formation, which like the Green River Formation, tends to be fractured both vertically and horizontally which allows fluids to migrate in the subsurface over large distances. Based on the topographical setting of the facility, it is not anticipated that an overland release would impact groundwater due to the short duration time involved and the fact it would spread out over a large area. The greatest potential for impact to groundwater, if present, would be from a release that occurred over a longer period of time such as a leaking pit. However to lessen any potential to impact groundwater, it would be highly recommended that the pit be lined in accordance to COGCC criteria and tested prior to placement of any materials into it.

Based on the information collected during the site investigation and desktop review, the potential to impact actual surface water features has been deemed to be moderate to high. However the potential to impact any live surface water (Barcus Creek if flowing) is deemed to be low due to the distance a potential release would have to migrate (~2.2 miles) to impact this drainage. Based on the topographical setting of the proposed facility the potential to impact ground water has been deemed low as well. Therefore the facility can be designated as being in a non-sensitive area.

Inspector Signature(s): _____ Date: 10/16/2010

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

_____ Date: 10/11/2010

Ashlee Lane, *Biologist*
HRL Compliance Solutions, Inc.