Sensitive Area Determination Checklist

Williams Production RMT Company			
Person(s) Conducting Field Inspection	Jennifer Belcastro *Environmental Scientist*	12/02/11	
Site Information			
Location:	Spruce Creek	Time: 1300	
Type of Facility:	Proposed Production Pit		
Environmental Conditions	Overcast with frozen ground conditions.		
Temperature (°F)	41°		

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.

   If yes, describe location relative to facility: One unnamed USGS identified intermittent drainage is located 911 feet northwest and two USGS identified intermittent drainages are located 395 and 1,000 feet respectively to the east southeast of the 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.

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

   ☒ Low ☐ High

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): Production 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 $\leq 1.0x10^{-7}$ 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 section of this sensitive area determination, there are three USGS identified unnamed intermittent drainages within a quarter (1/4) mile of the proposed facility. The greatest potential for impact to surface water features is to the unnamed intermittent drainage located 395 feet to the east southeast of the proposed facility. By COGCC decision this would classify the facility as being in a sensitive area. However, the facility as it is currently proposed, limits the direction of a potential release to the northern side. If a release were to migrate off the facility it would tend to flow to the north northeast following the natural contours of the area. Flow would tend to be parallel to the unnamed intermittent drainage. In addition, the drainage itself has a poorly defined channel and has a fairly heavily vegetated bottom indicating it does not flow a majority of the time. It is not anticipated that the drainage to the northwest would be impacted by a potential release from the facility. As stated above, flow would be parallel to the drainage and a majority of impact would be limited to the open field to the north. The second unnamed intermittent drainage to the east southeast of the proposed facility would not be impacted by any potential release. A ridgeline separates this drainage from the facility thus preventing any potential release from impacting it. It is strongly recommended that Best Management Practices (BMPs) be installed along the fill slope edges of the proposed facility. BMPs in the form of an earthen perimeter berm should be installed along the edge of the proposed facility and a diversion ditch should be constructed along the toe of the fill slope to contain any fluids that could potentially migrate off site. These should be monitored and maintained to ensure sight containment in the event of a potential release.

The State Engineers office and USGS records were reviewed and it was revealed that there is one (1) permitted water well located 263 feet northeast of the facility. Based on its location, it appears the well is utilized for providing water to livestock. The depth to groundwater in the well is 176 feet. The vegetative cover in the immediate vicinity of the proposed facility did not suggest the presence of shallow groundwater. No seeps or springs were identified during the site investigation.

Based on the information collected during the site investigation and desktop review, the potential to impact surface water features has been deemed low. Although the permitted water well is located 263 to the northeast of the proposed facility, the depth to groundwater is fairly deep and it is not anticipated that it will be impacted by the proposed facility. An overland release would not impact the well due to the short duration of time involved and the fact it would tend to spread out over a large area based on the topography of the area. The greatest potential for impact to the well would be from a release that occurred over a longer period of time such as a leaking pit. Therefore, the proposed pit on this location should be constructed and lined as outlined in COGCC rule 904. The pit should also be hydro tested for a minimum of 72 hours before any production liquids are placed into it. It would also be recommended that a baseline water quality sample be collected from the well prior to filling the pit. In addition, periodic monitoring of the well should be conducted to ensure that no fluids from the proposed facility are impacting

groundwater. With the potential to impact both surface and groundwater deemed to be low, and if the above recommendations are implemented, the facility can be designated as being located in a non-sensitive area.

Inspector Signature(s): _____ Date: 12/05/2011

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

_____ Date: 12/02/2011

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