

Sensitive Area Determination Checklist

Williams Production RMT Company		
Person(s) Conducting Field Inspection	Ashlee Lane	12/3/10
	Biologist	
Site Information		
Location:	Mautz Ranch	Time: 1200
Type of Facility:	Proposed Multi-Well Pit	
Environmental Conditions	Clear and breezy; snow patches in the area; soils saturated.	
Temperature (°F)	50s	

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: Ryan Gulch, a spring fed intermittent stream tributary to Piceance Creek and two unnamed irrigation ditches. In addition two springs were identified within the quarter mile buffer zone and are addressed in the additional comments section of this sensitive area determination checklist.

If yes, describe location relative to facility: Ryan Gulch is located 1,061 feet from the center of the proposed facility. The northern most irrigation ditch is located 843 feet from the proposed facility and the southernmost irrigation ditch is located approximately 1,200 feet from the 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 proposed facility would tend to flow to the southeast following the natural topographic contours of the area.

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

☐ High

☒ Low

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): Multi-Well 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:

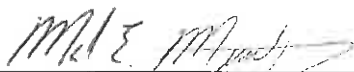
As stated in the surface water section of this sensitive area determination the northern most irrigation ditch is located 843 feet to the south of the proposed facility; there is no surface hydraulic connectivity to Ryan Gulch. Ryan Gulch, in the immediate vicinity south of the proposed facility, is identified as an intermittent stream based on the fairly well defined channel, providing evidence to support that the stream flows during certain times of the year. The southernmost irrigation ditch is located south of Ryan Gulch and flows parallel to Ryan Gulch for some distance. The facility as it is currently proposed, limits flow directions of a potential release to the southwestern and southeastern edges. If a potential release were to migrate off the facility on the southwestern or southeastern edges it would flow down the gently sloping hillside towards the northern most unnamed irrigation ditch. The greatest potential for impact would be if the irrigation ditch was flowing water. Impacts from a release could then potentially impact the irrigated fields in the immediate vicinity of the proposed facility. Therefore, the potential to impact Ryan Gulch is fairly low since any potential release would be diverted by the above mentioned irrigation ditch. Ryan Gulch could be potentially impacted by a very large release which would allow the irrigation ditch to overflow and allow fluids to migrate towards Ryan Gulch. It is not anticipated that the unnamed irrigation ditch south of Ryan Gulch would be impacted since any potential release would be captured by the irrigation ditch to the north and Ryan Gulch. It would be highly recommended that Best Management Practices (BMPs) be installed in the form of a perimeter berm on the northwestern, southwestern, and southeastern edges of the proposed facility and a diversion ditch along any fill slopes, especially on the southwestern and southeastern sides. It would also be recommended that BMPs be installed along the road as well where the access road to the facility intersects Ryan Gulch. These BMPs should be closely 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 that one application was submitted to the State Engineer's Office for a monitoring well approximately 1,250 feet to the northeast of the proposed facility. The records indicate that the well was never drilled. The vegetative cover in the immediate vicinity of the facility (service berry, oak brush, and sage brush) does not suggest the presence of shallow groundwater. However, the vegetative cover in the alluvial valley (Ryan Gulch) south of the facility does suggest the presence of shallow groundwater. It is not anticipated that the two springs identified on the USGS map and confirmed during the site visit would be impacted by a potential release from the proposed facility. The first spring is located approximately 1,247 feet to the southwest and is upgradient of the proposed facility. The second spring is located approximately 1,153 feet to the southeast of the proposed facility. Based on the topographical location of this spring, it appears that the water source for this spring is originating from the south and would not be impacted by a release from the proposed facility.

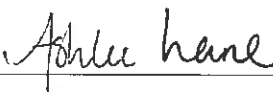
The proposed facility will be constructed in the Uintah formation. The Uintah in the immediate vicinity appears to be in a shaley section of the formation based on observations from the site

visit. Shaley sections of the Uintah Formation, like the Green River Formation, tend 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 proposed facility, a portion of the facility may intersect this shaley section. In addition, portions of the facility may reside in the alluvial fan sediments of the small valley which could potentially be hydraulically connected to the alluvial fill associated with the Ryan Gulch alluvium (floodplain). Therefore it is possible that an overland release could impact shallow groundwater which may be present south of the proposed facility due to the high to very high infiltration rates of the underlying soil. There is also the potential for impact to shallow groundwater from a release that occurred over a longer period of time such as a leaking pit. In either case 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 or surface waters has been deemed low mainly due to the very high infiltration rates of the underlying soil and the diversionary structures. The greatest potential for impacts from the facility is to shallow groundwater due to the geologic conditions in the area. With the potential to impact shallow groundwater, the facility should be designated as being in a sensitive area.

Inspector Signature(s):  Date: 12/8/2010

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

 Date: 12/7/2010

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