

**COGCC FORM 15
EARTHEN PIT PERMIT
SUPPLEMENTAL INFORMATION**

**Pit Name – GGU Miller 11D
Location ID: 335427**

Vanguard Operating, LLC (Operator Number 10531)

March, 2017

This supplement to the COGCC Form 15 for Vanguard Operating, LLC's (VNR) proposed multi-well pit provides additional information required by COGCC Rules 902, 903, and 904. This information is identified in the following sections by reference to the applicable section of these Rules. The design and operation of this proposed pit is described in detail below.

This pit will be a component of VNR's water management and reuse system. This pit is not used for the disposal of water. This pit will be used to store produced and flow-back water for the reuse in well completions throughout VNR's operations. Wells that could contribute produced or flowback water to this pit could come from any location throughout VNR's operations and the source(s) of this water varies depending upon current operations. Water will be transported to the pit via pipelines from producing well sites and flow-back of completed wells. The water will be stored in the pit and then transported to other well sites for completions via pipeline. The daily inflow and outflow of water varies depending upon water needs throughout the system.

When the water managed with this pit is no longer needed for reuse, the water is piped to one of VNR's injection well facilities for disposal. Currently, VNR has four injection wells that could be used for the disposal of this water:

- GGU Rodreick (Facility 159176)
- Specialty 13A-28-692 SWD (Facility 159212)
- Circle B Land 33A-35-692 (Facility 159277)
- Scott 41D-36-692 SWD (Facility 159159)

A topographic map with the pit location is included in Figure 1.

902.a.

This pit has been designed with features to prevent spills or leaks from impacting the environment. The implementation of VNR's Stormwater Management Plan, CDPS General Permit COR-03000(Certification Number COR-039752; Attachment A) and the operational policies and procedures described in this supplement are designed to minimize risk to the environment and accommodate rapid response in the event of an accidental spill or release of fluids. All transfers of water into and out of the pit are monitored by personnel during the entire transfer operation to ensure adequate freeboard (minimum of 2 feet) is maintained in the pit at all times. VNR has a spill response trailer staged at a location near all of our operations to facilitate response to any spills that may occur. The double lined pit will be installed with a leak detection system and this system will be checked at least once per week. In the event that a leak is detected, the pit will be drained as quickly as possible so that the source of the leak can be determined.

902.b.

This pit has been designed to provide a minimum of two (2) feet of freeboard at all times. Pit design, cross section details, and calculation details are included in Attachment B. Monitoring and maintaining free board is addressed above under Rule 902.a. Spills and releases will be reported in accordance with Rule 906.

902.c.

The pit will be checked by VNR staff or contractor at least twice each day and any accumulation of oil will be removed immediately by skimming.

902.d.

The pit has been designed with a fence in accordance with recommendations of CDOW and COGCC to prevent wildlife from entering.

902.e.

The Miller 11D pit will be constructed for use in the completion of wells drilled on adjacent locations and is thus being permitted as a multi-well pit. This pit will be used for a period of no more than three years.

902.h.

All produced water that will be stored in the pit is first treated by a 3-phase separator on the producing well and then cascaded through production tanks to give retention time for removal of additional sediment and hydrocarbons.

902.i.

The pit will be treated with biocide as necessary to control bacterial growth and related odors.

903.a.(4)

This supplemental information is being submitted with the COGCC Form 15 for a multi-well pit that is used to recycle and reuse produced water or completion fluids.

903.d.

Instructions contained in the COGCC Appendix 1 were used as a guide in the Form 15.

904.a.(5)

The multi-well pit will be lined in accordance with Rule 904. The materials being used are described in Rule 904.c below.

904.b.(1)

The liners being used in the construction of the pit are synthetic and impervious materials that have a high puncture and tear strength, and adequate elongation. The liners are resistant to deterioration by ultraviolet light, weathering, hydrocarbons, aqueous acids, alkali, fungi or other substances. Details and specifications of the materials to be used have been included in Attachment C.

904.b.(2)

The pit liners will be constructed, installed, and maintained in accordance with the manufacturers' specification and the pit has been designed with good engineering practices. Installation details have been included in Attachment C.

904.b.(3)

Field seams will be installed and tested in accordance with manufacturer specifications and good engineering practices. Test results will be maintained at VNR's Silt office and will be provided to the Director upon request.

904.c

The pit foundation will be compacted native soil free of sharp rocks. A 6 oz. double sided Geo composite will line 100% of the pit from anchor ditch to anchor ditch. Installed over this base Geo composite will be a 30 mil anti-skid secondary liner, an additional layer of 6oz. double sided Geo composite will line the floor of the pit and runners will extend to the anchor ditch. A 30 mil XR5 liner will then be used as the primary liner. The anchor ditch will be a minimum of 12 inches deep.

904.e.

Since the facility is within Elk and Mule deer concentration area, it is considered to be in a sensitive area. All material used in the determination are included in Attachment D. The pit will be fenced in accordance with the recommendations of the Colorado Division of Parks and Wildlife, specifically –

1. Minimum 7 foot perimeter fence constructed of wire mesh.
2. Installation of chicken wire around the lower portion of the fence to prevent small mammals from entering the pit with about 1 foot of the wire buried under ground.
3. Installation of netting, as necessary, to prevent a loss of waterfowl.

The pit will be double lined and constructed as described above in 904.c and include a leak detection system. The pit has been designed with features that significantly reduce the potential for the facility to impact nearby surface and ground water.