

June 14, 2021



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Robert M. Henry, PE Water system HBH Consulting Engineers, Inc. Via Email

Re: Well, UV and Rainwater Treatment (PR#140-2020) Gran Moraine Winery (PWS ID#95573) Conditional Approval

Dear Rob:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the revised project for Gran Moraine Winery. On February 10, 2021, our office received a narrative, plans, land use compatibility statement, and sample results. A plan review fee of \$825 was previously submitted.

The project includes two separate phases of work. The first phase includes a well (Well ID YAMH55206, L92925), drilled to a depth of 232 feet in May 2008. This well may produce enough water such that the winery will no longer need to haul water. A vineyard appears to be located within 100' sanitary setback for the well.

This phase also includes the replacement of the existing UV system with a Viqua Pro24-186 system. This UV system has a maximum allowable flowrate of 24 gpm and a required minimum intensity/dose of 186 mW/cm².

If the well does not produce enough water to serve the winery, then the second phase of the project will include a rainwater collection and surface water treatment system, including a 1,000 gallon concrete tank for collection, a 24,555 gallon tank for rainwater storage and a Harmsco Hurricane Muni 40 MP cartridge system. After the cartridge system, the water would be treated with the Viqua UV system installed in the first phase.

Since rainwater is considered surface water, under the second phase the water system would be required to meet 3-log Giardia removal/inactivation, 2-log cryptosporidium removal and 4-log viral inactivation. The Harmsco Hurricane Muni 40 MP cartridge system (when used with an approved main filter) is credited with 2.5-log removal of Giardia and 2.0-log removal of Cryptosporidium. The Viqua Pro24-186 is credited with 5.5-log inactivation of Giardia, 5.5-log inactivation of Cryptosporidium and 4-log inactivation of viruses.

At this time, neither phase includes chlorine, which is acceptable to DWS as long as the water system has no persistent coliform issues in the source or distribution.

Note that DWS can issue one conditional approval letter and one final approval letter under this plan review fee. If the water system chooses to close out the project after the first phase and not proceed to the second phase, the water system would need to pay an additional plan review fee in the future if the items in phase 2 are installed.

A regional geologist reviewed the well log construction details and noted the following:

- The well is cased to a depth of 29 feet and the casing is sealed to a depth of 28 feet. The casing seal is completed 9 feet into a sedimentary bedrock of low permeability that overlies the aquifer.
- The well likely draws water from fractures within a confined sedimentary bedrock aquifer of moderate depth. Water was first encountered at a depth of 72 feet with the water-bearing zone reported as extending from that depth to a depth of 212 feet. The aquifer is overlain by 53 feet of sandstone that acts as a confining layer. Water in the aquifer is under pressure, rising 45 feet above the aquifer to a depth of 27 feet below ground level.
- Results from a sensitivity analysis suggest that both the well and the aquifer are not sensitive to nearby land use practices, provided that nitrate concentrations are less than 5 mg/L.

The plans for the first phase are approved with the following conditions:

Well

- Piping arrangements must include provisions for pumping the total flow from the well to waste.
- A method of determining the total output of the well must be provided (typically a flowmeter is used for this purpose).
- The pitless adapter cap must be vented.

- An arsenic sample result must be submitted. This must be taken from the well head raw water sample tap. If the water system already has a result from this well for arsenic, that may be submitted instead.
- Because the well is properly constructed in a confined aquifer, a waiver is possible for any chemical usage within the 100' radius of the well. If chemicals are used on the vineyard within the 100' radius, then please submit a construction standard waiver request.

UV System for first phase using groundwater only

Note that with solely the use of the groundwater well, disinfection with UV light is not required and the requirements for the UV system are different than using UV light for the rainwater system.

- The unit must have a fixed flowrate control set at no more than 24 gpm.
- The UV lamps must be isolated from direct contact with water (lamps must be sleeved).
- There must be visual verification of the operation of the lamps, such as an indicator light.
- The UV lamps must be removable.
- The unit must be accessible for cleaning and replacement of lamp sleeves and sensor.
- There must be no bypass around the UV unity.

The plans for the second phase are approved with the following conditions:

Well

• The well must be protected by a backflow device or equivalent protection.

Roof catchment system

• Roof material must meet NSF Standard P151or equivalent.

UV System for second phase using surface water

- The units must have an automatic water flow shut-off if the intensity/dose drops below 186 mJ/cm².
- Flow restrictors or alternatives must be installed to assure that the max allowable flow rate of 24 gpm is not exceeded.
- Visual verification of the operations of the lamps is required (generally an indicator light or a SCADA display).
- A bypass around the UV system may not be installed (none were noted on plans).
- After installation is complete, performance testing of the UV units must be completed to

verify the ability to accurately measure UV, intensity and flowrate.

• After installation is complete, the ability to calculate/totalize the volume of the off-spec water produced must be determined, particularly during power quality sags.

Cartridge filtration system:

- Please clarify if the Harmsco HC/40-LT2 main filters will be used with the Hurricane Muni 40 MP housing.
- Flow restrictors or alternatives must be installed to assure that the max allowable flow rate is not exceeded.
- Filters must be changed per manufacturer's recommendation (this should be included in an operations and maintenance manual).
- A pilot study must be conducted when using cartridge filtration. The pilot study is required to identify any operational issues such as plugging of the prefilters. Pilot study protocol must be approved in advance. Parameters include (but are not limited to) raw turbidity, filtered turbidity and amount of filtration time for filter to reach maximum pressure drop of 30 psi. After the pilot study protocol is approved and prior to final approval of this project, results of a completed small scale, filter-to-waste pilot study must be submitted. If the system chooses, a full-scale study during the initial operation period may be approved as an alternative to the small scale, filter-to-waste study.

Until we receive verification that the conditions have been met and final approval has been issued, the facility is not approved for use. Upon completion of the project, the engineer must verify in writing that construction was completed according to the submitted plans. If substantial changes are made, a set of as-built drawings must be submitted. Documentation demonstrating how the above conditions were met should reference Plan Review #140-2020 and can be emailed to me at Carrie.L.Gentry@dhsoha.state.or.us or mailed to:

> Attn: Carrie Gentry OHA-Oregon Drinking Water Services PO Box 14450 Portland, OR 97293-0450

If you have any questions, please feel free to call me at (971) 201-9794.

Sincerely,

City

Carrie Gentry, PE Regional Engineer Drinking Water Services

ec: Nicole Alfafara, OHA/DWS Sarah Schwab, REHS, Oregon Department of Agriculture Kevin Johnston, Gran Moraine Winery Susanne Zechiel, Gran Moraine Winery