

April 23, 2025

Eric Vortriede
London Water Co-Op
72743 Shoestring Rd
Cottage Grove, OR 97424

**Re: Water Treatment Plant Replacement (PR#26-2025)
London Water Co-Op (PWS ID#00239)
Conditional Approval**

Dear Eric Vortriede:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the water treatment plant replacement for London Water Co-Op. On February 28, 2025, our office received engineered plans and specifications and a plan review fee of \$825.

The project will install a 35 gpm package water treatment plant including cartridge pre-filtration, followed by a Harmsco HC/90-LT2 filter, ultraviolet (UV) disinfection provided by two Viqua Pro24-186 reactors in series, and sodium hypochlorite for residual maintenance. The maximum flowrate through the UV equipment is limited to 24 gpm. One 32-gallon steel pressure tank and two 10,000-gallon polypropylene finished water storage tanks will also be installed.

The plans are approved subject to the following conditions:

UV Disinfection:

- The UV reactor was validated using the set-point dose at a UV Transmittance (UVT) of 70% to 99%. Take UVT samples now to assure the UV reactor will be valid for your water system. (More about UVT below)
 - Attached are two graphs, one titled Operating Diagram – Viqua Pro24-186 and one titled Dose Curves that together depict the “Operating Range” for which this UV system was validated and is provided for its proper use. Use this to track volumes of off-specification (off-spec) water. For instance, at 20 gpm, the intensity must be at least 15 mA and the UVT must exceed 90% to achieve

appropriate pathogen inactivation; otherwise, the water produced is considered to be off-spec. Since London relies on UV to treat viral as well as Giardia/Crypto inactivation, 0% of water produced is allowed to be off-spec every month. This includes during warm-up if water is being sent to the finished water tank.

- Assure ability to calculate and totalize off-spec water volume produced, particularly during power sags.
- An automatic water flow shut-off must be included that triggers if UV dose drops below 186 mJ/cm².
- A flow restrictor or alternative must be included to ensure the maximum allowable flow rate of 24 gpm is not exceeded.
- Sample tap must be provided upstream of the UV reactors for UVT sampling.

Pathogen Inactivation Credits

The UV treatment will be granted the following log inactivation credits:

- According to the UV validation report, the Viqua Pro24-186 reactors have been verified to provide the following inactivation credits by OHA-DWS as long as the UV reactors are operated within the operation diagram's boundaries:

<u>Pathogen</u>	<u>log-inactivation credit</u>
<i>Giardia lamblia</i>	5.5+
<i>Cryptosporidium parvum</i>	5.5+
Virus	4.0

- While your water system achieves *Giardia lamblia*, *Cryptosporidium sp.*, and virus inactivation compliance with the two UV reactors in series, we still require a detectable chlorine residual in the distribution. Additionally, at least 0.2 mg/L chlorine is required at the entry point.

Cartridge Filtration

- Pressure gauges must be installed before and after each cartridge filter. There must be a pressure gauge immediately before the Harmsco HC/90-LT2 filter to allow for accurate monitoring of pressure differential.
- A pilot study shall be conducted by the water supplier to demonstrate the effectiveness of any filtration method other than conventional filtration. Pilot study protocol shall be approved in advance by the Authority. Results of the pilot study shall be submitted to the Authority for review and approval. In lieu of a pilot study, the

new Harmsco cartridge filter can show compliance with the Surface Water Treatment Rule for 12 consecutive months from the date of installation prior to being granted Final Approval by DWS.

Disinfection Residual Maintenance

- A sample tap shall be provided before disinfectant application.
- Provisions shall be made to alert the water supplier before the chlorine supply is exhausted. This requirement can be satisfied by either installing a low-level alarm or by creating a written procedure to check the tank daily.
- The disinfectant must be applied in proportion to water flow.
- The 009M2QT reduced pressure backflow preventor in the plans does not meet the lead standard for potable water. Select a different backflow assembly for the chlorine injection line that meets the potable standards.

Finished Water Storage

- A fence or other method of vandal deterrence shall be provided around finished water storage reservoirs.
- An access manhole shall be provided to permit entry to the interior for cleaning and maintenance. When the access manhole is on the roof of the reservoir there shall be a curbing around the opening and a lockable watertight cover that overlaps the curbing.
- Internal ladders of durable material shall be provided where the only access manhole is located on the roof. This condition can be satisfied if a removable external ladder is available on site.
- Screened vents shall be provided above the highest water level to permit circulation of air above the water in finished water storage reservoirs.
- The outlet ends of the drain and overflow lines shall be fitted with angle-flap valves or equivalent protection.
- Following installation of finished water reservoirs and tanks, disinfection by chlorination shall be accomplished according to AWWA Standard C652. The reservoir or tank shall be drained after the prescribed contact period and refilled with potable water, and a sample taken for microbiological analysis.
- Pressure tanks for finished water shall be provided with a drain, a pressure gauge, an air blow-off valve, means for adding air and pressure switches for controlling the operation of the pump(s).

In addition to the above conditions, I have the following comments and recommendations:

- To avoid purchasing an inappropriate or ineffective reactor, it is strongly recommended to collect UVT data before purchasing a reactor.
- Testing equipment must be provided to determine the chlorine residual. The equipment must be a DPD-test kit or other EPA approved method of testing.

Until we receive verification that the conditions have been met and final approval has been issued, the replacement water treatment plant 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 # 26-2025 and can be emailed to me at baxter.call@oha.oregon.gov.

If you have any questions, please feel free to email me or call me at 541-393-4374.

Sincerely,



Baxter Call, PE
Regional Engineer
Drinking Water Services

CC: Julie Wray, DWS
Nicholas Alviani, REHS, OHA/DWS
Tyler Duncan, PE, RH2 Engineering, Inc.

Enc: Viqua Pro24-186 "Operating Range" Diagrams
Monthly Reporting Form
Sensor Calibration Form (Not required to report to DWS)
UVDGM Section 6.1.5 excerpt describing performance testing and off-spec reporting