

9 September 2025

Greg Benthin
City of Gates
101 Sorbin Avenue West
Gates, OR 97346

sent only via email

Re: Membrane Filter Replacement (PR# 100-2025)
City of Gates (WS ID# 00317)
Conditional Approval

Dear Mr. Benthin:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the water treatment plant for City of Gates. On 5 September 2025, our office received plans for replacing the filter in the existing water treatment plant, and a plan review fee of \$825.

The project includes replacing the old filters with new slightly different filters, replacing the ZW1000 v3 with the ZW1000 CPx filters. Both filters' challenge studies have been verified because the "CPx" filters are also known as "v4," according to Veolia's product manager, Anita Victory, on 5 September 2025.

The plans are approved subject to the following conditions:

- All wetted parts must conform to NSF standard 61, or equivalent certification.
- All chemicals must conform to NSF standard 60, or equivalent certification.

MEMBRANE FILTER CONDITIONS {-0050(4)(C)(G)}

- Direct Integrity Testing (DIT) parameters will need to be verified and programmed into the PLC/SCADA system. These parameters include:
 - An ongoing **log removal value (LRV_{ambient})** reflective of particle and pathogen removal in the 3 micron or less size range that is calculated every 15 minutes based on current ambient operating conditions and the most recent DIT result. In summary, LRV_{ambient} is the performance indicator used to demonstrate the

minimum 4.0-log (99.99%) *Cryptosporidium* removal that the membrane filters have been credited with.

- A **maximum pressure decay rate (PDR_{max})**, which will be set no higher than the number codified in the final approval letter after City of Gates meets the conditions in this letter and provides more parameters for monitoring membrane performance.

The PDR_{max} [expressed as psi/min] is an air leakage rate in the membrane that, if exceeded, will indicate a failure of the DIT and prompt an automatic shut-down of the filtration skid.

- Indirect Integrity Testing must be performed by continuously monitoring turbidity after each membrane skid. If turbidity readings are above 0.15 NTU for more than 15 minutes, the skid must immediately be taken off-line and a DIT performed.
- An operations and maintenance manual must be developed to include a diagnosis and repair plan to maintain the ability to remove pathogens.

The Removal LRCs granted in the final approval letter later are only valid provided operations are within the limits shown on the first page of Appendix A – Explanation of Operating Limits and Terms. Ensure SCADA/PLC programming accounts for the operating limits in Appendix A (e.g., set system alarms to ensure operating limits are met). **Some of the limits in Table A are yet to be determined today as indicated by “TBD” and must be established prior to final approval.**

To remain in compliance, $LRV_{ambient}$ values displayed in SCADA should be calculated using the formulae and variables shown in the membrane supplier’s calculations. Display those equations for the operator to see on the SCADA screen.

Additional information on the $LRV_{ambient}$ calculations, and its use as a compliance parameter are included in **Appendix B – Demonstrating Compliance and Performance Using $LRV_{ambient}$.**

Until we receive verification that the conditions have been met and final approval has been issued, the membrane filtration 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 # 100-2025 and can be emailed to me, peter.r.farrelly@oha.oregon.gov & cc:d to [Chantal Wikstrom](#).

If you have any questions, please feel free to email me or call me at 971.201.6428.
Chantal can be reached at 971.666.8512.

Sincerely,



Pete Farrelly, PE
Regional Engineer
Drinking Water Services

cc:

[Chantal Wikstrom](#), OHA/DWS
[Paula Villarreal](#), PE, Keller Associates
[Sarah Rote](#), EI, Keller Associates

enc:

App. A – Membrane Filters – Explanation of Operating Limits and Terms
App. B – SCADA Req'ts – Demonstrating Compliance & Performance with LRV_{ambient}

Membrane reporting form ([pdf](#) | [xlsx](#))