



September 16, 2024

Jason Canady
City of Grants Pass
101 NW A Street
Grants Pass, OR 97526

**Re: City of Grants Pass (PWS ID# 00342)
Membrane Filtration Treatment Plant – PR# 92-2024
Conditional Approval**

Dear Jason:

Thank you for submitting information regarding the new membrane water treatment plant for the City of Grants Pass. On July 16, 2024, we received the water treatment plant technical specifications plan set. On August 5, 2024, we received the membrane manufacturer's mechanical submittal package. A plan review fee payment in the amount of \$3,300 was also received. The project was assigned plan review (PR) #92-2024.

The project involves construction of a new 22.5 million-gallon per day (MGD) water treatment facility, and pipeline connections to existing raw water and finished water infrastructure. The new treatment plant will have five ultrafiltration skids, each skid will contain 92 filter modules:

Toray HFUG-2020AN - 460 total modules.

Additionally, a 1.0 million-gallon baffled concrete clearwell will be constructed to provide disinfection contact time, and a finished water pumping station consisting of three 350 HP VFD pumps will be included. The plans include piping connections and space for installation of one additional ultrafiltration skid and one additional finished water pump in the future. This plan review covers the treatment plant as detailed in the submitted plans, future additions or modifications will require approval through a separate plan review process.

The plans are approved with the following conditions:

Finished Water Storage Tank

1. A flow meter is required on the effluent line of the clearwell, prior to any diversions or additions of flow.
2. Disinfection of the reservoir prior to use must be accomplished according to AWWA

Standard C652.

- a. Coliform bacteria sample results must be submitted after disinfection of the reservoir is complete.

Membrane Filtration Processes

1. Direct Integrity Testing (DIT) Parameters will need to be verified and programmed into the PLC/SCADA system. These parameters include:
 - a. 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 direct integrity test 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.
 - b. A **maximum pressure decay rate (PDR_{max})**, which is set no higher than 0.048 psi/_{min} that indicates a failure of the direct integrity test and prompts an automatic shut-down of the filtration skid.
2. Indirect Integrity Testing is performed by continuously monitoring individual filter effluent (IFE) turbidity on each membrane unit. If IFE turbidity readings are above 0.15 NTU for a period greater than 15 minutes, the associated membrane unit must immediately be taken off-line and a DIT performed. The attached Turbidity-Triggered DIT form (Appendix A) should be used to record and report such instances.
3. An operations and maintenance manual is developed that includes a diagnosis and repair plan such that the ability to remove pathogens is not compromised.

When final approval is granted, each membrane filter unit will be granted log removal credits (LRCs) for pathogen removal as shown in Table 1. The LRCs are based on a verification of the Challenge Study Report for the Toray HFUG-2020AN membrane modules.

Table 1 – Filter Log Removal Credit (LRC)

Pathogen	Removal Credit (log ₁₀)
<i>Giardia lamblia</i>	4.0
<i>Cryptosporidium sp.</i>	4.0
Viruses	0.0

The LRCs are only valid provided operations are within the limits shown in Appendix B – Explanation of Operating Limits and Terms. Ensure SCADA/PLC programming accounts for the operating limits in Appendix B (e.g. set system alarms to ensure operating limits are met). **Some of the limits in Appendix B are yet to be determined as indicated by “TBD” and will need to be established prior to Final Approval.**

To remain in compliance, $LRV_{ambient}$ must be equal to or greater than the LRC for *Cryptosporidium* shown in Table 1. $LRV_{ambient}$ values displayed in SCADA should be calculated using the formulae and variables shown in the membrane supplier's calculations. Additional information on the $LRV_{ambient}$ calculations, and its use as a compliance parameter are included in Appendix C – Demonstrating Compliance and Performance Using $LRV_{ambient}$.

Thank you for your cooperation during this process and if you have any questions on the information above, or would like this information in an alternate format, please contact me at (541) 393-4374.

Sincerely,



Baxter Call, PE
Regional Engineer
Oregon Health Authority - Drinking Water Services

cc: Jason Canady, City of Grants Pass Public Works Director
File, DWS-Portland
Kent Downs, REHS, DWS-Springfield

Appendix A – Turbidity-Triggered DIT Form
Appendix B – Explanation of Operating Limits and Terms
Appendix C – Demonstrating Compliance and Performance Using $LRV_{ambient}$