

May 9, 2019

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**Re: City of Yamhill (PWS #00968) Water Master Plan (PR #68-2018)
Concurrence and approval of the updated June 2018 Master Plan and April
2019 Water System Master Plan Seismic Addendum**

Dear Mr. Chernishov:

I concur that the *April 2019 Water System Master Plan Seismic Addendum* submitted on behalf of the City of Yamhill to our office on April 16, 2019 meets the seismic assessment and mitigation planning requirements under OAR 333-061-0060(5)(J). I greatly appreciate the effort you and the City put into developing this document to accompany the June 2018 Master Plan reviewed under PR #68-2018. In reviewing the plan, I have the following recommendations:

- 1) Ensure CIP project 3H in any copies of the June 2018 Master Plan is flagged to account a change in pipe material from PVC to more seismically resilient HDPE as per Section 11.6.4 of the Seismic Addendum (Stage 2 Piping on page 11-13).
- 2) Prior to developing the next CIP plan, City planners, engineers, and water system operators should all review the following sections of the Water System Master Plan Seismic Addendum:
 - A. The Mitigation Plan under section 11.5 (pages 11-10),
 - B. Seismic Capital Improvements Plan under section 11.6 (page 11-12), and
 - C. The seismic evaluation findings, recommendations, and project cost estimates prepared by Peterson Structural Engineers in Appendix L as there are some relatively simple steps (some costing less than \$5,000) that can be taken to mitigate risk. Some of these steps include:
 - a. Treatment plant
 - i. Secure chemical storage tanks/barrels (chemicals needed to treat water such as chlorine and coagulant) and loose items stored above cabinets.
 - ii. Investigate and patch water intrusion issues around treatment building skylights.

- iii. Add blocking and clips between framing at interior dividing wall of treatment building where wood trusses meet TJI rafters.
- iv. Have geotechnical engineer determine seismic soil loads for the walls retaining soils on the north side of the sedimentation basin and filters for further seismic evaluation. Retaining walls did not appear to be designed for lateral seismic soil loads and stem and toe reinforcing in the north wall were found to be overstressed in PSE calculations.
- b. 0.5 MG steel tank
 - i. Consider lowering operating level to 13.5-ft in the 0.5 MG steel reservoir (at least during times of seasonally low demand). Reducing operating levels to 13.5-ft or even 14-15-ft or making seismic improvements can reduce damage to the roof due to seismically induced sloshing of water in the tank.
 - ii. Remove anchor chairs and add flexible pipe couplings to reduce damage caused by inadequate anchors.
 - iii. Monitor and repair corrosion.
- c. 0.5 MG round concrete reservoir
 - i. Keep operating level at 16.5-ft or less to reduce slosh damage.
 - ii. Retrofit roof-to-wall connections.
 - iii. Investigate red-tinged efflorescing and staining that could indicate corroding steel reinforcing within the concrete tank walls.
 - iv. Clean the roof and investigate the possibility of a lightweight membrane coating or covering on the roof of the tank to address concerns about ponded water on the roof seeping into the tank. This membrane covering could also be placed in such a way as to re-establish the required roof slope, which has changed due to deflection over the years.
 - v. Evaluate the interior of the tank to seal cracks and to help identify possible seismic retrofits.

Thank you for your patience and cooperation and if you have any questions or concerns, please do not hesitate to contact me at 971-673-0419 or via e-mail at evan.e.hofeld@state.or.us.

Sincerely,



Evan Hofeld, Regional Engineer
Oregon Health Authority – Drinking Water Services

cc: Kenneth Cannaday-Shults, MS, EIT, HBH Consulting Engineers
Richard Howard Sr. – Public Works Superintendent, City of Yamhill
Peter Farrelly, PE – Regional Engineer, OHA-DWS

Background:

May 9, 2018 - The Drinking Water Services (DWS) received a copy of the “April 2018” City of Yamhill Water System Master Plan (HBH Job No. 2017-003, DWS Plan Review #68-2018) and a check for \$4,125 (check #13093) on May 9, 2018. Several revisions were made to the master plan, resulting in an updated “June 2018” master plan received on July 17, 2018. The Master Plan serves as an update to the March 1, 1996 Water Master Plan and May 1998 Water System Master Plan Addendum, and represents a 20-year planning horizon for the City to the year 2037 (2017-2037).

July 18, 2018 – In a letter dated July 18, 2018, the Drinking Water Services (DWS) concurred that the “June 2018” Master Plan received in our office on 7/17/18 met the master plan requirements in Oregon Administrative Rules (OAR) 333-061-0060(5)(A through H), however, the updated plan did not fully address the seismic risk assessment and mitigation planning requirements under -0060(5)(J). Since the seismic components in the Master Plan did not meet these requirements, a scope of work for the seismic risk assessment and mitigation plan was required to be submitted by September 19, 2018 along with a schedule for when the work will be completed.

September 26, 2018 - Based on the enclosed scope of work and the proposed completion date of April 30, 2019 e-mailed to me on September 19, 2018, I issued a letter dated September 26, 2018 approving the scope of work.

April 16, 2019 - On April 16, 2019, I received the *Water System Master Plan Seismic Addendum – April 2019*, which was determined to have met the requirements under OAR 333-061-0060(5)(J), as acknowledged on page 1 of this letter.