

June 16, 2018

Collin Stelzig, PE  
City of Warrenton  
PO Box 250  
Warrenton, OR 97146

800 NE Oregon Street, Ste 640  
Portland, Oregon 97232  
Voice (971) 673-0405  
FAX (971) 673-0694  
TTY (971) 673-0372  
<http://public.health.oregon.gov/PHD/OEPH/DWP/Pages/index.aspx>

**Re: City of Warrenton (PWS #00932) May 2018 Water Master Plan (PR #74-2018)  
Concurrence with Master Plan/Need for Seismic Risk Assessment and Mitigation  
Plan**

Dear Mr. Stelzig:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the May 2018 Water System Master Plan for the City of Warrenton. On May 14, 2018, our office received a copy of the master plan. A plan review fee of \$4,125 was received on May 23, 2018.

The Master Plan represents a 20-year planning horizon out to the year 2037. The plan includes a system description, future demand estimates and CIP project lists with cost estimates. **Upon review of the Master Plan, it appears the criteria listed in Oregon Administrative Rules (OAR) 333-061-0060(5)(A through H) have been met and I concur with these findings.**

As known at the time of submittal, **the plan did not address the requirements of the seismic risk assessment and mitigation plan** set forth in OAR 333-061-0060(5)(J). I have enclosed the specific rule requirement and a frequently asked questions document to provide some clarity on these requirements. **A scope of work for the seismic risk assessment and mitigation plan must be submitted by August 20, 2018 along with a schedule for when the work will be completed.**

Additionally, I have the following comments/recommendations:

- 1) The storage analysis in Section 3.6 did not account for the volume in the 3.5 MG clearwell at the treatment plant needed to meet disinfection contact time requirements. Although there was a 2.23 MG surplus in meeting 2037 needs, I recommended that this storage volume be accounted for in future updates to the master plan.

- 2) The following minor discrepancies were found in reading through the master plan:
- a) The footnote is missing for Table ES-2.
  - b) There is a typo in the 1<sup>st</sup> paragraph of page 1-3 in which it states "...the system one a time setting..." . I believe this should be "...the system on a time setting..."
  - c) There is a typo in the last paragraph of page 2-6 in that treatment plant is spelled "treatemnt".
  - d) There are slight discrepancies in the population figures in Table 2-9, 2-7, 2-8 and the executive summary.
  - e) In Table 3-8, data is missing (the table has blank cells) for years 2022 and 2037.
  - f) There is an incomplete (or extraneous) sentence at the top of page 4-3 which simply states: "systems serving over 10,000 people", but nothing more.
  - g) The estimated population for 2017 was 8,783 in Table 2-10. The 1<sup>st</sup> paragraph in the executive summary on page ES-1 indicates a population of 9,000. Page 5-1 indicates a population of 9,080 people. It is assumed that the 8,783 is correct, since the other populations are used in general system descriptions.
  - h) Section 5.3 on page 5-1 indicates an average day demand (ADD) of 1.2 MGD, maximum day demand (MDD) of 2.5 MGD, and peak hour demand (PHD) of 4.0 MGD. Demand projections in Section 2 used an ADD of 1.81 MGD (Table 2-11), MDD of 2.5 MGD (Table 2-12), and PHD of 5.26 MGD (Table 2-13). It is assumed the values in the demand projection tables are correct, as Section 5.3 just provides a system overview.

Thank you for your cooperation in the plan review process and if you have any questions or would like this information in an alternate format, please feel free to contact me at any time at 971-673-0419 or via e-mail at: [evan.e.hofeld@state.or.us](mailto:evan.e.hofeld@state.or.us).

Sincerely,



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

OAR 333-061-0060(5)(a)(J):

- (J) A seismic risk assessment and mitigation plan for water systems fully or partially located in areas identified as VII to X, inclusive, for moderate to very heavy damage potential using the Map of Earthquake and Tsunami Damage Potential for a Simulated Magnitude 9 Cascadia Earthquake, Open File Report 0-13-06, Plate 7 published by the State of Oregon, Department of Geology and Mineral Industries.
  - (i) The seismic risk assessment must identify critical facilities capable of supplying key community needs, including fire suppression, health and emergency response and community drinking water supply points.
  - (ii) The seismic risk assessment must identify and evaluate the likelihood and consequences of seismic failures for each critical facility.
  - (iii) The mitigation plan may encompass a 50-year planning horizon and include recommendations to minimize water loss from each critical facility, capital improvements or recommendations for further study or analysis.



## Seismic Risk Assessment and Mitigation Plan

### Frequently Asked Questions

Oregon Health Authority Drinking Water Services

1. Why do community water systems with more than 300 connections need to conduct a seismic risk assessment and mitigation plan?

The Oregon Resilience Plan was developed in 2013 and provides the state's road map for earthquake preparedness. The goal is to identify critical infrastructure needed to supply water during an emergency, and identify projects to be completed in the next 50 years to ensure that piped water can be provided in the event of a strong earthquake. The plan and related information can be found at [www.oregon.gov/qov/policy/orr](http://www.oregon.gov/qov/policy/orr). Water supply infrastructure is addressed in Section 8 beginning on page 203.

2. Which systems need to submit a seismic risk assessment and mitigation plan?

Every community water system with more than 300 connections that intends to submit a master plan after January 10, 2018 is required to conduct a seismic risk assessment and mitigation plan if any of their facilities are located in Areas VII through X of Plate 7. Plate 7 is available at <http://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/PLANREVIEW/Documents/seismic-map.pdf>.

3. What must be included in a seismic risk assessment?

The seismic risk assessment must identify critical facilities needed to supply key community needs, including at a minimum: fire suppression, essential health care and first aid, emergency response, and drinking water supply points. The result would be a list of infrastructure backbone components including supply, treatment, distribution, and storage elements that are needed in order to continue to supply water for essential community needs immediately after a Cascadia subduction zone earthquake.

The assessment must also evaluate the likelihood and consequences of seismic failures for each facility identified as critical. General information for assessing various facilities by construction date and material can be found in the Oregon Resiliency Plan, which also references the American Lifelines Alliance (2001) Seismic Fragility Formulations for Water Systems, [www.americanlifelinesalliance.org](http://www.americanlifelinesalliance.org).

4. What must be included in the mitigation plan?

Based on the critical facilities identified to form the backbone, the mitigation plan consists of projects that will be completed over the next 50-year time period to upgrade, retrofit, or rebuild these facilities so that they will continue to provide water following a Cascadia subduction zone earthquake. The mitigations would include planned capital improvement projects, upgrades to minimize water loss from each critical facility, or recommendations for further study or analysis. The mitigation plan must also include a schedule as to when these mitigation efforts will be completed, within the 50 year planning horizon.

5. Are other formats of Plate 7 available?

Yes. Labels in pdf files (such as city names) can be turned off on the toolbar on the left hand side of the Adobe Acrobat Reader screen.

GIS files can be downloaded at <http://www.oregongeology.org/pubs/ofr/p-O-13-06.htm>. Under Publication Preview, click on "Download zip file (1.85 GB)". Refer to "Read me" file for instructions. Open the Appendix folder. Click on the .rar file (a zip utility such as WinZip is needed to open this GIS data file). The GIS layer for Plate 7 is "Oregon\_M\_9\_Scenario\_Site\_PGV." This file has the raw data and will need to be classified into the Mercalli rankings as shown on Plate 7. Remember that the Area X category includes the tsunami inundation zone.

6. Is any funding available to assist in development of this assessment and plan?

After July 1, 2018, systems serving 3,300 connections or less will be eligible for up to \$20,000 from the Drinking Water State Revolving Fund to complete the seismic risk assessment and mitigation plan. Funds will be awarded on a first-come, first-serve basis with submittal of a Letter of Interest. Funds cannot be used for mitigation activities (design or construction).

7. Are there additional technical resources to help develop the seismic risk assessment and mitigation plan?

Yes. Technical resources have been compiled in a document located at <http://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/PLANREVIEW/Documents/seismic-references.pdf>.

**For more information, contact Drinking Water Services at 971-673-0405**