PUBLIC HEALTH DIVISION
Drinking Water Services
Kate Brown, Governor

Oregon Health Authority

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May 10, 2022

Jimmy Su
Cascade Gorge Properties
PO Box 1518
Cave Junction, OR 97523

Re: Arsenic Treatment (PR#50-2022)
Cascade Gorge Properties (PWS ID#91556)
Conditional Approval

Dear Jimmy Su:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the arsenic treatment system for Cascade Gorge Properties public water system. DWS received product information, drawings, and a plan review fee of $248.

The project includes installation of central arsenic treatment for the water system's groundwater source. The arsenic treatment will be installed at the water system's water treatment plant. The water system is in Cascade Gorge, Oregon

The installed work shall adhere to all applicable DWS Oregon Administrative Rules (OAR). The submitted plan review material has been reviewed and the following items were noted as specific conditions of final approval:

- Per OAR 333-061-0060, preliminary plans, pilot studies, master plans and construction plans shall be prepared by a Professional Engineer registered in Oregon and submitted to the Authority unless exempted by the Authority (See OAR 333-061-0060(4)). The custom design of the submitted arsenic treatment system will require a licensed Professional Engineer with knowledge of water system arsenic treatment systems provide written approval of the proposed design prior to final approval being for the treatment system.
- Per OAR 333-061-0050(4)(a)(A), water treatment facilities shall be capable of producing water which consistently does not exceed MCLs. The type of treatment

shall depend on the raw water quality.

- Per OAR 333-061-0050(4)(a)(B), investigations shall be undertaken by the water supplier prior to the selection or installation of treatment facilities to determine the physical, chemical and microbiological characteristics of the raw water as appropriate. These investigations shall include a determination of the seasonal variations in water quality, as well as a survey to identify potential sources of contamination which may affect the quality of the raw water.
- Per OAR 333-061-0050(4)(a)(D), laboratory equipment shall be provided so that the water supplier can perform analyses necessary to monitor and control the treatment processes.
- Per OAR 333-061-0050(4)(a)(E), sampling taps shall be provided before and following the treatment process and before the first user when any form of water treatment is used at a public water system.
- Per OAR 333-061-0065, the water system's operation and maintenance protocols/manuals shall be updated to reflect. Water system operator shall take necessary training(s) to proficiently operate the arsenic treatment system.

The existing groundwater well (L94435) was reviewed by a DWS hydrogeologist, and the following comments were provided regarding the well.

The well is located in what is surficially mapped as Quaternary basalt, located near the contact for Mazama ash of the Qpm. The well appears to produce within what is reported volcanic tuff of the Quaternary Period. Based on the narrow reported water bearing zones the volcaniclastic sedimentary rocks are likely fractured. Based on the rise and static water level compared to the initial water bearing zone, the aquifer is considered to be confined.

The well was originally drilled to a depth of 500 feet in April 2008 (Jack 58749). A 6-inch casing extends to a depth of 98.5 feet. The casing seal consists of 12 sacks of bentonite chips which were dry poured to a depth of 21 feet (The casing seal terminates in what is reported as gray sandstone with tan clay). In 2009 the well was modified (Jack 59131) with the lower portion of the aquifer being sealed off below 460 feet. A new (schedule 40) 4 inch liner was installed to a depth of 460 feet and is perforated from 420-440 feet in depth. The well was confirmed E. coli contaminated on November 11, 2021. The casing seal does not meet standards based on shallow termination within sandstone with clay at a depth of 21 feet (OWRD consulted 11-30-2021) a minimum depth 26 feet was required. A deeper casing seal would likely seal out contaminated zones to the well bore.

For continued use of the well, the well shall be reconstructed. The well was confirmed to be E. coli positive November 11, 2021. Based on the reported depth of the initial water bearing zone (371 feet), GWUDI is not a concern if the casing seal is deepened to an

appropriate depth. The casing seal does not meet standards based on terminating within sandstone with clay at a depth of 21 feet. Contamination is likely due to the shallow casing seal, the required minimum depth is 26 feet. A deeper casing seal would likely seal out contaminated
shallow sections adjacent to the well bore. OHA recommends a casing seal depth of 47 feet or greater in an effort to seal out shallow contaminated zones. Plan review is required for new well construction or reconstruction; please contact DWS Plan Review at (971) 673-0408 to start that process prior to completion.

As per OAR 333-061-0032(6)(e) water supplies subject to the requirements of this section most, upon approval by the authority, implement one or more the following corrective action alternatives:

> *(A) all significant deficiencies associated with the source construction shall be corrected*
> *(C) Eliminate the source of contamination; (The well is considered to be the source of contamination)*
> *(D) If the groundwater source does not meet all of the applicable construction standards specified and the Authority determines the reconstruction of the groundwater source the significant measure of public health protection, then the groundwater source must be made to meet all applicable construction standards.*

The existing well has been confirmed to be E.coli positive and based on the hydrogeologist review, the wells as-built casing seal is not adequate to seal the groundwater well from surface water contamination. The groundwater well's casing seal will need to meet DWS construction standards prior to being allowed to be used again as an approved public water system water source. Please coordinate well improvements as part of this plan review.

Until we receive verification that the conditions have been met and final approval has been issued, the arsenic treatment system 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 #50-2022 and can be emailed to me at zachariah.cunningham-golik@dhsoha.state.or.us

If you have any questions, please feel free call me at 541-231-9077.

Sincerely,

Zach Golik, PE
Regional Engineer
Drinking Water Services

CC: Julie Wray, DWS Portland