

**OLYMPIC VALLEY PUBLIC SERVICE DISTRICT
WATER AND SEWER COMMITTEE MEETING
DATE: SEPTEMBER 22, 2026**

Directors Present: Directors Dale Cox, Joshua Toub

Attendees: Jessica Asher, Board Secretary; Dave Hunt, District Engineer; Gerry LaBudde, Owner, Hydros Engineering; Nic Massetani, Operations Superintendent; and Charley Miller, General Manager.

A. Call to order: 10:00 A.M.

B. Public comment: None

C. Full-Time Chlorination Feasibility Study

Mr. Labudde provided a slideshow presentation, attached to these Committee notes, regarding the District's Full-Time Chlorination Feasibility Study. He reviewed the purpose of the study, which was required by the Division of Drinking Water (DDW) and is intended to provide the District, regulators, and the public with an objective evaluation of the feasibility, water quality implications, operational requirements, and estimated costs associated with implementing full-time chlorination.

Mr. Labudde provided an overview of the District's drinking water system and reviewed its bacteriological water quality history. He noted that the District has had four total coliform events between 2008 and 2024, with no E. coli detections or evidence of fecal contamination. None of the District's wells have tested positive for total coliform.

Mr. Labudde reviewed the results of a regional survey of Tahoe-Truckee area water systems and discussed the potential benefits, considerations, and challenges associated with continuous chlorination. He also reviewed bench-top water quality testing conducted using an Environmental Protection Agency (EPA) free chlorine hold study protocol to estimate the formation of total trihalomethanes (TTHMs), a group of disinfection byproducts.

Mr. Labudde highlighted the proposed improvements to implement continuous chlorination, including estimated capital costs and ongoing operations and maintenance costs. Director Toub asked about the anticipated cost to replace chlorine dosing equipment over time. Mr. Hunt explained that replacement costs for the feed systems are relatively minor and that the equipment generally has an expected service life of approximately 20 years. Director Toub also asked how implementing continuous chlorination would affect the cost of other capital projects. Mr. Hunt explained that new facilities, such as the new wells at PlumpJack and Palisades Tahoe, would incorporate chlorination into their designs, which they have also historically. He noted that the addition of chlorination would not materially affect other components of the District's system.

Director Cox asked about disinfection byproducts. Mr. Labudde explained that some disinfection byproducts are known carcinogens and that their formation is an important consideration when adding disinfectant. He noted that the District's groundwater has low levels of organic compounds and, based on the bench-top testing, does not appear to present significant concerns regarding disinfection

byproduct formation. He also noted that the neighboring groundwater systems included in the regional survey did not report concerns related to disinfection byproducts.

Mr. Miller noted that the District is an outlier in the regional survey as the largest system in the area that does not continuously chlorinate. He stated that continuous chlorination has been included in the District's Water Resource Master Plan. Director Toub asked about the history of local systems transitioning from non-chlorinated to chlorinated systems. Mr. Miller explained that North Tahoe Public Utility District began chlorinating the Carnelian Woods system approximately three years ago and that Tahoe City Public Utility District has transitioned systems to chlorination as it has taken over systems on the West Shore. He noted that Tahoe Cedars recently transitioned approximately 1,200 connections to chlorination without reported negative unintended consequences.

Director Cox stated that the District has historically taken considerable pride in its drinking water quality and noted that being the largest non-chlorinated system in the region is not necessarily a negative distinction. He questioned the need to add maintenance requirements, capital costs, chemicals, and the potential for disinfection byproducts if chlorination is not required for public health protection. Director Cox stated that, if continuous chlorination is not mandated, he would be reluctant to pursue it solely because other systems have done so. He emphasized the importance of maintaining the quality of the District's water supply and expressed appreciation for the work of the District's operations and engineering teams to maintain the system's high water quality without continuous chlorination.

Director Toub asked whether the causes of previous total coliform detections were identified. Mr. Massetani explained that the District completed a Level 1 assessment and comprehensive system inspection following the more recent detections. The assessment identified a hot tap associated with a new residential service connection performed while the system was under pressure, as well as tank divers conducting an inspection, as possible points of contamination. However, Mr. Massetani noted that staff took great care to ensure sanitary conditions during these activities, and therefore it is not certain that either activity was the source of the detections. In coordination with the regulator, the District subsequently flushed the entire system using chlorinated water.

The Committee discussed whether future development, including the Village at Palisades Tahoe, could increase the District's risk of contamination due to construction activity and whether the increase in total coliform detections recently should be considered an indication of increased risk, despite the overall low number of contaminated samples.

Mr. Labudde stated that, from a water system owner's perspective, maintaining a chlorine residual can provide an additional level of assurance and greater peace of mind for system operators; he also highlighted that if a contamination incident occurred, The District would see a drop in the residual and have an early detection of an issue in the system.

Director Toub asked about the amount of chlorine used during the District's annual spring flushing program. Mr. Massetani explained that flushing generally begins with a chlorine dose of approximately 1.0 mg/L, with the residual typically declining to approximately 0.5 mg/L at the customer end of the system. He noted that historical operating procedures called for higher chlorine concentrations during flushing. Mr. Massetani explained that the purpose of spring flushing is not to introduce chlorine and then quickly flush it from the system. Rather, the system is continuously chlorinated while hydrant

flushing is underway to maintain a chlorine residual throughout the distribution system and allow the chlorinated water to contact all of the system's pipes and appurtenances.

Mr. Hunt discussed the potential public health benefits of continuous chlorination, including reducing the risk associated with microbial contamination. He also discussed system integrity and operational risk. He noted that the District currently collects monthly coliform samples, which creates operational concerns as there is no real-time method to monitor for total coliform. By contrast, a measurable chlorine residual could be monitored continuously, providing an additional indicator if chlorine is being consumed unexpectedly and the ability to identify a change in system conditions more quickly. Staff noted that having a chlorine residual and a continuous indicator would reduce operational stress regarding the system while providing an additional layer of public health protection.

Ms. Asher noted the importance of considering how the District would respond in the event of a contamination incident and emphasized taking a proactive approach if the District has the resources, rather than waiting for a regulatory requirement. She noted that while the District's water supply may be among the highest quality available, the distribution system has risks that should also be considered. Mr. Hunt added that a regulatory mandate would likely only occur if something went wrong, and as such emphasized the importance of being proactive.

Director Toub asked whether transitioning to continuous chlorination could result in water quality issues or additional disinfection byproduct formation for homes that are regularly vacant and may not have had water flow during the District's spring flushing events. Staff explained that maintaining a chlorine residual at these homes is especially beneficial and that any initial taste or odor issues would generally be resolved by running the water for approximately 10 minutes, which is recommended for homes that are not regularly occupied regardless of the District's chlorination operations.

Director Cox asked whether DDW may require continuous chlorination in the future. The Committee discussed that continuous chlorination is typically not mandatory for groundwater systems. Mr. Massetani explained that staff takes significant measures to maintain system integrity and avoid becoming a problem system, but that future risks are difficult to predict and could include backflow, microbial growth in backflow prevention devices, plumbing contractor activities, or other sources of contamination. While the District has a strong track record of maintaining water quality, that history does not eliminate the potential risks inherent in an unchlorinated distribution system.

Director Cox asked about the minimum chlorine residual that could be maintained without creating noticeable taste or odor impacts. Mr. Massetani explained that staff have been working to determine appropriate chlorine levels and that the District has been able to closely control chlorine concentrations during its current flushing program. He also noted that many residential water quality complaints can be resolved by flushing household plumbing for approximately 10 minutes.

Director Cox stated that he supports taking the measures necessary to provide customers with the highest quality water and protect public health, but does not want the District to compromise its high water quality simply because other systems have adopted continuous chlorination, and he would prefer not to chlorinate unless mandated. He expressed confidence in District staff's ability to maintain the system, as well as make decisions based on the specific needs and characteristics of the District's system.

Mr. Hunt explained that the addition of chlorine would not materially change the underlying chemical characteristics that contribute to the District's high-quality water. He noted that the aquifer would continue to have favorable hardness, mineral content, organic content, and total dissolved solids characteristics, and that the fundamental quality of the groundwater would remain unchanged. He added that maintaining a chlorine residual would provide an additional layer of public health protection while preserving the quality of the District's water source.

Director Toub suggested that, if the District moves toward continuous chlorination, staff should develop a communications plan and provide proactive public outreach. Mr. Massetani explained that the District already has procedures for receiving and responding to water quality complaints and that customer concerns are taken seriously. Director Toub suggested that proactive communication could help explain the reasons for the change and reassure customers that the District is taking steps to protect public health while maintaining its high water quality.

Mr. Miller stated that the next step will be to present the study as an informational item to the Board.

D. Adjourn: With no further business coming before the Water and Sewer Committee, the meeting was adjourned at 11:55 A.M.

By, JA



FULL-TIME CHLORINATION FEASIBILITY STUDY

Olympic Valley Public Service District

Presentation to the OVPD Board of Directors

Final Report | September 2026

Prepared by Hydros Engineering • Gerry LaBudda, P.E.

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Purpose of This Study

Prepared in response to direction from the California Division of Drinking Water (DDW)

The DDW requirement followed four historical total coliform detections in the OVPD distribution system between 2008 and 2024. The study is intended to provide the District, regulators, and the public with an objective evaluation of feasibility, water quality implications, operational requirements and estimated costs of full-time chlorination.

WHAT THE STUDY COVERS

1 System description & disinfection practice

Sources of supply, pressure zones, storage, existing chemical addition

2 Bacteriological history review

The four coliform events that preceded this study

3 Regional systems survey

Bacteriological & DBP experience of 20 Tahoe-Truckee area systems

4 Benefits & drawbacks assessment

Full-time chlorination considered on its technical merits

5 Bench-top water quality testing

Chlorine decay and DBP formation potential in OVPD source water

6 Conceptual design & cost estimates

Well Site 2R, Well Site 5R, Zone 3 Booster, Horizontal Wells

OVPD Chlorination Feasibility Study

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System Overview

Groundwater community water system serving Olympic Valley



OVPD distribution system — wells, storage, and pressure zones

908 metered connections

3 pressure zones

4 Active groundwater wells

2 Horizontal Wells

SOURCES OF SUPPLY

Well 1R	420 gpm	Well Site 2R mainfield
Well 2R	340 gpm	Well Site 2R mainfield
Well 3	115 gpm	Well Site 2R mainfield
Well 5R	425 gpm	standalone well house
Horizontal Wells 1 & 2	60 gpm	approved — standby supply

Combined active capacity ~1,200-1,300 gpm. Cautious soda (NaOH) is fed at Well Sites 2R and 5R for corrosion control; no continuous disinfection is currently practiced.

OVPD Chlorination Feasibility Study

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Bacteriological Water Quality History

Four total coliform events recorded between 2008 and 2024

NOV 2008

Total Coliform Positive

Everline Resort (Formerly Resort at Squaw Creek)

Routine: 420 Squaw Creek Rd — TC+
Repeat: 420 Squaw Creek Rd — TC+
Other: Remaining repeat results not in project file

Underwater tap flushing identified, stagnant water in service line to sample point. MCL violation occurred, resolved and closed. No violation found.

MCL Violation

NOV 2018

Total Coliform Positive

Forest Glen Road

Routine: 420 Forest Glen — TC+
Repeat 1: 2 TC+, 1 TC+ (300 Forest Glen)
Repeat 2: 3 TC+
Source: Four wells tested all TC+

Looking tap identified. Citation No. 25-02-100-003 issued compliance achieved 6/2/2025.

MCL Violation

OCT 2023

Total Coliform Positive

Zone 3 Booster & Everline Resort

Routine: Zone 3 Booster — TC+
Repeat 1: 2 TC+, 1 TC+ (2023 Sierra Ridge)
Repeat 2: 3 TC+
Routine: Everline Resort — TC+
Repeat 1: TC
Source: Three wells tested all TC+

Level 1 Assessment: stagnant water, contractor not tap, test after activity. System flushed.

No Violation

JAN 2024

Total Coliform Positive

Zone 3 Booster Station

Routine: Zone 3 Booster — TC+
Repeat 1: 3 TC+
Source: 3 wells TC+

Same location as October 2023 event. Project file did not document cause of positive sample.

No Violation

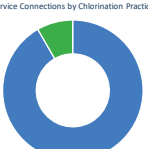
E. coli was absent in all samples across all four events, indicating no evidence of fecal contamination. Wells never tested TC positive — indication problem was within distribution/storage

OVPD Chlorination Feasibility Study

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Regional Survey of Tahoe-Truckee Area Systems

20 systems serving about 27,100 connections — 92 percent receive chlorinated water



Service Connections by Chlorination Practice

● Chlorinated — 24,872 (92%)
● Not chlorinated — 2,245 (8%)

Median system size of chlorinated systems: 612 connections
Median system size without disinfection: 128 connections
Connection counts from 2006, 2021-2026

CONTINUOUSLY OR ROUTINELY CHLORINATED (21 systems — 24,872 connections)

Truckee-Donner PUD: Truckee Main, Hirschdale
Northstar CSD: Northstar, Maris Valley
Tahoe City PUD: Tahoe City Main, McKinney/Quail
North Tahoe PUD: North Tahoe Main, Dollar Cove, Carleton Woods
Alpine Springs CWD
Olympic Valley MWC

WITHOUT CONTINUOUS DISINFECTION (9 systems — 2,245 connections)

Olympic Valley PSD
Tahoe City PUD: Tahoe Swiss Village, Alpine Peaks, Timberland, Glenridge, Kliner Park
Smaller systems: Talmont RID, Ward Well Water Company and Tahoe Park Water Company

OVPD Chlorination Feasibility Study

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Regional Systems — Service Connections & Water Source

Tahoe-Truckee area systems, grouped by chlorination practice

CHLORINATED SYSTEMS			NOT CONTINUOUSLY CHLORINATED		
District Name	Connections	Water Source	District Name	Connections	Water Source
Truckee-Donner PUD (TDPUD) — Main	11,764	Ground Water	Olympic Valley PSD (OVPD)	908	Ground Water
North Tahoe PUD (NTPUD) — Main	3,763	Surface Water	TCPUD Tahoe Swiss Village	385	Ground Water
TCPUD Tahoe City — Main	2,921	Ground Water	Talmonet Resort Improvement District	347	Ground Water
Northstar CSD — Maris Valley	1,343	Ground Water	Ward Well Water Company	226	Ground Water
Northstar Community Services District	959	Surface Water/Ground Water	TCPUD — Timberland	138	Ground Water
Alpine Springs County Water District	672	Springs/Ground Water	TCPUD — Alpine Peaks	96	Ground Water
TCPUD McKinney/Quail	571	Ground Water	Tahoe Park Water Company	96	Ground Water
North Tahoe PUD — Carleton Woods	298	Ground Water	TCPUD — Glenridge	46	Ground Water
North Tahoe PUD (NTPUD) — Dollar Cove	286	Ground Water	TCPUD — Kliner Park	1	Ground Water
Olympic Valley Mutual Water Co. (OVMWC)	270	Ground Water			
Truckee-Donner PUD (TDPUD) — Hirschdale	25	Ground Water			
Total — 91.7% of connections surveyed	24,872		Total — 8.3% of connections surveyed	2,245	

20 systems surveyed • 27,117 total connections • 91.7% receive chlorinated water | 8.3% receive non-chlorinated water

Source: California Drinking Water System Area Boundary (SAB), Division of Drinking Water, State Water Resources Control Board (plans range 2021-2026)

OVPD Chlorination Feasibility Study

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Regional Survey — Key Findings

What the surveyed systems show about chlorination practice and outcomes in the region

1 Majority of customers receive chlorinated water

92% of chlorinated vs 8% in unchlorinated in the systems surveyed

2 Lower violation rate among chlorinated systems

Non-chlorinated systems, as a group, experienced conform events more frequently

3 DBP formation is not a regional concern

No chlorinated Tahoe-Truckee system had a THM or HAAS MCL violation in the period reviewed.

4 Sodium hypochlorite is used in the region for disinfection

NaOCl is the disinfectant of choice across the continuously chlorinated systems surveyed in the region.

5 Larger Systems Are More Likely to Chlorinate

Seven of eight surveyed systems with more than 500 service connections use routine or continuous chlorination; OVPSD is the exception in this group. This pattern is specific to the systems surveyed and is not a regulatory requirement.

OVPSD Chlorination Feasibility Study 7

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Potential Benefits of Full-Time Chlorination

1 Pathogen Inactivation

Continuous barrier against contamination entering the system after the wellhead.

2 Biofilm Control

Suppresses biofilm on pipe and tank surfaces that can harbor pathogens, including Legionella.

3 System Integrity Indicator

A measurable residual gives real-time feedback on distribution system condition.

4 Multi-Barrier Protection

Adds an additional barrier that travels with the water, beyond source protection at the wells.

5 Seasonal Demand Swings

Shoulder season lows increase water age and stagnation – potential for bacteriological growth.

6 Vulnerable Populations

Infants, older adults and immunocompromised residents and guests face higher risk.

7 Emergency Conditions

Main breaks, wildfire fire-flow demands and low-pressure events raise contamination risk.

8 Reduced Reliance on Annual Flushing

A year-round residual lessens dependence on the annual flush-and-chlorinate program.

Without a residual, protection ends at the wellhead – there is no persistent barrier against regrowth or recontamination in the distribution system.

OVPSD Chlorination Feasibility Study 8

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Other Considerations

Operations & Maintenance

Daily or weekly residual checks, chemical inventory, equipment inspection, and periodic calibration of feed pumps and analyzers. Sodium hypochlorite requires secondary containment, PPE, and an updated Hazardous Materials Business Plan. Operators already handle hypochlorite during the annual flushing program; eyewash and shower stations are in place.

Regulatory Requirements

Water supply permit amendment, DBP Monitoring Plan, updated O&M Plan, SCADA alarming, MRDL compliance at 4.0 mg/L, and quarterly THM and HAAS monitoring. Monitoring may be reduced to annual if IMA results stay below 50 percent of the MCL and GDM approves.

Taste, Odor & Perception

Sensitivity varies among individuals. Some customers may notice chlorine taste or odor, particularly at points of low water age near Wells 18 and 58. Minimal or no perceptible change is anticipated at target residuals of 0.5 to 1.0 mg/L.

Customer Communication

A change in a system that has never chlorinated full-time will prompt customer questions about why the change is being made and what it means for their water. Outreach explaining the water quality basis for the change would support implementation.

OVPSD Chlorination Feasibility Study 9

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Bench-Top Water Quality Testing

Well 2R water, May 18–25, 2026 — chlorine decay and DBP formation potential

Sample collection and chlorine dose

Hold sample

Laboratory analysis

Projected water quality

Chlorine residual — target dose vs. maximum allowed

0.5 mg/L target dose — about one-eighth of the maximum allowed

MRDL 4.0 mg/L

THM formation — measured and projected vs. the standard

2.7 µg/L after 7 days • 6.9 µg/L projected at 30 days — under 10 percent of the standard

MCL 80 µg/L

No HAAS compounds were detected above the laboratory reporting limit at any interval. Total organic carbon measured 1.3 mg/L, consistent with low DBP formation potential.

OVPSD Chlorination Feasibility Study 10

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Bench-Top Testing — Summary & Implications

What the hold study results mean for OVPSD

✓ OVPSD source water has low total organic carbon (1.3 mg/L), consistent with low DBP formation potential.

✓ Projected 30-day THM concentration (~6.9 µg/L) is far below the 80 µg/L regulatory MCL.

✓ Results are consistent with regional experience: no chlorinated Tahoe-Truckee groundwater system has recorded a THM or HAAS MCL violation.

✓ A temporary rise in DBPs is possible at initial startup as chlorine mobilizes organic material from biofilm; annual flushing is expected to moderate this effect.

Bench-scale testing indicates that DBP formation is unlikely to be a limiting factor for OVPSD if full-time chlorination is implemented.

OVPSD Chlorination Feasibility Study 11

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Proposed Chlorination Improvements

Four feed locations under one design basis

CHEMICAL/STORAGE

Sodium hypochlorite, double-contained storage

DOSE CONTROL

Flow-paced feed at the primary sources

MONITORING

Residuals recorded and alarmed through SCADA

Site	Role	Dose control	Storage	Monitoring	
Well Site 2R	Primary source	Flow-paced from the manifold meter, adjustable via SCADA	120-gallon double-contained HDPE tank	Each CL17 / SC200 continuous analyzer	
Well Site 58	Primary source	Flow-paced from the VFD pump meter, adjustable via SCADA	60-gallon double-contained HDPE tank	Each CL17 / SC200 continuous analyzer	
Zone 3 Booster Station	End-of-system boost	Proposed regardless of a system-wide decision	Set by the operator based on observed residual trends	5-gallon cube, contingency use	Nalgene Systems inline probe, zero discharge
Horizontal Wells 1 & 2	Standby source	When placed in service	Manual on/off with the well pump	5-gallon cube	Operator grab samples at a new sample station

Continuous residual monitoring at both primary sources, with recording and alarming through SCADA; feed equipment sized for the 0.5 mg/L target dose at each site.

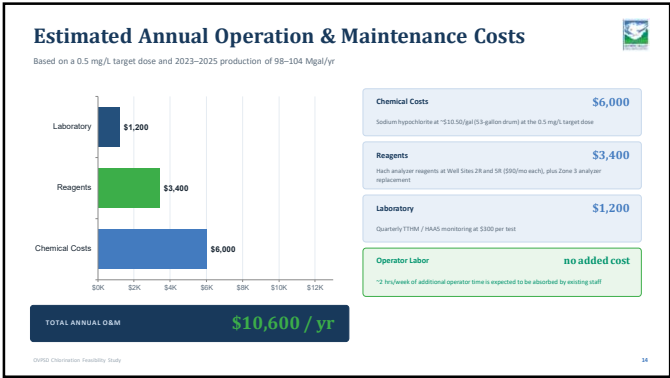
OVPSD Chlorination Feasibility Study 12

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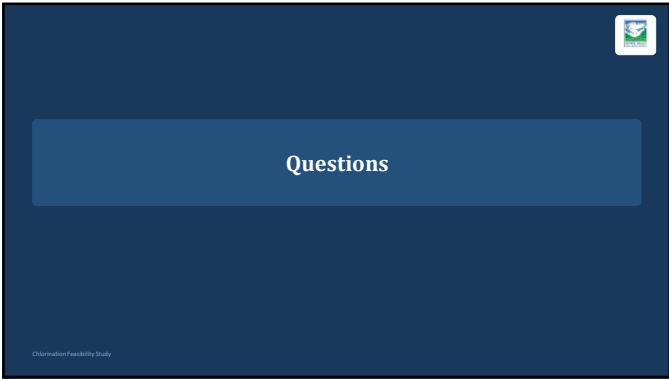
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