

2026 Annual Report

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM

WATERSHED-BASED WASTE DISCHARGE PERMIT

March 2026





National Pollutant Discharge Elimination System (NPDES) Watershed-Based Waste Discharge Permit Annual Report

March 2026

Clean Water Services hereby submits this NPDES Watershed-Based Waste Discharge Permit Annual Report in accordance with NPDES Permit Numbers 101141, 101142, 101143 and 101144. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for the gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

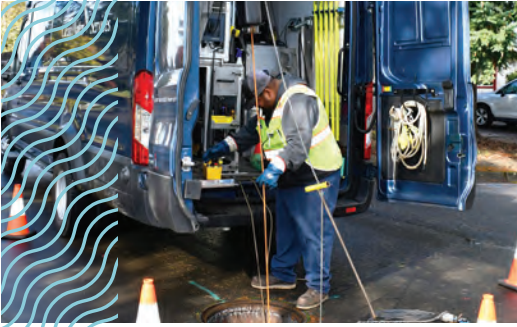
A handwritten signature in blue ink, appearing to read "R. Shanley", is written over a horizontal line. The signature is fluid and cursive.

Rick Shanley
Interim Chief Executive Officer/General Manager

2026 Annual Report

INFLOW AND INFILTRATION

March 2026



1. Introduction

Schedule D.1 of the Clean Water Services (CWS) watershed-based NPDES Permit requires an annual inflow and infiltration (I/I) report, which must include:

- An assessment of I/I issues at the four water resource recovery facilities based on comparisons of summer and winter flows.
- Details of activities performed in the previous year to identify and reduce I/I.
- Details of activities planned for the following year to identify and reduce I/I.
- A summary of sanitary sewer overflows that occurred during the previous year.

CWS is making continual progress in identifying and reducing I/I throughout the collection system. CWS continued its commitment to I/I abatement and rehabilitation through its Capital Improvement Program (CIP) and substantial maintenance, television (TV) inspection, and flow monitoring programs. Staff members use these programs to identify, quantify, and reduce I/I within the sanitary sewer collection system.

2. Collection System Description

CWS' collection system includes assets owned by CWS or its co-implementers including 45 pump stations, approximately 1,852 miles of sanitary sewer line, 72 miles of force main, and about 49,686 sanitary sewer manholes. Pipes range from 4 inches to 84 inches in diameter. CWS has intergovernmental agreements with each of the 12 cities in its service area and with Washington County that articulate the division of responsibilities and Performance Standards for managing, operating, and maintaining the collection system. The Performance Standards detail maintenance frequency and measurement criteria for activities such as line cleaning, manhole maintenance and repairs, root control, TV inspections, and emergency response. These standards provide consistency across the entire service area and are designed to maintain the collection system efficiently and cost-effectively; promptly identify and address potential issues; and minimize the risk of sanitary sewer overflows due to inadequate capacity, maintenance, or structural deficiencies.

3. Inflow and Infiltration Abatement Programs – 2025

3.1 Inflow and Infiltration Assessment

The following table summarizes the statistics used to compare dry weather and wet weather flows at CWS’ four water resource recovery facilities (WRRFs) to support an assessment of facility I/I issues in 2025. Wet weather flows include those from November to April; dry weather flows include those from May through October.

Table 1: 2025 Water Resource Recovery Facility Influent Flow Statistics

Daily Average Flow	Rock Creek	Durham	Forest Grove	Hillsboro
Average wet weather flow, MGD	43.4	28.9	5.8	5.6
Maximum month wet weather flow, MGD	49.2	33.9	7.5	7.4
Peak wet weather flow, MGD	102.5	74.1	19.2	15.6
Wet weather peaking factor	2.4	2.6	3.3	2.8
Average dry weather flow, MGD	30.1	19.5	4.2	3.1
Maximum month dry weather flow, MGD	30.1	22.2	5.0	3.4
Peak dry weather flow, MGD	42.1	26.8	5.8	5.5
Dry weather peaking factor	1.4	1.4	1.4	1.8
Ratio of wet weather to dry weather average monthly flow	1.4	1.5	1.4	1.8

Peaking factors in excess of 4 and high ratios of wet versus dry average flows are an indication of significant levels of I/I entering the sanitary sewer system. Wet weather peaking factors at the WRRFs ranged from 2.4 to 3.3; wet to dry average flow ratios range from 1.4 to 1.8. The Forest Grove WRRF and Hillsboro WRRF have the highest wet weather peaking factors of 3.3 and 2.8, respectively. The Hillsboro and Durham WRRFs have the highest wet versus dry average flow ratios of 1.8 and 1.5, respectively.

CWS is focusing on capital projects to reduce I/I in partnership with our co-implementor partner cities in the priority areas identified in Section 3.3 and 3.4 below.

3.2 Activities Performed in 2025 to Identify and Reduce I/I

3.2.1 Capital Improvement Program

Capital Improvement Program Staffing: In 2025, CWS employed a division manager (0.5 FTE) and senior engineer (1 FTE) to work on CWS’ I/I reduction program. The division manager is responsible for managing the overall I/I reduction program and the large-diameter sewer rehabilitation program. The senior engineer is responsible for planning, designing, and administering the I/I abatement projects.

CIP Prioritization: CWS has observed rapid residential growth over the past decade and anticipates that this trend will continue. Capital project priorities have accordingly been

focused on capacity assurance. One method of providing capacity is reducing I/I. Recent I/I abatement efforts have targeted high I/I basins to achieve capacity for growth and to reduce or eliminate downstream gravity sewer, pump station, and water resource recovery facility expansion projects.

3.3 Study and Project Summary 2025

3.3.1 Clean Water Services

Aloha 3 Pump Station Project: In 2022, CWS began a project to investigate the collection system for I/I-driven capacity constraints within the collection system tributary to the Aloha 3 Pump Station. The results of this investigation determined the potential for I/I abatement within the tributary basin to offset future improvements at the pump station and were presented in 2025.

Bohmann Exposed Mainlines Rehabilitation: This project addresses two locations of exposed sewer mainlines crossing Fanno Creek and the high calculated I/I for the surrounding areas. Work will include eliminating the creek crossing and rehabilitating approximately 2,000 linear feet of mainline with the associated structures and service laterals. Planning and design began in 2025.

Cedar Hills Rehabilitation: This project included replacing approximately 13,000 linear feet of 6, 8, and 10-inch sanitary sewer mainline and the associated structures and service lateral connections to reduce the I/I observed in the project area. The project was completed in August 2025 for \$5.3 million.

East Basin I/I Abatement and Rehabilitation: Approximately \$30 million in I/I reduction improvements were identified in CWS' East Basin Master Plan for the Durham WRRF sewershed. In 2024, CWS began investigating I/I removal opportunities and the feasibility of how I/I removal will help offset future capital projects in this basin (i.e., rehabilitation of the system or building a wet weather pump station). This investigation continued in 2025.

Forest Grove Sewer Rehabilitation Phase 3 – Pacific Avenue & E Street: Design of phase 3 began in early 2025 to help address the high I/I observed at the Forest Grove WRRF during storms. The project will consist of rehabilitating approximately 4,000 linear feet of pipe and include the associated structures and service laterals. Construction is planned for 2026.

I/I Abatement Master Planning: CWS continued to review flow meter data and strategically relocated meters to further isolate and identify the sanitary flow basins experiencing the highest rates of I/I. Refer to the Flow Monitoring section of this report for additional information.

West Basin Master Plan: CWS studied I/I abatement as part of the development of the West Basin Master Plan to better understand the I/I influence from the sewershed areas that discharge to the Hillsboro, Rock Creek, and Forest Grove WRRFs. Some high areas of I/I in the West Basin included the Aloha 3 pump station, Forest Grove, Johnston

Creek, McKay Creek, and Turner Creek. This Master Plan was completed and adopted by the Board in 2025.

3.3.2 City of Beaverton

SW 131st, Barlow to Hanson, Sanitary Sewer Inflow & Infiltration Reduction

Project: In 2020 and 2021, CWS installed five flow monitors within a 250-acre residential area, dividing the area into six subbasins. The City of Beaverton initiated a more focused investigation of the 45-acre SW 131st Barlow to Hanson subbasin, which contributes the highest levels of I/I among the six subbasins. Investigation in the subbasin proceeded in 2024 and 2025 with vapor testing, CCTV inspections, and data analysis. Preliminary design began at the end of 2025, and the project team will be working toward a 30% design milestone for construction in early 2026.

3.3.3 City of Hillsboro

Sanitary Sewer I&I Abatement Project #6 for the 1911/1936 Basins: The City of Hillsboro completed the design to rehabilitate or replace the remaining sanitary sewer line in this project. Construction on the project started in 2025 with completion scheduled for 2026.

3.4 Activities Planned for 2026 to Identify and Reduce I/I

3.4.1 Clean Water Services

Aloha 3 Pump Station Twin Trunks Rehabilitation: Investigation, design, and planning for the rehabilitation of the twin trunks — called the Butternut trunklines — are expected to begin in 2026. The project consists of rehabilitating approximately 13,000 linear feet of 21-inch sanitary sewer trunklines and the associated manholes. Construction is anticipated to begin in 2027. This project is a spinoff of the Aloha 3 Pump Station investigation project that was completed in 2025.

Bohmann Exposed Mainlines Rehabilitation: Design and planning of this project began in 2025 and will continue in 2026 to allow for the elimination of the creek crossings and I/I rehabilitation. Construction is anticipated to begin at the end of 2026 or in 2027.

East Basin I/I Abatement and Rehabilitation: The planning and evaluation of the scope of the necessary I/I abatement projects will continue in 2026; the evaluation is expected to be completed in late 2026. Design is expected to occur from 2027 through 2030, with construction following according to the priority and need of the projects.

Fanno Interceptor Pipeline Rehabilitation: This project was identified in the East Basin Master Plan and will involve rehabilitating approximately 45,000 linear feet of the existing 36-inch to 60-inch diameter interceptor. The evaluation of this project was completed in 2025 with design scheduled to begin in 2026 and continue through 2032. Construction is expected to take five years.

Forest Grove Sewer Rehabilitation Phase 3 – Pacific Avenue & E Street: Design of phase 3 will conclude in early 2026. Rehabilitating approximately 4,000 linear feet of pipe and the associated structures and service laterals is anticipated to begin in 2026.

I/I Abatement Master Planning: CWS annually reviews flow meter data and strategically relocates meters to further isolate and identify the sanitary flow basins experiencing the highest rates of I/I. Refer to the Flow Monitoring section of this report for additional information.

3.4.2 City of Beaverton

SW 131st, Barlow to Hanson, Sanitary Sewer Inflow & Infiltration Reduction

Project: This project targets I/I in the 45-acre SW 131st Barlow to Hanson subbasin and is anticipated to continue past 30% design in 2026. Design will continue throughout 2026.

3.4.3 City of Hillsboro

Sanitary Sewer I&I Abatement Project #6 for the 1911/1936 Basins: The City of Hillsboro is continuing construction of the sixth phase of the NW 1911-1936 Sanitary Sewer District rehabilitation and I/I abatement in 2026 and work is expected to conclude by fall 2026.

4. Operations and Maintenance

CWS provides regional services for chemical or mechanical root control, manhole rehabilitation activities, and flow monitoring, which are presented in this report.

Lateral Rehabilitation: CWS continued implementing its comprehensive lateral rehabilitation per Resolution and Order 98-67. CWS CCTV inspected 46 private laterals and repaired or replaced 35 laterals as part of routine maintenance.

Manhole Rehabilitation and Root Control: CWS performed chemical or mechanical root control on 143,306 linear feet of sanitary sewer. CWS crews rehabilitated 58 manholes to eliminate or reduce infiltration and completed eight internal pipe repairs to reduce infiltration.

Flow Monitoring: Flow monitoring data provides conveyance system and WRRF operators information to better manage their respective systems and provides data for I/I evaluation. CWS uses flow monitoring within the gravity sanitary conveyance system on major conveyance trunklines, upstream of some CWS pump stations, and strategically placed branches off the trunklines in CWS-owned and city-owned systems to assess sanitary sewer flows.

CWS continued to operate and upgrade its flow monitoring program in 2025, which includes 61 permanent and 28 portable flow monitoring locations, as shown in Figure 1. The permanent monitoring locations provide flow information for major trunklines, areas of operations and maintenance concern, and model calibration. The portable flow meters

can be moved to collect data in support of CWS and its co-implementers' capital projects. CWS also maintains 14 telemetered rain gauges across the service area.

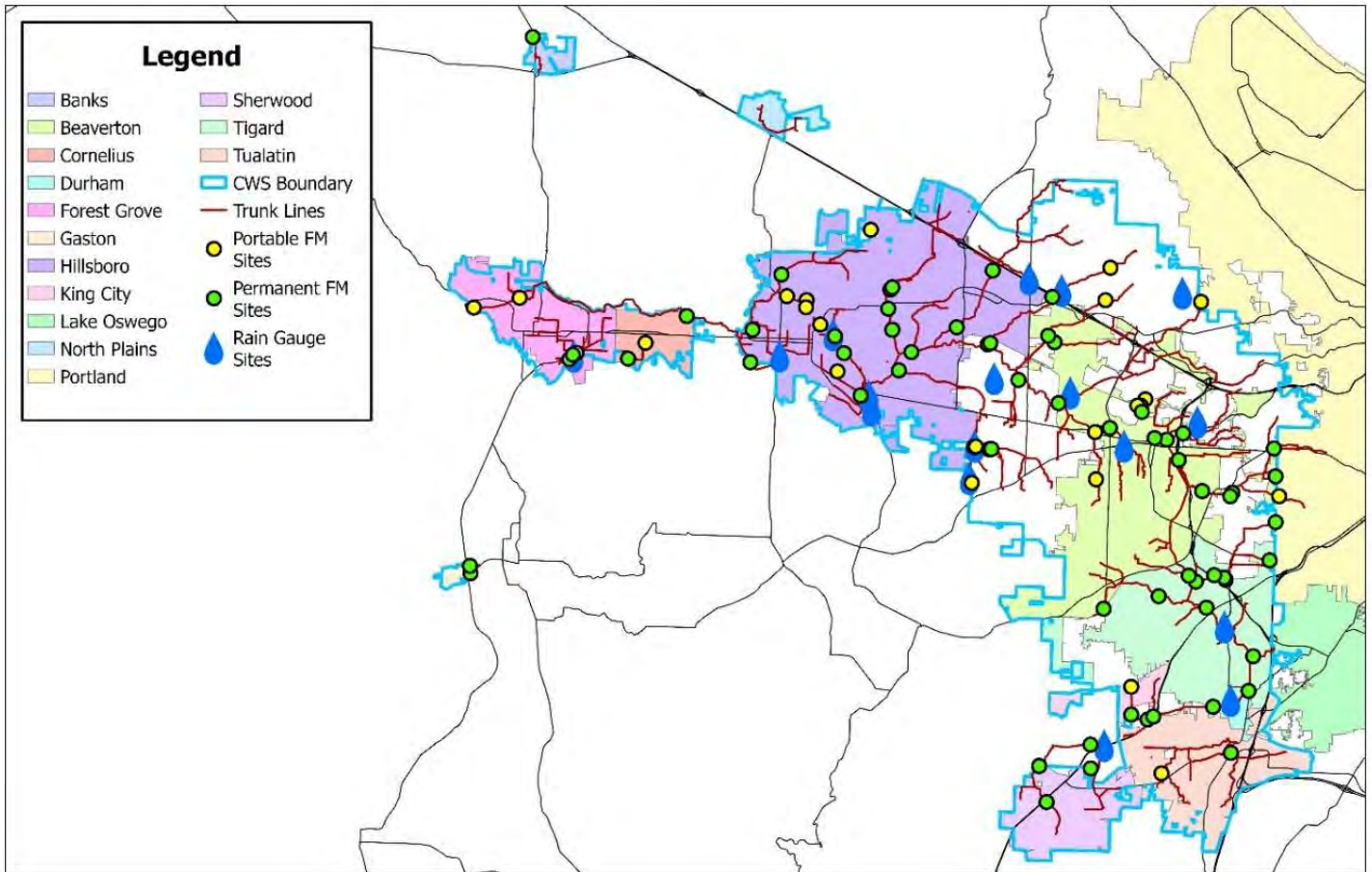


Figure 1. Locations of the 61 permanent and 28 portable flow monitoring sites and the 14 telemetered rain gauges that CWS maintains. Locations are current as of January 2026.

CWS places flow meters for three primary purposes: model calibration, I/I analysis, and Field Operations monitoring of high-flow areas.

Model Calibration: Modeling analyses help staff identify areas with higher I/I and prioritize I/I abatement projects. Flow meters are placed throughout the sanitary conveyance system for model calibration, typically on major trunklines, branches off major trunklines, or in an area of the system where additional information is needed.

I/I Analysis: Flow meter placement is also determined based on modeling analyses showing which larger trunklines, pump stations, or WRRF basins are experiencing high I/I. CWS analyzes where flow meters are located and then breaks down the basin into smaller, similar-sized areas to determine where the I/I originates. Flow meter placement is also influenced by CWS master plan information and by evaluating pump station runtimes during the wet versus dry weather periods.

Field Operations: Flow meters are placed throughout the CWS sanitary conveyance system in locations that have shown high flows and where modeling suggests surcharge conditions. Field Operations monitors these locations in real time, receiving an alarm if crews need to be deployed for potential remediation of high flow conditions or a potential sanitary sewer overflow (SSO).

Flow monitor data is evaluated year-round, but primarily during the wet weather period (November – April). The data is analyzed and input into a model of the entire CWS system to determine where high flows and I/I are found. Modeling is typically conducted for the larger basins, and then the basins are broken down into smaller subbasins if additional investigation is needed.

Preventive Maintenance Program: The Performance Standards for CWS and its co-implementers include internal pipe CCTV inspection of every line once every eight years. All new construction is internally inspected at the time of construction and again within 12 months after construction is completed.

CWS crews CCTV inspected 436,979 linear feet of sanitary sewer one or more times within its maintenance area. CWS' co-implementers inspected an additional 821,902 linear feet of sanitary sewer one or more times. The combined CWS and co-implementer effort represents internal pipe inspection of 13.2% of the total system inventory of sanitary sewer lines.

5. Summary of Sanitary Sewer Overflows

CWS implements a program to reduce SSOs based on the capacity, management, operation, and maintenance approach. For wastewater collection systems, a key performance indicator is the number of SSOs per 100 miles of sewer pipe per year. Over the past 10 years (2016-2025), CWS has averaged fewer than one SSO per 100 miles of sewer main per year, indicative of a high-performing collection system (Figure 2).

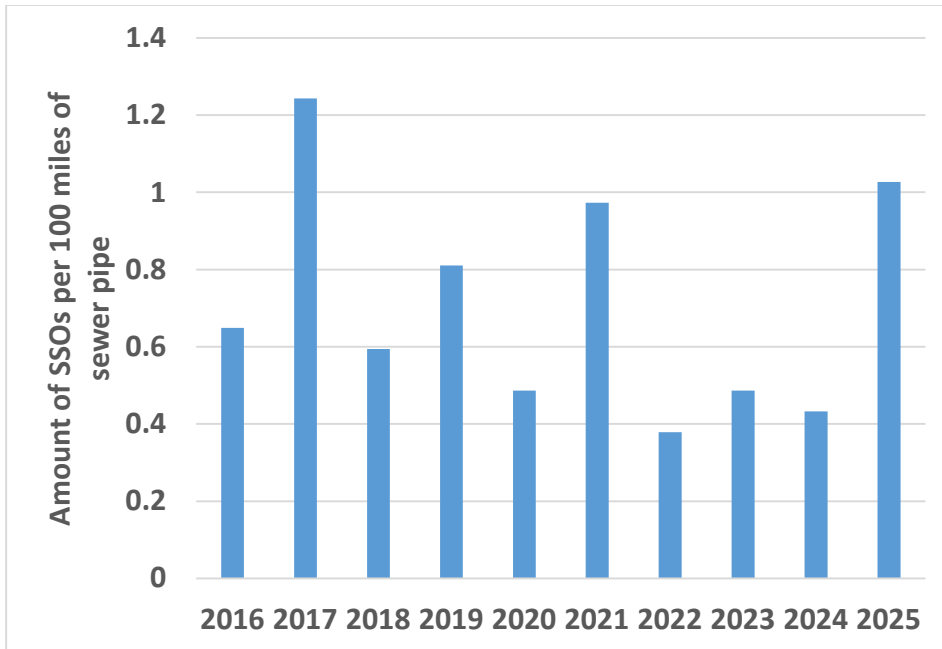


Figure 2. Number of SSOs per 100 miles of sewer pipe from 2016-2025 within the CWS system.

This section summarizes SSOs in 2025. The date given is the date the SSO started; the date the SSO was first reported to CWS or a co-implementer city is listed if the start date is unknown. CWS and the cities responded to 18 SSOs in 2025, of which two reached surface waters. Of the 18 events, the causes included seven blockages caused by wipes, roots, and grease; one from a collapsed line due to a private road washout; one from a contractor bore-through; one from a contractor incorrectly slip lining the public mainline; one from a float in an air release valve becoming stuck; four from construction debris or gravel; one from a power failure; and two from materials commonly associated with sewage. For all SSOs, appropriate corrective action was taken as described. CWS submitted written reports on all SSOs to DEQ, except when waived by DEQ.

1. Date: January 14, 2025

OERS #: 2025-0120

Location: 808 S Alpine Street, Cornelius

Estimated volume: Unknown.

Cause: The float of an air release valve became stuck, preventing proper sealing and causing an overflow through the valve.

Follow-up actions: CWS Field Operations and pump station staff isolated the impacted infrastructure and stopped the overflow. The air release valve was rebuilt by replacing all internal parts and put back into service after functionality testing. The manufacturer of the valve was consulted to determine the root cause.

Results of ambient monitoring: The SSO reached the MS4 but did not reach surface waters. CWS submitted the 5-day report to Oregon DEQ on January 17, 2025.

- 2. Date: January 24, 2025**
OERS #: 2025-0204
Location: 8320 SW Parrway Drive, unincorporated Washington County
Estimated volume: Unknown.
Cause: Blockage of roots in a private lateral connection to the public sanitary mainline.
Follow-up actions: CWS field staff cleaned the impacted soil using rakes and shovels. Crews removed the roots and applied root-foaming chemicals to the line.
Results of ambient monitoring: The SSO did not reach the MS4 or surface waters. CWS submitted the 5-day report to Oregon DEQ on January 27, 2025.
- 3. Date: January 29, 2025**
OERS #: 2025-0250
Location: 11643 SW Pacific Highway, Tigard
Estimated volume: Unknown.
Cause: Blockage of construction debris in a public sanitary manhole.
Follow-up actions: City of Tigard field staff cleared the blockage, and TV inspected the sanitary system downstream of the overflow while removing any remaining debris. City field crews also cleaned the impacted areas and stormwater system components using a vactor truck and inspected and cleaned any surrounding lines potentially impacted by the construction project.
Results of ambient monitoring: The SSO reached the MS4 but did not reach surface waters. CWS submitted the 5-day report to Oregon DEQ on January 31, 2025.
- 4. Date: February 3, 2025**
OERS #: 2025-0296
Location: 11581 SW Pacific Highway, Tigard
Estimated volume: Unknown.
Cause: Blockage of construction debris in a public sanitary manhole.
Follow-up actions: City of Tigard field staff cleared the blockage and TV-inspected the sanitary system downstream of the overflow while removing any remaining debris. City field crews also cleaned the impacted areas and stormwater system components using a vactor truck and inspected and cleaned any surrounding lines potentially impacted by the construction project.
Results of ambient monitoring: The SSO reached the MS4 but did not reach surface waters. CWS submitted the 5-day report to Oregon DEQ on February 7, 2025.
- 5. Date: February 13, 2025**
OERS #: 2025-0384
Location: 702 SW Backcourt Place, Beaverton
Estimated volume: Unknown.
Cause: Blockage from toilet paper in a public sanitary manhole.
Follow-up actions: CWS crews cleared the blockage, reestablished flow in the line, and cleaned the impacted areas around the manhole and associated catch basin.

Results of ambient monitoring: The SSO did not reach the MS4 or surface waters. CWS submitted the 5-day report to Oregon DEQ on February 18, 2025.

6. Date: February 24, 2025

OERS #: 2025-0491

Location: 770 S 1st Avenue, Hillsboro

Estimated volume: Approximately 125,000 gallons.

Cause: A power failure at CWS' Hillsboro WRRF and the subsequent failure of a contractor's back-up pump system resulted in an overflow from a manhole within a construction project at the Hillsboro WRRF.

Follow-up actions: Contractor crews from the construction project restarted the back-up pumps, stopping the overflow. CWS WRRF and Field Operations staff rinsed and vactored the impacted areas. A debrief meeting was held between CWS and the contractor, who failed to follow CWS' stipulated notification requirements and maintain their back-up pump system. The meeting resulted in improvements to the back-up pumping system and a review of the contractor's Discharge Emergency Response Plan.

Results of ambient monitoring: The SSO did not reach the MS4 but did reach surface waters. Samples were taken on February 24, 25, and 27. Sample results from February 27 indicated there was no further impact of the overflow on the wetlands. Oregon DEQ granted an extension on the submittal of the 5-day report; CWS submitted the 5-day report to Oregon DEQ on March 6, 2025.

7. Date: March 25, 2025

OERS #: 2025-0777

Location: 8005 SW Laurelwood Court, Portland

Estimated volume: Unknown.

Cause: A blockage of grease and rags in the public sanitary mainline caused an overflow from an upstream manhole.

Follow-up actions: City of Beaverton crews cleared the blockage and cleaned up the impacted areas. The public sanitary line was added to a hot spot list so that it will receive increased maintenance and cleaning. A nearby business suspected of contributing to the blockage was contacted to provide outreach regarding the impacts of wipes on the sanitary system.

Results of ambient monitoring: The SSO did not reach the MS4 or surface waters. CWS submitted the 5-day report to Oregon DEQ on March 27, 2025.

8. Date: March 27, 2025

OERS #: 2025-0810

Location: 7689 SW Barnes Road, Portland

Estimated volume: Unknown.

Cause: A private road crossing Golf Creek washed out and broke the adjacent public sanitary line, causing an overflow into Golf Creek.

Follow-up actions: CWS Field Operations crews inspected the road washout and public sanitary line and determined that safety concerns prevented immediate access to the line. Only one private lateral from a private utility building is connected to the broken public sanitary line, so crews provided a portable restroom for the building and blocked off existing restrooms to prevent any additional flow into the broken public sanitary line until repairs could be safely completed.

Results of ambient monitoring: The SSO did not reach the MS4 but did reach surface waters. Samples were taken on March 27, and results indicated no further impact of the overflow on Golf Creek. Oregon DEQ granted an extension for the submittal of the 5-day report; CWS submitted the report to DEQ on April 11, 2025.

9. Date: April 23, 2025

OERS #: 2025-1028

Location: 20855 SW 90th Avenue, Tualatin

Estimated volume: Unknown.

Cause: Roots caused a blockage in a public sanitary mainline, causing an overflow from an upstream manhole.

Follow-up actions: City of Tualatin crews cleared the root blockage and cleaned up the impacted areas by washing them down and vacuuming up the SSO debris and wash water. A root cutter was used to remove the roots and associated debris, and a repair to the line was made to prevent the issue from reoccurring.

Results of ambient monitoring: The SSO reached the MS4 but did not reach surface waters. CWS submitted the 5-day report to Oregon DEQ on April 28, 2025.

10. Date: May 7, 2025

OERS #: 2025-1137

Location: 15109 NW Todd Street, Beaverton

Estimated volume: Unknown.

Cause: A blockage of materials commonly associated with sewage in a public sanitary mainline caused an overflow from an upstream manhole.

Follow-up actions: CWS Field Operations staff jetted the line to clear the blockage and cleaned the impacted areas. The manhole was added to a hot spot list so that it will receive more frequent maintenance and cleaning.

Results of ambient monitoring: The SSO reached the MS4 but did not reach surface waters. Samples were taken on May 7. Follow-up sample results taken on May 8 and 9 indicated no further impact of the overflow on the MS4 or the unnamed tributary. CWS submitted the 5-day report to Oregon DEQ on May 12, 2025.

11. Date: May 9, 2025

OERS #: 2025-1170

Location: 16504 SW Perth Road, Tigard

Estimated volume: Unknown.

Cause: A blockage of gravel in a public sanitary line, likely associated with ongoing residential construction, caused an overflow from an upstream manhole.

Follow-up actions: City of Tigard crews cleared the blockage and cleaned the impacted areas by washing and then vactoring the wash water. An ongoing construction project likely resulted in debris within the sanitary system and caused the overflow. City of Tigard staff provided education to the project developer and subcontractor regarding the serious impact of construction debris on the sanitary system.

Results of ambient monitoring: The SSO reached the MS4 but did not reach surface waters. CWS submitted the 5-day report to Oregon DEQ on May 14, 2025.

12. Date: May 25, 2025

OERS #: 2025-1275

Location: 5131 SW 193rd Place, Beaverton

Estimated volume: Unknown.

Cause: Sticks in a manhole caused a blockage of a public sanitary line and an overflow from the blocked manhole. CCTV inspection of the line also revealed that gravel typically associated with aquariums had been flushed into the line and contributed to the blockage.

Follow-up actions: CWS Field Operations staff cleared the blockage and cleaned up the impacted areas by washing them and vactoring the wash water. The line was added to a hot spot list so that it will receive more frequent maintenance and cleaning. Nearby residents were contacted to provide education on the serious impact of debris on the sanitary system.

Results of ambient monitoring: The SSO reached the MS4 but did not reach surface waters. CWS submitted the 5-day report to Oregon DEQ on May 29, 2025.

13. Date: July 21, 2025

OERS #: 2025-1844

Location: 5670 SW Powhatan Avenue, Tualatin

Estimated volume: 10 gallons.

Cause: A blockage in a public sanitary line caused an overflow in an upstream public cleanout.

Follow-up actions: City of Tualatin staff jetted the line to clear the blockage and cleaned the impacted areas by washing them and vactoring the wash water. The line was TV inspected and confirmed to have no additional blockages.

Results of ambient monitoring: The SSO reached the MS4 but did not reach surface waters. CWS submitted the 5-day report to Oregon DEQ on July 25, 2025.

14. Date: August 19, 2025

OERS #: 2025-2127

Location: 9600 SW Oak Street, Tigard

Estimated volume: Unknown.

Cause: A contractor slip lined a sanitary sewer line blocking a private sanitary lateral line and causing an overflow from a connected private manhole.

Follow-up actions: City of Tigard staff notified the contractor of the impacted line. The contractor then reinstated the lateral, clearing the blockage and stopping the overflow. City of Tigard crews cleaned up the impacted areas and confirmed that the public and private lines were clear via CCTV inspection. The City of Tigard educated the contractor on the impacts of improperly slip lining a sanitary line.

Results of ambient monitoring: The SSO did not reach the MS4 or surface waters. CWS submitted the 5-day report to Oregon DEQ on August 21, 2025.

15. Date: September 11, 2025

OERS #: 2025-2363

Location: 7085 SW 169th Avenue, Beaverton

Estimated volume: Unknown.

Cause: A contractor bored through a public sanitary mainline adjacent to a private residence, which caused an overflow in the residence and in a private cleanout in the residence's backyard, and a sinkhole along the public sidewalk near the bore-through.

Follow-up actions: CWS Field Operations staff jetted the public sanitary mainline to restore flow and cleaned the impacted areas with wash water and used a combo truck to vacuum the wash water. The property owner hired a private contractor to clean inside the residence. CWS crews replaced the bored-through section of the mainline and educated the contractor on properly locating lines.

Results of ambient monitoring: The SSO did not reach the MS4 or surface waters. CWS submitted the 5-day report to Oregon DEQ on September 15, 2025.

16. Date: September 16, 2025

OERS #: 2025-2397

Location: 18040 SW Lower Boones Ferry Road, Tualatin

Estimated volume: Approximately 100 gallons.

Cause: A grease blockage in a public sanitary line caused an overflow from two connected manholes.

Follow-up actions: City of Tualatin staff jetted the public sanitary mainline, cleaned the impacted areas with fresh water, and used a vactor truck to vacuum up the wash water. City staff added the line to a hot spot list so that it receives more frequent maintenance and cleaning. The City and CWS coordinated with local food service establishments to determine the source of the grease and educate them on proper disposal of grease.

Results of ambient monitoring: The SSO did not reach the MS4 or surface waters. CWS submitted the 5-day report to Oregon DEQ on September 18, 2025.

17. Date: October 19, 2025

OERS #: N/A; 5-day reporting waiver granted by DEQ on October 21, 2025.

Location: 9225 SW Alpine Terrace, Portland

Estimated volume: Unknown.

Cause: A root blockage in a private lateral and public sanitary line caused an overflow within a private residence.

Follow-up actions: A contractor was hired to clear the blockage in the private lateral. CWS Field Operations staff jetted the public sanitary line to clear the blockage in the public line and treated the public line with root chemical. The property owner cleaned the overflow in the basement.

Results of ambient monitoring: The SSO was contained to the private residence and did not reach the MS4 or surface waters. DEQ waived the submission of a 5-day SSO report.

18. Date: November 17, 2025

OERS #: 2025-2915

Location: 12148 NW Old Quarry Road, Portland

Estimated volume: Unknown.

Cause: Root intrusions through a broken public cleanout caused a blockage in a private lateral, resulting in an overflow into the basement of a connected private residence.

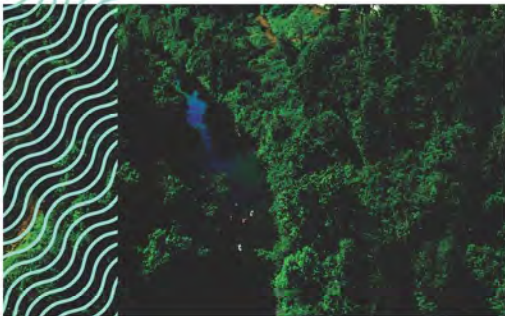
Follow-up actions: A contractor who had been hired by the property owner to clear the blockage in the private lateral notified CWS of the potential blockage in the public cleanout. CWS Field Operations staff responded, CCTV inspected the line, and confirmed the public cleanout was broken and allowed root intrusions. CWS crews replaced the broken cleanout to prevent further intrusion. The property owner cleaned the overflow in the basement.

Results of ambient monitoring: The SSO was contained to the private residence and did not reach the MS4 or surface waters. DEQ waived the submission of a 5-day SSO report.

2026 Annual Report

WATER QUALITY CREDIT TRADING

March 2026



Executive Summary

Clean Water Services (CWS) implements a water quality credit trading program that includes flow enhancement and riparian planting activities. The thermal credits generated by these activities are used to offset the thermal load discharged from CWS' Rock Creek Water Resource Recovery Facility (WRRF), Durham WRRF, and Forest Grove WRRF including the Natural Treatment System (NTS).

In 2025, CWS released an average of 45.5 cubic feet per second (cfs) of stored water from Hagg Lake in July and an average 52.6 cfs in August. CWS also released an average of 7.68 cfs of stored water from the Barney Reservoir in July and an average of 13.5 cfs in August. The Wapato instream lease provided 5.4 cfs in July and August. The stored releases and instream lease generated 1,535 million kilocalories (kcal) per day of thermal credit for July and 1,895 million kcal per day of thermal credit for August. Compliance with the allowable thermal load to the river is assessed during the months of July and August, which is defined as the critical time period for fish in the Temperature TMDL.

CWS also enrolled 10 riparian planting projects in 2025, enhancing over 7 stream miles and generating approximately 17 million kcal per day of thermal credit. CWS established the trading program in 2004 and has 221 active planting projects along streams in the Tualatin River Watershed that have generated approximately 660 million kcal/day of thermal credit.

The thermal credits generated from CWS' flow enhancement and riparian planting activities completely offset the thermal load discharged by the Rock Creek, Durham, and Forest Grove WRRFs and NTS. This annual report details CWS' flow enhancement and riparian planting activities during 2025 and provides an accounting of thermal credits used to offset the thermal load discharged from the treatment plants.

The At a Glance graphic on the following page summarizes the benefits to date of CWS' water quality credit trading program for the Tualatin River Watershed.

AT A GLANCE

Clean Water Services' Water Quality Trading Program Provides Watershed-Scale Benefits

SHADE PROVIDED

CWS has implemented **221** riparian planting projects along streams in the Tualatin River Watershed. Shade provided by these projects helps block potential solar load (sunlight) from warming streams.

TO DATE: **1,319,000,000**
KILOCALORIES PER DAY OF
SOLAR LOAD BLOCKED

STREAMFLOW ENHANCED

CWS releases cool stored water from Barney Reservoir and Hagg Lake during the summertime to enhance stream flows and improve water quality in the Tualatin River and its tributaries.

IN 2025

AN AVERAGE OF **38** CUBIC FEET PER SECOND
(25 MILLION GALLONS PER DAY) WERE RELEASED
FROM SCOGGINS AND BARNEY RESERVOIRS

REDUCTIONS OF SEDIMENT, PHOSPHORUS, AND NITROGEN

The CWS riparian planting program not only provides shade for the streams but also helps reduce sediment and nutrients from reaching the streams.

IN 2025 SEDIMENT REDUCED: **1,620,000 LBS.**
NITROGEN REDUCED: **12,700 LBS.**
PHOSPHORUS REDUCED: **22,200 LBS.**

STREAM MILES RESTORED

CWS' riparian planting program spans both urban and rural areas across the Tualatin River Watershed.

TO DATE: **120**
STREAM MILES RESTORED

1. Background

CWS is a county service district that serves the urban portion of Washington County and small portions of Clackamas, Multnomah, and Yamhill counties. CWS owns and operates four WRRFs in the Tualatin River basin and works in partnership with its co-implementers — the 12 cities in the service area and Washington County. The WRRFs, NTS, and the municipal separate storm sewer system are permitted by the Oregon Department of Environmental Quality (DEQ) under CWS' watershed-based National Pollutant Discharge Elimination System (NPDES) permit. CWS' NPDES permit (Permit) was reissued by DEQ on December 8, 2022, and became effective on January 1, 2023. This annual report covers CWS' activities under the water quality credit trading program from January 1 – December 31, 2025. This report satisfies the reporting requirements specified in the Permit.

The Permit includes thermal load limits for the CWS' Rock Creek, Durham, and Forest Grove WRRFs and NTS based on the 2021 Temperature Total Maximum Daily Load for the Tualatin River. The Permit allows CWS to offset the thermal loads from the Rock Creek, Durham, and Forest Grove WRRFs and the NTS by implementing a water quality credit trading program for temperature. The program includes flow enhancement and riparian planting as specified in Schedule D.13. of the Permit and CWS' DEQ-approved Thermal Load Management Plan (TLMP). The TLMP documents CWS' approach and programs for offsetting the thermal load from the Rock Creek, Durham, and Forest Grove WRRFs and the NTS and specifies CWS' methodology for calculating the thermal credits associated with the riparian planting and flow enhancement programs. CWS updated its TLMP in July 2021; DEQ approved it with the 2022 Permit.

As required by Schedule D.13.f. of the Permit, CWS submitted information regarding thermal loads and credits in the July and August 2025 Discharge Monitoring Reports (DMRs) for the Rock Creek, Durham, and Forest Grove WRRFs and the NTS to demonstrate that CWS is offsetting thermal loads from its WRRFs and the NTS. The July and August DMRs include the aggregate thermal load from the WRRFs and NTS, aggregate thermal credits from flow enhancement, aggregate thermal credits from riparian shade, aggregate total thermal credits, and the net thermal load to the Tualatin River.

Schedule D.13.g. of the Permit also requires CWS to submit a Water Quality Credit Trading Report annually by March 31 that summarizes the implementation and performance of the TLMP over the previous calendar year.

The Permit and TLMP require the annual report to include the following for each new riparian planting project that is enrolled within the calendar year:

- Project name and number.
- Stream length planted.
- Thermal load blocked.
- Thermal credits generated.

All this information is summarized in Section 5, Table 7.

The following information is also presented in this report. The section where the information appears in this report is noted.

- Thermal load reduction activities – recycled water use, treatment facility changes including use of the NTS, and source control activities (Section 2).
- Thermal loads discharged by the Rock Creek, Durham, and Forest Grove WRRFs and NTS (Section 3, Table 4).
- Allowed thermal loads for the Rock Creek, Durham, and Forest Grove WRRFs and NTS (Section 3, Table 4).
- Thermal load credits for flow enhancement (Section 3, Table 5).
- Thermal load credits for riparian shade (Section 5, Table 7).

For flow enhancement activities:

- The average daily effluent flow and maximum daily effluent temperature from the Rock Creek, Durham, and Forest Grove WRRFs and NTS for July 1 – August 31 (Appendix D).
- The average daily Tualatin River flow for July 1 – August 31 at Farmington Bridge (River Mile 33) and Golf Course Road (Appendix D).
- The average daily flow enhancement rate from Hagg Lake for July 1 – August 31 (Appendix D).

For riparian shade activities (at each site):

- Baseline vegetation conditions (density, width) (Appendix A).
- Enhanced vegetation conditions (type, width, anticipated density) (Appendix A).
- Stream characteristics (stream aspect, elevation, wetted width, near stream disturbance zone, incision) (Appendix A).
- Baseline thermal load blocked by existing vegetation and the anticipated thermal load blocked by the enhanced vegetation (Section 5, Table 7).
- Thermal credits from each riparian planting project (Section 5, Table 7, Appendices A and B).
- Riparian vegetation monitoring and maintenance activities (Section 2, Appendix A).
- Baseline compliance assessment (Section 2).
- Documentation of the use of public conservation funds (Section 2).

This report includes all the above information and fulfills the requirements for submitting an annual report of CWS' water quality trading activities for 2025.

2. 2025 Thermal Load Management Activities

The thermal load management activities presented in this report are from January 1 to December 31, 2025.

CWS implements a number of strategies to reduce the thermal load discharged from the WRRFs and NTS. The water quality credit trading program, which includes flow enhancement and riparian planting activities, is used to offset the remaining thermal load from the WRRFs and NTS.

2.1 2025 Thermal Load Reduction Activities

CWS' TLMP states that, on an annual basis, CWS will submit a report that specifies the actions taken to reduce the thermal load discharged from the WRRFs and NTS. CWS identified its recycled water program, the NTS, WRRF improvements, and source control activities as methods that could be used to reduce the thermal load discharged by the WRRFs and NTS. The following is a summary of the actions taken in each of these areas in 2025.

2.1.1 Recycled Water Program

CWS produced 53.8 million gallons of Class A recycled water at the Durham WRRF and 98.5 million gallons of Class A recycled water at the Rock Creek WRRF in 2025. This volume of recycled water represents a direct reduction in the thermal load discharged by CWS' WRRFs. Recycled water from the Durham WRRF is used at three golf courses, two public school athletic fields, a City of Tigard natural area, a CWS-owned natural area, a privately-owned farm, Durham City Park, and for onsite irrigation. Recycled water from the Rock Creek WRRF is used at the Reserve Golf Course.

2.1.2 Forest Grove Natural Treatment System

In 2017, CWS began discharging treated effluent from the Forest Grove and Hillsboro WRRFs through the 95-acre NTS in Forest Grove. Before implementing the NTS, the Forest Grove and Hillsboro WRRFs transferred wastewater through twin 24-inch pipelines to the Rock Creek WRRF for treatment and discharge during the dry season. Wastewater from the Forest Grove and Hillsboro service areas is now treated at the Forest Grove WRRF during the dry season; the treated effluent from the Forest Grove WRRF is then directed through the NTS for further treatment prior to discharge to the Tualatin River. CWS operated the NTS between June and September in 2025.

2.1.3 Improvements at Water Resource Recovery Facilities

CWS pursues capital improvements to further reduce thermal loads discharged from the Rock Creek, Durham, and Forest Grove WRRFs. In 2025, no significant changes were made at any of the WRRFs that would have reduced the thermal load. In previous years, CWS built a cogeneration facility at the Durham WRRF that included air-cooled radiators to dissipate excess heat to the atmosphere and avoid discharging excess heat to the treatment facility effluent. CWS also completed several projects at the Durham facility to expand the utilization of heat recovered from the operation of the cogeneration facility and displace the natural gas usage.

The hot weather in the past few years has highlighted the need to further evaluate temperature profiles across the WRRFs. In 2021, CWS began a study of the temperature profiles across key unit processes at the Rock Creek and Durham WRRFs to evaluate opportunities to further reduce discharge temperatures. The study has been used to evaluate the effect of managing surface area by removing treatment units from service and shading secondary clarifiers. A pilot study was completed in 2023, and the results agree with model predictions that shading secondary clarifiers has the potential to reduce peak daily temperatures by approximately 0.2 degrees Celsius. CWS will continue to study temperature profiles, evaluate results, and define actions, if any, to further reduce discharge temperatures at the WRRFs.

2.1.4 Source Control

CWS regulates all significant industrial user discharges into the sanitary sewer system as part of its DEQ-approved industrial pretreatment program. In 2025, there were no significant changes in permitted industrial sources that would have resulted in substantive changes in the thermal load to the WRRFs. CWS continues to evaluate new and potential industrial thermal loads. Two significant industrial users continue to implement cooling systems at their facilities, which results in a substantial reduction in thermal load to the Rock Creek WRRF.

2.2 2025 Thermal Load Trading Activities

This section summarizes CWS' flow enhancement and riparian planting activities in 2025 as well as riparian monitoring and maintenance activities and shade monitoring activities. Additionally, this section describes CWS' programmatic evaluation of the riparian planting projects enrolled in the water quality trading program, including an assessment of baseline compliance and documentation of the use of public conservation funds for each project enrolled.

2.2.1 Flow Enhancement Activities

In 2025, CWS had 12,618 acre-feet of stored water available in Hagg Lake and 1,654 acre-feet in Barney Reservoir. CWS releases stored water during the summer and fall to meet the following objectives:

- Maintain minimum stream flows in the Tualatin River.
- Generate thermal credits to offset a portion of the thermal load from the CWS' WRRFs and NTS.
- Enhance tributary stream flows.
- Provide sustainable base flows in the upper Tualatin River.
- Improve dissolved oxygen levels and overall water quality in the Tualatin River.

Stored water releases in July and August form the basis of CWS' flow enhancement credit.

In 2025, CWS began releasing stored water from Hagg Lake on May 24 and continued until November 3. Stored water releases from Barney Reservoir began on July 15 and ended on September 12. Table 1 shows the average monthly release rates from Hagg Lake and Barney Reservoir for the 2025 release season.

CWS leases U.S. Fish & Wildlife Service natural flow water rights for instream use at Wapato Lake Wildlife Refuge as described in the 2020 Water Quality Credit Trading Annual Report. The water rights are relatively senior (1928) and located in the upper Tualatin River. They can be protected over the entire downstream length of the Tualatin River from May 1 to September 30. If natural flow water rights are regulated off, the water rights include access to supplemental water from the Tualatin Valley Irrigation District (TVID). Thermal credits are available from the instream lease as long as CWS maintains an agreement with the U.S. Fish & Wildlife Service and TVID for the instream lease. The credits are calculated for July and August as defined by CWS’ Permit and TLMP. Temperature benefits and thermal credits associated with the instream lease at the Forest Grove, Rock Creek, and Durham WRRFs and NTS are calculated using the formulae in the TLMP.

CWS worked with the Oregon Water Resources Department District 18 Watermaster’s office to protect the instream lease rate of 5.4 cfs and have it included as part of the base flow for the Tualatin River. From May 1 until the end date of the lease on September 30, the instream lease was based on natural flow in the Tualatin River. Table 1 shows the average instream rate of the Wapato instream lease for the 2025 release season.

Table 1: 2025 Average Monthly Release Rates from Hagg Lake and Barney Reservoir and the Wapato Instream Lease

Month	2025 Average Release Rate from Scoggins Reservoir (cfs)	2025 Average Release Rate from Barney Reservoir (cfs)	2025 Average Rate from Wapato Instream Lease (cfs)	2025 Average Combined Stored Water Release Rate + Instream Lease (cfs)
May	13.8 ^a	-	5.4	8.9
June	19.3	-	5.4	24.7
July	45.5	14.0 ^a	5.4	58.6
August	52.6	13.5	5.4	71.5
September ^b	44.8	14.0 ^a	5.4	55.4
October	25.6	-	-	22.3
November ^b	40.0 ^a	-	-	40.0

- a) Average based on days stored water was released.
- b) Stored water releases from Hagg Lake and Barney Reservoir ended on November 3 and September 12, respectively.

CWS also works with landowners to lease their natural flow water rights for instream use. To date, CWS has leased 27 water rights on the mainstem Tualatin River or tributaries, totaling approximately 570 acre-feet, for instream use. CWS has not yet used this water to generate credits as part of its water quality credit trading program.

In 2025, CWS used approximately 11,596 acre-feet (approximately 92% of its stored water) from Hagg Lake and 1,611 acre-feet (approximately 97% of its stored water) from Barney Reservoir.

2.2.2 Riparian Planting Activities

This section lists the riparian planting projects enrolled in the water quality trading program in 2025, describes the project summary created for each project, and describes CWS’ Capital and Landowner Incentive programs.

For 2025, CWS enrolled 10 projects that total approximately 7.61 stream miles in the Tualatin River Basin for thermal credit. Table 2 presents the riparian planting projects and the stream length associated with each project.

Table 2: 2025 Enrolled Riparian Planting Projects

Project	Stream Name	Stream Length (ft)
1646 – 185th to Kaiser – Springville Creek	Springville Creek	13,047
2474 – Reedville Creek Expansion	Reedville Creek	1,942
2497 – Village at Summer Creek HOA	Summer Creek	571
2529 – Rock Creek – TV Highway	Rock Creek	1,852
2530 – Witch Hazel Creek – Brookwood Crossing	Witch Hazel Creek	883
2541 – TSWCD – Tualatin River	Tualatin River	6,793
2542 – TSWCD – Christensen Creek Tributary	Christensen Creek	3,221
2552 – TSWCD – Fanno Creek Tributary	Fanno Creek	2,081
2563 – TSWCD – Gales Creek	Gales Creek	3,188
6882 – Cedar Mill Trunk – Jenkins to Beaverton Interceptor	Cedar Mill Creek	6,620
Total Stream Miles		7.61 miles

HOA: Homeowner Association; TSWCD: Tualatin Soil and Water Conservation District

2.2.2.1 Project Summaries

Appendix A contains a project summary for each project enrolled in 2025. Project summaries contain general site information (location, size in acres, stream length and average width, plant communities, etc.), project activities and partners, a site assessment report, a summary of the thermal credits generated, and the input and output data used to calculate the effective shade and thermal load blocked for each project.

2.2.2.2 Capital Program

Riparian planting projects implemented under CWS’ capital program mostly occur on public lands where large-scale restoration opportunities are available, and multiple water quality and ecological benefits can be achieved. Project activities under this program include securing easements, agreements, or contracts with property owners, preparing the site, managing invasive species, revegetating and planting, monitoring, and ongoing maintenance. Additional enhancement activities such as reconfiguring channels; placing

large wood, gravel, and boulders; and creating off-channel habitats are performed on a site-specific basis to improve a broader range of ecosystem functions.

Six riparian enhancement projects, totaling 4.72 stream miles, were planted under CWS' capital program and enrolled in 2025.

2.2.2.3 Landowner Incentive Program

CWS contracts with the Tualatin Soil and Water Conservation District (TSWCD) to secure project agreements with landowners. Using CWS funding, TSWCD offers financial incentives to landowners to participate in the U.S. Department of Agriculture's Conservation Reserve Enhancement Program (ECREP) and a Vegetated Buffer Areas for Conservation (VEGBAC) program. The ECREP provides an opportunity to leverage local and federal programs. This collaboration has greatly increased the acceptance and implementation of restoration programs at the local level. Riparian planting projects in rural areas primarily consist of site preparation, revegetation, managing invasive species, monitoring, and maintenance.

In 2025, four riparian enhancement projects were undertaken under the CWS' landowner incentive program, resulting in 2.89 stream miles of riparian planting.

2.2.2.4 Riparian Monitoring and Maintenance Activities

Site monitoring and maintenance are critical to ensure the success of riparian planting projects because revegetated sites need protection from a variety of stressors, including invasive species, herbivores, and dry weather. As a result, CWS implements a robust monitoring and maintenance program that includes qualitative and quantitative monitoring activities. The following sections outline CWS' approach toward monitoring and maintenance. The results of the activities at each project site are presented in site assessment reports. The reports for projects enrolled in 2025 are presented in Appendix A; the reports for projects enrolled between 2004 and 2024 are available upon request.

2.2.2.5 Qualitative and Quantitative Monitoring

CWS conducts qualitative and quantitative monitoring, typically during the summer at the riparian planting projects enrolled for thermal credit. Site conditions and site-specific management actions are documented in site assessment reports.

Qualitative monitoring is conducted annually to assess overall project health and inform management actions. This assessment approach not only helps project managers determine the necessary level of maintenance needed at each riparian planting project site (e.g., inter-planting, seeding, weed control, herbivore protections) but also accounts for the dynamic nature of riparian planting projects as they mature from initial plantings to stable riparian ecosystems.

Quantitative monitoring is conducted every two years and gathers information regarding native tree and shrub counts, species composition, species diversity, stem density, and riparian structure. Project phase (i.e., transitional, established, or stewardship phase) is derived from these metrics for each plant community and informs management actions.

2.2.2.6 Site Assessment Reports

CWS prepares an assessment report for each project site after monitoring is completed and uses the report to document site conditions, identify management actions taken, and propose maintenance actions for the following year. Each site assessment report contains project-specific information, including project acreage, the initial planting year, the year when thermal credit was taken, and the stream length associated with the project. Site assessment reports also contain information regarding each plant community (e.g., riparian forest, forested wetland, upland forest, scrub-shrub) within a project. This information includes a list of categorized plant species, stem densities, and the phase of each plant community.

As described in the site assessment reports, the 10 projects enrolled in 2025 range from 3.61 to approximately 83 acres. Most of the projects were planted with a riparian forest-type plant community; other plant communities included scrub-shrub, forested wetland, and emergent marsh. Management actions completed in 2025, and additional management actions recommended for 2026 at these sites include inter-planting, seeding, and invasive weed treatment.

2.2.3 Shade Monitoring

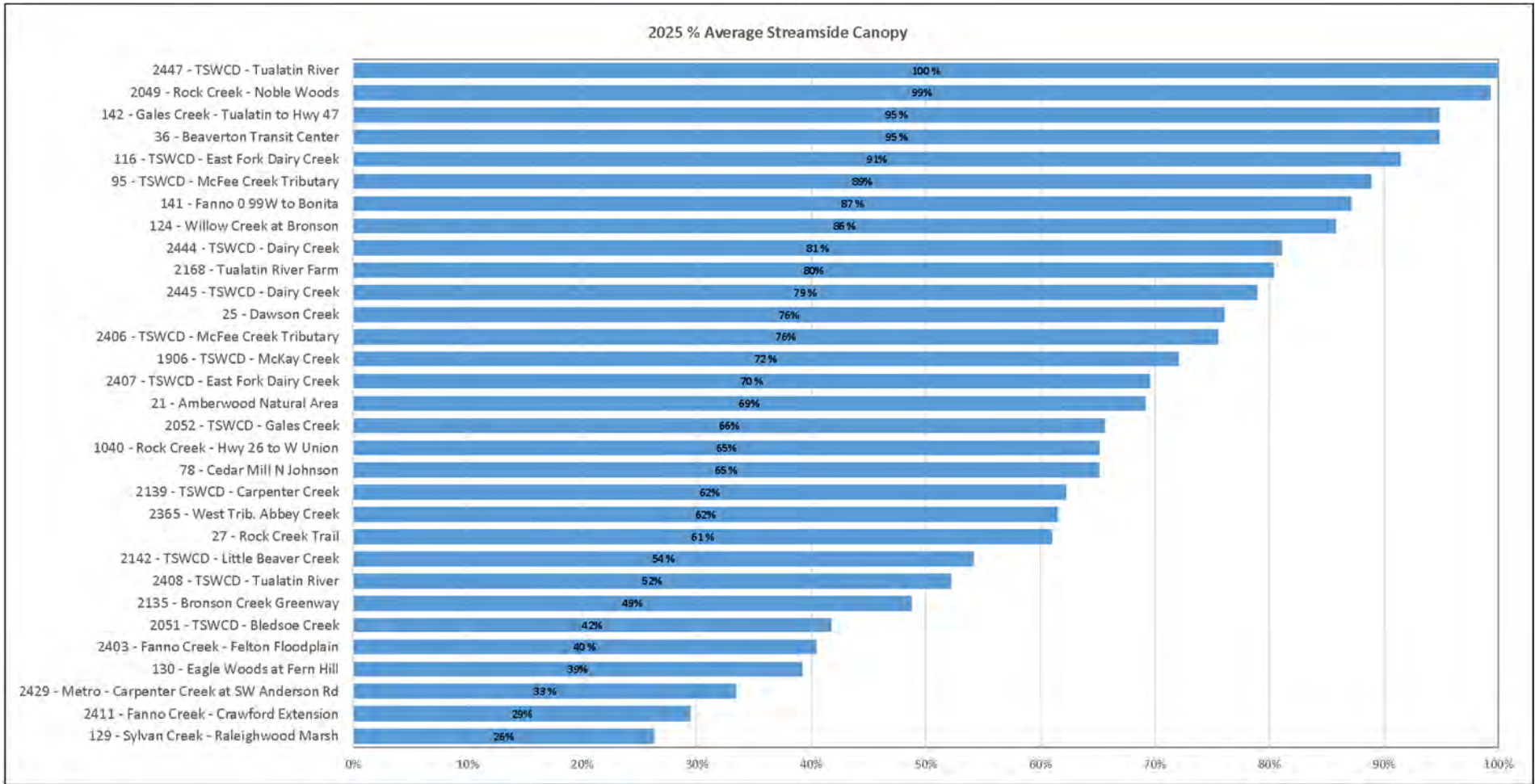
In addition to the monitoring described above, CWS collects data to assess shade at riparian projects every five years. An accurate representation of streamside canopy cover is difficult to obtain due to the challenges associated with field shade monitoring protocols. CWS conducts shade monitoring using field measurements and remotely sensed datasets, including Light Detection and Ranging (LiDAR) and aerial photos. The protocol for monitoring shade in the field is establishing one monitoring point for each 500-foot stream segment of a project with a minimum of three monitoring points per project. Photographs and densiometer readings are taken at each monitoring point. Photographic monitoring includes upstream and downstream views of each stream bank within the project. Shade is estimated as densiometer readings of canopy cover on each stream bank within the project.

This year marks the 21st anniversary of CWS' water quality credit trading program. Figure 1 presents the shade monitoring results at the 31 sites enrolled in the program in 2005, 2010, 2015, and 2020 that were monitored for shade in 2025. Eleven of the 31 sites have been enrolled in the program for 20 years and were monitored for shade in 2005, six were monitored for shade in 2010, seven were monitored for shade in 2015, and 10 were monitored for shade in 2020.

The majority of projects are achieving performance goals. Twenty-seven of the 31 projects provided 40% or greater streamside canopy cover; the remaining four provided less than 40%. Exceptions to this are detailed below.

Minor variations in shade estimates at project sites are likely due to challenges associated with the precision of field shade monitoring protocols; more significant changes in shade are likely a result of natural processes that alter stream and riparian characteristics.

Figure 1: 2025 Shade Monitoring Results



*Some project names have changed since their enrollment in the trading program to better reflect their location in the watershed. The project numbers have not changed.

Four projects had an average streamside canopy cover of less than 40% when field monitored for shade in 2025, 129 – Sylvan Creek – Raleighwood Marsh, 130 – Eagle Woods at Fernhill, 2411 – Fanno Creek – Crawford Extension, and 2429 – Metro – Carpenter Creek at SW Anderson Road. Significant canopy cover was not expected at two of them, 2411 – Fanno Creek – Crawford Extension and 2429 – Metro–Carpenter Creek at SW Anderson Road, because they have been enrolled in the trading program for only five years. CWS will continue to monitor these sites and increase management actions if the projects are not performing as expected when monitored 10 years after project enrollment. Project 130 – Eagle Woods at Fernhill was monitored for shade in 2025 using a densiometer, however the data collected was considered to be anomalous and likely unrepresentative. Shade monitoring data from LiDAR and aerial imagery will be used to correct the densiometer data in 2026 (see below for further details on LiDAR data).

The 129 – Sylvan Creek-Raleighwood Marsh project had an average streamside canopy cover of 26% when monitored in 2025. This project was planted with 3,630 native shrubs and trees when enrolled in 2007 and has extensive emergent wetland complexes and significant beaver activity. The project has received focused attention, including invasive weed treatment and inter-planting.

This project will continue to be monitored for invasive species cover, and plant diversity and density. Completed and recommended management actions, as well as detailed monitoring data for this project, including recent stem density, cover, and observed species can be found in Appendix C.

Two projects (2137 – TSWCD – Gales Creek and 2138 – TSWCD – Little Beaver Creek) were not monitored for canopy cover using field densiometers in 2025 because there was no landowner contract in place; these projects were monitored for shade using LiDAR and aerial imagery in 2025. Results of the LiDAR monitoring are expected to be available in 2026.

CWS is committed to ensuring the success of each of its planting projects. Each project site is monitored extensively to evaluate plant diversity and density, overall project health, and project phase. Should a project not perform as expected, CWS implements management actions to ensure the project's success. Out of the 221 active riparian planting projects enrolled in CWS' water quality trading program, five required additional management actions to improve project performance in 2025. Appendix C describes the challenges encountered and the additional management actions taken at each project site.

Monitoring and management follow-up efforts have improved project conditions and overall performance. For example, Project 2051 – TSWCD – Bledsoe Creek was previously not performing as expected, but additional management actions have increased canopy cover to 41% when monitored using a field densiometer in 2025. This project has been removed from Appendix C.

2.2.4 Programmatic Assessment of Enrolled Riparian Planting Projects

This section describes the programmatic assessments conducted for riparian planting projects enrolled in the water quality trading program in 2025. These include a baseline compliance assessment and an evaluation of the use of public conservation funds.

2.2.4.1 Baseline Compliance Assessment

In accordance with Schedule D.13.c.ii. of the Permit, CWS conducts a baseline compliance assessment for each riparian planting project enrolled in the trading program. CWS identifies the regulatory requirements regarding riparian areas that apply at each site and verifies that the project is in compliance. CWS then determines the conditions that should be used to determine a baseline for calculating thermal credit.

For riparian planting projects in agricultural areas, local water quality management rules (Oregon Administrative Rules (OAR) Chapter 603, Division 95) developed by the Oregon Department of Agriculture (ODA) were identified as the regulatory requirements that apply. These rules include non-disturbance criteria for streamside riparian areas. The TSWCD, with the support of local partners, implements the Agricultural Water Quality Management Plan as a local management agency for the ODA. Only projects that are in compliance with applicable rules are enrolled into the shade monitoring program, and the TSWCD verifies compliance. For sites deemed to be in compliance, existing vegetation is used to define baseline conditions for determining thermal credit. The three riparian planting projects located in agricultural areas in 2025 were in compliance with the ODA's local water quality management rules. Thus, existing conditions were used as a baseline to determine thermal credit. The projects are:

1. 2541 – TSWCD – Tualatin River
2. 2542 – TSWCD – Christensen Creek Tributary
3. 2563 – TSWCD – Gales Creek

For riparian planting projects in urban areas, CWS' Design and Construction Standards (D&C Standards) (adopted in 2019 by CWS Resolution and Order 19-5 and amended by CWS Resolution and Order 19-22) apply to all active construction sites and to all construction project sites undertaken since the mid-1990s. In 2025, CWS did not enroll any projects for thermal credit in urban areas governed by the D&C Standards.

In cases where the D&C Standards do not apply, the cities in the CWS service area and Washington County also have regulations regarding riparian protection in urban natural resource areas. Five projects were implemented in the cities of Hillsboro, Beaverton, and Tigard in 2025. These cities' regulations regarding riparian protection are voluntary and do not require active riparian planting. Therefore, existing conditions were used as a baseline to determine thermal credits for the project. The projects and the corresponding city regulations are:

City of Hillsboro (Community Development Code Chapter 12.27.235)

1. 2474 – Reedville Creek Expansion
2. 2529 – Rock Creek – TV Highway
3. 2530 – Witch Hazel Creek – Brookwood Crossing

City of Beaverton (Ordinance No. 4414)

4. 6882 – Cedar Mill Trunk – Jenkins to Beaverton Interceptor

City of Tigard (Community Development Code Chapter 18.510.080)

5. 2497 – Village at Summer Creek.

Two projects are located outside an urban area, but not where agricultural activities occur. As a result, neither the ODA’s local water quality management rules nor CWS’ D&C Standards apply. However, these projects are in Washington County, where regulations regarding riparian protection are voluntary and do not require active riparian planting (Washington County Development Code Section 422-1). Therefore, existing conditions were used as a baseline for determining thermal credits. The projects are:

1. 1646 – Springville Creek – 185th to Kaiser
2. 2552 – TSWCD – Fanno Creek

2.2.4.2 Public Conservation Funds

CWS’ TLMP includes a requirement to document the use of public conservation funds (PCFs) for each project in the trading program. PCFs are defined in OAR 340-039-0005(4) as “[p]ublic funds that are targeted to support voluntary natural resource protection or restoration.” OAR 340-039-0040(4) states that “[c]redits generated under an approved trading plan may not include water quality benefits obtained with public conservation funds. Where public sources of funding are used for credit-generating activities, it is the entity’s responsibility to demonstrate compliance with this requirement in its annual report.” Based on the definition of water quality benefits in DEQ’s Water Quality Trading Internal Management Directive, credit-generating activities include site preparation, planting, monitoring, and maintenance activities.

CWS works with several partner agencies to implement riparian planting projects. For projects where PCFs are used, CWS uses the approaches described in Section 3 to demonstrate that the thermal credits being claimed are based on CWS’ contribution toward credit-generating activities (e.g., site preparation, planting, monitoring, and maintenance activities).

For projects conducted through the VEGBAC and ECREP programs, PCFs are not used. CWS funds the cost of all credit-generating activities and thus is eligible for 100% of the thermal credits generated by these projects.

As part of the capital program, CWS partners with the co-implementers, Metro, Tualatin Hills Park & Recreation District (THPRD), and other agencies to implement riparian planting projects. For Metro and THPRD projects, CWS has intergovernmental

agreements that identify the work performed by each entity at a project site. CWS conducts the credit-generating activities; thus, 100% of the thermal credits generated are available for CWS' use. For projects where CWS partners with the co-implementers or other agencies such as the U.S. Fish & Wildlife Service, PCFs are not used. CWS funds the cost of all credit-generating activities and is, therefore, eligible for 100% of the thermal credits generated by these projects.

PCFs were not used at any of the riparian projects enrolled in 2025.

3. Calculation of Thermal Loads and Credits for 2025

Schedule B.4.f. of the Permit requires CWS to report the aggregate thermal load to offset and the aggregate thermal credits for the Durham, Rock Creek, and Forest Grove WRRFs and NTS. As referenced in Table 3 (which is Table B9 in Schedule B.4.f. of the Permit), the “aggregate thermal load to offset” is the combined “excess thermal load to offset” from the Durham, Rock Creek, and the Forest Grove WRRFs and NTS. The aggregate thermal credit is the combined credits from riparian shade plantings and flow enhancement. The “aggregate thermal load to offset” is the aggregate of the excess thermal load minus the allowable thermal load at each WRRF and the NTS.

Table 3: Aggregate Thermal Load to Offset and Aggregate Thermal Credits Generated

Item or Parameter	Units	Time Period	Minimum Frequency	Sample Type / Required Action	Report Statistic (See note a.)
Aggregate Thermal Load to Offset	Million kcals/day	July 1 – August 31	1/month	Calculation (See note b.)	Monthly Maximum
Aggregate Thermal Load Credit	Million kcals/day	July 1-August 31	1/month	Calculation (See note c.)	Monthly Maximum
Note: a. When submitting DMRs electronically, all data used to determine summary statistics must be submitted in a DEQ-approved format as a spreadsheet via electronic reporting unless otherwise directed by DEQ. b. The aggregate thermal load to offset is the combined thermal load to offset from the Durham and Rock Creek WRRFs and the Forest Grove NTS. c. The aggregate thermal credit is the combined credits from riparian shade plantings and flow enhancement.					

The section below presents the aggregate thermal load to offset and the aggregate thermal load credits for the Rock Creek, Durham, and Forest Grove WRRFs and NTS for 2025.

3.1 Aggregate Thermal Load to Offset

The excess thermal loads discharged from the Rock Creek, Durham, and Forest Grove WRRFs and NTS are based on daily maximum effluent temperature and daily average effluent flow conditions for each WRRF and the NTS for July and August. The period July 1 to August 31 is identified in the Permit as the temperature credit trading period and corresponds to the time of year when river temperatures are of most concern.

The excess thermal loads discharged from each WRRF and the NTS are calculated daily for July and August using the equation from Schedule A.2 in the Permit:

$$\text{Excess Thermal Load} \left(\text{million} \frac{\text{kcal}}{\text{day}} \right) = Q_{PS} \times \Delta T \times \left(\frac{1000}{35.3} \right) \times 86400 \times 5/9$$

where: $\Delta T = T_{PS} - T_{SP}$ (degrees F)

Q_{PS} = treatment plant effluent flow (cfs)

T_{PS} = treatment plant maximum daily effluent temperature (degrees F)

T_{SP} = system potential temperature (degrees F)

(Durham WRRF = 64.6 degrees F, Rock Creek WRRF=58.5 degrees F, Forest Grove WRRF and NTS = 53.1 degrees F)

Other factors: 1000 kg/m³; 35.3 ft³/m³; 86,400 sec/day; (5 degrees C)/(9 degrees F)

The daily average effluent flow and daily maximum effluent temperatures that are used to calculate the excess thermal loads for each WRRF and the NTS for July and August are presented in Appendix D.

The allowable thermal load, which represents the permitted thermal load, is also calculated for each WRRF and the NTS for July and August. The aggregate thermal load to offset for the WRRFs and NTS is calculated as shown in the following equation:

$$\begin{aligned} \text{Aggregate Thermal Load to Offset} \\ = \text{Aggregate Excess Thermal Load} - \text{Aggregate Allowable Thermal Load} \end{aligned}$$

In 2025, the aggregate thermal load to offset from the WRRFs and NTS was 1,144 million kcal/day for July and 1,240 million kcal/day for August. The aggregate excess thermal loads, aggregate allowable thermal loads, and aggregate thermal loads to offset the WRRFs and NTS for July and August 2025 are presented in Table 4.

Table 4: Aggregate Thermal Load Summary for July and August 2025

Data Aggregate Summary for Rock Creek WRRF, Durham WRRF, and Forest Grove WRRF and NTS	
July 2025	
Aggregate excess thermal load	1,201 million kcal/day
Aggregate allowable thermal load	58 million kcal/day
Aggregate thermal load to offset	1,144 million kcal/day
August 2025	
Aggregate excess thermal load	1,299 million kcal/day
Aggregate allowable thermal load	59 million kcal/day
Aggregate thermal load to offset	1,240 million kcal/day

3.2 Aggregate Thermal Load Credits Generated

This section presents the aggregate thermal load credits generated from flow enhancement and riparian planting for the Durham, Rock Creek, and Forest Grove WRRFs and NTS for July and August 2025.

3.2.1 Flow Enhancement Credits

Table 5 presents the median flow at the Farmington gauge, on the Tualatin River at River Mile 33, and the average flow enhancement rate for July and August 2025. Flow enhancement credits are calculated using empirical equations that quantify the temperature benefits of CWS’ stored water releases at each facility. The aggregate thermal credits from flow enhancement were 1,535 million kcal/day for July 2025 and 1,895 million kcal/day for August 2025. Thermal credits from flow enhancement in July and August are based on CWS’ stored water releases from Hagg Lake, Barney Reservoir, and the Wapato instream lease.

Table 5: Flow Enhancement and Resulting Aggregate Thermal Credits (July and August 2025)

Flow Enhancement Summary	
July 2025	Flow rate / credits
Median flow at Farmington gauge	158 cfs
Average flow enhancement rate	58.6 cfs
Aggregate thermal credits from flow enhancement	1,535 million kcal/day
August 2025	Flow rate / credits
Median flow at Farmington gauge	163 cfs
Average flow enhancement rate	71.5 cfs
Aggregate thermal credits from flow enhancement	1,895 million kcal/day

4. Reconciliation of Thermal Loads and Credits for 2025

Table B1 and Table B9 from Schedule B.4.f. of the Permit require CWS to report the aggregate thermal load to offset and the aggregate thermal credits for the Durham, Rock Creek, and Forest Grove WRRFs and NTS as part of the July and August DMRs submitted to DEQ. Note that the July and August 2024 DMRs were updated due to a minor error in the credit calculations and were resubmitted to DEQ in January 2026. The numbers presented in Table 6 were reported in the July 2025 and August 2025 DMR to show:

- The aggregate excess thermal load.
- The aggregate allowable thermal load.
- The aggregate thermal load to offset from the Rock Creek, Durham, and Forest Grove WRRFs and NTS.
- The aggregate thermal credits generated with flow enhancement.
- The 645 million kcal/day of aggregate thermal credits generated with riparian plantings for 2004 – 2024.
- The total aggregate thermal load credit.
- The net thermal load to the Tualatin River.

Table 6: Aggregate Thermal Loads and Credits Summary (July and August 2025)

Thermal Loads and Credits: July and August 2025 ^a (in million kcal/day)								
	Aggregate Excess Thermal Load	Aggregate Allowable Thermal Load	Aggregate Thermal Load to Offset	Aggregate Thermal Credits from Flow Augmentation	Aggregate Thermal Credits from Riparian Shade		Aggregate Thermal Load Credit	Net Thermal Load (to Tualatin River)
					Generated Before Reporting Period (2004-2024)	Generated During Reporting Period		
Jul	1,201	58	1,144	1,535	645	17	2,196	0
Aug	1,299	59	1,240	1,895	645	17	2,556	0

a) Thermal loads and credits are reported in the July and August DMRs only

Note: In accordance with Schedule A.2, compliance with the thermal load limits is demonstrated by generating thermal credits that meet or exceed the Aggregate Thermal Load to Offset discharged from the Durham, Rock Creek, and Forest Grove water resource recovery facilities. The term “Net Thermal Load to Tualatin River” is the “Aggregate Thermal Load to Offset” minus the “Aggregate Thermal Load Credit.” Compliance with the thermal load limits is achieved if the “Net Thermal Load to Tualatin River” is zero.

This table shows that CWS continues to offset the excess thermal loads from the Rock Creek, Durham, and Forest Grove WRRFs and NTS using credits generated from flow enhancement and riparian shade planting activities, as demonstrated by a zero net thermal load to the Tualatin River.

CWS generated significantly more thermal credits with its water quality trading program than needed to offset thermal loads from the WRRFs and NTS. In 2025, CWS generated

1,052 million kcal/day and 1,316 million kcal/day of extra thermal credits in July and August, respectively. Note that the river flow data used to calculate the thermal loads and credits for the July and August DMRs is raw data and subject to change.

5. Riparian Planting Credits Available for 2025

As specified in Schedule D.13.g. of the Permit, this report must include, at a minimum, the project name, project number, stream length planted, thermal load blocked, and thermal credits generated for each new riparian shade project completed within the calendar year.

Table 7 presents this information for the riparian planting projects enrolled in 2025. The table shows:

- The stream miles planted.
- The thermal load blocked by existing vegetation conditions (baseline).
- The thermal load blocked by future enhanced vegetation conditions modeled using a 20-year shade establishment period.
- The overall thermal load reduction.

Using riparian vegetation codes (Appendix E) and stream characteristic information as inputs, the “Shade-a-Lator” component of DEQ’s Heat Source temperature model (version 6.0) was used to calculate effective shade and thermal load blocked with baseline riparian vegetation conditions and for the future enhanced vegetation conditions. The difference between them represents the reduction in thermal load (i.e., environmental benefit) associated with the riparian planting project. CWS’ TLMP specifies a 2-to-1 trading ratio for calculating credit for shade, meaning the thermal credit for shade is equal to half of the reduction in thermal load.

For 2025, CWS generated approximately 16.5 million kcal/day of thermal credit from 10 new riparian planting projects.

Table 7: 2025 New Riparian Planting Projects and Associated Thermal Credit

Project	CWS Program	Stream Length (feet)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) ^a (million kcal/day)	Thermal Credits Available ^b (million kcal/day)	CWS Thermal Credits ^c (million kcal/day)
1646 – 185th to Kaiser – Springville Creek	Capital	13,047	9.91	22.4	12.5	6.26	6.26
2474 – Reedville Creek Expansion	Capital	1,942	2.09	3.91	1.82	0.910	0.910
2497 – Village at Summer Creek HOA	Capital	571	0.0906	2.18	2.09	1.04	1.04
2529 – Rock Creek – TV Highway	Capital	1,852	2.69	3.50	0.816	0.408	0.408
2530 – Witch Hazel Creek – Brookwood Crossing	Capital	883	0.450	0.868	0.417	0.209	0.209
2541 – TSWCD – Tualatin River	VEGBAC	6,793	18.7	24.4	5.76	2.88	2.88
2542 – TSWCD – Christensen Creek Tributary	VEGBAC	3,221	2.71	3.57	0.867	0.433	0.433
2552 – TSWCD – Fanno Creek	VEGBAC	2,081	5.68	6.63	0.947	0.474	0.474
2563 – TSWCD – Gales Creek	VEGBAC	3,188	4.48	7.06	2.58	1.29	1.29
6882 – Cedar Mill Trunk – Jenkins to Beaverton Interceptor	Capital	6,620	12.1	17.3	5.27	2.64	2.64

a) The “Thermal Load Reduction” represents the thermal load blocked by enhanced conditions minus the thermal load blocked by baseline conditions.

b) Using CWS’ 2-to-1 trading ratio, the “Thermal Credits Available” represent 50% of the “Thermal Load Reduction.” Note there are minor differences in the calculation of thermal credits due to rounding associated with the application of the trading ratio.

c) “CWS Thermal Credits” represents the thermal credit claimed by CWS based on its contribution to credit-generating activities. Public conservation funds were not used at any of the riparian projects enrolled in 2025, so CWS is eligible for 100% of the thermal credits generated by these projects.

CWS has 221 active riparian shade projects enrolled in the water quality trading program, resulting in approximately 660 million kcal/day of riparian shade credit and the restoration of approximately 120 stream miles of riparian vegetation. Appendix B summarizes these riparian shade projects, including project name, credit year, project characteristics (average wetted width and stream length), and the thermal credit claimed by CWS.

CWS gains thermal credits for project sites for which a valid contract or agreement is in place with the landowner. For projects without a landowner contract in place, CWS conducts routine shade monitoring using LiDAR and aerial imagery and gains thermal credits if the project sites provide the expected canopy cover.

Five projects were removed from the water quality trading calculation portfolio in 2019 because the landowners opted not to renew their contracts or agreements. In 2023, CWS reactivated these projects into the water quality trading shade portfolio after review of the 2019 LiDAR and aerial imagery data, ensuring a continuation of function. In the future, should the projects require onsite work to create adequate shade and a landowner agreement or contract is not in place, the project will be removed from the program until a landowner contract or agreement is renewed.

In 2025, CWS voluntarily removed one of these five projects, Project 1421 – TSWCD – Tualatin River, from its portfolio of riparian shade projects because monitoring indicated it no longer provided the anticipated shade, and a landowner agreement is not in place to conduct onsite work. The 660 million kcal/day of riparian shade credit and miles of stream restored reflect the removal of this project and its associated credits from CWS' portfolio. CWS will review the project to ensure it continues to function as intended before re-enrolling it into CWS' water quality credit trading program.

CWS' 660 million kcal/day of riparian shade credit includes the addition of the approximately 17 million kcal/day of riparian shade credits that were generated by the 10 riparian shade projects enrolled in the program in 2025. The 660 million kcal/day of riparian shade credit will be available for use in 2026 and will be reported in the July and August 2026 DMRs for the Rock Creek, Durham, and Forest Grove WRRFs and NTS.

6. Adaptive Management

In its February 6, 2019, policy memorandum on water quality trading, the Environmental Protection Agency noted that adaptive management is a key principle of a water quality trading program. An updated TLMP was submitted to DEQ as an addendum to the Permit renewal application in July 2021. The updated plan incorporated the adaptive management changes to the TLMP that CWS made during the 2016 Permit cycle. The updated TLMP was approved by DEQ when it reissued the Permit in December 2022.

CWS implements an adaptive management program to assess effectiveness and to improve its water quality trading program. Project-specific adaptive management strategies are discussed in Shade Monitoring (Section 2.2.3). Additionally, CWS reviews its TLMP to ensure it reflects current implementation strategies and updates are included

in this annual report. There were no other adaptive management changes implemented in 2025.

7. Environmental Benefits

CWS' water quality credit trading program provides numerous benefits beyond temperature benefits. Ecosystem benefits include improved stream functions (e.g., floodplain roughness, bank stabilization, peak flow attenuation, habitat creation), increased diversity of aquatic and terrestrial plant and animal species, filtering of stormwater runoff, and improved water quality. The increased complexity of structure and diversity of restored riparian forests, forested wetlands, and scrub-shrub wetlands support many important ecosystem functions for the aquatic environment. One example is the colonization of some stream reaches by beavers, a keystone species for stream function in the watershed. By raising the water table, beavers promote floodplain wetlands with enhanced plant, animal, and geomorphic diversity in comparison to the original simplified stream channel. These features, and the resulting geomorphic complexity, enhance fish habitat quality and create off-channel habitats that may provide cold water refuges. CWS works with multiple partners to enhance riparian areas, which improves the overall health of the Tualatin River Watershed and improves water quality.

CWS has estimated the annual water quality benefits associated with sediment and nutrient reduction from the riparian planting program using methods developed in the Chesapeake Bay¹ that provide a wide range of sediment and nutrient removal reduction for stream restoration projects. In 2025, the 221 active riparian planting projects enrolled in CWS' water quality trading program are estimated to have removed the approximate amounts of sediment and nutrients below that would otherwise be released to streams in the Tualatin Basin.

- 1,620,000 pounds of sediment.
- 12,700 pounds of total nitrogen.
- 22,200 pounds of phosphorus.

CWS' release of stored water flow enhancement provides cooling effects, buffers against temperature changes, and results in higher dissolved oxygen levels and improved overall water quality to support aquatic life. CWS' releases of stored water also sustain base flows in the upper Tualatin River that otherwise would not exist. The release of stored water and the release of highly treated discharges from CWS' Rock Creek, Durham, and Forest Grove WRRFs and NTS provide a sustainable base flow to the mainstem Tualatin River during the dry season.

¹ Schueler, T., Stack, B. 2013. Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects. Chesapeake Stormwater Network and Center for Watershed Protection, Ellicott City, MD. Pages 1-131 available at: http://www.chesapeakebay.net/documents/Final_CBP_Approved_Stream_Restoration_Panel_report_LONG_with_appendices_A-G_02062014.pdf

8. Appendices

Appendix A: Project Summaries for Riparian Planting Projects Enrolled in 2025

Appendix B: Riparian Shade Planting Projects (2004-2025)

Appendix C: Additional Management Actions

Appendix D: Identification of Trading Baselines for Flow Enhancement

Appendix E: Riparian Codes for Shade-a-Lator

Appendix A
Project Summaries for Riparian Planting Projects Enrolled in 2025

1646 – 185th to Kaiser – Springville Creek

Project Summary

Project ID	Acres
1646	82.86
Location	
Public property in urban Washington County, bisected by Springville Creek, located between NW Kaiser Road and 185 th Avenue.	
Program	
Capital	
Lat/Long	Number of Plants Installed
45.56, -122.84	451,332
Stream Length	Average Stream Width
13,047 feet	12.9 feet
Initial Planting Year/Credit Year	CWS Thermal Benefits/Credits
2009/2025	6.26 million kcal/day
Plant Communities	
Riparian Forest, Scrub-Shrub, and Upland Forest (refer to the Site Assessment Report for additional information)	
Partners	
Tualatin Hills Park & Recreation District	
Riparian Planting Activities	
Site preparation, targeted invasive species treatment, and riparian plantings	
Instream Enhancement Activities	
None	

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 2,850

Phase: Establishment

Native Tree	Native Shrub	Native Herbaceous	Invasives
bigleaf maple	arroyo willow	American speedwell	bull thistle
black cottonwood	beaked hazelnut	beggarticks	Canada thistle
black hawthorn	black twinberry	bluejoint reedgrass	common hawthorn
casacara	*clustered wild rose	cleavers	common velvetgrass
Douglas-fir	*Douglas' spirea	common beggarticks	herb Robert
*Oregon ash	dune willow	common cattail	Himalayan blackberry
Oregon oak	mock orange	common horsetail	reed canary grass
red alder	native wild rose	common sweet cicely	St. John's wort
	nootka rose	common yarrow	tansy ragwort
	oceanspray	fowl bluegrass	
	osoberry, indian plum	fringecup	
	Pacific ninebark	*giant horsetail	
	*Pacific Willow	grooved rush	
	red elderberry	hedgenettle	
	red-osier dogwood	lady fern	
	serviceberry	large-leaved avens	
	Sitka Willow	marsh pennywort	
	snowberry	nodding beggarticks	
	tall Oregon grape	Pacific rush	
	thimbleberry	pasture rush	
	*trailing blackberry	piggyback	
		rice cutgrass	
		small duckweed	
		small-fruited bulrush	
		spike bentgrass	
		tall annual willowherb	
		taperfruit shortscale sedge	
		tufted hairgrass	
		wapato	
		water parsely	
		western swordfern	
		willowherb	
		yellow touch-me-not	

Plant Community: Scrub-Shrub

Stems per Acre: 2,212

Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
bignone maple	baldhip rose	American speedwell	bull thistle
bitter cherry	beaked hazelnut	beggarticks	Canada thistle
black hawthorn	black twinberry	bignone lupine	common hawthorn
casara	clustered wild rose	bittercress	common velvetgrass
*Oregon ash	*Douglas' spirea	Blue Wildrye	herb Robert
Oregon oak	mock orange	bracken fern	Himalayan blackberry
pacific crab apple	native wild rose	broadfruit bur-reed	reed canary grass
vine maple	nootka rose	cleavers	St. John's wort
W. v. ponderosa pine	oceanspray	common beggarticks	tansy ragwort
	osoberry, indian plum	*common cattail	
	Pacific ninebark	common horsetail	
	Pacific Willow	common spikerush	
	red elderberry	curlytop knotweed	
	red flowering currant	denseflower willowherb	
	red-osier dogwood	division blister buttercup	
	*snowberry	Douglas aster	
	tall Oregon grape	fowl bluegrass	
	thimbleberry	fowl mannagrass	
	trailing blackberry	fringecup	
		giant horsetail	
		grooved rush	
		lady fern	
		marsh pennywort	
		meadow barley	
		mild waterpepper	
		northern water plantain	
		nutsedge	
		Pacific rush	
		pasture rush	
		pondweed	
		rice cutgrass	
		sedge	
		skullcap speedwell	
		slender rush	
		slough sedge	
		small duckweed	
		small-fruited bulrush	
		soft rush	
		spike bentgrass	
		tall annual willowherb	
		taperfruit shortscale sedge	
		wapato	
		water horsetail	
		water smartweed	
		western swordfern	
		western water hemlock	
		willowherb	
		*yellow touch-me-not	

Plant Community: Upland Forest

Stems per Acre: 2,700

Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
bigleaf maple	Douglas' spirea	American speedwell	Canada thistle
casacara	Sitka Willow	common beggarticks	common velvetgrass
*Douglas-fir	snowberry	common cattail	Himalayan blackberry
*Oregon ash	*tall Oregon grape	*marsh pennywort	morning-glory
Oregon oak	thimbleberry	sedge	reed canary grass
	*trailing blackberry	small duckweed	
		*small-fruited bulrush	
		spikerush	
		willowherb	

Management Actions

Completed: 2025	Recommended: 2026
<input type="checkbox"/> Interplant	<input checked="" type="checkbox"/> Interplant
<input type="checkbox"/> Invasive weed treatment	<input checked="" type="checkbox"/> Invasive weed treatment
<input checked="" type="checkbox"/> Seeding	<input type="checkbox"/> Seeding
<input type="checkbox"/> Herbivore Control	<input type="checkbox"/> Herbivore Control
<input type="checkbox"/> Other	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Monitoring for Adaptive Management	<input checked="" type="checkbox"/> Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
1646 – 185th to Kaiser – Springville Creek	Capital	13,047	9.91	22.43	12.52	6.26	6.26

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK – code only, vegetation that CWS is responsible for										RIPARIAN CODES – RIGHT BANK – code only, vegetation that CWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (° deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft		
1646 - Springville Creek – 185th to Kaiser	23%	7.84E+04	100	267.0	7.1	11.0	1.8	1375	1375	1375	1300	1325	1375	1000	1000	1000	1375	1350	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	73%	1.21E+05	53	343.0	7.1	11.0	1.8	1175	1150	1100	1100	1125	1125	1100	1125	1150	1175	1175	1175	1175	1175	1175	1175	1175	1175		
1646 - Springville Creek – 185th to Kaiser	61%	2.09E+05	100	324.0	7.1	11.0	1.8	1150	1150	1125	1125	1125	1125	1125	1150	1175	1175	1175	1150	1125	1125	1100	1100	1100	1100		
1646 - Springville Creek – 185th to Kaiser	70%	2.38E+05	100	334.0	7.1	11.0	1.8	1125	1175	1150	1175	1175	1000	1000	1000	1000	1150	1150	1125	1100	1100	1125	1100	1125	1125		
1646 - Springville Creek – 185th to Kaiser	75%	2.55E+05	100	329.0	7.1	11.0	1.8	1175	1175	1175	1150	1000	1000	1000	1000	1000	1175	1175	1000	1000	1100	1100	1100	1125	1125		
1646 - Springville Creek – 185th to Kaiser	75%	2.56E+05	100	331.0	7.1	11.0	1.8	1175	1175	1175	1150	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	14%	4.85E+04	100	287.0	7.1	11.0	1.8	1325	1300	1300	1325	1300	1000	1000	1000	1000	1375	1375	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	13%	4.34E+04	100	280.0	7.1	11.0	1.8	1325	1300	1325	1300	1000	1000	1000	1000	1000	1375	1375	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	21%	7.20E+04	100	284.0	7.1	11.0	1.8	1375	1350	1000	1000	1000	1000	1000	1000	1000	1325	1325	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	19%	6.64E+04	100	285.0	7.1	11.0	1.8	1350	1000	1000	1000	1000	1000	1000	1000	1000	1375	1325	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	30%	1.04E+05	100	243.0	7.1	11.0	1.8	1375	1350	1000	1000	1000	1000	1000	1000	1000	1350	1325	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	13%	4.45E+04	100	275.0	7.1	11.0	1.8	1325	1375	1375	1000	1000	1000	1000	1000	1000	1350	1350	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	4%	1.30E+04	100	284.0	7.1	11.0	1.8	1300	1325	1375	1350	1000	1000	1000	1000	1000	1375	1375	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	19%	6.32E+04	100	237.0	7.1	11.0	1.8	1325	1325	1325	1325	1325	1000	1000	1000	1000	1325	1350	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	0%	0.00E+00	100	162.0	15.0	16.0	0.5	1300	1300	1300	1300	1000	1000	1000	1000	1000	1300	1300	1300	1300	1300	1300	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	0%	1.68E+01	100	171.0	100.0	200.0	1.0	1300	1300	1300	1300	1300	1325	1300	1300	1300	1300	1300	1300	1300	1325	1325	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	0%	4.08E+01	100	174.0	50.0	120.0	0.5	1300	1300	1300	1300	1350	1000	1000	1000	1000	1300	1300	1300	1325	1350	1000	1000	1000			
1646 - Springville Creek – 185th to Kaiser	1%	4.94E+03	100	176.0	15.0	16.0	0.5	1300	1300	1300	1300	1300	1000	1000	1000	1000	1300	1300	1300	1325	1325	1000	1000	1000			
1646 - Springville Creek – 185th to Kaiser	0%	0.00E+00	100	173.0	100.0	200.0	1.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1300	1300	1300	1300	1300	1300	1300	1000	1000		
1646 - Springville Creek – 185th to Kaiser	79%	1.36E+05	100	178.0	3.6	0.8	1.4	1175	1175	1150	1125	1000	1000	1000	1000	1000	1175	1175	1125	1100	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	0%	0.00E+00	73	151.0	3.6	0.8	1.4	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300		
1646 - Springville Creek – 185th to Kaiser	0%	0.00E+00	100	160.0	3.6	0.8	1.4	1100	1100	1100	1100	1100	1100	1100	1000	1000	1100	1100	1100	1100	1100	1100	1100	1100	1100		
1646 - Springville Creek – 185th to Kaiser	51%	8.81E+04	100	171.0	3.6	0.8	1.4	1125	1125	1100	1125	1000	1000	1000	1000	1000	1150	1150	1100	1100	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	39%	2.13E+05	100	325.0	11.3	15.6	1.5	1150	1125	1100	1100	1150	1000	1000	1000	1000	1150	1125	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	0%	0.00E+00	95	296.0	11.3	15.6	1.5	1100	1100	1100	1100	1100	1100	1150	1150	1175	1100	1100	1100	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek – 185th to Kaiser	0%	0.00E+00	100	300.0	11.3	15.6	1.5	1100	1100	1100	1100	1100	1100	1150	1150	1150	1100	1100	1100	1100	1000	1000	1000	1000	1000		

Baseline Conditions (cont.)

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES - LEFT BANK - code only vegetation that CWS is responsible for										RIPARIAN CODES - RIGHT BANK - code only vegetation that CWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (scat/ft)	Segment Length (ft)	Orientation (0 deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft		
1646 - Springville Creek - 185th to Kaiser	2%	9.66E-05	100	300.0	11.3	15.6	1.5	1900	1100	1125	1150	1125	1100	1000	1000	1100	1100	1100	1125	1125	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	40%	2.13E-05	100	292.0	11.3	15.6	1.5	1950	1150	1175	1175	1125	1000	1000	1100	1100	1100	1125	1100	1100	1100	1100	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	20%	1.08E-05	100	294.0	11.3	15.6	1.5	1125	1125	1150	1125	1125	1000	1100	1000	1000	1100	1100	1100	1100	1125	1100	1100	1000	1000		
1646 - Springville Creek - 185th to Kaiser	2%	1.01E-04	100	322.0	11.3	15.6	1.5	1100	1100	1100	1125	1125	1100	1000	1000	1000	1100	1000	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	0%	0.00E-00	100	303.0	11.3	15.6	1.5	1900	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1100	1100	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	0%	1.83E-03	100	314.0	11.3	15.6	1.5	1300	1300	1000	1000	1000	1000	1000	1000	1100	1300	1300	1300	1300	1225	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	0%	0.00E-00	100	305.0	11.3	15.6	1.5	1100	1100	1000	1000	1000	1000	1000	1000	1000	1100	1000	1100	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	34%	1.87E-05	100	296.0	11.3	15.6	1.5	1150	1125	1000	1000	1000	1000	1000	1000	1000	1100	1000	1150	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	1%	4.77E-03	100	303.0	11.3	15.6	1.5	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1100	1125	1100	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	0%	0.00E-00	100	346.0	11.3	15.6	1.5	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300		
1646 - Springville Creek - 185th to Kaiser	0%	0.00E-00	96	347.0	11.3	15.6	1.5	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300		
1646 - Springville Creek - 185th to Kaiser	2%	7.62E-03	100	327.0	7.3	7.3	0.6	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1325	1300	1300	1300	1300	1300	1300	1300		
1646 - Springville Creek - 185th to Kaiser	0%	0.00E-00	100	316.0	7.3	7.3	0.6	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300		
1646 - Springville Creek - 185th to Kaiser	8%	2.80E-04	100	247.0	7.1	11.0	1.8	1100	1100	1100	1100	1150	1125	1150	1150	1125	1125	1150	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	0%	0.00E-00	77	273.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	0%	0.00E-00	100	273.0	7.1	11.0	1.8	1300	1300	1300	1300	1325	1375	1175	1175	1000	1300	1300	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	18%	6.11E-04	100	285.0	7.1	11.0	1.8	1350	1350	1325	1325	1350	1375	1150	1175	1000	1325	1300	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	34%	1.17E-05	100	310.0	7.1	11.0	1.8	1350	1350	1125	1125	1125	1125	1125	1000	1000	1350	1350	1325	1325	1325	1300	1300	1000	1000		
1646 - Springville Creek - 185th to Kaiser	74%	2.53E-05	100	270.0	7.1	11.0	1.8	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1150	1250	1250	1250	1300	1300	1000	1000		
1646 - Springville Creek - 185th to Kaiser	74%	2.54E-05	100	254.0	7.1	11.0	1.8	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1150	1125	1300	1300	1300	1300	1300		
1646 - Springville Creek - 185th to Kaiser	77%	2.63E-05	100	260.0	7.1	11.0	1.8	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1150	1125	1100	1300	1300	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	1%	2.87E-03	100	227.0	7.1	11.0	1.8	1100	1100	1100	1100	1100	1125	1125	1000	1100	1100	1100	1300	1300	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	0%	1.21E-02	100	253.0	7.1	11.0	1.8	1100	1100	1100	1100	1100	1100	1125	1150	1125	1100	1300	1300	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	0%	3.05E-00	100	258.0	7.1	11.0	1.8	1100	1100	1100	1100	1100	1100	1100	1100	1125	1100	1300	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	2%	7.33E-03	100	309.0	7.1	11.0	1.8	1100	1100	1100	1100	1100	1100	1100	1125	1150	1100	1100	1125	1125	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	71%	2.43E-05	100	294.0	7.1	11.0	1.8	1175	1175	1175	1175	1175	1175	1150	1100	1100	1150	1175	1150	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	69%	2.36E-05	100	282.0	7.1	11.0	1.8	1175	1150	1150	1175	1175	1000	1000	1000	1000	1175	1150	1150	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	77%	2.64E-05	100	259.0	7.1	11.0	1.8	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	73%	2.49E-05	100	247.0	7.1	11.0	1.8	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	57%	1.94E-05	100	241.0	7.1	11.0	1.8	1150	1150	1175	1175	1175	1150	1100	1100	1125	1150	1150	1150	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	53%	1.80E-05	100	254.0	7.1	11.0	1.8	1150	1150	1125	1125	1125	1100	1100	1125	1100	1125	1125	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	58%	1.96E-05	100	255.0	7.1	11.0	1.8	1150	1150	1125	1125	1150	1150	1125	1125	1150	1175	1175	1150	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	49%	1.66E-05	100	216.0	7.1	11.0	1.8	1150	1100	1125	1100	1100	1100	1100	1100	1100	1175	1175	1150	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	20%	6.67E-04	100	211.0	7.1	11.0	1.8	1125	1100	1100	1100	1100	1100	1100	1100	1100	1125	1100	1100	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	15%	5.16E-04	100	227.0	7.1	11.0	1.8	1125	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1300	1300	1300	1300		
1646 - Springville Creek - 185th to Kaiser	67%	2.29E-05	100	247.0	7.1	11.0	1.8	1175	1175	1125	1100	1100	1100	1100	1100	1100	1150	1300	1300	1300	1300	1300	1300	1300	1300		
1646 - Springville Creek - 185th to Kaiser	70%	2.40E-05	100	243.0	7.1	11.0	1.8	1175	1175	1150	1125	1125	1125	1100	1125	1100	1175	1300	1300	1300	1300	1300	1300	1300	1000		
1646 - Springville Creek - 185th to Kaiser	73%	2.48E-05	100	249.0	7.1	11.0	1.8	1175	1175	1175	1150	1175	1175	1000	1000	1000	1175	1175	1125	1325	1300	1300	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	74%	2.52E-05	100	254.0	7.1	11.0	1.8	1175	1175	1175	1175	1150	1000	1000	1000	1000	1175	1150	1125	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	1%	4.06E-03	100	255.0	7.1	11.0	1.8	1100	1100	1125	1125	1125	1100	1100	1000	1000	1100	1100	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	5%	1.70E-04	100	256.0	7.1	11.0	1.8	1100	1100	1100	1100	1100	1100	1100	1100	1100	1125	1125	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	0%	0.00E-00	100	275.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300		
1646 - Springville Creek - 185th to Kaiser	0%	0.00E-00	100	173.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300		
1646 - Springville Creek - 185th to Kaiser	25%	8.54E-04	100	224.0	7.1	11.0	1.8	1375	1350	1300	1300	1300	1300	1300	1300	1300	1300	1300	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	20%	6.78E-04	100	237.0	7.1	11.0	1.8	1350	1325	1300	1300	1300	1300	1300	1300	1300	1000	1000	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	0%	0.00E-00	100	241.0	7.1	11.0	1.8	1000	1000	1000	1300	1300	1300	1300	1300	1300	1000	1000	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	18%	6.20E-04	100	241.0	7.1	11.0	1.8	1325	1300	1300	1300	1300	1300	1300	1300	1300	1125	1125	1000	1000	1000	1000	1000	1000	1000		
1646 - Springville Creek - 185th to Kaiser	6%	1.98E-04	100	239.0																							

Baseline Conditions (cont.)

PROJECT	Effective Shade (%)	Thermal Load Block (kcal/d)	Segment Length (ft)	Orientation (θ deg-N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft	
1646 - Springville Creek - 185th to Kaser	70%	2.40E+05	100	277.0	7.1	11.0	1.8	1175	1175	1125	1100	1100	1100	1100	1100	1100	1175	1150	1100	1125	1125	1175	1175	1175	1125	
1646 - Springville Creek - 185th to Kaser	73%	2.48E+05	100	271.0	7.1	11.0	1.8	1175	1175	1125	1100	1100	1100	1100	1100	1100	1150	1150	1125	1150	1125	1125	1125	1125	1100	1100
1646 - Springville Creek - 185th to Kaser	70%	2.39E+05	100	282.0	7.1	11.0	1.8	1175	1175	1150	1150	1100	1100	1100	1100	1000	1000	1000	1000	1100	1100	1100	1100	1100	1000	1000
1646 - Springville Creek - 185th to Kaser	76%	2.60E+05	100	259.0	7.1	11.0	1.8	1175	1175	1175	1150	1000	1000	1000	1000	1000	1150	1175	1150	1125	1125	1125	1125	1000	1000	
1646 - Springville Creek - 185th to Kaser	62%	2.12E+05	100	266.0	7.1	11.0	1.8	1150	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1125	1100	1100	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	73%	2.49E+05	100	251.0	7.1	11.0	1.8	1175	1175	1375	1000	1000	1000	1000	1000	1000	1175	1175	1175	1150	1100	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	71%	2.43E+05	100	252.0	7.1	11.0	1.8	1175	1150	1325	1300	1300	1000	1000	1000	1000	1175	1150	1125	1100	1125	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	75%	2.56E+05	100	269.0	7.1	11.0	1.8	1175	1175	1325	1300	1300	1300	1000	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	22%	7.55E+04	100	270.0	7.1	11.0	1.8	1350	1300	1300	1300	1300	1300	1300	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	4.58E+02	100	206.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1325	1300	1000	1300	1300	1300	1300	1300	1300	1300	1300	1300	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	63	280.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1000	1000	1300	1300	1100	1100	1100	1100	1100	1100	1100	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	272.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1000	1000	1300	1300	1300	1300	1100	1100	1100	1100	1100	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	261.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1000	1000	1300	1300	1300	1300	1300	1300	1100	1100	1100	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	252.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1100	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	245.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	254.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1000	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	247.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1000	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	245.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1000	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	263.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1000	1000	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	269.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1000	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	269.0	22.5	62.5	0.5	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	271.0	22.5	62.5	0.5	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	274.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	273.0	7.1	11.0	1.8	1300	1325	1300	1300	1300	1300	1000	1000	1000	1300	1300	1300	1300	1300	1300	1300	1300	1300	
1646 - Springville Creek - 185th to Kaser	9%	3.18E+04	100	271.0	7.1	11.0	1.8	1325	1325	1300	1300	1000	1000	1000	1000	1000	1300	1300	1300	1300	1300	1300	1300	1300	1300	
1646 - Springville Creek - 185th to Kaser	5%	1.74E+04	100	248.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1000	1000	1000	1000	1325	1350	1325	1300	1300	1300	1300	1300	1300	
1646 - Springville Creek - 185th to Kaser	15%	5.27E+04	100	247.0	7.1	11.0	1.8	1325	1300	1300	1300	1000	1000	1000	1000	1000	1325	1325	1325	1300	1300	1300	1300	1300	1300	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	228.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1000	1000	1000	1300	1300	1300	1300	1300	1300	1300	1300	1300	
1646 - Springville Creek - 185th to Kaser	1%	1.88E+03	100	275.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1100	1100	1100	1100	1125	1000	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	3.05E+02	100	244.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1325	1325	1300	1300	1300	1300	1300	1300	1100	1100	1100	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	243.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1325	1300	1300	1300	1300	1300	1100	1100	1100	1100	
1646 - Springville Creek - 185th to Kaser	2%	6.75E+03	100	243.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1100	1150	1175	1125	1000	
1646 - Springville Creek - 185th to Kaser	1%	4.87E+03	100	243.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1100	1100	1100	1150	1150	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	245.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1100	1100	1100	1100	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	1%	2.13E+03	100	246.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1100	1100	1125	1100	1100	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	1%	3.75E+03	100	243.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1100	1100	1100	1125	1125	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	4%	1.49E+04	100	248.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1100	1100	1150	1175	1175	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	3%	1.04E+04	100	230.0	7.1	11.0	1.8	1100	1100	1300	1300	1300	1300	1300	1300	1300	1100	1100	1100	1150	1150	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	268.0	7.1	11.0	1.8	1100	1100	1100	1300	1300	1300	1300	1300	1300	1100	1100	1100	1000	1000	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	237.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1000	1000	1000	1300	1300	1300	1300	1300	1300	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	8.97E+00	89	261.0	7.1	11.0	1.8	1300	1300	1300	1350	1350	1350	1325	1000	1000	1300	1300	1300	1300	1300	1300	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	3.22E+02	100	263.0	7.1	11.0	1.8	1300	1300	1300	1350	1350	1300	1000	1000	1000	1300	1300	1300	1300	1300	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	270.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1000	1300	1300	1300	1300	1000	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	269.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1000	1300	1300	1300	1300	1300	1000	1000	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	6.14E+02	100	280.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1000	1300	1300	1300	1300	1300	1325	1325	1000	1000	
1646 - Springville Creek - 185th to Kaser	0%	3.60E+02	100	285.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1000	1300	1300	1300	1300	1300	1300	1325	1325	1000	1000
1646 - Springville Creek - 185th to Kaser	0%	0.00E+00	100	278.0	7.1	11.0	1.8	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
1646 - Springville Creek - 185th to Kaser	0%	2.72E+02	100	264.0	7.1	11.0	1.8	1300																		

Enhanced Shade Conditions (cont.)

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK – code only vegetation that CWS is responsible for										RIPARIAN CODES – RIGHT BANK – code only vegetation that CWS is responsible for							
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (0 deg-N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft
1646 - Springville Creek – 185th to Kaiser	32.0%	1.12E+05	100	243.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1000	1000
1646 - Springville Creek – 185th to Kaiser	32.2%	1.10E+05	100	245.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1000	1000
1646 - Springville Creek – 185th to Kaiser	32.6%	1.11E+05	100	246.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1000	1000	
1646 - Springville Creek – 185th to Kaiser	33.1%	1.83E+05	100	243.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1000	1000	
1646 - Springville Creek – 185th to Kaiser	35.7%	1.22E+05	100	248.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1000	1000	
1646 - Springville Creek – 185th to Kaiser	49.3%	2.35E+05	100	230.0	7.1	11.0	1.8	1175	1175	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1000	1000	
1646 - Springville Creek – 185th to Kaiser	76.0%	2.59E+05	100	268.0	7.1	11.0	1.8	1175	1175	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1000	1000	
1646 - Springville Creek – 185th to Kaiser	35.8%	1.22E+05	100	237.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1000	1000	1375	1375	1375	1375	1375	1375	1000	1000	
1646 - Springville Creek – 185th to Kaiser	25.7%	7.82E+04	89	261.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1000	1000	1375	1375	1375	1375	1375	1375	1000	1000	
1646 - Springville Creek – 185th to Kaiser	24.8%	8.44E+04	100	263.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1000	1000	1000	1375	1375	1375	1375	1375	1000	1000		
1646 - Springville Creek – 185th to Kaiser	22.1%	7.54E+04	100	270.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1375	1000	1375	1375	1375	1375	1000	1000	1000	1000	
1646 - Springville Creek – 185th to Kaiser	25.1%	8.55E+04	100	289.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1000	1375	1375	1375	1375	1375	1000	1000	1000	1000	
1646 - Springville Creek – 185th to Kaiser	21.1%	7.19E+04	100	280.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1000	1375	1375	1375	1375	1375	1375	1375	1000	1000	
1646 - Springville Creek – 185th to Kaiser	22.8%	7.77E+04	100	285.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1000	1375	1375	1375	1375	1375	1375	1375	1000	1000	
1646 - Springville Creek – 185th to Kaiser	20.9%	7.12E+04	100	278.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	
1646 - Springville Creek – 185th to Kaiser	24.3%	8.29E+04	100	264.0	7.1	11.0	1.8	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1000	

2474 – Reedville Creek Expansion

Project Summary

Project ID	Acres
2474	7.71
Location	
Public property in City of Hillsboro, bisected by Reedville Creek, located between SE 51 st Avenue and SE 73 rd Avenue.	
Program	
Capital	
Lat/Long	Number of Plants Installed
45.51, -122.92	6,750
Stream Length	Average Stream Width
1,942 feet	29.6 feet
Initial Planting Year/Credit Year	CWS Thermal Benefits/Credits
2020/2025	0.910 million kcal/day
Plant Communities	
Riparian Forest, Scrub-Shrub, and Forested Wetland (refer to the Site Assessment Report for additional information)	
Partners	
City of Hillsboro	
Riparian Planting Activities	
Targeted invasive species treatment and riparian plantings	
Instream Enhancement Activities	
None	

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Forested Wetland

Stems per Acre: 1,567

Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
bigleaf maple	clustered wild rose	American sloughgrass	Canada thistle
Oregon ash	*Douglas' spirea	American speedwell	reed canary grass
	native wild rose	American water horehound	
	*Pacific ninebark	beggarticks	
	Pacific Willow	blue skullcap	
	*red-osier dogwood	common horsetail	
	tall Oregon grape	fowl bluegrass	
		*giant horsetail	
		golden nutsedge	
		horsetweed	
		marsh yellowcress	
		meadow barley	
		meadow woollyheads	
		northern water plantain	
		pasture rush	
		*redroot flatsedge	
		*rice cutgrass	
		slender hairgrass	
		*slough sedge	
		small-fruited bulrush	
		spike bentgrass	
		tufted hairgrass	
		water foxtail	
		*willowherb	
		witchgrass	

Plant Community: Riparian Forest

Stems per Acre: 4,700

Phase: Establishment

Native Tree	Native Shrub	Native Herbaceous	Invasives
bingleaf maple	*beaked hazelnut	American sloughgrass	common hawthorn
*Douglas-fir	black twinberry	American water horehound	English ivy
*Oregon ash	*Douglas' spirea	checkermallow	Himalayan blackberry
*Oregon oak	native wild rose	common beggarticks	reed canary grass
vine maple	osoberry, indian plum	*common horsetail	
	Pacific ninebark	fowl bluegrass	
	Pacific poison oak	giant horsetail	
	red-osier dogwood	lady fern	
	salmonberry	meadow barley	
	Scouler's Willow	meadow checkerbloom	
	serviceberry	nodding beggarticks	
	*snowberry	pasture rush	
	tall Oregon grape	rice cutgrass	
	trailing blackberry	slender hairgrass	
		slough sedge	
		small-fruited bulrush	
		spike bentgrass	
		tall mannagrass	
		taperfruit shortscale sedge	
		tufted hairgrass	
		wapato	
		*willowherb	
		yellowcress	

Plant Community: Scrub-Shrub

Stems per Acre: 1,475

Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
black hawthorn	beaked hazelnut	American sloughgrass	Canada thistle
*Oregon ash	Douglas' spirea	American speedwell	common velvetgrass
red alder	native wild rose	common beggarticks	Himalayan blackberry
	*Pacific Willow	common horsetail	reed canary grass
	*red-osier dogwood	dense sedge	
	Sitka Willow	fringecup	
	tall Oregon grape	*giant horsetail	
	trailing blackberry	lady fern	
		marsh pennywort	
		Mexican hedgenettle	
		pasture rush	
		*rice cutgrass	
		tall mannagrass	
		taperfruit shortscale sedge	
		western swordfern	
		willowherb	

Management Actions

Completed: 2025	Recommended: 2026
<input checked="" type="checkbox"/> Interplant	<input checked="" type="checkbox"/> Interplant
<input checked="" type="checkbox"/> Invasive weed treatment	<input type="checkbox"/> Invasive weed treatment
<input type="checkbox"/> Seeding	<input type="checkbox"/> Seeding
<input type="checkbox"/> Herbivore Control	<input type="checkbox"/> Herbivore Control
<input type="checkbox"/> Other	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Monitoring for Adaptive Management	<input checked="" type="checkbox"/> Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2474 – Reedville Creek Expansion	Capital	1,942	2.09	3.91	1.82	0.910	0.910

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK – code only vegetation that CWS is responsible for										RIPARIAN CODES – RIGHT BANK – code only vegetation that CWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (0 deg-N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft		
2474 - Reedville Creek Expansion	31%	2.89E-05	100	282.0	19.5	25.5	1.3	1175	1150	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1125	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	31%	1.84E-05	64	272.0	19.5	25.5	1.3	1175	1175	1175	1000	1000	1000	1000	1000	1000	1150	1150	1150	1150	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	5%	5.03E-04	100	276.0	19.5	25.5	1.3	1100	1150	1125	1000	1000	1000	1000	1000	1000	1150	1150	1175	1175	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	16%	1.48E-05	100	272.0	19.5	25.5	1.3	1125	1125	1125	1000	1000	1000	1000	1000	1000	1150	1175	1175	1175	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	24%	2.21E-05	100	273.0	19.5	25.5	1.3	1150	1125	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	31%	2.88E-05	100	273.0	19.5	25.5	1.3	1175	1175	1000	1000	1000	1000	1000	1000	1000	1175	1175	1150	1000	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	16%	1.46E-05	100	283.0	19.5	25.5	1.3	1125	1150	1150	1175	1175	1175	1175	1175	1150	1150	1150	1125	1000	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	7%	4.88E-04	78	319.0	19.5	25.5	1.3	1000	1100	1000	1125	1000	1000	1000	1000	1000	1000	1175	1150	1000	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	5%	4.69E-04	100	306.0	19.5	25.5	1.3	1100	1125	1150	1175	1175	1125	1000	1000	1000	1100	1000	1100	1000	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	26%	2.48E-05	100	321.0	19.5	25.5	1.3	1150	1175	1175	1175	1175	1125	1000	1000	1000	1100	1100	1100	1125	1125	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	25%	2.31E-05	100	301.0	19.5	25.5	1.3	1150	1175	1150	1150	1125	1000	1000	1000	1000	1100	1100	1100	1125	1125	1125	1000	1000	1000		
2474 - Reedville Creek Expansion	12%	1.17E-05	100	294.0	19.5	25.5	1.3	1125	1150	1150	1175	1175	1175	1150	1150	1150	1100	1100	1100	1100	1100	1100	1000	1000	1000		
2474 - Reedville Creek Expansion	2%	2.02E-04	100	270.0	19.5	25.5	1.3	1325	1325	1300	1300	1300	1325	1325	1325	1000	1300	1325	1350	1350	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	0%	9.75E-02	100	275.0	60.0	70.0	1.3	1300	1325	1350	1325	1300	1000	1000	1000	1000	1300	1000	1300	1325	1325	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	0%	2.32E-03	100	274.0	60.0	70.0	1.3	1000	1000	1325	1300	1000	1000	1000	1000	1000	1000	1000	1325	1325	1300	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	0%	8.36E-02	100	273.0	60.0	70.0	1.3	1000	1300	1300	1350	1000	1000	1000	1000	1000	1000	1000	1300	1325	1325	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	0%	6.85E-03	100	263.0	60.0	70.0	1.3	1000	1300	1325	1350	1325	1300	1300	1325	1375	1000	1325	1350	1350	1325	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	1%	1.78E-04	100	251.0	60.0	70.0	1.3	1350	1325	1325	1350	1325	1300	1300	1325	1300	1300	1325	1350	1350	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	1%	9.81E-03	100	260.0	19.5	25.5	1.3	1300	1300	1300	1350	1350	1325	1000	1000	1000	1300	1350	1350	1325	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	2%	1.69E-04	100	263.0	19.5	25.5	1.3	1300	1325	1325	1300	1325	1350	1350	1325	1000	1325	1375	1375	1000	1000	1000	1000	1000	1000		

Enhanced Shade Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK – code only vegetation that GWS is responsible for										RIPARIAN CODES – RIGHT BANK – code only vegetation that GWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (° deg-ft)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft		
2474 - Reedville Creek Expansion	31.4%	2.94E+05	100	352.0	19.5	25.5	1.3	1175	1175	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	31.2%	1.58E+05	64	272.0	19.5	25.5	1.3	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	30.5%	2.95E+05	100	276.0	19.5	25.5	1.3	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	31.2%	2.92E+05	100	272.0	19.5	25.5	1.3	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	30.8%	2.89E+05	100	273.0	19.5	25.5	1.3	1175	1175	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	30.8%	2.89E+05	100	273.0	19.5	25.5	1.3	1175	1175	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	31.7%	2.97E+05	100	283.0	19.5	25.5	1.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	17.0%	1.22E+05	78	319.0	19.5	25.5	1.3	1000	1175	1000	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	43.6%	4.08E+05	100	306.0	19.5	25.5	1.3	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1000	1175	1000	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	48.4%	4.53E+05	100	321.0	19.5	25.5	1.3	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	43.1%	4.03E+05	100	301.0	19.5	25.5	1.3	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	38.0%	3.56E+05	100	294.0	19.5	25.5	1.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	4.5%	4.24E+04	100	270.0	19.5	25.5	1.3	1375	1375	1375	1375	1375	1375	1375	1375	1000	1375	1375	1375	1375	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	0.7%	2.09E+04	100	275.0	60.0	70.0	1.3	1375	1375	1375	1375	1375	1000	1000	1000	1000	1375	1000	1375	1375	1375	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	0.2%	5.61E+03	100	274.0	60.0	70.0	1.3	1000	1000	1375	1375	1000	1000	1000	1000	1000	1000	1000	1375	1375	1375	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	0.2%	5.44E+03	100	273.0	60.0	70.0	1.3	1000	1375	1375	1375	1000	1000	1000	1000	1000	1000	1000	1375	1375	1375	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	0.5%	1.32E+04	100	263.0	60.0	70.0	1.3	1000	1375	1375	1375	1375	1375	1375	1375	1375	1000	1375	1375	1375	1375	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	1.6%	4.51E+04	100	251.0	60.0	70.0	1.3	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	5.6%	5.28E+04	100	260.0	19.5	25.5	1.3	1375	1375	1375	1375	1375	1375	1375	1000	1000	1375	1375	1375	1375	1000	1000	1000	1000	1000		
2474 - Reedville Creek Expansion	5.2%	4.88E+04	100	263.0	19.5	25.5	1.3	1375	1375	1375	1375	1375	1375	1375	1000	1000	1375	1375	1375	1000	1000	1000	1000	1000	1000		

2497 – Village at Summer Creek HOA

Project Summary

Project ID		Acres	
2497		3.78	
Location			
Private property in City of Tigard, bisected by Summer Creek, located between SW Barrows Road and SW 135 th Avenue.			
Program			
Capital			
Lat/Long		Number of Plants Installed	
45.44, -122.82		4,800	
Stream Length		Average Stream Width	
571 feet		25.3 feet	
Initial Planting Year/Credit Year		CWS Thermal Benefits/Credits	
2025/2025		1.04 million kcal/day	
Plant Communities			
Riparian Forest and Forested Wetland (refer to the Site Assessment Report for additional information)			
Partners			
Homeowners Association			
Riparian Planting Activities			
Site preparation, targeted invasive species treatment, riparian plantings, and native herbaceous seeding			
Instream Enhancement Activities			
None			

Project Number: 2497

Project Name: Village at Summer Creek HOA

Project Acres: 3.78

Initial Planting Year: 2025

Initial Credit Year: 2025

Length of Stream: 571 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Forested Wetland

Stems per Acre: 2,733

Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
	*clustered wild rose	American speedwell	reed canary grass
	Pacific Willow	American water horehound	
	Sitka Willow	cottonbatting plant	
		denseflower willowherb	
		marsh seedbox	
		mild waterpepper	
		*ovate spikerush	
		pasture rush	
		*rice cutgrass	
		small duckweed	
		*strawcolored flatsedge	
		tapertip rush	
		water foxtail	
		*willowherb	
		yellowcress	

Plant Community: Riparian Forest

Stems per Acre: 2,175

Phase: Establishment

Native Tree	Native Shrub	Native Herbaceous	Invasives
*Oregon ash	clustered wild rose	bigleaf lupine	common hawthorn
vine maple	osoberry, indian plum	denseflower willowherb	common velvetgrass
W. v. ponderosa pine	Pacific ninebark	Douglas aster	
	*Pacific Willow	fringe cup	
	red flowering currant	grand collomia	
	*red-osier dogwood	slender hairgrass	
	salal	slender rush	
	serviceberry	slough sedge	
	snowberry	western swordfern	
	tall Oregon grape	*willowherb	
	thimbleberry		
	trailing blackberry		

Management Actions

Completed: 2025	Recommended: 2026
<input type="checkbox"/> Interplant	<input type="checkbox"/> Interplant
<input checked="" type="checkbox"/> Invasive weed treatment	<input checked="" type="checkbox"/> Invasive weed treatment
<input checked="" type="checkbox"/> Seeding	<input type="checkbox"/> Seeding
<input type="checkbox"/> Herbivore Control	<input type="checkbox"/> Herbivore Control
<input type="checkbox"/> Other	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Monitoring for Adaptive Management	<input checked="" type="checkbox"/> Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2497 – Village at Summer Creek HOA	Capital	571	0.0906	2.18	2.09	1.04	1.04

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK – code only vegetation that CWS is responsible for									RIPARIAN CODES – RIGHT BANK – code only vegetation that CWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (° deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft	
2497 - Village at Summer Creek HOA	1%	9.71E-03	100	283.0	25.3	26.7	1.0	1100	1100	1100	1100	1100	1100	1125	1150	1100	1100	1100	1100	1100	1100	1150	1150	1000	1000	
2497 - Village at Summer Creek HOA	1%	8.22E-03	71	315.0	25.3	26.7	1.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1125	1125	1150	1150
2497 - Village at Summer Creek HOA	1%	9.97E-03	100	307.0	25.3	26.7	1.0	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1125	1150	1150	1000	
2497 - Village at Summer Creek HOA	2%	2.19E-04	100	274.0	25.3	26.7	1.0	1100	1100	1100	1100	1100	1125	1100	1125	1100	1100	1100	1100	1100	1100	1150	1175	1175	1150	1000
2497 - Village at Summer Creek HOA	2%	2.20E-04	100	270.0	25.3	26.7	1.0	1100	1100	1100	1150	1150	1150	1150	1125	1100	1100	1100	1100	1100	1100	1125	1175	1175	1000	1000
2497 - Village at Summer Creek HOA	2%	1.89E-04	100	275.0	25.3	26.7	1.0	1100	1100	1100	1100	1100	1100	1100	1100	1000	1100	1100	1100	1100	1100	1125	1175	1175	1000	1000

Enhanced Shade Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK – code only vegetation that CWS is responsible for									RIPARIAN CODES – RIGHT BANK – code only vegetation that CWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (° deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft	
2497 - Village at Summer Creek HOA	37.2%	3.20E-05	100	283.0	25.3	26.7	1.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000
2497 - Village at Summer Creek HOA	42.7%	9.69E-05	71	315.0	25.3	26.7	1.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2497 - Village at Summer Creek HOA	40.3%	4.90E-05	100	307.0	25.3	26.7	1.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000
2497 - Village at Summer Creek HOA	35.7%	3.25E-05	100	274.0	25.3	26.7	1.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000
2497 - Village at Summer Creek HOA	27.9%	3.39E-05	100	270.0	25.3	26.7	1.0	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000
2497 - Village at Summer Creek HOA	36.5%	3.23E-05	100	275.0	25.3	26.7	1.0	1175	1175	1175	1175	1175	1175	1175	1175	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000

2529 – Rock Creek – TV Highway

Project Summary

Project ID		Acres	
2529		5.27	
Location			
Private property in City of Hillsboro, directly adjacent to Rock Creek, located south of Tualatin Valley Highway.			
Program			
Capital			
Lat/Long		Number of Plants Installed	
45.50, -122.95		9,800	
Stream Length		Average Stream Width	
1,852 feet		24 feet	
Initial Planting Year/Credit Year		CWS Thermal Benefits/Credits	
2025/2025		0.408 million kcal/day	
Plant Communities			
Riparian Forest (refer to the Site Assessment Report for additional information)			
Partners			
Private landowner			
Riparian Planting Activities			
Targeted invasive species treatment and riparian plantings			
Instream Enhancement Activities			
None			

Project Number: 2529

Project Name: Rock Creek - TV Highway

Project Acres: 5.27

Initial Planting Year: 2025

Initial Credit Year: 2025

Length of Stream: 1,852 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 850

Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
black cottonwood	clustered wild rose	Blue Wildrye	bull thistle
black hawthorn	Douglas' spirea	California brome	common velvetgrass
Douglas-fir	mock orange	cleavers	tansy ragwort
*Oregon ash	red-osier dogwood	common beggarticks	
*paper birch	Sitka Willow	grand collomia	
	snowberry	horseweed	
	trailing blackberry	piggyback	
		triangle orache	
		willowherb	
		yellow touch-me-not	

Management Actions

Completed: 2025	Recommended: 2026
<input checked="" type="checkbox"/> Interplant	<input checked="" type="checkbox"/> Interplant
<input checked="" type="checkbox"/> Invasive weed treatment	<input type="checkbox"/> Invasive weed treatment
<input type="checkbox"/> Seeding	<input type="checkbox"/> Seeding
<input type="checkbox"/> Herbivore Control	<input type="checkbox"/> Herbivore Control
<input type="checkbox"/> Other	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Monitoring for Adaptive Management	<input checked="" type="checkbox"/> Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2529 – Rock Creek – TV Highway	Capital	1,852	2.69	3.50	0.816	0.408	0.408

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK – code only vegetation that CWS is responsible for										RIPARIAN CODES – RIGHT BANK – code only vegetation that CWS is responsible for								
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (° deg-N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft	
2529 - Rock Creek - TV Highway	20%	2.32E-05	100	172.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1150	1125	1125	1125	1100	1000	1000	
2529 - Rock Creek - TV Highway	11%	6.51E-04	51	309.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1150	1125	1100	1100	1100	1100	
2529 - Rock Creek - TV Highway	1%	1.06E-04	100	15.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1125	1125
2529 - Rock Creek - TV Highway	1%	1.46E-04	100	299.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1150	1175
2529 - Rock Creek - TV Highway	4%	4.70E-04	100	263.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1125	1150	1150	1175	1175	1175	1175	1175	1175	1175
2529 - Rock Creek - TV Highway	18%	2.06E-05	100	197.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1175	1175	1150	1125	1000	1000	1000	
2529 - Rock Creek - TV Highway	29%	3.30E-05	100	156.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1150	1150	1150	1175	1175	1175	1150	1150	
2529 - Rock Creek - TV Highway	14%	1.66E-05	100	196	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1150	1150	1150	1100	1100	1100	1000	1000	
2529 - Rock Creek - TV Highway	18%	2.04E-05	100	196	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1175	1175	1125	1000	1000	1000	1000	
2529 - Rock Creek - TV Highway	12%	1.32E-05	100	226	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1150	1100	1100	1100	1125	1175	1175	
2529 - Rock Creek - TV Highway	4%	5.16E-04	100	287	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1150	1175	1150	1125	1000	1000	1000	1000	
2529 - Rock Creek - TV Highway	21%	2.48E-05	100	344	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1150	1175	1150	1125	
2529 - Rock Creek - TV Highway	17%	1.92E-05	100	7	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1125	1125	1125	1125	1150	1175	1175	1150	
2529 - Rock Creek - TV Highway	2%	2.05E-04	100	299	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1100	1100	1125	1175	1175	1175	1175	
2529 - Rock Creek - TV Highway	3%	3.59E-04	100	250	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1100	1150	1150	1150	1150	1175	1175	
2529 - Rock Creek - TV Highway	20%	2.27E-05	100	204	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1150	1150	1150	
2529 - Rock Creek - TV Highway	20%	2.29E-05	100	204	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1150	
2529 - Rock Creek - TV Highway	18%	2.09E-05	100	211	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1125	1000	
2529 - Rock Creek - TV Highway	6%	6.88E-04	100	184	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1100	1125	1150	1175	1150	1000	1000	

Enhanced Shade Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES - LEFT BANK - code only vegetation that CWS is responsible for										RIPARIAN CODES - RIGHT BANK - code only vegetation that CWS is responsible for								
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (0 deg=V)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft	
2529 - Rock Creek - TV Highway	27.0%	3.11E+05	100	172.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000
2529 - Rock Creek - TV Highway	11.3%	6.70E+04	51	303.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2529 - Rock Creek - TV Highway	3.4%	3.89E+04	100	15.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175
2529 - Rock Creek - TV Highway	1.6%	1.81E+04	100	299.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175
2529 - Rock Creek - TV Highway	5.0%	6.04E+04	100	283.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2529 - Rock Creek - TV Highway	21.1%	2.42E+05	100	197.0	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000
2529 - Rock Creek - TV Highway	30.6%	3.52E+05	100	156	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2529 - Rock Creek - TV Highway	21.5%	2.47E+05	100	196	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000
2529 - Rock Creek - TV Highway	20.9%	2.41E+05	100	196	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000
2529 - Rock Creek - TV Highway	14.5%	1.67E+05	100	226	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2529 - Rock Creek - TV Highway	5.2%	5.99E+04	100	287	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000
2529 - Rock Creek - TV Highway	21.7%	2.50E+05	100	344	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2529 - Rock Creek - TV Highway	25.2%	2.90E+05	100	7	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2529 - Rock Creek - TV Highway	9.9%	1.14E+05	100	299	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2529 - Rock Creek - TV Highway	8.5%	9.78E+04	100	250	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2529 - Rock Creek - TV Highway	19.9%	2.29E+05	100	204	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2529 - Rock Creek - TV Highway	19.9%	2.29E+05	100	204	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2529 - Rock Creek - TV Highway	18.2%	2.10E+05	100	211	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000
2529 - Rock Creek - TV Highway	24.2%	2.78E+05	100	184	24.0	36.7	10.7	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000

2530 – Witch Hazel Creek – Brookwood Crossing

Project Summary

Project ID	Acres
2530	3.61
Location	
Public, urban property in City of Hillsboro, bisected by a tributary to Rock Creek, located on either side of SE Lone Oak Street.	
Program	
Capital	
Lat/Long	Number of Plants Installed
45.50, -122.94	7,110
Stream Length	Average Stream Width
883 feet	6.7 feet
Initial Planting Year/Credit Year	CWS Thermal Benefits/Credits
2024/2025	0.209 million kcal/day
Plant Communities	
Riparian Forest (refer to the Site Assessment Report for additional information)	
Partners	
City of Hillsboro	
Riparian Planting Activities	
Targeted invasive species treatment and riparian plantings	
Instream Enhancement Activities	
None	

Project Number: 2530 Project Name: Witch Hazel Creek - Brookwood Crossing

Project Acres: 3.61 Initial Planting Year: 2024 Initial Credit Year: 2025 Length of Stream: 883 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 1,420

Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
*Douglas-fir	*beaked hazelnut	beggarticks	Canada thistle
*red alder	Pacific poison oak	bracken fern	Himalayan blackberry
*western red cedar	*snowberry	California poppy	
	*tall Oregon grape	denseflower willowherb	
	thimbleberry	Douglas aster	
	trailing blackberry	*giant horsetail	
		grand collomia	
		meadow checkerbloom	
		Rocky Mt. goldenrod	
		western swordfern	
		willowherb	

Management Actions

Completed: 2025	Recommended: 2026
<input checked="" type="checkbox"/> Interplant	<input type="checkbox"/> Interplant
<input checked="" type="checkbox"/> Invasive weed treatment	<input checked="" type="checkbox"/> Invasive weed treatment
<input type="checkbox"/> Seeding	<input type="checkbox"/> Seeding
<input type="checkbox"/> Herbivore Control	<input type="checkbox"/> Herbivore Control
<input type="checkbox"/> Other	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Monitoring for Adaptive Management	<input checked="" type="checkbox"/> Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2530 – Witch Hazel Creek – Brookwood Crossing	Capital	883	0.450	0.87	0.417	0.209	0.209

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK – code only vegetation that CWS is responsible for										RIPARIAN CODES – RIGHT BANK – code only vegetation that CWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (0 deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft		
2530 - Witch Hazel Creek - Brookwood Crossing	30%	3.54E+04	100	223	6.7	28.7	2.0	1175	1175	1175	1175	1175	1175	1175	1000	1125	1150	1150	1150	1000	1000	1000	1000	1000	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	3%	9.28E+03	100	246	6.7	28.7	2.0	1100	1100	1100	1100	1100	1100	1000	1000	1100	1125	1175	1175	1175	1150	1000	1000	1000	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	9%	2.88E+04	100	246	6.7	28.7	2.0	1125	1100	1100	1100	1100	1100	1000	1000	1100	1125	1175	1175	1175	1150	1000	1000	1000	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	11%	3.39E+04	100	212	6.7	28.7	2.0	1100	1100	1100	1125	1100	1100	1100	1000	1000	1125	1175	1175	1175	1175	1000	1000	1000	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	2%	5.40E+03	100	256	6.7	28.7	2.0	1100	1100	1100	1100	1100	1100	1000	1000	1000	1100	1100	1125	1150	1150	1125	1125	1125	1125		
2530 - Witch Hazel Creek - Brookwood Crossing	34%	1.09E+05	100	208	6.7	28.7	2.0	1175	1175	1175	1175	1150	1000	1000	1000	1150	1125	1125	1175	1175	1175	1150	1125	1125	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	19%	5.97E+04	100	201	6.7	28.7	2.0	1100	1175	1175	1175	1175	1175	1150	1000	1000	1100	1150	1150	1175	1150	1175	1150	1000	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	9%	3.02E+04	100	247	6.7	28.7	2.0	1125	1150	1125	1125	1125	1100	1000	1000	1000	1100	1125	1175	1175	1150	1000	1000	1000	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	30%	7.88E+04	83	215	6.7	28.7	2.0	1175	1175	1175	1175	1175	1125	1100	1000	1000	1150	1000	1000	1000	1000	1000	1000	1000	1000		

Enhanced Shade Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK – code only vegetation that CWS is responsible for										RIPARIAN CODES – RIGHT BANK – code only vegetation that CWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (0 deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft		
2530 - Witch Hazel Creek - Brookwood Crossing	35.5%	1.14E+05	100	223	6.7	28.7	2.0	1175	1175	1175	1175	1175	1175	1175	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	25.5%	8.16E+04	100	246	6.7	28.7	2.0	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	25.6%	8.18E+04	100	246	6.7	28.7	2.0	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1175	1175	1175	1175	1175	1000	1000	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	37.9%	1.21E+05	100	212	6.7	28.7	2.0	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	16.1%	5.15E+04	100	256	6.7	28.7	2.0	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175		
2530 - Witch Hazel Creek - Brookwood Crossing	38.6%	1.23E+05	100	208	6.7	28.7	2.0	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	39.5%	1.26E+05	100	201	6.7	28.7	2.0	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	24.6%	7.87E+04	100	247	6.7	28.7	2.0	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000		
2530 - Witch Hazel Creek - Brookwood Crossing	33.6%	8.95E+04	83	215	6.7	28.7	2.0	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1000	1000	1000	1000	1000	1000	1000	1000		

2541 – TSWCD – Tualatin River

Project Summary

Project ID	Acres
2541	47.03
Location	
Private, rural property in Washington County, directly adjacent to Tualatin River, located east of SW 345 th Avenue.	
Program	
VEGBAC	
Lat/Long	Number of Plants Installed
45.51, -123.04	8,348
Stream Length	Average Stream Width
6,793 feet	46.8 feet
Initial Planting Year/Credit Year	CWS Thermal Benefits/Credits
2024/2025	2.88 million kcal/day
Plant Communities	
Riparian Forest (refer to the Site Assessment Report for additional information)	
Partners	
Tualatin Soil and Water Conservation District	
Riparian Planting Activities	
Site preparation, targeted invasive species treatment, seeding, and riparian plantings	
Instream Enhancement Activities	
None	

Project Number: 2541

Project Name: TSWCD Project 2541 - Tualatin River

Project Acres: 47.03

Initial Planting Year: 2024

Initial Credit Year: 2025

Length of Stream: 6,793 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 3,182

Phase: Establishment

Native Tree	Native Shrub	Native Herbaceous	Invasives
bigleaf maple	*beaked hazelnut	Alaska brome	bull thistle
bitter cherry	black twinberry	American trailplant	Canada thistle
black cottonwood	blue elderberry	bedstraw	English ivy
black hawthorn	Douglas' spirea	Blue Wildrye	Himalayan blackberry
Douglas-fir	elderberry	common horsetail	poison hemlock
*Oregon ash	native wild rose	Douglas aster	St. John's wort
Oregon oak	nootka rose	feathery false lily of the valley	tansy ragwort
red alder	oceanspray	*fringecup	traveler's joy
W. v. ponderosa pine	osoberry, indian plum	giant horsetail	
western red cedar	Pacific ninebark	inside-out flower	
	*Pacific poison oak	meadowrue	
	red-osier dogwood	native clover	
	serviceberry	sedge	
	*snowberry	stinging nettle	
	tall Oregon grape	tall annual willowherb	
	thimbleberry	threepetal bedstraw	
	*trailing blackberry	tufted hairgrass	
		western swordfern	
		willowherb	

Management Actions

Completed: 2025	Recommended: 2026
<input checked="" type="checkbox"/> Interplant	<input type="checkbox"/> Interplant
<input checked="" type="checkbox"/> Invasive weed treatment	<input checked="" type="checkbox"/> Invasive weed treatment
<input checked="" type="checkbox"/> Seeding	<input checked="" type="checkbox"/> Seeding
<input checked="" type="checkbox"/> Herbivore Control	<input type="checkbox"/> Herbivore Control
<input type="checkbox"/> Other	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Monitoring for Adaptive Management	<input checked="" type="checkbox"/> Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2541 – TSWCD – Tualatin River	VEGBAC	6,793	18.67	24.43	5.76	2.88	2.88

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES - LEFT BANK- code only vegetation that CWS is responsible for										RIPARIAN CODES - RIGHT BANK- code only vegetation that CWS is responsible for							
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (° deg N)	Wetted Width (ft)	NSD2 Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft
2541 - TSWCD - Tualatin River	0%	9.18E+03	100	115	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1150	1175	1150	1150	1125	1100	1000
2541 - TSWCD - Tualatin River	17%	3.59E+03	93	126	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	12%	2.69E+03	100	214	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	13%	2.92E+03	100	214	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1150	1150
2541 - TSWCD - Tualatin River	13%	2.85E+03	100	214	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1150	1100	1100	1100
2541 - TSWCD - Tualatin River	12%	2.62E+03	100	217	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1125	1100	1100	1100
2541 - TSWCD - Tualatin River	11%	2.56E+03	100	216	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1150	1100	1100	1100	1100
2541 - TSWCD - Tualatin River	11%	2.48E+03	100	208	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1125	1100	1100	1100	1100	1100	1100
2541 - TSWCD - Tualatin River	13%	2.91E+03	100	192	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1125	1100	1100	1100	1100	1100	1100
2541 - TSWCD - Tualatin River	5%	1.14E+03	100	158	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1125	1125	1100	1100	1100	1100	1100	1100	1100
2541 - TSWCD - Tualatin River	4%	8.69E+04	100	155	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1125	1100	1100	1100	1000	1000	1000	1000	1000
2541 - TSWCD - Tualatin River	0%	0.00E+00	100	171	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1000	1000	1000	1000	1000	1000	1000
2541 - TSWCD - Tualatin River	0%	0.00E+00	100	196	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1000	1000	1000	1000	1000	1000	1000
2541 - TSWCD - Tualatin River	11%	2.55E+03	100	209	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1150	1000	1000	1000	1000	1000	1000
2541 - TSWCD - Tualatin River	12%	2.60E+03	100	217	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000
2541 - TSWCD - Tualatin River	9%	2.04E+03	100	222	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1150	1150	1125	1000	1000	1000	1000	1000
2541 - TSWCD - Tualatin River	10%	2.18E+03	100	221	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1150	1100	1100	1100	1000	1000	1000
2541 - TSWCD - Tualatin River	7%	1.67E+03	100	222	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1125	1100	1100	1100	1100	1100	1000	1000
2541 - TSWCD - Tualatin River	7%	1.51E+03	100	229	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1125	1100	1100	1100	1100	1100	1000	1000
2541 - TSWCD - Tualatin River	9%	1.95E+03	100	210	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1125	1100	1100	1100	1100	1100	1100	1100
2541 - TSWCD - Tualatin River	12%	2.74E+03	100	195	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1100	1100	1100	1100	1100	1100	1100
2541 - TSWCD - Tualatin River	0%	0.00E+00	100	192	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1100	1100	1100	1100	1100	1100	1000
2541 - TSWCD - Tualatin River	12%	2.62E+03	100	188	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1150	1100	1100	1100	1000	1000	1000	1000
2541 - TSWCD - Tualatin River	13%	2.91E+03	100	188	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1100	1100	1100	1000	1000	1000	1000
2541 - TSWCD - Tualatin River	12%	2.61E+03	100	183	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1150	1100	1000	1000	1000	1000	1000
2541 - TSWCD - Tualatin River	13%	2.88E+03	100	176	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1150	1100	1000	1000	1000	1000	1000	1000

Baseline Conditions (cont.)

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES - LEFT BANK - code only vegetation that CWS is responsible for										RIPARIAN CODES - RIGHT BANK - code only vegetation that CWS is responsible for							
	Effective Shade (%)	Thermal Load Blocked (kcal/D)	Segment Length (ft)	Orientation (° deg N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft
2541 - TSWCD - Tualatin River	4%	3.95E-04	100	187	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1125	1125	1100	1000	1000	1000	1000	1000	1000
2541 - TSWCD - Tualatin River	16%	3.49E-05	100	200	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	14%	3.15E-05	100	203	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	11%	2.49E-05	100	202	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1125	1150	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	11%	2.44E-05	100	196	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1150	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	14%	3.22E-05	100	144	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1125	1150	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	12%	2.59E-05	100	65	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1175	1175	1175	1150	1125	1100	
2541 - TSWCD - Tualatin River	17%	3.92E-05	100	57	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	13%	2.88E-05	100	62	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	14%	3.16E-05	100	59	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	15%	3.32E-05	100	64	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	11%	2.41E-05	100	77	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1150	1150	1175	1175	1150	1150	1175
2541 - TSWCD - Tualatin River	18%	3.95E-05	100	122	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	21%	4.64E-05	100	146	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1150	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	21%	4.76E-05	100	146	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	21%	4.76E-05	100	145	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	18%	4.04E-05	100	149	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1175	1150	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	21%	4.70E-05	100	152	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1150	1150	1150
2541 - TSWCD - Tualatin River	21%	4.71E-05	100	153	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	17%	3.87E-05	100	157	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1150	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	20%	4.51E-05	100	154	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1150	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	16%	3.62E-05	100	134	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1150	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	10%	2.21E-05	100	116	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1150	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	10%	2.19E-05	100	94	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	15%	3.44E-05	100	62	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1150	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	20%	4.45E-05	100	23	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	19%	4.37E-05	100	13	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	19%	4.31E-05	100	9	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2541 - TSWCD - Tualatin River	18%	4.10E-05	100	11	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1125	1150	1150	1150	1150	1175
2541 - TSWCD - Tualatin River	13%	3.00E-05	100	68	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1150	1125	1100	1000
2541 - TSWCD - Tualatin River	10%	2.29E-05	100	162	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1150	1150	1150	1150	1150	1175	1150	1150
2541 - TSWCD - Tualatin River	7%	1.61E-05	100	146	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1150	1150	1150	1150	1150	1150	1150
2541 - TSWCD - Tualatin River	6%	1.32E-05	100	69	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1125	1150	1150	1150	1150	1100	1100	1100	1175
2541 - TSWCD - Tualatin River	14%	3.14E-05	100	40	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1150	1150	1150	1150	1125	1125	1150	1175
2541 - TSWCD - Tualatin River	16%	3.53E-05	100	50	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1175	1175	1175	1175	1125	1150	1125	1100
2541 - TSWCD - Tualatin River	10%	2.31E-05	100	78	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1150	1175	1175	1175	1175	1175	1175	1125
2541 - TSWCD - Tualatin River	10%	2.15E-05	100	64	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1125	1125	1150	1175	1175	1175	1175	1150
2541 - TSWCD - Tualatin River	19%	4.17E-05	100	38	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1150	1175	1175	1175	1175	1175	1175	1125
2541 - TSWCD - Tualatin River	14%	3.05E-05	100	57	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1150	1175	1175	1175	1175	1150	1150	1125
2541 - TSWCD - Tualatin River	3%	7.20E-04	100	86	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1125	1125	1125	1125	1100	1000	1000	1000	1000
2541 - TSWCD - Tualatin River	11%	2.39E-05	100	108	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1150	1175	1175	1150	1150	1000	1000
2541 - TSWCD - Tualatin River	6%	1.42E-05	100	119	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1125	1125	1150	1175	1175	1175	1175	1175	1150

Enhanced Conditions (cont.)

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK -- code only vegetation that CWS is responsible for										RIPARIAN CODES -- RIGHT BANK -- code only vegetation that CWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (pcald)	Segment Length (ft)	Orientation (0 deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft		
2541 - TSWCD - Tualatin River	13.1%	2.94E+05	100	69	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175		
2541 - TSWCD - Tualatin River	19.4%	4.35E+05	100	40	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175		
2541 - TSWCD - Tualatin River	18.5%	4.16E+05	100	50	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175		
2541 - TSWCD - Tualatin River	10.5%	2.36E+05	100	78	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175		
2541 - TSWCD - Tualatin River	14.8%	3.32E+05	100	64	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175		
2541 - TSWCD - Tualatin River	19.5%	4.37E+05	100	38	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175		
2541 - TSWCD - Tualatin River	17.5%	3.92E+05	100	57	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175		
2541 - TSWCD - Tualatin River	8.4%	1.90E+05	100	86	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000		
2541 - TSWCD - Tualatin River	10.6%	2.39E+05	100	108	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000		
2541 - TSWCD - Tualatin River	15.9%	3.58E+05	100	119	46.8	67.9	16.9	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175		

2542 – TSWCD – Christensen Creek Tributary

Project Summary

Project ID	Acres
2542	18.61
Location	
Private, rural property in Washington County, bisected by a tributary to Christensen Creek, located south of SW Firdale Road.	
Program	
VEGBAC	
Lat/Long	Number of Plants Installed
45.44, -123.01	17,600
Stream Length	Average Stream Width
3,221 feet	5.5 feet
Initial Planting Year/Credit Year	CWS Thermal Benefits/Credits
2024/2025	0.433 million kcal/day
Plant Communities	
Riparian Forest and Scrub-Shrub (refer to the Site Assessment Report for additional information)	
Partners	
Tualatin Soil and Water Conservation District	
Riparian Planting Activities	
Site preparation, targeted invasive species treatment, seeding, and riparian plantings with fenced enclosures	
Instream Enhancement Activities	
None	

Project Acres: 18.61 Initial Planting Year: 2024 Initial Credit Year: 2025 Length of Stream: 3,221 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 1,933

Phase: Establishment

Native Tree	Native Shrub	Native Herbaceous	Invasives
*bigleaf maple	*beaked hazelnut	American trailplant	bull thistle
*cascara	blue elderberry	curlytop knotweed	Canada thistle
*Douglas-fir	low Oregon grape	fragrant bedstraw	common hawthorn
grand fir	oceanspray	giant horsetail	common velvetgrass
Oregon ash	*Pacific poison oak	horseweed	herb Robert
*western red cedar	red huckleberry	inside-out flower	Himalayan blackberry
	snowberry	lady fern	
	thimbleberry	miner's lettuce	
	*trailing blackberry	piggyback	
		skunk cabbage	
		slender rush	
		stinging nettle	
		taperfruit shortsedge	
		water parsley	
		*western swordfern	
		wild ginger	
		willow dock	
		willowherb	

Plant Community: Scrub-Shrub

Stems per Acre: 1,058

Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
bigleaf maple	beaked hazelnut	American sloughgrass	bull thistle
Douglas-fir	Douglas' spirea	American speedwell	Canada thistle
grand fir	dune willow	beggarticks	herb Robert
Oregon ash	elderberry	common spikerush	Himalayan blackberry
red alder	*Pacific Willow	common sweet cicely	reed canary grass
*western red cedar	red elderberry	giant horsetail	tansy ragwort
	red huckleberry	golden nutsedge	
	salmonberry	horseweed	
	Sitka Willow	lady fern	
	snowberry	lateral sedge	
	trailing blackberry	needle spikerush	
		northern water plantain	
		ovate spikerush	
		pasture rush	
		piggyback	
		*rice cutgrass	
		*sedge	
		skullcap speedwell	
		slender rush	
		slough sedge	
		soft rush	
		stinging nettle	
		taperfruit shortscale sedge	
		tapertip rush	
		water parsely	
		western swordfern	
		*willowherb	
		witchgrass	

Management Actions

Completed: 2025	Recommended: 2026
<input checked="" type="checkbox"/> Interplant	<input checked="" type="checkbox"/> Interplant
<input checked="" type="checkbox"/> Invasive weed treatment	<input checked="" type="checkbox"/> Invasive weed treatment
<input checked="" type="checkbox"/> Seeding	<input checked="" type="checkbox"/> Seeding
<input type="checkbox"/> Herbivore Control	<input checked="" type="checkbox"/> Herbivore Control
<input type="checkbox"/> Other	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Monitoring for Adaptive Management	<input checked="" type="checkbox"/> Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2542 – TSWCD – Christensen Creek Tributary	VEGBAC	3,221	2.71	3.57	0.867	0.433	0.433

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES – LEFT BANK – code only vegetation that CWS is responsible for										RIPARIAN CODES – RIGHT BANK – code only vegetation that CWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (° deg-N)	Wetted Width (ft)	NSD2 Width (ft)	Channel Incision (%)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft		
2542 - TSWCD – Christensen Creek Tributary	9%	2.87E-04	100	72	6.6	16.3	1.0	1375	1375	1375	1350	1300	1000	1000	1000	1375	1175	1175	1175	1175	1175	1150	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	5%	3.83E-03	56	50	6.6	16.3	1.0	1300	1300	1300	1300	1300	1300	1300	1325	1250	1325	1350	1000	1000	1000	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	2%	7.07E-03	100	64	6.6	16.3	1.0	1300	1300	1325	1350	1325	1300	1300	1300	1300	1300	1325	1375	1375	1375	1175	1175	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	4%	1.20E-04	100	78	6.6	16.3	1.0	1325	1300	1325	1350	1375	1325	1325	1300	1325	1350	1375	1175	1175	1175	1175	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	3%	3.08E-03	100	84	6.6	16.3	1.0	1325	1300	1300	1300	1300	1300	1300	1325	1375	1325	1350	1175	1175	1175	1150	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	4%	1.38E-04	100	78	6.6	16.3	1.0	1325	1300	1325	1300	1300	1300	1300	1300	1325	1375	1175	1175	1175	1175	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	58%	1.85E-05	100	90	6.6	16.3	1.0	1325	1300	1300	1300	1300	1300	1300	1300	1300	1175	1175	1175	1150	1000	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	5%	1.43E-04	100	79	6.6	16.3	1.0	1325	1325	1325	1300	1300	1300	1300	1300	1300	1375	1175	1175	1175	1175	1175	1175	1150	1150		
2542 - TSWCD – Christensen Creek Tributary	8%	2.53E-04	100	71	6.6	16.3	1.0	1325	1300	1325	1325	1350	1375	1375	1375	1350	1375	1175	1175	1175	1175	1175	1175	1175	1175		
2542 - TSWCD – Christensen Creek Tributary	5%	1.59E-04	100	82	6.6	16.3	1.0	1350	1350	1350	1350	1325	1350	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	6%	1.94E-04	100	78	6.6	16.3	1.0	1375	1375	1375	1375	1350	1325	1300	1300	1375	1175	1175	1175	1175	1175	1125	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	58%	1.83E-05	100	93	6.6	16.3	1.0	1350	1350	1350	1350	1325	1300	1300	1300	1300	1175	1175	1175	1175	1175	1125	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	52%	1.68E-05	100	71	6.6	16.3	1.0	1350	1325	1300	1300	1300	1300	1300	1325	1175	1175	1175	1175	1175	1150	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	47%	1.48E-05	100	52	6.6	16.3	1.0	1350	1325	1350	1325	1300	1300	1325	1375	1375	1175	1175	1175	1175	1150	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	23%	7.44E-04	100	50	6.6	16.3	1.0	1350	1375	1375	1350	1350	1325	1000	1000	1350	1175	1175	1150	1100	1000	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	50%	1.09E-05	100	135	4.5	6.8	1.6	1325	1300	1325	1350	1175	1175	1175	1150	1150	1150	1100	1000	1000	1000	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	2%	2.89E-03	65	126	4.5	6.8	1.6	1300	1325	1325	1000	1000	1000	1000	1000	1300	1300	1300	1325	1375	1375	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	12%	2.63E-04	100	137	4.5	6.8	1.6	1300	1350	1350	1350	1175	1175	1175	1150	1000	1300	1325	1350	1375	1000	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	8%	1.63E-04	100	145	4.5	6.8	1.6	1300	1300	1325	1350	1175	1175	1175	1000	1000	1300	1300	1300	1350	1000	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	34%	7.36E-04	100	151	4.5	6.8	1.6	1325	1325	1350	1350	1350	1150	1175	1125	1325	1300	1325	1375	1000	1000	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	9%	1.95E-04	100	153	4.5	6.8	1.6	1300	1325	1350	1350	1375	1175	1175	1175	1150	1300	1300	1325	1350	1350	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	1%	2.26E-03	100	121	4.5	6.8	1.6	1300	1300	1300	1300	1300	1325	1125	1150	1150	1300	1300	1300	1325	1325	1375	1350	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	28%	5.96E-04	100	106	4.5	6.8	1.6	1325	1325	1300	1300	1300	1300	1300	1325	1325	1325	1375	1375	1350	1000	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	55%	1.20E-05	100	112	4.5	6.8	1.6	1375	1350	1300	1300	1300	1300	1300	1300	1300	1375	1375	1375	1150	1125	1125	1150	1150	1125		
2542 - TSWCD – Christensen Creek Tributary	63%	1.36E-05	100	112	4.5	6.8	1.6	1350	1325	1300	1300	1300	1300	1300	1300	1300	1375	1175	1150	1175	1150	1000	1000	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	70%	1.50E-05	100	154	4.5	6.8	1.6	1375	1350	1325	1300	1300	1300	1300	1300	1300	1375	1175	1175	1175	1175	1175	1175	1175	1125		
2542 - TSWCD – Christensen Creek Tributary	58%	1.25E-05	100	105	4.5	6.8	1.6	1375	1300	1300	1300	1325	1375	1375	1175	1375	1175	1175	1175	1175	1175	1175	1175	1175	1175		
2542 - TSWCD – Christensen Creek Tributary	69%	1.49E-05	100	137	4.5	6.8	1.6	1350	1325	1300	1300	1325	1325	1325	1350	1175	1175	1150	1150	1175	1150	1125	1125	1000	1000		
2542 - TSWCD – Christensen Creek Tributary	77%	1.68E-05	100	147	4.5	6.8	1.6	1375	1350	1325	1300	1325	1350	1125	1000	1000	1175	1175	1175	1175	1175	1175	1150	1150	1150		
2542 - TSWCD – Christensen Creek Tributary	75%	1.61E-05	100	128	4.5	6.8	1.6	1375	1325	1300	1100	1125	1150	1175	1175	1000	1175	1175	1175	1175	1175	1175	1175	1175	1150		
2542 - TSWCD – Christensen Creek Tributary	70%	1.51E-05	100	121	4.5	6.8	1.6	1325	1300	1300	1100	1100	1100	1125	1175	1175	1175	1175	1175	1175	1175	1175	1150	1150	1100		
2542 - TSWCD – Christensen Creek Tributary	76%	1.65E-05	100	107	4.5	6.8	1.6	1375	1325	1300	1300	1300	1150	1175	1175	1175	1175	1175	1175	1175	1150	1125	1125	1100	1100		
2542 - TSWCD – Christensen Creek Tributary	76%	1.64E-05	100	120	4.5	6.8	1.6	1375	1325	1300	1300	1300	1325	1175	1175	1175	1175	1175	1175	1175	1150	1125	1150	1150	1150		

Enhanced Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK -- code only vegetation that DWS is responsible for										RIPARIAN CODES -- RIGHT BANK -- code only vegetation that DWS is responsible for							
	Effective Shade (%)	Thermal Load Blocked (tcal/d)	Segment Length (ft)	Orientation (0 deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft
2542 - TSWCD - Christensen Creek Tributary	9.1%	2.87E-04	100	72	6.6	16.3	1.0	1375	1375	1375	1375	1000	1000	1000	1000	1000	1375	1175	1175	1175	1175	1175	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	16.7%	2.97E-04	56	50	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1000	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	9.0%	2.85E-04	100	64	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1000	1000
2542 - TSWCD - Christensen Creek Tributary	5.4%	1.70E-04	100	78	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1000	1000
2542 - TSWCD - Christensen Creek Tributary	4.4%	1.40E-04	100	94	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1000	1000
2542 - TSWCD - Christensen Creek Tributary	6.1%	1.94E-04	100	78	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	59.2%	1.88E-05	100	90	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1000	1000	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	5.9%	1.87E-04	100	79	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175
2542 - TSWCD - Christensen Creek Tributary	9.8%	3.12E-04	100	71	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175
2542 - TSWCD - Christensen Creek Tributary	5.3%	1.69E-04	100	82	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1000	1000
2542 - TSWCD - Christensen Creek Tributary	6.1%	1.94E-04	100	78	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1000	1000
2542 - TSWCD - Christensen Creek Tributary	57.9%	1.83E-05	100	93	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1000	1000
2542 - TSWCD - Christensen Creek Tributary	53.3%	1.69E-05	100	71	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	48.3%	1.53E-05	100	52	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1000	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	25.4%	8.06E-04	100	50	6.6	16.3	1.0	1375	1375	1375	1375	1375	1375	1375	1000	1000	1375	1175	1175	1175	1175	1000	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	74.2%	1.60E-05	100	135	4.5	6.8	1.6	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	62.6%	8.82E-05	65	126	4.5	6.8	1.6	1375	1375	1375	1000	1000	1000	1000	1000	1000	1375	1375	1375	1375	1375	1375	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	64.4%	1.39E-05	100	137	4.5	6.8	1.6	1375	1375	1375	1375	1175	1175	1175	1175	1000	1375	1375	1375	1375	1000	1000	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	65.5%	1.42E-05	100	145	4.5	6.8	1.6	1375	1375	1375	1375	1175	1175	1175	1000	1000	1375	1375	1375	1375	1000	1000	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	66.0%	1.43E-05	100	151	4.5	6.8	1.6	1375	1375	1375	1375	1375	1175	1175	1175	1175	1375	1375	1375	1375	1000	1000	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	66.1%	1.43E-05	100	153	4.5	6.8	1.6	1375	1375	1375	1375	1375	1175	1175	1175	1175	1375	1375	1375	1375	1375	1375	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	61.8%	1.34E-05	100	121	4.5	6.8	1.6	1375	1375	1375	1375	1375	1375	1175	1175	1175	1375	1375	1375	1375	1375	1375	1375	1000	1000
2542 - TSWCD - Christensen Creek Tributary	49.4%	1.07E-05	100	106	4.5	6.8	1.6	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1000	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	55.6%	1.20E-05	100	112	4.5	6.8	1.6	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175
2542 - TSWCD - Christensen Creek Tributary	64.2%	1.39E-05	100	112	4.5	6.8	1.6	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1000	1000	1000
2542 - TSWCD - Christensen Creek Tributary	70.3%	1.52E-05	100	154	4.5	6.8	1.6	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175
2542 - TSWCD - Christensen Creek Tributary	57.8%	1.25E-05	100	105	4.5	6.8	1.6	1375	1375	1375	1375	1375	1375	1375	1175	1175	1375	1175	1175	1175	1175	1175	1175	1175	1175
2542 - TSWCD - Christensen Creek Tributary	75.3%	1.63E-05	100	137	4.5	6.8	1.6	1375	1375	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000
2542 - TSWCD - Christensen Creek Tributary	77.5%	1.67E-05	100	147	4.5	6.8	1.6	1375	1375	1375	1375	1375	1375	1175	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2542 - TSWCD - Christensen Creek Tributary	75.0%	1.62E-05	100	128	4.5	6.8	1.6	1375	1375	1375	1175	1175	1175	1175	1175	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2542 - TSWCD - Christensen Creek Tributary	75.9%	1.64E-05	100	121	4.5	6.8	1.6	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2542 - TSWCD - Christensen Creek Tributary	76.2%	1.65E-05	100	107	4.5	6.8	1.6	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2542 - TSWCD - Christensen Creek Tributary	76.0%	1.64E-05	100	120	4.5	6.8	1.6	1375	1375	1375	1375	1375	1375	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175

2552 – TSWCD – Fanno Creek Tributary

Project Summary

Project ID	Acres
2552	4.15
Location	
Private, urban property in City of Beaverton, bisected by Fanno Creek, located west of SW Oleson Road.	
Program	
VEGBAC	
Lat/Long	Number of Plants Installed
45.48, -122.75	9,665
Stream Length	Average Stream Width
2,081 feet	13.4 feet
Initial Planting Year/Credit Year	CWS Thermal Benefits/Credits
2025/2025	0.474 million kcal/day
Plant Communities	
Riparian Forest (refer to the Site Assessment Report for additional information)	
Partners	
Tualatin Soil and Water Conservation District	
Riparian Planting Activities	
Targeted invasive species treatment and riparian plantings	
Instream Enhancement Activities	
None	

Project Number: 2552

Project Name: TSWCD Project 2552 - Fanno Creek

Project Acres: 4.15

Initial Planting Year: 2025

Initial Credit Year: 2025

Length of Stream: 2,081 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 2,100

Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
*bigleaf maple	*beaked hazelnut	*Alaska brome	Canada thistle
Oregon ash	osoberry, indian plum	*Blue Wildrye	English ivy
*red alder	red elderberry	cleavers	Himalayan blackberry
vine maple	red flowering currant	common beggarticks	morning-glory
	red-osier dogwood	nodding beggarticks	poison hemlock
	serviceberry	*stinging nettle	reed canary grass
	*snowberry	taperfruit shortscale sedge	
	trailing blackberry	willowherb	
		yellow touch-me-not	

Management Actions

Completed: 2025	Recommended: 2026
<input type="checkbox"/> Interplant	<input type="checkbox"/> Interplant
<input type="checkbox"/> Invasive weed treatment	<input checked="" type="checkbox"/> Invasive weed treatment
<input type="checkbox"/> Seeding	<input type="checkbox"/> Seeding
<input type="checkbox"/> Herbivore Control	<input type="checkbox"/> Herbivore Control
<input type="checkbox"/> Other	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Monitoring for Adaptive Management	<input checked="" type="checkbox"/> Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2552 – TSWCD – Fanno Creek	VEGBAC	2,081	5.68	6.63	0.947	0.474	0.474

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION				RIPARIAN CODES – LEFT BANK – code only vegetation that CWS is responsible for										RIPARIAN CODES – RIGHT BANK – code only vegetation that CWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (° degree N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft	
2552 - TSWCD – Fanno Creek	24%	1.51E+05	100	197	13.4	19.6	6.6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1150	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD – Fanno Creek	17%	8.75E+04	81	205	13.4	19.6	6.6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1150	1150	1125	1100	1000	1000	1000	1000	1000	1000
2552 - TSWCD – Fanno Creek	20%	1.30E+05	100	225	13.4	19.6	6.6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2552 - TSWCD – Fanno Creek	55%	3.55E+05	100	121	13.4	19.6	6.6	1150	1175	1175	1175	1175	1175	1175	1175	1175	1150	1175	1175	1175	1175	1175	1150	1000	1000	1000
2552 - TSWCD – Fanno Creek	57%	3.68E+05	100	149	13.4	19.6	6.6	1150	1150	1175	1175	1175	1175	1175	1175	1175	1150	1150	1175	1175	1175	1175	1150	1125	1125	1125
2552 - TSWCD – Fanno Creek	60%	3.86E+05	100	259	13.4	19.6	6.6	1175	1150	1175	1175	1175	1175	1150	1175	1175	1175	1175	1175	1175	1150	1125	1100	1000	1000	1000
2552 - TSWCD – Fanno Creek	59%	3.82E+05	100	230	13.4	19.6	6.6	1175	1150	1150	1175	1175	1175	1150	1000	1000	1175	1175	1175	1125	1125	1000	1000	1000	1000	1000
2552 - TSWCD – Fanno Creek	59%	3.82E+05	100	235	13.4	19.6	6.6	1175	1175	1000	1000	1000	1000	1000	1000	1000	1175	1175	1150	1150	1150	1150	1150	1150	1150	1150
2552 - TSWCD – Fanno Creek	60%	3.87E+05	100	213	13.4	19.6	6.6	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2552 - TSWCD – Fanno Creek	60%	3.83E+05	100	84	13.4	19.6	6.6	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1150	1000	1000	1000
2552 - TSWCD – Fanno Creek	63%	4.05E+05	100	157	13.4	19.6	6.6	1175	1175	1175	1175	1175	1150	1150	1150	1175	1150	1175	1175	1175	1175	1150	1125	1125	1000	1000
2552 - TSWCD – Fanno Creek	40%	2.57E+05	100	270	13.4	19.6	6.6	1150	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD – Fanno Creek	31%	2.00E+05	100	189	13.4	19.6	6.6	1175	1175	1175	1175	1175	1150	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD – Fanno Creek	22%	1.39E+05	100	156	13.4	19.6	6.6	1150	1125	1175	1175	1175	1125	1150	1175	1125	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD – Fanno Creek	54%	3.44E+05	100	197	13.4	19.6	6.6	1175	1175	1150	1150	1150	1150	1150	1125	1150	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD – Fanno Creek	36%	2.34E+05	100	226	13.4	19.6	6.6	1150	1175	1175	1175	1175	1150	1125	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD – Fanno Creek	24%	1.53E+05	100	272	13.4	19.6	6.6	1125	1175	1150	1125	1150	1125	1100	1100	1125	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD – Fanno Creek	56%	3.57E+05	100	268	13.4	19.6	6.6	1175	1175	1175	1000	1000	1000	1000	1000	1000	1125	1100	1125	1150	1150	1125	1125	1125	1000	1000
2552 - TSWCD – Fanno Creek	33%	2.15E+05	100	169	13.4	19.6	6.6	1125	1150	1125	1125	1000	1000	1000	1000	1000	1125	1125	1125	1125	1150	1175	1150	1150	1150	1150
2552 - TSWCD – Fanno Creek	25%	1.61E+05	100	156	13.4	19.6	6.6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1125	1150	1175	1150	1125	1000	1000	1000	1000	1000
2552 - TSWCD – Fanno Creek	32%	2.05E+05	100	172	13.4	19.6	6.6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1150	1000	1000	1000	1000	1000	1000	1000	1000

Enhanced Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK -- code only vegetation that DWS is responsible for										RIPARIAN CODES -- RIGHT BANK -- code only vegetation that DWS is responsible for							
	Effective Shade (%)	Thermal Load Blocked (cal/d)	Segment Length (ft)	Orientation (0 deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft
2552 - TSWCD -- Fanno Creek Tributary	25.2%	1.62E+05	100	197	13.4	19.6	6.6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	25.5%	1.32E+05	81	205	13.4	19.6	6.6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	20.2%	1.29E+05	100	225	13.4	19.6	6.6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2552 - TSWCD -- Fanno Creek Tributary	56.7%	4.29E+05	100	121	13.4	19.6	6.6	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	69.5%	4.47E+05	100	149	13.4	19.6	6.6	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175
2552 - TSWCD -- Fanno Creek Tributary	61.2%	3.94E+05	100	259	13.4	19.6	6.6	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	61.7%	3.97E+05	100	230	13.4	19.6	6.6	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1175	1175	1175	1175	1175	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	59.8%	3.85E+05	100	235	13.4	19.6	6.6	1175	1175	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2552 - TSWCD -- Fanno Creek Tributary	60.1%	3.87E+05	100	213	13.4	19.6	6.6	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2552 - TSWCD -- Fanno Creek Tributary	59.5%	3.83E+05	100	84	13.4	19.6	6.6	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	70.0%	4.51E+05	100	157	13.4	19.6	6.6	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	51.1%	3.29E+05	100	270	13.4	19.6	6.6	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	31.4%	2.02E+05	100	189	13.4	19.6	6.6	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	26.5%	1.70E+05	100	155	13.4	19.6	6.6	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	55.0%	3.54E+05	100	197	13.4	19.6	6.6	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	42.2%	2.72E+05	100	226	13.4	19.6	6.6	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	48.4%	3.12E+05	100	272	13.4	19.6	6.6	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	57.4%	3.69E+05	100	268	13.4	19.6	6.6	1175	1175	1175	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	68.0%	4.37E+05	100	169	13.4	19.6	6.6	1175	1175	1175	1175	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175
2552 - TSWCD -- Fanno Creek Tributary	42.9%	2.76E+05	100	156	13.4	19.6	6.6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000
2552 - TSWCD -- Fanno Creek Tributary	33.9%	2.18E+05	100	172	13.4	19.6	6.6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000

2563 – TSWCD – Gales Creek

Project Summary

Project ID	Acres
2563	17.12
Location	
Public, rural property in Washington County, directly adjacent to Gales Creek, located west of Gales Creek Road.	
Program	
VEGBAC	
Lat/Long	Number of Plants Installed
45.55, -123.19	6,350
Stream Length	Average Stream Width
3,188 feet	37.4 feet
Initial Planting Year/Credit Year	CWS Thermal Benefits/Credits
2025/2025	1.29 million kcal/day
Plant Communities	
Riparian Forest (refer to the Site Assessment Report for additional information)	
Partners	
Tualatin Soil and Water Conservation District	
Riparian Planting Activities	
Site preparation, targeted invasive species treatment, and riparian plantings	
Instream Enhancement Activities	
None	

Project Acres: 17.12 Initial Planting Year: 2025 Initial Credit Year: 2025 Length of Stream: 3,188 ft

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Riparian Forest

Stems per Acre: 3,295

Phase: Establishment

Native Tree	Native Shrub	Native Herbaceous	Invasives
*bigleaf maple	beaked hazelnut	Alaska brome	common velvetgrass
black cottonwood	Douglas' spirea	American sloughgrass	English ivy
*Oregon ash	gooseberry	American speedwell	garlic mustard
*red alder	oceanspray	Blue Wildrye	herb Robert
vine maple	*osoberry, indian plum	coast tarweed	Himalayan blackberry
western red cedar	Pacific ninebark	coastal hedgenettle	morning-glory
	Pacific Willow	Columbia brome	perennial pea
	red elderberry	common horsetail	reed canary grass
	*red-osier dogwood	curlytop knotweed	St. John's wort
	salmonberry	disc mayweed	tansy ragwort
	Sitka Willow	field mint	
	*snowberry	fringe cup	
	thimbleberry	lady fern	
	trailing blackberry	manroot	
	wax current	Pacific bleeding heart	
		Pacific waterleaf	
		piggyback	
		polypody	
		redroot amaranth	
		sedge	
		silverleaf phacelia	
		starry false lily of the valley	
		stinging nettle	
		water smartweed	
		western swordfern	
		willowherb	
		yellowcress	

Management Actions

Completed: 2025	Recommended: 2026
<input checked="" type="checkbox"/> Interplant	<input checked="" type="checkbox"/> Interplant
<input checked="" type="checkbox"/> Invasive weed treatment	<input checked="" type="checkbox"/> Invasive weed treatment
<input checked="" type="checkbox"/> Seeding	<input type="checkbox"/> Seeding
<input type="checkbox"/> Herbivore Control	<input type="checkbox"/> Herbivore Control
<input type="checkbox"/> Other	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Monitoring for Adaptive Management	<input checked="" type="checkbox"/> Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
2563 – TSWCD – Gales Creek	VEGBAC	3,188	4.48	7.06	2.58	1.29	1.29

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION				RIPARIAN CODES – LEFT BANK – code only vegetation that CWS is responsible for										RIPARIAN CODES – RIGHT BANK – code only vegetation that CWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (° deg=N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft	
2563 - TSWCD – Gales Creek	3%	1.62E-06	96	162	37.4	56.6	4.3	1150	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	3%	4.61E-04	100	155	37.4	56.6	4.3	1000	1000	1000	1150	1150	1175	1150	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	12%	2.28E-05	100	172	37.4	56.6	4.3	1175	1175	1175	1175	1175	1125	1125	1125	1125	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	2%	2.80E-04	100	55	37.4	56.6	4.3	1100	1100	1125	1125	1100	1125	1150	1150	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	0%	2.86E-03	100	103	37.4	56.6	4.3	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	0%	0.00E-00	100	165	37.4	56.6	4.3	1100	1100	1100	1100	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	1%	9.40E-03	100	198	37.4	56.6	4.3	1100	1100	1100	1125	1100	1100	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	12%	2.21E-05	100	223	37.4	56.6	4.3	1175	1175	1175	1175	1175	1150	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	14%	2.44E-05	100	199	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	12%	2.14E-05	100	169	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	11%	2.03E-05	100	163	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1100	1100	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	9%	1.61E-05	100	124	37.4	56.6	4.3	1150	1175	1175	1175	1175	1175	1175	1175	1150	1125	1175	1125	1100	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	2%	3.94E-04	100	100	37.4	56.6	4.3	1100	1150	1175	1175	1175	1175	1175	1175	1175	1100	1150	1175	1100	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	5%	9.69E-04	100	122	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1100	1125	1125	1150	1100	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	4%	6.91E-04	100	88	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1100	1100	1100	1125	1125	1125	1125	1000	1000	
2563 - TSWCD – Gales Creek	11%	1.89E-05	100	42	37.4	56.6	4.3	1150	1150	1175	1175	1175	1175	1175	1175	1175	1125	1125	1125	1100	1100	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	2%	3.21E-04	100	122	37.4	56.6	4.3	1100	1125	1125	1100	1125	1125	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	3%	6.13E-04	100	145	37.4	56.6	4.3	1100	1100	1125	1125	1150	1175	1175	1175	1175	1100	1100	1125	1100	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	12%	2.13E-05	100	162	37.4	56.6	4.3	1150	1150	1150	1150	1175	1175	1175	1175	1175	1100	1100	1100	1150	1150	1175	1150	1150	1125	
2563 - TSWCD – Gales Creek	20%	3.66E-05	100	163	37.4	56.6	4.3	1150	1175	1175	1175	1175	1175	1175	1175	1175	1150	1150	1175	1175	1175	1175	1175	1175	1175	
2563 - TSWCD – Gales Creek	18%	3.30E-05	100	159	37.4	56.6	4.3	1100	1125	1150	1150	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1150	1000	
2563 - TSWCD – Gales Creek	18%	3.23E-05	100	153	37.4	56.6	4.3	1100	1150	1150	1150	1150	1150	1175	1175	1175	1175	1175	1175	1150	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	15%	2.74E-05	100	156	37.4	56.6	4.3	1100	1100	1150	1175	1175	1175	1175	1175	1175	1175	1150	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	7%	1.19E-05	100	164	37.4	56.6	4.3	1100	1150	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	12%	2.22E-05	100	174	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	5%	8.73E-04	92	129	37.4	56.6	4.3	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	5%	9.01E-04	100	127	37.4	56.6	4.3	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	6%	1.05E-05	100	129	37.4	56.6	4.3	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	7%	1.33E-05	100	137	37.4	56.6	4.3	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	3%	5.47E-04	100	113	37.4	56.6	4.3	1175	1175	1175	1175	1150	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	5%	8.14E-04	100	67	37.4	56.6	4.3	1150	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	
2563 - TSWCD – Gales Creek	4%	6.48E-04	100	62	37.4	56.6	4.3	1100	1150	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	

Enhanced Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK -- code only vegetation that DWS is responsible for										RIPARIAN CODES -- RIGHT BANK -- code only vegetation that DWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (psal/d)	Segment Length (ft)	Orientation (0 deg=0)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft		
2563 - TSWCD -- Gales Creek	11.0%	1.90E+05	96	162	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	3.7%	8.66E+04	100	155	37.4	56.6	4.3	1000	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	12.8%	2.29E+05	100	179	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	6.8%	1.22E+05	100	55	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	2.6%	4.66E+04	100	109	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	11.5%	2.07E+05	100	165	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	13.6%	2.43E+05	100	198	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	12.4%	2.22E+05	100	223	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	13.6%	2.44E+05	100	199	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	11.9%	2.14E+05	100	169	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	22.4%	4.03E+05	100	163	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	15.3%	2.74E+05	100	124	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	6.6%	1.19E+05	100	100	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	14.1%	2.53E+05	100	122	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	7.3%	1.31E+05	100	88	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000		
2563 - TSWCD -- Gales Creek	20.9%	3.76E+05	100	42	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000		
2563 - TSWCD -- Gales Creek	4.9%	8.82E+04	100	122	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	22.0%	3.95E+05	100	145	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	24.7%	4.44E+05	100	162	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175		
2563 - TSWCD -- Gales Creek	24.8%	4.45E+05	100	163	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175		
2563 - TSWCD -- Gales Creek	24.4%	4.38E+05	100	159	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000		
2563 - TSWCD -- Gales Creek	23.5%	4.21E+05	100	153	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	22.0%	3.95E+05	100	156	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	11.4%	2.05E+05	100	164	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	12.4%	2.22E+05	100	174	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	5.3%	8.73E+04	92	129	37.4	56.6	4.3	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	5.0%	9.01E+04	100	127	37.4	56.6	4.3	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	5.8%	1.05E+05	100	129	37.4	56.6	4.3	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	7.4%	1.33E+05	100	137	37.4	56.6	4.3	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	3.1%	5.52E+04	100	113	37.4	56.6	4.3	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	5.1%	9.15E+04	100	67	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
2563 - TSWCD -- Gales Creek	5.8%	1.05E+05	100	62	37.4	56.6	4.3	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		

6882 – Cedar Mill Trunk – Jenkins to Beaverton Interceptor

Project Summary

Project ID	Acres
6882	40.48
Location	
Public, rural property in City of Beaverton, directly adjacent to Cedar Mill Creek, located east of 170 th Avenue.	
Program	
Capital	
Lat/Long	Number of Plants Installed
45.50, -122.85	204,093
Stream Length	Average Stream Width
6,620 feet	14.3 feet
Initial Planting Year/Credit Year	CWS Thermal Benefits/Credits
2021/2025	2.64 million kcal/day
Plant Communities	
Riparian Forest, Scrub Shrub, and Forested Wetland (refer to the Site Assessment Report for additional information)	
Partners	
Tualatin Hills Park and Recreation District	
Riparian Planting Activities	
Targeted invasive species treatment and riparian plantings	
Instream Enhancement Activities	
None	

Summary of Current Conditions by Plant Community Type

* denotes species that are considered diverse

Plant Community: Forested Wetland

Stems per Acre: 2,644

Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
black cottonwood	beaked hazelnut	American bird's-foot trefoil	Canada thistle
black hawthorn	Douglas' spirea	American sloughgrass	common hawthorn
casacara	elderberry	annual hairgrass	common velvetgrass
Douglas-fir	native wild rose	blue skullcap	English ivy
*Oregon ash	nootka rose	Blue Wildrye	herb Robert
Oregon oak	osoberry, indian plum	bracken fern	Himalayan blackberry
pacific crab apple	Oval-leaved viburnum	California oatgrass	reed canary grass
Pacific dogwood	Pacific ninebark	cinquefoil	shiny geranium
red alder	Pacific Willow	clarkia	tansy ragwort
W. v. ponderosa pine	*red-osier dogwood	cleavers	yellow flag iris
western red cedar	salal	Columbia brome	
white alder	salmonberry	common beggarticks	
	*snowberry	common horsetail	
	tall Oregon grape	denseflower willowherb	
	thimbleberry	*fowl bluegrass	
	trailing blackberry	fragrant bedstraw	
	wax current	fringecup	
	willow	grand collomia	
		grooved rush	
		lady fern	
		lance self heal	
		large-leaved avens	
		lateral sedge	
		meadow barley	
		Pacific waterleaf	
		pasture rush	
		riverbank lupine	
		sawbeak sedge	
		sedge	
		Siberian springbeauty	
		*slender hairgrass	
		slender rush	
		slough sedge	
		spike bentgrass	
		stinging nettle	
		taperfruit shortscale sedge	
		toad rush	
		tufted hairgrass	
		*water foxtail	
		water parsely	
		western swordfern	
		willowherb	
		winecup clarkia	
		yellow touch-me-not	
		yellowcress	

Plant Community: Riparian Forest

Stems per Acre: 4,041

Phase: Establishment

Native Tree	Native Shrub	Native Herbaceous	Invasives
bigleaf maple	beaked hazelnut	American bird's-foot trefoil	bull thistle
black cottonwood	clustered wild rose	annual hairgrass	common velvetgrass
black hawthorn	Douglas' spirea	blue skullcap	English ivy
Douglas-fir	dune willow	bracken fern	herb Robert
grand fir	elderberry	cleavers	Himalayan blackberry
*Oregon ash	low Oregon grape	denseflower willowherb	reed canary grass
pacific crab apple	native wild rose	enchanter's nightshade	shiny geranium
red alder	nootka rose	*fowl bluegrass	St. John's wort
vine maple	osoberry, indian plum	fragrant bedstraw	tansy ragwort
W. v. ponderosa pine	Pacific ninebark	fringecup	
western red cedar	Pacific Willow	grand collomia	
	*red-osier dogwood	grooved rush	
	salmonberry	Henderson's sedge	
	serviceberry	lady fern	
	Sitka Willow	large-leaved avens	
	*snowberry	meadow barley	
	tall Oregon grape	Pacific waterleaf	
	*trailing blackberry	scouring rush	
	wax current	Siberian springbeauty	
	Western wahoo	skunk cabbage	
	willow	slender hairgrass	
		*slough sedge	
		spike bentgrass	
		stinging nettle	
		taperfruit shortscale sedge	
		tufted hairgrass	
		*western swordfern	
		willowherb	
		winecup clarkia	
		yellow touch-me-not	

Plant Community: Scrub-Shrub

Stems per Acre: 1,967

Phase: Implementation

Native Tree	Native Shrub	Native Herbaceous	Invasives
grand fir	black twinberry	American bird's-foot trefoil	common velvetgrass
noble fir	Douglas' spirea	*annual hairgrass	
Oregon ash	elderberry	beggarticks	
Oregon oak	native wild rose	common beggarticks	
pacific crab apple	Pacific ninebark	denseflower willowherb	
red alder	*Pacific Willow	disc mayweed	
W. v. ponderosa pine	red flowering currant	fowl bluegrass	
white alder	red-osier dogwood	*meadow barley	
	snowberry	sedge	
	thimbleberry	*slender hairgrass	
	willow	spike bentgrass	
		toad rush	
		*tufted hairgrass	
		*water foxtail	
		willowherb	

Management Actions

Completed: 2025	Recommended: 2026
<input type="checkbox"/> Interplant	<input type="checkbox"/> Interplant
<input type="checkbox"/> Invasive weed treatment	<input type="checkbox"/> Invasive weed treatment
<input type="checkbox"/> Seeding	<input type="checkbox"/> Seeding
<input type="checkbox"/> Herbivore Control	<input type="checkbox"/> Herbivore Control
<input type="checkbox"/> Other	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Monitoring for Adaptive Management	<input checked="" type="checkbox"/> Monitoring for Adaptive Management

Thermal Credit for Shade Enhancement

Project	CWS Program	Stream Length (ft)	Thermal Load Blocked (Baseline Conditions) (million kcal/day)	Thermal Load Blocked (Enhanced Conditions) (million kcal/day)	Thermal Load Reduction (Environmental Benefits) (million kcal/day)	Thermal Credits Available (million kcal/day)	CWS Thermal Credits (million kcal/day)
6882 – Cedar Mill Trunk – Jenkins to Beaverton Interceptor	Capital	6,620	12.05	17.32	5.27	2.64	2.64

Shade-a-Lator Input and Output Spreadsheets

Baseline Conditions

PROJECT	SHADE & HEAT		STREAM INFORMATION				RIPARIAN CODES – LEFT BANK – code only vegetation that CWS is responsible for												RIPARIAN CODES – RIGHT BANK – code only vegetation that CWS is responsible for											
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (° deg-N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft					
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	0%	0.00E+00	100	227	14.3	17.8	2.4	1100	1100	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	24%	1.09E+05	87	252	14.3	17.8	2.4	1125	1150	1175	1175	1150	1100	1125	1000	1000	1100	1125	1150	1150	1125	1125	1125	1125	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	46%	3.18E+05	100	251	14.3	17.8	2.4	1175	1175	1150	1175	1175	1175	1150	1000	1000	1100	1125	1150	1175	1175	1175	1175	1175	1175	1175				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	55%	3.79E+05	100	234	14.3	17.8	2.4	1175	1175	1175	1150	1150	1125	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1150	1150	1175				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	17%	1.18E+05	100	229	14.3	17.8	2.4	1100	1100	1100	1000	1000	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1175	1175				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	2%	1.04E+04	100	290	14.3	17.8	2.4	1100	1100	1125	1150	1125	1125	1125	1125	1150	1300	1300	1300	1300	1300	1300	1100	1125	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	7%	2.93E+04	64	243	14.3	17.8	2.4	1000	1000	1000	1100	1125	1150	1150	1000	1000	1350	1350	1325	1325	1325	1325	1300	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	3%	1.77E+04	100	240	14.3	17.8	2.4	1000	1000	1100	1125	1175	1175	1150	1150	1000	1300	1300	1300	1300	1300	1300	1325	1350	1350	1325				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	21%	1.44E+05	100	231	14.3	17.8	2.4	1125	1150	1150	1150	1150	1125	1000	1000	1000	1300	1300	1300	1300	1300	1300	1300	1300	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	16%	1.13E+05	100	219	14.3	17.8	2.4	1100	1150	1175	1175	1150	1000	1000	1000	1000	1300	1300	1300	1300	1300	1300	1100	1100	1150	1150				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	11%	7.71E+04	100	225	14.3	17.8	2.4	1100	1125	1150	1150	1125	1125	1100	1100	1100	1300	1300	1300	1300	1300	1100	1125	1150	1150	1150				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	1%	5.30E+03	100	261	14.3	17.8	2.4	1100	1100	1100	1125	1150	1150	1100	1100	1100	1300	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	2%	1.64E+04	100	250	14.3	17.8	2.4	1100	1100	1150	1175	1175	1125	1125	1100	1100	1300	1300	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	46%	3.18E+05	100	214	14.3	17.8	2.4	1125	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1150	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	30%	1.85E+05	89	226	14.3	17.8	2.4	1150	1175	1000	1175	1175	1175	1175	1175	1150	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	35%	2.42E+05	100	216	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	16%	1.13E+05	100	218	14.3	17.8	2.4	1100	1150	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	8%	5.74E+04	100	242	14.3	17.8	2.4	1100	1125	1175	1175	1175	1175	1175	1150	1150	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	39%	2.69E+05	100	326	14.3	17.8	2.4	1175	1175	1150	1150	1150	1150	1150	1125	1125	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	26%	1.79E+05	100	341	14.3	17.8	2.4	1125	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	33%	2.28E+05	100	320	14.3	17.8	2.4	1150	1175	1175	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	26%	1.79E+05	100	315	14.3	17.8	2.4	1150	1000	1000	1175	1175	1175	1175	1150	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	20%	1.34E+05	100	313	14.3	17.8	2.4	1125	1000	1175	1175	1150	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	0%	0.00E+00	100	295	14.3	17.8	2.4	1000	1000	1000	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	42%	2.85E+05	100	249	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				
6882 - Cedar Mill Trunk – Jenkins to Beaverton Interceptor	40%	2.77E+05	100	236	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000				

Enhanced Conditions (cont.)

PROJECT	SHADE & HEAT		STREAM INFORMATION					RIPARIAN CODES -- LEFT BANK -- code only vegetation that DWS is responsible for										RIPARIAN CODES -- RIGHT BANK -- code only vegetation that DWS is responsible for									
	Effective Shade (%)	Thermal Load Blocked (kcal/d)	Segment Length (ft)	Orientation (° deg N)	Wetted Width (ft)	NSDZ Width (ft)	Channel Incision (ft)	LB 0-15 ft	LB 15-30 ft	LB 30-45 ft	LB 45-60 ft	LB 60-75 ft	LB 75-90 ft	LB 90-105 ft	LB 105-120 ft	LB 120-135 ft	RB 0-15 ft	RB 15-30 ft	RB 30-45 ft	RB 45-60 ft	RB 60-75 ft	RB 75-90 ft	RB 90-105 ft	RB 105-120 ft	RB 120-135 ft		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	47.5%	3.26E+05	100	219	14.3	17.8	2.4	1175	1175	1175	1175	1175	1000	1000	1000	1000	1375	1375	1375	1375	1375	1175	1175	1175	1175		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	48.4%	3.82E+05	100	225	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1375	1375	1375	1375	1375	1175	1175	1175	1175		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	46.7%	3.20E+05	100	291	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	47.4%	3.25E+05	100	250	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1375	1375	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	56.1%	3.85E+05	100	214	14.3	17.8	2.4	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175	1175	1175	1175	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	36.7%	2.94E+05	89	206	14.3	17.8	2.4	1175	1175	1000	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	35.3%	2.42E+05	100	216	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	35.8%	2.45E+05	100	218	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	41.8%	2.86E+05	100	242	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	40.3%	2.76E+05	100	326	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	37.6%	2.58E+05	100	341	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	40.7%	2.79E+05	100	320	14.3	17.8	2.4	1175	1175	1175	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	36.5%	2.50E+05	100	315	14.3	17.8	2.4	1175	1000	1000	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	38.5%	2.64E+05	100	313	14.3	17.8	2.4	1175	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	0.0%	0.00E+00	100	295	14.3	17.8	2.4	1000	1000	1000	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	41.6%	2.85E+05	100	249	14.3	17.8	2.4	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	40.4%	2.77E+05	100	236	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	41.9%	2.87E+05	100	269	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	42.5%	2.92E+05	100	312	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	44.1%	3.02E+05	100	296	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	39.4%	2.70E+05	100	332	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	43.7%	2.98E+05	100	295	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	31.7%	2.17E+05	100	348	14.3	17.8	2.4	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	38.7%	2.65E+05	100	274	14.3	17.8	2.4	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	0.0%	0.00E+00	100	284	14.3	17.8	2.4	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	0.0%	0.00E+00	100	278	14.3	17.8	2.4	1000	1000	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	35.6%	2.44E+05	100	277	14.3	17.8	2.4	1175	1000	1000	1000	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	39.0%	2.67E+05	100	269	14.3	17.8	2.4	1175	1000	1000	1000	1000	1000	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	36.2%	2.48E+05	100	239	14.3	17.8	2.4	1175	1000	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	0.0%	0.00E+00	100	198	14.3	17.8	2.4	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	32.2%	2.20E+05	100	207	14.3	17.8	2.4	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	28.8%	1.97E+05	100	217	14.3	17.8	2.4	1175	1000	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	25.0%	1.71E+05	100	179	14.3	17.8	2.4	1175	1175	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	16.8%	1.15E+05	100	130	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	28.2%	1.93E+05	100	179	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	41.9%	2.87E+05	100	251	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	41.5%	2.84E+05	100	248	14.3	17.8	2.4	1175	1175	1175	1175	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	40.5%	2.77E+05	100	237	14.3	17.8	2.4	1175	1175	1175	1175	1000	1000	1000	1000	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	42.4%	2.90E+05	100	254	14.3	17.8	2.4	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	12.3%	8.44E+04	100	346	14.3	17.8	2.4	1000	1000	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1175	1175	1175	1175	1175	1175		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	15.1%	1.04E+05	100	309	14.3	17.8	2.4	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	13.8%	9.47E+04	100	234	14.3	17.8	2.4	1000	1000	1000	1000	1000	1000	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	52.8%	3.62E+05	100	229	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1000	1000	1175	1000	1000	1000	1000	1000	1175	1175	1175		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	44.5%	3.05E+05	100	273	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1175	1175	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	57.1%	3.91E+05	100	192	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1000	1000	1000	1000	1000		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	55.8%	3.82E+05	100	180	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175	1175	1175	1175	1175		
8882 - Cedar Mill Trunk - Jenkins to Beaverton Interceptor	53.3%	3.66E+05	100	213	14.3	17.8	2.4	1175	1175	1175	1175	1175	1175	1175	1175	1175	1000	1000	1000	1000	1175						

Appendix B
Riparian Shade Planting Projects
2004-2025

Appendix B: Riparian Shade Planting Projects (2004-2025)

Appendix B presents a summary of the 221 active riparian shade projects enrolled in CWS' water quality trading program. The project name, credit year, project characteristics (average wetted width and stream length), and the thermal credit claimed by CWS are presented in Table B. In previous years, the average wetted width and stream length were reported as rounded values. CWS takes thermal credit for those projects for which a valid contract or agreement is in place. For projects that do not have a landowner contract in place, CWS conducts routine shade monitoring using LiDAR and aerial imagery and takes thermal credits if they are providing the expected canopy cover. The 221 active riparian shade projects have restored approximately 120 stream miles and have generated approximately 660 million kcal/day of thermal credit.

Table B: Active Riparian Shade Planting Projects (2004-2025)

Project ID	Project Name	Project Status	Credit Year	Average Wetted Width (ft)	Segment Length (ft)*	CWS Thermal Credits (million kcal/d)
121	Tualatin River – Thomas Dairy	Active	2004	210	500	3.16
122	Summer Creek – Fowler	Active	2004	9.9	1,600	1.55
123	Fanno Creek – Englewood	Active	2004	8.9	4,400	6.77
126	Rock Creek – Evergreen to Cornell	Active	2004	19.7	2,500	4.41
131	Rock Creek – WWTP	Active	2004	22	700	0.84
136	Johnson Creek South – Summercrest	Active	2004	1.9	1,800	0.60
138	Bronson Creek – W Union to Laidlaw	Active	2004	4.7	5,400	3.15
1166	Fanno Creek – OES Marsh	Active	2004	9.3	1,300	2.04
1767	Cedar Creek – Stella Olsen	Active	2004	15	1,500	4.08
21	Rock Creek – Amberwood Natural Area	Active	2005	17.7	900	0.19
25	Dawson Creek – Evergreen Blvd	Active	2005	8.3	1,800	1.36
27	Rock Creek – Trail – Evergreen to Hwy 26	Active	2005	20	800	3.07
36	Beaverton Creek – Transit Center	Active	2005	12.4	1,500	2.70
78	North Johnson Creek – Cedar Mill Wetlands	Active	2005	13.2	800	0.08
95	95 – TSWCD – McFee Creek Tributary	Active	2005	2	2,700	0.97
124	Willow Creek – Bronson Rd	Active	2005	4.8	800	0.04
129	Sylvan Creek – Raleighwood Marsh	Active	2005	7	2,100	3.14
141	Fanno Creek – Hall Blvd to Ash Ave	Active	2005	21	2,100	6.45
142	Gales Creek – Tualatin River to Hwy 47	Active	2005	26	4,000	14.60
1040	Rock Creek – Golf Course to Bethany Pond	Active	2005	14.4	2,900	7.62
138	Bronson Creek – W Union to Laidlaw	Active	2005	5	900	1.06
126	Rock Creek Evergreen to Cornell	Active	2005	20	3,400	8.69
131	Rock Creek – WWTP	Active	2005	22	2,300	4.27
18	Banks Elementary	Active	2006	1.6	600	0.19
65	Fanno Creek tributary – Downing to 125th	Active	2006	0.9	600	0.11
94	94 – TSWCD – East Fork Dairy Creek	Active	2006	12.3	5,300	4.12
96	96 – TSWCD – Tualatin River	Active	2006	46.9	6,300	25.30
97	97 – TSWCD – West Fork Dairy Creek	Active	2006	20	2,400	4.13
102	102 – TSWCD – West Fork Dairy Creek	Active	2006	8	1,300	0.21
114	114 – TSWCD – Tualatin River	Active	2006	45.4	1,800	7.30
137	Willow Creek – Beaverton Creek Confluence	Active	2006	11.8	1,300	1.43
1020	Dairy Creek – Davis Tool	Active	2006	42	4,900	4.76
1160	Johnson Creek – Lowami Hart Woods	Active	2006	6	500	0.52
1181	1181 – TSWCD – Tualatin River	Active	2006	29.6	10,700	14.90
1422	Beaverton Creek – 153rd to St Marys	Active	2006	9.3	4,900	9.36
1767	Cedar Creek – Stella Olsen	Active	2006	15	700	1.12
123	Fanno Creek – Englewood	Active	2006	9	2,500	1.50

Table B-1: Active Riparian Shade Planting Projects (2004-2025) (Continued)

Project ID	Project Name	Project Status	Credit Year	Average Wetted Width (ft)	Segment Length (ft)*	CWS Thermal Credits (million kcal/d)
1141	1141 – TSWCD – Council Creek Tributary	Active	2007	4	6,300	4.64
104	104 – TSWCD – McFee Creek	Active	2007	7.9	1,500	0.73
105	105 – TSWCD – Tualatin River	Active	2007	33.2	1,800	5.81
109	109 – TSWCD – West Fork Dairy Creek	Active	2007	20	1,600	2.55
110	110 – TSWCD – Chicken Creek Tributary	Active	2007	3	800	0.40
112	112 – TSWCD – Tualatin River	Active	2007	43.3	8,200	31.30
125	Beaverton Creek – Quatama – 205th Ave to 231st Ave	Active	2007	23	7,300	13.90
132	Tualatin River – Gales Creek to Fernhill Rd	Active	2007	44.9	4,300	9.79
1140	1140 – TSWCD – Council Creek Tributary	Active	2007	9.5	1,100	2.18
1522	1522 – TSWCD – Abbey Creek	Active	2007	6.4	1,500	1.58
1524	1524 – TSWCD – Rock Creek	Active	2007	10	1,600	2.57
1767	Cedar Creek – Stella Olsen	Active	2007	15	700	0.34
12	Tualatin River – Metro King	Active	2008	56.8	800	3.61
117	Metro – Lovejoy	Active	2008	44.5	8,100	21.80
128	Bronson Creek – Tanasbrook Ponds	Active	2008	6.7	2,700	3.04
143	Gales Creek – B St to Hwy 47	Active	2008	23	3,300	4.49
1080	Fanno Creek – Greenway Park	Active	2008	10.9	6,000	9.15
1886	1886 – TSWCD – Abbey Creek Tributary	Active	2008	2.6	700	0.22
1907	1907 – TSWCD – West Fork Dairy Creek	Active	2008	10	600	0.01
1930	1930 – TSWCD – Bledsoe Creek	Active	2008	5	1,100	1.00
1927	1927 – TSWCD – Cedar Creek	Active	2008	8	900	1.51
103	103 – TSWCD – East Fork Dairy Creek	Active	2009	11.4	3,100	0.81
107	107 – TSWCD – Tualatin River Tributary	Active	2009	5	600	0.03
108	108 – TSWCD – Tualatin River	Active	2009	50	3,600	5.19
113	113 – TSWCD – Chicken Creek	Active	2009	5	500	0.26
100	TRNWR – Dennis	Active	2009	120	4,700	3.48
115	Metro – Munger	Active	2009	120	2,100	0.69
2007	2007 – TSWCD – West Fork Dairy Creek	Active	2009	15	2,800	0.70
1080	Fanno Creek – Greenway Park	Active	2009	9	1,100	0.71
130	Tualatin River – Eagle Woods at Fern Hill	Active	2010	23	1,100	0.69
116	116 – TSWCD – East Fork Dairy Creek	Active	2010	36	2,879	5.38
1906	1906 – TSWCD – McKay Creek	Active	2010	20	5,900	8.74
2049	Rock Creek – Noble Woods	Active	2010	19	1,170	2.39
2051	2051 – TSWCD – Bledsoe Creek	Active	2010	5	2,643	2.36
2052	2052 – TSWCD – Gales Creek	Active	2010	40	900	1.98
2087	Gales Creek – Half Mile Lane	Active	2011	27	1,306	2.62
2097	2097 – TSWCD – Gales Creek	Active	2011	75	3,755	15.70
131	Rock Creek – WWTP	Active	2011	8	3,022	2.15
135	Willow Creek Enhancement	Active	2012	8	1,190	1.55
2106	2106 – TSWCD – Tualatin River	Active	2012	30	1,969	2.31
2122	2122 – TSWCD – Gales Creek	Active	2012	7.6	2,800	1.03
1181	1181 – TSWCD – Tualatin River	Active	2012	6	3,300	3.20
2105	2105 – TSWCD – Carpenter Creek	Active	2012	4	1,756	0.32
2100	2100 – TSWCD – Tualatin River	Active	2013	11.8	4,272	2.76
2101	2101 – TSWCD – Christensen Creek	Active	2013	3	1,693	1.07
2102	2102 – TSWCD – Christensen Creek	Active	2013	3	1,700	0.91
2103	2103 – TSWCD – Tualatin River	Active	2013	16.8	4,082	9.78
2126	2126 – TSWCD – Cedar Creek Tributary	Active	2013	2	587	0.17
2128	2128 – TSWCD – Jackson Creek	Active	2013	5	679	0.28

Table B-1: Active Riparian Shade Planting Projects (2004-2025) (Continued)

Project ID	Project Name	Project Status	Credit Year	Average Wetted Width (ft)	Segment Length (ft)*	CWS Thermal Credits (million kcal/d)
2129	2129 – TSWCD – Jackson Creek	Active	2013	5	700	0.45
124	Willow Creek – Bronson Rd	Active	2013	7.4	500	0.29
2140	2140 – TSWCD – Gales Creek	Active	2013	40	2,054	5.38
17	Durham City Park	Active	2014	20	4,193	3.48
2093	Barrows Meadows	Active	2014	6	800	0.16
2130	2130 – TSWCD – Gales Creek	Active	2014	35	5,052	11.30
2131	2131 – TSWCD – McKay Creek	Active	2014	30	4,161	5.74
2135	Bronson Creek Greenway	Active	2015	5.8	4,600	0.08
2137	2137 – TSWCD – Gales Creek	Active	2015	25	2,257	2.63
2138	2138 – TSWCD – Little Beaver Creek	Active	2015	7.5	572	0.71
2139	2139 – TSWCD – Carpenter Creek	Active	2015	6	4,023	1.74
2142	2142 – TSWCD – Little Beaver Creek	Active	2015	11.7	5,161	3.30
2168	Tualatin River Farm	Active	2015	66	2,794	0.89
1767	Cedar Creek – Stella Olsen	Active	2015	16	2,027	2.29
2099	2099 – TSWCD – Tualatin River	Active	2016	55	3,700	1.60
2199	TRNWR – Naujock	Active	2016	118	6,400	5.90
2163	2163 – TSWCD – Little Beaver Creek	Active	2016	4	1,350	0.98
2164	2164 – TSWCD – Gales Creek Tributary	Active	2016	25	2,070	0.15
2165	2165 – TSWCD – McKay Creek	Active	2016	12	3,693	0.05
2166	2166 – TSWCD – Dairy Creek	Active	2016	19	1,375	0.06
2184	Metro – Maroon Ponds Natural Area	Active	2016	45	2,700	3.30
2201	2201 – TSWCD – Tualatin River	Active	2016	52	2,247	2.80
2202	2202 – TSWCD – East Fork Dairy Creek	Active	2016	33.1	3,397	3.20
2203	2203 – TSWCD – Council Creek	Active	2016	7	1,071	0.10
2204	2204 – TSWCD – McKay Creek	Active	2016	30	2,500	3.20
2205	2205 – TSWCD – Tualatin River	Active	2016	64	3,000	0.31
2206	2206 – TSWCD – McFee Creek	Active	2016	11	550	0.27
2207	2207 – TSWCD – Tualatin River	Active	2016	50	500	0.26
2208	2208 – TSWCD – McKay Creek Tributary	Active	2016	9.3	2,046	2.20
2209	2209 – TSWCD – McKay Creek	Active	2016	28	1,091	0.32
2216	Beaverton Creek – Quatama – 197th Ave	Active	2016	32	1,676	1.30
2186	Metro – Woodard Natural Area	Active	2017	32	752	22.00
2190	Metro – Farmington Natural Area	Active	2017	123	599	0.83
2213	2213 – TSWCD – West Fork Dairy Creek	Active	2017	19	7,890	9.00
2218	Beaverton Creek – Quatama – 185th Ave	Active	2017	18	1,454	1.04
2260	2260 – TSWCD – McFee Creek	Active	2017	15	800	0.22
2261	2261 – TSWCD – Davis Creek	Active	2017	4	1,374	0.91
2262	2262 – TSWCD – Abbey Creek	Active	2017	4	1,530	0.19
2263	Fanno Creek – Crawford Reach	Active	2017	28	800	1.09
2265	Wapato View	Active	2017	2	5,045	1.41
2345	Metro – Carpenter Creek S	Active	2017	16	1,800	3.95
2346	Metro – Carpenter Creek N	Active	2017	16	382	0.90
1644	1644 – Banks High School	Active	2018	4	587	0.17
2043	2043 – Gales Creek at B Street Bridge	Active	2018	57	1,400	0.80
2187	2187 – Metro – Bonita Natural Area	Active	2018	6.3	1,732	1.57
2210	2210 – TSWCD – East Fork Dairy Creek	Active	2018	21	4,866	2.19
2215	2215 – TSWCD – Graver Creek	Active	2018	4.3	700	0.50
2259	2259 – TSWCD – McFee Creek	Active	2018	16.9	2,100	2.71
2318	2318 – TSWCD – Storey Creek	Active	2018	3	785	0.49

Table B-1: Active Riparian Shade Planting Projects (2004-2025) (Continued)

Project ID	Project Name	Project Status	Credit Year	Average Wetted Width (ft)	Segment Length (ft)*	CWS Thermal Credits (million kcal/d)
2321	2321 – TSWCD – McKay Creek Tributary	Active	2018	5.7	468	0.31
2322	2322 – TSWCD – Gales Creek	Active	2018	24.5	2,153	1.18
2324	2324 – TSWCD – Iler Creek	Active	2018	8.8	1,900	0.20
2327	2327 – TRNWR – Dennis Expansion Area	Active	2018	127.5	2,000	3.86
2333	2333 – TSWCD – Gales Creek	Active	2018	26.7	1,300	1.13
2414	2414 – TSWCD – East Fork Dairy Creek	Active	2018	32.2	5,089	0.81
2449	2449 – Steed Creek Expansion	Active	2018	3.7	500	0.41
6701	6701 – Bethany Creek Enhancement	Active	2018	2.7	1,377	0.45
78	78 – North Johnson Creek – Cedar Mill Wetlands	Active	2019	12.5	887	0.26
98	98 – TSWCD – Tualatin River Tributary	Active	2019	11.0	900	0.06
1807	1807 – Hedges Creek Marsh	Active	2019	49.5	3,395	0.10
2019	2019 – Chicken Creek at Green Heron	Active	2019	17.9	686	0.97
2075	2075 – Summer Creek – 116th to Fowler	Active	2019	15.0	1,000	0.79
2081	2081 – Grace Johnson	Active	2019	33.1	4,500	5.00
2116	2116 – Jack Park	Active	2019	1.8	2,253	0.18
2144	2144 – Fanno Creek – Ash Ave to Main St	Active	2019	13.0	1,400	1.85
2145	2145 – Woodhaven Park	Active	2019	2.1	700	0.16
2235	2235 – THPRD – Whispering Woods	Active	2019	26.6	2,200	5.27
2264	2264 – TRNWR – Oleson	Active	2019	30.0	1,400	0.26
2277	2277 – Spring Hill	Active	2019	23.4	9,527	15.89
2320	2320 – TSWCD – McKay Creek	Active	2019	24.8	393	0.02
2325	2325 – TSWCD – McKay Creek	Active	2019	50.0	575	0.06
2326	2326 – TSWCD – McKay Creek	Active	2019	40.0	383	0.16
2335	2335 – Metro – Baker Heaton	Active	2019	11.3	5,041	3.71
2336	2336 – Metro – Middle Baker	Active	2019	11.0	3,550	2.59
2351	2351 – Metro – River's Bend Munger	Active	2019	115.6	3,559	1.17
2379	2379 – Nyberg Creek – Stafford	Active	2019	9.3	800	0.99
2410	2410 – Upper Hedges Creek	Active	2019	19.9	1,200	0.15
2365	2365 – West Trib. Abbey Creek	Active	2020	14.7	2,720	1.04
2403	2403 – Fanno Creek – Felton Floodplain	Active	2020	23.8	1,700	0.68
2406	2406 – TSWCD – McFee Creek Tributary	Active	2020	7.0	1,965	0.40
2407	2407 – TSWCD – East Fork Dairy Creek	Active	2020	27.0	2,956	1.59
2408	2408 – TSWCD – Tualatin River	Active	2020	6.0	1,300	0.52
2411	2411 – Fanno Creek – Crawford Extension	Active	2020	33.0	961	1.39
2429	2429 – Metro – Carpenter Creek at SW Anderson Rd	Active	2020	8.0	800	1.00
2444	2444 – TSWCD – Dairy Creek	Active	2020	22.0	3,676	1.29
2445	2445 – TSWCD – Dairy Creek	Active	2020	55.0	1,000	0.16
2447	2447 – TSWCD – Tualatin River	Active	2020	123.0	2,195	0.37
2052	2052 – TSWCD – Gales Creek	Active	2021	29.5	3,519	9.02
2183	2183 – Fanno Creek – Denney Rd to Hall Blvd	Active	2021	8.5	4,385	3.25
2332	2332 – TRNWR – Bump – Brennar	Active	2021	125.0	2,089	0.11
2353	2353 – Metro – Dairy McKay – RF	Active	2021	32.5	5,195	2.43
2424	2424 – Bronson Creek – NW Bethany Blvd to NW 147th Pl	Active	2021	5.0	14,650	0.19
2443	2443 – Bronson Creek – OHSU	Active	2021	12.3	3,086	2.35
2448	2448 – NRCS – Hutchinson Wetland Reserve – O'Neil Creek	Active	2021	5.5	3,294	1.83
2485	2485 – TSWCD – McKay Creek	Active	2021	16.0	9,184	9.71
2492	2492 – Bronson Creek Park	Active	2021	33.0	851	0.96
2502	2502 – TSWCD – Dairy Creek	Active	2021	30.4	6,600	2.40
2175	2175 – McKay Creek – Swallowtail Farm	Active	2022	29.4	3,800	2.03

Table B-1: Active Riparian Shade Planting Projects (2004-2025) (Continued)

Project ID	Project Name	Project Status	Credit Year	Average Wetted Width (ft)	Segment Length (ft)*	CWS Thermal Credits (million kcal/d)
2283	2283 – TRNWR – Chicken Creek	Active	2022	23.0	14,315	16.76
2319	2319 – TSWCD – Tualatin River Tributary	Active	2022	12.8	1,072	0.16
2360	2360 – Fanno Creek – Brown Natural Area	Active	2022	17.3	51,109	5.19
2376	2376 – Dawson Creek – DVIR Daycare	Active	2022	14.3	452	0.42
2404	2404 – Dawson Creek – Port of Portland	Active	2022	11.2	4,951	0.44
2409	2409 – Lower Hedges Creek	Active	2022	68.4	2,965	0.10
2457	2457 – Glencoe Creek – Corridor	Active	2022	23.5	10,405	12.90
2469	2469 – TSWCD – Tualatin River Tributary	Active	2022	4.2	5,936	4.69
2472	2472 – Cedar Creek – Sunset	Active	2022	10.7	3,420	2.19
2486	2486 – TSWCD – Christensen Creek	Active	2022	7.2	2,666	1.19
2487	2487 – TSWCD – Tualatin River Tributary	Active	2022	4.3	648	0.51
2506	2506 – TSWCD – Clear Creek	Active	2022	10.7	599	0.25
2375	2375 – West Bethany Creek	Active	2023	2.3	3,595	0.97
2420	2420 – Balm Grove	Active	2023	28.3	1,188	2.11
2439	2439 – Ghost Creek – Sunset Creek	Active	2023	4.6	500	0.49
2501	2501 – TSWCD – McKay Creek	Active	2023	30.0	2,865	0.74
2503	2503 – Butternut Creek at 198th Ave	Active	2023	11.7	1,157	1.83
2519	2519 – TSWCD – Tualatin River	Active	2023	46.6	400	0.03
2520	2520 – TSWCD – Tualatin River	Active	2023	46.7	791	0.08
2521	2521 – TSWCD – Tualatin River	Active	2023	45.0	1,900	0.26
2522	2522 – TSWCD – Tualatin River	Active	2023	46.0	2,380	1.67
2538	2538 – TSWCD – West Fork Dairy Creek	Active	2023	23.5	900	0.61
2470	2470 – Metro–Baker Creek	Active	2024	13.5	2,600	1.38
2537	2537 – TSWCD–Bledsoe Creek	Active	2024	11.1	2,088	0.26
2540	2540 – TSWCD–East Fork Dairy Creek	Active	2024	26.0	2,300	18.57
2565	2565 – Fanno Creek	Active	2024	22.3	379	0.10
2584	2584 – Hill Creek	Active	2024	25.6	8,900	97.61
1646	1646 – 185th to Kaiser – Springville Creek	Active	2025	12.9	13,047	6.26
2474	2474 – Reedville Creek Expansion	Active	2025	29.6	1,942	0.91
2497	2497 – Village at Summer Creek HOA	Active	2025	25.3	571	1.04
2529	2529 – Rock Creek – TV Highway	Active	2025	24.0	1,852	0.41
2530	2530 – Witch Hazel Creek – Brookwood Crossing	Active	2025	6.7	883	0.21
2541	2541 – TSWCD – Tualatin River	Active	2025	46.8	6,793	2.88
2542	2542 – TSWCD – Christensen Creek Tributary	Active	2025	5.5	3,221	0.43
2552	2552 – TSWCD Project 2552 – Fanno Creek	Active	2025	13.4	2,081	0.47
2563	2563 – TSWCD – Gales Creek	Active	2025	37.4	3,188	1.29
6882	6882 – Cedar Mill Trunk – Jenkins to Beaverton Interceptor	Active	2025	14.6	6,620	2.64

*Some project names have changed since their enrollment in the trading program to better reflect their location in the watershed. The project numbers have not changed.
**Segment Length: Some projects were enrolled over multiple years. The segment length planted each year is presented in this table.
***This number has been revised to reflect the correct thermal credits for the project.

Appendix C

Additional Management Actions

Appendix C – Additional Management Actions

The following is a summary of actions at sites enrolled in the trading program for 10 years or more that did not provide anticipated shade as noted in previous annual reports. These sites will continue to be monitored for invasive species, and plant diversity and density. CWS’ project managers evaluate project performance to determine the additional management actions to implement, including the number of plants planted each year. In 2021, CWS began aggregating plant data for riparian planting projects on the fiscal year, July 1 to June 30. Previously, calculations were performed from January 1 to December 31. As a result, plant numbers listed below may differ from previous annual reports. Completed and recommended management actions and detailed monitoring data, such as recent stem density, canopy cover, and observed species, can be found in CWS’ site assessment reports, which are available upon request.

135 – Willow Creek Enhancement:

This project was initially planted with 700 native shrubs and trees in 2006 and has extensive wetland complexes, significant beaver activity, and ongoing challenges with invasive yellow flag iris. Focused actions on this project include invasive weed treatment and inter-planting as shown below:

2007: 75 plants
2008: 2,100 plants
2011: 300 plants
2020: 3,100 plants
2023: 2,000 plants
2024: 15,160 plants*
2025: 8,877 plants*

Targeted invasive species treatment and inter-planting were completed in 2024. Additional invasive species treatment and inter-planting were completed in 2025. This project will continue to be monitored for invasive species cover, and plant diversity and density as the project transitions from ash forested wetland to scrub shrub.

* This project is part of a group of 16 projects that are collectively managed; as such, only a portion of the total plants were allocated to this project.

2128 – TSWCD – Jackson Creek:

This project was initially planted with 4,000 native shrubs and trees in 2013 and has extensive wetland complexes, significant beaver activity, and ongoing challenges with deer, elk, and beaver browsing. Focused actions on this project include invasive weed treatment and inter-planting as shown below:

2015: 1,014 plants
2016: 4,800 plants
2017: 1,000 plants
2018: 1,000 plants

2019: 1,000 plants
2024: 1,600 plants

This project will continue to be monitored for invasive species cover, and plant diversity and density. Tree tubes will be used to protect trees from herbivory. In the future, strategic caging of trees along the creek could assist in the establishment of a tall canopy.

1422 – Beaverton Creek – 153rd to St Mary’s:

This project was initially planted with 20,390 native shrubs and trees in 2007. The project has extensive wetland complexes and significant beaver activity. Adaptive management efforts are ongoing to address natural changes to the project’s plant communities. Focused actions on this project include invasive weed treatment and inter-planting as shown below:

2008: 12,462 plants
2009: 3,970 plants
2010: 3,000 plants
2011: 14,000 plants
2012: 15,000 plants
2013: 1,743 plants
2014: 5,227 plants
2024: 7,350 plants
2025: 21,070 plants

This project will continue to be monitored for invasive species cover, and plant diversity and density.

2137 – TSWCD – Gales Creek:

This project was initially planted with 12,000 native shrubs and trees in 2015. Initially, it was difficult for landowner to keep cattle out of the stream and project area. TSWCD is assisting with fencing and monitoring, and trees and shrubs are establishing. Focused actions on this project include invasive weed treatment and inter-planting as shown below:

2018: 11,650 plants
2019: 2,132 plants
2020: 2,500 plants

This project will continue to be monitored for invasive species cover, and plant diversity and density.

129 – Sylvan Creek – Raleighwood Marsh:

This project was initially planted with 3,630 native shrubs and trees in 2007. Due to the successful initial restoration, woody vegetation was quickly established throughout the site. However, this, in turn, attracted beaver to the project, and their activities have created a mosaic of open water and emergent wetland that has been somewhat dynamic over time, due to dam removal by landowners and response by beaver. This has reduced the total amount of woody

cover on the site below initial estimates. Increased attention has focused on responding to the changing conditions through increased native herbaceous vegetation that is more characteristic of emergent wetlands, as well as woody plants that are more tolerant of frequent and prolonged inundation. Recent monitoring shows low stems per acre in the scrub shrub portions of the site most impacted, but also low invasive cover. Establishment of native herbaceous plants and more tolerant woody plants will help the native plant community respond positively to the dynamic nature of this area. Focused actions include invasive weed treatment and inter-planting as shown below:

2008: 120 plants
2010: 2,175 plants
2011: 4,500 plants
2012: 6,600 plants
2013: 2,000 plants
2014: 3,200 plants
2015: 4,265 plants
2017: 4,900 plants
2018: 3,500 plants
2019: 5,800 plants
2023: 11,100 plants*
2024: 15,903 plants*
2025: 41,308 plants*

This project will continue to be monitored for invasive species cover, and plant diversity and density.

* This project is part of a group of 35 projects that are collectively managed; as such, only a portion of the total plants were allocated to this project.

Appendix D
Identification of Trading Baselines for Flow Enhancement

Appendix D: Identification of Trading Baselines for Flow Enhancement

The following tables present the daily average effluent flow and daily maximum effluent temperature from the Rock Creek, Durham, and Forest Grove WRRFs and NTS; daily average Tualatin River flow at the Farmington Bridge (River Mile 33) and at Golf Course Road; and daily average flow enhancement rate from Hagg Lake and Barney Reservoir and the Wapato instream lease rate for July and August 2025. This information is used to calculate the allowable thermal loads, the excess thermal loads discharged, and flow enhancement credit for the Rock Creek, Durham, and Forest Grove WRRFs and NTS.

Table D-1: Trading Baseline for Flow Enhancement for July 2025

Date	Durham WRRF Effluent Flow (MGD)	Durham WRRF Effluent Temperature (C)	Rock Creek WRRF Effluent Flow (MGD)	Rock Creek WRRF Effluent Temperature (C)	Forest Grove NTS Effluent Flow (MGD)	Forest Grove NTS Effluent Temperature (C)	Golf Course Flow (cfs)	Farmington Flow (cfs)	CWS Hagg Release Rate (cfs)	Wapato Instream Lease (cfs)	CWS Barney Release Rate (cfs)
7/1/2025	16.4	22.5	23.13	22.3	2.77	28	105	193	30	5.4	0
7/2/2025	16.4	22.3	23.01	22.2	2.46	28	94	167	30	5.4	0
7/3/2025	16.0	22.3	23.70	22.1	2.74	26	101	162	30	5.4	0
7/4/2025	15.2	21.7	21.62	21.7	2.62	23	132	169	50	5.4	0
7/5/2025	15.4	22.0	22.18	21.7	2.70	26	139	184	50	5.4	0
7/6/2025	16.1	22.2	23.33	21.8	2.43	27	135	190	50	5.4	0
7/7/2025	16.4	22.5	22.32	22.2	2.14	28	129	187	50	5.4	0
7/8/2025	15.9	22.7	24.09	22.4	2.42	28	108	177	40	5.4	0
7/9/2025	16.1	22.5	25.06	22.3	2.71	26	102	166	40	5.4	0
7/10/2025	15.7	22.7	24.22	22.4	2.57	27	117	163	40	5.4	0
7/11/2025	15.7	22.9	23.89	22.5	2.97	27	99	173	40	5.4	0
7/12/2025	15.7	23.1	23.92	22.7	2.29	28	117	161	50	5.4	0
7/13/2025	16.1	23.3	24.08	22.9	1.82	28	116	171	50	5.4	0
7/14/2025	16.0	23.2	23.17	22.9	2.33	28	116	170	50	5.4	0
7/15/2025	15.9	23.1	23.48	22.7	1.31	27	115	170	50	5.4	14
7/16/2025	15.9	23.3	23.62	22.9	0.66	29	117	168	50	5.4	14
7/17/2025	15.7	23.3	23.75	22.9	1.67	28	143	171	50	5.4	14
7/18/2025	15.3	23.3	23.55	22.9	2.05	27	130	185	50	5.4	14
7/19/2025	15.4	23.2	22.77	22.8	2.30	26	110	179	40	5.4	14
7/20/2025	16.4	22.5	23.58	22.4	2.29	22	123	169	40	5.4	14
7/21/2025	17.1	22.7	24.66	22.3	2.22	24	127	182	40	5.4	14
7/22/2025	16.3	22.9	24.37	22.6	2.43	25	118	184	40	5.4	14
7/23/2025	16.9	23.3	22.79	22.9	2.46	27	114	181	30	5.4	14
7/24/2025	15.9	23.4	22.68	23.1	2.37	27	108	171	40	5.4	14
7/25/2025	15.8	23.4	22.13	22.9	2.49	26	121	169	50	5.4	14
7/26/2025	15.3	23.0	21.87	22.6	2.40	23	145	178	60	5.4	14
7/27/2025	15.8	23.1	22.38	22.5	2.24	24	159	193	60	5.4	14
7/28/2025	15.8	23.2	22.94	22.6	2.24	24	147	206	60	5.4	14
7/29/2025	15.6	23.4	22.28	22.8	2.47	26	111	192	50	5.4	14
7/30/2025	15.7	23.3	22.07	22.9	2.30	25	115	172	50	5.4	14
7/31/2025	15.6	23.4	22.04	23.0	2.23	26	108	172	50	5.4	14

Table D-2: Trading Baseline for Flow Enhancement for August 2025

Date	Durham WRRF Effluent Flow (MGD)	Durham WRRF Effluent Temperature (C)	Rock Creek WRRF Effluent Flow (MGD)	Rock Creek WRRF Effluent Temperature (C)	Forest Grove NTS Effluent Flow (MGD)	Forest Grove NTS Effluent Temperature (C)	Golf Course Flow (cfs)	Farmington Flow (cfs)	CWS Hagg Release Rate (cfs)	Wapato Instream Lease (cfs)	CWS Barney Release Rate (cfs)
8/1/2025	15.5	23.6	22.27	23.2	2.39	26	103	171	50	5.4	14
8/2/2025	15.0	23.4	21.73	23.2	2.40	25	100	168	50	5.4	14
8/3/2025	15.4	23.0	22.90	22.7	2.40	23	111	167	50	5.4	14
8/4/2025	15.4	23.0	21.60	22.6	2.07	22	112	176	50	5.4	14
8/5/2025	15.8	23.1	23.56	22.8	3.23	23	107	175	50	5.4	14
8/6/2025	16.6	22.7	24.13	22.6	2.82	22	120	177	50	5.4	14
8/7/2025	16.0	22.8	23.54	22.7	3.09	22	127	189	50	5.4	14
8/8/2025	15.4	23.1	24.58	22.8	2.94	22	131	199	50	5.4	14
8/9/2025	14.9	23.2	22.76	22.9	2.45	23	115	200	50	5.4	14
8/10/2025	15.2	23.5	22.38	23.2	1.91	26	112	186	50	5.4	14
8/11/2025	15.4	23.9	22.13	23.5	1.84	27	121	183	60	5.4	14
8/12/2025	15.8	24.1	21.87	23.7	2.01	27	121	184	60	5.4	0
8/13/2025	15.8	24.1	22.83	23.7	2.18	26	120	183	60	5.4	14
8/14/2025	15.6	23.8	23.01	23.3	3.62	24	104	184	50	5.4	14
8/15/2025	16.0	23.3	24.24	23.0	2.71	22	122	182	50	5.4	14
8/16/2025	16.0	23.5	24.02	22.9	2.02	23	108	197	40	5.4	14
8/17/2025	16.1	23.5	24.18	22.8	2.01	23	111	195	40	5.4	14
8/18/2025	15.8	23.5	23.51	22.8	2.28	23	103	193	40	5.4	14
8/19/2025	15.7	23.7	23.10	22.9	2.34	23	98.3	182	40	5.4	14
8/20/2025	15.4	23.8	22.48	23.1	2.33	23	115	178	50	5.4	14
8/21/2025	15.1	23.7	22.28	23.1	2.22	23	114	185	60	5.4	14
8/22/2025	15.0	23.8	22.91	23.2	2.39	24	111	183	60	5.4	14
8/23/2025	14.9	24.0	21.29	23.4	2.63	25	125	180	60	5.4	14
8/24/2025	15.5	24.1	22.69	23.6	2.54	25	134	189	60	5.4	14
8/25/2025	16.0	24.1	23.91	23.5	2.66	25	125	196	60	5.4	14
8/26/2025	15.6	24.1	24.21	23.7	2.82	25	117	191	60	5.4	14
8/27/2025	15.7	24.3	23.60	23.8	2.18	25	98.1	182	50	5.4	14
8/28/2025	15.6	24.4	23.80	23.8	1.79	24	101	175	50	5.4	14
8/29/2025	15.2	24.2	22.99	23.7	1.38	23	92.7	174	60	5.4	14
8/30/2025	15.0	23.6	22.27	23.3	1.30	22	103	170	60	5.4	14
8/31/2025	15.2	23.9	22.40	23.3	1.28	23	111	177	60	5.4	14

Appendix E
Riparian Codes for Shade-a-Lator

Appendix E: Riparian Codes for Shade-a-Lator

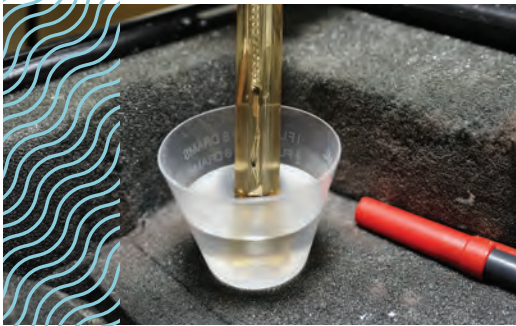
Code	Description	Height (m)	Density (%)	Overhang (m)
1000	Not in project	0.0	0%	0.0
1175	Forest fully vegetated	18.3	75%	3.0
1150	Forest partially vegetated	18.3	50%	3.0
1125	Forest partially vegetated	18.3	25%	3.0
1100	Forest minimally vegetated	0.0	0%	0.0
1375	Wetland fully vegetated	6.1	75%	0.6
1350	Wetland partially vegetated	6.1	50%	0.6
1325	Wetland partially vegetated	6.1	25%	0.6
1300	Wetland minimally vegetated	0.0	0%	0.0

Source: Clean Water Services

2026 Annual Report

PRETREATMENT PROGRAM

March 2026



Form 1 – Cover Sheet

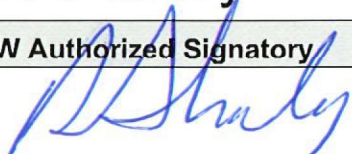
Control Authority
Clean Water Services

Treatment Plant Name:	Forest Grove Water Resource Recovery Facility
Address	1345 SW Fern Hill Road
City	Forest Grove
Zip Code	97116

	Numbers	Expiration Date
EPA ID	OR0020168	November 30, 2027
DEQ Permit ID	101142	November 30, 2027
Your DEQ Online RID	89595	November 30, 2027
Population Served	47,180	

Pretreatment Contact	Katie Thomas
Title	Environmental Services Supervisor
Address	2550 SW Hillsboro Highway
City, State, Zip	Hillsboro, Oregon, 97123-9379
Email	Thomask@CleanWaterServices.org
Phone	503.681.3691
Fax	503.681.5138

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name	Title
Rick Shanley	Interim Chief Executive Officer/General Manager
POTW Authorized Signatory	Date
	3/24/2020

Form 1 – Cover Sheet


Control Authority
Clean Water Services

Treatment Plant Name:	Hillsboro Water Resource Recovery Facility
Address	770 South First Avenue
City	Hillsboro
Zip Code	97123

	Numbers	Expiration Date
EPA ID	OR-0023345	November 30, 2027
DEQ Permit ID	101143	November 30, 2027
Your DEQ Online RID	89595	November 30, 2027
Population Served	42,180	

Pretreatment Contact	Katie Thomas
Title	Environmental Services Supervisor
Address	2550 SW Hillsboro Highway
City, State, Zip	Hillsboro, Oregon, 97123-9379
Email	ThomasK@CleanWaterServices.org
Phone	503.681.3691
Fax	503.681.5138

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name	Title
Rick Shanley	Interim Chief Executive Officer/General Manager
POTW Authorized Signatory	Date
	3/24/2022

Form 1 – Cover Sheet


Control Authority
Clean Water Services

Treatment Plant Name:	Rock Creek Water Resource Recovery Facility
Address	3235 SE River Road
City	Hillsboro
Zip Code	97123

	Numbers	Expiration Date
EPA ID	OR-0029777	November 30, 2027
DEQ Permit ID	101144	November 30, 2027
Your DEQ Online RID	89595	November 30, 2027
Population Served	326,553	

Pretreatment Contact	Katie Thomas
Title	Environmental Services Supervisor
Address	2550 SW Hillsboro Highway
City, State, Zip	Hillsboro, Oregon, 97123-9379
Email	ThomasK@CleanWaterServices.org
Phone	503.681.3691
Fax	503.681.5138

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name	Title
Rick Shanley	Interim Chief Executive Officer/General Manager
POTW Authorized Signatory	Date
	3/24/2028

Form 1 – Cover Sheet


Control Authority
Clean Water Services

Treatment Plant Name:	Durham Water Resource Recovery Facility
Address	16580 SW 85th Avenue
City	Tigard
Zip Code	97224

	Numbers	Expiration Date
EPA ID	OR-0028118	November 30, 2027
DEQ Permit ID	101141	November 30, 2027
Your DEQ Online RID	89595	November 30, 2027
Population Served	211,134	

Pretreatment Contact	Katie Thomas
Title	Environmental Services Supervisor
Address	2550 SW Hillsboro Highway
City, State, Zip	Hillsboro, Oregon, 97123-9379
Email	Thomask@CleanWaterServices.org
Phone	503-681-3691
Fax	503-681-5138

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name	Title
Rick Shanley	Interim Chief Executive Officer/General Manager
POTW Authorized Signatory	Date
	3/24/2024

Form 2: Program Status and Updates

		Date
1.	Approval date of original pretreatment program	August 22, 1978
1a.	Incorporation date into a NPDES/WPFC permit	March 13, 1983
Comments:		
N/A		

		Planned Submission Date
2.	Program materials under development	December 31, 2027
Comments:		
<p>Clean Water Services (CWS) will update the City of Tualatin IGA by November 2026 and is targeting update to the City of Lake Oswego IGA in 2027. CWS is in the process of updating its Nondomestic Waste Discharge Permits and template enforcement letters with submission to DEQ projected in 2027. The Mercury Minimization Plan will be submitted with the permit renewal package submitted in June 2027.</p>		

		Date Submitted
3.	Program materials submitted for review/approval	January 24, 2025 and February 17, 2026
Comments:		
<p>CWS submitted the Hauled Waste Permit Application, Nondomestic Waste Discharge Permit template, and Nondomestic Waste Discharge Application and Instructions to DEQ on January 24, 2025. DEQ approved the materials as a non-substantial modifications on March 4, 2025. CWS submitted the Permit Fact Sheet template and Industrial Inspection form to DEQ in YDO on February 17, 2026.</p>		

4. Program materials approved since original pretreatment program approval		
Description of Modification	Date Approved	Incorporation Date
Local Limits	February 28, 2022	January 1, 2023
Mercury Minimization Plan	December 8, 2022	January 1, 2023
Nondomestic Waste Ordinance - 42	January 29, 2021	January 1, 2023
Industrial Pretreatment Program Implementation Manual	June 22, 2021	January 1, 2023

Comment Space - Question 6c

CWS' Local Limits include basin-wide limits, plant-specific limits, and industry-specific mass-based limits depending on parameter. The various copper and molybdenum Local Limits are explained below:

The copper Local Limit includes a concentration-based plant-specific local limit and a mass-based limit for select industries. The copper Local Limit is 2.71 mg/L for industrial users discharging to Rock Creek, Durham, and Hillsboro Water Resource Recovery Facilities (WRRFs). Industrial users discharging to the Forest Grove WRRF must meet a more restrictive concentration limit of 1.15 mg/L. Select large contributors of copper were allocated a mass-based limit of 8 lbs/day and 1.24 lbs/day.

The molybdenum Local Limit includes a concentration-based and mass-based limit for a select large industrial contributors of molybdenum. Three industrial users have a mass-based allocation of 4.26 lbs/day allocated for molybdenum, while all other industrial users discharging to any CWS WRRF are regulated by the concentration-based limit of 0.56 mg/L.

7. Additional noteworthy pretreatment activities/accomplishments.

Operational Incident Response

Clean Water Services' (CWS) Operational Incident Response (OIR) team is an internal work group that investigates instances of treatment plant process impact or instability. The OIR team includes various departments within CWS such as Water Resource Recovery Operations & Services, Regulatory Affairs, and Research & Innovation.

One successful OIR investigation in 2025 identified an industrial source of historic treatment plant instability at the Durham Water Resource Recovery Facility (DM WRRF). Since 2016, the DM WRRF has experienced periods of instability within its biological nutrient removal (BNR) process. In collaboration with Research & Innovation, Field Operations, and Plant Operations staff, Pretreatment Program staff developed a list of potential industrial contributors. CWS conducted routine targeted sampling of selected priority industrial users, which included bench-scale assays to test for nitrification inhibition potential. As a result of the sewershed investigation, an industrial user was identified as a potential contributor to the observed BNR instability at the DM WRRF. Pretreatment Program staff are continuing the investigation and working with the industrial user to assess sewershed impact and confirm if contributions are part of this challenge. The OIR team continues to investigate the conveyance system and other industries to determine any additional potential contributors.

Another successful OIR investigation in 2025 identified an industrial source of nitrification inhibition at the Forest Grove Water Resource Recovery Facility (FG WRRF). As documented in Form 5, the FG WRRF had a nitrification inhibition event in 2025. Pretreatment Program staff conducted a thorough investigation, which included targeted sampling and review of industrial users discharging to the FG WRRF. Through collaborative efforts between Pretreatment Program staff, Treatment Plant Operations staff, and Research & Innovation staff, CWS identified an industrial user and pollutant source responsible for the nitrification inhibition. Enforcement action was taken against the industrial user, and the discharge of the identified pollutant was prohibited. As a result of the successful investigation and enforcement response, the FG WRRF unit operations are stabilized.

In addition to the successful investigations brought about by the OIR team, collaborative efforts were also showcased as part of recurring projection meetings between industrial users and CWS' Field Operations, Plant Operations, Research & Innovation, and Pretreatment program staff. These meetings evaluate existing pollutant load trends, projected industrial growth, and treatment plant capacity needs. From 2024 to 2025, Pretreatment program staff increased the frequency of additional monitoring requirements for all permitted industrial users to better characterize pollutant contributions and ensure ongoing protection of POTW capacity and compliance with current and future effluent limits and water quality standards.

7. Additional noteworthy pretreatment activities/accomplishments (continued).

PFAS

In 2025, the Pretreatment program continued quarterly PFAS monitoring of targeted priority industrial users to understand industrial loading of PFAS to CWS' facilities. Pretreatment program staff continued its tiered strategy through the amendment of remaining pretreatment permits to include a requirement to develop a PFAS Management Plan. At the time of report submission, 59 out of the 60 reporting industry permits have been amended to include a PFAS Management Plan development requirement that includes source identification, reduction strategies, and PFAS sampling and reporting requirements.

To further assist industrial users in the identification of PFAS sources, Pretreatment program staff developed outreach materials for sectors that have a high source of PFAS that included materials for the Metal Finishing and Semiconductor sectors, along with a general outreach document intended to be used more broadly and apply to any industrial sector. The outreach materials developed can be found by businesses and industry, including the general public, by visiting CWS' developed PFAS webpage. CWS intends to directly distribute the outreach materials to all reporting industries in 2026. To further develop technical assistance documents and informational materials regarding PFAS as it relates to industrial practices, CWS intends to develop additional sector-specific materials for the identified high-priority industrial sectors in the 2026 calendar year.

As established in CWS' Industrial and Commercial Stormwater Strategy, in 2025 CWS routinely sampled the sanitary wastewater and stormwater from commercial businesses for PFAS. Selected commercial businesses were representative of sectors that CWS identified as having a high potential to discharge PFAS into CWS' conveyance systems. CWS is in the process of mitigating PFAS inputs into its conveyance systems by providing technical assistance and distributing targeted PFAS outreach materials to commercial businesses in the 2026 calendar year. CWS intends to build on its initial round of general outreach materials to commercial businesses by developing and distributing sector-specific materials for the identified high-priority commercial sectors during the 2026 calendar year.

Surveying

In 2025 the Pretreatment program worked with co-implementor cities to obtain active business license data within the CWS service area. This data was used to inform the industrial user surveying effort and prioritize industries that were not already in CWS' pretreatment database inventory. CWS is in the process of developing an automated system to support the business screening process and improve the identification of facilities requiring Pretreatment program involvement or additional evaluation.

Form 3: Treatment Plant Monitoring

Provide all treatment plant influent, effluent and biosolids (sludge) data for toxic pollutants and non-conventional pollutants collected during the calendar year. Discuss all data anomalies including cause and actions taken to prevent recurrence. Include all re-sampling results for samples taken to meet NPDES/WPCF permit monitoring requirements because of monitoring that was invalidated for any reason.

(See [Instructions for completing form](#)).

All effluent data collected and analyzed must be in accordance with 40 CFR 136; and 40 CFR Part 503 for Biosolids

Form 4: Headworks Loading Comparison

Durham Water Resource Recovery Facility

1.	Provide a comparison of POTW's "maximum allowable headworks loading (MAHL in lb/day)" to the highest recorded actual loading for each local limit pollutant.		
	Local Limit Pollutant	MAHL lb/day	Highest recorded
Arsenic		2.24	0.30
Cadmium		1.22	0.04
Chromium		73.16	0.48
Copper		37.72	12.01
Cyanide		17.16	0.90
Lead		6.52	0.30
Mercury		0.41	0.02
Molybdenum		5.41	0.48
Nickel		20.90	0.86
Selenium		3.25	1.78
Silver		0.96	0.14
Zinc		80.40	38.60

Form 4: Headworks Loading Comparison

Forest Grove Water Resource Recovery Facility

1.	Provide a comparison of POTW's "maximum allowable headworks loading (MAHL in lb/day)" to the highest recorded actual loading for each local limit pollutant.		
	Local Limit Pollutant	MAHL lb/day	Highest recorded
Arsenic	1.24	0.17	
Cadmium	0.83	0.01	
Chromium	56.80	0.19	
Copper	2.82	4.59	
Cyanide	5.68	0.22	
Lead	2.29	0.17	
Mercury	0.25	0.003	
Nickel	50.64	0.83	
Selenium	5.22	0.03	
Silver	0.78	0.02	
Zinc	17.04	7.58	

Form 4: Headworks Loading Comparison

Rock Creek Water Resource Recovery Facility

1.	Provide a comparison of POTW's "maximum allowable headworks loading (MAHL in lb/day)" to the highest recorded actual loading for each local limit pollutant.		
	Local Limit Pollutant	MAHL lb/day	Highest recorded
Arsenic	2.50	0.66	
Cadmium	1.96	0.04	
Chromium	93.69	0.86	
Copper	57.06	20.13	
Cyanide	12.24	1.76	
Lead	12.02	0.41	
Mercury	0.43	0.04	
Molybdenum	12.68	2.16	
Nickel	29.22	5.72	
Selenium	6.53	0.26	
Silver	0.63	0.07	
Zinc	124.14	89.87	

1a.	For each MAHL exceedance provide a narrative discussion and show associated calculations to demonstrate whether a pass through occurred.	
Exceeded Pollutant	1. Hillsboro WRRF - Ni, 4/23/25	
Calculations		
Effluent concentration = 17.30 ug/L; RPA Workbook Daily Maximum Permit Limit (From 2021 Local Limits, Appendix H) = 159.98 ug/L; No pass through occurred. See “Comment Space” following Form 4, Question 2 for narrative description.		
Exceeded Pollutant	2. Hillsboro WRRF - Cu, 4/23/25	
Calculations		
Effluent concentration = 10.10 ug/L; NPDES Permit Limit (From 2021 Local Limits, Appendix H) = 11.00 ug/L; No pass through occurred. See “Comment Space” following Form 4, Question 2 for narrative description.		
Exceeded Pollutant	3. Hillsboro WRRF - Cu, 6/26/25	
Calculations		
Hillsboro WRRF was transferring flow to Forest Grove WRRF, MAHL is not applicable. See “Comment Space” following Form 4, Question 2 for narrative description.		
Exceeded Pollutant	4. Hillsboro WRRF - Cu, 7/9/25	
Calculations		
Hillsboro WRRF was transferring flow to Forest Grove WRRF, MAHL is not applicable. See “Comment Space” following Form 4, Question 2 for narrative description.		

*Please upload a picture of hand written calculations or a screenshot of from an application used for constructing complex mathematical equations.

Exceeded Pollutant	5. Hillsboro WRRF - Cu, 7/24/25
Calculations	
<p>Hillsboro WRRF was transferring flow to Forest Grove WRRF, MAHL is not applicable. See "Comment Space" following Form 4, Question 2 for narrative description.</p>	
Exceeded Pollutant	6. Hillsboro WRRF - Cu, 8/11/25
Calculations	
<p>Hillsboro WRRF was transferring flow to Forest Grove WRRF, MAHL is not applicable. See "Comment Space" following Form 4, Question 2 for narrative description.</p>	
Exceeded Pollutant	7. Hillsboro WRRF - Cu, 9/9/25
Calculations	
<p>Hillsboro WRRF was transferring flow to Forest Grove WRRF, MAHL is not applicable. See "Comment Space" following Form 4, Question 2 for narrative description.</p>	
Exceeded Pollutant	8. Forest Grove WRRF - Cu, 6/26/25
Calculations	
<p>No effluent sample. Highest effluent concentration during monitoring year = 7.75 ug/L; NPDES Permit Limit (From 2021 Local Limits, Appendix H) = 12.25 ug/L; No pass through occurred. See "Comment Space" following Form 4, Question 2 for narrative description.</p>	
Exceeded Pollutant	9. Forest Grove WRRF - Cu, 7/9/25
Calculations	
<p>No effluent sample. Highest effluent concentration during monitoring year = 7.75 ug/L; NPDES Permit Limit (From 2021 Local Limits, Appendix H) = 12.25 ug/L; No pass through occurred. See "Comment Space" following Form 4, Question 2 for narrative description.</p>	

Exceeded Pollutant	10. Forest Grove WRRF - Cu, 7/22/25
Calculations	
<p>Forest Grove WRRF was discharging through the Natural Treatment System, MAHL not applicable. See "Comment Space" following Form 4, Question 2 for narrative description.</p>	
Exceeded Pollutant	11. Forest Grove WRRF - Cu, 7/24/25
Calculations	
<p>Forest Grove WRRF was discharging through the Natural Treatment System, MAHL not applicable. See "Comment Space" following Form 4, Question 2 for narrative description.</p>	
Exceeded Pollutant	12. Natural Treatment System - Cu, 7/22/25
Calculations	
<p>Pass through AHL not exceeded. Influent load exceeded 90% of Inhibition AHL. Effluent concentration = 2.08 ug/L; NPDES Permit Limit (From 2021 Local Limits, Appendix H) = 8.50 ug/L; No pass through or inhibition occurred. See "Comment Space" following Form 4, Question 2 for narrative description.</p>	
Exceeded Pollutant	13. Natural Treatment System - Zn, 8/11/25
Calculations	
<p>Pass through AHL not exceeded. Influent load exceeded 90% of Inhibition AHL. No effluent sample. Highest total zinc effluent concentration from monitoring year = 39.00 ug/L; RPA Workbook Daily Maximum Permit Limit (From 2021 Local Limits, Appendix H) = 116.94 ug/L; No pass through or inhibition occurred. See "Comment Space" following Form 4, Question 2 for narrative description.</p>	
Exceeded Pollutant	14. Natural Treatment System - Zn, 9/9/25
Calculations	
<p>Pass through AHL not exceeded. Influent load exceeded 90% of Inhibition AHL. No effluent sample. Highest total zinc effluent concentration from monitoring year = 39.00 ug/L; RPA Workbook Daily Maximum Permit Limit (From 2021 Local Limits, Appendix H) = 116.94 ug/L; No pass through or inhibition occurred. See "Comment Space" following Form 4, Question 2 for narrative description.</p>	

Exceeded Pollutant	15. Hillsboro WRRF - Cu, 12/8/25
Calculations	
<p>Effluent concentration = 3.56 ug/L; NPDES Permit Limit (From 2021 Local Limits, Appendix H) = 11.00 ug/L; No pass through occurred. See "Comment Space" following Form 4, Question 2 for narrative description.</p>	
Exceeded Pollutant	
Calculations	
Exceeded Pollutant	
Calculations	
Exceeded Pollutant	
Calculations	
Exceeded Pollutant	
Calculations	

Exceeded Pollutant	
Calculations	

2.	Provide a narrative discussion of the POTW's local limits: any problems encountered in the application of the approved limits, any additional pollutants of concern that may have been observed in either industrial effluent or POTW influent, and any plans to revise or augment existing limits.
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CWS wrote the narrative discussions of the MAHL exceedances based on the following notes.

The 2025 Pretreatment Annual Report guidance requires a comparison of the corresponding effluent concentration with the appropriate water quality standard. CWS determined that the appropriate water quality standards for this evaluation are the pass through based RPA permit limits from the Appendix H workbooks for each facility from the 2021 Local Limits evaluation. Additionally, for dates that a MAHL exceedance occurred but an effluent sample was not collected, CWS reviewed all effluent sample results for the 2025 monitoring year against the applicable water quality standards.

The 2025 Pretreatment Annual Report guidance required that all MAHL exceedances must be evaluated for pass through. For the MAHL evaluation of the Forest Grove Natural Treatment System data, CWS notes that inhibition AHLs are the limiting allowable headwork loading values for the metals discussed in Form 4 of this report. The pass through AHL values are higher than the inhibition AHL values for copper, nickel, and zinc for the Forest Grove Natural Treatment System. CWS included a discussion of these exceedances even though the pass through AHLs were not exceeded at the Natural Treatment System.

Where appropriate in the MAHL exceedance narratives below, CWS conducted a dissolved fraction partitioning calculation based on the procedure for calculating a translator value detailed in Section 4.3 of The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit From a Dissolved Criterion (EPA 1996). The calculated translators are equal to the geomean of the dissolved to total metal ratios for data collected between January 1, 2019, to December 31, 2025. CWS confirmed that the data used for these calculations had a log-normal distribution and were not dependent on TSS.

CWS has evaluated the need for updating the 2021 Local Limits evaluation and is in the process of updating the Local Limits evaluation.

Form 4 - Comment Space

1. Hillsboro WRRF, Ni, 4/23/25 - The MAHL value for pass through was exceeded at Hillsboro for total nickel on 4/23/25. The influent load was 9.77 lbs/day. The AHL for pass through is 8.71 lbs/day and the AHL for inhibition is 45.03 lbs/day. The effluent concentration from this date was 17.30 ug/L, which is the highest total nickel effluent concentration of the monitoring year. The effluent concentration was compared to the RPA Workbook Daily Maximum Permit Limit for pass through from Appendix H of the 2021 Local Limits evaluation, which is 159.98 ug/L. This water quality standard was not exceeded at the "end of pipe," therefore, pass through did not occur.
2. Hillsboro WRRF, Cu, 4/23/25 - The MAHL value for pass through was exceeded at Hillsboro for total copper on 4/23/25. The influent load was 4.54 lbs/day. The AHL for pass through is 4.17 lbs/day and the AHL for inhibition is 51.48 lbs/day. The effluent concentration for total copper from this date was 10.10 ug/L. Using an updated dissolved/total metal translator value of 0.74, the calculated dissolved copper effluent concentration was 7.48 ug/L. The calculated effluent concentration for dissolved copper was compared to the NPDES Permit Limit for pass through from Appendix H of the 2021 Local Limits evaluation, which is 11.00 ug/L for dissolved copper. This water quality limit was not exceeded at the "end of pipe," therefore, pass through did not occur.
3. Hillsboro WRRF, Cu, 6/26/25 - The MAHL value for pass through was exceeded at Hillsboro for total copper on 6/26/25. During this event, the Hillsboro WRRF was transferring flow to Forest Grove therefore this MAHL is not applicable during this operational period.
4. Hillsboro WRRF, Cu 7/9/25 - The MAHL value for pass through was exceeded at Hillsboro for total copper on 7/9/25. During this event, the Hillsboro WRRF was transferring flow to Forest Grove therefore this MAHL is not applicable during this operational period.
5. Hillsboro WRRF, Cu, 7/24/25 - The MAHL value for pass through was exceeded at Hillsboro for total copper on 7/24/25. During this event, the Hillsboro WRRF was transferring flow to Forest Grove therefore this MAHL is not applicable during this operational period.
6. Hillsboro WRRF, Cu, 8/11/25 - The MAHL value for pass through was exceeded at Hillsboro for total copper on 8/11/25. During this event, the Hillsboro WRRF was transferring flow to Forest Grove therefore this MAHL is not applicable during this operational period.
7. Hillsboro WRRF, Cu, 9/9/25 - The MAHL value for pass through was exceeded at Hillsboro for total copper on 9/9/25. During this event, the Hillsboro WRRF was transferring flow to Forest Grove therefore this MAHL is not applicable during this operational period.
8. Forest Grove WRRF, Cu, 6/26/25 - The MAHL value for pass through was exceeded at Forest Grove for total copper on 6/26/25. The influent load was 4.10 lbs/day. The AHL for pass through is 2.82 lbs/day and the AHL for inhibition is 56.80 lbs/day. This sample day was not during the required quarterly pretreatment suite. No effluent sample was collected this day. The maximum dissolved copper effluent concentration from the 2025 monitoring year at the Forest Grove effluent location was 7.24 ug/L. The dissolved copper effluent samples from 2025 ranged from 2.67 ug/L to 7.24 ug/L. Using an updated dissolved/total metal translator value of 0.71, the highest calculated dissolved copper concentration was 7.75 ug/L. The effluent concentrations collected during 2025 were compared to the NPDES Permit Limit for pass through from Appendix H of the 2021 Local Limits evaluation, which is 12.25 ug/L. This water quality limit was not exceeded at the "end of pipe" for any samples collected during the monitoring year therefore pass through was not expected to occur during this event.
9. Forest Grove WRRF, Cu, 7/9/25 - The MAHL value for pass through was exceeded at Forest Grove for total copper on 7/9/25. The influent load was 2.87 lbs/day. The AHL for pass through is 2.82 lbs/day and the AHL for inhibition is 56.80 lbs/day. This sample day was not during the required quarterly pretreatment suite. No effluent sample was collected this day. The maximum dissolved copper effluent concentration from the 2025 monitoring year at the Forest Grove effluent location was 7.24 ug/L. The dissolved copper effluent samples from 2025 ranged from 2.67 ug/L to 7.24 ug/L. Using an updated dissolved/total metal translator value of 0.71, the highest calculated dissolved copper concentration was 7.75 ug/L.

Form 4 - Comment Space

9. Forest Grove WRRF, Cu, 7/9/25, continued - The effluent concentrations collected during 2025 were compared to the NPDES Permit Limit for pass through from Appendix H of the 2021 Local Limits evaluation, which is 12.25 ug/L. This water quality limit was not exceeded at the "end of pipe" for any samples collected during the monitoring year, therefore, pass through was not expected to occur during this event.

10. Forest Grove WRRF, Cu, 7/22/25 - The MAHL value for pass through was exceeded at Forest Grove for total copper on 7/22/25. During this event, the Forest Grove WRRF was discharging through the Natural Treatment System, therefore, this MAHL is not applicable during this operational period.

11. Forest Grove WRRF, Cu, 7/24/25 - The MAHL value for pass through was exceeded at Forest Grove for total copper on 7/24/25. During this event, the Forest Grove WRRF was discharging through the Natural Treatment System, therefore, this MAHL is not applicable during this operational period.

12. Natural Treatment System, Cu, 7/22/25 - The influent loading at the Forest Grove NTS exceeded 90% of the MAHL value for inhibition for total copper on 7/22/25. The influent load was 4.59 lbs/day. The AHL for pass through is 9.41 lbs/day and the AHL for inhibition is 4.73 lbs/day. The influent load did not exceed the pass through allowable loading limit. The effluent concentration from this date was 2.08 ug/L, and the maximum dissolved copper effluent concentration for the monitoring year was 4.39 ug/L. The effluent concentration was also compared to the NPDES Permit Limit for pass through from Appendix H of the 2021 Local Limits evaluation, which is 8.50 ug/L. This water quality limit was not exceeded at the "end of pipe," therefore, pass through did not occur. No evidence of a nitrification inhibition event on this date was documented at the facility.

13. Natural Treatment System, Zn, 8/11/25 - The influent load at the Forest Grove NTS exceeded 90% of the MAHL value for inhibition for total zinc on 8/11/25. The influent load was 6.20 lbs/day. The AHL for pass through is 56.13 lbs/day and the AHL for inhibition is 6.31 lbs/day. The influent load did not exceed the pass through allowable loading limit. This sample day was not during the required quarterly pretreatment suite. No effluent sample was collected this day. The maximum measured total zinc effluent concentration from the 2025 monitoring year at the Forest Grove NTS effluent location was 39.00 ug/L. The measured total zinc effluent concentrations from 2025 ranged from 3.80 ug/L to 39.00 ug/L. The effluent concentrations collected during 2025 were compared to the RPA Workbook Daily Maximum Permit Limit for pass through from Appendix H of the 2021 Local Limits evaluation, which is 116.94 ug/L. This water quality limit was not exceeded at the "end of pipe" for any samples collected during the monitoring year, therefore, pass through was not expected to occur during this event.

14. Natural Treatment System, Zn, 9/9/25 - The influent load at the Forest Grove NTS exceeded 90% of the MAHL value for inhibition for total zinc on 9/9/25. The influent load was 6.04 lbs/day. The AHL for pass through is 56.13 lbs/day and the AHL for inhibition is 6.31 lbs/day. The influent load did not exceed the pass through allowable loading limit. This sample day was not during the required quarterly pretreatment suite. No effluent sample was collected this day. The maximum measured total zinc effluent concentration from the 2025 monitoring year at the Forest Grove NTS effluent location was 39.00 ug/L. The measured total zinc effluent concentrations from 2025 ranged from 3.80 ug/L to 39.00 ug/L. The effluent concentrations collected during 2025 were compared to the RPA Workbook Daily Maximum Permit Limit for pass through from Appendix H of the 2021 Local Limits evaluation, which is 116.94 ug/L. This water quality limit was not exceeded at the "end of pipe" for any samples collected during the monitoring year, therefore, pass through was not expected to occur during this event.

15. Hillsboro WRRF, Cu, 12/8/25 - The MAHL value for pass through was exceeded at Hillsboro for total copper on 12/8/25. The influent load was 5.74 lbs/day. The AHL for pass through is 4.17 lbs/day and the AHL for inhibition is 51.48 lbs/day. The effluent concentration for dissolved copper from this date was 3.56 ug/L. The effluent concentration was compared to the NPDES Permit Limit for pass through from Appendix H of the 2021 Local Limits evaluation, which is 11.00 ug/L for dissolved copper. This water quality limit was not exceeded at the "end of pipe," therefore, pass through did not occur.

Form 5: Treatment Plant Upsets/Problem

Durham Water Resource Recovery Facility

1.	Has the control authority experienced any of the following?	Yes	No	Unk
	Interference	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Pass Through	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Fire or explosions (including flash point violations)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Corrosive structural damage (including pH<5.0)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Flow obstructions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Excessive flow or pollutant concentrations	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Heat problems	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Interference due to oil or grease	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Toxic fumes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Illicit dumping of hauled waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

1a.	If yes to any of the above, please provide a brief narrative.
N/A	

2.	Provide a description of each instance of treatment plant upset (pass through or interference) due in whole or in part to a non-domestic discharge (See Instructions for completing FORM 5).
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N/A

Form 5: Treatment Plant Upsets/Problem

Forest Grove Water Resource Recovery Facility

1.	Has the control authority experienced any of the following?	Yes	No	Unk
	Interference	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Pass Through	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Fire or explosions (including flash point violations)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Corrosive structural damage (including pH<5.0)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Flow obstructions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Excessive flow or pollutant concentrations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Heat problems	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Interference due to oil or grease	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Toxic fumes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Illicit dumping of hauled waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

1a.	If yes to any of the above, please provide a brief narrative.
	<p>On February 18, 2025, at approximately 6:20 PM, the Forest Grove Water Resource Recovery Facility (WRRF) began experiencing nitrification inhibition (NI). There were no violations of the Clean Water Services (CWS) NPDES permit as a result of this event.</p> <p>Environmental Services (ES) staff selected Industrial Users to inspect and sample based on the following criteria: Discharges to the affected WRRF, proximity, historic noncompliance, significant flow, and best professional judgment.</p> <p>On February 19, 2025, ES staff collected one grab sample at each of the selected industries during site visits. All samples were returned to the CWS Water Quality Laboratory for analysis.</p> <p>On February 20, 2025, an industry [Industry A] provided additional information about its facility operations on February 18, 2025, the date of NI. Industry A reported the discharge of 200 gallons of immersion tin solution through its pretreatment system on February 18, 2025, from 2-3:30 PM. The immersion tin solution was reported to contain thiourea, a chemical known to cause NI. Both dates of immersion tin discharge by the industry coincide with the two most recent NI events at the WRRF.</p> <p>CWS conducted NI testing using 10% of Industry A effluent, which resulted in 100% NI. Industry A was determined to be the cause of the excessive pollutant concentrations and the NI event. After the investigation, it was determined that similar NI events had occurred through historic discharges of the immersion tin solution. On April 24, 2025, CWS issued an enforcement to the industry responsible for this event.</p>

2.	Provide a description of each instance of treatment plant upset (pass through or interference) due in whole or in part to a non-domestic discharge (See Instructions for completing FORM 5).
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Pass through or interference did not occur from the discharges described in Question 1.a above.

Form 5: Treatment Plant Upsets/Problem

Hillsboro Water Resource Recovery Facility

1.	Has the control authority experienced any of the following?	Yes	No	Unk
	Interference	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Pass Through	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Fire or explosions (including flash point violations)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Corrosive structural damage (including pH<5.0)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Flow obstructions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Excessive flow or pollutant concentrations	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Heat problems	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Interference due to oil or grease	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Toxic fumes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Illicit dumping of hauled waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

1a.	If yes to any of the above, please provide a brief narrative.
	N/A

2.	Provide a description of each instance of treatment plant upset (pass through or interference) due in whole or in part to a non-domestic discharge (See Instructions for completing FORM 5).
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N/A

Form 5: Treatment Plant Upsets/Problem

Rock Creek Water Resource Recovery Facility

1.	Has the control authority experienced any of the following?			
	Yes	No	Unk	
Interference	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Pass Through	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Fire or explosions (including flash point violations)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Corrosive structural damage (including pH<5.0)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Flow obstructions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Excessive flow or pollutant concentrations	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Heat problems	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Interference due to oil or grease	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Toxic fumes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Illicit dumping of hauled waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

1a.	If yes to any of the above, please provide a brief narrative.
N/A	

2.	Provide a description of each instance of treatment plant upset (pass through or interference) due in whole or in part to a non-domestic discharge (See Instructions for completing FORM 5).
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N/A

Form 6: List of Regulated Users

Industrial User	Status	Permit Issued	40 CFR Part No.	SIU	CIU	NDCIU	NSCIU	MTCIU	SIC/NAICS Code
BASF Corporation	Deleted	<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8731
Immunology Consultants Laboratory		<input type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2836
Lotus Applied Technology		<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8731
Mi Conveyance Solutions		<input type="checkbox"/>	40 CFR 428.56 (a)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3053
Acumed - Brookwood Campus		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3842
Acumed, LLC.		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3842
Analog Devices		<input checked="" type="checkbox"/>	40 CFR 469.18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3674
Anodize Solutions, LLC		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3471
Davis Tool, Incorporated		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3471
Forest Dental Equipment		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3843
FormFactor, Inc		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3825
Genentech, Inc.		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2834
Hillsboro Landfill Inc		<input checked="" type="checkbox"/>	40 CFR 445.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4953
Intel Corporation - Aloha Campus		<input checked="" type="checkbox"/>	40 CFR 469.18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3674
Intel Corporation - Ronler Acres Campus		<input checked="" type="checkbox"/>	40 CFR 469.18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3674

Check all that apply.

MTCIU = Middle Tier CIU

Industrial User	Status	Permit Issued	40 CFR Part No.	SIU	CIU	NDCIU	NSCIU	MTCIU	SIC/NAICS Code
JAE Oregon Inc		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3678
Jireh Semiconductor, Incorporated		<input checked="" type="checkbox"/>	40 CFR 469.18	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3674
KoMiCo Hillsboro LLC		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3479
Lam Research Corp		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3559
Leupold & Stevens Inc		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3827
Northwest Rubber Extruders, Inc.		<input checked="" type="checkbox"/>	40 CFR 428.56 (a)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3061
Pioneer Metal Finishing		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3471
Qorvo		<input checked="" type="checkbox"/>	40 CFR 469.18/ 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3674
QuantumClean		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3479
Sheldon Manufacturing, Inc.		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3821
Sumitomo Electric Semiconductor Materials, Inc.		<input checked="" type="checkbox"/>	40 CFR 469.28	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3674
TTM Technologies North America, LLC		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3672
Westak of Oregon, Inc.		<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3672
Fujimi Corporation		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3291
Warne Scope Mounts		<input checked="" type="checkbox"/>	40 CFR 438	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3484

Check all that apply.
MTCIU = Middle Tier CIU

Industrial User	Status	Permit Issued	40 CFR Part No.	SIU	CIU	NDCIU	NSCIU	MTCIU	SIC/NAICS Code
Lieb Foods, LLC		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2035
New Season Foods, Inc.		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2033
Old Trapper Smoked Products		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2013
Oregon Health Sciences University West Campus ONPRC		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8733
Pacific Foods		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2099
Pacific Nutritional Foods		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2099
Prudential Cleanroom Services		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7218
Resers Fine Foods - Century Blvd Plant		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2099
Summit Foods, Inc		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2034
TOK America		<input checked="" type="checkbox"/>	40 CFR 403.3 (v)(1)(ii)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2899
Continental Coatings	Deleted	<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3479
Engle Dental Systems		<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3843
Finishing First Inc	Deleted	<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3479
Ichor Systems - Cal Weld		<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3471
Integrated Metal Components		<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3599

Check all that apply.
MTCIU = Middle Tier CIU

Industrial User	Status	Permit Issued	40 CFR Part No.	SIU	CIU	NDCIU	NSCIU	MTCIU	SIC/NAICS Code
KAI Logistics		<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3421
Meta Fab, Inc		<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3479
Nortek Air Solutions, LLC		<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3585
NW Die Casting		<input type="checkbox"/>	40 CFR 464.12	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3363
Powder Tech, Inc.		<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3479
St Jude Medical	Deleted	<input type="checkbox"/>	40 CFR 463.16	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3643
Tufcoat ProPowder Powder Coating		<input type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3479
Valmont Coatings Pacific States Galvanizing		<input type="checkbox"/>	40 CFR 438	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3479
Genentech, Inc.	Deleted	<input checked="" type="checkbox"/>	40 CFR 439.46	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2834
Lotus Applied Technology	Deleted	<input checked="" type="checkbox"/>	40 CFR 433.17	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8731
		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Check all that apply.
MTCIU = Middle Tier CIU

Form 6A: Industrial Survey Update

*Check box to answer "Yes", If "No" leave box blank

Industrial User	Survey Returned	Permit App Req	Permit App Returned	Permit Issued	Comments
AVALON INTERNATIONAL ALUMINUM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluation in progress.
FULCRUM TECHNOLOGIES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluation in progress.
HELSEY INDUSTRIES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluation in progress.
NORTHWEST SPRING MFG CO	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluation in progress.
PCB ASSEMBLY EXPRESS INC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluation in progress.
Q PACIFIC MANUFACTURING CORPORATION	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluation in progress.
SUBURBAN PLATING LLC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluation in progress.
VERSALOGIC CORPORATION	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluation in progress.
ZINCFIVE POWER INC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluation in progress.
MAG45	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Follow-up in progress.
CINTAS CORPORATION	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Permit pending issuance.
CHEMSTATION	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No permit required. Discharge Authorization issued.
NTT DATA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluation in progress.
INDUSTRIAL ELECTRIC MANUFACTURING	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evaluation in progress.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comment Space

In 2025, Clean Water Services (CWS) conducted a comprehensive surveying effort that began by gathering data on active businesses in the CWS service area. Staff worked with co-implementors to obtain business license listings when/where available. This information was used to isolate businesses associated with manufacturing.

Pretreatment program staff cross referenced CWS pretreatment records with the list of isolated manufacturing businesses to identify businesses that CWS had no previous record of and identified those for additional survey. These businesses were researched to determine the potential of internal processes that may require pretreatment involvement. This was typically done by looking at the business' website and by reviewing the location/building using mapping tools. Businesses that were determined to be within CWS service area boundary, potentially discharge to the sanitary sewer, and likely require pretreatment involvement were then contacted and required to submit a New User Industrial Questionnaire form from the CWS website.

In anticipation of receiving a large response from the industries contacted during 2025 surveying efforts, staff are working to streamline the intake process through the development of automated tools. These improvements will provide Pretreatment program staff with meaningful data in an efficient way to support ongoing industrial user surveying efforts.

Form 7: Compliance/Oversight Summary (SIUs)

SIU Name	Permit Exp. Date	Total # of Documented Inspections	All Regulated Pollutants		SNC by Quarter			
			POTW Sampling	SIU Self-Monitoring	1	2	3	4
ACUMED Brookwood Campus	6/30/2029	1	1	2				
ACUMED, LLC.	6/30/2029	1	1	2				
Analog Devices	8/31/2030	1	1	pH continuous				
Anodize Solutions, LLC	10/31/2030	1	1	2				
Davis Tool, Incorporated	5/31/2029	1	1	41				
Forest Dental Equipment	1/9/2029	1	1	41				
FormFactor, Inc	5/31/2029	1	1	2				
Fujimi Corporation	1/31/2029	2	1	2				
Genentech, Inc.	3/31/2030	2	2	2				
Hillsboro Landfill Inc	2/28/2029	1	4	48				
Intel Corporation - Aloha Campus	10/31/2029	1	1	46				
Intel Corporation - Ronler Acres Campus	10/31/2028	1	1	47				
JAE Oregon Inc	1/22/2030	2	1	2				
Jireh Semiconductor, Incorporated	6/7/2026	1	2	pH continuous				

SIU Name	Permit Exp. Date	Number of Documented Inspections	All Regulated Pollutants		SNC by Quarter			
			POTW Sampling	SIU Self-Monitoring	1	2	3	4
KoMiCo Hillsboro LLC	12/13/2026	2	1	2				
Lam Research Corp	6/30/2027	1	1	3				
Leupold & Stevens Inc	11/5/2027	1	1	2				
Lieb Foods, LLC	2/4/2029	1	1	2				
New Season Foods, Inc.	11/30/2029	2	1	2				
Northwest Rubber Extruders, Inc.	3/31/2026	1	1	1*				
Old Trapper Smoked Products	8/31/2030	2	1	2				
Oregon Health Sciences University West Campus ONPRC	7/31/2029	1	1	2				
Pacific Foods	9/30/2026	1	1	2				
Pacific Nutritional Foods	9/30/2028	1	1	2				
Pioneer Metal Finishing	1/22/2031	1	1	2				
Prudential Cleanroom Services	12/31/2030	1	1	2				

Use the following codes for SNC:

A – SNC with Applicable Pretreatment Standards

B – SNC with Self-Monitoring

C – SNC with Reporting

D – SNC with Compliance Schedule

SIU Name	Permit Exp. Date	Number of Documented Inspections	All Regulated Pollutants		SNC by Quarter			
			POTW Sampling	SIU Self-Monitoring	1	2	3	4
Qorvo	1/9/2029	1	2	3				
QuantumClean	11/30/2027	1	1	2				
Resers Fine Foods - Century Blvd Plant	10/31/2030	1	1	1**				
Sheldon Manufacturing, Inc.	9/30/2027	1	1	2				
Sumitomo Electric Semiconductor Materials, Inc.	8/31/2028	1	1	12				
Summit Foods, Inc. - Main Location	1/31/2029	1	1	2				
TOK America	8/11/2026	1	1	2				
TTM Technologies North America, LLC	9/30/2030	1	1	3				
Westak of Oregon, Inc.	1/31/2031	1	1	2				

Use the following codes for SNC:

A – SNC with Applicable Pretreatment Standards

B – SNC with Self-Monitoring

C – SNC with Reporting

D – SNC with Compliance Schedule

Comment Space

* Northwest Rubber Extruders, Inc. sampled categorical limits applicable to 40 CFR 428.56 twice in 2025, but only sampled for CWS Local Limits once because it operated most of the year under a permit that did not include monitoring requirements for local limit parameters. A permit issued in December 2025 includes a requirement to monitor for Local Limit parameters.

** Resers Fine Foods - Century Blvd Plant sampled for CWS Local Limits once in 2025 because it operated most of the year under a permit that did not include monitoring requirements for local limit parameters. A permit issued in November 2025 includes a requirement to monitor Local Limit parameters.

Form 8: Noncompliance/Enforcement Summary (SIUs)

SIU Name	Violation Type	Violation Date	Analyte	POTW Enforcement	POTW Response Date	Compliance Return Date
ACUMED Brookwood Campus	Failure to Monitor Correctly or Improper Sampling	12/11/2025	-	Warning Letter	1/30/2026	1/8/2026
Anodize Solutions, LLC	Exceeding Concentration Minimum Limit	5/28/2025	pH	Warning Letter	7/10/2025	5/29/2025
Anodize Solutions, LLC	Reporting Violation	5/28/2025	-	Warning Letter	7/10/2025	5/29/2025
Davis Tool, Incorporated	Exceeding Concentration Minimum Limit	9/3/2025	pH	Notice of Violation	11/5/2025	9/4/2025
FormFactor, Inc	Reporting Violation	6/7/2025	-	Warning Letter	7/10/2025	6/10/2025
FormFactor, Inc	Failure to Install, Operate or Maintain Monitoring Equip.	6/7/2025	-	Warning Letter	7/10/2025	6/10/2025
Fujimi Corporation	Failure to Monitor for all Pollutants	7/10/2025	-	Warning Letter	11/24/2025	11/7/2025
Genentech, Inc.	Self Monitoring Report submitted late	10/14/2025	-	Warning Letter	11/3/2025	11/7/2025
Intel Corporation - Ronler Acres Campus	Failure to Monitor for all Pollutants	6/30/2025	-	Notice of Violation	8/7/2025	7/27/2025
JAE Oregon Inc	Failure to Install, Operate or Maintain Monitoring Equip.	8/11/2025	-	Warning Letter	8/29/2025	8/14/2025
Lam Research Corp	Failure to Install, Operate or Maintain Monitoring Equip.	8/27/2025	-	Warning Letter	9/24/2025	10/13/2025
Lam Research Corp	Failure to Install, Operate or Maintain Monitoring Equip.	12/7/2025	-	Notice of Violation	1/20/2026	12/9/2025
Lieb Foods, LLC	Reporting Violation	9/6/2025	-	Warning Letter	9/25/2025	10/14/2025
Lieb Foods, LLC	Reporting Violation	12/11/2025	-	Notice of Violation	1/16/2026	2/13/2026
New Season Foods, Inc.	Exceeding Concentration Minimum Limit	1/28/2025	-	Notice of Violation	2/28/2025	2/28/2025

Place comments on page 31 in the space provided. Please include SIU Name and Violation Date.

SIU Name	Violation Type	Violation Date	Analyte	POTW Enforcement	POTW Response Date	Compliance Return Date
New Season Foods, Inc.	Failure to Monitor Correctly or Improper Sampling	2/28/2025	-	Warning Letter	4/2/2025	5/7/2025
New Season Foods, Inc.	Failure to Monitor Correctly or Improper Sampling	3/31/2025	-	Warning Letter	4/15/2025	5/7/2025
New Season Foods, Inc.	Exceeding Concentration Minimum Limit	7/19/2025	pH	Notice of Violation	8/29/2025	7/22/2025
New Season Foods, Inc.	Exceeding Concentration Minimum Limit	7/21/2025	pH	Notice of Violation	8/29/2025	7/22/2025
New Season Foods, Inc.	Reporting Violation	7/31/2025	-	Notice of Violation	8/29/2025	7/22/2025
New Season Foods, Inc.	Failure to Install, Operate or Maintain Monitoring Equip.	8/11/2025	-	Notice of Violation	9/29/2025	10/1/2025
Northwest Rubber Extruders, Inc.	Exceeding Concentration Minimum Limit	4/30/2025	pH	Warning Letter	7/10/2025	5/5/2025
Old Trapper Smoked Products	Reporting Violation	2/17/2025	-	Notice of Violation	4/16/2025	4/18/2025
Old Trapper Smoked Products	Exceeding Concentration Minimum Limit	2/17/2025	pH	Notice of Violation	4/16/2025	4/18/2025
Old Trapper Smoked Products	Failure to Install, Operate or Maintain Monitoring Equip.	7/15/2025	-	Notice of Violation	8/29/2025	7/24/2025
Old Trapper Smoked Products	Reporting Violation	7/15/2025	-	Notice of Violation	8/29/2025	7/24/2025
Old Trapper Smoked Products	Reporting Violation	12/2/2025	-	Notice of Violation	12/4/2025	12/4/2025
Oregon Health Sciences University West Campus ONPRC	Failure to Monitor Correctly or Improper Sampling	2/25/2025	-	Notice of Violation	4/4/2025	-*
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Minimum Limit	2/26/2025	pH	Notice of Violation	4/4/2025	-*
Oregon Health Sciences University West Campus ONPRC	Failure to Install, Operate or Maintain Monitoring Equip.	2/26/2025	-	Notice of Violation	4/4/2025	-*
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Minimum Limit	4/4/2025	pH	Notice of Violation	6/24/2025	-*
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Minimum Limit	4/9/2025	pH	Notice of Violation	6/24/2025	-*

Place comments on page 31 in the space provide. Please include SIU Name and Violation Date.

SIU Name	Violation Type	Violation Date	Analyte	POTW Enforcement	POTW Response Date	Compliance Return Date
Oregon Health Sciences University West Campus ONPRC	Failure to Install, Operate or Maintain Monitoring Equip.	6/23/2025	-	Notice of Violation	8/8/2025	7/22/2025
Oregon Health Sciences University West Campus ONPRC	Exceeding Concentration Minimum Limit	9/2/2025	pH	Notice of Violation	12/2/2025	-*
Oregon Health Sciences University West Campus ONPRC	Reporting Violation	9/3/2025	-	Notice of Violation	12/2/2025	-*
Pacific Nutritional Foods	Failure to properly operate and maintain pretreatment eq	1/20/2025	-	Notice of Violation	1/30/2025	2/13/2025
Pacific Nutritional Foods	Failure to Monitor for all Pollutants	7/10/2025	-	Warning Letter	8/15/2025	8/18/2025
Prudential Cleanroom Services	Self Monitoring Report submitted late	7/14/2025	-	Warning Letter	7/23/2025	8/15/2025
Prudential Cleanroom Services	Failure to Monitor Correctly or Improper Sampling	11/24/2025	-	Warning Letter	1/28/2026	2/4/2026
QuantumClean	Exceeding Concentration Maximum Limit	1/24/2025	Total Nickel	Notice of Violation	3/13/2025	2/7/2025
QuantumClean	Failure to properly operate and maintain pretreatment eq	11/14/2025	-	Notice of Violation	2/16/2026	-**
QuantumClean	Exceeding Concentration Maximum Limit	11/14/2025	Total Nickel	Notice of Violation	2/16/2026	-**
QuantumClean	Reporting Violation	11/21/2025	-	Notice of Violation	2/16/2026	-**
Resers Fine Foods - Century Blvd Plant	Failure to Renew Permit	5/13/2025	-	Warning Letter	7/10/2025	7/7/2025
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	5/18/2025	pH	Notice of Violation	7/10/2025	5/19/2025
Resers Fine Foods - Century Blvd Plant	Reporting Violation	5/19/2025	-	Notice of Violation	7/10/2025	5/19/2025
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	7/13/2025	pH	Notice of Violation	8/20/2025	7/26/2025
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	7/25/2025	pH	Notice of Violation	8/20/2025	7/26/2025
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	8/4/2025	pH	Notice of Violation	9/24/2025	10/29/2025

Place comments on page 31 in the space provide. Please include SIU Name and Violation Date.

SIU Name	Violation Type	Violation Date	Analyte	POTW Enforcement	POTW Response Date	Compliance Return Date
Resers Fine Foods - Century Blvd Plant	Failure to properly operate and maintain pretreatment eq	8/4/2025	-	Notice of Violation	9/24/2025	10/29/2025
Resers Fine Foods - Century Blvd Plant	Reporting Violation	8/4/2025	-	Notice of Violation	9/24/2025	10/29/2025
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	11/3/2025	pH	Notice of Violation	1/28/2026	1/9/2026
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Minimum Limit	11/4/2025	pH	Notice of Violation	1/28/2026	1/9/2026
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	11/12/2025	pH	Notice of Violation	1/28/2026	1/9/2026
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	11/13/2025	pH	Notice of Violation	1/28/2026	1/9/2026
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	11/17/2025	pH	Notice of Violation	1/28/2026	1/9/2026
Resers Fine Foods - Century Blvd Plant	Exceeding Concentration Maximum Limit	12/4/2025	pH	Notice of Violation	1/28/2026	1/9/2026
Resers Fine Foods - Century Blvd Plant	Reporting Violation	12/5/2025	-	Notice of Violation	1/28/2026	1/9/2026
Resers Fine Foods - Century Blvd Plant	Reporting Violation	12/11/2025	-	Notice of Violation	1/28/2026	1/9/2026
Resers Fine Foods - Century Blvd Plant	Reporting Violation	12/20/2025	-	Notice of Violation	1/28/2026	1/9/2026
TOK America	Failure to Monitor for all Pollutants	3/31/2025	-	Notice of Violation	10/8/2025	6/30/2025
TOK America	Failure to Install, Operate or Maintain Monitoring Equip.	8/12/2025	-	Notice of Violation	9/24/2025	8/17/2025
TTM Technologies North America, LLC	Slug Discharge	2/19/2025	-	Notice of Violation	4/24/2025	3/17/2025
TTM Technologies North America, LLC	Reporting Violation	2/19/2025	-	Notice of Violation	4/24/2025	3/17/2025
TTM Technologies North America, LLC	Exceedance of Local, State, or Federal standards	2/19/2025	-	Notice of Violation	4/24/2025	3/17/2025
Pacific Nutritional Foods	Exceeding Concentration Maximum Limit	8/14/2025	pH	Notice of Violation	8/29/2025	8/15/2025

Place comments on page 31 in the space provide. Please include SIU Name and Violation Date.

Comment Space

* Oregon Health Sciences University West Campus ONPRC (OHSU) has not achieved final permit compliance. OHSU is under a Mutual Agreement and Order to complete a pH pretreatment and monitoring system sufficient to achieve permit compliance by March 31, 2026.

** QuantumClean has not yet achieved final permit compliance. Corrective actions are required and due to CWS for review and approval by March 6, 2026.

*** Leupold & Stevens Inc has not yet achieved final permit compliance as the next permit required sample collection period has not yet passed. Missed sampling parameter was not a regulated pollutant.

Form 9: Resource Summary

Full Time Employees	Reporting Year	Planned	Comments
Enforcement Officers	4	4	Fraction of the 7 total staff dedicated to pretreatment enforcement, 2 staff in legal, and 2 staff in management
Management	0.85	1.25	Fraction of the 3 total staff overseeing the Pretreatment program. 1 director position vacant intended to be filled in 2026
Administration	0.25	0.25	Fraction of the 2 total admin assistants
Inspection Personnel	3	3	Fraction of the 7.25 total staff dedicated to pretreatment inspections
Laboratory Staff	0.25	0.25	Fraction of lab technician staff time spent on pretreatment laboratory analysis
Sampling Technicians	1.25	1.25	Fraction of the 3 total lab technicians and 7 environmental services staff dedicated to pretreatment sampling
Total	9.6	10	

Resources	Reporting Year	Planned	Comments
Vehicle Totals	4	4	Fraction of the 6 total vehicles dedicated for Pretreatment program use
Analytical Equipment	9	9	Includes pH meters, ICPMS, COD spec, CN instrument, and COD digestion blocks
Safety Equipment (Number/Type)	50	50	Includes gas monitors, solo-worker communicators, sampling and general PPE for all pretreatment inspection and sampling personnel.
Sample collection, handling, and storage equipment (e.g. number of samplers)	9	9	Includes 6 composite samplers for IU site monitoring and 3 sample pole/reels

Operating costs may include laboratory costs, sampling and inspection costs, permit writing costs, and enforcement costs. Income sources may include sewer use fees, extra strength surcharges, impervious area fees, enforcement penalties, and other revenue streams.

Keeping these in mind, do you feel like your program is adequately funded with sufficient resources? If not, please explain what area(s) need(s) greater funding/attention.

Comment Space

CWS' industrial Pretreatment program is adequately funded with sufficient resources.

Form 10: Pretreatment Program Evaluation

		Yes	No
1.	Has a change in contributing jurisdictions occurred since the last annual report	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If yes, identify the jurisdiction that have been added or removed			
N/A			

		Yes	No
2.	Has the Control Authority updated its Industrial User Survey to identify new Industrial Users (IUs) or changes in wastewater discharges at existing IUs? [(403.8(f)(2)(i)] If yes:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2a	Are any of these IUs located in new service areas (describe)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2b	Have any IUs located in contributing jurisdictions where the POTW has no inter-jurisdictional agreements or IU Contracts?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Describe:			
Survey efforts include interdepartmental and inter-jurisdictional coordination including an online survey form directed to new industry. CWS expanded its survey efforts to include review of all active business licenses in its service area and cross-referenced with active facilities in the pretreatment database to identify industrial users that CWS had no record of (reported in Form 6A).			

For any NEW Categorical Industrial User identified during reporting period

		Yes	No
3a	Baseline Monitoring Report (BMR) Submitted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3b	Final (90 – Day) Compliance Report (FCR) Submitted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

4.	During the reporting period, how many IUs are currently permitted or identified by the Control Authority in each of the following categories.	
	NDCIUs not subject to zero discharge limits	11
	Categorical Industrial Users (CIUs)	23
	Significant Non-Categorical IUs	12
	Zero Discharge Categorical Industrial Users	0
	“Middle Tier” CIUs	N/A

4.	Continued from previous page	
	Total SIUs	35
	NDCIUs not subject to zero discharge limits	11
	Non-Significant CIUs	3
	Other regulated non-categorical IUs (describe)	203
Other regulated IUs include Non-Significant Industrial Users, Washwater, Liquid Waste Haulers, and Discharge Authorization (no permit required) Letters.		

For both NSCIUs and MTCIUs please indicate N/A if the POTW has NOT adopted these provisions. "0" if you have adopted the provisions but do not currently permit any IUs as such)

		Yes	No
5.	Is the Control Authority's definition of "Significant Industrial User" the same as EPA's? [403.3(v)(1)(i-ii)]	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If not, the Control Authority has defined "Significant Industrial User" to mean:			
N/A			

6.	How many SIUs are required to be covered by an individual control mechanism?	35
6a.	How many SIUs are not covered by an existing, unexpired permit or other control mechanism?	0
Explain:		
All Significant Industrial Users (SIUs) are required to be covered under an individual control mechanism.		

		Yes	No
7.	Were individual control mechanisms issued/reissued for 90% of the SIUs within 180 days of the expiration date?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7a.	How many control mechanisms were not issued within 180 days of the expiration date?	0	

7b.	Explain answer for 7a.
All individual control mechanisms were issued/ reissued within 180 days of permit expiration.	

		#	%
8a.	How many Zero Discharge Categorical Industrial Users have been issued a control mechanism? (Number/percent)	0	0
8b.	How many NDCIUs NOT subject to a zero discharge and have been issued a control mechanism?	0	0
8c.	Does the POTW require annual certification of NDCIUs in lieu of issuing a control mechanism?	Yes	
Comments:			
CWS adopted the legal authority to include the NDCIU annual certification statement instead of issuing a control mechanism (i.e., permit). CWS continues to implement the adopted annual certification requirement in lieu of a permit. All annual certifications have been submitted and received by CWS.			

		Yes	No
9.	Does the POTW accept hauled domestic waste?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10.	Does the POTW accept hauled non-hazardous industrial waste?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11.	Does the Control Authority have a control mechanism for regulating IUs whose waste are trucked to the treatment plant?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11a.	If yes, does control mechanism designate a discharge point?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Describe:			
CWS designates the discharge point(s) for any permitted, trucked, or hauled waste approved for discharge through a CWS-issued control mechanism. CWS has a DEQ approved Hauled Waste Plan that describes permits, contracts, licensing, and authorization letters required to haul industrial waste. The Hauled Waste Annual report is attached separately.			

		Yes	No	NA
12.	Are all applicable categorical standards and local limits applied to IUs whose wastes are trucked into the POTW?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, why?				
<p>There are currently no CIUs applicable to categorical pretreatment standards or requirements that discharge hauled waste to CWS. CWS' 2021 Local Limit evaluation excluded non-categorical hauled waste from applicability to CWS developed Local Limits.</p>				

		Yes	No
13.	Has the Control Authority evaluated the need for SIUs to develop slug discharge control plans? [403.8(f)(2)(vi)]	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, when was the evaluation last conducted and what criteria were used to identify the IUs for slug plans?			
Slug Control Plans	Actions	During Report Period	Program Total
How many were...	Required	13	35
How many were...	Received	13	34
How many were...	Approved	11	34

		Yes	No	N/A
14.	Are TTO standards or alternatives (solvent management plans or oil & grease monitoring) being implemented for IUs subject to TTO limitations? If no, explain why in the comment space below.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14a	Are TTO standards being applied to other IUs?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Comment Space				

15. How many times were the following monitored during the past year?				
Type	Influent	Effluent	Sludge	Ambient (Receiving Water)
Metals	12-26	15-40	20	6-9
Priority Poll.	6-12	10-22	13	4
Biomonitoring	0	0	0	0
TCLP	0	0	0	0
EP Tox	0	0	0	0
Other	-	-	-	-

Comment Space
<p>In accordance with the annual report guidance form, this table was not separated by Water Resource Recovery Facility (WRRF). Ranges are given when the number of sampling events differed among the 4 WRRFs. There are 5 ambient (receiving water) monitoring sites paired with the 4 WRRFs. The number of samples collected at each site varied depending on the seasonal discharge of the associated WRRF or special projects.</p>

16.	Has the Control Authority had any problems performing compliance monitoring?	Yes	No
	Scheduled	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Unscheduled	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Demand	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If yes, explain:			
N/A			

How many, and what percentage of SIUs were (a) not sampled at least once, or (b) no inspected at least once during the reporting period [403.8(f)(2)(vi)]		#	%
17a.	Number and Percent not sampled	0	0
17b.	Number and Percent not inspected	0	0

Does the control authority routinely spilt samples with industrial personnel?		Yes	No
18a.	If requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>
18b.	To verify IU self-monitoring	<input checked="" type="checkbox"/>	<input type="checkbox"/>

19.	Provide the following information regarding pollutant analyses.		
	Criteria	Analytical Method	Name of Laboratory
	Mercury	EPA 1631E, EPA 6020B, EPA 245.1	CWS Lab, ALS
	Other Metals	EPA 200.8, EPA 6020B	CWS Lab
	Cyanide	Kelada-01	CWS Lab
	Organics	EPA 601, EPA 624.1, EPA 625.1	CWS Lab, ALS, Caltest
	Others	-	-

Comment Space
N/A

		Yes	No
20.	Do control authority use QA/QC for sampling analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, describe:			
<p>Clean Water Service's Water Quality Laboratory maintains a comprehensive QA/QC program that complies with NPDES permit monitoring QA/QC requirements. Components of the program include QA/QC manager and analyst positions, a QA/QC program document, written SOPs for sampling and analysis, use of EPA-approved analytical methods and method QC requirements, analysis of commercially provided proficiency testing (PT) samples twice a year, PT acceptance criteria, and participation in the EPA's DMRQA program.</p>			

21.	How much time normally elapses between sample collection and obtaining analytical results?	1-3 weeks
-----	--	-----------

		Yes	No
22.	Is there an established protocol clearly detailing sampling location and procedures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

23.	How frequently does the control authority use closed cup flashpoint test specified in 40 CFR Part 261.21 to monitor SIUs? [403.5(b)(1)]
	Once per year <input type="checkbox"/>
	Prior to each sampling <input type="checkbox"/>
	Other <input checked="" type="checkbox"/>

Yes	No
<input type="checkbox"/>	<input checked="" type="checkbox"/>

23a. Did the control authority find any problems?

If yes, explain

N/A

		Yes	No
24.	Does the Control Authority compare all monitoring data to applicable pretreatment standards and requirements contained in the control mechanism within 15 days of its receipt?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

		Yes	No
25.	Does the Control Authority use EPA's definition of Significant Noncompliance (SNC)? [403.8(f)(2)(viii)]	<input checked="" type="checkbox"/>	<input type="checkbox"/>

		Yes	No	NA
26.	Are SIUs required to notify the Control Authority within 24 hours of becoming aware of a violation and to submit additional monitoring within 30 days after the violation is identified? [403.12(g)(2)]	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.	If the Control Authority conducts monitoring in lieu of the user, does the Control Authority resample and obtain results within 30 days of identifying and violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
28.	Date that administrative penalties were last updated:	11/10/2020		

29. Indicate the compliance/enforcement options that are available in the event of IU noncompliance:	
Notice of Violation or Letter of Violation	<input checked="" type="checkbox"/>
Compliance Schedule	<input checked="" type="checkbox"/>
Injunctive Relief	<input checked="" type="checkbox"/>
Imprisonment	<input type="checkbox"/>
Termination of Service	<input checked="" type="checkbox"/>
Administrative Order	<input checked="" type="checkbox"/>
Revocation of Permit	<input checked="" type="checkbox"/>

29a. Fines (Maximum Amount) per day per violation	
Civil	N/A
Criminal	N/A
Administrative	\$5,000

30.	List the amount of enforcement actions issued by the control authority for the reporting period.		
	Actions	Total Actions Taken	Total Industries Affected
	Written notice or letter of violation	42	21
	Administrative Orders	0	0
	Administrative Fines	23	12
	Show Cause Hearings	0	0
	Compliance Orders	0	0
	Permit Revocation	0	0
	Civil Action	0	0
	Termination of Service	0	0
	Other (Specify Below)	1	1
	Comment Space		
<p>Notes: Warning letters are informal enforcement action and Notice of Violations are formal enforcement actions, though both are included as a written notice. There were 16 Warning Letters and 26 Notice of Violation letters issued in the calendar year. 23 enforcement actions included administrative fines. 3 Notice of Violations had penalties that are stayed as part of a Mutual Agreement and Order (action noted as "Other" in the table above) and were not included in the total number of actions taken that included administrative fines. The penalties stayed as part of the Mutual Agreement and Order were not included as an action with administrative fines. Enforcement actions above include those CWS has taken for SIUs only for all CWS Water Resource Recovery Facilities.</p>			

31.	For each of the listed enforcement actions, identify the following for the ones the Control Authority has used during the reporting period:		
	Actions	Total Actions Taken	Amount in Dollars
	Civil	0	0
	Administrative	42	\$78,106
	Total	42	\$78,106

32.	Indicate the number and percent of SIUs that were identified as being in SNC (as defined by EPA) with the following during the reporting period:		
	Actions	# SNC SIUs	% SNC SIUs
	Applicable pretreatment standards	0	0
	Self-monitoring requirements	0	0
	Reporting requirements	0	0
	Pretreatment compliance schedule	0	0
	Other	0	0

		Yes	No
33.	Did the Control Authority publish all SIUs in SNC in newspapers, or general arbitration that provides meaningful public notice within the instructions served by the POTW? [403.8(f)(2)(vii)]	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, attach a copy, or attach a copy of the affidavit of publication.			

34	Indicate the number of SIUs that are currently in SNC with self-monitoring and were not inspected or sampled:	0
35	How many SIUs are currently on compliance schedules in order to meet new or revised national pretreatment standards or requirements?	0

		Yes	No
36.	Have any CIUs been allowed more than 3 years from the effective date of a categorical standard to achieve compliance? [403.6(b)]	<input type="checkbox"/>	<input checked="" type="checkbox"/>
37	Have any IUs requested that data be held confidential?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
38	Have any requests been made by the public to review files?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
39	Are all records maintained for at least 3 years?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
40	Does the Control Authority have the technical documents necessary for implementing its pretreatment program?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

		Yes	No
41.	Are there significant public or community issues impacting the POTW's pretreatment program?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If yes, explain:

N/A

Form 11: Sewage Treatment Plant Profiles

Complete this section for each sewage treatment plant operated under an NPDES/WPCF Permit.

DEQ NPDES/WPCF Permit Number:		101141	
1.	Treatment Plant Design Dry Weather Flow	37.7	MGD
2.	Treatment Plant Actual Dry Weather Flow (Avg)	19.5	MGD
3.	Treatment Plant Design Wet Weather Flow	180	MGD
4.	Treatment Plant Actual Peak Wet Weather Flow	74.1	MGD

5.	Sewerage System Percentages and Totals		
	Separate	100	
	Combined	0	
	Total Number of CSOs	0	

6.	Industrial Contributions		
	Flow (MGD)	1.06	
	Percent of Influent	5.44%	
	Number of contributing SIUs (non-CIUs)	3	
	Number of contributing CIUs	7	

7.	Levels of Treatment		Description
	Preliminary	<input checked="" type="checkbox"/>	6 influent pumps
	Primary	<input checked="" type="checkbox"/>	4 barscreen, grit basin & clarifiers
	Secondary	<input checked="" type="checkbox"/>	5 BNR basins & clarifiers
	Tertiary	<input checked="" type="checkbox"/>	3 clarifiers, 3 CCB & 13 filters
	Type of disinfection		Sodium hypochlorite

8.	Receiving Water		
	Name	Tualatin River	
	Classification (Hydro Code)	17090010000038	
	Designated Beneficial Uses (OAR 340-41)	All but commercial navigation and transport	

		Yes	No
9.	Effluent Discharged to Any Location Other than Receiving Water?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, Indicate Where, When, and Describe:			
<p>Class A recycled water at the Durham WRRF is typically produced between April and October and distributed to 3 golf courses (Tualatin, King City, and Summerfield), 2 school athletic fields (Durham Elementary and Tigard High), 2 parks (Durham City and Tigard Cook), and 2 other properties (Thomas Dairy, a CWS-owned natural area, and Hickox, a privately owned farm).</p>			

10.	Indicated methods of biosolids (sludge) disposal (Mg/Kg (dry weight) / year)	
	Land Application	4,295 (Dry US Tons)
	Municipal Solid Waste Landfill	0
	Sale or Donation to Public	0
	Other (Specify)	0

Form 11: Sewage Treatment Plant Profiles

Complete this section for each sewage treatment plant operated under an NPDES/WPCF Permit.

DEQ NPDES/WPCF Permit Number:		101142	
1.	Treatment Plant Design Dry Weather Flow	4.2	MGD
2.	Treatment Plant Actual Dry Weather Flow (Avg)	4.2	MGD
3.	Treatment Plant Design Wet Weather Flow	20	MGD
4.	Treatment Plant Actual Peak Wet Weather Flow	19.2	MGD

5.	Sewerage System Percentages and Totals		
	Separate	100	
	Combined	0	
	Total Number of CSOs	0	

6.	Industrial Contributions		
	Flow (MGD)	0.07	
	Percent of Influent	1.67	
	Number of contributing SIUs (non-CIUs)	4	
	Number of contributing CIUs	0	

7.	Levels of Treatment		Description
	Preliminary	<input checked="" type="checkbox"/>	6 influent pumps, 2 barscreens
	Primary	<input checked="" type="checkbox"/>	2 primary clarifiers (in construction)
	Secondary	<input checked="" type="checkbox"/>	2 aeration basins, 3 secondary clarifiers
	Tertiary	<input checked="" type="checkbox"/>	Natural Treatment System (summer only)
	Type of disinfection		4 duty UV vessels, 1 back-up vessel

8.	Receiving Water	
	Name	Tualatin River
	Classification (Hydro Code)	17090010018350
	Designated Beneficial Uses (OAR 340-41)	All but commercial navigation and transport

		Yes	No
9.	Effluent Discharged to Any Location Other than Receiving Water?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If yes, Indicate Where, When, and Describe:			
<p>Effluent from the Forest Grove WRRF is discharged to the Natural Treatment System (NTS) typically May through October, which subsequently is discharged to the Tualatin River. Effluent can also be transferred to the Rock Creek WRRF.</p>			

10.	Indicated methods of biosolids (sludge) disposal (Mg/Kg (dry weight) / year)	
	Land Application	N/A
	Municipal Solid Waste Landfill	N/A
	Sale or Donation to Public	N/A
	Other (Specify)	Solids transferred to CWS' Rock Creek WRRF

Form 11: Sewage Treatment Plant Profiles

Complete this section for each sewage treatment plant operated under an NPDES/WPCF Permit.

DEQ NPDES/WPCF Permit Number:		101143	
1.	Treatment Plant Design Dry Weather Flow	N/A	MGD
2.	Treatment Plant Actual Dry Weather Flow (Avg)	3.1	MGD
3.	Treatment Plant Design Wet Weather Flow	20	MGD
4.	Treatment Plant Actual Peak Wet Weather Flow	15.6	MGD

5.	Sewerage System Percentages and Totals		
	Separate	100	
	Combined	0	
	Total Number of CSOs	0	

6.	Industrial Contributions		
	Flow (MGD)	0.1	
	Percent of Influent	3.23%	
	Number of contributing SIUs (non-CIUs)	1	
	Number of contributing CIUs	3	

7.	Levels of Treatment		Description
	Preliminary	<input checked="" type="checkbox"/>	4 influent pumps, 2 barscreen channels
	Primary	<input checked="" type="checkbox"/>	2 primary clarifiers
	Secondary	<input checked="" type="checkbox"/>	1 aeration basin, 3 secondary clarifiers
	Tertiary	<input type="checkbox"/>	N/A
	Type of disinfection		2 UV channels

8.	Receiving Water	
	Name	Tualatin River
	Classification (Hydro Code)	17090010018350
	Designated Beneficial Uses (OAR 340-41)	All but commercial navigation and transport

		Yes	No
9.	Effluent Discharged to Any Location Other than Receiving Water?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If yes, Indicate Where, When, and Describe:			
<p>Effluent from the Hillsboro WRRF is discharged to the Forest Grove Natural Treatment System (NTS) typically May through October, which subsequently is discharged to the Tualatin River. Effluent can also be transferred to the Rock Creek or Forest Grove WRRF.</p>			

10.	Indicated methods of biosolids (sludge) disposal (Mg/Kg (dry weight) / year)	
	Land Application	N/A
	Municipal Solid Waste Landfill	N/A
	Sale or Donation to Public	N/A
	Other (Specify)	Solids transferred to CWS' Rock Creek WRRF

Form 11: Sewage Treatment Plant Profiles

Complete this section for each sewage treatment plant operated under an NPDES/WPCF Permit.

DEQ NPDES/WPCF Permit Number:		101144	
1.	Treatment Plant Design Dry Weather Flow	57.0	MGD
2.	Treatment Plant Actual Dry Weather Flow (Avg)	30.1	MGD
3.	Treatment Plant Design Wet Weather Flow	198	MGD
4.	Treatment Plant Actual Peak Wet Weather Flow	102.5	MGD

5.	Sewerage System Percentages and Totals		
	Separate	100	
	Combined	0	
	Total Number of CSOs	0	

6.	Industrial Contributions		
	Flow (MGD)	7.1	
	Percent of Influent	23.6%	
	Number of contributing SIUs (non-CIUs)	5	
	Number of contributing CIUs	13	

7.	Levels of Treatment		Description
	Preliminary	<input checked="" type="checkbox"/>	Fine screens, grit removal
	Primary	<input checked="" type="checkbox"/>	4 Primary clarifiers
	Secondary	<input checked="" type="checkbox"/>	6 Aeration basins, 10 sec clarifiers
	Tertiary	<input checked="" type="checkbox"/>	Anthracite filters, HRC, claricones
	Type of disinfection		Chlorination

8.	Receiving Water	
	Name	Tualatin River
	Classification (Hydro Code)	17090010018350
	Designated Beneficial Uses (OAR 340-41)	All but commercial navigation and transport

		Yes	No
9.	Effluent Discharged to Any Location Other than Receiving Water?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

If yes, Indicate Where, When, and Describe:

Class A Recycled Water is produced at the Rock Creek WRRF typically between April and October and is distributed for irrigation.

10.	Indicated methods of biosolids (sludge) disposal (Mg/Kg (dry weight) / year)	
	Land Application	6,530 (Dry US Tons)
	Municipal Solid Waste Landfill	0
	Sale or Donation to Public	0
	Other (Specify)	0

Form 12: Pretreatment Program Profiles

Information pertaining to contributing jurisdictions (Complete for each jurisdiction)

1.	Name of contributing jurisdiction:	City of Portland
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		Yes	No
1a	DEQ approved IJA, IGS, or MJA	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Date approved by DEQ	NA	
	Date incorporated into NPDES/WPCF Permit	7/20/1999	
	Number of other SIUs in contributing jurisdiction	0	

1.	Name of contributing jurisdiction:	City of Tualatin and City of Lake Oswego
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		Yes	No
1b	DEQ approved IJA, IGS, or MJA	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Date approved by DEQ	NA	
	Date incorporated into NPDES/WPCF Permit	2011	
	Number of other SIUs in contributing jurisdiction	0	

1c.	If relying on contributing jurisdictions, indicate, for each, which activities they are required to perform	
Name	City of Portland	
Industrial User Survey	<input checked="" type="checkbox"/>	Specify here:
Permit Issuance	<input checked="" type="checkbox"/>	There are currently no SIUs in the boundaries covered under the IJA. CWS and the City of Portland submit surveying activities and findings of potential industrial users within the designated regions governed annually.
Notification of Industrial Users (IUs) of Pretreatment Requirements	<input type="checkbox"/>	
Receipt and Review of IU Reports	<input type="checkbox"/>	
Analysis of Samples Other (Specify)	<input checked="" type="checkbox"/>	

1c.	If relying on contributing jurisdictions, indicate, for each, which activities they are required to perform	
Name	City of Tualatin and City of Lake Oswego	
Industrial User Survey (IUS)	<input type="checkbox"/>	Specify here:
Permit Issuance	<input type="checkbox"/>	The IGA includes information on the area of sewage flow that drains by gravity to CWS. There are currently no SIUs in this area. The IGA will be updated as reported in Form 2.
Notification of Industrial Users (IUs) of Pretreatment Requirements	<input type="checkbox"/>	
Receipt and Review of IU Reports	<input type="checkbox"/>	
Analysis of Samples Other (Specify)	<input type="checkbox"/>	

1c.	If relying on contributing jurisdictions, indicate, for each, which activities they are required to perform	
Name	City of Hillsboro	
Industrial User Survey (IUS)	<input checked="" type="checkbox"/>	Specify here:
Permit Issuance	<input type="checkbox"/>	The City of Hillsboro is required to notify CWS of any new Industrial Users. CWS implements the Pretreatment program in exception to the commercial FOG program associated with food service establishments.
Notification of Industrial Users (IUs) of Pretreatment Requirements	<input type="checkbox"/>	
Receipt and Review of IU Reports	<input type="checkbox"/>	
Analysis of Samples Other (Specify)	<input type="checkbox"/>	

1c.	If relying on contributing jurisdictions, indicate, for each, which activities they are required to perform	
Name	City of Beaverton	
Industrial User Survey (IUS)	<input checked="" type="checkbox"/>	Specify here:
Permit Issuance	<input type="checkbox"/>	The City of Beaverton (City) is required to notify CWS of any new Industrial Users. CWS implements the Pretreatment program in exception to the locally owned FOG abatement program for food service establishments implemented by the City.
Notification of Industrial Users (IUs) of Pretreatment Requirements	<input type="checkbox"/>	
Receipt and Review of IU Reports	<input type="checkbox"/>	
Analysis of Samples Other (Specify)	<input type="checkbox"/>	

2.	Indicate approved pretreatment program compliance and inspection frequency requirements:	
a.	Inspection	
	CIUs	Once per year
	Other SIUs	Once per year

b.	Sampling by Control Authority (i.e.) the municipality or POTW	
	CIUs	Once per year
	Other SIUs	Once per year
c.	Industrial user (IU) self-monitoring	
	CIUs	Twice per year
	Other SIUs	Twice per year
d.	Reporting by IUs	
	Other CIUs	Monthly
	Other SIUs	Monthly

Removal Credits:

		Yes	No
3a	Is the Control Authority currently authorized to issue removal credits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

		Yes	No
3b	Has the Control Authority applied for authorization to issue removal credits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Date applied	N/A	

		Yes	No
3c	Has the Control Authority issued any removal credits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Date issued	N/A	

		Date
3d	Date of most recent removal credits approval (if applicable)	N/A

		Yes	No
4.	Is any part of the pretreatment program being operated under any pretreatment- related consent decree, administrative order, compliance schedule, or other enforcement action?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If yes, explain:

N/A

5. List NPDES/WPCF Permit effluent and biosolids limits violated and suspected causes:

Parameters Violated	Date	Causes
N/A	N/A	N/A

Yes	No
<input type="checkbox"/>	<input checked="" type="checkbox"/>

6. Have treatment plant biosolids violated any TCLP tests?

If yes, explain:

N/A

Form 13: Pretreatment Summary - Durham

Form/Section	Question	Answer
2.6	Date of Most Recent Technical Evaluation for Local Limits?	5/28/2021
	Date of Most Recent Adoption of Technically Based Local Limits?	2/28/2022
	Local Limit Pollutants?	Yes
10.4*	Has City adopted NSCIU/MTCIU?	NSCIU only
	Number of SIUs	10
	Number of CIUs	7
	Number of non-categorical SIUs	3
	Number of zero discharge categorical industrial users	0
	Number of NDCIU NOT subject to zero discharge	12
	Number of NSCIU	1
	Other Permitted IUs (not SIUs or CIUs)	52
10.6*	SIUs Without Control Mechanism?	0
10.9	Acceptance of Hauled Domestic Wastes (Yes or No)	Yes
10.10	Acceptance of Non-Hazardous Industrial Wastes? (Yes or No)	Yes
10.17*	SIUs not sampled?	0
	SIUs not inspected	0
10.30*	Violation Notices Issued to SIUs	2
	Administrative Orders Issued to SIUs	NA
	Civil suits filed against SIUs	0
	Criminal suites filed against SIUs	0
10.31*	Industrial Users (IUs) from which Penalties have been collected?	2
	Dollar Amount of Penalties Collected?	\$3,700

10.32*	SIUs in SNC with pretreatment standards	0
	SIUs in SNC with self-monitoring standards	0
	SIU in SNC with reporting requirements	0
	SIUs in SNC with pretreatment compliance schedule	0
10.33*	SIU in SNC published in newspaper	0
	Removal credits application status	N/A
12.3*	Date of most recent removal credits approval	N/A
	Removal credits	N/A

* If your Approved Program has multiple wastewater treatment plants, please submit multiple Form 13; data from Forms such as Form 10 may need to be split up by wastewater treatment plant.

Form 13: Pretreatment Summary: Forest Grove

Form/Section	Question	Answer
2.6	Date of Most Recent Technical Evaluation for Local Limits?	
	Date of Most Recent Adoption of Technically Based Local Limits?	
	Local Limit Pollutants?	
10.4*	Has City adopted NSCIU/MTCIU?	
	Number of SIUs	
	Number of CIUs	
	Number of non-categorical SIUs	
	Number of zero discharge categorical industrial users	
	Number of NDCIU NOT subject to zero discharge	
	Number of NSCIU	
Other Permitted IUs (not SIUs or CIUs)		
10.6*	SIUs Without Control Mechanism?	
10.9	Acceptance of Hauled Domestic Wastes (Yes or No)	
10.10	Acceptance of Non-Hazardous Industrial Wastes? (Yes or No)	
10.17*	SIUs not sampled?	
	SIUs not inspected	
10.30*	Violation Notices Issued to SIUs	
	Administrative Orders Issued to SIUs	
	Civil suits filed against SIUs	
	Criminal suites filed against SIUs	
10.31*	Industrial Users (IUs) from which Penalties have been collected?	
	Dollar Amount of Penalties Collected?	

<u>10.32*</u>	SIUs in SNC with pretreatment standards	
	SIUs in SNC with self-monitoring standards	
	SIU in SNC with reporting requirements	
	SIUs in SNC with pretreatment compliance schedule	
<u>10.33*</u>	SIU in SNC published in newspaper	
	Removal credits application status	
<u>12.3*</u>	Date of most recent removal credits approval	
	Removal credits	

*1 SIU discharges to both the Forest Grove WRRF and the Hillsboro WRRF. The SIU that discharges to both CWS WRRF's is only counted in the Hillsboro Form 13 Pretreatment Summary to not over count the total number of SIUs. There are 35 Total SIUs for CWS' Pretreatment Program. The complete SIU count per WRRF is reported in Form 11.

Form 13: Pretreatment Summary: Hillsboro

Form/Section	Question	Answer
2.6	Date of Most Recent Technical Evaluation for Local Limits?	
	Date of Most Recent Adoption of Technically Based Local Limits?	
	Local Limit Pollutants?	
10.4*	Has City adopted NSCIU/MTCIU?	
	Number of SIUs	
	Number of CIUs	
	Number of non-categorical SIUs	
	Number of zero discharge categorical industrial users	
	Number of NDCIU NOT subject to zero discharge	
	Number of NSCIU	
Other Permitted IUs (not SIUs or CIUs)		
10.6*	SIUs Without Control Mechanism?	
10.9	Acceptance of Hauled Domestic Wastes (Yes or No)	
10.10	Acceptance of Non-Hazardous Industrial Wastes? (Yes or No)	
10.17*	SIUs not sampled?	
	SIUs not inspected	
10.30*	Violation Notices Issued to SIUs	
	Administrative Orders Issued to SIUs	
	Civil suits filed against SIUs	
	Criminal suites filed against SIUs	
10.31*	Industrial Users (IUs) from which Penalties have been collected?	
	Dollar Amount of Penalties Collected?	

<u>10.32*</u>	SIUs in SNC with pretreatment standards	
	SIUs in SNC with self-monitoring standards	
	SIU in SNC with reporting requirements	
	SIUs in SNC with pretreatment compliance schedule	
<u>10.33*</u>	SIU in SNC published in newspaper	
	Removal credits application status	
<u>12.3*</u>	Date of most recent removal credits approval	
	Removal credits	

*1 SIU discharges to both the Forest Grove WRRF and the Hillsboro WRRF. The SIU that discharges to both CWS WRRF's is only counted in the Hillsboro Form 13 Pretreatment Summary to not over count the total number of SIUs. There are 35 Total SIUs for CWS' Pretreatment Program. The complete SIU count per WRRF is reported in Form 11.

Form 13: Pretreatment Summary: Rock Creek

Form/Section	Question	Answer
2.6	Date of Most Recent Technical Evaluation for Local Limits?	
	Date of Most Recent Adoption of Technically Based Local Limits?	
	Local Limit Pollutants?	
10.4*	Has City adopted NSCIU/MTCIU?	
	Number of SIUs	
	Number of CIUs	
	Number of non-categorical SIUs	
	Number of zero discharge categorical industrial users	
	Number of NDCIU NOT subject to zero discharge	
	Number of NSCIU	
Other Permitted IUs (not SIUs or CIUs)		
10.6*	SIUs Without Control Mechanism?	
10.9	Acceptance of Hauled Domestic Wastes (Yes or No)	
10.10	Acceptance of Non-Hazardous Industrial Wastes? (Yes or No)	
10.17*	SIUs not sampled?	
	SIUs not inspected	
10.30*	Violation Notices Issued to SIUs	
	Administrative Orders Issued to SIUs	
	Civil suits filed against SIUs	
	Criminal suites filed against SIUs	
10.31*	Industrial Users (IUs) from which Penalties have been collected?	
	Dollar Amount of Penalties Collected?	

<u>10.32*</u>	SIUs in SNC with pretreatment standards	
	SIUs in SNC with self-monitoring standards	
	SIU in SNC with reporting requirements	
	SIUs in SNC with pretreatment compliance schedule	
<u>10.33*</u>	SIU in SNC published in newspaper	
	Removal credits application status	
<u>12.3*</u>	Date of most recent removal credits approval	
	Removal credits	

Form 14: Hauled Waste Annual Report

1.	Year:	2025
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2.	Facility Name:	Durham Water Resource Recovery Facility
3.	Facility Location	16580 SW 85th Avenue Tigard, Oregon 97224

4.	YDO RID:	88907
5.	Permit #:	101141
6.	EPA ID #:	OR0028118

7.	Number of Permitted or Approved Liquid Waste Haulers?	44
8.	Number of Receiving Stations	1
9.	Number of upsets caused/contributed by or suspected to be caused/contributed by (a) liquid waste load(s) during reporting period (N/A if not applicable):	0
10.	All Liquid Waste Loads Monitored during Reporting Period? Yes / No	Yes
11.	If no, approximately what % not monitored?	N/A

12.	Waste Type	Number of Loads	Total Gallons*
	Wastewater Solids **	0	0
	RV/Gray Water	5,847	175410
	Grease Trap Waste	3,144	13264587
	Septage/ Portable and Chemical Toilet Waste	7,658	11077016
	Landfill Leachate (Hauled In)	0	0
	Groundwater Remediation Wastewaters	0	0
	Other Commercial/Industrial Wastewaters	0	0
	Total Gallons All Hauled Waste:		24517013

*Sum of loads in gallons, **Wastewater solids from other wastewater treatment facilities

13.	pH Range of all tested loads	3.6 - 14.4 S.U.*
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*pH range reported includes septage (domestic) hauled waste only. An automatic valve closes after 10 seconds outside pH 5-10 S.U. As of 2026, CWS has modified the program set points to 5-11 S.U. after 5 seconds. CWS did not observe any treatment plant impacts from the event.

***** do not use published value, must be minimum to maximum pH value from tested loads within the reporting period.**

ATTACHMENTS:

Please attach additional information regarding upsets known or suspected to be caused/contributed by liquid waste loads.

Please attach ALL SAMPLE RESULTS from sampled loads, not including ph.

Form 14: Hauled Waste Annual Report

1.	Year:	2025
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2.	Facility Name:	Rock Creek Water Resource Recovery Facility
3.	Facility Location	3235 SE River Road, Hillsboro, Oregon 97123

4.	YDO RID:	88907
5.	Permit #:	101144
6.	EPA ID #:	OR-0029777

7.	Number of Permitted or Approved Liquid Waste Haulers?	44
8.	Number of Receiving Stations	1
9.	Number of upsets caused/contributed by or suspected to be caused/contributed by (a) liquid waste load(s) during reporting period (N/A if not applicable):	0
10.	All Liquid Waste Loads Monitored during Reporting Period? Yes / No	No
11.	If no, approximately what % not monitored?	0

12.	Waste Type	Number of Loads	Total Gallons*
	Wastewater Solids **	0	0
	Septage	1127	1978735
	Grease Trap Waste	0	0
	Portable and Chemical Toilet Waste	1879	823497
	Landfill Leachate (Hauled In)	0	0
	Groundwater Remediation Wastewaters	0	0
	Other Commercial/Industrial Wastewaters	9	56822
	Total Gallons All Hauled Waste:		2859054

*Sum of loads in gallons, **Wastewater solids from other wastewater treatment facilities

13.	pH Range of all tested loads	N/A*
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*The Rock Creek receiving station was closed for plant modifications for most of 2025. pH samples of hauled waste not collected. A continuous pH meter with automatic valve shut-off will be installed.

***** do not use published value, must be minimum to maximum pH value from tested loads within the reporting period.**

ATTACHMENTS:

Please attach additional information regarding upsets known or suspected to be caused/contributed by liquid waste loads.

Please attach ALL SAMPLE RESULTS from sampled loads, not including ph.

2026 Annual Report

NTS OPERATIONS PLAN REPORT

March 2026



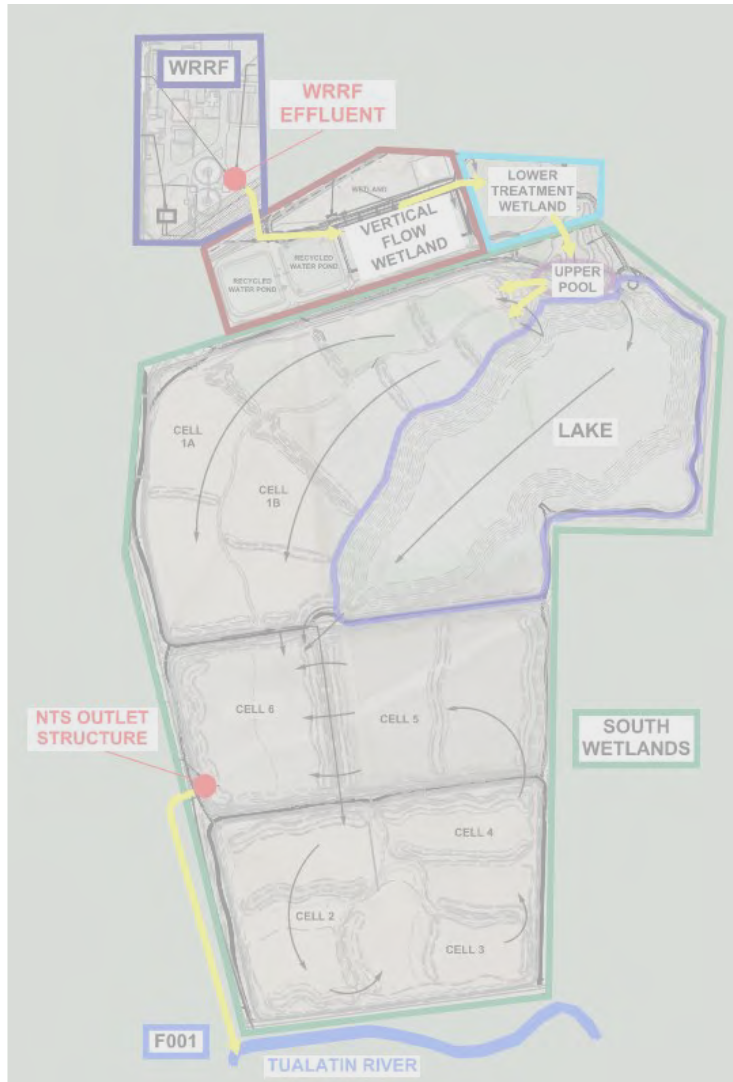
2026 Forest Grove Natural Treatment System Operations Plan

Submitted by March 31, 2026, to fulfill requirements of Schedule D, Condition 12 of the National Pollutant Discharge Elimination System (NPDES) permit.

Background: NTS Flow Path and Controls

The Natural Treatment System (NTS) comprises the Vertical Flow Wetland, Lower Treatment Wetland, and South Wetlands. When the NTS is in use, fully treated and disinfected secondary effluent is discharged from the Clean Water Services (CWS) Forest Grove Water Resource Recovery Facility (WRRF) to the NTS for further polishing. Water is typically sent through the nitrifying Vertical Flow Wetland to the Lower Treatment Wetland and from there to the vegetated South Wetlands, where it flows sequentially through Cells 1 through 6 before being discharged to the Tualatin River through the NTS outlet structure and Outfall F001 (Figure 1).

Figure 1. Forest Grove WRRF and NTS dry season flow path



Downstream of the Vertical Flow Wetland, the NTS contains no pumps, and all flow moves by gravity. Passive flow control structures at the end of each cell allow operators to alter water levels by adding or removing weir boards. Actuated sliding weir gates at the end of Cell 6 can be moved up or down to adjust the size of the aperture and to enable discharge from either the water surface or lower in the water column. Manual sliding weir gates at the ends of Cells 1A, 1B, and 4 enable further management of water levels and flows within the NTS.

When the NTS is in use, treated flows from the WRRF are added to Fernhill Lake to maintain the water level and for storage and aesthetic purposes. Water can leave the lake via a weir box to the influent of Cells 1A and 1B or through an actuated weir gate to the northeast corner of Cell 6. This latter connection draws water from a structure in the southwest corner of the lake and can be used to partially draw down the water level of the lake.

NTS Operations Plan

CWS has developed an Operations Plan to optimize effluent quality at the NTS that includes the following elements:

- Spring startup plan.
- Reintroduction of effluent during the operational period.
- Flow control plan.
- Lake operations.
- Maintenance plan, including vegetation management, pest management, and infrastructure maintenance.
- Compliance monitoring.
- Event recognition, prevention, and management.
- Adaptive management.
- End of season and wet season plan.
- Communication and coordination.
- Reporting.

Startup

“Startup” refers to the introduction of flow from the WRRF into the NTS and subsequent discharge from the NTS to the Tualatin River. This includes the annual transition from direct WRRF discharge to NTS operation leading into the dry season. It also refers to the resumption of flow after interruptions due to extended shutoffs during the dry season, such as those that may arise due to construction activities or as needed to maintain compliance. Generally, this relates to periods of three or more consecutive days without flow out of the NTS, which may lead to stagnation or exposure of submerged sediments.

Spring Startup

CWS’ NPDES permit authorizes discharge from the Forest Grove NTS. During the high river flow period, when the Forest Grove WRRF discharges directly to the Tualatin River, the compliance point (F001) is at the Forest Grove WRRF prior to discharge to Outfall F001. During discharge from the NTS, the compliance point (F001) moves to the NTS outfall. During the low

river flow period, if stream flows are greater than or equal to 350 cfs at the Farmington gage and discharge through the NTS is not possible due to hydraulic constraints, the Forest Grove WRRF is permitted to discharge directly to the river at Outfall F001. When discharging directly under these circumstances, the compliance point for all parameters is at the Forest Grove WRRF effluent channel, but the low river flow period limits must be met. When stream flows are below 350 cfs at Farmington, all discharge must go through the NTS, and the compliance point for some parameters shifts to the NTS outlet structure.

Before seasonal startup, CWS will assess the state of infrastructure and conduct maintenance as required. CWS aims to start each operational season with vegetation in an optimal state of health; this entails planting in target areas and promoting plant establishment and growth in the spring before the start of discharge.

The NTS uses plants native to the Tualatin Valley to perform the treatment objectives. Emergent wetland plants native to the Tualatin are genetically adapted to dry summers and wet winters. It is critical for plant health and vigor to provide as natural a hydraulic condition as possible during spring plant emergence. This also helps new or younger plants get established in the NTS. Prolonged inundation before startup will delay the spring plant emergence and will limit plant cover for shading during the long daylight hours of late May through June.

To promote plant emergence and establishment, certain physical conditions must be met. Wetland cells must be dewatered to expose bare substrate for planting new vegetation. If river flows remain high in the spring, the NTS may remain submerged to a depth that precludes installing and establishing new plants. In such cases, mechanical dewatering may be required to ensure that planting can occur during the appropriate window to ensure long-term viability.

CWS will undertake the following actions before initial discharge from the NTS.

- Inspect the Natural Treatment System.
- Conduct pre-discharge maintenance to reduce potential sources of sediment.
 - Clean control structures.
 - Remove sediment from NTS outlet vault and weir boxes at effluent of Cells 1A, 1B, and 4.
 - Clear obstructions and debris resulting from beaver activity.
 - Install coir logs in any channelized areas.
 - Repair potential sources of sediment (e.g., eroded berms).
- Initiate weekly meetings to coordinate action items and scheduling.
- Dewater wetland cells as needed.
- Conduct annual targeted wetland planting as needed.
- Install aerators.
- Deploy continuous monitoring instruments. Determine the startup date for NTS based on the status of maintenance work, monitoring equipment, and seasonal weather and flow patterns.
- Before the release of water into the NTS, Evaluate and adjust weir gate positions between cells to meet startup goals.

Reintroduction of Effluent During Operational Period

Stable operations, rather than frequent starts and stops of flow, are important to optimizing effluent quality in the NTS. While the overarching goal is to achieve continuous flow, it is expected that the NTS may be subject to periodic starts and stops due to operational issues at the Forest Grove WRRF, natural phenomena, and other unanticipated developments.

The Operations Plan aims to optimize effluent quality after effluent flow from the Forest Grove WRRF is reintroduced after an extended period with no flow. When water is reintroduced to the NTS, staff will set and adjust the height of weir gates between cells to minimize the potential for flow surges as water moves into each subsequent cell. The goal of this approach is to reduce resuspension of solids and limit transport of solids to downstream cells, thereby optimizing discharge quality.

Flow Control Plan

The aim of the flow control plan is to maintain relatively consistent flows and water levels throughout the vegetated cells to support plant health, minimize short-circuiting of flow, and optimize water quality. Operational strategies will include:

- Maintain consistent flows into and out of the NTS.
 - Maintain an appropriate operating level to:
 - Help avoid drying and rewetting cycles that may increase turbidity, lower dissolved oxygen (DO), and cause nutrient fluctuations.
 - Avoid total stagnation that may contribute to cyanobacterial growth, to the extent feasible.
 - Help ramp flows and minimize local water velocity by using weir gates as necessary to limit resuspension of sediment, especially near the outfall.
 - Decrease residence times to promote diatoms and green algae.
 - Evaluate options for determining optimum dry season flows through the NTS.
 - Monitor flow via the effluent flow meter at the NTS outlet structure.
- Identify and minimize preferential flow paths.
 - During the winter drawdown, conduct annual monitoring using drones to identify any preferential flow paths that may contribute to short-circuiting of flow.
 - Place coir logs or other established wetland flow control tools to minimize preferential flow paths.
- Use weir gates at the end of Cells 1A, 1B, 4, and 6 to control flow and water levels in segments of the NTS.
 - Adjust aperture to moderate impacts of flow fluctuations and minimize swings in water level to limit shear and resuspension of sediment.
 - Adjust operating depth of the NTS on a cell-by-cell basis to potentially increase chlorophyll and algal growth if supported by monitoring data.

Alternate flow paths within the NTS may be used for short periods to enable maintenance or restoration during the dry weather season. This may involve isolating or bypassing parts of the regular flow path to enable access while minimizing the impact of sediment disturbances or other water quality concerns on the wider treatment system. Examples of reasons for using an alternate flow path include repairing damage caused by wildlife, vandalism, or equipment failure,

improving effluent water quality, calibrating or repairing instrumentation, or conducting selective revegetation. Any use of alternate flow paths is intended to be of short duration and will be noted along with the reason in operational logs.

Lake Operation

The large open-water expanse of Fernhill Lake provides habitat and storage for a large volume of water. Prior monitoring in the lake has identified water quality concerns, such as high pH and populations of cyanobacteria, that may arise in summer months. The goal of lake operation is to maintain water quality and aesthetics and to avoid detrimental impacts to the treatment system. Strategies will include:

- Reduce lake level before the start of dry season operations. The decrease in level will expose perimeter mudflats and minimize shallow stagnant zones that are conducive to the growth of cyanobacteria.
 - When feasible, route water through Cells 1A and 1B (rather than directly to Cell 6) to maximize treatment.
- Isolate the lake from the NTS flow path in summer as necessary, based on current conditions; add fully treated secondary effluent to the lake as needed.
- Monitor pH and other water quality parameters to guide lake water quality management.
- Operate aerators to minimize stratification to maintain water quality.
- Evaluate technology options for maintaining and improving water quality; the lake may be incorporated into the NTS flow path with improved water quality.

Maintenance Plan

Vegetation Management

Emergent vegetation in the wetland cells provides shade and transpiration to cool effluent before discharge. Maintaining a target level of vegetative cover is required for optimal cooling. Annual flooding, animal feeding or burrowing, and other natural phenomena can contribute to vegetation loss. Regular upkeep is required to maintain and reestablish plant cover throughout the NTS. Steps for vegetation management will include:

- Regularly evaluate vegetation health and shade cover.
 - Walk the perimeter weekly during the dry season to note plant health and cover.
 - Conduct annual drone flights to generate shade maps for historical comparison.
- Revegetate as needed in response to monitoring, with a target of maintaining 80% cover in the vegetated cells (ongoing). Maintain an emphasis on incorporating native vegetation. In addition to developing and maintaining shade cover in wetland cells, plant shrubs and trees on adjacent upland slopes to increase shading.
- Manage nuisance invasive plant species such as reed canary grass.
- Conduct site maintenance and response to minimize preferential flow paths that may contribute to localized loss of vegetation (ongoing).
- Mimic the natural hydroperiod before annual startup and at the beginning and end of the dry season by adjusting water levels and flow.
- Minimize over-inundation and allow for plant establishment and recovery. Partly or fully drain NTS vegetated cells via gravity or mechanical dewatering as needed in spring

before starting NTS operations. This exposes bare substrate, enabling planting and seeding and promoting the establishment of young vegetation before the start of flow.

- Send flows through the NTS during the high flow period in spring and autumn as needed to support plant health

Pest Management

Pest species such as carp and nutria feed extensively on plant roots to a degree that is unsustainable and damaging to the ecosystem. This activity contributes to expanding the open water with minimal shade and may increase sediment suspension. Carp burrow into sediments to lay eggs, which increases turbidity levels. Additionally, burrowing by nutria can lead to berm erosion. Pest management aims to decrease the number of pest species present in the NTS and limit the damage resulting from them. Due to the location of the NTS within the floodplain, it is impossible to eradicate problem species permanently; fish are reintroduced from the river via annual flooding, and excluding nutria is functionally impossible. Ongoing management is required and will include strategies such as:

- Minimize open water areas where carp tend to thrive, primarily in spring, to reduce carp populations.
- Consult fisheries experts on management techniques.
- Identify and incorporate native wetland plants that are less vulnerable to animal damage.
- Control nutria populations.
 - Annual contract with Animal and Plant Health Inspection Service (through U.S. Department of Agriculture) to assist with nutria management.

Physical Assets Assessment and Earthwork

The NTS physical infrastructure includes a system of berms and weirs that can be adjusted to control flow into and out of cells. Earthwork, weirs, weir boxes/lids, and weir gates need to be regularly monitored and maintained to allow for desired flows and treatment. Measures will include:

- Conduct routine inspections during the operating season.
 - Identify and implement opportunities for repair and maintenance.
- Conduct ongoing maintenance to reduce potential sources of sediment.
- Clean NTS outlet vault at least monthly during the low river flow season.
- Conduct pre- and post-dry season surveys using fall drone flights and seasonal walk-throughs to identify areas to target for repair and maintenance:
 - Preferential flow paths.
 - Bare substrate scoured during winter flooding.
 - Zones with extensive nutria and pest damage.
- Respond to emergent conditions during dry season operations:
 - Place temporary flow barriers (e.g., coir logs, rocks, sod mats, logs, or wooden post weirs) to prevent short-circuiting.
 - Regular checks and manual clearing of debris from weir boxes.
- Perform offseason maintenance:
 - Restore damaged berms. Where appropriate, block nutria burrows and stabilize the toe of the slope with barriers (e.g., rocks or chain-link fencing) to prevent further damage.

- Conduct more permanent earthwork to correct or reverse preferential flow paths and minimize short-circuiting.

Compliance Monitoring Plan and Target Effluent Concentrations

The startup, flow control, and maintenance plans described above are geared toward optimizing the quality of the effluent discharged from the NTS. CWS will implement these measures and monitor to verify that water quality targets and limits are being met and to assess the effectiveness of different strategies. Monitoring will include parameters in Table 1.

During dry season conditions when the NTS is in use, F001 represents the monitoring location at the NTS outlet structure. The Forest Grove WRRF serves as an internal monitoring point (F004) to characterize the initial quality of the water being released to the NTS. If the composite sampler at the NTS outlet fails, manual grab samples may be composited under certain circumstances; refer to Table B8 note e and Internal Memo “24-hour composite sample procedure at Forest Grove NTS” (July 2023) for procedures.

Table 1. NTS Effluent Monitoring (Outfall F001)

Parameter	Limits	Monitoring Frequency	Sample Type
CBOD ₅	10 mg/L (monthly median) ^a 15 mg/L (weekly median) ^a	3/week	24-hour composite
TSS	10 mg/L (monthly median) ^a 20 mg/L (weekly median) ^a	3/week	24-hour composite
Dissolved Oxygen	6.0 mg/L or greater as a daily average	Daily	Continuous
pH	6.3 to 9 SU	2/week	Grab
Thermal Shock Thermal Load ^b	85 million kcal/day (May) 68 million kcal/day (June) 93 million kcal/day (July) 76 million kcal/day (August) 60 million kcal/day (September) 69 million kcal/day (October)	N/A	Calculation
Excess Thermal Load ^c	7 million kcal/day (offset with water quality trading program)	N/A	Calculation
Total Phosphorus	81.6 lb/d – monthly median TP mass load from R001 (monthly median limit) 66.1 lb-d – monthly median TP mass load from R001 (seasonal median limit) (Applies May 1 – September 30)	2/week	24-hour composite
Ammonia (as N) for DO	Bubbled Tier 1 and Tier 2	3/week	24-hour composite

Notes:

^a Per note (i) in Table A1 of the 2022 NPDES Permit:

- The operation of the NTS can be impacted by extreme unpredictable natural and physical events that are determined by DEQ to impact the ability for the NTS to properly meet limits (e.g., declared droughts, smoke from forest fires, flash flooding, etc.). Such events are expected to be rare, infrequent and of limited duration, and can affect the ability of the NTS to meet the CBOD₅ and TSS monthly and weekly median concentration limits. During such an event, the permittee must ensure that the following requirements are met:

- i. The permittee must notify DEQ of the event as soon as practicable, but no later than three business days, after receiving any single F001 discharge sample result exceeding the weekly median values for CBOD5 or TSS. The notice must include a description of the abnormal event suspected of causing the elevated CBOD5 or TSS discharge concentration; the estimated duration of the abnormal event if it is ongoing; and any steps that the permittee is taking to reduce CBOD5 or TSS discharge concentrations in response to the abnormal event.
- ii. Monitoring of the Forest Grove WRRF effluent at internal monitoring location (Outfall F004) meets the CBOD5 and TSS concentration targets in Table A1-1 below:

Table A1-1 Target Concentrations for CBOD5 and TSS at Forest Grove WRRF Effluent

Parameter	Monthly Average	Weekly Average
CBOD5	15 mg/L	25 mg/L
TSS	20 mg/L	30 mg/L

- iii. Monitoring of the effluent from the Forest Grove NTS outlet structure F001 meets the following effluent limits in Table A1-2 below:

Table A1-2 Effluent Limits for CBOD5 and TSS at NTS Outlet Structure

Parameter	Monthly Average	Weekly Average
CBOD5	25 mg/L	40 mg/L
TSS	30 mg/L	45 mg/L

- iv. Report exceedance of monthly or weekly median concentration limit for CBOD5 and TSS in discharge monitoring reports as required by Schedule B for the duration of exceedance. For each discharge monitoring report, the permittee shall include a statement describing any abnormal event that the permittee believes caused the exceedances, the estimated duration of the abnormal event if it is ongoing, the reasons the permittee believes that the exceedances were caused by the abnormal event, the measures that the permittee undertook to implement the NTS Operations Plan in response to the abnormal event, any steps that the permittee is taking to reduce CBOD5 or TSS discharge concentrations in response to the abnormal event and any adaptive management actions that the permittee will take in anticipation of similar future events.
- v. Provided that the permittee was operating the NTS per the NTS Operations Plan required by Condition D.12 of this permit at the time of the event, complied with the target concentrations in Table A1-1 and prepared the required documentation and reporting of the event, the limits in Table A1-2 will apply for the duration of the event.
- j. For all NTS start-up periods, the following limits apply to any calendar week for seven days after start-up, provided the permittee has implemented the NTS Operations Plan required by Schedule D.12 of this permit and complies with the internal Outfall F004 CBOD5 and TSS concentration targets in Table A1-1:”

Table A1-3 Weekly Effluent Limits for CBOD5 and TSS for NTS Start-Ups

Parameter	Weekly Average
CBOD ₅	40 mg/L
TSS	45 mg/L

- b Based on thermal plume requirements; temperature not to exceed 32 C
- c Based on Tualatin sub-basin Temperature TMDL wasteload allocations

Interpretive note: The 7-day start-up period and the rest of the calendar week have different TSS and CBOD limits. The 7-day start-up period may break over two weeks if the start-up period begins any day other than Sunday. “Week” is defined in NPDES permit definitions as Sunday-Saturday. Therefore, the 7-day start-up period limits apply until the end of the calendar week after the start-up period ends.

In addition to the parameters in Table 1, CWS will monitor for NH₃-N, TKN, nitrates, metals, copper Biotic Ligand Model parameters, aluminum parameters, and toxics, as well as Whole Effluent Toxicity testing, per permit requirements.

Table 2. TSS Action Levels

Number of Samples	Probability	Concentration	Action Levels
Single Sample	0.005	30 mg/L	Threshold indicating that levels of TSS are potentially elevated above permit limits and actions are needed to respond to elevated TSS

Applied Monitoring Program

CWS will also conduct monitoring within the NTS to support the optimization of operations. The applied monitoring will be updated annually and as needed to support operations. This monitoring will be carried out as needed and may include:

- Continuous temperature monitoring to evaluate the thermal impact of vegetation changes.
- Turbidity profiles to analyze whether flow strategies lead to reduced sediment suspension; select TSS monitoring to provide correlations to support the turbidity profiles.
- Longitudinal nutrient profiles and/or algal sampling.

Abnormal Conditions: Event Recognition, Prevention, Management

An abnormal event is any condition that results in or appears to be leading toward conditions that increase any regulated water quality parameters. Over the past year, abnormal conditions have caused elevated levels of TSS. Abnormal events are defined in comment (i) of Table A1. An event may be identified through routine monitoring or maintenance activities, including walk-throughs, data review, planned or unplanned maintenance, or severe weather alerts. For example, construction at the Forest Grove facility may cause termination of flow to the NTS, resulting in a substantial change to the flow pattern. Events may result in decreasing inflow to or outflow from the NTS, using alternate flow paths, or terminating flow and subsequent restart. Once initiated, event management will include initiating the communication plan, increasing monitoring as needed, and implementing the applicable components of an adaptive management action.

Adaptive Management Actions

CWS has identified short-term and longer-term adaptive management actions to optimize water quality and promote stable operations. Many of the strategies presented in this document include adaptive management elements.

Longer-term actions include targeted revegetation, berm restoration, and major projects such as infrastructure improvements that are planned and reviewed seasonally. Shorter-term adaptive management includes day-to-day responses such as removing debris and installing temporary flow barriers to limit short-circuiting and altering temporary flow paths within the NTS as described in the Flow Control Plan.

Short-term adaptive management actions are focused on optimizing temperature, dissolved oxygen, and TSS levels to meet permit limits for those parameters. Because of the five-day turnaround time for the CBOD test, short-term adaptive management actions are focused on optimizing TSS levels in the effluent, which will also be effective in optimizing CBOD levels. For all events, CWS will initially inspect and evaluate the NTS to determine the likely cause of the abnormal operating conditions. CWS may increase the monitoring of parameters. The following actions will be taken to meet DO, temperature, and TSS targets at the NTS outlet structure:

Dissolved Oxygen

- Ensure proper operation of aerators in the outlet structure.
- Control flow into the NTS outlet structure to ensure that aerators can maintain the target DO.
- Adjust the aperture of the weir gates leading into the NTS outlet structure to ensure aeration steps are available and not inundated during periods when DO is naturally lower in the wetland.
- Close outlet gate as necessary to ensure that the DO target is met.

Temperature

- Evaluate using the outlet weir gate to draw water from below the surface to ensure that the warmest water is not being discharged.
- Adjust discharge flow to meet thermal load limits specified in the table above.
- Close the outlet gate as necessary to ensure temperature and thermal load limits are met.

TSS

CWS will monitor NTS effluent TSS levels. If a significant increase in TSS is observed, staff will:

- Attempt to isolate the cause and initiate maintenance or repairs.
- Temporarily divert flow, if feasible and appropriate.
- Adjust water levels and flows during and after event response to minimize sediment suspension.
- Terminate discharge from the NTS if necessary.

If discharge from the NTS is projected to be interrupted for an extended period, Forest Grove WRRF effluent flow may be redirected away from the NTS to prevent the NTS from flooding. The need to divert Forest Grove WRRF flow would depend on multiple factors, including NTS water depth, Forest Grove WRRF effluent flow rate, and the cause and expected duration of the interrupted discharge from the NTS. If flow is diverted from the NTS, Forest Grove WRRF effluent flow will be directed to the Rock Creek WRRF until flows to the NTS resume.

In the event of a prolonged cessation of NTS discharge, CWS will follow the steps enumerated under the “Reintroduction of Effluent During Operational Period” section upon resuming flow into and out of the NTS.

Reporting Abnormal Events Outside of Reasonable Control

In the case of an abnormal event beyond CWS’ reasonable control, CWS will notify DEQ as soon as practicable, but no later than three business days after receiving any sample exceeding the weekly median value of 15 mg/L of CBOD₅ or 20 mg/L of TSS. The notice must include a description of the abnormal event suspected of causing the elevated CBOD₅ or TSS discharge concentration; the estimated duration of the abnormal event if it is ongoing; and any steps that the permittee is taking to reduce CBOD₅ or TSS discharge concentrations in response to the abnormal event.

Plan for End of Season and Wet Season

At the end of the dry season, the Forest Grove WRRF may discharge directly to the Tualatin River without sending flow through the NTS. In the past, the operation of the NTS at high flows during the winter and early spring has disrupted vegetative growth; high flows can dislodge seedlings and topsoil and inhibit effective rooting. Future strategies will aim to avoid wet-season NTS operations that may damage vegetation. However, the NTS may still be used for some periods outside the permit-defined dry weather season, such as to help establish plants in spring or if there is a prolonged dry period due to a delay in fall rains. When the NTS is offline during the wet season, CWS staff will evaluate the status of the NTS infrastructure and vegetation and carry out restoration work.

CWS will take the following actions:

- **Fall:** Stop sending flow into the NTS at the end of the dry season as needed to allow water levels to be drawn down before the start of regular winter rains. This will allow for fall-season restoration planting and late-season growth and rooting of macrophytes, giving them a better chance of survival during the annual winter inundation. Additional fall activities will include:
 - Divert the treatment plant effluent away from the NTS about a week before the weir gates close. Weir gates remain open for about a week within and at the outlet structure of the NTS to allow water drainage and minimize sediment deposition near gates. Monitoring requirements apply to both outlets during dual discharges.
 - Identify and schedule repairs and revegetation.
 - Begin earthwork restoration.
 - Review the status of major projects.
 - Conduct annual NTS operations and performance reviews and update the Operations Plan as needed.
- **Winter:** Minimize the use of the NTS to the extent feasible. If the NTS is used, limit wet season flows to a maximum of 6 MGD to avoid stressing dormant vegetation.
- **Spring:** Avoid discharging flow through the NTS from mid-March through late April to allow the NTS to naturally dewater and plants to propagate. Spring activities will include:
 - Conduct annual targeted wetland planting in March and April.
 - Carry out invasive plant management.

- Decrease water level in Fernhill Lake and dewater vegetated cells in NTS.
- Install monitoring equipment at the NTS outlet in mid- to late April.
- Coordinate debris management and clean-out of control structures before May 1.

Communication and Coordination

- Weekly coordination meetings will begin April 1 of each year and will continue through the dry season. Members of Forest Grove WRRF management, the Wetland Manager, and Operations Analysts will meet to discuss items including:
 - Prepare for initial NTS startup: vegetation, dewatering, pest management, Fernhill Lake dewatering, NTS filling schedule.
 - Construction coordination.
 - Flow status/flow management.
 - Data review.
 - WRRF process changes.
 - NTS maintenance needs and status of projects.
 - Event management.
 - Compliance status.
- The Forest Grove WRRF Superintendent, Operations Analyst, and Wetland Manager will communicate regularly regarding process or flow changes, operational incidents, maintenance activities, and other topics that require immediate attention.

Reporting

- Monthly data and operational notes included in monthly DMRs.
- By March 1 of each year, review the previous year's NTS Operations Plan, maintenance, and operational activities to determine if updates or revisions are needed. An updated NTS Operations Plan must be submitted to DEQ by March 31.
- If changes to the Operations Plan are deemed necessary, document revisions before the start of dry season operations.