City Council Workshop Agenda
Monday, January 06, 2025, 4:30 PM
Council Chambers, 616 NE 4th AVE

NOTE: The City welcomes public meeting citizen participation. TTY Relay Service: 711. In compliance with the ADA, if you need special assistance to participate in a meeting, contact the City Clerk's office at (360) 834-6864, 72 hours prior to the meeting so reasonable accommodations can be made (28 CFR 35.102-35.104 ADA Title 1)

To observe the meeting (no public comment ability)
- go to www.cityofcamas.us/meetings and click "Watch Livestream" (left on page)

To participate in the meeting (able to public comment)
- go to https://us06web.zoom.us/j/88548119347
(public comments may be submitted to publiccomments@cityofcamas.us)

CALL TO ORDER

ROLL CALL

PUBLIC COMMENTS

WORKSHOP TOPICS

1. C-TRAN Light Rail and Interstate Bridge Replacement Presentation
   Presenter: Leann Caver and Scott Patterson
   Time Estimate: 25 minutes

2. Fallen Leaf Lake Property Transfer from Columbia Land Trust
   Presenter: Steve Wall, Public Works Director
   Time Estimate: 5 minutes

3. Lacamas Lake Dam Improvements and Inspection Contract Amendment
   Presenter: Will Noonan, Public Works Operations Manager
   Time Estimate: 5 minutes

4. Ultraviolet Equipment Pre-purchase at Waste Water Treatment Plant
   Presenter: Rob Charles, Utilities Manager
   Time Estimate: 5 minutes

5. Staff Miscellaneous Updates
   Presenter: Doug Quinn, City Administrator
   Time Estimate:10 minutes

COUNCIL COMMENTS AND REPORTS

PUBLIC COMMENTS

CLOSE OF MEETING

C-TRAN

Board of Directors: IBR and LRT O&M Funding Update

December 10, 2024

« OUR COMMUNITY, OUR PROMISE »

C-TRAN Revision to MLPA Condition

Strike current A 2 language

~~C-TRAN will not be responsible for any costs for operations and maintenance of LRT in Vancouver or Clark County, including any new park and rides that may be constructed as part of the project. Items such as co-located station maintenance, security, and other operational support items may be considered by C-TRAN and its Board. If the IBR team recommends a scenario – beyond co-located station costs or security – where C-TRAN through the agency, any PTBA funding or tax initiative managed by the agency for fiscal responsibility of LRT operation and maintenance in any form, the C-TRAN Board of Director's approval of this MLPA will be immediately rescinded.~~

Proposed language for A 2

C-TRAN may participate in funding the operations and maintenance of the bi-state transit, including any new park-and-rides that may be constructed or co-located station maintenance, security, and other operational support as agreed to and part of the project.

IBR and LRT O&M Funding Update

Agenda

1. IBR SDEIS/FEIS Update
2. FTA Capital Investment Grant Process overview
3. C-TRAN Sales Tax Funding – Current options for funding LRT O&M

Interstate Bridge Replacement Current Status

- Draft Supplemental Environmental Impact Statement published Sept 20, 2024.
- DSEIS 60-day comment period closed Nov 18, 2024
- Final Supplemental Environmental Impact Statement Mid-2025
- FTA Rating Submittal early/mid-2026

Interstate Bridge Replacement

FTA Capital Investment Grant (CIG) program

- Longstanding discretionary/competitive FTA grant program with history of investing in transformative transit infrastructure around the country (and in this region)
- Lots of rules and procedures…
- New Starts Ratings - projects rated using FTA CIG Policy Guidance and Annual Reporting instructions

*** IBR hopes to secure $1 billion from FTA CIG grant**

Interstate Bridge Replacement

Capital Investment Grant (CIG) program

- Discretionary & Competitive Federal Grant Program
- Roughly $4.6 billion appropriated each year, through Bipartisan Infrastructure Law.
- Historical average federal share for projects in the program = 50%
- Demand for funds exceeds supply – 29 projects in current pipeline.

*** Impact of new Administration is potentially significant.**

Interstate Bridge Replacement

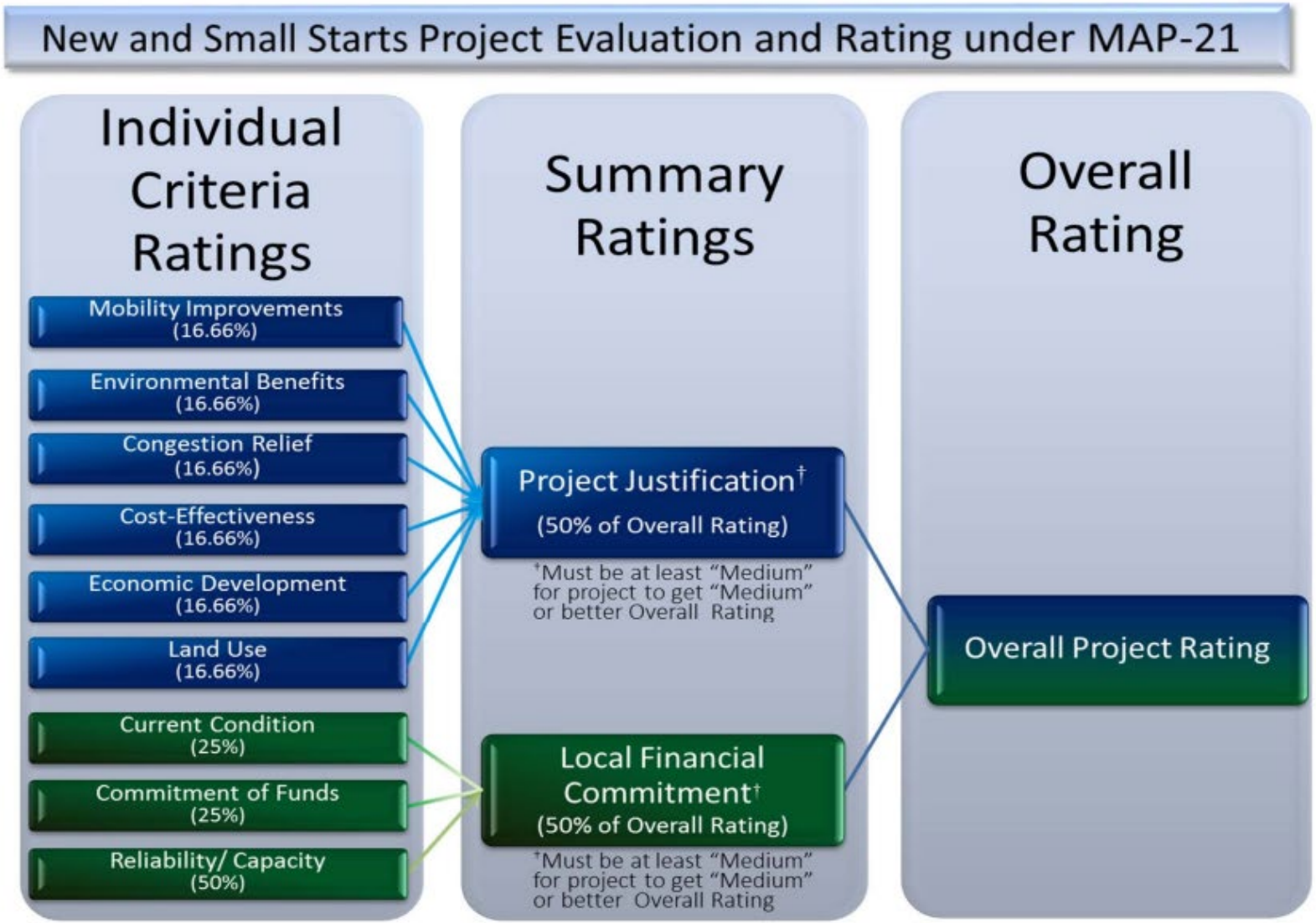
Capital Investment Grant (CIG) program

- Three distinct phases:
  - 1) Project Development: FTA approved IBR's request to begin this phase in September 2023. This phase is time limited to two years and is scheduled to expire in September 2025.
  - 2) Engineering: Design work that results in 100% final design. This also includes executing a Full Funding Grant Agreement with FTA at the very end. **This is when all LRT O&M funding must be committed (3-4 years from now).**
  - 3) Construction

Interstate Bridge Replacement

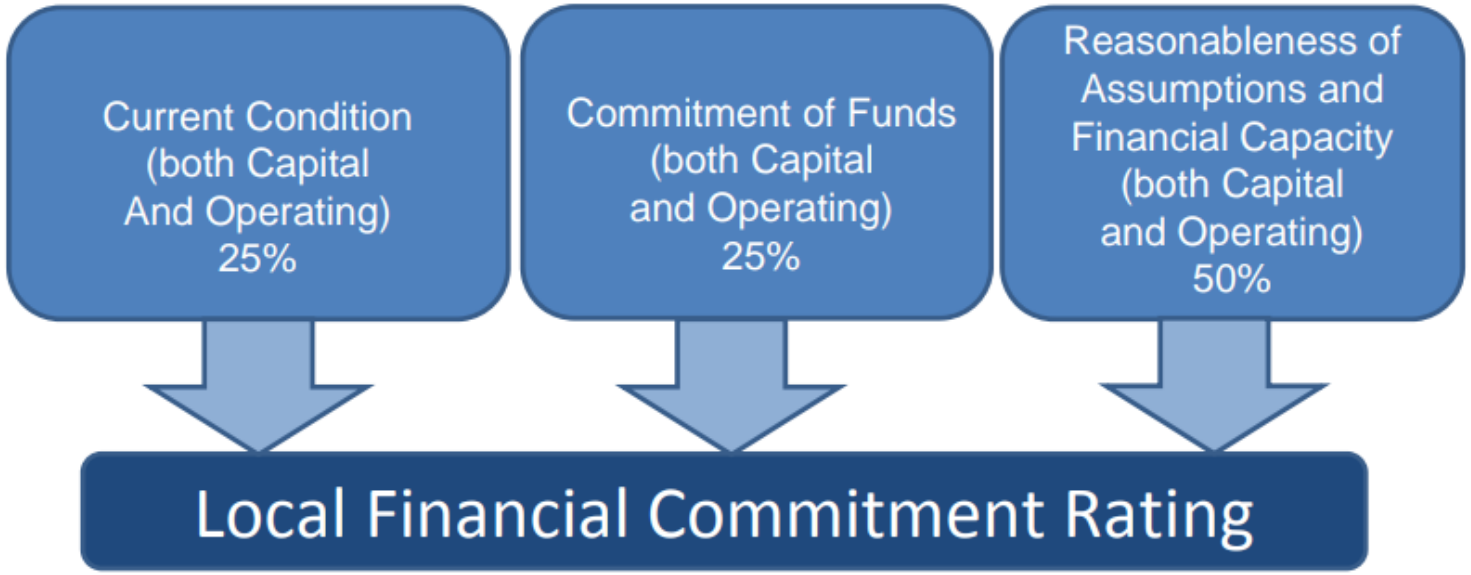
Capital Investment Grant (CIG) program

- All proposed projects must go through a multi-year, multi-step development process outlined in the law.
- FTA is required to evaluate and rate CIG projects on statutorily defined **project justification** and **local financial commitment**.
- Project must receive at least a “Medium” overall rating to advance through the steps in the process and receive a construction grant award (FTA requires annual updates with updated ratings).



Courtesy of FTA

Local Financial Commitment



To encourage overmatch, projects proposing less than 50% Section 5309 share will have their local financing commitment rating raised one level

Courtesy of FTA

Interstate Bridge Replacement

Capital Investment Grant (CIG) program

- IBR does not have a CIG rating and will not until it's first submittal packet that is currently scheduled for early/mid 2026.
- Before that submittal occurs, two key updates will take place:
  1. Capital Cost update for both LRT and the total project.
  2. Transit ridership update (current project ridership data based on 2019 pre-pandemic Metro regional model)

Interstate Bridge Replacement

O&M Cost Framework

- Boundary = limits of service (Expo to Evergreen)
- Geographic split = state line
  - Light Rail (LRT) = 55% Oregon/45% Washington O&M cost split
    - LRT guideway on MLPA is 9,690 ft long
    - The State Line is 5,300 ft north of EXPO station
    - Oregon 5,300 ft. / 9,690 ft = 0.547 **(55%)**
    - Washington 4,390 ft. / 9,690 ft = 0.453 **(45%)**
  - Express Bus = 62% Oregon/38% Washington O&M cost split
    - 101 & 105 combined Express bus total route miles is 54.1 miles
    - Washington 20.382 mi/54.1 mi = 0.375 **(38%)**
    - Oregon 33.791 mi/54.1 mi = 0.625 **(62%)**

Interstate Bridge Replacement

Opening Day O&M Cost

- Based on 2019 Modified Locally Preferred Alternative (MLPA) Travel Demand forecast; Service headways
- Costs are escalated to Opening Day FY2033 dollars at an average inflation rate of 4.5%
  - TriMet Light Rail O&M escalated cost = $20,238,570
  - C-TRAN Express O&M escalated cost = $1,551,920
  - Total Light Rail + Express Bus O&M cost = **$21,790,490**

Interstate Bridge Replacement

O&M Cost SDEIS

- Applies estimated fare recovery of 25%
  - $21.8M - $5.45M (25%) = $16.35M
- TriMet share
  - $8,348,411 (OR LRT only)
  - $ 721,643 (OR Express Bus only)
  - $9,070,054 Total FY2033
- WA funding source share
  - $6,830,518 Total FY2033 (WA LRT only)
- C-TRAN share
  - $ 442,297 Total FY2033 (WA Express Bus only)

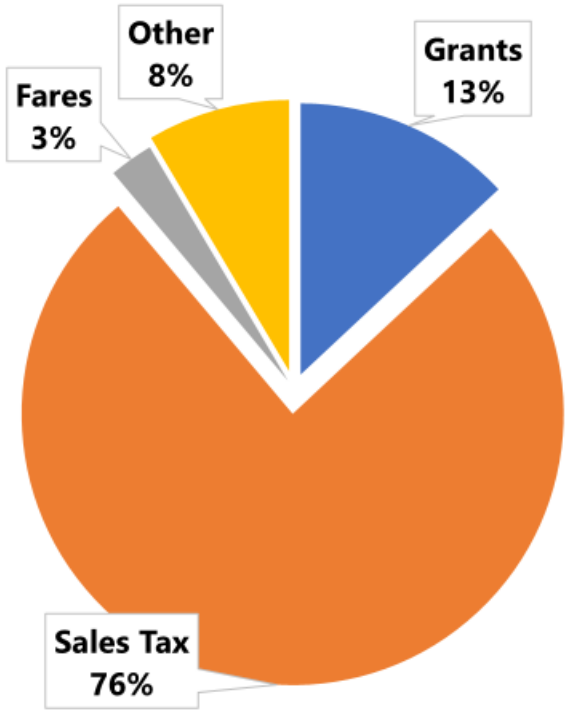
LRT & Express Bus Split	
WA LRT Share (45%)	$6,830,518
OR LRT share (55%)	$8,348,411
FY2033 LRT Costs	**$15,178,929**
WA Express Bus share (38%)	$442,297
OR Express bus Share (62%)	$721,643
FY2033 Express Bus Costs	**$1,163,940**
Total FY2033 IBR O&M	**$16,342,869**
Washington Share of all O&M	45%
Oregon Share of all O&M	55%

C-TRAN Sales Tax Funding Overview

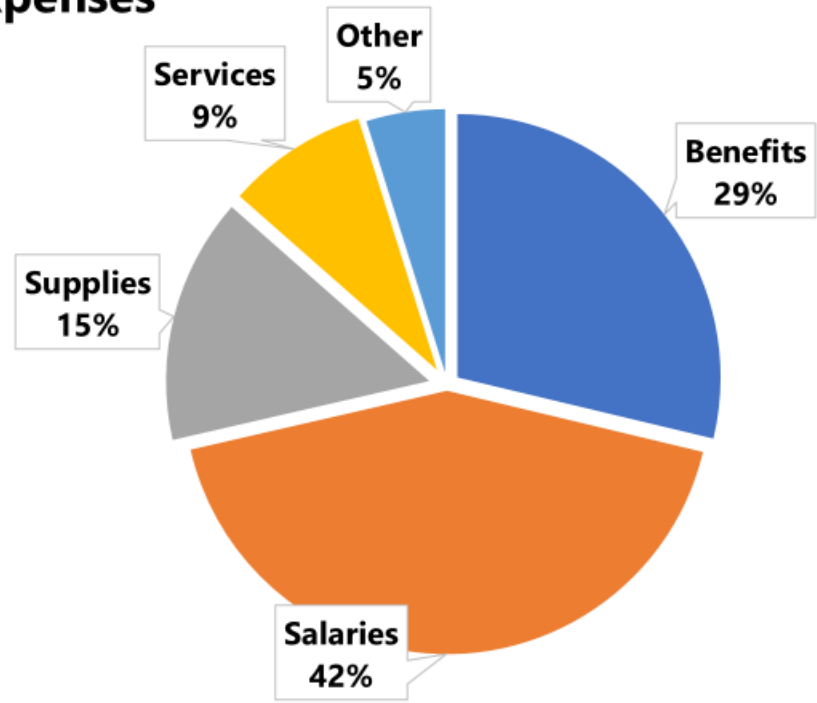
- RCW 82.14.045 (Sales and Use taxes for public transportation)
- Voter approval required for all public transit agencies in the state of Washington, including C-TRAN (up to 0.9% - 9 cents on $10 purchase)
- C-TRAN currently collects 0.7% (0.2% voter approved authority remains)
  - 1980 – Voters approved 0.3% sales tax (county-wide plus state match)
  - 2005 – Voters approved a 0.2% increase to make it 0.5%
  - 2011 – Voters approved a 0.2% increase to make it 0.7%

Funding snapshot

2023 Revenue



2023 Expenses



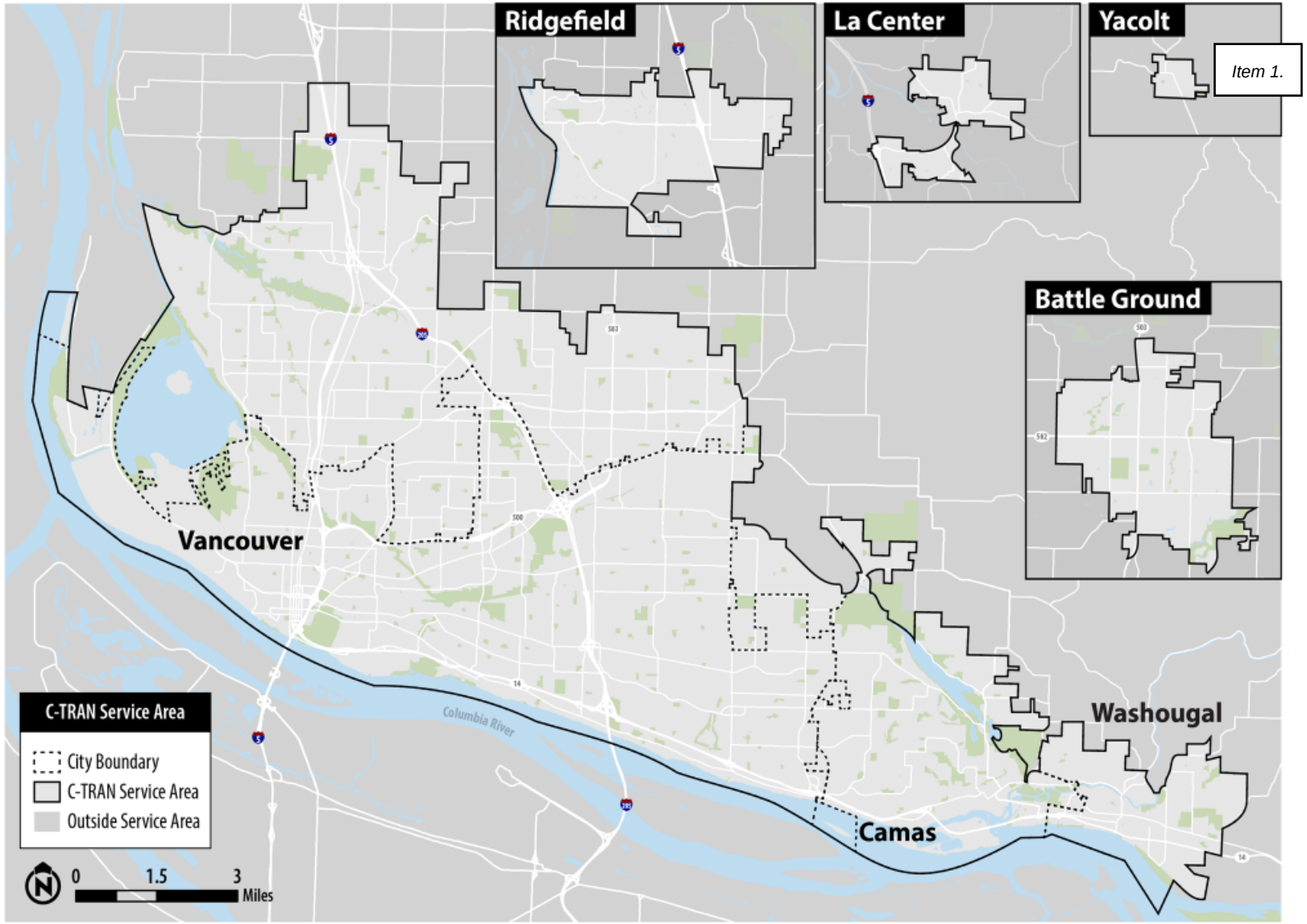
C-TRAN Sales Tax Funding Overview

- C-TRAN 2045 Plan still in development assumes seeking voter approval for the final 0.2% for both service preservation and improvements throughout the PTBA.
- Current projections show this could be in the next 6-7 years as that may be the point when revenue will not be sufficient to meet the level of transit service.
- Both financial and service concepts continue to be developed and staff is looking at a full day Board workshop likely in Q2 2025 to provide more information.

C-TRAN LRT O&M Existing Options

1. RCW 82.14.105 – Seek voter approval for a 0.1% or a 0.2% sales tax increase as noted and discussed in the previous slides.
2. RCW 81.104.170 – High Capacity Transit Sales Tax
   - Voter approved PTBA wide sales tax up to 0.9%
3. RCW 81.104.200 – High Capacity Transit Sales Tax
   - Voter approved "sub-district" sales tax up to 0.9%
   - This provides an option of not taxing the full PTBA, rather a smaller geographic area which could include the city of Vancouver or other variations as well.

C-TRAN Service & Taxing Boundary



Recommended Next Steps

- There is no pressing need to advance a specific LRT O&M funding strategy at this time.
- As we move into 2025, we will be able to better assess how the FTA CIG program will be administered with a new Administration.
- The LRT O&M and capital costs will be updated once new ridership modeling is completed.
- C-TRAN will be able to advance and hopefully complete its C-TRAN 2045 Plan.

Questions?

Table 2: Financial Plan Rating Standards

	High	Medium High	Medium	Medium Low	Low
Current Capital and Operating Condition (25% of local financial commitment rating)	• Average bus fleet age under 6 years. • Current ratio exceeding 2.0 • Bond ratings less than 2 years old (if any) of AAA (Fitch/S&P) or Aaa (Moody's) • Historical positive cash flow. No cash flow shortfalls. • No service cutbacks in recent years.	• Average bus fleet age under 6 years. • Current ratio exceeding 1.5 • Bond ratings less than 2 years old (if any) of AA (Fitch/S&P) or Aa3 (Moody's) or better • Historical positive cash flow. No cash flow shortfalls. • No service cutbacks in recent years.	• Average bus fleet age under 8 years. • Current ratio exceeding 1.2 • Bond ratings less than 2 years old (if any) of A (Fitch/S&P) or A3 (Moody's) or better • Historical positive cash flow. No cash flow shortfalls. • Only minor service adjustments in recent years	• Average bus fleet age under 12 years. • Current ratio exceeding 1.0 • Bond ratings less than 2 years old (if any) of BBB+ (Fitch/S&P) or Baa (Moody's) or better • Historical positive cash flow. No cash flow shortfalls. • Major service cutbacks in recent years.	• Average bus fleet age of 12 years or more. • Current ratio less than1.0 • Bond ratings less than 2 years old (if any) of BBB (Fitch/S&P) or Baa3 (Moody's) or below • Recent historical cash flow problems. • Major service cutbacks in recent years.
Commitment of capital and operating funds (25% of local financial commitment rating)	• At least 75% of the Non-Section 5309 capital funds are committed or budgeted. • At least 75% of the funds needed to operate and maintain the proposed transit system in the opening year of the project are committed or budgeted.	• At least 50% of the Non-Section 5309 capital funds are committed or budgeted. • At least 50% of the funds needed to operate and maintain the proposed transit system in the opening year of the project are committed or budgeted.	• At least 30% of the Non-Section 5309 capital funds are committed or budgeted. • At least 30% of the funds needed to operate and maintain the proposed transit system in the opening year of the project are committed or budgeted.	• At least 10% of the Non-Section 5309 capital funds are committed or budgeted. • While no additional operating and maintenance funding has been committed, a reasonable plan to secure funding commitments has been presented.	• Less than 10% of the Non-Section 5309 capital funds are committed or budgeted. • The applicant does not have a reasonable plan to secure operating and maintenance funding.
Reasonableness of capital and operating cost estimates and planning assumptions/capital funding capacity (50% of local financial commitment rating)	• Financial plan contains very conservative planning assumptions and cost estimates when compared with recent historical experience. • The applicant has access to funds via additional debt capacity, cash reserves, or other committed funds to cover cost increases or funding shortfalls equal to at least 50% of estimated project cost and 50% (6 months) of annual system wide operating expenses.	• Financial plan contains conservative planning assumptions and cost estimates when compared with recent historical experience. • The applicant has access to funds via additional debt capacity, cash reserves, or other committed funds to cover cost increases or funding shortfalls equal to at least 25% of estimated project cost and 25% (3 months) of annual system wide operating expenses.	• Financial plan contains planning assumptions and cost estimates that are consistent with recent historical experience. • The applicant has access to funds via additional debt capacity, cash reserves, or other committed funds to cover cost increases or funding shortfalls equal to at least 15% of estimated project cost and 12% (1.5 months) of annual system wide operating expenses.	• Financial plan contains optimistic planning assumptions and cost estimates when compared to recent historical experience. • The applicant has access to funds via additional debt capacity, cash reserves, or other committed funds to cover cost increases or funding shortfalls equal to at least 10% of estimated project cost and 8% (1 month) of annual system wide operating expenses.	• Financial plan contains planning assumptions and cost estimates that are far more optimistic than recent history suggests. • The applicant has a reasonable plan to cover only minor (< 10%) capital cost increases or funding shortfalls. • Projected operating cash balances are insufficient to maintain balanced budgets.

Staff Report

January 6, 2025 Council Workshop Meeting

Fallen Leaf Lake Property Transfer from Columbia Land Trust
Presenter: Steve Wall, Public Works Director
Time Estimate: 5 minutes

Phone	Email
360.817.7899	swall@cityofcamas.us

BACKGROUND: The three properties shown in Figure 1, which are located on the north, west, and south sides; respectively, of Fallen Leaf Lake, were purchased by the Columbia Land Trust (CLT) in 1999. CLT is a nonprofit nature conservancy corporation as defined by RCW 64.04.130. The primary purpose of CLT is to conserve natural resources and open space for the benefit of the public, consistent with its corporate charter, tax-exempt status, and acquisition policies.

The parcels were acquired for conservation purposes using Clark County, WA Conservation Futures Funding. The three properties consist of approximately 43.43 acres identified by parcel numbers 90850000 (1.09 acres), 90245000 (30.45 acres) and 90229000 (11.89 acres). The City originally intended to acquire title to the Property using Conservation Futures Funding provided through Clark County. The property was consistent with the City's plans and goals to provide open space and recreation lands along Fallen Leaf Lake, and was also consistent with the Conservation Futures Natural Areas Acquisition Plan. However, the City desired to defer the acquisition of title to maximize its opportunities to obtain grants and other funds. Pending acquisition, the City desired to have title held by CLT.

CLT was willing to acquire and hold title to the Property on an interim basis and to convey the Property to the City upon request. The City and CLT have abided by the terms of a Memorandum of Understanding dated April 12, 1999, most recently amended June 17, 2024. The Parties continue to honor the terms of that MOU.

SUMMARY: The attached Property Transfer/Purchase Agreement provides for the terms and conditions of CLT transferring title of the three properties to the City. As per the terms of the agreement, payment by the City includes using the services of CLT to work with the Title Company and record all necessary documents with Clark County.

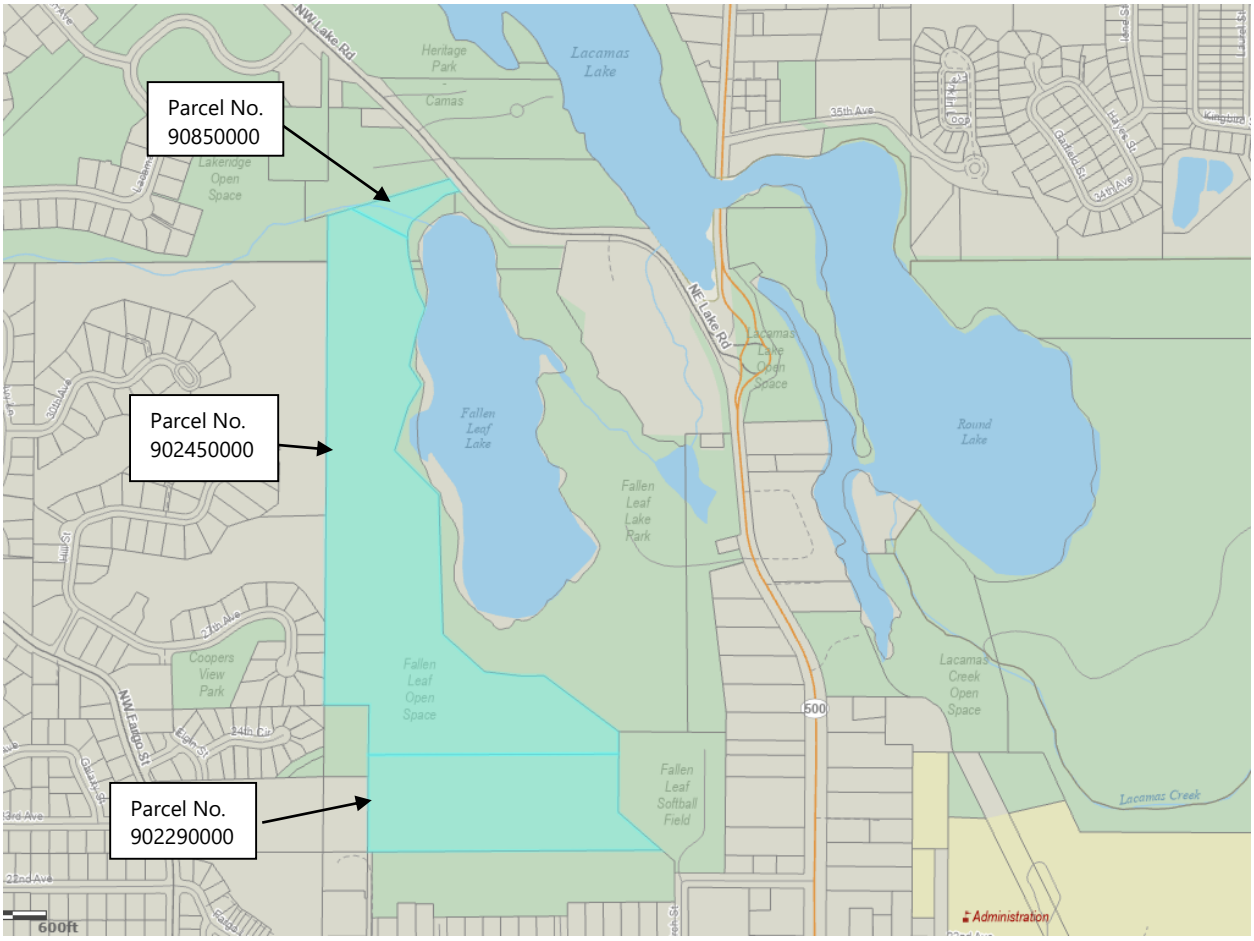


Figure 1: Properties to be Transferred from Columbia Land Trust to City of Camas

BENEFITS TO THE COMMUNITY: The land associated with the three parcels to be transferred has been held in ownership ("title") by CLT, but maintained by the City and available for public use since the date of purchase. Transferring title to the City will ensure continued use and enjoyment by the Public and is consistent with the objectives of the Parks, Recreation and Open Space (PROS) Plan.

BUDGET IMPACT: As identified in the Transfer Agreement, the City would pay $31,500 to Columbia Land Trust which shall be considered payment in full for all outstanding stewardship fees, acceptance of Title and transaction costs associated with the transfer.

RECOMMENDATION: Staff recommends the City Council place this item on the January 21, 2025 Consent Agenda for consideration.

PROPERTY TRANSFER/PURCHASE AGREEMENT

The City of Camas, Washington and Columbia Land Trust hereby make the following agreement regarding the transfer of interest in real property.

RECITALS:

1. The Parties:

The parties to this agreement are the City of Camas, a municipal corporation of the State of Washington, hereafter referred to as City, and Columbia Land Trust, a nonprofit corporation organized under the laws of the State of Washington, with its principal place of business in Vancouver, Washington, hereafter referred to as Land Trust. Columbia Land Trust is a nonprofit nature conservancy corporation as that term is defined by RCW 64.04.130. The primary purpose of the Land Trust is to conserve natural resources and open space for the benefit of the public, consistent with its corporate charter, tax-exempt status and acquisition policies.

2. The Property:

The real property which is the subject of this agreement consists of approximately 43.43 acres known as "Fallen Leaf Lake" identified by parcel numbers 90850000 (1.09 acres), 90245000 (30.45 acres) and 90229000 (11.89 acres). The Property is located on the north, west, and south sides; respectively, of Fallen Leaf Lake in Camas, WA. Full legal descriptions of these parcels are attached to this agreement as "Exhibit A", and is hereby incorporated by reference. The parcels were acquired for conservation purposes using Clark County, WA Conservation Futures Funding.

3. The Parties' Mutual Interest in the Property

The City intended to acquire title to the Property, using Conservation Futures Funding provided through Clark County, WA, consistent with the City's plans and goals to provide open space and recreation lands along Fallen Leaf Lake, which is also consistent with the Conservation Futures Natural Areas Acquistion Plan. The City desired to defer the acquisition of title in order to maximize its opportunities to obtain grants and other funds. Pending acquisition, the City desired to have title held by the Land Trust.

Land Trust was willing to acquire and hold title to the Property on an interim basis and to convey the Property to the City upon request.

The City and the Land Trust have abided by the terms of a Memorandum of Understanding dated April 12, 1999 as most recently amended by an Amendment 3 regarding the Property dated June 17, 2024 (the "MOU"). The Parties continue to honor the terms of that MOU and confirm its terms.

4. Land Trust agrees to transfer title of the Property to the City, subject to the following terms and conditions:

a) City and Land Trust have executed this property transfer/purchase agreement;

b) Land Trust shall furnish any legal and due diligence documents in the Land Trust's possession to City related to the MOU;

c) Upon request, Land Trust shall furnish City all annual inspection and management reports regarding the Property prepared by Land Trust during the time Land Trust held title to Property

d) Land Trust shall transfer title by bargain and sale deed, subject to a deed restriction requiring that the Property remain in conservation as a park and/or natural area;

e) The City will purchase title insurance in the full fair market value of the Property; and

f) The City shall pay all escrow fees and closing costs, including, but not limited to, recording fees, taxes and title insurance premiums.

5. Compensation:

City agrees to pay Land Trust $31,500 in consideration for the Land Trust holding title to the Property for an extended period of time. Compensation shall be considered as payment in full for all outstanding stewardship fees, acceptance and holding of title for the Property consistent with previous and current agreements, and for any transaction costs associated with the tranfer of Fallen Leaf Lake property.

6. Indemnity:

City agrees to reimburse, save, indemnify, protect, defend and hold harmless the Land Trust and its officers, directors, employees and agents from and against any and all claims, losses, liabilities, costs, damages and expenses (including reasonable attorneys' fees at trial, including any trial or proceedings in bankruptcy and on any appeal or review) incurred by the Land Trust or the other indemnified parties arising in any manner out of the operations or activities of the City or in connection with the Property before or after the Closing. The indemnity obligations set forth in this Section 6 shall survive Closing and the recordation of the deed conveying the Property to the City. CLT hereby certifies that to the best of their knowledge there are no pending claims related to the property nor are they aware of any incidents which may reasonably result in any claim for damages being presented.

7. General Provisions:

a. Names, addresses and notices:

All notices and correspondence shall be addressed to the parties, as follows:

COLUMBIA LAND TRUST
850 Officers' Row
Vancuver, WA 98661
(360) 696-0131

CITY OF CAMAS
City Hall
616 NE 4th Ave.
Camas, WA 98607
(360) 834-6864

b. Counterparts:

The parties may execute this agreement in two or more counterparts, which shall, in the aggregate, be signed by the authorized agents for both parties, and each counterpart shall be deemed an original instrument as against the party who signed it.

c. Amendments:

This Agreement constitutes the entire agreement between the parties. Any amendment to this Agreement shall be in writing and signed by both parties.

8. Choice of Law, Jurisdiction and Venue:

This agreement is governed by the law of the State of Washington. The Superior Court of Clark County, State of Washington, and this Agreement shall be governed by Washington law. The prevailing party in a lawsuit to enforce the terms of this Agreement shall be entitled to recover from the other its reasonable attorney's fees and costs.

EXECUTED on the _____ day of _____, 2025.

APPROVED AS TO FORM ONLY:

By:_____

CITY OF CAMAS, WASHINGTON

By:_____ Date:_____
Steven C. Hogan
Mayor

COLUMBIA LAND TRUST

By:_____ Date:_____
Meg Rutledge
Executive Director

Exhibit A
Legal Description of the Property

Staff Report

January 6, 2025 Council Workshop Meeting

Lacamas Lake Dam Improvements and Inspection Contract Amendment
Presenter: Will Noonan, Public Works Operations Manager
Time Estimate: 5 minutes

Phone	Email
360.817.7983	wnoonan@cityofcamas.us

BACKGROUND: In 2018, the City took ownership of the two dams on Round Lake from Georgia Pacific. The dams fall under the jurisdiction of the Washington State Dept of Ecology and must be inspected annually. The City has contracted with Stantec since taking ownership of the dams to complete the required annual inspections.

In addition to the annual inspections, the City has contracted with Stantec to complete design of the Dam Gate Improvements at the upper dam. The gate improvements were intended to be completed in 2024. Unfortunately, the improvements have been pushed back to 2025 due to an access issue to the upper dam through County property. The bridge on the access road has been deemed structurally deficient and closed. The new contract will include the necessary verbiage for prospective bidders to account for this in their bids.

SUMMARY: The intention is to amend the current contract with Stantec to include inspection for one more year, 2025. Additionally, staff has asked Stantec to move forward with a temporary solution to the bridge issue so the Dam Gate Improvements project can go out to bid in 2025. Stantec is going to provide inspection services for the gate improvements, and it will be most efficient to extend their annual inspection duties another year since they are already going to be onsite.

BUDGET IMPACT: This will be an amendment to the original contract. This addition is not to exceed $18,541. The adopted 2025 budget for the Stormwater Fund has sufficient budget to support this contract amendment.

RECOMMENDATION: Staff recommends this item be placed on the January 21st, 2025 Council Regular Meeting Agenda for Council's consideration.

Exhibit "A" Scope of Services
Amendment 3

Summary

In accordance with the original Contract P1018 dated 1 August 2022 and Amendments 1 and 2 thereto, this Amendment 3 alters the terms of the contract as detailed below.

1. The Contract's completion date will be extended to **31 December 2025** to accommodate the updated schedule of completion of the projects.

2. The scope and budget will be updated as shown below to include the addition of the performance specifications and bid document creation for the addition of a temporary bridge. Scope of construction work will be added to the current bid package for the gate and valve replacement. Currently, it's anticipated that bid package will be issued in Q1 of 2025 and construction will be completed in 2025.

3. The scope will be updated as shown below to include State of Washington Department of Dam Safety dam inspections for calendar year 2025.

   a. This addition of one more annual dam inspections to the scope will result in an increase of **$18,540.65** to the current Contract value of **$199,350.00** to **$217,890.65**

4. Adoption of revised labor rate schedule. Stantec has not modified the professional services labor rate schedule since inception of the agreement in August of 2022. Since the duration of services has now been extended through 2025, the following rate table will become effective November 1, 2024 and will be valid through December 31, 2025.

November 1, 2024 thru December 31, 2025 – Project Rate Table – Lacamas Dam	
Labor Classification	**Rate**
Accounting / Admin	$120
Designer 1	$135
Designer 2	$155
Deputy Project Manager	$165
Associate Project Engineer	$165
Project Engineer	$195
Senior Project Engineer / Cost Estimator	$215
Discipline Lead	$245
Principal / Subject Matter Expert	$270
Project Manager	$270

Scope of Work

Stantec will perform the additional scope of services identified as Task 12000 and Task 13000 with the acceptance and execution of Amendment 3. No other scope modifications will result to the current contract and as amended by Amendment 1 and 2.

Task 12000 – 2025 Dam Safety Inspection.

12000.1 Task Specific Objectives:

This is a three-part task, consisting of our initial meeting with the City, our preparation for the field inspection and the field inspection itself. The specific objectives of the task are:

A. Open and clear communication with the City, such that Stantec fully understands the goals of the inspection, and to share with the City any preliminary findings from the information review that may alter the focus of the inspection;

B. Pre-inspection preparation for the inspection to promote a thorough and efficient inspection during the time on-site. Stantec will prepare custom pre-printed inspection checklists that will capture specific City points of interest as well as any features of interest stemming from the information review;

C. Performance of a safe, efficient, and thorough field inspection of the dams and the appurtenant features. The items identified on the pre-printed checklists will be inspected as well as any other observations deemed to be pertinent to our inspection team. Items requiring repair will be identified.

12000.2 Task Specific Services and Assumptions:

A. Field Inspection - Stantec has allocated one full day for two professional engineers to walk the site and conduct a noninvasive inspection. We have assumed that the City will arrange for full site access. Our level of effort has assumed that the inspection will be limited to areas with access provided by the City. Areas not inspected due to access issues will be documented in the final report. This inspection will not include any drilling, sampling, or materials testing of the dam or foundation materials, and does not include any in-situ destructive or non-destructive testing.

B. Inspection Summary - Stantec will prepare a field observation and inspection summary along with completed inspection checklists and identification of items requiring repair. These documents will be used to prepare the reports identified below.

C. Draft Report - the draft report will include the findings from the field inspection and Stantec's overall assessment of the condition of the dams. A draft will be provided to the City for review and comment. If necessary, a teleconference with the City can be scheduled to address specific questions from the inspection that the City may have.

D. Final Report - Stantec will modify the draft report as appropriate in response to City comments. The Final report will be prepared in general compliance with Ecology's Dam Safety Guidelines.

E. Professional judgments presented in the final report will be based partly on the evaluation of technical information gathered and on Stantec's understanding of the characteristics of the dams. Stantec does not guarantee the performance of the dams in any respect, only that our engineering work and judgments · rendered meet the standard of care of our profession.

F. The opinions and recommendations contained in this Report are dependent on the accuracy, completeness, and correctness of the data, documents, and other information provided by the City or other third parties noted in the report, whether provided in writing or orally ("Information"). Information may include information and documents relating to the facility, personnel, systems, equipment, protocols, procedures and policies and the compliance by City employees, subcontractors and others with such requirements. If any of the Information is inaccurate, incomplete or incorrect, the opinions and recommendations of Stantec contained in the Report cannot be relied upon by the City.

G. Stantec's opinions and recommendations are provided based on assessment of the facility as of the date of this report based on the available information and our surface observations. If changes to existing conditions should occur, analysis, opinions, and recommendations by Stantec may no longer be valid and should not be relied upon.

H. The field inspection is scheduled for September 2025.

12000.3 Task Specific Deliverables:

Stantec will deliver the following:

A. PDF Draft Report transmitted via e-mail

B. PDF Final Report transmitted via e-mail

12000.4 Period of Performance

A. Stantec will begin work by preparing for the· field inspection a few days prior to the planned inspection. The inspection is scheduled for the last week September 2025 to coincide with a planned drawdown of the reservoir. Stantec will have the draft report to the City within 10 calendar days of the inspections. The final report will be presented to the City within 3 full working days of receiving comments from the City and resolving any questions.

12000.5 Not to Exceed Budget

A. Stantec will complete the services described in this task for a not to exceed budget of **$13,500** per the terms and conditions of the contract and Exhibit B of this amendment. This funding will be from a new budget allotment.

Task	Description	Personnel	Labor Rate	Hours	Total Labor Costs	Other Direct Costs	Total Costs
12000	2025 Annual Dam Inspection	Worthen, J.	$ 245.00	28	$ 6,860.00	$ 310.00	**$ 7,170.00**
		Brumley, B	$ 215.00	28	$ 6,020.00	$ 310.00	**$ 6,330.00**
Totals				56	**$ 12,880.00**	**$ 620.00**	**$ 13,500.00**

Task 13000 – Temporary Bridge Documents

13000.1 Task Specific Objectives:

The City has been working with Clark County (County) on the County's plan to replace a vehicular access bridge located to the west of NW TanOak Drive. The County has been delayed in replacing the bridge and the bridge is needed to be able to complete the gate and valve replacement project. Subsequently, the City has requested that Stantec develop performance requirements and bid documents necessary to define the needs of a temporary bridge to be design and installed by the Contractor as part of the gate and valve replacement project.

A. This Task 13000 will be to develop the performance requirements, baseline information including record drawings and bid documents and include the package with the existing bid package for the gate and valve replacement project that was developed in 2023. This gate and valve bid package has been held pending this replacement of the bridge by the County, however, with the delays, the City has elected to move forward with a temporary solution and the temporary bridge will be salvaged by the Contractor upon completion of the gates and valves replacement.

13000.2 Task Specific Services and Assumptions:

A. As of September 27, 2024, Stantec has completed Tasks 1000, 2000, 3000 and 4000 of the original agreement. Moreover, Stantec has also completed Tasks 5000 and 6000 of the agreement as modified by Amendment 1 and 2. See tables below:

Stantec Project Summary
Upper Lacamas Dam Gate Replacement
Project No. 2002006280
As of September 27, 2024

PHASE 1

Task	Description	Contract Amount	Amount this Invoice	Amount Previously Billed	Amount Billed to Date	% of Contract Maximum Amount	Contract Amount Remaining	Physical Percent Complete	Earned Value
1000	Upper Dam Spillway Gate Replacement Preliminary Design	$ 11,900.00	$ -	$ 11,515.00	$ 11,515.00	97%	$ 385.00	100%	$ 11,900.00
2000	Gates and Valve Automation Evaluation and Report	$ 58,200.00	$ -	$ 60,270.00	$ 60,270.00	104%	$ (2,070.00)	100%	$ 58,200.00
3000	2022 Annual Dam Safety Inspection	$ 12,350.00	$ -	$ 11,022.13	$ 11,022.13	89%	$ 1,327.87	100%	$ 12,350.00
4000	Project Management	$ 3,380.00	$ -	$ 2,972.50	$ 2,972.50	88%	$ 407.50	100%	$ 3,380.00
Totals		**$ 85,830.00**	**$ -**	**$ 85,779.63**	**$ 85,779.63**	**100%**	**$ 50.37**	**100%**	**$ 85,830.00**

PHASE 2

Task	Description	Contract Amount	Amount this Invoice	Amount Previously Billed	Amount Billed to Date	% of Contract Maximum Amount	Contract Amount Remaining	Physical Percent Complete	Earned Value
5000	90% Design	$ 39,600.00	$ -	$ 21,088.75	$ 21,088.75	53%	$ 18,511.25	100%	$ 39,600.00
6000	Final Design	$ 12,420.00	$ -	$ 3,971.25	$ 3,971.25	32%	$ 8,448.75	100%	$ 12,420.00
7000	Bid Support	$ 5,650.00	$ -	$ -	$ -	0%	$ 5,650.00	0%	$ -
8000	Construction Support	$ 22,100.00	$ -	$ -	$ -	0%	$ 22,100.00	0%	$ -
9000	Project Management	$ 8,250.00	$ 330.00	$ 2,617.50	$ 2,947.50	36%	$ 5,302.50	75%	$ 6,187.50
10000	2023 Annual Dam Inspection	$ 12,500.00	$ -	$ 6,771.02	$ 6,771.02	54%	$ 5,728.98	100%	$ 12,500.00
11000	2024 Annual Dam Inspection	$ 13,000.00	$ 2,354.65	$ -	$ 2,354.65	18%	$ 10,645.35	20%	$ 2,600.00
Totals		**$ 113,520.00**	**$ 2,684.65**	**$ 34,448.52**	**$ 37,133.17**	**33%**	**$ 76,386.83**	**65%**	**$ 73,307.50**
GRAND TOTAL		**$ 199,350.00**	**$ 2,684.65**	**$ 120,228.15**	**$ 122,912.80**	**62%**	**$ 76,437.20**	**80%**	**$ 159,137.50**

B. As shown in the above tables, (Contract Amount Remaining for Tasks 1000 through 6000 and Task 10000), $32,739.35 in contract funding is available for re-allocation. This Amendment 3 will re-allocate a portion of this amount ($27,500) into a new Task 13000 – Temporary Bridge.

C. Task 13000 – Temporary Bridge will consist of services as follows:

1. Developing recommended geotechnical parameters for the site to be used for design of the temporary bridge

2. Performing a one-day site visit by one engineer to document the roadway approach, existing conditions, and other pertinent site data.

3. Developing 90% and 100% Final drawing(s) for a conceptual temporary bridge that will span over, and be entirely separate from, the existing county-owned bridge.

4. Specifications for work will be based on WSDOT Division 6 General Special Provisions and refer to WSDOT Standard Specifications.

5. It is assumed the one coordination meeting will be held with the City and County to review the 90% Design Complete deliverables to receive any review comments, establishing any permitting or authorization requirements and to make the required modifications prior to finalizing the design. This coordination meeting will occur 7 to 10 calendar days after the 90% submittal.

6. Develop 100% documents for integration into the existing bid package for the gate and valve replacement.

13000.3 Task Specific Deliverables:

Stantec will deliver the following:

A. 90% Design Package transmitted via e-mail

B. 100% Design Package transmitted via e-mail

13000.4 Period of Performance

A. Stantec will begin work following acceptance of this Amendment No. 3. Preparation and completion of 90% design package will be achieved within 4 weeks of notice to proceed. 100% design package will be completed within 7 weeks of notice to proceed assuming one week of City/County review time post 90% design package submittal.

13000.5 Not to Exceed Budget

A. Stantec will complete the services described in this task for a not to exceed budget of **$27,500** however this will result in a no net change contract amount due to the re-allocation of remaining budget from Task 1000 through 6000 and Task 10000. Tasks 1000 through 6000 and Task 10000 will be closed to further charges.

Task	Description	Personnel	Labor Rate	Hours	Total Labor Costs	Other Direct Costs	Total Costs
13000	Temporary Bridge	Worthen, J.	$ 245.00	4	$ 980.00	$ -	**$ 980.00**
		Brumley, B	$ 215.00	8	$ 1,720.00	$ -	**$ 1,720.00**
		Deilami, H.	$ 245.00	30	$ 7,350.00	$ -	**$ 7,350.00**
		Zhaung, H.	$ 215.00	80	$ 17,200.00	$ 250.00	**$ 17,450.00**
Totals				122	**$ 27,250.00**	**$ 250.00**	**$ 27,500.00**

Task 7000 – Bid Support.

A. Following completion and acceptance of the 100% design package for the Temporary Bridge, Stantec will integrate these new documents into the existing bid package for the gate and valve replacement and prepare a final set of bid documents.

B. Additional time will be required to address questions and RFI's are anticipated in regard to the temporary bridge.

C. As noted, $32,739.35 in contract funding is available from Tasks 1000 through 6000 and Task 10000, however after re-allocation to Task 13000, only $5,239.35 remains of which $2,700 will be re-allocated to Task 7000 – Bid Support.

Task	Description	Personnel	Labor Rate	Hours	Total Labor Costs	Other Direct Costs	Total Costs
7000	Bid Support	Deilami, H.	$ 245.00	4	$ 980.00	$ -	**$ 980.00**
		Zhaung, H.	$ 215.00	8	$ 1,720.00	$ -	**$ 1,720.00**
Totals				12	**$ 2,700.00**	**$ -**	**$ 2,700.00**

D. This task will be increased by **$2,700** for a total task budget of **$8,350.**

E. All other scope of services, assumptions and deliverables of Task 7000 will remain unchanged.

Task 8000 – Construction Support.

A. Additional time will be required to review submittals, address RFI's and attend periodic site visits associated with the temporary bridge.

B. As noted, $32,739.35 in contract funding is available from Tasks 1000 through 6000 and Task 10000. However, after funding Tasks 13000 and 7000, only $2,539.35 is remaining. Task 8000 budget needs to be increased by $3,500 of which $2,539.35 will be re-allocated and $960.65 of new funding allotted.

Task	Description	Personnel	Labor Rate	Hours	Total Labor Costs	Other Direct Costs	Total Costs
8000	Construction Support	Deilami, H.	$ 245.00	4	$ 980.00	$ -	**$ 980.00**
		Zhaung, H.	$ 215.00	10	$ 2,150.00	$ 370.00	**$ 2,520.00**
Totals				14	**$ 3,130.00**	**$ 370.00**	**$ 3,500.00**

C. This task will be increased by **$3,500** for a total task budget of **$25,600.**

D. All other scope of services, assumptions and deliverables of Task 8000 will remain unchanged.

Task 9000 – Project Management

A. Additional time will be required due to the one-year extension of contract time.

B. New budget allotment will be made to Task 9000 – Project Management in the amount of $4,080.

Task	Description	Personnel	Labor Rate	Hours	Total Labor Costs	Other Direct Costs	Total Costs
9000	Project Management	Horne, A.	$ 120.00	18	$ 2,160.00	$ -	**$ 2,160.00**
		Rogers, S.	$ 120.00	16	$ 1,920.00	$ -	**$ 1,920.00**
Totals				34	**$ 4,080.00**	**$ -**	**$ 4,080.00**

C. This task will be increased by **$4,080** for a total task budget of **$12,330**

D. All other scope of services, assumptions and deliverables of Task 9000 will remain unchanged.

Schedule

The project's schedule is amended to the following:

Task	Schedule
Approval of Amendment Three	November 1st, 2024
Completion of 90% Design of Temporary Bridge	November 1st to December 15th, 2024
Completion of 100% Design of Temporary Bridge	January 1st to February 1st, 2025
Bid Support	March 1st to March 31st, 2025
Construction Support	June 1st to December 31st, 2025
2025 Dam Safety Inspections	September 1st to December 31st, 2025

Stantec

Exhibit "B" Fee Proposal
Amendment 3

Compensation for this additional Scope of Work will be on a time and materials basis utilizing the labor rate schedule and Other Project Direct Costs shown in the original Contract P1018, unless amended herein.

Table B-1 Updated Breakdown of Engineering Fees and Other Direct Charges by Task

Stantec Project Summary Upper Lacamas Dam Gate Replacement Project No. 2002006280 As Modified by Amendment 3						
Task	**Description**	**Current Contract Amount**	**Re-Allocation or New Fundings**	**Final Contract Amount**	**Contract Remaining as of 27 Sep 2024***	**Comment**
1000	Upper Dam Spillway Gate Replacement Preliminary Design	$ 11,900.00	$ (385.00)	$ 11,515.00	$ -	Task is closed
2000	Gates and Valve Automation Evaluation and Report	$ 58,200.00	$ 2,070.00	$ 60,270.00	$ -	Task is closed
3000	2022 Annual Dam Safety Inspection	$ 12,350.00	$ (1,327.87)	$ 11,022.13	$ -	Task is closed
4000	Project Management	$ 3,380.00	$ (407.50)	$ 2,972.50	$ -	Task is closed
5000	90% Design	$ 39,600.00	$ (18,511.25)	$ 21,088.75	$ -	Task is closed
6000	Final Design	$ 12,420.00	$ (8,448.75)	$ 3,971.25	$ -	Task is closed
7000	Bid Support	$ 5,650.00	$ 2,700.00	$ 8,350.00	$ 8,350.00	Task will be active in 2025
8000	Construction Support	$ 22,100.00	$ 3,500.00	$ 25,600.00	$ 25,600.00	Task will be active in 2025
9000	Project Management	$ 8,250.00	$ 4,080.00	$ 12,330.00	$ 9,382.50	15 months (October 2024 to December 2025
10000	2023 Annual Dam Inspection	$ 12,500.00	$ (5,728.98)	$ 6,771.02	$ -	Task is closed
11000	2024 Annual Dam Inspection	$ 13,000.00	$ -	$ 13,000.00	$ 10,645.35	Task is underway
12000	2025 Annual Dam Inspection	$ -	$ 13,500.00	$ 13,500.00	$ 13,500.00	Task will be active in 2025
13000	Temporary Bridge		$ 27,500.00	$ 27,500.00	$ 27,500.00	Task will be active in 2024 and 2025
Totals		**$ 199,350.00**	**$ 18,540.65**	**$ 217,890.65**	**$ 94,977.85**	

* Pending approval of Amendment 3

Current contract price of $199,350 will be increased by **$18,540.65** to a new current contract price of **$217,890.65.**

Staff Report

January 6, 2025 Council Workshop Meeting

Ultraviolet Equipment Pre-purchase at Waste Water Treatment Plant
Presenter: Rob Charles, Utilities Manager
Time Estimate: 5 minutes

Phone	Email
360.817.7003	rcharles@cityofcamas.us

BACKGROUND: Ultraviolet (UV) Equipment is used as the final treatment of liquid effluent to remove any disease causing organisms before the water is sent to the receiving body of water. The UV Equipment at the Waste Water Treatment Plant is over 20 years old and parts are not readily available for repairs.

The City is currently planning on replacing the UV Equipment as part of a large maintenance project starting in the summer of 2025. To facilitate the equipment being available for a contractor next summer, the City is pre-purchasing the equipment so it will be on-site when a contractor is awarded the project in spring of 2025.

SUMMARY: Trojan Technologies is the only bidder that the city solicited bids from due to other suppliers not being able to meet the specifications on the project. Wedeco and Denora, two other suppliers of UV Equipment, both required channel modifications to allow their equipment to treat the required flow of effluent for the plant. Trojan's UV Equipment can fit within the existing UV channel thereby saving significant construction costs during installation.

A Sole Source justification letter from the City's Consultant, HDR, Inc., was submitted and approved but the City's Finance Department.

Figure 1: UV Equipment Bank

Figure 2: UV Equipment Controls

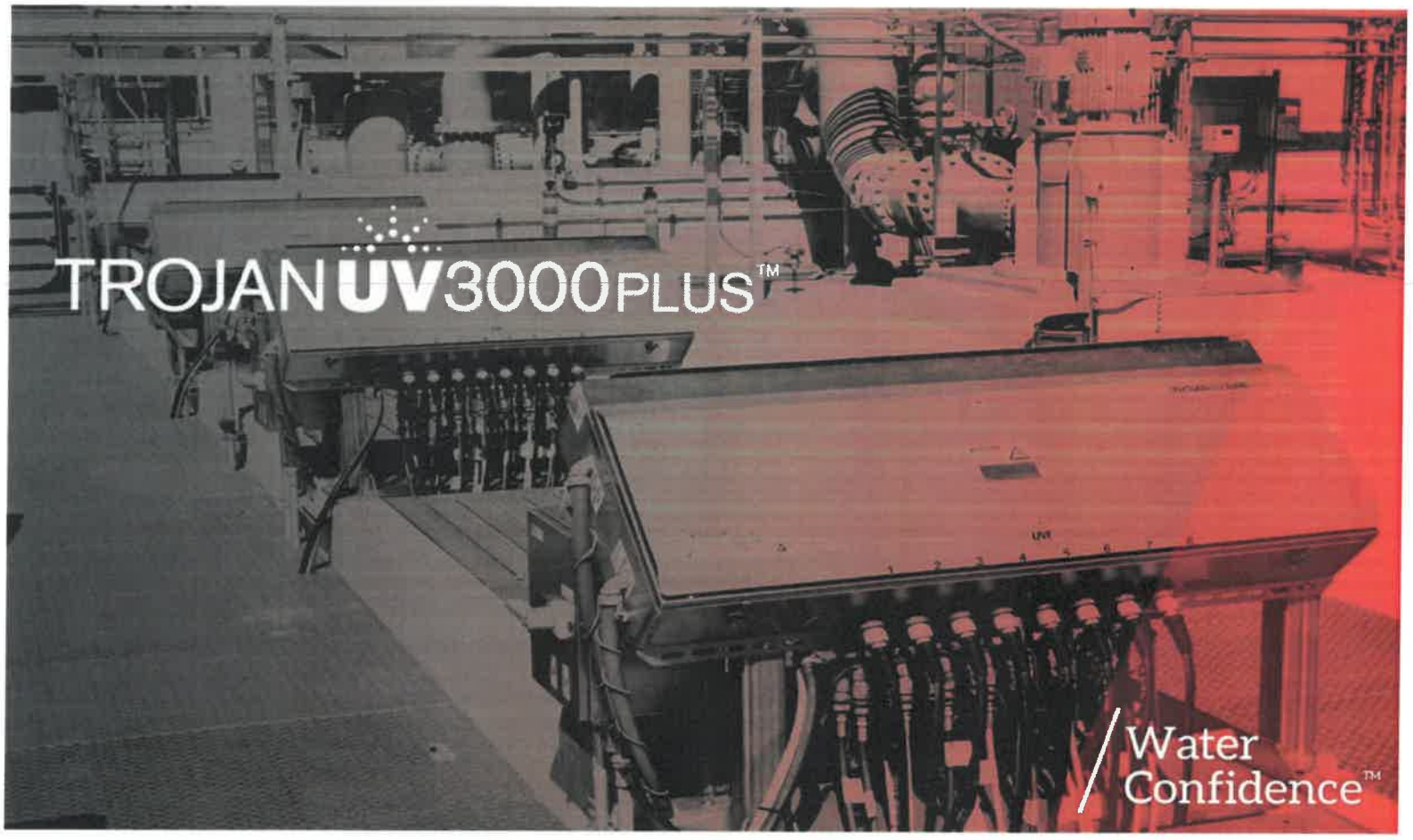
BENEFITS TO THE COMMUNITY: By installing this new UV Equipment, the City will continue to meet its National Pollutant Discharge Elimination System (NPDES) Permit from the Department of Ecology. It will also reduce the amount of time staff currently spends maintaining the current UV Equipment.

BUDGET IMPACT: The cost of purchasing the UV Equipment is $704,475.31. There is sufficient budget in Sewer to cover this item.

Future costs for installation of the UV Equipment will be brought to Council as a separate approval when bids for the larger maintenance project are obtained.

RECOMMENDATION: Staff recommends this item be placed on the January 21, 2025 Council Regular Meeting for Council's consideration.

TROJAN UV



RESPONSE TO THE REQUEST FOR PROPOSALS

City of Camas – Camas TO4 UV Procurement Documents Project Manual (HDR Project No. 10371791)

Submitted by Trojan Technologies
November 2024

Jackie Corlett, Trojan Technologies
(519) 457-3400, jcorlett@trojantechnologies.com
www.trojantechnologies.com

Bill Reilly, Wm. H. Reilly & Co.
(503) 223-6197, Bill@whreilly.com
www.whreilly.com

This page is intentionally left blank.

TROJAN UV™

November 29th, 2024

Subject: **City of Camas – Camas T04 UV Procurement**

Attention: Sydney Baker – City Clerk

City of Camas – City Clerk's Office
626 NE 4th Avenue
Camas, Washington
98606

Trojan Technologies appreciates the opportunity to submit this bid proposal for the UV Disinfection Improvements project for the City of Camas WWWTP. I trust that you will find the enclosed bid proposal complete and informative. The enclosed bid proposal is based on the **TrojanUV3000Plus®** system energy-efficient, low-pressure high-output lamp horizontal system.

During our 47-year history, Trojan Technologies has led global innovation in UV. Trojan introduced the UV3000Plus® product into the market in 2000 and being our flagship UV system, it has been continuously improved with numerous updates to the product. The latest generation product released in 2022 continues to enhance and focus on the features our customers value. In fact, today it is operating in over 3,000 municipal wastewater plants around the world. Disinfecting over 17 billion gallons a day, the UV3000Plus system has become the reference standard in the municipal wastewater industry.

The UV3000Plus uses a preassembled, factory sealed 250-Watt amalgam lamp and quartz sleeve unit with variable-output electronic ballasts to provide dimming capability. Trojan's ActiClean® system is the industry's only automatic chemical and mechanical quartz sleeve cleaning system, and that means plants' operations are uninterrupted by offline cleans and can rely on consistent UV Dose delivery with the ActiClean system.

The design and support of the proposed TrojanUV3000Plus system is provided by Trojan Technologies, a world leader in UV-based disinfection technologies. Purchasing a UV system from Trojan Technologies offers the following advantages:

- The largest installed base of municipal systems in the world. In fact, nearly 8 out of 10 wastewater plants in North America using UV, use Trojan equipment.
- Today, Trojan has over 13,000 municipal drinking water and wastewater UV systems operating worldwide.
- The UV3000Plus system relies on an extended lamp warranty with a validated end-of-lamp-life of 98% output after 12,0000 hours and our unique ActiClean® system that is validated to maintain 95% of sleeve transmittance.
- The TrojanUV3000Plus system has been independently third-party bioassay validated to USEPA and NWRI guidelines.

- The UV3000Plus system has an integrated Stream™ platform that provides remote monitoring capability for operators. This remote monitoring minimizes on-site intervention, gives real-time alerts, and access diagnostics.
- Used lamp recycling at an EPA approved lamp recycling facility. This service is provided to the City of Camas WWTP free of charge for the life of the system.
- A simple disinfection performance guarantee is provided, at no extra cost, and is valid for the life of the system.
- Trojan offers a toll-free number with qualified Technicians available 24 hours per day / 7 days per week for emergency support.
- Trojan installations are supported by a network of over 30 factory trained certified technicians in North America. The nearest local certified technicians for the Camas WWTP are in Portland and Roseburg, Oregon.

Trojan Technologies would like to thank the City of Camas for considering our UV3000Plus equipment proposal as the very best UV solution for replacing the existing UV3000® equipment that has been operating at the Camas WWTP since 2000.

If you have any questions or require any additional information, please do not hesitate to contact our local representative Bill Reilly with Wm. H. Reilly at (503) 223-6197 or myself at (604) 754-8431.

With best regards,

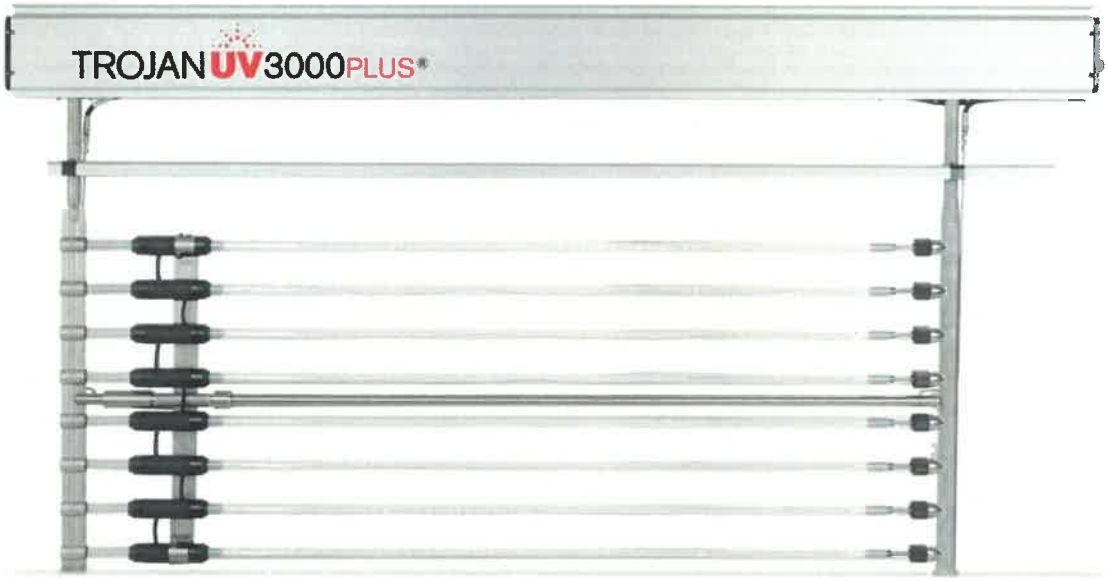
Jackie Corlett
Regional Sales Manager

Table of Contents

This page is intentionally left blank.

TROJAN UV

Section 1 – Trojan Technologies Scope of Supply



This page is intentionally left blank.

TROJAN UV
WATER CONFIDENCE™

SCOPE OF SUPPLY FOR CAMAS UV3000 REPL. WASTEWATER TREATMENT PLANT

ULTRAVIOLET DISINFECTION EQUIPMENT – TROJAN SYSTEM UV3000Plus™

Prepared for:	City of Camas
Project Name:	Camas T04 UV Procurement
Consulting Engineer:	HDR, Inc.
Specification Section:	46 66 65 – Open Channel Low Pressure High Intensity Ultraviolet Treatment Equipment
Addendum No.:	1
Trojan Quote:	244008

Design Criteria:

Peak Design Flow:	12.4 MGD
UV Transmission:	65% minimum
Total Suspended Solids:	10 mg/L (30 day average, grab sample)
Minimum UV Dose:	30 mJ/cm² MS2 Reduction Equivalent Dose (RED)
Discharge Limit:	200 *Fecal Coliform* per 100 mL, 30 day eometric Mean)

We are pleased to submit the following scope of equipment based on the above criteria.

The purchaser is responsible for reading all information contained in this Supply Contract. Trojan will not be held accountable for the supply of equipment not specifically detailed in this document. Supplemental Terms and Conditions are attached to this document. Detailed installation instructions are provided with the shop drawings and are available earlier upon request. Changes to this Scope of Supply that affect selling price will be handled through a change order.

Please refer inquiries to Trojan Manufacturer's Representative:

Representative: Bill Reilly, Jr.
Wm. H. Reilly & Co.
Phone: (503) 223-6197

This proposal has been respectfully submitted by,
Trojan Technologies

Jackie Corlett

Jackie Corlett
Regional Sales Manager

Unless otherwise indicated in this proposal all anchor bolts, conduit, conductors, local disconnects and transformers (if required) are the responsibility of the CONTRACTOR and are not included in this Scope of Supply. Specific cable types listed below are for reference only. Selecting cables that are appropriate for the installation environmental conditions and in compliance with local code is the responsibility of the Installation Contractor.

ULTRAVIOLET MODULES

Trojan's Responsibility:
Each module supplied shall be completely assembled containing lamps, quartz sleeves and be electrically wired to each electronic ballast. Modules are shipped in a support rack and crated.

Model and Make:	Standard UV3000Plus™ System
Quantity Supplied:	27 UV modules each containing 6 Lamp - 4.0" Spacing (2022)
Material of Construction:	316 Stainless Steel frame
Approximate Weight:	98 lbs

SYSTEM CONTROL CENTER

Trojan's Responsibility:
One (1) System Control Center (SCC) shall be supplied to monitor and control the UV System. Trojan will provide a PLC I/O and soft address map to aid the Contractor with integration of the UV PLC and WWTP SCADA system. The UV SCC shall consist of the following:

Quantity Supplied:	One (1) SCC
Location:	Wall Mounted
Enclosure Material / Rating:	304 Stainless Steel - Type 4X (IP66)
Controller Type:	Modicon M340 or M580
Operator Interface:	HMIDT732
Panel UPS:	30 Min on 24VDC
SCADA Protocol:	Modbus Ethernet (PLC)
Surge Protection:	Yes
Approximate Weight:	200 lbs

Note: If Trojan is required to provide a managed switch in the SCC, the Plant's IT department or System Integrator will be responsible for configuring the switch to meet the Plant's security and traffic routing requirements.

Installation Contractor's Responsibility:
The Installation Contractor is responsible for mounting the SCC as indicated on the drawings. The Installation Contractor is also responsible for the supply, installation and connection of the following at the SCC:

1. One (1) 120V 60Hz, 1 Phase, 2 Wire + GND, 1.44 kVA power supply
2. One (1) 4 – 20 mA DC analog signal from plant flow meter
3. One (1) Ground Link , 14 gauge (2.5 mm²) minimum type TWH stranded, daisy chained to the HSC and PDCs
4. One (1) serial communication link consisting of one (1) shielded twisted pair communication line, 18 gauge (1 mm²) maximum from the HSC and other PDCs (daisy chained)
5. One (1) 4 – 20 mA DC analog signal from the On-Line UVT Monitor
6. Discrete signals from Plant SCADA for remote monitoring (or serial communication link to SCADA – describe protocol, Modbus, Ethernet, DH+ etc.)
7. One (1) 4-20 mA analog shielded twisted pair from the Level Sensor Monitor Panel
8. One (1) 24V DC, 2 conductors + GND, power to the Level Sensor Monitor
9. Control signal conductors (as required by actuator) for control of inlet gates (provided by others)

POWER DISTRIBUTION CENTERS

Trojan's Responsibility:
The Power Distribution Center (PDC) distributes power to the UV Modules and shall consist of the following:

Quantity Supplied:	Three (3) PDCs
Enclosure Material / Rating:	304 Stainless Steel - Type 4X (IP66)
Approximate Weight:	220 lbs

Installation Contractor's Responsibility:
The Installation Contractor is responsible for setting in place and bolting the Power Distribution Centers to the top of channel. The Installation Contractor is also responsible for the supply, installation and connection of the following at each of the PDCs:

1. One (1) 480/277V 60Hz, 3 Phase, 4 Wire + GND, 13.80 kVA power feed with local disconnect (provided by others)
2. One (1) Ground Link,14 gauge (2.5 mm²) minimum, TWH stranded single wire from the HSC
3. One (1) communication link consisting of one (1) shielded twisted pair communication line, 18 gauge (1 mm²) maximum from the SCC and daisy chained to other PDCs
4. One (1) pair 24Volt DC, 2 conductor + GND, 16 gauge (1.5 mm²) minimum power feed from PDCs to the Level Control Panel (LCP) of the channel
5. One (1) pair of 24 VDC, 16 gauge minimum discrete signal from the LCP to each PDC per channel
6. Connection of communication, power cables and hydraulic lines from the UV Modules

HYDRAULIC SYSTEM CENTER

Trojan's Responsibility:
The Hydraulic System Center (HSC) houses the ancillary equipment required to operate the quartz sleeve cleaning system.

Quantity Supplied:	One (1) HSC
Enclosure Material / Rating:	304 Stainless Steel - Type 4X (IP66)
Hydraulic Fluid:	Mineral Oil
Approximate Weight:	310 lbs

Installation Contractor's Responsibility:
The Installation Contractor is responsible for setting in place and bolting the HSC and manifold as shown on the contract drawings. The HSC should be located within 50 feet from the farthest PDC. The Installation Contractor is also responsible for the supply, connection and installation of the following HSCs:

1. One (1) 480V/208V, 50/60Hz, 3 Phase, 3 Wire + GND, from power the distribution palnel.
2. One (1) ground link of 14 gauge (2.5 mm²) minimum, TWH stranded from the PDC(s).
3. Connection of the hydraulic hoses from PDC(s). Hoses and connections will be supplied by Trojan
4. One (1) serial communication link of one (1) shielded twisted pair communication line, 18 gauge (1 mm²) maximum cable from the SCC and daisy chained to the PDC(s).

SUPPORT RACKS

Trojan's Responsibility:
Support racks are provided to support UV modules in the effluent channel.

Quantity Supplied:	Three (3) Module Support Racks
Material of Construction:	304 Stainless Steel
Approximate Weight:	< 100 lbs each

Installation Contractor's Responsibility:
The Installation Contractor is responsible for setting in place and bolting the support racks to the channel walls. The Contractor will be required to supply eight (8) 1/2" Diameter x 5 1/2" Long expansion anchor bolts per rack.

Install approved (engineered) anchor points for personnel to use as part of their fall restraint system around the open channels. The anchor points must be positioned so that the preferred retractable lifeline of 8 feet is of sufficient length to access the work at the channel. Refer to local safety regulation.

LEVEL CONTROLLER

Trojan's Responsibility:
A level control device is required per channel to maintain and control the effluent level, regardless of flow rate.

Description:	Motorized Weir Gate
Quantity Supplied:	One (1) level controller
Material of Construction:	304 Stainless Steel

Installation Contractor's Responsibility:
The Installation Contractor is responsible for setting in place, grouting and sealing the level control device. Supporting I-beams (if required) for the level controllers are outside of Trojan Scope of Supply and shall be provided by the Contractor.

WEIR GATE LEVEL CONTROLLER

Modulating Weir Gates (MWGs) shall be self-contained and shall be designed and manufactured by an experienced and reputable manufacturer, based on the AWWA C561 Standard for Fabricated Stainless Steel Slide Gates and AWWA C542 Standard for Electric Motor Actuators for Valves and Slide Gates in effect as of the date of this specification.

MWGs shall be designed for the following performance criteria:

- *MWG actuation speeds shall be between 10" (255 mm) and 14" (356 mm) per minute*
- *MWG maximum design rate of change of flow shall be limited to 25% of the Peak Design Flow/Channel per minute, or alternatively, flow shall be ramped up (zero to peak) or down (peak to zero) in no less than 4 minutes*
- *MWG actuators shall employ AWWA compliant, S4-50% duty class motors with a rated minimum 900 starts per hour capability*
- *MWG actuators shall employ AWWA compliant, Class B, solid-state Thyristor based switchgear capable of at least 5,000,000 modulating steps before overhaul; electromechanical type actuators and controls are not permitted*

It is the responsibility of the Plant designers to ensure the stated performance criteria are acceptable for the plant process or to modify the design accordingly.

Trojan's Responsibility:
Level control devices are required to maintain and control the effluent level in the channel, regardless of flow rate.

Quantity Supplied:	One (1) Water Level Controller
Description:	Whipps or RW Gate
Actuator:	AUMA Electric Actuator
Material of Construction:	304 / 316 Stainless Steel
Mounting Anchors:	Supplied with each Gate
Control Method:	Digital Pulsed Open/Close Position Signals from the UV SCC

Installation Contractor's Responsibility:
The Installation Contractor is responsible for setting in place, grouting and sealing the level control weir gate and the installation of the following connections at each weir gate:

1. One (1) 380-480V, 50/60 Hz, 3 Phase, 3 Wire + GND power feed
2. One (1) discrete, 2 conductors, 20 gauge minimum, open command from the SCC
3. One (1) discrete, 2 conductors, 20 gauge minimum, close command from the SCC
4. One (1) discrete, 2 conductors, 20 gauge minimum, remote mode indication to the SCC
5. One (1) discrete, 2 conductors, 20 gauge minimum, fault indication to the SCC
6. One (1) 4-20 mA analog shielded twisted pair, 20 gauge minimum, gate position indication to the SCC

ULTRASONIC WATER LEVEL SENSOR

Trojan's Responsibility:
One (1) Echomax XPS-10/15 ultrasonic level sensor and Siemens Milltronics MR200 HMI monitor panel will be supplied per motorized weir gate (MWG), to monitor channel effluent levels specifically for the MWG control. The transducer will be supplied with a sufficient length of cable to distribute to the monitor panel.

Description:	Ultrasonic Sensor with monitor panel to be supplied per MWG
Quantity Supplied:	One (1)

Disclaimer Note (*for Ultrasonic package for flow measurement option*): Please be advised that for cases where the ultrasonic level sensor package is used to calculate 'flow over weir', the resulting 'flow over weir' is only intended for UV equipment operation and disinfection purposes. This calculated flow value should not be used for any external flow reporting or overall plant operation.

Installation Contractor's Responsibility:
The Installation Contractor is responsible for mounting the bracket and transducer in the UV channel and for mounting the monitor panel adjacent to the channel. Installation Contractor shall distribute the following cable/wiring between these two components and the SCC in appropriate conduit at each sensor:

1. One (1) 24 VDC, 2 conductors + GND, 36 VA power from the SCC to the Level Sensor Monitor
2. One (1) 4-20 mA analog shielded twisted pair from the Level Sensor Monitor to the SCC
3. One (1) communication link using 33 ft of cable (supplied by Trojan) from the Level Sensing Transducer to the Level Sensor Monitor

WATER LEVEL SENSOR KIT

Trojan's Responsibility:
The Low water level sensor is located downstream of the UV System and provides a digital signal to shut down & protect the UV System if the water level is too low. The Water Level Sensor Kit includes the water level sensor probe as well as a Level Control Panel (LCP).

Quantity Supplied:	One (1) Electrode type low water level sensor and one (1) LCP per UV channel
Enclosure Rating:	Type 4X
Approximate Weights:	25 lbs (LCP) and 10 lbs (Sensor)

Installation Contractor's Responsibility:
The Installation Contractor is responsible for setting in place and bolting the water level probe assembly to the effluent channel wall and mounting the Level Control Panel as indicated on the drawings as well as for the supply and installation of mounting hardware and watertight conduit.
The Installation Contractor is also responsible for the supply, installation and connection of the following:

1. One (1) 24 VDC, 2 conductors + GND power feed from two (2) PDCs to the LCP
2. One (1) pair of 12 VDC, 16 gauge (1.5 mm²) minimum discrete signal per channel for each water level sensor to the LCP
3. One (1) pair of 24 VDC, 16 gauge (1.5 mm²) minimum discrete signal from the LCP to each PDC per channel

ON-LINE UV TRANSMISSION MONITOR

Trojan's Responsibility:
An on-line UV Transmission Monitor will be supplied to provide a UVT measurement of the source water.

Description:	One (1) Hach UVT meter containing: • one (1) submersible UVAS probe with multi-beam flash photometer, • one (1) 25' cable between the probe and the controller, • one (1) Hach SC4500 UV-254 Controller.
Enclosure Rating:	UL50E type 4X, IEC/EN 60529–IP 66, NEMA 250 type 4X Metal enclosure with a corrosion-resistant finish
Controller Dimensions:	5.7 x 5.7 x 7.6 in
Altitude:	6562 ft maximum
Operating Temperature:	35.6 to 104°F (Probe), -4 to 113°F (Controller)
Approximate Weight:	30 lbs (includes Probe and Controller)
Probe Immersion Depth:	Minimum 6 feet
Probe Mounting:	Pole mounting hardware provided includes wall mount bracket, hardware and 6.5 6ft pole
Controller Mounting:	Pedestal provided
Sunroof:	Included, with visor and mounting hardware

Installation Contractor's Responsibility:
The Installation Contractor is responsible for setting in place and mounting the Controller panel and the probe. The Installation Contractor is also responsible for the supply, installation and connection of the following at each Controller:

1. Standard One (1) 120 Volt, 1 Phase, 2 Wire + GND, 1 A (28 W sensor load) power supply,
2. One (1) 4-20mA DC Analog communications link between the Controller and the SCC
3. Installation of sensor communication cable between Probe and Controller (Cable supplied by Trojan)
4. Supply of the required bolts for mounting Controller to the pedestal and Probe to the channel edge

UV PHOTOMETER

Trojan's Responsibility:
A single beam portable/shelf-top RealTech UV254 UV Photometer shall be provided to measure the UV transmission of the effluent. The range of the UV Photometer shall be 0 - 100% transmittance with a wavelength accuracy of +/- 0.16 half bandwidth. The UV Photometer will come equipped with two (2) matched quartz cuvettes, 100% T standard solution and cuvette cleaning solution.

INDIVIDUAL UV MODULE LIFTING SLING WITH FRAME

Trojan's Responsibility:
In order to remove individual modules, by mechanical means, a two (2) rope sling with frame shall be supplied to interface with the existing overhead crane.

Quantity:	One (1) Sling Kit
Materials of Construction:	304 Stainless Steel
Approximate Weight:	5 lbs

STREAM™ CONNECTION

Trojan's Responsibility:
Stream™ Connection is a digital support tool that provides our Technical Assistance Center with instant access to the UV system to quickly diagnose and resolve UV issues. The Stream connection is a free service throughout the warranty period to streamline technical support requests. Stream provides secure and encrypted connection external to the SCADA network and configured in the UV System Control Center.

SPARE PARTS, SAFETY EQUIPMENT AND ADDITIONAL EQUIPMENT

Trojan's Responsibility:
The following spare parts and safety equipment will be supplied with the UV system:

Description	Quantity
TrojanUV3000Plus Integra Lamp/Sleeve Assembly (10%)	Sixteen (16)
TrojanUV3000Plus Ballasts (10%)	Eight (8)
Operator's Kit (Includes: UVFace Shield, and Glooves)	Two (2)
UV Intensity Sensor	One (1)
Wiper Seal Kit (10%)	Twenty (20)
Acticlean (20L pail)	One (1)

MICROBIOLOGICAL PERFORMANCE TESTING

Trojan's Responsibility:
Trojan will supply a performance testing protocol to the Installation Contractor to be forwarded to the Engineer for approval. Trojan will produce the final test report (based on data supplied by the independent lab) and will forward the final report to the Installation Contractor. Trojan will also supply the services of a trained technician for conducting sampling and training the Contractor staff for two (2) days.

Installation Contractor's Responsibility:
The Installation Contractor is responsible for covering all associated onsite costs for performance testing (retaining an independent lab for sample analysis and services, bottles, shipment, etc.). The Installation Contractor is also responsible for completing the performance testing as per the testing protocol supplied by Trojan and approved by the Engineer.

DOCUMENTATION (SHOP DRAWINGS AND O&M MANUALS)

The following documentation will be supplied by Trojan per the following schedule:

- One (1) electronic copy of Trojan Shop Drawing Submittals within a minimum **4 – 6** weeks after receipt of written purchase order. Note that Submittals will not be issued until PO is fully executed.
- One (1) electronic copy of Trojan Standard O&M manuals at time of equipment delivery (hardcopies available upon request)

DELIVERY, START-UP AND TRAINING

- Equipment shipment to be within **26 – 28** weeks after approval of Shop Drawings.

Trojan's Responsibility:
The following start-up services will be provided by Trojan-certified technicians:

- Installation assistance as required by phone or fax. Technical Assistance Center 1-866-388-0488 or tac@trojantechnologies.com
- Up to 5 days in two (2) trips for:
  - Additional operator training.
  - Start-up, testing of the installed UV equipment and classroom and/or jobsite training for operations staff, and Performance Testing visit

  - Note that if the Trojan's Certified Service Technician determines the Contractor work is not complete and the start-up cannot be completed in the allotted time a return visit will be scheduled at the Contractors expense
  - If trainees are not available a return visit will be scheduled at the Contractors expense.
- One (1) trained personnel for two (2) on-site days in one (1) trip for performance testing (as stated above in section "MICROBIOLOGICAL PERFORMANCE TESTING")
- One (1) trained personnel for one (1) day on-seite in one (1) trip for harmonic testing

Installation Contractor's Responsibility:
The Contractor is responsible for:

- Unloading of the components supplied by Trojan, storage of all components, if required in a clean dry environment including ActiClean™ Gel. *Note the ActiClean gel must be stored in a climate-controlled area to prevent freezing.*
- Installing the equipment outlined in the scope of Supply in accordance with contract drawings, Trojan's shop drawings, instructions and installation checklist(s).
- Supplying all conduits and conductors and components per the sites state regulations and components indicated as supplied by others.
- Completing and submitting the Checklist at least two (2) weeks prior to date requested for commissioning.

WARRANTY

Trojan will warrant the equipment and parts for 12 months after substantial completion. Warranty does not cover labor, consumables and/or wear components. Refer to attached Terms and Conditions for additional details.

- UV lamps shall be warranted for 12,000 hours prorated after 9,000 hours.
- Lamp drivers shall be warranted for 5 years, prorated after 1 year.

SELLING PRICE $ See Bid Form For Procurement Contract (EJCDC P-400)

- Selling price does not include any taxes that may be applicable.
- Freight included if destination is within North America.
- Price is valid for 90 days from the date of this letter.

PAYMENT TERMS AND INVOICING MILESTONE BREAKDOWN

Net 30 Days

Payment Line Item (Lump Sum)	Percentage of Lump Sum
1. Approval of Shop Drawings	20
~~2. Approval of Preliminary O&M Manuals~~	~~5~~
3. Delivery of Good	60
~~4. Approval of Final O&M Manuals~~	~~5~~
~~5. Delivery of Final O&M Manuals~~	~~5~~
6. Performance of Start Up ~~Manufacturer's~~ Field Service	10
7. ~~Satisfactory~~ Completion of Acceptance Testing	10
Total Procurement Contract Price (Lump Sum)	100

TERMS AND CONDITIONS – ATTACHED

Trojan appreciates the opportunity to submit this proposal. Our proposal is submitted subject to and based on Trojan's standard terms and conditions, which we have attached as part of our proposal. We believe these terms and conditions are customary in the trade and respectfully reserve the opportunity to negotiate, fair and reasonable contract terms acceptable to both parties, if Trojan is selected for this project.

TROJAN technologies

TERMS AND CONDITIONS OF SALE

This document sets forth the Terms & Conditions of Sale for goods manufactured and/or supplied, and services provided, by the seller entity identified on the purchase order ("SELLER") and sold to the original purchaser thereof ("BUYER"). The term "SELLER" includes only SELLER, and none of its affiliates. Unless otherwise specifically stated in a previously-executed written purchase agreement signed by authorized representatives of SELLER and BUYER, these Terms & Conditions of Sale establish the rights, obligations and remedies of SELLER and BUYER which apply to this offer and any resulting order or contract for the sale of SELLER's goods and/or services ("Products").

1. **APPLICABLE TERMS & CONDITIONS:** These Terms & Conditions of Sale are contained directly and/or by reference in SELLER's proposal, offer, order acknowledgment, packing slip, and/or invoice documents. The first of the following acts constitutes an acceptance of SELLER's offer and not a counteroffer and creates a contract of sale ("Contract") in accordance with these Terms & Conditions of Sale: (i) BUYER's issuance of a purchase order document against SELLER's offer; (ii) acknowledgement of BUYER's order by SELLER; or (iii) commencement of any performance by SELLER pursuant to BUYER's order. Provisions contained in BUYER's purchase documents (including electronic commerce interfaces) that materially alter, add to, or subtract from the provisions of these Terms & Conditions of Sale are not a part of the Contract.

2. **CANCELLATION AND RETURN:** The whole or any part of this order may be cancelled only with the prior written consent of SELLER. If SELLER does consent to a cancellation, such consent will be given only upon payment of reasonable cancellation charges in an amount determined by SELLER and which will include recovery of costs plus reasonable profit. In addition, with respect to any Products returned on cancellation, BUYER will pay SELLER's cost of placing the returned Products in a saleable condition, sales expenses incurred by SELLER in connection with such returned Products, a reasonable restocking charge and freight costs incurred in connection with the original shipment and in connection with returning such Products to SELLER, all in such amounts as are advised to the BUYER by SELLER. SELLER may cancel all or part of any order prior to delivery without liability if the order includes any Products that SELLER determines may not comply with export, safety, local certification, or other applicable compliance requirements. If SELLER'S offer contains a cancellation schedule, such schedule shall apply in lieu of the cancellation charges stated above.

3. **DELIVERY:** Delivery will be accomplished FCA SELLER's determined shipping point; or on SELLER's discretion it will ship DDP or DAP foreign port unless otherwise expressly agreed between the parties using Incoterms® 2020. At SELLER's discretion other terms under Incoterms® 2020 may be used as required. In the event of any reference to "prepay and add" the applicable Incoterms® 2020 will be DDP or DAP at SELLER's discretion, while any reference to "collect" will be deemed to be FCA under the Incoterms® 2020 regardless of reference to reference to shipping point. In the event DDP or DAP is used for a transaction SELLER reserves the right to select the carrier and shipping mode. BUYER agrees to pay SELLER for any sales tax, brokerage fees, or other costs incurred as a result of the shipping mode chosen by SELLER. For all intents and purposes the FOB/FOD Legal title and risk of loss or damage pass to BUYER upon transfer to the first carrier, regardless of final destination and mode of transit. SELLER will use commercially reasonable efforts to deliver the Products ordered herein within SELLER's normal lead-time necessary for SELLER to deliver the Products sold hereunder. Upon prior agreement with BUYER and for an additional charge paid by BUYER, SELLER will deliver the Products on an expedited basis. Seller may, in its sole discretion, without liability or penalty, deliver partial shipments of Products to Buyer and ship the Products as they become available, in advance of the quoted delivery date. If the Products are delivered in installments, then insofar as each shipment is subject to the same Agreement, the Agreement will be treated as a single contract and not severable. Products will be boxed or crated as determined appropriate by SELLER for protection against normal handling and there will be an extra charge to the BUYER for additional packaging required by the BUYER with respect to waterproofing or other added protection. BUYER has sole responsibility for off-loading, storage and handling of the Products at the site. Where BUYER is responsible for any delay in the delivery date or installation date, the earlier of the date of delivery or the date on which the Products are ready for shipment by SELLER may be treated as the delivery date for purposes of determining the time of payment of the purchase price. Moreover, BUYER will be responsible for storage and insurance expenses with respect to such Products. Should BUYER fail to effect pick-up of Product as previously agreed in a timely manner, SELLER may, at its discretion, assess storage charges and a surcharge to the account of BUYER.

4. **INSPECTION**: BUYER will promptly inspect and accept any Products delivered pursuant to this Contract after receipt of such Products. In the event the Products do not conform to any applicable specifications, BUYER will promptly notify SELLER of such nonconformance in writing. SELLER will have a reasonable opportunity to repair or replace the nonconforming Product at its option. BUYER will be deemed to have accepted any Products delivered hereunder and to have waived any such nonconformance for such Products unless a written notification pursuant to this paragraph is received by SELLER within fourteen (14) calendar days of delivery to BUYER destination on order.

5. **PRICES & ORDER SIZES:** Prices do not include any charges for services such as insurance; brokerage fees; sales, use, inventory, or excise taxes; import or export duties; special financing fees; value added tax, income, or royalty taxes imposed outside the U.S. or Canada; consular fees; special permits or licenses; or other charges imposed upon the production, sale, distribution, or delivery of Products. BUYER will either pay any and all such charges or provide SELLER with acceptable exemption certificates, which obligation survives performance under this Contract. Installation, maintenance and any other services which relate to the Products are not included unless specifically set forth in the offer. SELLER reserves the right to establish minimum order sizes and will advise BUYER accordingly. Any orders below the minimum order size are subject to a fee as set out by SELLER. Notwithstanding anything to the contrary set out herein, in the event of any delay to SELLER's delivery schedule caused by BUYER or its representatives (other than for Force Majeure or delays caused by SELLER), including without limitation, a suspension of work or the project, a postponement of the delivery date or failure to timely issue of a notice of commencement or similar document, then (i) the Purchase Price shall increase by 1% for every month or partial month of such delay and this Agreement shall be construed as if the increased Purchase Price were originally inserted herein, and BUYER shall be billed by SELLER on the basis of such increased Purchase Price, or (ii) SELLER shall have the right to terminate this Contract without penalty.

6. **PAYMENTS**: All payments must be made in agreed-to currency, normally Canadian or U.S. Dollars. Unless other payment terms are expressly agreed to by SELLER or otherwise required by the SELLER, invoices are due and payable NET 30 DAYS from date of the invoice, without regard to delays for inspection or transportation, with payments to be made by check to SELLER at the address listed in the purchase order or by bank transfer to the account obtainable from SELLER's Accounts Receivable Manager. In the event payments are not made or not made in a timely manner, SELLER may, in addition to all other remedies provided at law, either: (a) declare BUYER's performance in breach and terminate this Contract for default; (b) withhold future shipments until delinquent payments are made; (c) deliver future shipments on a cash-with-order or cash-in-advance basis even after the delinquency is cured; (d) charge interest on the outstanding balance at a rate of 1.5% per month or the maximum rate permitted by law, if lower, for each month or part thereof that there is an outstanding balance plus applicable storage charges and/or inventory carrying charges; (e) repossess the Products for which payment has not been made; (f) pursue other collection efforts and recover all associated costs including reasonable attorney's fees; or (g) combine any of the above rights and remedies as is practicable and permitted by law. BUYER is prohibited from setting off any and all monies owed under this Contract from any other sums, whether liquidated or not, that are or may be due to the BUYER, which arise out of a different transaction with SELLER or any of its affiliates. Should BUYER's financial condition become unsatisfactory to SELLER in its discretion, SELLER may require payment in advance or other security. If BUYER fails to meet these requirements, SELLER may treat such failure as reasonable grounds for repudiation of this Contract, in which case reasonable cancellation charges shall be due to SELLER. BUYER hereby grants SELLER a security interest in the Products, wherever located, and whether now existing or hereafter arising or acquired from time to time, and in all accessions thereto and replacements or modifications thereof, as well as all proceeds of the foregoing, to secure payment in full of all amounts to SELLER, which payment releases the security interest but only if such payment could not be considered an avoidable transfer under applicable laws. The security interest granted hereby constitutes a purchase money security interest under the applicable Uniform Commercial Code or Personal Property Security Act or other applicable law, and SELLER is authorized to make whatever registration or notification or take such other action as SELLER deems necessary or desirable to perfect such security interest. BUYER's insolvency, bankruptcy, assignment for the benefit of creditors, or dissolution or termination of the existence of BUYER, constitutes a default under this Contract and affords SELLER all of the remedies of a secured creditor under applicable law, as well as the remedies stated above for late payment or non-payment.

7. **LIMITED WARRANTY:** Unless specifically provided otherwise in SELLER's offer, SELLER provides the following Limited Warranty. SELLER warrants that Products sold hereunder will be free from defects in material and workmanship and will, when used in accordance with the manufacturer's operating and maintenance instructions, conform to any express written

warranty pertaining to the specific goods purchased, which for Products is for a period of twelve (12) months from delivery. SELLER warrants that services furnished hereunder will be free from defects in workmanship for a period of thirty (30) days from the completion of the services. Products repaired or replaced are not covered by any warranty except to the extent repaired or replaced by SELLER, an authorized representative of SELLER, or under specific instructions by SELLER, in which cases, the Products will be covered under warranty up to the end of the warranty period applicable to the original Products. The above warranties do not include the cost of shipping and handling of returned items. Parts provided by SELLER in the performance of services may be new or refurbished parts functioning equivalent to new parts. Any non-functioning parts that are repaired by SELLER shall become the property of SELLER. Except as included in SELLER'S offer, no warranties are extended to consumable items and for normal wear and tear. SELLER's special warranties may include additional limitations. All other guarantees, warranties, conditions and representations, either express or implied, whether arising under any statute, law, commercial usage or otherwise, including implied warranties of merchantability and fitness for a particular purpose, are hereby excluded. The sole remedy for Products not meeting this Limited Warranty is replacement, repair, credit or refund of the purchase price, as determined by SELLER in its sole discretion. This remedy will not be deemed to have failed of its essential purpose so long as SELLER is willing to provide such replacement, credit or refund. To make a warranty claim, BUYER must notify SELLER in writing within 5 days of discovery of the defect in question. This notification must include a description of the problem, a copy of the applicable operator's log, a copy of BUYER's maintenance record and any analytical results detailing the problem. Any warranty hereunder or performance guarantees shall only be enforceable if (a) all equipment is properly installed, inspected regularly, and is in good working order, (b) all operations are consistent with SELLER recommendations, (c) operating conditions at the installation site have not materially changed and remain within anticipated specifications, and (d) no reasonably unforeseeable circumstances exist or arise. Products manufactured by a third party ("Third Party Product") which are not incorporated into SELLER's Products are not covered by the warranty. With respect to any Third Party Product, the warranty, if any, is provided solely through the manufacturer of such Third Party Product, the terms of which vary from manufacturer to manufacturer and Seller assumes no responsibility on their behalf. For Third Party Products, specific warranty terms may be obtained from the manufacturer's warranty statement.

8. **INDEMNIFICATION:** Indemnification applies to a party and to such party's successors-in-interest, assignees, affiliates, directors, officers, and employees ("Indemnified Parties"). SELLER is responsible for and will defend, indemnify and hold harmless the BUYER Indemnified Parties against all losses, claims, expenses or damages to the proportional extent caused by SELLER's breach of the Limited Warranty. BUYER is responsible for and will defend, indemnify and hold harmless SELLER Indemnified Parties against all losses, claims, expenses, or damages which may result from accident, injury, damage, or death due to the negligence or misuse or misapplication of any Products or the breach of any provision of this Contract by the BUYER or any third party affiliated or in privity with BUYER.

9. **PATENT PROTECTION:** SELLER shall further defend and indemnify BUYER Indemnitees from and against all Claims for actual infringement of all letters patent, trademarks, copyright or corresponding rights pertaining to goods provided under the Purchase Order, solely by reason of the sale or normal use of any goods sold to BUYER hereunder as finally determined by a court of competent jurisdiction in any suit for infringement of any U.S. patent. SELLER's warranty as to use patents only applies to infringement arising solely out of the inherent operation of the goods according to their applications as envisioned by SELLER's specifications. In case the goods are in such suit held to constitute infringement and the use of the goods is enjoined, SELLER will, at its own expense and at its option, either procure for BUYER the right to continue using such goods or replace them with non-infringing products, or modify them so they become non-infringing, or remove the goods and refund the purchase price (prorated for depreciation) and the transportation costs thereof. The foregoing states the entire liability of SELLER for patent infringement by the goods. Further, to the same extent as set forth in SELLER's above obligation to BUYER, BUYER agrees to defend, indemnify and hold harmless SELLER for patent infringement related to (x) any goods manufactured to the BUYER's design, (y) services provided in accordance with the BUYER's instructions, or (z) SELLER's goods when used in combination with any other devices, parts or software not provided by SELLER hereunder. Subject to all limitations of liability provided herein, SELLER will, with respect to any Products of SELLER's design or manufacture, indemnify BUYER from any and all damages and costs as finally determined by a court of competent jurisdiction in any suit for infringement of any U.S. or Canadian patent (or European patent for Products that SELLER sells to BUYER for end use in a member state of the E.U. or the U.K.) that has issued as of the delivery date, solely by reason of the sale or normal use of any Products sold to BUYER hereunder and from reasonable expenses incurred by BUYER in defense of such suit if SELLER does not undertake the defense thereof, provided that BUYER promptly notifies SELLER of such suit and offers SELLER either (i) full and exclusive control of the defense of such

suit when Products of SELLER only are involved, or (ii) the right to participate in the defense of such suit when products other than those of SELLER are also involved. SELLER's warranty as to use patents only applies to infringement arising solely out of the inherent operation of the Products according to their applications as envisioned by SELLER's specifications. In case the Products are in such suit held to constitute infringement and the use of the Products is enjoined, SELLER will, at its own expense and at its option, either procure for BUYER the right to continue using such Products or replace them with non-infringing products, or modify them so they become non-infringing, or remove the Products and refund the purchase price (prorated for depreciation) and the transportation costs thereof. The foregoing states the entire liability of SELLER for patent infringement by the Products. Further, to the same extent as set forth in SELLER's above obligation to BUYER, BUYER agrees to defend, indemnify and hold harmless SELLER for patent infringement related to (x) any goods manufactured to the BUYER's design, (y) services provided in accordance with the BUYER's instructions, or (z) SELLER's Products when used in combination with any other devices, parts or software not provided by SELLER hereunder.

10. **TRADEMARKS AND OTHER LABELS**: BUYER agrees not to remove or alter any indicia of manufacturing origin or patent numbers contained on or within the Products, including without limitation the serial numbers or trademarks on nameplates or cast, molded or machined components.

11. **SOFTWARE AND INTELLECTUAL PROPERTY**: All licenses to SELLER's separately provided software products are subject to the separate software license agreement(s) accompanying the software media. In the absence of such express licenses and for all other software, SELLER grants BUYER only a personal, non-exclusive license to access and use the software provided by SELLER with Products purchased hereunder solely as necessary for BUYER to enjoy the benefit of the Products. A portion of the software may contain or consist of open source software, which BUYER may use under the terms and conditions of the specific license under which the open source software is distributed. BUYER agrees that it will be bound by all such license agreements. Title to software remains with the applicable licensor(s). All SELLER contributions to the Products, the results of the services, and any other work designed or provided by SELLER hereunder may contain or result in statutory and non-statutory Intellectual Property, including but not limited to patentable subject matter or trade secrets; and all such Intellectual Property remains the sole property of SELLER; and BUYER shall not disclose (except to the extent inherently necessary during any resale of Product sold hereunder), disassemble, decompile, or any results of the Services, or any Products, or otherwise attempt to learn the underlying processes, source code, structure, algorithms, or ideas.

12. **PROPRIETARY INFORMATION AND PRIVACY**: "Proprietary Information" means any information, technical data, or know-how in whatever form, whether documented, contained in machine readable or physical components, mask works or artwork, or otherwise, which SELLER considers proprietary, including but not limited to service and maintenance manuals. BUYER and its customers, employees, and agents will keep confidential all such Proprietary Information obtained directly or indirectly from SELLER and will not transfer or disclose it without SELLER's prior written consent, or use it for the manufacture, procurement, servicing, or calibration of Products or any similar products, or cause such products to be manufactured, serviced, or calibrated by or procured from any other source, or reproduce or otherwise appropriate it. All such Proprietary Information remains SELLER's property. No right or license is granted to BUYER or its customers, employees or agents, expressly or by implication, with respect to the Proprietary Information or any patent right or other proprietary right of SELLER, except for the limited use licenses implied by law. In respect of personal data supplied by BUYER to SELLER, BUYER warrants that is duly authorized to submit and disclose these data, including but not limited to obtaining data subjects´ informed consent. SELLER will manage BUYER's information and personal data in accordance with its Privacy Policy, a copy of which is available to BUYER upon request. In respect of other data and information that SELLER may receive in connection with BUYER´s use of the Products including without limitation data that are captured by the Products and transmitted to SELLER, BUYER hereby grants SELLER a non-exclusive, worldwide, royalty-free, perpetual, non-revocable license to use, compile, distribute, display, store, process, reproduce, or create derivative works of such data as needed for Product operation and maintenance, and to aggregate such data for use in an anonymous manner, solely to facilitate marketing, sales and R&D activities of SELLER and its affiliates.

13. **SPECIAL TOOLS, DIES, JIGS, FIXTURES AND PATTERNS**: Any tools, dies, jigs, fixtures, patterns and similar items which are included or required in connection with the manufacture and/or supply of the Products will remain the property of SELLER without credit to the BUYER. SELLER assumes the cost for maintenance and replacement of such items and shall have the right to discard and scrap any such item after it has been inactive for a minimum of one year, without credit to the BUYER.

14. **CHANGES AND ADDITIONAL CHARGES**: SELLER reserves the right to make design changes or improvements to any products of the same general class as Products being delivered hereunder without liability or obligation to incorporate such changes or improvements to Products ordered by BUYER unless agreed upon in writing before the Products' delivery date. SELLER shall not be obligated to implement any changes or variations in the scope of work described in SELLER's scope of supply unless BUYER and SELLER agree in writing to the details of the change and any resulting price, schedule or other contractual modifications. This includes any changes or variations necessitated by a change in applicable law occurring after the effective date of this Agreement including these Terms.

15. **SITE ACCESS / PREPARATION / WORKER SAFETY / ENVIRONMENTAL COMPLIANCE:** In connection with services provided by SELLER, BUYER agrees to permit prompt access to equipment. BUYER assumes full responsibility to back-up or otherwise protect its data against loss, damage or destruction before services are performed. BUYER is the operator and in full control of its premises, including those areas where SELLER employees or contractors are performing service, repair, and maintenance activities. BUYER will ensure that all necessary measures are taken for safety and security of working conditions, sites, and installations during the performance of any services. BUYER is the generator of any resulting wastes, including without limitation hazardous wastes. BUYER is solely responsible to arrange for the disposal of any wastes at its own expense. BUYER will, at its own expense, provide SELLER employees and contractors working on BUYER's premises with all information and training required under applicable safety compliance regulations and BUYER's policies. SELLER has no responsibility for the supervision or actions of BUYER's employees or contractors or for non-SELLER items (e.g., chemicals, equipment) and disclaims all liability and responsibility for any loss or damage that may be suffered as a result of such actions or items, or any other actions or items not under SELLER's control.

16. **LIMITATIONS ON USE:** BUYER will not use any Products for any purpose other than those identified in SELLER's catalogs and literature as intended uses. Unless SELLER has advised the BUYER in writing, in no event will BUYER use any Products in drugs, food additives, food, or cosmetics, or medical applications for humans or animals. In no event will BUYER use in any application any Product that requires FDA 510(k) clearance unless and only to the extent the Product has such clearance. BUYER will not sell, transfer, export, or re-export any SELLER Products or technology for use in activities which involve the design, development, production, use, or stockpiling of nuclear, chemical, or biological weapons or missiles, nor use SELLER Products or technology in any facility which engages in activities relating to such weapons. Unless the "ship-to" address is in California, U.S.A., the Products are not intended for sale in California and may lack markings required by California Proposition 65; accordingly, unless BUYER has ordered Products specifying a California ship-to address, BUYER will not sell or deliver any SELLER Products for use in California. Any warranty granted by SELLER is void if any goods covered by such warranty are used for any purpose not permitted hereunder.

17. **EXPORT AND IMPORT LICENSES AND COMPLIANCE WITH LAWS**: Unless otherwise expressly agreed, BUYER is responsible for obtaining any required export or import licenses necessary for Product delivery. BUYER will comply with all laws and regulations applicable to the installation or use of all Product, including applicable import and export control laws and regulations of the U.S., E.U., and any other country having proper jurisdiction, and will obtain all necessary export or import licenses in connection with any subsequent export, re-export, transfer, and use of all Product and technology delivered hereunder. BUYER will not sell, transfer, export, or re-export any SELLER Product or technology for use in activities which involve the design, development, production, use or stockpiling of nuclear, chemical, or biological weapons or missiles, nor use SELLER Product or technology in any facility which engages in activities relating to such weapons. BUYER will comply with all local, national, and other laws of all jurisdictions globally relating to anti-corruption, bribery, extortion, kickbacks, or similar matters which are applicable to BUYER's business activities in connection with this Contract, including but not limited to the U.S. Foreign Corrupt Practices Act of 1977, as amended (the "FCPA"). BUYER agrees that no payment of money or provision of anything of value will be offered, promised, paid, or transferred, directly or indirectly, by any person or entity, to any government official, government employee, or employee of any company owned in part by a government, political party, political party official, or candidate for any government office or political party office to induce such organizations or persons to use their authority or influence to obtain or retain an improper business advantage for BUYER or for SELLER, or which otherwise constitute or have the purpose or effect of public or commercial bribery, acceptance of or acquiescence in extortion, kickbacks, or other unlawful or improper means of obtaining business or any improper advantage, with respect to any of BUYER's activities related to this Contract. SELLER asks BUYER to "Speak Up!" if aware of any violation of law, regulation, or our Code of Conduct ("CoC") in relation to this Contract. See

https://www.veraltointegrity.com and https://www.veralto.com/integrity-compliance for a copy of the CoC and for access to our Helpline portal.

18. **RELATIONSHIP OF PARTIES**: BUYER is not an agent or representative of SELLER and will not present itself as such under any circumstances, unless and to the extent it has been formally screened by SELLER's compliance department and received a separate duly-authorized letter from SELLER setting forth the scope and limitations of such authorization.

19. **FORCE MAJEURE**: SELLER is excused from performance of its obligations under this Contract to the extent caused by acts or omissions that are beyond its control, including but not limited to Government embargoes, blockages, seizures or freezing of assets, delays, or refusals to grant an export or import license, or the suspension or revocation thereof, or any other acts of any Government; fires, floods, severe weather conditions, or any other acts of God; quarantines; epidemics and pandemics; labor strikes or lockouts; riots; strife; insurrections; civil disobedience or acts of criminals or terrorists; war; material shortages or delays in deliveries to SELLER by third parties. In the event of the existence of any force majeure circumstances, the period of time for delivery, payment terms, and payments under any letters of credit will be extended for a period of time equal to the period of delay. If the force majeure circumstances extend for six months, SELLER may, at its option, terminate this Contract without penalty and without being deemed in default or in breach thereof.

20. **NON-ASSIGNMENT AND WAIVER**: BUYER will not transfer or assign this Contract or any rights or interests hereunder without SELLER's prior written consent. Failure of either party to insist upon strict performance of any provision of this Contract, or to exercise any right or privilege contained herein, or the waiver of any breach of the terms or conditions of this Contract, will not be construed as thereafter waiving any such terms, conditions, rights, or privileges, and the same will continue and remain in force and effect as if no waiver had occurred. This Agreement is for the sole benefit of the parties hereto and their respective successors and permitted assigns and nothing herein, express or implied, is intended to or shall confer upon any other person or entity any legal or equitable right, benefit or remedy of any nature whatsoever under or by reason of these Terms.

21. **FUNDS TRANSFERS**: BUYER and SELLER both recognize that there is a risk of banking fraud when individuals impersonating a business demand payment under new mailing or banking transfer instructions. To avoid this risk, BUYER must verbally confirm any new or changed mailing or banking transfer instructions by calling SELLER and speaking with SELLER's Accounts Receivable Manager before transferring any monies using the new instructions. Both parties agree that they will not institute mailing or banking transfer instruction changes and require immediate payment under the new instructions, but will instead provide a ten (10) day grace period to verify any mailing or banking transfer instruction changes before any new or outstanding payments are due using the new instructions.

22. **LIMITATION OF LIABILITY**: None of SELLER, its successors-in-interest, assignees, affiliates, directors, officers, and employees will be liable to any BUYER Indemnified Parties under any circumstances for any special, treble, incidental, or consequential damages, including without limitation, damage to or loss of property other than for the Products purchased hereunder; damages incurred in installation, repair, or replacement; lost profits, revenue, or opportunity; loss of use; losses resulting from or related to downtime of the Products or inaccurate measurements or reporting; the cost of substitute products; or claims of any of BUYER's Indemnified Parties' customers for such damages, howsoever caused, and whether based on warranty, contract, and/or tort (including negligence, strict liability or otherwise). The total liability of SELLER, its successors-in-interest, assignees, affiliates, directors, officers, and employees arising out of the performance or nonperformance hereunder, or SELLER's obligations in connection with the design, manufacture, sale, delivery, and/or use of Products, will in no circumstance exceed the amount actually paid to SELLER for Products delivered hereunder.

23. **APPLICABLE LAW AND DISPUTE RESOLUTION**: All issues relating to the construction, validity, interpretation, enforcement, and performance of this agreement and the rights and obligations of SELLER and the BUYER hereunder shall be governed by the laws of the Province of Ontario and the federal laws of Canada applicable therein; provided that if SELLER is Trojan Technologies Corp., then the applicable governing laws shall be the State of New York and the applicable federal laws therein. Any provisions of the International Sale of Goods Act or any convention on contracts for the international sale of goods shall not be applicable to this agreement. The parties submit to and consent to the non-exclusive jurisdiction of courts located in the Province of Ontario; provided that if SELLER is Trojan Technologies Corp., then the parties submit to and consent to the non-exclusive jurisdiction of courts located in the State of New York.

24. **ENTIRE AGREEMENT, MODIFICATION, & SURVIVAL**: These Terms & Conditions of Sale constitute the entire agreement between the parties and supersede any prior agreements or representations, whether oral or written. Upon thirty (30) days prior written notice, SELLER may, in its sole discretion, elect to terminate any order for the sale of Products and provide a pro-rated refund for any pre-payment of undelivered Products. No change to or modification of these Terms & Conditions shall be binding upon SELLER unless in a written instrument specifically referencing that it is amending these Terms & Conditions of Sale and signed by an authorized representative of SELLER. SELLER rejects any additional or inconsistent Terms & Conditions of Sale offered by BUYER at any time, whether or not such terms or conditions materially alter the Terms & Conditions herein and irrespective of SELLER's acceptance of BUYER's order for the described goods and services. All payment, confidentiality and indemnity obligations, warranties, limitations of liability, product return, and ownership of materials provisions together with those sections the survival of which is necessary for the interpretation or enforcement of these Terms, shall continue in full force and effect for the duration stated in such provisions or the applicable statute of limitations.

TERMS AND CONDITIONS COVERING SALES OF CONFIGURED-TO-ORDER PROJECTS AND SYSTEMS

In addition to all terms and conditions above, unless otherwise addressed as part of SELLER's offer, the following sections apply to sales of Configured-to-Order Projects, Systems, and the like, except for any Aria Filtra Products:

101. PAYMENT.

101.1 Payments will be made per the schedule of payment events set forth in SELLER's offer; provided that if the Start-Up Date (as defined below) is less than 30 days after the Delivery Date, 90% of the purchase price is due before the Start-Up Date.

101.2. In the event that achievement of a scheduled payment event is delayed or suspended due to the BUYER's convenience or other reasons for which the BUYER or its representatives is responsible, such payment event will be deemed to have occurred and SELLER shall be entitled to invoice BUYER as if achievement of such payment event had been achieved. In such circumstances, BUYER must notify SELLER in writing of the reasons for the delay and anticipated duration of the delay. SELLER will mark the Products (or parts thereof) as the BUYER's property and BUYER shall make arrangements for a third party to store the Products at BUYER's cost.

102. DELIVERY

102.1 SELLER will request the BUYER to provide a firm date for delivery of the Products to the project site (the "Delivery Date") which SELLER will then use to establish the production schedule for the Products. The Delivery Date will then be binding on the BUYER except for any changes made in accordance with the provisions below.

102.2 SELLER reserves the right to reschedule the Delivery Date to a date prior to or subsequent to the scheduled Delivery Date in order to accommodate its shipping, production or other requirements. This right to reschedule will be applicable unless otherwise agreed to in writing by an authorized officer of SELLER. SELLER will provide the BUYER or its representative with a minimum of 24 hours' notice of any such rescheduling.

102.3 Where any change to the Delivery Date is made at BUYER's request and upon SELLER's agreement, for all purposes with respect to the warranty and payment requirements provided by SELLER in connection with the Products, the initial Delivery Date will be deemed to be the Delivery Date regardless of any change later made to the Delivery Date.

103. ACCEPTANCE

103.1 During the period between the Delivery Date and the Start-up Date, the BUYER shall prepare the Products and the project site for installation and start-up and, unless otherwise agreed in writing by an authorized representative of SELLER, shall complete acceptance testing with respect to the Products. The Products shall be deemed to be accepted on the earliest to occur of the following dates (the "Acceptance Date"): (a) that date on which the Products can function in either manual or automatic operation and provide treatment in accordance with criteria specified in the Quotation, or (b) 60 days after the Delivery Date.

103.2 All amounts which remain owing by the BUYER for the Products, including any amount which is specified to be payable on the Acceptance Date, will be paid by the BUYER to SELLER within 30 days after the Acceptance Date, unless otherwise agreed in writing by an authorized representative of SELLER.

103.3 Written notification must be given by the BUYER to SELLER within seven days after the Acceptance Date listing any outstanding deficiencies with respect to the Products and SELLER will use all reasonable efforts to correct such deficiencies promptly.

104. START-UP

104.1 SELLER will request a firm date for start-up of the Equipment (the "Start-Up Date"). Trojan will then schedule its technician to be on-site for the Start-up Date. The Start-up Date is binding except for any changes made in accordance with the provisions below.

104.2 On the Start-up Date, BUYER must have the Equipment and site ready as provided in the Installation Preparation Checklist contained in the Contractor Installation Package sent to BUYER and must have paid all amounts then due and payable to SELLER.

104.3 BUYER can request a rescheduling of the Start-up Date by notifying SELLER in writing not less than three weeks prior to the Start-up Date. BUYER may request that the Start-up Date be extended but may not request that the Start-up Date be moved forward. SELLER requires a minimum extension period of two weeks between the existing Start-up Date and the requested new Start-up Date in order to reschedule its technician.

104.4 SELLER may, in its sole discretion, agree to reschedule the Start-up Date where a BUYER requests less than a two-week extension but is under no obligation to do so. In the event that SELLER does agree to less than a two- week extension or that BUYER requests more than two changes to the Start-up Date, BUYER will be charged an administration fee in an amount determined by SELLER.

104.5 SELLER reserves the right to reschedule the Start-up Date to a date which is prior to or subsequent to the scheduled Start-up Date in order to accommodate its resource availability. This right to reschedule will be applicable unless otherwise agreed in writing by an authorized officer of SELLER. SELLER will provide BUYER or its representative with a minimum of 72 hours' notice of any such change to the Start-up Date.

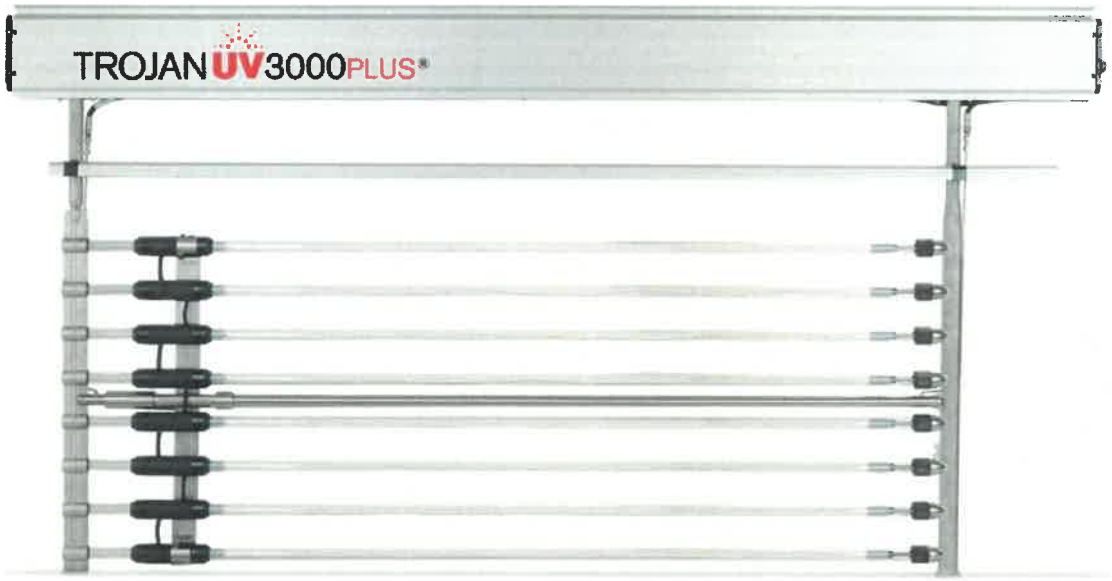
104.6 In the event that SELLER'S technician arrives at the project site and finds that the Equipment or the project site is not ready for start-up as defined in the Contractor Installation Package, or any amounts then due and payable to SELLER remain unpaid, BUYER may either:

(a) provided all amounts then due and payable to SELLER have been paid, issue a purchase order for all costs involved in having SELLER correct the deficiencies, or

(b) have SELLER'S technician leave the site and then reschedule the Start-up Date to a date when all deficiencies will be corrected, and the Equipment will be ready for start-up as defined in the Contractor Installation Package. If BUYER selects this option, the cost of rescheduling will be not less than a minimum amount specified by SELLER, with the final cost being determined by SELLER based on its costs and expenses incurred in connection with the rescheduling.

Rev. May 21, 2024

Section 2 – Bid Form



This page is intentionally left blank.

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

BID FORM FOR PROCUREMENT CONTRACT

Prepared By

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

ACEC
AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

NSPE
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

BID FORM FOR PROCUREMENT CONTRACT

TABLE OF CONTENTS

BID FORM FOR PROCUREMENT CONTRACT

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 1—BUYER AND BIDDER

1.01 This Bid is submitted to:

1.02 **City of Camas, Washington** The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Procurement Contract with Buyer in the form included in the Procurement Bidding Documents, and to furnish the Goods and Special Services as specified or indicated in the Procurement Bidding Documents, for the prices and within the times indicated in this Bid, and in accordance with the other terms and conditions of the Procurement Bidding Documents.

ARTICLE 2—BASIS OF BID

2.01 *Lump Sum Bids*

A. Bidder will furnish the Goods and Special Services in accordance with the Procurement Contract Documents for the following Procurement Contract Price(s):

1. Lump Sum Bid Price

Lump Sum Bid Price	$ 639,286

2.02 *Buyer's Contingency Allowance*

A. The Bid Price is supplemented by the following Buyer's Contingency Allowance, as described in the General Conditions, Paragraph 11.06:

Buyer's Contingency Allowance	$10,000

2.03 *Total Bid Price*

A. The following Total Bid Price is the sum of the Lump Sum Bid Price from Paragraph 2.01, and the Buyer's Contingency Allowance. The Total Bid Price, if accepted and incorporated in the Procurement Contract to be awarded, will be subject to any Buyer-accepted Alternates and Buyer's Contingency Allowance adjustments.

Total Bid Price	$ 649,286

ARTICLE 3—TIME OF COMPLETION

3.01 Bidder agrees that the furnishing of Goods and Special Services will conform to the schedule of Procurement Contract Times set forth in Article 2 of the Procurement Agreement.

3.02 Bidder accepts the provisions of the Procurement Agreement as to liquidated damages.

ARTICLE 4—ATTACHMENTS TO THIS BID

4.01 The following documents are attached to and made a condition of this Bid:

A. Required Bid security in the form prescribed in the Instructions to Bidders.

B. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids.

C. Required Bidder Qualification Statement with supporting data.

ARTICLE 5—BIDDER'S ACKNOWLEDGMENTS

5.01 Bidder accepts all terms and conditions of the Instructions to Bidders. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period that Bidder may agree to in writing upon request of Buyer.

5.02 Bidder has examined and carefully studied the Procurement Bidding Documents, the related data identified in the Procurement Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum No.	Addendum Date
1	November 14, 2024

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

A. In submitting this Bid, Bidder represents that:

1. Bidder has examined and carefully studied the Procurement Contract Documents.

2. If required by the Instructions to Bidders to visit the Point of Destination and the site where the Goods are to be installed or Special Services will be provided, or if, in Bidder's judgment, any observable local or site conditions may affect the delivery, cost, progress, or furnishing of the Goods and Special Services, then Bidder has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided (as applicable) and become familiar with and is satisfied as to the observable local and site conditions that may affect delivery, cost, progress, and furnishing of the Goods and Special Services.

3. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect the cost, progress, and performance of Seller's obligations under the Procurement Contract.

4. Bidder has carefully studied, considered, and correlated the information known to Bidder with respect to the effect of such information on the cost, progress, and performance of Seller's obligations under the Procurement Contract.

5. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Procurement Contract Documents, and the written resolution (if any) thereof by Engineer is acceptable to Bidder.

6. The Procurement Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance of Seller's obligations under the Procurement Contract.

7. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of the Bidding Requirements, that without exception the Bid (including all Bid prices) is premised upon furnishing the Goods and Special Services as required by the Procurement Contract Documents.

6.02 *Bidder's Certifications*

A. Bidder certifies that:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

3. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Procurement Contract. For the purposes of this Paragraph 6.02.A.4:

a. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;

b. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Buyer, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Buyer of the benefits of free and open competition;

c. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Buyer, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

d. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process.

Date:	November 6, 2024
Project:	Camas WWTP TO4 UV Disinfection
To:	City of Camas
From:	Andrew Staples, PE, PMP
Subject:	UV Disinfection System Sole Source Justification
Attachments:	Appendix A – UV Disinfection System Replacement Technical Memorandum Appendix B – City of Camas NPDES Permit

1.0 Introduction

The City of Camas has engaged HDR to replace the existing Trojan 3000 Ultraviolet (UV) disinfection equipment at the City of Camas Wastewater Treatment Plant (WWTP). One of the tasks involved in the design is to evaluate UV disinfection systems from multiple manufacturers based on effluent requirements in the City's NPDES permit (City of Camas, 2004), design criteria to meet the NPDES permit requirements, limitations of the existing facility, and cost efficiency. Specific UV disinfection requirements can be found in the City's NPDES permit, Appendix B. Following HDR's evaluation, only one manufacturer of UV disinfection systems can met the permit and required design conditions. This letter provides information from investigation of manufacturers with conclusions to justify sole sourcing the UV disinfection equipment from the one acceptable manufacturer.

2.0 Investigated Manufacturers

HDR solicited proposals from three manufacturers for preliminary design and budgetary numbers for a new UV disinfection system to replace the Camas WWTP existing system. These proposals provided sufficient details, information and design criteria to evaluate if the manufacturers equipment could be incorporated into the existing facility. The three manufacturers were Trojan, WEDECO, and DeNora.

Trojan supplied the existing UV disinfection system at the Camas WWTP prompting them to be an acceptable candidate for submitting a preliminary proposal. WEDECO and DeNora are manufacturers HDR has experience with at other UV disinfection projects and were considered acceptable manufacturers to submit their design proposals for evaluation.

The following sections summarize the results of HDR's evaluation of UV disinfection systems considered as suitable replacement systems of the Camas WWTP UV disinfection system outlined in the UV Disinfection System Replacement Technical Memorandum (HDR Inc., 2024).

3.0 Investigation Results

WEDECO DURON

Due to the flow rates, existing water depth, and channel configuration, the WEDECO Duron inclined-lamp system was not suitable for the Camas WWTP. The existing UV channel would require significant physical modifications, making the WEDECO system cost prohibitive. HDR requested a proposal from WEDECO on their TAK horizontal lamp system, but WEDECO declined to provide one. Due to the requirement for channel modifications and the lack of a proposal for the TAK system, WEDECO was not pursued further.

DENORA

DeNora proposed their C3500D UV disinfection system which consisted of 3 UV banks operating as 2 duty, 1 standby. The system is a horizontal lamp system suitable for open channel. Without channel modifications, the maximum flow rate the system could operate at is 9.2 MGD. It would require channel modifications to meet the 12.4 MGD design flow rate, but the added issue is the headloss and water depth changes associated with this UV disinfection system. The determination was this system would not be suitable for the Camas WWTP UV Disinfection Facility.

TROJAN

Trojan proposed the UV3000+ system consisting of 3 banks operating as 2 duty, 1 standby to treat the peak design flow of 12.4 MGD. The upstream and downstream channel water levels are 29.29 feet and 28.88 feet, respectively, for the peak design flow. This headloss is minimal compared to the DeNora system. This system is essentially an in-kind replacement of the existing UV disinfection system with enhanced technology to meet the design flows of 12.4 MGD. The one difference from the existing system is the UV3000+ system uses mechanical and chemical cleaning mechanisms to clean the UV lamps.

4.0 Selected Manufacturer

As discussed in the UV Disinfection System Replacement Technical Memorandum (HDR Inc., 2024), it was determined the Trojan UV3000+ UV disinfection system is the only acceptable system to be considered as a replacement of the existing system. General arrangement layout of the system and other technical data can be found in the technical memorandum, Appendix A. This system meets the effluent requirements in the City's NPDES permit (City of Camas, 2004), the system design criteria adhering to the NPDES permit requirements, considers the limitations of the existing facility, and is the most cost-efficient option. Therefore, HDR recommends the City to sole source the replacement of the UV disinfection system to Trojan taking into consideration it is the only manufacturer to meet the performance requirements and can be installed in the existing channel without modifications.

5.0 References

1. HDR, Inc., 2024. UV Disinfection System Replacement Technical Memorandum. September 20.
2. City of Camas, 2004. National Pollutant Discharge Elimination System Waste Discharge Permit No. WA0020249. December 1.

Appendices

Appendix A

UV Disinfection System Replacement Technical Memorandum

Secondary Treatment Facilities & Equipment Building Upgrades

UV Disinfection System Replacement Technical Memorandum

Task Order 4

City of Camas, Washington
September 20, 2024

Contents

Tables

Figures

Appendices

This page is intentionally left blank.

1 Introduction

1.1 Background

The City of Camas (City) owns and operates the City of Camas Wastewater Treatment Plant (WWTP). This treatment facility produces secondary effluent for discharge to the Columbia River and Class A biosolids. The City has engaged HDR to lead implementation of improvements to various treatment components of the WWTP including the Ultraviolet (UV) disinfection facility. HDR Engineering, Inc. (HDR) will perform the design services described in the Task Order 4 Scope of Services (TO4 SOW, December 2023).

The existing UV disinfection equipment consists of an older Trojan system that no longer has support for parts. The UV disinfection system will be evaluated in this Technical Memorandum to understand current and future regulations, capacities, and make recommendations to the City based on the currently available equipment and building configurations. Electrical and control equipment for the UV disinfection equipment will also be upgraded. HDR will utilize previously established hydraulic profiles for the UV Facilities and provide recommendations of equipment size and capacity (both style of equipment and flow capacity of the facility). Redundancy will be factored into the capacity of the UV disinfection equipment to meet current regulations for number of banks or channels out of service a peak flow condition. HDR will utilize in-house UV subject matter experts for assistance in equipment selection and sizing. HDR will also reach out to Trojan, Xylem/WEDECO, and DeNora for system proposals.

1.2 Existing UV Treatment System

The existing Trojan UV3000 horizontal open channel UV disinfection system consists of four, UV banks (Bank 1A, Bank 1B, Bank 1C, and Bank 1D). The system is installed inside the UV Disinfection/Effluent Pump Station Building inside a single channel. The channel is 49.7 feet long by 3 feet wide by 5.5 feet deep. Water level in the UV channel is controlled by an adjustable weir gate (08 WG 01) located downstream of the UV Bank 1D.

Each UV bank has a disinfection capacity of 3.05 MGD. The system is rated for a peak day flow of 10.04 MGD with four banks in operation. One UV bank provides redundancy. Each bank consists of 12 modules with 8 UV lamps per module for a total of 96 lamps per bank and a total of 384 UV lamps for the UV disinfection system.

There are four power distribution center (PDC), one for each UV bank, that require a 208V, 3PH service. The UV disinfection system is controlled by a Type A System Control Center (SCC) consisting of a wall mounted Allen Bradley Compact Logix PLC controller with Ethernet/IP. The UV System dosing is based on a flow-pacing control philosophy using an effluent flowmeter.

The design criteria for the existing UV disinfection system is summarized in the table below.

Table 1-1. Existing UV Disinfection Design Criteria

Design Parameter	Parameter Value
Peak Day Flow	10.04 MGD
Suspended Solids a	Less than 20 mg/L
Percent Transmittance	70% minimum at 254 nm
Disinfection Dose	Minimum 30 mJ/cm2 @ Peak Design Flow
Disinfection Standards b	Less than 200 Fecal Coliform per 100 mL

Source: 2014 Wastewater Treatment Plant O&M Manual prepared by Gray & Osborne Consulting Engineers
a Based on a 30-day average; b Based on a 30-day geometric mean;

2 UV Disinfection System Design Basis

The UV system receives filtered effluent and provides disinfection prior to discharging to the Columbia River via a 36-inch Final Effluent gravity line or through the Effluent Pump Station. A portion of the disinfected effluent is used within the plant as equipment wash water that is supplied through the Non-Potable Water Pumps.

2.1 Disinfection Treatment Objectives

The basis of design for the UV Disinfection system are driven by the effluent requirements at Outfall #001 set forth in the City's National Pollutant Discharge Elimination System (NPDES) permit for the facility (NPDES Permit No. WA0020249). The primary driver for the UV disinfection system is the Fecal Coliform Bacteria Limit set at 200 cfu / 100mL of water average monthly (30-day geometric mean) and 400 cfu / 100 mL weekly average (7-day geometric mean).

2.2 Additional Reclaimed Water Standards

HDR understands that the City has evaluated the beneficial reuse of reclaimed water generated by the WWTP as part of the 2010 General Sewer Plan. However, it was determined that the production of reclaimed water should only be pursued if the cost of producing reclaimed water is less than or equal to the cost of purchasing water or developing additional sources. At this time, the City has no plans to produce reclaimed water at the WWTP and additional reclaimed water standards are not considered in the design criteria for the replacement UV system.

2.3 Current Effluent Quality and Baseline Design Criteria

The City furnished water quality data for the WWTP for a five-year period from 2019-2023. The data was provided in Excel spreadsheets and reported in daily values. The following subsections provide a high-level summary of the important parameters and performance of the existing UV disinfection system.

2.3.1 Flow

Based on the data provided by the City, the influent flows to the WWTP are summarized in Table 2-1. The WWTP total daily and peak daily flow measurements from 2019 to 2023 is graphed in Figure 2-1. Based on the hourly flow data, the minimum hourly flow observed is approximately 0.35 MGD and will be included in the design criteria for the UV system and downstream weir gate controls.

Table 2-1. City of Camas WWTP Influent Flows in MGD for 2019-2023

Year	Average Annual Flow (AAF) a	Peak Daily Flow (PDF) b	Peak Hourly Flow (PHF) c	Notes/Remarks
2019	2.3	5.2	7.5	See footnotes
2020	2.5	6.6	9.6	See footnotes
2021	2.6	7.5	11.1	See footnotes
2022	2.7	7.8	12.7	See footnotes
2023	2.6	6.8	10.8	See footnotes

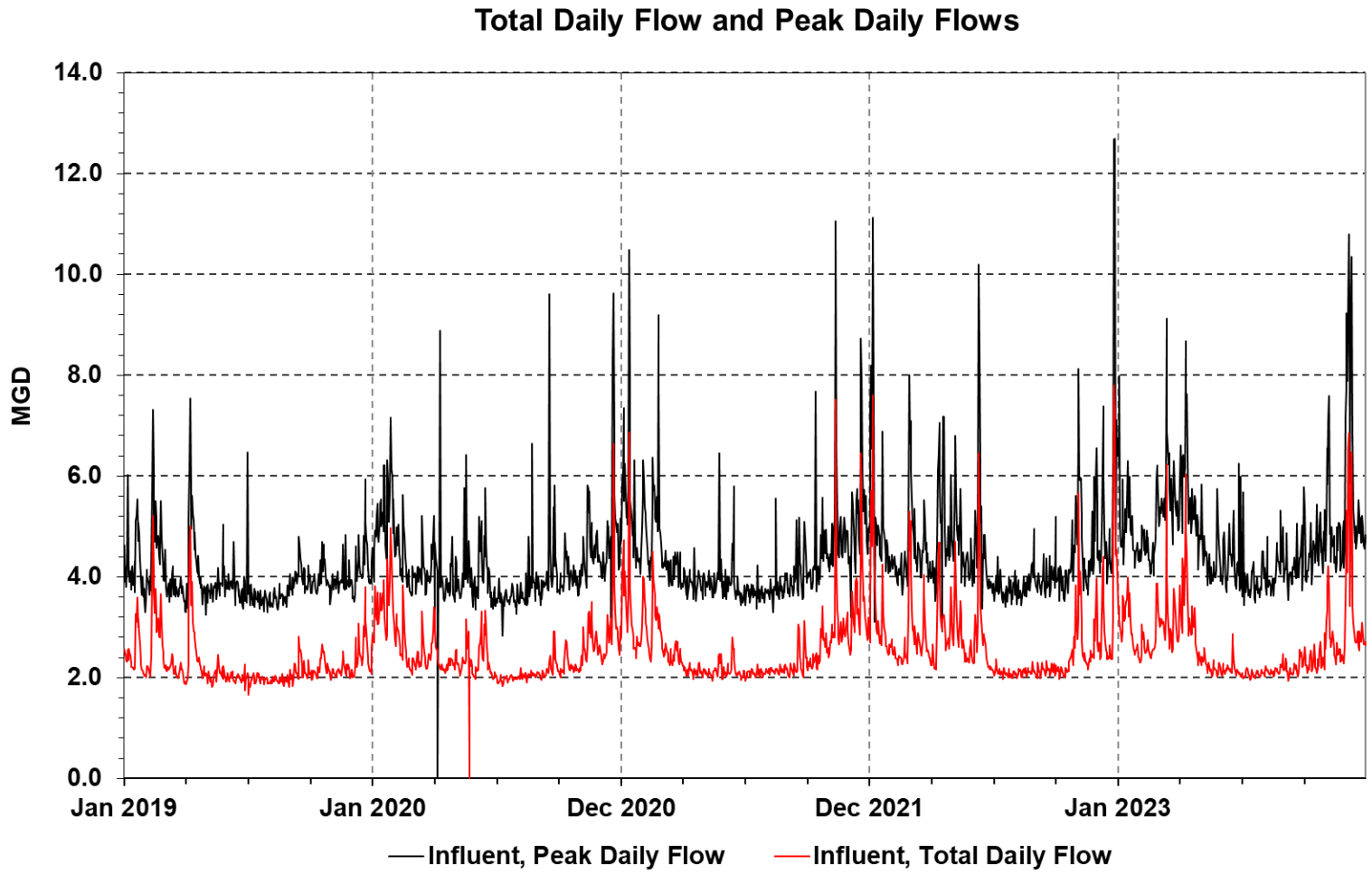
Source: City of Camas 2019-2023 Data Set; All values expressed in MGD.

[a] AAF is the average of the totalized daily flow values in the provided data set.

[b] PDF is the max value of the totalized daily flow values in the provided data set.

[c] PHF is the max of the peak daily flow values in the provided data set.

Figure 2-1. City of Camas WWTP Total and Peak Daily Flow Measurements for 2019-2023



2.3.2 Total Suspended Solids

Based on the data provided by the City, the effluent TSS concentrations from the WWTP are summarized in Table 2-2. The WWTP Effluent TSS measurements from 2019 to 2023 is graphed in Figure 2-2.

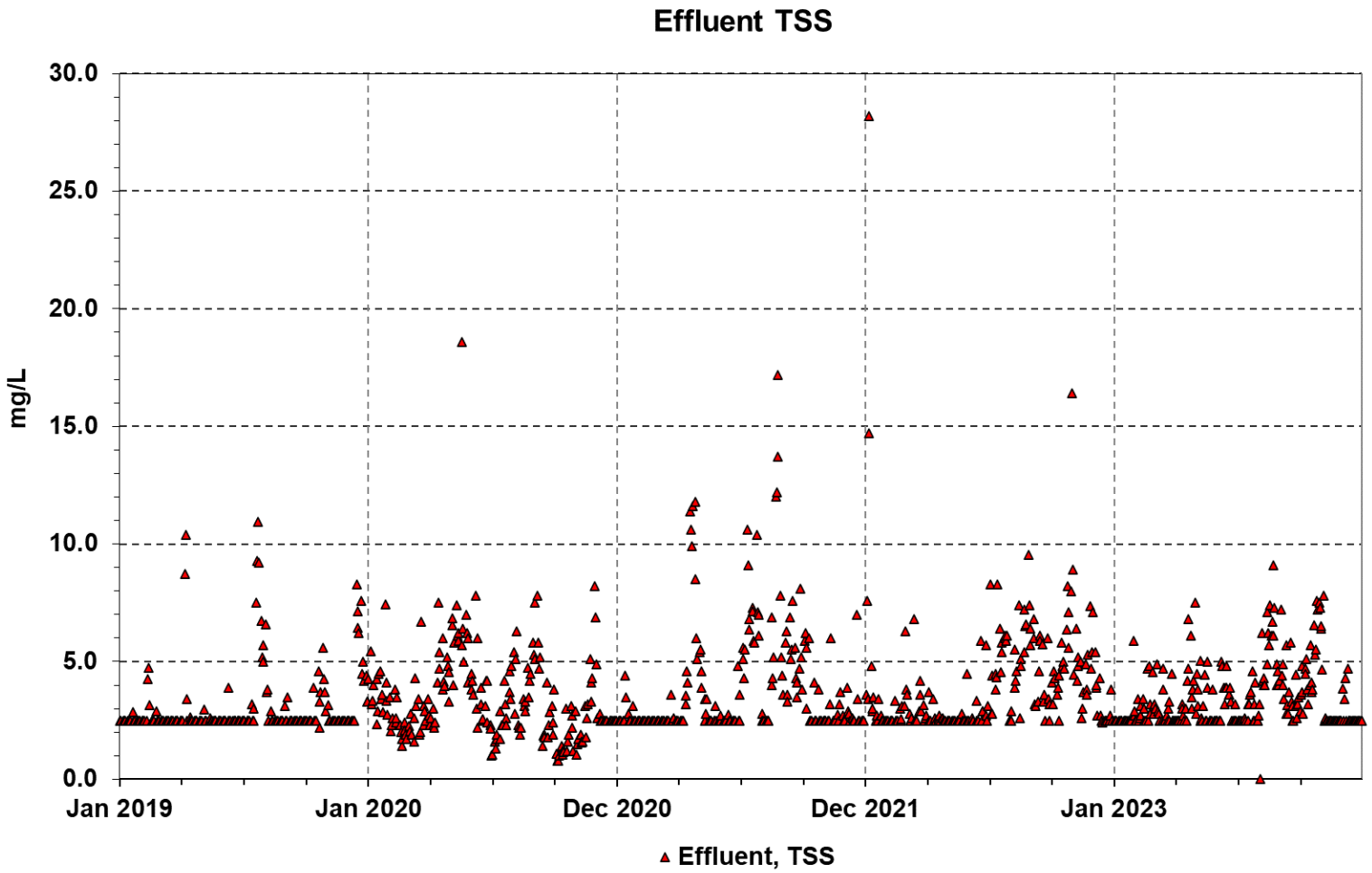
Since the UV Disinfection System does not impact TSS concentrations, these values are assumed to be produced upstream of the UV System as part of the Filter Effluent.

Table 2-2. City of Camas WWTP Effluent TSS Concentrations for 2019-2023

Year	AD (mg/L) a	MM (mg/L) b	MW (mg/L) c	MD (mg/L) d
2019	2.50	4.93	8.74	10.61
2020	2.90	6.07	7.51	12.11
2021	2.50	7.14	11.81	15.03
2022	3.10	6.75	8.93	20.84
2023	2.80	5.86	7.41	8.09

Source: City of Camas 2019-2023 Data Set;
[a] Average Day (AD) = 50th Percentile
b Max Month (MM) = 91.7th Percentile
c Max Week (MW) = 98.1st Percentile
d Max Day (MD) = 99.7th Percentile

Figure 2-2. City of Camas WWTP Effluent TSS Measurements for 2019-2023



2.3.3 UV Transmittance

Based on the data provided by the City, the effluent UVT measurements from the WWTP are summarized in Table 2-3. The WWTP Effluent UVT measurements from 2019 to 2023 is graphed in Figure 2-3.

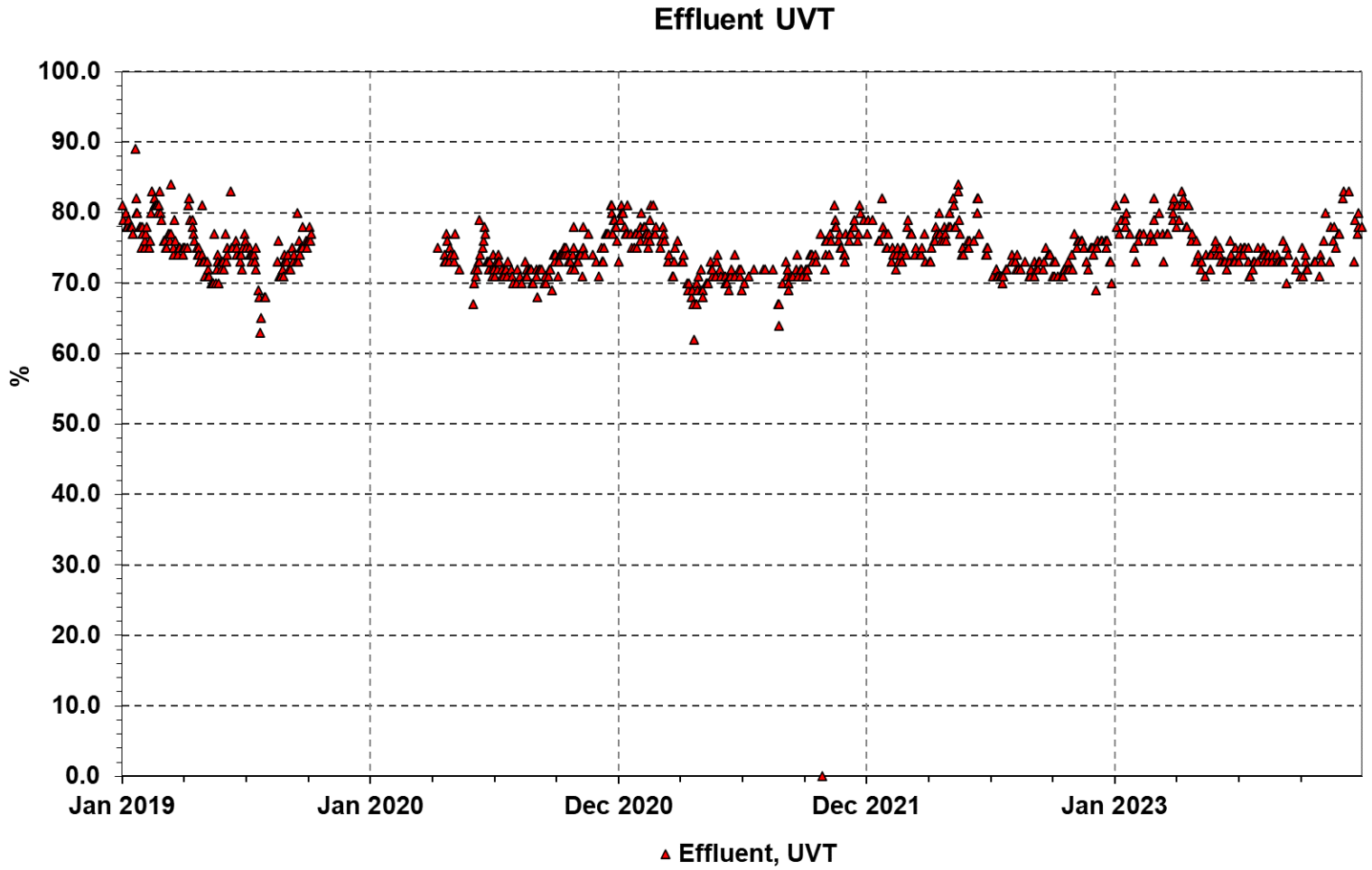
It is important to note that the data set is not complete and has sporadic data gaps throughout the year. The most notable is a 6-month period from early October 2019 to early April 2020.

Table 2-3. City of Camas WWTP Effluent UVT Measurements for 2019-2023

Year	10th Percentile
2019 [1]	71.0
2020 [1]	71.0
2021	69.6
2022	71.0
2023	72.4
Historical Average	71.0

Source: City of Camas 2019-2023 Data Set; UVT Measured at 253.7 nm
1. 6-month gap in data set observed between 10/2019 and 4/2020.
2. 10th Percentile of historical data used for design UVT per NWRI guidelines.

Figure 2-3. City of Camas WWTP Effluent UVT Measurements for 2019-2023



2.4 Proposed Design Criteria

The proposed design criteria for the new UV Disinfection System include regulatory requirements, the peak, average, and minimum flows, as well as the end-of-lamp-life factor (EOLL) and fouling factor, which represents efficiency of the UV system at the end of the lamp life and efficiency of the system with fouled lamp sleeves. Table 2-4 summarizes the key parameters to design and operate the UV Disinfection System.

Table 2-4. UV Disinfection Proposed Design Criteria

Description/Parameter	Design Criteria	Notes/Remarks
Peak Design Flow	12.4 MGD	2045 Flow Projection Memo
Average Design Flow	2.3 MGD	2019-2024 Hourly Flow Data
Minimum Design Flow	0.35 MGD	2022 to 2024 Hourly Flow Data
Effluent TSS	< 20 mg/L	NPDES Permit; 30-day Average
Fecal Coliform	<200 Fecal Coliform per 100 mL	NPDES Permit; 30-day Geometric Mean
	400 cfu / 100 mL weekly average	(7-day geometric mean)
UV Dose	30 mJ/cm2	Minimum @ end of lamp life
UV Transmittance	70%	Minimum; Fouled and @ end of lamp life

Additional requirements for the design of the new UV Disinfection System include:

- UV system needs to fit into the existing open channel reactor with no major structural modifications required.
- Redundancy of N+1 is required under the peak design flow.
- Channel depth and hydraulics are limited by the upstream effluent filter controlling weir and the downstream adjustable weir gate. No physical changes to the elevations shall be done. Maximum water depth in the channel shall be limited to 30-inches.
- The UV system will be designed to deliver a minimum UV dose indicated in the design criteria table at peak flow with a UV transmittance of 70% at end of lamp life after reduction of lamp output through quartz sleeve fouling.
- The design UV dose shall be based on the End-of-lamp-life (EOLL) factor of 0.50 unless UV supplier has a technology specific EOLL factor certified by an independent third party. EOLL greater than 0.90 will not be accepted.
- The design UV dose shall be based on the Fouling Factor (FF) of 0.8 unless UVSS has a technology-specific fouling factor certified by an independent third party. FF greater than 0.90 will not be accepted.

It is important to note that the flows presented in Table 2-4 have been estimated using a linear projection of the population growth for the City of Camas for the year 2045. Refer to the City of Camas Wastewater Projection Memo prepared on March 15, 2024 for

rationale and calculations. The UV system will be designed to handle the peak design flow using the available head through the system. However, the hydraulic capacity of the upstream process was not reviewed as part of this project. It is recommended that the City confirm the 2045 Projected Flows and impacts of to the plant's hydraulic capacity including existing piping, channels, and processes at the projected peak day flow.

3 Equipment Options and Recommendations

This section presents equipment options and recommendations for UV technology and presents a UV equipment evaluation for selection of the most appropriate reactor technology for the Camas WWTP.

3.1 UV Technology

UV technologies have been used routinely in wastewater disinfection for several decades. The Camas WWTP UV system, in place since 2002, has been consistently effective in meeting permitted effluent standards. However, due to the existing Trojan system that is no longer supported for replacement parts, the City is looking to upgrade the UV disinfection system to current and future regulations, capacities, and recommendations described in this evaluation. With UV disinfection, specific electromagnetic wavelengths are used to inactivate microorganisms through denaturing of their deoxyribonucleic acid (DNA). Wavelengths ranging from 250 to 270 nm are readily absorbed by DNA in bacteria and viruses, effectively inactivating pathogens found in wastewater by rendering them unable to replicate.

The expected effluent limits will continue to be based on Fecal Coliforms based on discussions with the Plant Supervisor. UV avoids the need for chlorination (and dechlorination), avoiding the need for Camas WWTP to receive and store chemicals on-site.

Based on these advantages, coupled with the successful previous use of UV technology at the Camas WWTP, it is recommended to continue the use of UV as the primary disinfection system. Selection of the particular UV technology, based on lamp types and reactor configuration, is detailed in the following sections.

3.1.1 Lamp Systems

One of the major components of a UV system is the UV lamps arranged in a specific array. UV disinfection systems are categorized based on the source of UV light or the type of UV lamp used in the system. UV technology is available in the following three lamp systems for wastewater treatment.

- Low-pressure low-output (LPLO)
- Medium-pressure high-output (MPHO)
- Low-pressure high-output (LPHO)

Early wastewater UV systems used LPLO lamps. Because of low output (intensity), a relatively large number of LPLO lamps are required for disinfection. Consequently, their use is currently limited to low-flow applications. Technology development in the last 30

years has resulted in systems capable of delivering higher intensity, leading to reduction in the number of lamps required and smaller footprint. Consequently, the LPLO lamp system is not considered for this application, as more efficient systems are available.

MPHO lamp systems operate with lamps at a much higher intensity than LPLO lamp systems. This results in the need for fewer lamps per unit of flow treated. However, the MPHO lamps have a shorter operating life and a lower efficiency for converting energy into germicidal light (254 nm wavelength). Additionally, the MPHO lamp systems have higher power requirements and experience more fouling due to high operating temperatures. Between 600˚C and 800˚C. MPHO lamp systems are polychromatic, producing UV light over a wider range of wavelengths in which the germicidal wavelength is a small portion of the entire generated light spectrum. These medium-pressure lamps are not as efficient as low-pressure lamps in terms of conversion of applied power to UV energy. Overall energy requirements for MPHO lamp systems are three to five times those of LPHO lamp systems. The MPHO technology was initially developed for industrial applications and later used for disinfecting poor-quality (low UVT) effluent.

Driven by the need to enhance energy efficiency, the LPHO system was developed specifically for disinfecting treated municipal effluents. It combines the benefits of both LPLO and MPHO lamp technologies. Because the LPHO lamp systems emit monochromatic germicidal light at higher intensity levels, their germicidal efficiency is higher than that of MPHO systems and the number of lamps needed to deliver a given dose is less than that of the LPLO lamp systems. The operating temperatures of LPHO lamp systems range from 140˚C to 180˚C. The lower operating temperatures when compared to MPHO lamp systems result in the LPHO lamp systems having longer operational life than MPHO lamp systems. In addition, lower operating temperatures help limit fouling of the protective lamp sleeves, particularly in wastewater treatment applications. A comparison of the LPHO and MPHO lamp systems in terms of equipment, operation, and cost is summarized in Table 3-1.

Table 3-1. Comparison of LPHO and MPHO Lamp Systems

LPHO	MPHO
Commonly used in wastewater disinfection applications	Commonly used in drinking water and low-UVT wastewater applications
More lamps	Less lamps
Lower lamp cost (~$100-$350/lamp)	Higher lamp cost (~$500/lamp)
Longer lamp life (~ 12,000 hours)	Shorter lamp life (~ 5,000 hours)
Low power demand per lamp (~300 W)	High power demand per lamp (~ 4,000 W)
Low operating temperature (~ 140˚-180˚C)	High operating temperature (~ 600˚-800˚C)
Higher power to germicidal light conversion efficiency (~40%)	Lower power to light conversion efficiency (~15%)
Lower overall system power consumption	Higher overall system power consumption (more than three times)
Low fouling potential	High fouling potential

Table 3-1. Comparison of LPHO and MPHO Lamp Systems

LPHO	MPHO
No cool down before restart	Cool down required before restart

3.1.2 Reactor Configuration

UV disinfection reactors are available in open-channel, closed-vessel, and non-contact configurations. The LPHO lamp systems are typically configured as modular arrangements in open, gravity-flow channels. LPHO lamps are also used in non-contact configurations and closed vessels. The MPHO lamp is generally used in pressurized closed vessels where the system head loss is typically greater than in open-channel configurations.

Open-Channel Reactor Configuration

UV disinfection systems with open-channel reactors are the most common UV disinfection installations in municipal wastewater and combined sewer overflow (CSO) treatment stations. This is the type of system currently installed at the Camas WWTP. Open-channel reactors consist of modules of lamps with the modules spanning the width of the channel to form a bank. The reactor is typically configured as a long, narrow channel with several UV banks arranged in series and the lamps completely submerged in the flowing effluent.

Cleaning of the open-channel reactors requires the UV system to be taken out of service for removal of a module/bank from the channel.

Closed-Vessel Reactor Configuration

In closed-vessel reactors, the UV lamps are enclosed. Flanged pipes are typically connected to the inlet and outlet of the closed vessel. Multiple reactors can be arranged in series and in parallel to increase capacity and provide redundancy. Typically, wastewater flows full or pressurized through the closed vessels, resulting in the lamps being completely submerged. The lamps can be accessed through watertight ports on the side of the reactor, so that chemical cleaning can be completed in place. Closed vessel systems may be a consideration if a new UV system is desired versus retrofitting UV equipment into an existing channel.

Non-Contact Reactor Configuration

The non-contact reactors are configured with UV lamps in a dry box and wastewater flowing through tubes arranged parallel to the lamps. Wastewater is disinfected by receiving UV light exposure through the tube walls. Presently only one manufacturer provides non-contact reactors in the United States market. The non-contact reactors use LPHO non-amalgam lamp systems and electronic ballasts. Lamps and flow tubes are in a staggered array and parallel configuration in an enclosed box. The high operating temperature of the UV lamps requires each box to be equipped with a cooling system including water pumps, heat exchangers, and radiators to maintain the ambient

temperature inside the reactor. The lamp/tube boxes can be arranged in series in to form a reactor. Wastewater can either be pumped or flow by gravity through arrays of approximately 2-inch-diameter tubes. Based on layout size and system complexity, the non-contact reactor will not be considered for further evaluation since it will not fit into the existing channel.

Comparison of Reactor Configurations

A comparison of the submerged reactors (open-channel and closed-vessel reactor configurations) in terms of equipment and operation is summarized in Table 3-2.

Table 3-2. Comparison of Submerged Reactors: Open Channel and Closed Vessel

Open Channel	Closed Vessel
Algae growth in channel	Algae growth in closed vessel
Gravity flow through system with flow control via weirs/gates	Pressurized flow full control via actuated inline valve
Existing concrete channel configuration	Pipe flanged reactors requiring modifications to existing configuration
Existing crane to lift lamps/modules/banks out of channel for periodic channel cleaning	Cleaning in place
Automated wiper system, easy visual observation and manual cleaning	Automated wiper system; difficult manual cleaning
Less turbulent flow and minor risk of short-circuiting	More turbulent flow and less risk of short

3.1.3 Lamp Orientation

In open-channel reactors, there are three typical lamp orientations:

- Horizontal and parallel to flow
- Vertical and perpendicular to flow
- Diagonal/inclined to flow

Figure 3-1 provides an example of each type of lamp configuration.

Figure 3-1. Lamp Orientation (left to right): Vertical, Inclined, Horizontal

Horizontal lamp systems typically require larger footprints and shallower channels compared with vertical or inclined systems. The water level in the channel must be maintained within a very tight band to ensure that the top lamp remains submerged, but

the submergence is not high enough to risk short-circuiting along the surface without proper exposure to the UV light. The head loss is generally less than vertical systems, but the modules are limited in size and number of lamps. Multiple modules form one bank and the electrical/lamp connectors are submerged. This is the existing lamp orientation currently used at the Camas WWTP.

Equipment setting and operational and maintenance characteristics are very similar between the vertical and diagonal/inclined lamp systems. Vertical or diagonal/inclined lamp systems consist of an open frame that rests on the bottom of the channel, with a bank in a vertical lamp system, and the water level fluctuations are more generous than horizontal systems (partial exposure of a lamp does not risk damage to the lamp or short-circuiting of process water), although the head loss is higher. All electrical connectors in the vertical lamp system can be located above water, while lamp connectors are completely submerged in the horizontal lamp system. While the channel must be deeper, the overall footprint of the installation is reduced. See Table 3-3 for a summary comparison of lamp orientations.

Table 3-3. Comparison of Horizontal and Vertical/Inclined Lamp Orientations

Horizontal	Vertical/Inclined
Completely submerged electrical connectors	All electrical connectors located above wastewater
Lower hydraulic head loss	Higher hydraulic head loss
Smaller-capacity modules; multiple modules in bank	Larger-capacity module; one module can form a bank
Utilize existing crane for module lifting	Large crane required to remove module (options for automatic removal mechanisms)
Requires module removal from channel for lamp replacement	Lamp replacement without module removal from channel
Sensitive to water level changes	Higher allowable water level changes
Requires little to no channel modifications	Potentially requires a deeper channel subject to existing channel modifications

3.1.4 Recommended Reactor Type and Geometry

Based on the review of the UV technologies presented above, it is recommended that the preliminary evaluation of UV disinfection systems for Camas WWTP consider:

- LPHO lamps as the best fit for Camas WWTP, given the small size of the reactors that are needed for this application and low operating temperature of LPHO lamps. This will match the current existing Trojan UV3000 system.
- Open-channel reactor keeping with the existing layout and configuration. This would avoid the complexity of installing a closed-vessel configuration and maintains familiarity of operation and maintenance of the UV lamp modules/banks.
- Open-channel reactors that reuse the existing channel will be the lower-cost option.

- Horizontal orientation which is the same orientation as the existing system, is the only configuration that will fit into the existing plant hydraulics without major infrastructure changes.

4 Preliminary Design

HDR reached out to Trojan, WEDECO, and the DeNora to evaluate options for replacing the existing UV Disinfection system.

Trojan proposed the UV3000+ system consisting of 3 banks operating as 2 duty, 1 standby to treat the peak design flow of 12.4 MGD. There is a total of 162 lamps with 108 duty, 54 standby. The upstream and downstream water levels are 29.29 feet and 28.88 feet, respectively, for the peak design flow and is acceptable for the upstream and downstream of the open channel.

DeNora proposed to supply the C3500D UV disinfection system consisting of 3 banks operating as 2 duty, 1 standby for the WWTP. Their system is a horizontal open-channel system that does not use chemicals for cleaning the UV lamp sleeves. The DeNora system uses 204 W per lamp, reducing the number of total lamps that need to be maintained. The DeNora system consists of a total of 90 lamps with 5 lamps to a rack and 6 racks to each bank. However, the DeNora C3500D would require modifications to the channel to meet the peak design flow of 12.4 MGD at 30 inches of water depth. Without channel modifications, the maximum flow rate the system could operate is 9.2 MGD with a headloss of 1.45 inches.

Unfortunately, due to channel configuration and existing water depth, the WEDECO Duron inclined lamp system is not compatible without making significant modifications to the channel. WEDECO also declined to provide a proposal using their TAK horizontal open-channel UV disinfection system noting that the flows would be too high for a single channel.

HDR recommends the Trojan UV3000+ system for the WWTP UV improvements. However, during the detailed design, additional follow-up questions, including replacement of the downstream weir gate will be investigated. The Trojan system will be similar to an in-kind replacement of the existing UV system and will not require any channel modifications.

4.1 Considerations for new UV system

There are items that the City must consider if the new peak flow is increased to 16.4 MGD and the additional UV disinfection capacity is installed at the WWTP. These items are outlined below:

- Additional UV capacity to treat the projected peak flow of 16.4 MGD will trigger additional review from the Washington Department of Ecology. The additional review will likely result in the requirement by Ecology to produce a Facility Plan and Engineering Report including evaluating the available capacities within the sewer collection system, lift stations, and upstream plant processes.

- Hydraulic impacts caused by the throughout the plant have not been investigated since it is not part of this Scope of Work.
- Channel modifications will be required to accommodate the additional DeNora unit. Based on initial discussion, the channel will need to be widened by a minimum of 12 inches to accommodate the additional banks needed to treat the increased peak flow.

Therefore, HDR recommends for this design effort to limit the peak capacity of the UV Disinfection system to the current peak flow of 12.4 MGD. HDR also recommends the completion of a facility plan to understand the needs of the Camas plant as a whole and develop a roadmap that can be used to develop a capital improvements project plan. In addition, the facility plan may also offer additional disinfection evaluation options that could include, but are not limited to:

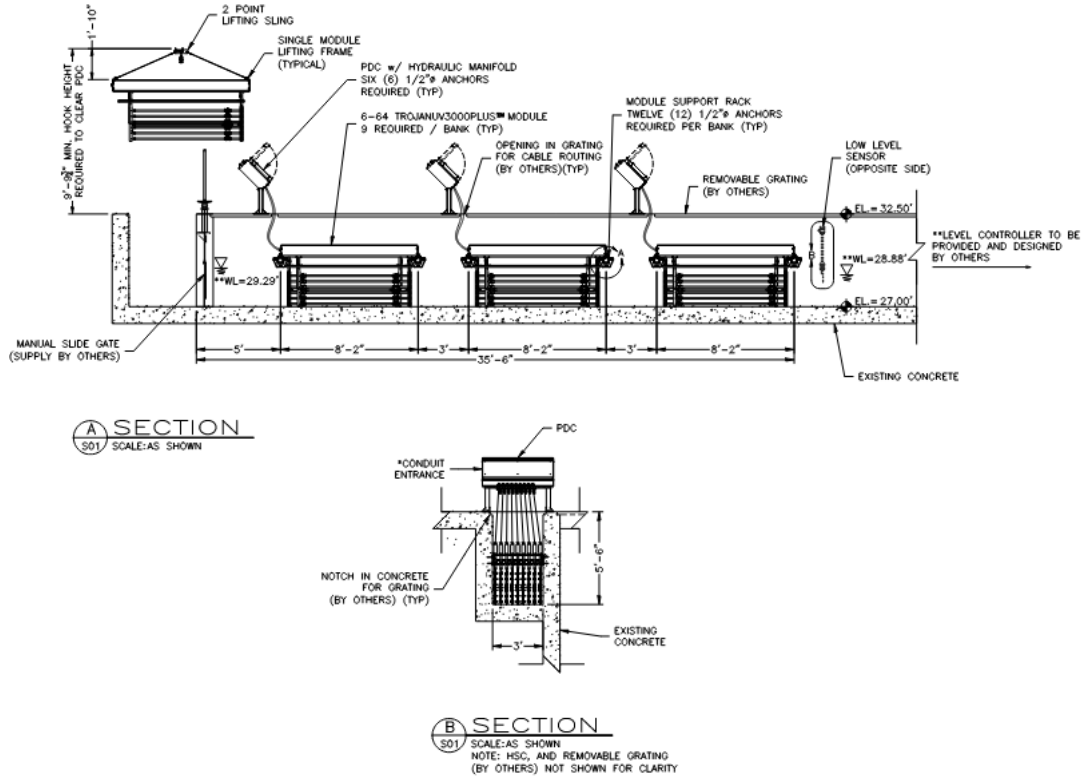
- Improved filtration followed by smaller UV system.
- Hybrid disinfection systems consisting of UV and chlorination.
- Alternative disinfectants such as peracetic acid.

4.2 Equipment Layout

The proposed Trojan UV3000+ system installation is similar to the existing Trojan UV3000 system, with 3 UV banks inside the channel. Channel modifications such as channel narrowing plates or expansion of the channel would not be required to accommodate the banks, given the width of 36 inches is adequate.

The Operator Station and Power Distribution Center panels will be installed over the channel width like the existing panels currently installed at the plant. The UV transformers will be reused where possible, with replacements installed in the same location as the existing units. Figure 4-1 shows the Trojan UV3000+ system layout.

Figure 4-1. Proposed UV Disinfection System Layout



Source: Trojan UV3000+ Budgetary Proposal

4.3 Structural Considerations

The new UV equipment will require housekeeping pads and anchorage to the existing structure. Housekeeping pads and equipment anchorage will be designed for all required equipment operational loads and seismic loads as described in ASCE 7-16, Chapter 13 (Seismic Design of Non-Structural Components). It is assumed that the existing equipment and new equipment are of similar weight and size, and that a full evaluation of the existing building for current code seismic loads will not be required.

The concrete channel has not been drained and inspected since the last UV upgrades were conducted at the WWTP. It is assumed to be in acceptable condition and that repairs will be minor and limited to patching. A concrete condition assessment conducted by a qualified professional should be carried out once a temporary bypass is installed and the channel is drained.

4.4 Process and Instrumentation Diagrams and Electrical Design

The new UV control panels will be fed via the existing feeders from the MDS-UV, assuming the new loads are less than 12kVA each. If the new UV systems exceed 12kVA each, then a redesign and new electrical system will be required for those circuits, including:

- MDS breakers,
- Conduits,
- Feeders,
- Transformers,
- Selective coordination,
- And other related electrical equipment.

Refer to the Appendix A for a sketch of the modified one-line diagram and preliminary P&ID.

The new UV power distribution center panels will be NEMA 4X rated for washdown and corrosion resistance. These panels will be installed over the width of the channel near each UV bank. The panels may have local operator stations. Existing conduits and conductors will be used to the extent possible but may require replacement depending on field conditions.

The new UV Disinfection system will be a vendor package. The vendor package will be provided with a PLC control panel with a local PanelView or similar touchscreen in the front to provide local control for the Plant Operators. The PLC panel will be placed in the same location as the existing Trojan PLC panel located in the Electrical Room. The PLC will be either an Allen-Bradley CompactLogix or a Schneider Electric Modicom M340. The exact model will be determined after discussions with the Plant Supervisor and the System Integrator.

UV dosing will be accomplished by using the existing effluent flowmeter (08 MFM 01), located in the vault upstream of the disc effluent filters. The existing adjustable weir gate (08 WG 01) at the downstream end will continue to be used to adjust water levels within the UV disinfection channel. This gate is controlled by the Plant PLC using a submersible level transmitter located in a stilling well directly upstream from the gate.

Additional instrumentation includes DO (08 DO 01), pH (08 pH 01), and ammonium (08 AM 01) probes installed within the UV channel. These instruments are assumed to be in working condition. They will be removed and reinstalled after the new UV banks are installed. If the City wishes to be replaced, these instruments will be included in the final construction documents.

4.5 Construction Sequencing/MOPO

Plant operations must be maintained during the installation of the new UV disinfection system and ancillary equipment. The construction sequence outlined in this section are preliminary and not meant to dictate a contractor's means and methods of construction. Contractor performing work shall be responsible for preparing and coordinating MOPOs with Plant Staff prior to conducting the work.

1. Install temporary bypass piping and temporary UV disinfection system or other City approved temporary disinfection system. Contractor to coordinate exact location of temporary system to minimize impact to ingress/egress into UV Building.
2. Close slide gate 08 SH 02 and raise adjustable weir gate 08 WG 01 to max elevation. Drain UV channel and berm the interior of the gates using sandbags.
3. Remove existing UV disinfection system electrical panels, control centers, and associated gear.
4. Inspect concrete channel. Patch and repair as needed.
5. Repair and/or install electrical conduits as needed.
6. Install new UV disinfection system including control panels, power distribution panels, and associated gear.
7. Perform startup and commissioning activities for the new UV disinfection system.

Appendix A. Electrical, Instrumentation & Controls Diagrams

KEY NOTES: (X)

1. SUPPLIED AS A PACKAGE SYSTEM (NOT IN CONTRACT).

PLC-MCC-C1 (EXISTING)

FLOW FI 0801

LOW LEVEL YA 0801

MODBUS/TCP UU 0801

ALARM YA 0801

UV DOSE AI 0801

DO AI 0801

pH AI 0801

AMMONIA AI 0801

LEVEL AI 0801

480V

UV HYDRAULIC PANEL
08 HCP 01 (1)

480V

UV CONTROL PANEL
08 SCC 01 (1)

FIT 0801 (M)

FROM FILTERS

M

LSL 0801

480V

UV BANK NO.1
08 UV 01 (1)
AE 0801 UVT

480V

UV BANK NO.2
08 UV 02 (1)
AE 0802 UVT

480V

UV BANK NO.3
08 UV 03 (1)
AE 0803 UVT

AIT 0801 — AE 0801 DO

AIT 0801 — AE 0801 pH

AIT 0801 — AE 0801 AM

LIT 0801 — LE 0801

M

UV CHANNEL WEIR GATE
08 WG 01
(MODULATING LEVEL CONTROL GATE)

PLE 1 P-040
TO EFFLUENT PUMPS

ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	A. STAPLES
DESIGN MANAGER	
DRAWN BY	E F PILAPIL
CHECKED BY	
ELECTRICAL	
STRUCTURAL	
MECHANICAL	
PROJECT NUMBER	10371791

NOT FOR CONSTRUCTION

CITY OF CAMAS WWTP
UV DISINFECTION
IMPROVEMENTS

P&ID

ULTRAVIOLET DISINFECTION

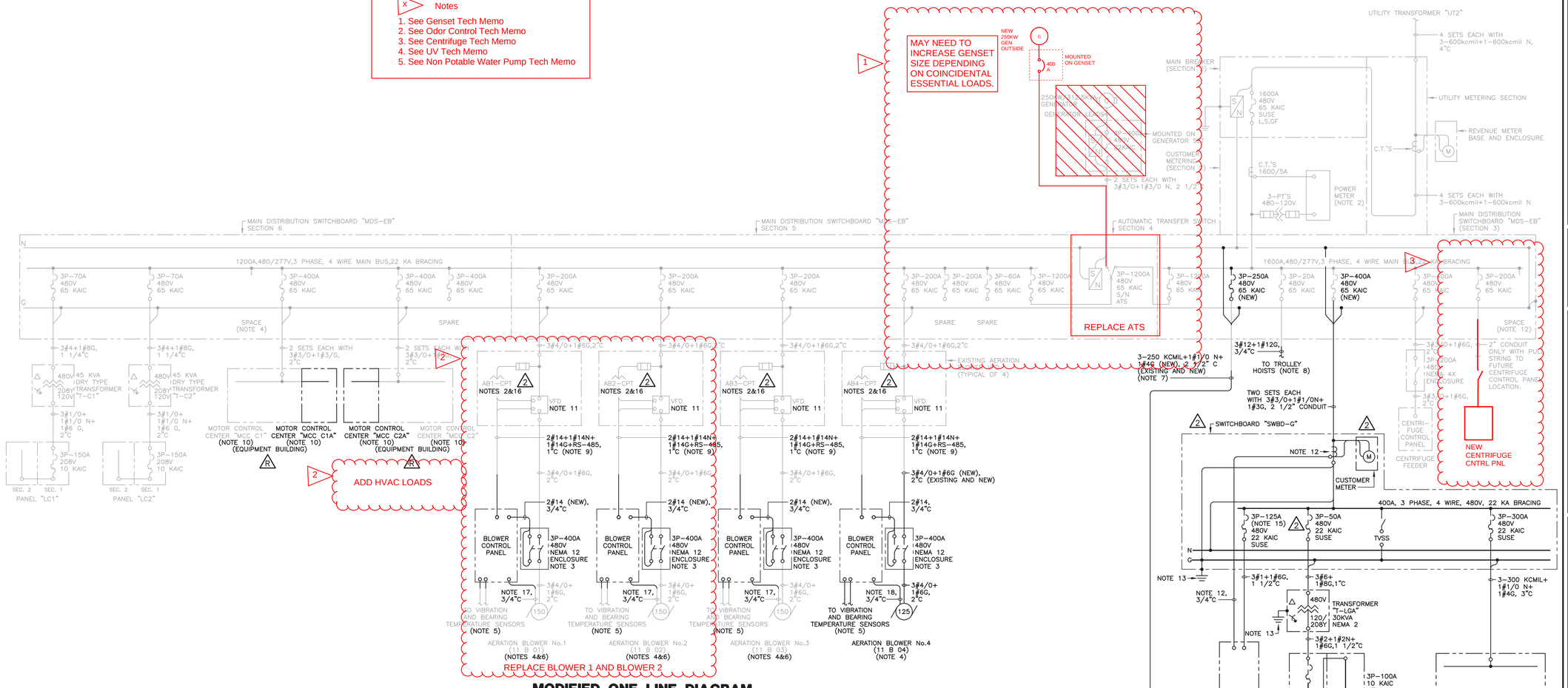
0 1" 2"

FILENAME P-030.dwg

SCALE NONE

SHEET P-030

Notes
1. See Genset Tech Memo
2. See Odor Control Tech Memo
3. See Centrifuge Tech Memo
4. See UV Tech Memo
5. See Non Potable Water Pump Tech Memo



MODIFIED ONE LINE DIAGRAM
MAIN DISTRIBUTION SWITCHBOARD - EQUIPMENT BUILDING "MDS-EB"
(NOTE 1)

NOTES:

1. MATERIALS SHOWN IN BACKGROUND (GRAYSCALE) ARE EXISTING AND TO REMAIN. ITEMS SHOWN IN FOREGROUND (BLACK OR BOLD) ARE NEW, OR EXISTING TO BE MODIFIED AS NOTED.
2. MODBUS COMMUNICATIONS TO AERATION BLOWER CONTROL PANEL VIA MODBUS COMMUNICATIONS CARD (VW3A66301U).
3. EXISTING DISCONNECT SWITCH MAY BE REUSED OR NEW DISCONNECT SWITCH MAY BE PROVIDED.
4. SEE SPECIFICATION SECTION 11371 FOR ADDITIONAL INFORMATION ON THIS WORK.
5. PROVIDE MANUFACTURER RECOMMENDED CABLES FOR SENSORS (OR REUSE EXISTING IF POSSIBLE).
6. EXTEND EXISTING CONDUITS AND CONNECT TO NEW BLOWER CONTROL PANEL AND PROVIDE NEW CONDUCTORS. AT THE CONTRACTOR'S OPTION IT IS ACCEPTABLE TO REUSE THE EXISTING CONDUCTORS IF THEY CAN BE EXTENDED WITHOUT SPLICES TO THE NEW CONTROL PANEL.
7. THE NEUTRAL AND GROUND CONDUCTORS MAY BE PROVIDED WITH THHN/THWN OR XHHW INSULATION.
8. EXTEND EXISTING CIRCUIT AND CONNECT TO NEW TROLLEY HOIST ASSOCIATED WITH BLOWER 11 B 04.
9. PROVIDE NEW CONDUCTORS. THE RS-485 CABLE SHALL BE BELDEN 9841 OR EQUIVALENT. FOLLOW THE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR RS-485 TERMINATION. PROVIDE NEW CONDUIT BETWEEN FLOOR AND THE BLOWER CONTROL PANEL.
10. SEE SHEET E-11 FOR MODIFIED MOTOR CONTROL CENTER SCHEDULES. SEE SHEET E-12 FOR NEW MOTOR CONTROL CENTER SECTION SCHEDULES.
11. REPLACE HIM (LCD/KEYPAD) MODULES. SEE E.W.D. 5/E-14 FOR ADDITIONAL INFORMATION ON VFD WIRING.
12. PROVIDE CURRENT TRANSFORMER (SIZE, RATINGS AND TYPE AS REQUIRED BY MANUFACTURER OF ACTIVE FILTER) ON INCOMING CONDUCTORS FOR PROPER OPERATION OF ACTIVE FILTER. PROVIDE CONDUCTORS FROM CURRENT TRANSFORMER TO ACTIVE FILTER (SIZE, RATINGS AND TYPE AS REQUIRED BY MANUFACTURER OF ACTIVE FILTER) FOR PROPER OPERATION OF ACTIVE FILTER
13. SEE GROUNDING PLAN ON SHEET E15-4 FOR ADDITIONAL INFORMATION. (1)
14. SEE GROUNDING PLAN ON SHEET E18-3 FOR ADDITIONAL INFORMATION. (1)
15. SIZE CIRCUIT BREAKER AND FEEDER CONDUCTORS PER ACTIVE FILTER MANUFACTURER'S RECOMMENDATIONS.
16. THE EXISTING AERATION BLOWER VFDS ARE SQUARE D ALTIVAR 66 UNITS, AND THE NEW MODBUS COMMUNICATIONS CARD REFERRED TO IN NOTE 2 IS THE SQUARE D MODEL NUMBER FOR THE OPTION.
17. PROVIDE SHIELDED CABLE SUITABLE FOR EXISTING THERMISTORS. EXISTING CABLE MAY BE REUSED IF OF SUITABLE LENGTH.
18. PROVIDE MANUFACTURER RECOMMENDED CABLES FOR MOTOR WINDING TEMPERATURE SENSORS.

Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 200
SEATTLE, WASHINGTON 98109 • (206) 284-0860

DATE: OCT 2009 | SCALE: NOTED | DRAWN: THP | CHECKED: PLC | APPROVED: PLC

No.	REVISION	DATE	APPD
1	RECORD DRAWING	11/12	THP
2	ADDENDUM NO.2 REVISIONS	12/09	PLC
1	ADDENDUM NO.1 REVISIONS	12/09	PLC

RECORD DRAWING
Based upon best available information obtained during construction.
Date: NOV. 2012
By: N.K.R.
Checked By: P.L.C.

0 1" 2"
TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

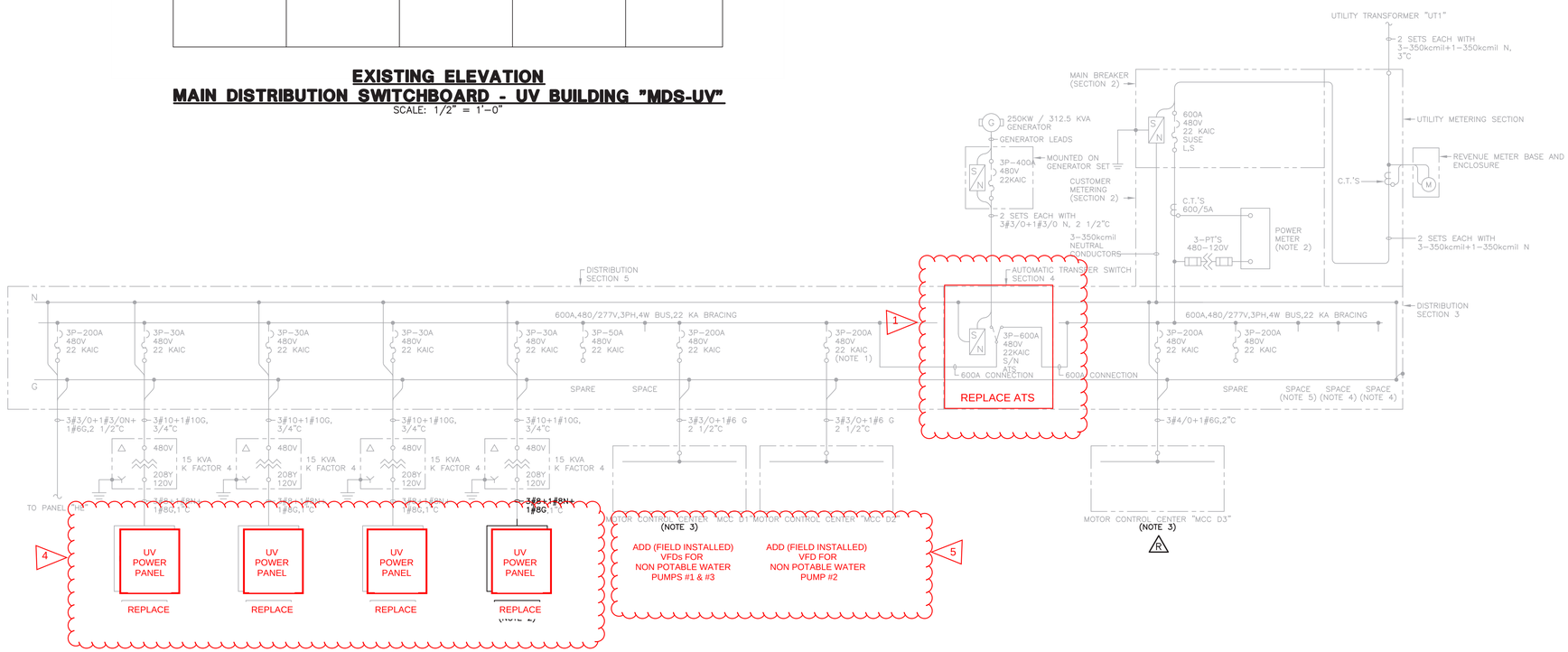
CITY OF CAMAS
WASHINGTON
CLARK COUNTY
WWTF IMPROVEMENTS - PHASE 2
MODIFIED ONE LINE DIAGRAM EQUIPMENT BUILDING SWITCHBOARD

SHEET: E-8
OF: 47
JOB NO.: 07511
DWG: C-E00-07_08

SECTION 5	SECTION 4	SECTION 3	SECTION 2	SECTION 1
DISTRIBUTION SECTION	AUTOMATIC TRANSFER SWITCH	DISTRIBUTION SECTION	CUSTOMER METERING	UTILITY METERING
			MAIN BREAKER	

EXISTING ELEVATION
MAIN DISTRIBUTION SWITCHBOARD - UV BUILDING "MDS-UV"
SCALE: 1/2" = 1'-0"

Notes
1. See Genset Tech Memo
2. See Odor Control Tech Memo
3. See Centrifuge Tech Memo
4. See UV Tech Memo
5. See Non Potable Water Pump Tech Memo



MODIFIED ONE LINE DIAGRAM
MAIN DISTRIBUTION SWITCHBOARD - UV BUILDING "MDS-UV"
(NOTE 1)

NOTES:

1. MATERIALS SHOWN IN BACKGROUND (GRAYSCALE) ARE EXISTING AND TO REMAIN. ITEMS SHOWN IN FOREGROUND (BLACK OR BOLD) ARE TO BE MODIFIED AS NOTED.
2. PROVIDE NEW UV POWER DISTRIBUTION PANEL.
3. SEE SHEET E-15 FOR INFORMATION ON REVISIONS TO MOTOR CONTROL CENTERS "MCC D1" AND "MCC D3".

RECORD DRAWING
Based upon best available information obtained during construction.
Date: NOV. 2012
By: N.K.R.
Checked By: P.L.C.

0 1" 2"
TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 200
SEATTLE, WASHINGTON 98109 • (206) 284-0860

DATE: OCT 2009
SCALE: NOTED
DRAWN: THP
CHECKED: PLC
APPROVED: PLC

No.	REVISION	DATE	APPD
1	RECORD DRAWING	11/12	THP
2	ADDENDUM NO.3 REVISIONS	12/09	PLC

THEODORE H. PALMATIER — STATE OF WASHINGTON — 21488 — REGISTERED PROFESSIONAL ENGINEER

CITY OF CAMAS
WASHINGTON
CLARK COUNTY
WWTF IMPROVEMENTS - PHASE 2
MODIFIED ONE LINE DIAGRAM UV BUILDING SWITCHBOARD

SHEET: E-9
OF: 47
JOB NO.: 07511
DWG: C-E00-09

Appendix B

City of Camas NPDES Permit

DEPARTMENT OF ECOLOGY
State of Washington

Issuance Date: September 25, 2015
Effective Date: October 1, 2015
Expiration Date: September 30, 2020

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT NO. WA0020249

State of Washington
DEPARTMENT OF ECOLOGY
Olympia, Washington 98504-7600

Southwest Regional Office
P.O. Box 47775
Olympia, Washington 98504-7775

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1342 et seq.

City of Camas
616 Northeast 4th Avenue
Camas, Washington 98607

is authorized to discharge in accordance with the Special and General Conditions that follow.

Plant Location: City of Camas Wastewater Treatment Plant 1129 Southeast Polk Street Camas, WA 98607	Receiving Water: Columbia River Discharge Location: Latitude: 45.57479 Longitude: -122.391897

Treatment Type: Activated Sludge with Nutrient removal, pH adjustment, filtration, and UV disinfection.

Rich Doenges
Southwest Section Manager
Water Quality Program
Washington State Department of Ecology

TABLE OF CONTENTS

SUMMARY OF PERMIT REPORT SUBMITTALS

Refer to the Special and General Conditions of this permit for additional submittal requirements.

Permit Section	Submittal	Frequency	First Submittal Date
S3.A.	Discharge Monitoring Report	Monthly	November 15, 2015
S3.E.	Reporting Permit Violations	As necessary	
S3.F.	Other Reporting	As necessary	
S4.B.	Plans for Maintaining Adequate Capacity	As necessary	
S4.D.	Notification of New or Altered Sources	As necessary	
S4.E.	Infiltration and Inflow Evaluation	Annually	July 15, 2016
S4.F.	Wasteload Assessment	Annually	July 15, 2016
S5.F.	Bypass Notification	As necessary	
S5.G.	Operations and Maintenance Manual Update or Review Confirmation Letter	Annually	October 15, 2015
S6.E.	Industrial User Survey Submittal	1/permit cycle	January 15, 2017
S6.E.	Industrial User Survey Update	Once every 2 years	January 15, 2019
S6.F.1.	Local Limits Sampling and Evaluation Plan	1/permit cycle	July 15, 2017
S6.F.1.	Results of Initial Screening	1/permit cycle	December 1, 2017
S6.F.2.	Results of local limits monitoring	1/permit cycle	February 15, 2019
S6.F.3.	Local Limits Proposed for Ecology Approval	1/permit cycle	July 15, 2019
S6.F.4.	Copy of Codified Ordinance	1/permit cycle	December 15, 2019
S6.G.	Quarterly Pretreatment Monitoring	3/year except in 2018	January 15, 2016
S6.G.	Annual Pretreatment Monitoring	1/year except in 2018	January 15, 2017
S8.	Application for Permit Renewal	1/permit cycle	April 1, 2020
S9.	Spill Plan	1/permit cycle	March 15, 2016
S10.	Receiving Water Study – Quality Assurance Plan	1/permit cycle	July 15, 2016
S10.	Receiving Water Study Results	1/permit cycle	December 1, 2017
S11.	Outfall Evaluation	Once every 5 years	September 15, 2016
S12.A.	Acute Toxicity Characterization Data	Quarterly for One Year	February 15, 2017

Permit Section	Submittal	Frequency	First Submittal Date
S12.C.	Acute Toxicity Compliance Monitoring Reports	If triggered	May 15, 2017
S12.D.	Acute Toxicity: "Causes and Preventative Measures for Transient Events"	As necessary	
S12.D.	Acute Toxicity TI/TRE Plan	As necessary	
S12.D.	Acute Toxicity Compliance Testing	Quarterly for 1 year	May 16, 2016
S12.F.	Acute Toxicity Effluent Test Results to include with Permit Renewal Application	2/permit cycle	February 15, 2019, August 15, 2019, and April 1, 2020
S13.D.	Chronic Toxicity: "Causes and Preventative Measures for Transient Events"	As necessary	
S13.D.	Chronic Toxicity TI/TRE Plan	As necessary	
S13.D.	Chronic Toxicity Compliance Testing	Quarterly for 1 year	May 16, 2016
S13.F.	Chronic Toxicity Effluent Test Results to include with Permit Renewal Application	2/permit cycle	February 15, 2019, August 15, 2019, and April 1, 2020
G1.	Notice of Change in Authorization	As necessary	
G4.	Reporting Planned Changes	As necessary	
G5.	Engineering Report for Construction or Modification Activities	As necessary	
G7.	Notice of Permit Transfer	As necessary	
G10.	Duty to Provide Information	As necessary	
G13.	Payment of Fees	As assessed	
G20.	Compliance Schedules	As necessary	
G21.	Contract Submittal	As necessary	

SPECIAL CONDITIONS

S1. DISCHARGE LIMITS

A. Effluent Limits

All discharges and activities authorized by this permit must comply with the terms and conditions of this permit. The discharge of any of the following pollutants more frequently than, or at a level in excess of, that identified and authorized by this permit violates the terms and conditions of this permit.

Beginning on the effective date of this permit, the Permittee may discharge municipal wastewater to the Columbia River at the permitted location subject to compliance with the following limits:

Effluent Limits: Outfall # 001 Latitude 45.57479 Longitude -122.391897		
Parameter	**Average Monthly [b]**	**Average Weekly [c]**
Biochemical Oxygen Demand (5-day) (BOD_5)	20 milligrams/liter (mg/L) 1,017 pounds/day (lbs/day) 74%[e] removal of influent BOD_5	30 mg/L 1,525 lbs/day
Total Suspended Solids (TSS)	20 mg/L 1,017 lbs/day 76%[e] removal of influent TSS	30 mg/L 1,525 lbs/day
Ammonia (NH3 as N) Summer[a]	20 mg/L	-----
Ammonia (NH3 as N) Winter[a]	7 mg/L	-----
Parameter	**Minimum**	**Maximum**
pH	6.0 Standard Units (SU)	9.0 SU
Parameter	**Monthly geometric mean**	**7- day geometric mean**
Fecal Coliform Bacteria [d]	200/100 milliliter (mL)	400/100 mL

a	Summer Ammonia limits apply to the months of June through September. Winter Ammonia limits apply to the months of October through May (inclusively).
b	Average monthly effluent limit means the highest allowable average of daily discharges over a calendar month. To calculate the discharge value to compare to the limit, you add the value of each daily discharge measured during a calendar month and divide this sum by the total number of daily discharges measured. See footnote c for fecal coliform calculations.

Effluent Limits: Outfall # 001 Latitude 45.57479 Longitude -122.391897	
c	Average weekly discharge limitation means the highest allowable average of ``daily discharges" over a calendar week, calculated as the sum of all ``daily discharges" measured during a calendar week divided by the number of ``daily discharges" measured during that week. See footnote c for fecal coliform calculations.
d	The Department of Ecology (Ecology) provides directions to calculate the monthly and the 7-day geometric mean concentration of colony forming units in publication No. 04-10-020, *Information Manual for Treatment Plant Operators* available at: http://www.ecy.wa.gov/pubs/0410020.pdf
e	Removal of 85 percent of influent BOD_5 and TSS are required if the Permittee does not submit the Inflow analysis report required at S4.E.1 by **July 15, 2017**, or does not complete the projects identified in the plan and schedule for Inflow reduction projects inserted at section S4.E.2.

B. Mixing Zone Authorization

Mixing Zone for Outfall No.001:

The paragraph below defines the maximum boundaries of the mixing zones.

Chronic Mixing Zone

The width of the chronic mixing zone is limited to ¼ of the width of the River (approximately 1,000 feet). The length of the chronic mixing zone extends 100 feet upstream and 321 feet downstream of the outfall. The mixing zone extends vertically from the river bed to the water surface. The concentration of pollutants at the edge of the chronic zone must meet chronic aquatic life criteria and human health criteria.

Acute Mixing Zone

The width of the acute mixing zone is limited to a distance of 1000 feet in any horizontal direction from the outfall. The length of the acute mixing zone extends 10 feet upstream and 32 feet downstream of the outfall. The mixing zone encompasses the entire water column from the river bed to the top of the water surface within this area. The concentration of pollutants at the edge of the acute zone must meet acute aquatic life criteria.

Available Dilution (dilution factor)	
Acute Aquatic Life Criteria	23:1 (winter) 27:1 (summer)
Chronic Aquatic Life Criteria	121:1 (winter) 185:1 (summer)
Human Health Criteria - Carcinogen	185:1
Human Health Criteria - Non-carcinogen	185:1

S2. MONITORING REQUIREMENTS

A. Monitoring Schedule

The Permittee must monitor in accordance with the following schedule and meet the requirements specified in Appendix A.

Parameter	Units & Speciation	Minimum Sampling Frequency	Sample Type
(1) Wastewater Influent			
Wastewater Influent means the raw sewage flow from the collection system into the treatment facility. Influent samples must be taken at the headworks of the treatment plant, may be after screening and de-gritting, but may not include any side-stream returns from inside the plant.			
Flow	MGD	Continuous[1]	Meter or Flume
BOD_5	mg/L	4/week	24-Hour Flow Proportionate Composite[2]
BOD_5	lbs/day	4/week	Calculation[3]
TSS	mg/L	4/week	24-Hour Flow Proportionate Composite[2]
TSS	lbs/day	4/week	Calculation[3]
Ammonia	mg/L	4/week	24-Hour Flow Proportionate Composite[2]
pH	Standard Units	Continuous[1,5]	Recording Probe/Meter
(2) Final Wastewater Effluent			
Final Wastewater Effluent means wastewater which has exited the last treatment process or operation. For Camas, this is after the ultraviolet disinfection process. When adding chlorine for process control or disinfection purposes, the Permittee must either confirm the absence of any free chlorine, or dechlorinate samples taken for BOD before analysis.			
Flow	MGD	Continuous[1]	Meter or flume
BOD_5	mg/L	4/week[7]	24-Hour Flow Proportionate Composite[2]
BOD_5	lbs/day	4/week	Calculated[3]
BOD_5	% removal	Monthly	Calculated[4]

Parameter	Units & Speciation	Minimum Sampling Frequency	Sample Type
TSS	mg/L	4/week	24-Hour Flow Proportionate Composite[2]
TSS	lbs/day	4/week	Calculated[3]
TSS	% removal	Monthly	Calculated[4]
Fecal Coliform	#Organisms /100 ml[6] SM 9222 D	4/week	Grab[8]
pH	Standard Units	Continuous[1,5]	Metered/Recorded
Temperature	Degrees centigrade (°C)	Continuous[1,13]	Metered/Recorded
Ammonia	mg/L	4/week	24-Hour Flow Proportionate Composite[2]
(3) Whole Effluent Toxicity Testing – Final Wastewater Effluent			
Acute Toxicity Testing	Toxicity, NOEC, LC50	Quarterly for first year & Semi-Annually in last year before reapplication[12]	See section S12
Chronic Toxicity Testing	Toxicity, NOEC, LC50	Semi-Annually in the last year before reapplication[12]	See section S13
Additional requirements are specified in Permit Condition S12 and S13. Guidance may be found in the Ecology manual *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*:			
(4) Pretreatment			
As specified in Permit Condition S6.			
(5) Effluent Characterization – Final Wastewater Effluent			
Total Phosphorus	mg/L as P	Monthly[10]	24-Hour Composite
Ortho-Phosphorus (PO4)	mg/L as P (SM 4500-PE/PF)	Monthly[10]	24-Hour Composite
Nitrate-Nitrite Nitrogen	mg/L as N	Monthly[10]	24-Hour Composite
Total Kjeldahl Nitrogen (TKN)	mg/L as N	Monthly[10]	24-Hour Composite
(6) Permit Renewal Application Requirements – Final Wastewater Effluent			
Total Residual Chlorine	mg/L	Annually[11]	Grab[8]

Parameter	Units & Speciation	Minimum Sampling Frequency	Sample Type
Dissolved Oxygen	mg/L	Annually[11]	Meter or Probe
Oil and Grease	mg/L	Annually[11]	Grab[8]
Total Dissolved Solids	mg/L	Annually[11]	24-Hour Composite
Total Hardness	mg/L	Annually[11]	24-Hour Composite
Metals Cyanide and Total Phenols[13, 14]	µg/L; nanograms (ng/L) for mercury	Annually[11]	Grabs for mercury, Cyanide and Total Phenols[8], 24-hr composite for all others.
Acid Compounds[13, 14]	µg/L	Annually[11]	24-Hour Composite
Volatile Compounds[13, 14]	µg/L	Annually[11]	Grab
Base/neutral Compounds[13, 14]	µg/L	Annually[11]	24-Hour Composite

*See respective lists at Appendix A to this permit

1	Continuous means uninterrupted except for brief lengths of time for calibration, for power failure, or for unanticipated equipment repair or maintenance. The Permittee must sample no less frequently than every three hours when continuous monitoring is not possible. Continuous pH and temperature probes shall be calibrated monthly according to manufacturer's instructions. Continuous flow monitoring devices shall be calibrated at least annually.
2	Twenty-four (24)-hour flow proportionate composite means a series of individual samples collected by adjusting the sample aliquot volume or sampling interval in direct proportion to changes in flow over a 24-hour period, composited into a single container, and analyzed as one sample.
3	Calculate the mass loading by multiplying concentration (in parts per million) by flows (in MGD) over the same 24-hour period and a conversion factor (8.34 lbs/gal).
4	Percent Removal = Influent concentration (mg/L) – Effluent concentration (mg/L) x 100 Influent concentration (mg/L) Calculate the percent removal of BOD_5 and TSS using the above equation. Where "concentration" is the average concentration over the month for all days (same 24-hour period) over which both an influent and effluent sample result is obtained.
5	The Permittee must report the instantaneous maximum and minimum pH for each day.
6	Report a numerical value for fecal coliforms following the procedures in Ecology's *Information Manual for Wastewater Treatment Plant Operators*, Publication Number 04-10-020 available at: http://www.ecy.wa.gov/programs/wq/permits/guidance.html. Do not report a result as too numerous to count (TNTC).

Parameter		Units & Speciation	Minimum Sampling Frequency	Sample Type
7	The Permittee must check for total chlorine residual concentrations before processing BOD samples on days when using chlorine for process control or disinfection purposes and dechlorinate before running BOD5 tests if chlorine is present.			
8	Grab means an individual sample collected over a 15 minute, or less, period.			
9	Four (4)/week means four times during each calendar week and on a rotational basis throughout the days of the week, except weekends and holidays.			
10	Monthly means once every calendar month during alternate weeks.			
11	Annually means once each calendar year **starting January 1, 2016.**			
12	WET testing includes: Quarterly Acute WET testing of final effluent for one year, quarterly monitoring if there is an Acute limit, and Semi-annual Acute and Chronic WET testing in the last year (in time to include in the permit reapplication). See sections S12 & S13 for details.			
13	When measuring temperature continuously, the Permittee may determine and report a daily maximum from half-hour (or more frequent) measurements over the 24-hour period. Continuous monitoring instruments must achieve an accuracy of 0.2 degrees C and the Permittee must verify accuracy monthly. When continuous monitoring devices are not functioning, temperature grab sampling must occur when the effluent is at or near its daily maximum temperature, which usually occurs in mid- to late afternoon.			
14	The Permittee must: A. Report the results of analysis for each analyte listed in Appendix A for each given category of pollutants. B. Report results in the same order and using the same analyte names shown at Appendix A. C. Use the analytical methods described in Appendix A or an alternative 40 Code of Federal Regulations (CFR) 136 approved method sensitive enough to achieve the detection (DL) or quantitation (QL) levels shown at Appendix A for the each pollutant. D. If sampling done by the Permittee according to approved methods for wastewater yields sample results for analytes not required to be sampled under this permit, include these additional pollutant analysis results obtained at the end of the list of required analytes or in a separate list. E. Report analytical values that fall below the detection limit as "< (detection level)" where (detection level) is numeric value reported by the laboratory. F. Report analytical values which fall between the agency-required detection and quantitation levels with qualifier code of 'j' following the value. G. Report both individual and average values when more than one sample result is obtained over a monitoring period. H. Calculate the average of multiple sample results using the following method: • Average the reported numeric value for all parameters above the agency-required detection limit.			

Parameter	Units & Speciation	Minimum Sampling Frequency	Sample Type
• Report the value as one-half the detection limit if any sample over the reporting period was above the detection limit, or report zero if none were. I. Include the laboratory's explanation of why the detection level of Appendix A were not obtained should a contracted laboratory not meet the detection level or quantitation level specified in Appendix A. In cases where the laboratory was unable to obtain the required DL and QL due to matrix effects, submit a matirx-specific detection limit (MDL) and a quantitation limit (QL) to Ecology with appropriate laboratory documentation.			

B. Sampling and Analytical Procedures

Samples and measurements taken to meet the requirements of this permit must represent the volume and nature of the monitored parameters. The Permittee must conduct representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions that may affect effluent quality.

Sample collection methods, container type, size, headspace, method of preservation, and hold times must conform to the latest revision of the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 Code of Federal Regulations (CFR) Part 136.

Analytical methods used to meet the monitoring requirements specified in this permit must conform to those methods included at Attachment A of this permit or any more sensitive method approved under 40 CFR Part 136.

C. Flow Measurement, Field Measurement, and Continuous Monitoring Devices

The Permittee must:

1. Select and use appropriate flow measurement, field measurement, and continuous monitoring devices and methods consistent with accepted scientific practices.

2. Install, calibrate, and maintain these devices to ensure the accuracy of the measurements is consistent with the accepted industry standard and the manufacturer's recommendation for that type of device.

3. Calibrate continuous monitoring instruments monthly unless the Permittee has developed and submitted protocols to the Department of Ecology (Ecology) which justify a less frequent calibration interval. Such protocols must be based on manufacturer's recommendations or the demonstrated performance over time which indicates a longer interval between calibrations is sufficient to produce high quality data. The Permittee:

    a. May calibrate apparatus for continuous monitoring of dissolved oxygen by air calibration.

b. Must calibrate continuous pH measurement instruments using a grab sample analyzed in the lab with a pH meter calibrated with standard buffers and analyzed within 15 minutes of sampling. This requirement is satisfied if the grab sample and continuous meter results agree to within the sensitivity of the continuous meter (0.2 su).

4. Calibrate micro-recording temperature devices, known as thermistors (if used), using protocols from Ecology's Quality Assurance Project Plan Development Tool *Continuous Temperature Sampling Protocols for the Environmental Monitoring and Trends*. This document is available online at: http://www.ecy.wa.gov/programs/eap/qa/docs/QAPPtool/Mod6%20Ecology%20SOPs/Protocols/ContinuousTemperatureSampling.pdf. Calibration as specified in this document is not required if the Permittee uses recording devices certified by the manufacturer.

5. Use field measurement devices as directed by the manufacturer and do not use reagents beyond their expiration dates.

6. Calibrate these devices at the frequency recommended by the manufacturer if more frequently than required above.

7. Calibrate flow monitoring devices at a minimum frequency of at least one calibration per year by an independent party.

8. Maintain all calibration records for at least three years.

D. Laboratory Accreditation

The Permittee must ensure that all monitoring data required by Ecology is prepared by a laboratory registered or accredited under the provisions of chapter 173-50 Washington Administrative Code (WAC), Accreditation of Environmental Laboratories. Flow, temperature, settleable solids, conductivity, pH, and internal process control parameters are exempt from this requirement. The Permittee must obtain accreditation for conductivity and pH if it must receive accreditation or registration for other parameters.

S3. REPORTING AND RECORDING REQUIREMENTS

The Permittee must monitor and report in accordance with the following conditions. Falsification of information submitted to Ecology is a violation of the terms and conditions of this permit.

A. Reporting

The first monitoring period begins on the effective date of the permit. The Permittee must:

1. Summarize, report, and submit monitoring data obtained during each monitoring period on a Discharge Monitoring Report (DMR) form provided, or otherwise approved, by Ecology. Include a summary listing daily results for the parameters tabulated in Special Condition S2, including method detection levels (MDLs) and quantitation levels (QLs) when applicable. If submitting DMRs electronically,

report a value for each day sampling occurred and for the summary values (when applicable) included on the form.

2. Submit the form as required with the words "No Discharge" entered in place of the monitoring results, if the facility did not discharge during a given monitoring period. If submitting DMRs electronically, you must enter "No Discharge" for an entire DMR, for a specific monitoring point, or for a specific parameter as appropriate.

3. Report, for any analytical method not specified in the permit or described in Appendix A, the test method, the detection limit (DL), and the quantitation limit (QL) as well as the results of analysis.

4. Include the following information (for priority pollutant organic and metal parameters lab reports): sampling date, sample location, date of analysis, parameter name, CAS number, analytical method/number, detection level (DL) and quantitation level (QL) as defined in App A, reporting units, and concentration detected. The Permittee must submit a copy of the contract laboratory report to provide this information. Analytical results from samples sent to a contract laboratory must also include information on the chain of custody, QA/QC results, and documentation of accreditation for the parameter. If the Permittee submits electronic DMRs, then it must attach an electronic file of the lab report to the electronic DMR.

5. Ensure that DMR forms are postmarked or received by Ecology no later than the dates specified below, unless otherwise specified in this permit. If submitting DMRS electronically, submit the DMR no later than the dates specified below, unless otherwise specified in this permit.

6. Submit DMRs for parameters with the monitoring frequencies specified in S2 (monthly, quarterly, annual, etc.) at the reporting schedule identified below. The Permittee must:

   a. Submit **monthly** DMRs by the 15th day of the following month.

   b. Submit **annual DMRs**, unless otherwise specified in the permit, by January 15 for the previous calendar year. The annual sampling period is the calendar year.

7. Submit reports to Ecology online using Ecology's electronic DMR submittal forms or send reports to Ecology at:

   Water Quality Permit Coordinator
   Department of Ecology
   Southwest Regional Office
   P.O. Box 47775
   Olympia, WA 98504-7775

B. Records Retention

The Permittee must retain records of all monitoring information for a minimum of three years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

C. Recording of Results

For each measurement or sample taken, the Permittee must record the following information:

1. The date, exact place, method, and time of sampling or measurement.

2. The individual who performed the sampling or measurement.

3. The dates the analyses were performed.

4. The individual who performed the analyses.

5. The analytical techniques or methods used.

6. The results of all analyses.

D. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by Condition S2 of this permit, then the Permittee must include the results of such monitoring in the calculation and reporting of the data submitted in the Permittee's DMR.

E. Reporting Permit Violations

The Permittee must take the following actions when it violates or is unable to comply with any permit condition:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the noncompliance and correct the problem.

2. If applicable, immediately repeat sampling and analysis. Submit the results of any repeat sampling to Ecology within 30 days of sampling.

   a. Immediate Reporting

      The Permittee must immediately report to Ecology and the Local Health Jurisdiction (at the numbers listed below), all:

      - Failures of the disinfection system.

      - Collection system overflows.

- Plant bypasses resulting in a discharge.
- Any other failures of the sewage system (pipe breaks, etc.).

Southwest Regional Office	360-407-6300
Clark Regional health district	360-397-8083

b. Twenty-Four-Hour Reporting

The Permittee must report the following occurrences of noncompliance by telephone, to Ecology at the telephone number listed above, within 24 hours from the time the Permittee becomes aware of any of the following circumstances:

i. Any noncompliance that may endanger health or the environment, unless previously reported under immediate reporting requirements.

ii. Any unanticipated bypass that causes an exceedance of an effluent limit in the permit also comply with Section S5.F, "Bypass Procedures" of this permit).

iii. Any upset that causes an exceedance of an effluent limit in the permit (See G.15, "Upset").

iv. Any violation of a maximum daily or instantaneous maximum discharge limit for any of the pollutants in Section S1.A of this permit.

v. Any overflow prior to the treatment works, whether or not such overflow endangers health or the environment or exceeds any effluent limit in the permit.

c. Report Within Five Days

The Permittee must also provide a written submission within five days of the time that the Permittee becomes aware of any reportable event under subparts a or b, above. The written submission must contain:

i. A description of the noncompliance and its cause.

ii. The period of noncompliance, including exact dates and times.

iii. The estimated time the Permittee expects the noncompliance to continue if not yet corrected.

iv. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

v. If the noncompliance involves an overflow prior to the treatment works, an estimate of the quantity (in gallons) of untreated overflow.

d. Waiver of Written Reports

Ecology may waive the written report required in subpart c, above, on a case-by-case basis upon request if the Permittee has submitted a timely oral report.

e. All Other Permit Violation Reporting

The Permittee must report all permit violations, which do not require immediate or within 24 hours reporting, when it submits monitoring reports for S3.A ("Reporting"). The reports must contain the information listed in subpart c, above. Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply.

f. Report Submittal

The Permittee must submit reports to the address listed in S3.A.

F. Other Reporting

The Permittee must report a spill of oil or hazardous materials in accordance with the requirements of Revised Code of Washington (RCW) 90.56.280 and chapter 173-303-145. You can obtain further instructions at the following website: http://www.ecy.wa.gov/programs/spills/other/reportaspill.htm.

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to Ecology, it must submit such facts or information promptly.

G. Maintaining a Copy of this Permit

The Permittee must keep a copy of this permit at the facility and make it available upon request to Ecology inspectors.

S4. FACILITY LOADING

A. Design Criteria

The flows or waste loads for the permitted facility must not exceed the following design criteria:

Maximum Monthly Flow:	6.10 MGD
Peak Day Flow:	10.04 MGD
BOD_5 Influent Loading for Maximum Month:	5,616 lbs/day

TSS Influent Loading for Maximum Month:	8,011 lbs/day
Ammonia (NH3+NH4 as N) Influent Loading for Maximum Month	1,956 lbs/day

B. Plans for Maintaining Adequate Capacity

1. Conditions Triggering Plan Submittal

The Permittee must submit a plan and a schedule for continuing to maintain capacity to Ecology within 90 days after:

a. The actual flow or waste load reaches 85 percent of any one of the design criteria in S4.A for three consecutive months.

b. The projected plant flow or loading (per the City's annual assessment as required by S4.F) shows loadings are expected to reach design capacity within five years.

2. Plan and Schedule Content

The plan and schedule above must identify the actions necessary to maintain adequate capacity for the expected population growth while meeting the limits and requirements of the permit. The Permittee must address the following topics and actions in its plan.

a. Analysis of the present design and proposed process modifications.

b. Reduction of both infiltration and inflow of uncontaminated ground and surface water into the sewer system.

c. Limits on future sewer extensions or connections or additional waste loads.

d. Modification or expansion of facilities.

e. Reduction of industrial or commercial flows or wasteloads.

Engineering documents associated with the plan must meet the requirements of WAC 173-240-060, "Engineering Report," and be approved by Ecology prior to any construction.

If the Permittee intends to apply for state or federal funding for the design or construction of a facility project, the plan may also need to meet the environmental review requirements as described in 40 CFR 35.3040 and 40 CFR 35.3045, and it may also need to demonstrate cost effectiveness as required by WAC 173-95-730. The plan must specify any contracts, ordinances, methods for financing, or other arrangements necessary to achieve this objective.

C. Duty to Mitigate

The Permittee must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

D. Notification of New or Altered Sources

1. The Permittee must submit written notice to Ecology whenever any new discharge or a substantial change in volume or character of an existing discharge into the wastewater treatment plant is proposed which:

   a. Would interfere with the operation of, or exceed the design capacity of, any portion of the wastewater treatment plant (including the collection system).

   b. Is not part of an approved general sewer plan or approved plans and specifications.

   c. Is subject to pretreatment standards under 40 CFR Part 403 and Section 307(b) of the Clean Water Act.

2. This notice must include an evaluation of the wastewater treatment plant's ability to adequately transport and treat the added flow and/or waste load, the quality and volume of effluent to be discharged to the treatment plant, the anticipated impact on the Permittee's effluent, whether the Permittee believes it can accommodate the requested discharge, and what limits and safeguards the Permittee would like Ecology to impose in a State Waste Discharge Permit for the new or changed discharge to protect the treatment works [40 CFR 122.42(b) and 173-216 WAC].

E. Infiltration and Inflow Evaluation

1. The Permittee must conduct a study of inflow sources. This study must be submitted by **July 15, 2016**:

   - Quantify the level of inflow from each collection system basin or sub-basin in order to identify areas exceeding a peak day to monthly average peaking factor of 3.4:1 during the design rainfall event.

   - Determine the inflow related actions and projects necessary to reduce inflow in each identified sub-basin.

   - Describe policies and practices for removing inflow sources. Address both sewer customers and the public collection system. Include policies which consider where stormwater conveyance systems both are and aren't available and describe ordinance provisions necessary to effectively reduce inflow.

   - Estimate the cost for each major project.

- Prioritize the list of projects to most cost effectively reduce the level of inflow to a peaking factor of 3.4:1 or less.

- Propose a schedule for completing the inflow related actions and projects within the shortest feasible time frames.

2. Inflow Project List and Schedule. The Permittee shall implement the inflow strategy of its October 21, 2014, proposal. This includes completing initial and follow-up studies of inflow sources in years one and five of the permit, and accomplishing inflow specific projects commensurate with the funding levels proposed for years 2-4 of the permit.

3. The Permittee must conduct an annual analysis of infiltration and inflow according to Ecology's guidance manual for treatment plant operators. This report shall consider the 12 month period May 1st through the following April 30th as the annual period and shall be submitted by **July 15, 2017**, and **annually** thereafter. This report shall include an update on the status of each inflow reduction project completed in fulfillment of S4.E.2 (above) including the funds expended or contractually obligated, and the proportion of the project completed as of the end of the reporting period. For each basin or sub-basin in which work has been done within the reporting period, the report shall include the estimated inflow rates before and after the project and the estimated effect on the overall Publicly Owned Treatment Works (POTW) inflow rate.

F. Wasteload Assessment

The Permittee must conduct an annual assessment of its influent flow and wasteload for the period May 1st through April 30th and submit a report to Ecology by **June 15, 2016**, and **annually** thereafter.

The report must contain:

1. A description of compliance or noncompliance with the permit effluent limits.

2. A comparison between the existing and design:

   a. Maximum monthly average flows

   b. Peak daily flows

   c. BOD_5 loadings

   d. Total Suspended Solids loadings.

   e. Ammonia loadings

3. The percent change in the above parameters since the previous report (except for the first report).

4. The present and design population or population equivalent.

5. The projected population growth rate.

6. The estimated date upon which the Permittee expects the wastewater treatment plant to reach design capacity, according to the most restrictive of the parameters above.

S5. OPERATION AND MAINTENANCE

The Permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances), which are installed to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes keeping a daily operation logbook (paper or electronic), adequate process control monitoring, laboratory controls, and appropriate quality assurance procedures. The Permittee shall operate backup or auxiliary facilities when necessary to achieve compliance with the conditions of this permit.

A. Certified Operator

This permitted facility must be operated by an operator certified by the state of Washington for a Class 4 plant. This operator must be in responsible charge of the day-to-day operation of the wastewater treatment plant. An operator certified for at least a Class 3 plant must be in charge during all regularly scheduled shifts.

B. Operation and Maintenance Program

The Permittee must:

1. Institute an adequate operation and maintenance program for the entire sewage system.

2. Keep maintenance records on all major electrical and mechanical components of the treatment plant, as well as the sewage system and pumping stations. Such records must clearly specify the frequency and type of maintenance recommended by the manufacturer and must show the frequency and type of maintenance actually performed.

3. Make maintenance records available for inspection at all times.

C. Short-Term Reduction

The Permittee must schedule any facility maintenance, which might require interruption of wastewater treatment and degrade effluent quality, during non-critical water quality periods and carry this maintenance out in a manner approved by Ecology.

If a Permittee contemplates a reduction in the level of treatment that would cause a violation of permit discharge limits on a short-term basis for any reason, and such reduction cannot be avoided, the Permittee must:

1. Give written notification to Ecology, if possible, 30 days prior to such activities.

2. Detail the reasons for, length of time of, and the potential effects of the reduced level of treatment.

This notification does not relieve the Permittee of its obligations under this permit.

D. Electrical Power Failure

The Permittee must ensure that adequate safeguards prevent the discharge of untreated wastes or wastes not treated in accordance with the requirements of this permit during electrical power failure at the treatment plant and/or sewage lift stations. Adequate safeguards include, but are not limited to, alternate power sources, standby generator(s), or retention of inadequately treated wastes.

The Permittee must maintain Reliability Class II (EPA 430/9-74-001) at the wastewater treatment plant. Reliability Class II requires a backup power source sufficient to operate all vital components and critical lighting and ventilation during peak wastewater flow conditions. Vital components used to support the secondary processes (i.e., mechanical aerators or aeration basin air compressors) need not be operable to full levels of treatment, but must be sufficient to maintain the biota.

E. Prevent Connection of Inflow

The Permittee must strictly enforce its sewer ordinances and not allow the connection of inflow (roof drains, foundation drains, etc.) to the sanitary sewer system.

F. Bypass Procedures

This permit prohibits a bypass, which is the intentional diversion of waste streams from any portion of a treatment facility. Ecology may take enforcement action against a Permittee for a bypass unless one of the following circumstances (1, 2, or 3) applies.

1. Bypass is for essential maintenance without the potential to cause violation of permit limits or conditions.

   This permit authorizes a bypass if it allows for essential maintenance and does not have the potential to cause violations of limits or other conditions of this permit, or adversely impact public health as determined by Ecology prior to the bypass. The Permittee must submit prior notice, if possible, at least 10 days before the date of the bypass.

2. Bypass is unavoidable and unanticipated. This permit authorizes such a bypass only if:

   a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.

   b. No feasible alternatives to the bypass exist, such as:

      - The use of auxiliary treatment facilities.

- Retention of untreated wastes.
- Maintenance during normal periods of equipment downtime, but not if the Permittee should have installed adequate backup equipment in the exercise of reasonable engineering judgment to prevent a bypass.
- Transport of untreated wastes to another treatment facility or preventative maintenance), or transport of untreated wastes to another treatment facility.

c. Ecology is properly notified of the bypass as required in Condition S3.E of this permit.

3. If bypass is anticipated and has the potential to result in noncompliance with this permit.

a. The Permittee must notify Ecology at least 30 days before the planned date of bypass. The notice must contain:

- A description of the bypass and its cause.
- An analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing.
- A cost-effectiveness analysis of alternatives including comparative resource damage assessment.
- The minimum and maximum duration of bypass under each alternative.
- A recommendation as to the preferred alternative for conducting the bypass.
- The projected date of bypass initiation.
- A statement of compliance with State Environmental Policy Act (SEPA).
- A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated.
- Details of the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

b. For probable construction bypasses, the Permittee must notify Ecology of the need to bypass as early in the planning process as possible. The Permittee must consider the analysis required above during preparation of the engineering report or facilities plan and plans and specifications and must include these to the extent practical. In cases where the

Permittee determines the probable need to bypass early, the Permittee must continue to analyze conditions up to and including the construction period in an effort to minimize or eliminate the bypass.

c. Ecology will consider the following prior to issuing an administrative order for this type of bypass:

- If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.
- If feasible alternatives to bypass exist, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.
- If the Permittee planned and scheduled the bypass to minimize adverse effects on the public and the environment.

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve or deny the request. Ecology will give the public an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Ecology will approve a request to bypass by issuing an administrative order under RCW 90.48.120.

G. Operations and Maintenance (O&M) Manual

1. O&M Manual submittal and requirements

The Permittee must:

a. Annually review their Operations and Maintenance (O&M) Manual to ensure it meets the requirements of 173-240-150 WAC and includes the content described in Ecology's *Criteria for Sewage Works Design* section G1-4.4 and table G1-3 for all treatment components and that it addresses both the treatment works and all tributary pump stations.

b. Confirm this review through a notification letter to Ecology (due **October 15, 2015**, and **annually** thereafter).

c. Submit substantial changes or updates to the O&M Manual to Ecology for review and approval before incorporating them into the manual in both paper and electronic copy with instructions for posting the changes. Submit all other changes to the manual with the annual review letter.

d. Keep the approved O&M Manual at the permitted facility.

e. Follow the instructions and procedures of this manual, including keeping records of all maintenance activities and process control monitoring results.

S6. PRETREATMENT

A. General Requirements

The Permittee must work with Ecology to ensure that all commercial and industrial users of the Publicly Owned Treatment Works (POTW) comply with the pretreatment regulations in 40 CFR Part 403 and any additional regulations that the Environmental Protection Agency (U.S. EPA) may promulgate under Section 307(b) (pretreatment) and 308 (reporting) of the Federal Clean Water Act.

B. Duty to Enforce Discharge Prohibitions

1. In keeping with federal regulations [40 CFR 403.5(a) and (b)], the Permittee must not authorize or knowingly allow the discharge of any pollutants into its POTW which may be reasonably expected to cause pass through or interference, or which otherwise violate general or specific discharge prohibitions contained in 40 CFR Part 403.5 or WAC-173-216-060.

2. The Permittee must not authorize or knowingly allow the introduction of any of the following into their treatment works:

   a. Pollutants which create a fire or explosion hazard in the POTW (including, but not limited to waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21).

   b. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, or greater than 11.0 standard units, unless the works are specifically designed to accommodate such discharges.

   c. Solid or viscous pollutants in amounts that could cause obstruction to the flow in sewers or otherwise interfere with the operation of the POTW.

   d. Any pollutant, including oxygen-demanding pollutants, (BOD_5, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.

   e. Petroleum oil, non-biodegradable cutting oil, or products of mineral origin in amounts that will cause interference or pass through.

   f. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity which may cause acute worker health and safety problems.

   g. Heat in amounts that will inhibit biological activity in the POTW resulting in interference but in no case heat in such quantities such that the temperature at the POTW headworks exceeds 40 degrees Centigrade (104 degrees Fahrenheit) unless Ecology, upon request of the Permittee, approves, in writing, alternate temperature limits.

h. Any trucked or hauled pollutants, except at discharge points designated by the Permittee.

i. Wastewaters prohibited to be discharged to the POTW by the Dangerous Waste Regulations (chapter 173-303 WAC), unless authorized under the Domestic Sewage Exclusion (WAC 173-303-071).

3. The Permittee must also not allow the following discharges to the POTW unless approved in writing by Ecology:

a. Noncontact cooling water in significant volumes.

b. Stormwater and other direct inflow sources.

c. Wastewaters significantly affecting system hydraulic loading, which do not require treatment, or would not be afforded a significant degree of treatment by the system.

4. The Permittee must notify Ecology if any industrial user violates the prohibitions listed in this section (S6.B), and initiate enforcement action to promptly curtail any such discharge.

C. Wastewater Discharge Permit Required

The Permittee must

1. Establish a process for authorizing non-domestic wastewater discharges that ensures all SIUs in all tributary areas meet the applicable State Waste Discharge Permit (SWDP) requirements in accordance with chapter 90.48 RCW and chapter 173-216 WAC.

2. Immediately notify Ecology of any proposed discharge of wastewater from a source, which may be a significant industrial user (SIU) [see fact sheet definitions or refer to 40 CFR 403.3(v)].

3. Require all SIUs to obtain a SWDP from Ecology prior to accepting their non-domestic wastewater, or require proof that Ecology has determined they do not require a permit.

4. Require the documentation as described in S6.C.3 at the earliest practicable date as a condition of continuing to accept non-domestic wastewater discharges from a previously undiscovered, currently discharging, and unpermitted SIU.

5. Require sources of non-domestic wastewater, which do not qualify as SIUs but merit a degree of oversight, to apply for a SWDP and provide it a copy of the application and any Ecology responses.

6. Keep all records documenting that its users have met the requirements of S6.C.

D. Identification and Reporting of Existing, New, and Proposed Industrial Users

1. The Permittee must take continuous, routine measures to identify all existing, new, and proposed SIUs and potential SIUs discharging or proposing to discharge to the Permittee's sewer system (see Appendix B of the fact sheet for definitions).

2. Within 30 days of becoming aware of an unpermitted existing, new, or proposed industrial user who may be a significant industrial user (SIU), the Permittee must notify such user by registered mail that, if classified as an SIU, they must apply to Ecology and obtain a State Waste Discharge Permit. The Permittee must send a copy of this notification letter to Ecology within this same 30-day period.

3. The Permittee must also notify all potential SIUs as they are identified, that if their classification should change to an SIU, they must apply to Ecology for a State Waste Discharge Permit within 30 days of such change.

E. Industrial User Survey

The Permittee must complete an industrial user survey listing all SIUs and potential SIUs discharging to the POTW. The Permittee must submit the survey to Ecology by **January 15, 2017**. At a minimum, the Permittee must develop the list of SIUs and potential SIUs by means of a telephone book search, a water utility billing records search, and a physical reconnaissance of the service area. Information tabulated on potential SIUs must include, at a minimum, the business name, telephone number, address, description of the industrial process(s), and the known wastewater volumes and characteristics. To the extent feasible, the Permittee shall use the process described in the Ecology publication "*Guidance Manual for Performing an Industrial User Survey*" to identify, survey, and categorize the sources of non-domestic wastewater to the POTW.

The Permittee must submit an update to the Industrial User Survey by **January 15, 2019**, and **every two years** thereafter both by paper an electronic copy. The updated survey must identify present SIU's, new SIU's, and Potential SIU's. The list shall include all new industrial users and industrial users which the Permittee discovers have significantly altered processes or disposal practices since submittal of the last survey or survey update. For industrial users which are potentially significant industrial users, the Permittee must obtain and include the same information as the initial survey (above).

F. Local Limits Development

The Permittee shall develop and codify local limits for the follow pollutants and any other which the initial screening shows may adversely affect the POTW: Antimony, Arsenic, Cadmium, Chromium (both total and hexavalent), Copper, Cyanide, Fluoride, Total Petroleum Hydrocarbons, FOG (Fats, Oil and Grease), Lead, Mercury, Molybdenum, Nickel, pH, Selenium, Silver, Sulfate, Total Dissolved Solids, and Zinc (20 total). The Permittee shall also establish either limits or a strategy for controlling non-domestic loadings of compatible pollutants: BOD, TSS, and Ammonia through loading allocations, surcharges, or similar means.

The Permittee shall follow the methodology described in Ecology Publication: *Guidance Manual for Developing Local Discharge Limits*, Ecology Publication 11-10-056.

https://fortress.wa.gov/ecy/publications/publications/1110056.pdf to develop local limits for the protection of its treatment works on the following schedule:

1. The Permittee shall provide a local limits development plan by **July 15, 2017**. The Permittee shall perform an initial screening of their **influent and effluent** of all pollutants listed in Appendix A of this permit to determine which if any pollutants in addition to the 20 pollutants listed above are of potential concern to POTW processes and receiving waters. The Permittee must submit the results of this initial screening and the proposed list of pollutants of concern based on the test results to Ecology by **December 1, 2017**.

2. During calendar year 2018, the Permittee shall collect and analyze at least eight samples (two in each calendar quarter) for all pollutants of concern (as determined per the above paragraph). The Permittee shall sample at each of four locations: The influent after screening and degritting, the final effluent, final biosolids, and ambient waters. Ambient monitoring required to support this effort is described in section S10. Biosolids monitoring may be one sample for quarter in each of the four quarters rather than two (four biosolids samples during 2016). The analytical methods shall be in accordance with those listed in Appendix A of this permit for influent and effluent samples. Biosolids monitoring shall employ SW846 approved methods. Influent and Effluent samples shall be 24-hour composites except where inappropriate such as for Cyanide and Oil & Grease which must be grab samples. The Permittee shall submit laboratory results quarterly within 45 days of the end of each calendar quarter, and compile all data and enter it into Ecology's local limits spreadsheet, http://www.ecy.wa.gov/programs/wq/permits/newll11blank.xlsm, by **February 15, 2019**.

3. The Permittee shall submit the spreadsheet with sampling data entered their proposed limits, and explanations of the basis for each by **July 15, 2019**. This analysis shall:

    a. Establish a maximum allowable headworks loading for each conservative pollutant, allocate a proportion of this loading to industrial users and propose a technically based mass or concentration based local limit for each conservative pollutant of concern which they believe is appropriate and protective of the POTW.

    b. Propose a management strategy, limits, and/or surcharge rates for BOD, TSS, and Ammonia based on allocating a portion of available treatment capacity to non-domestic sources, and recovery of the cost of construction and operation of the POTW. The Permittee shall propose limits for pH and FOG based on AKART and State and Federal rules.

    c. Propose end-of-pipe limits that prevent adverse effects for pollutants of concern due to vapor toxicity or explosivity.

4. The Permittee shall allow Ecology 30 days for review of the proposed limits and shall codify limits which meet Ecology's review concerns in a local Ordinance by **December 15, 2019**.

G. Routine Pretreatment Monitoring Requirements

Beginning the first calendar quarter after the effective date of this permit for all years except 2018 (when monitoring for developing local limits is being conducted per S6.F), the Permittee must:

1. Annually in the last calendar quarter (October 1 and December 31 monitor the influent, effluent, and biosolids for each pollutant listed at Appendix A of this permit under: "Nonconventional Pollutants;" "Metals, Cyanide & Total Phenols;" "Acid Compounds;" "Volatile Compounds;" and "Base/Neutral Compounds" (monitoring for "Pesticides" is not required). Include any other pollutants for which local limits have been developed or are expected from non-domestic sources within the Permittee's service area. Use U.S. EPA 40 CFR part 136 approved procedures for collection, preservation, storage, and analysis. Samples of the effluent must meet the quantitation levels of Appendix A. Biosolids analyses are not limited to the methods or expected to meet the detection levels of Appendix A, but should use SW846 approved methods where they exist and are sensitive enough to quantify the analyte. Report the results of the annual monitoring by January 15th (within 15 days after the end of the reporting period).

2. Quarterly in the first three calendar quarters monitor influent, effluent, and sludge samples for the 20 pollutants for which local limits are required to be developed under S6.F except pH and any additional pollutants for which local limits are subsequently developed (except compatible pollutants BOD5, TSS, and Ammonia). Report the results of quarterly monitoring by the 15th day of the month following the calendar quarter.

3. Collect samples of the POTW's influent and effluent on days when industrial discharges are occurring at normal-to-maximum levels.

4. Obtain 24-hour composite samples for the analysis of metals, acid, and base/neutral extractable compounds.

5. Collect grab samples at equal intervals for a total of four grab samples per day for the analysis of volatile compounds. The laboratory may run a single analysis for volatile compounds (Method 624) for each monitoring day by compositing equal volumes of each grab sample directly in the GC purge and trap apparatus in the laboratory, with no less than 1 ml of each grab included in the composite.

6. Ensure that all reported test data for metals represents the total amount of the constituents present in all phases, whether solid, suspended, or dissolved elemental or combined, including all oxidation states unless otherwise indicated.

7. Handle, prepare, and analyze all wastewater samples taken for GC/MS analysis in accordance with the U.S. EPA Methods 624 and 625 (October 26, 1984).

8. Use the analytical methods at Appendix A for analysis of influent and effluent samples. Obtain the quantitation levels at Appendix A for effluent samples.

9. Collect a sludge sample concurrently with a wastewater sample as a single grab of residual sludge. Sludge organic priority pollutant sampling and analysis must conform to U.S. EPA Methods 624 and 625 unless the Permittee requests an alternate method and Ecology has approved. Sludge metals priority pollutant sampling and analysis must conform to U.S. EPA SW 846 6000/7000 Series Methods unless the Permittee requests an alternate method and Ecology has approved.

10. Collect grab samples for cyanide, phenols, and oils. Measure hexane soluble oils (or equivalent) using EPA method 1664 for the influent and effluent.

11. Make a reasonable attempt to indentify all other substances and quantify all pollutants shown to be present by gas chromatograph/mass spectrometer (GC/MS) analysis per 40 CFR 136, Appendix A, Methods 624 and 625, in addition to quantifying pH, oil and grease, and all priority pollutants.

    The Permittee should attempt to make determinations of pollutants for each fraction, which produces identifiable spectra on total ion plots (reconstructed gas chromatograms). The Permittee should attempt to make determinations from all peaks with responses 5 percent or greater than the nearest internal standard. The 5 percent value is based on internal standard concentrations of 30 μg/L, and must be adjusted downward if higher internal standard concentrations are used or adjusted upward if lower internal standard concentrations are used. The Permittee may express results for non-substituted aliphatic compounds as total hydrocarbon content.

12. Use a laboratory whose computer data processing programs are capable of comparing sample mass spectra to a computerized library of mass spectra, with visual confirmation by an experienced analyst.

13. Conduct additional sampling and appropriate testing to determine concentration and variability, and to evaluate trends for all detected substances determined to be pollutants, if the pollutant has previously been determined to be a pollutant of concern, or if the pollutants concentrations are such that there is a potential to cause problems with the POTW performance, human health, or the environment.

S7. SOLID WASTES

A. Solid Waste Handling

The Permittee must handle and dispose of all solid waste material in accordance with Chapters 173-308 WAC and 173-350 WAC, and in such a manner as to prevent its entry into state ground or surface water other than authorized under a permit administered under these chapters. For biosolids, the Permittee shall track the wet volume produced each year, percent solids, total dry tons produced, and biosolids quality and use this information to inform their local limits development process and periodic validation.

B. Leachate

The Permittee may reintroduce leachate to the treatment works downstream of the influent sample point, but may not allow leachate from its solid waste material to enter

state waters, including groundwater, without disclosing the practice and obtaining a separate discharge permit for that discharge. Leachate discharges to surface waters or to ground must provide all known, available, and reasonable methods of treatment (AKART) and show they will not violate the State's Surface or Ground Water Quality Standards, (respectively Chapters 173-201A and 173-200) before they can be permitted.

S8. APPLICATION FOR PERMIT RENEWAL OR MODIFICATION FOR FACILITY CHANGES

The Permittee must submit an application for renewal of this permit by **April 1, 2020**.

The Permittee must also submit a new application or supplement at least 180 days prior to commencement of discharges, resulting from the activities listed below, which may result in permit violations. These activities include any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility.

S9. SPILL CONTROL PLAN

A Spill Control Plan Submittals and Requirements

The Permittee must:

1. Submit a spill control plan for the prevention, containment, and control of spills or unplanned releases of pollutants to Ecology by **March 15, 2016**. The plan must address all chemicals stored onsite.

2. Review the plan at least annually and update the spill plan as needed.

3. Send changes to the plan to Ecology.

4. Follow the plan and any supplements throughout the term of the permit.

B. Spill Control Plan Components

The spill control plan must include the following:

1. A list of all materials used and/or stored on-site which may become pollutants or cause pollution upon reaching state's waters. Separately identify all oils, petroleum products, and other materials which would designate as Dangerous Waste (DW) or Extremely Hazardous Waste (EHW) by the procedures set forth in WAC 173-303-070 if spilled.

2. A description of preventive measures and facilities which prevent, contain, or treat spills of these materials. Include a drawing of the facility up to its property boundaries showing drainage patterns, storage areas, overhead cover, berms, containment features, and emergency supplies.

3. A description of the reporting system the Permittee will use to alert responsible managers and legal authorities in the event of a spill.

4. A description of how staff will be trained to implement the plan.

The Permittee may integrate the above requirements with plans and manuals required by 40 CFR Part 112, contingency plans required by Chapter 173-303 WAC, or other plans required by other agencies and submit the integrated plan.

S10. RECEIVING WATER STUDY

The Permittee must collect receiving water information necessary to support establishing technically based local limits and determine if the effluent has a reasonable potential to cause a violation of the water quality standards. Where a reasonable potential to violate a criteria exists, Ecology will use the study information to calculate effluent limits.

The Permittee must:

1. Submit a sampling and quality assurance plan for Ecology review and approval by **July 15, 2016**.

2. Conduct all sampling and analysis in accordance with the guidelines given in *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies*, Ecology Publication 04-03-030. This document is available at: http://www.ecy.wa.gov/programs/eap/qa/docs/QAPPtool/Mod3%20Guidelines/GuidelinesforPreparingQAPPS.pdf.

3. Locate the receiving water sampling locations outside the zone of influence of the effluent.

4. Use sampling station accuracy requirements of ± 20 meters.

5. Time the sampling as close as possible to the critical period.

6. Follow the clean sampling techniques (Method 1669: *Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels*, EPA Publication No. 821-R-95-034, April 1995). The Permittee may make modifications to this method if they find such changes will not increase the potential for sample contamination.

7. Collect at least eight receiving water samples, two per calendar quarter in 2016 and analyze the samples for Total Suspended Solids, Hardness, Temperature, Ph, Salinity, Orthophosphate, Total Phosphorus, Nitrate, Total Kjeldahl Nitrogen, and both the Total and Dissolved fractions for the following metals: Arsenic, Cadmium, Chromium (total Chromium, Chromium+3 and Chromium+6), Copper, Fluoride, Lead, Mercury, Nickel, Selenium, Silver, and Zinc.

8. Conduct all chemical analysis using the methods and the detection levels identified in Appendix A.

9. Submit the results of the study to Ecology by **December 1, 2017**.

10. Also enter the data electronically into Ecology's Environmental Information Management (EIM) System. Submittal guidelines and instructions are at the following link: http://www.ecy.wa.gov/eim/MyEIM.htm.

The Permittee may conduct a cooperative receiving water study with other NPDES Permittees discharging in the same vicinity.

S11. OUTFALL EVALUATION

The Permittee must inspect, every five years, the submerged portion of the outfall line and diffuser to document its integrity and continued function. If conditions allow for a photographic verification, the Permittee must include such verification in the report. The report must include both a plan (top) and section (side) view of the outfall line and diffusers with key dimensions noted (e.g. distance from shore, height of ports above the bottom, and depth of water at the ports). The plan and section views must note all damages observed during the inspection. The report must describe the corrective actions taken and planned to fix all observed damage. The report must note the river flow (cfs) at the time of the inspection, the 7Q10 flow, and include a graph of river current velocity over the 24-hour period when the inspection is done. By **September 15, 2016**, and every five years thereafter, the Permittee must revisit the outfall line, and submit an updated inspection report to Ecology.

S12. ACUTE TOXICITY

A. Effluent Characterization

The Permittee must:

1. Conduct acute toxicity testing quarterly for one year on composite samples of the final effluent taken during a normal business weekday. Samples must be collected in each calendar quarter of 2016.

2. Follow the analysis methods and test report content described in S12.G.

3. Submit the written report to Ecology within 45 days of each sampling.

4. Use a dilution series consisting of a minimum of five concentrations and a control. The five concentrations should include the ACEC of 4.3 percent effluent.

5. Conduct the following three acute toxicity tests on each sample:

Acute Toxicity Tests	Species	Method
Fathead minnow 96-hour static-renewal test	*Pimephales promelas*	EPA-821-R-02-012
Daphnid 48-hour static test	*Ceriodaphnia dubia*, *Daphnia pulex*, or *Daphnia magna*	EPA-821-R-02-012

6. The effluent limit for acute toxicity listed in Section B below applies if after one year of effluent characterization:

   - The median survival of any species in 100 percent effluent is below 80 percent.

- Any one test of any species exhibits less than 65 percent survival in 100 percent effluent.

If the limit applies, then the Permittee must immediately follow the instructions in Sections C, D, E, and G. If the limit does not apply, then the Permittee must follow the instructions in Sections F and G.

B. Effluent Limit for Acute Toxicity

The effluent limit for acute toxicity is:

No acute toxicity detected in a test concentration representing the acute critical effluent concentration (ACEC).

The ACEC means the maximum concentration of effluent during critical conditions at the boundary of the acute mixing zone, defined in Section S1.B of this permit. The ACEC equals 4.3 percent effluent.

C. Compliance with the Effluent Limit for Acute Toxicity

Compliance with the effluent limit for acute toxicity means the results of the testing specified in Section D show no statistically significant difference in survival between the control and the ACEC.

If the test results show a statistically significant difference in survival between the control and the ACEC, the test does not comply with the effluent limit for acute toxicity. The Permittee must then immediately conduct the additional testing described in Section E. The Permittee will comply with the requirements of this section by meeting the requirements of Section E.

The Permittee must determine the statistical significance by conducting a hypothesis test at the 0.05 level of significance (Appendix H, EPA/600/4-89/001). If the difference in survival between the control and the ACEC is less than 10 percent, the Permittee must conduct the hypothesis test at the 0.01 level of significance.

D. Compliance Testing for Acute Toxicity

The requirements of this section apply only if the characterization required by section S12.A shows the Permittee has an acute toxicity limit (per S12.A.6).

The Permittee must:

1. Perform the acute toxicity tests with 100 percent effluent, the ACEC, and a control, or with a full dilution series.

2. Conduct quarterly acute toxicity testing on the final effluent. Testing must begin in the first calendar quarter of 2016. Quarters means January through March, April through June, July through September, and October through December.

3. Submit a quarterly written report to Ecology for one year within 45 days of sampling with the first report due no later than **May 15, 2016**. Follow the testing and reporting instructions and report content requirements of Section S12.G.

4. The Permittee must perform compliance tests using each of the species and protocols listed below on a rotating basis:

Acute Toxicity Tests	Species	Method
Fathead minnow 96-hour static-renewal test	*Pimephales promelas*	EPA-821-R-02-012
Daphnid 48-hour static test	*Ceriodaphnia dubia, Daphnia pulex,* or *Daphnia magna*	EPA-821-R-02-012

E. Response to Noncompliance with the Effluent Limit for Acute Toxicity

If a toxicity test conducted under Section S12.D determines a statistically significant difference in response between the ACEC and the control, using the statistical test described in Section S12.C, the Permittee must begin additional testing within one week from the time of receiving the test results. The Permittee must:

1. Conduct one additional test each week for four consecutive weeks, using the same test and species as the failed compliance test.

2. Test at least five effluent concentrations and a control to determine appropriate point estimates. One of these effluent concentrations must equal the ACEC. The results of the test at the ACEC will determine compliance with the effluent limit for acute toxicity as described in Section C.

3. Return to the monitoring frequency in Section S12.D.2 (quarterly) after completion of the additional compliance monitoring.

Anomalous Test Results: If a toxicity test conducted under Section D indicates noncompliance with the acute toxicity limit and the Permittee believes that the test result is anomalous, the Permittee may notify Ecology that the compliance test result may be anomalous. The Permittee may take one additional sample for toxicity testing and wait for notification from Ecology before completing the additional testing. The Permittee must submit the notification with the report of the compliance test result and identify the reason for considering the compliance test result to be anomalous.

If Ecology determines that the test result was not anomalous, the Permittee must complete all of the additional monitoring required in this section. Or,

If the one additional sample fails to comply with the effluent limit for acute toxicity, then the Permittee must complete all of the additional monitoring required in this section. Or,

If Ecology determines that the test result was anomalous, the one additional test result will replace the anomalous test result.

If all of the additional testing in this section complies with the permit limit, the Permittee must submit a report to Ecology on possible causes and preventive measures for the transient toxicity event, which triggered the additional compliance monitoring. This report must include a search of all pertinent and recent facility records, including:

- Operating records
- Monitoring results
- Inspection records
- Spill reports
- Weather records
- Production records
- Raw material purchases
- Pretreatment records, etc.

If the additional testing in this section shows another violation of the acute toxicity limit, the Permittee must submit a Toxicity Identification/Reduction Evaluation (TI/RE) plan to Ecology within 60 days after the sample date (WAC 173-205-100(2)).

F. Testing when there is No Permit Limit for Acute Toxicity

The Permittee must:

1. Conduct acute toxicity testing on final effluent during December 2018 (with a report of results by **February 15, 2019**) and June 2019 (with a report of results by **August 15, 2019**).

2. Submit the results to Ecology with the permit renewal application by **April 1, 2020**.

3. Conduct acute toxicity testing on a series of at least five concentrations of effluent, including 100 percent effluent and a control.

4. Use each of the following species and protocols for each acute toxicity test:

Acute Toxicity Tests	Species	Method
Fathead minnow 96-hour static-renewal test	*Pimephales promelas*	EPA-821-R-02-012
Daphnid 48-hour static test	*Ceriodaphnia dubia, Daphnia pulex,* or *Daphnia magna*	EPA-821-R-02-012

G. Sampling and Reporting Requirements

1. The Permittee must submit all reports for toxicity testing in accordance with the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. Reports must contain bench sheets and reference toxicant results for test methods. If the lab provides the toxicity test data in electronic format for entry into Ecology's database, then the Permittee must send the data to Ecology along with the test report, bench sheets, and reference toxicant results.

2. The Permittee must collect 24-hour composite effluent samples or grab samples for toxicity testing. The Permittee must cool the samples to 0 - 6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.

3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*.

4. All toxicity tests must meet quality assurance criteria and test conditions specified in the most recent versions of the EPA methods listed in Subsection C and the Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.

5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Section A or pristine natural water of sufficient quality for good control performance.

6. The Permittee must conduct whole effluent toxicity tests on an unmodified sample of final effluent.

   a. The Permittee may choose to conduct a full dilution series test during compliance testing in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the acute critical effluent concentration (ACEC). The ACEC equals 4.3 percent effluent.

   b. All whole effluent toxicity tests, effluent screening tests, and rapid screening tests that involve hypothesis testing must comply with the acute statistical power standard of 29 percent as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

S13. CHRONIC TOXICITY

A. Effluent Chronic Toxicity Characterization (Not required by this permit)

B. Effluent Limit for Chronic Toxicity

The effluent limit for chronic toxicity is:

No toxicity detected in a test concentration representing the chronic critical effluent concentration (CCEC).

The CCEC means the maximum concentration of effluent during critical conditions at the boundary of the mixing zone, defined in Section S2 of this permit. The CCEC equals 0.83 percent effluent.

C. Compliance with the Effluent Limit for Chronic Toxicity

Compliance with the effluent limit for chronic toxicity means the results of the testing specified in Subsection D or F show no statistically significant difference in response between the control and the CCEC.

If the test results show a statistically significant difference in survival between the control and the CCEC, and Ecology has not determined the test result to be anomalous under Section E, and the test is otherwise valid, the result is a violation of the effluent limit for chronic toxicity. The Permittee must immediately conduct the additional testing described in Section D.

The Permittee must determine the statistical significance by conducting a hypothesis test at the 0.05 level of significance (Appendix H, EPA/600/4-89/001). If the difference in response between the control and the CCEC is less than 20 percent, the Permittee must conduct the hypothesis test at the 0.01 level of significance.

Ecology will reevaluate the need for the chronic toxicity limit in future permits. Therefore, the Permittee must also conduct this same hypothesis test (Appendix H, EPA/600/4-89/001) to determine whether a statistically significant difference in response exists between the acute critical effluent concentration (ACEC) and the control.

D. Compliance Testing for Chronic Toxicity

If testing required under S13.F determines that the Permittee has an effluent limit for chronic toxicity, the Permittee must:

1. Perform the chronic toxicity tests using the CCEC, the ACEC, and a control, or with a full dilution series.

2. Conduct quarterly chronic toxicity testing on the final effluent. Testing must begin within 60 days after submitting the final characterization report of S3.F. Quarterly means calendar quarters (January through March, April through June, July through September, and October through December).

3. Submit a quarterly written report to Ecology for one year within 45 days of sampling with the first report due no later than **May 15, 2016**. Follow the testing and reporting instructions and report content requirements of Section S13.G.

4. Perform compliance tests using the following species on a rotating basis and the most recent version of the following protocols:

Freshwater Chronic Test	Species	Method
Fathead minnow survival and growth	*Pimephales promelas*	EPA-821-R-02-013
Water flea survival and reproduction	*Ceriodaphnia dubia*	EPA-821-R-02-013

E. Response to Noncompliance with the Effluent Limit for Chronic Toxicity

If a toxicity test conducted under Subsection D determines a statistically significant difference in response between the CCEC and the control using the statistical test described in Subsection C, the Permittee must begin additional testing within one week from the time of receiving the test results. The Permittee must:

Conduct additional testing each month for three consecutive months using the same test and species as the failed compliance test.

1. Use a series of at least five effluent concentrations and a control to determine appropriate point estimates. One of these effluent concentrations must equal the CCEC. The results of the test at the CCEC will determine compliance with the effluent limit for chronic toxicity as described in Subsection B.

2. Return to the original monitoring frequency in Subsection D after completion of the additional compliance monitoring.

Anomalous test results: If a toxicity test conducted under Subsection D indicates noncompliance with the chronic toxicity limit and the Permittee believes that the test result is anomalous, the Permittee may notify Ecology that the compliance test result may be anomalous. The Permittee may take one additional sample for toxicity testing and wait for notification from Ecology before completing the additional testing. The Permittee must submit the notification with the report of the compliance test result and identify the reason for considering the compliance test result to be anomalous.

If Ecology determines that the test result was not anomalous, the Permittee must complete all of the additional monitoring required in this section; or

If the one additional sample fails to comply with the effluent limit for chronic toxicity, then the Permittee must complete all of the additional monitoring required in this section; or

If Ecology determines that the test result was anomalous, the one additional test result will replace the anomalous test result.

If all of the additional testing required by this section complies with the permit limit, the Permittee must submit a report to Ecology on possible causes and preventive measures for the transient toxicity event, which triggered the additional compliance monitoring. This report must include a search of all pertinent and recent facility records, including:

- Operating records
- Monitoring results
- Inspection records
- Spill reports
- Weather records
- Production records
- Raw material purchases
- Pretreatment records, etc.

If the additional testing required by this section shows another violation of the chronic toxicity limit, the Permittee must submit a Toxicity Identification/Reduction Evaluation (TI/RE) plan to Ecology within 60 days after the sample date [WAC 173-205-100(2)].

F. Chronic Toxicity Testing for Permit Reapplication

The Permittee must:

1. Conduct chronic toxicity testing on final effluent during December 2018 (with a report of results by **February 15, 2019**) and June 2019 (with a report of results by **August 15, 2019**).

2. Also summarize the results in the permit renewal application by **April 1, 2020**.

3. Conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control. This series of dilutions must include the acute critical effluent concentration (ACEC). The ACEC equals 4.3 percent effluent. The series of dilutions should also contain the CCEC of 0.83 percent effluent.

4. Compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in Appendix H, EPA/600/4-89-001.

5. If the results of monitoring demonstrate toxicity per S13.C, continue monitoring as specified in S13.D and S13.E.

6. Perform chronic toxicity tests with all of the following species and the most recent version of the following protocols:

Freshwater Chronic Tests	Species	Method
Fathead minnow survival and growth	*Pimephales promelas*	EPA-821-R-02-013
Water flea survival and reproduction	*Ceriodaphnia dubia*	EPA-821-R-02-013

G. Sampling and Reporting Requirements

1. The Permittee must submit all reports for toxicity testing in accordance with the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. Reports must contain bench sheets and reference toxicant results for test methods. If the lab provides the toxicity test data in electronic format for entry into Ecology's database, then the Permittee must send the data to Ecology along with the test report, bench sheets, and reference toxicant results.

2. The Permittee must collect 24-hour composite effluent samples or grab samples for toxicity testing. The Permittee must cool the samples to 0 - 6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.

3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in the most recent version of Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*.

4. All toxicity tests must meet quality assurance criteria and test conditions specified in the most recent versions of the EPA methods listed in Subsection C and the Ecology Publication No. WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.

5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Section A or pristine natural water of sufficient quality for good control performance.

6. The Permittee must conduct whole effluent toxicity tests on an unmodified sample of final effluent.

7. The Permittee may choose to conduct a full dilution series test during compliance testing in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the ACEC. The ACEC equals 4.3 percent effluent.

8. All whole effluent toxicity tests, effluent screening tests, and rapid screening tests that involve hypothesis testing must comply with the acute statistical power standard of 29 percent as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

GENERAL CONDITIONS

G1. SIGNATORY REQUIREMENTS

A. All applications, reports, or information submitted to Ecology must be signed and certified.

1. In the case of corporations, by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or

- The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

- In the case of a partnership, by a general partner.

- In the case of sole proprietorship, by the proprietor.

- In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

Applications for permits for domestic wastewater facilities that are either owned or operated by, or under contract to, a public entity shall be submitted by the public entity.

B. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to Ecology.

2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

C. Changes to authorization. If an authorization under paragraph B.2, above, is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph B.2, above, must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Certification. Any person signing a document under this section must make the following certification:

> "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 gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering 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."

G2. RIGHT OF INSPECTION AND ENTRY

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

A. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit.

B. To have access to and copy, at reasonable times and at reasonable cost, any records required to be kept under the terms and conditions of this permit.

C. To inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.

D. To sample or monitor, at reasonable times, any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G3. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated either at the request of any interested person (including the Permittee) or upon Ecology's initiative. However, the permit may only be modified, revoked and reissued, or terminated for the reasons specified in 40 CFR 122.62, 40 CFR 122.64 or WAC 173-220-150 according to the procedures of 40 CFR 124.5.

A. The following are causes for terminating this permit during its term, or for denying a permit renewal application:

1. Violation of any permit term or condition.

2. Obtaining a permit by misrepresentation or failure to disclose all relevant facts.

3. A material change in quantity or type of waste disposal.

4. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations and can only be regulated to acceptable levels by permit modification or termination.

5. A change in any condition that requires either a temporary or permanent reduction, or elimination of any discharge or sludge use or disposal practice controlled by the permit.

6. Nonpayment of fees assessed pursuant to RCW 90.48.465.

7. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.

B. The following are causes for modification but not revocation and reissuance except when the Permittee requests or agrees:

1. A material change in the condition of the waters of the state.

2. New information not available at the time of permit issuance that would have justified the application of different permit conditions.

3. Material and substantial alterations or additions to the permitted facility or activities which occurred after this permit issuance.

4. Promulgation of new or amended standards or regulations having a direct bearing upon permit conditions, or requiring permit revision.

5. The Permittee has requested a modification based on other rationale meeting the criteria of 40 CFR Part 122.62.

6. Ecology has determined that good cause exists for modification of a compliance schedule, and the modification will not violate statutory deadlines.

7. Incorporation of an approved local pretreatment program into a municipality's permit.

C. The following are causes for modification or alternatively revocation and reissuance:

1. When cause exists for termination for reasons listed in A1 through A7 of this section, and Ecology determines that modification or revocation and reissuance is appropriate.

2. When Ecology has received notification of a proposed transfer of the permit. A permit may also be modified to reflect a transfer after the effective date of an automatic transfer (General Condition G7) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new Permittee.

G4. REPORTING PLANNED CHANGES

The Permittee must, as soon as possible, but no later than 60 days prior to the proposed changes, give notice to Ecology of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in:

A. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).

B. A significant change in the nature or an increase in quantity of pollutants discharged.

C. A significant change in the Permittee's sludge use or disposal practices. Following such notice, and the submittal of a new application or supplement to the existing application, along with required engineering plans and reports, this permit may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G5. PLAN REVIEW REQUIRED

Prior to constructing or modifying any wastewater control facilities, an engineering report and detailed plans and specifications must be submitted to Ecology for approval in accordance with chapter 173-240 WAC. Engineering reports, plans, and specifications must be submitted at least 180 days prior to the planned start of construction unless a shorter time is approved by Ecology. Facilities must be constructed and operated in accordance with the approved plans.

G6. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit excuses the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G7. TRANSFER OF THIS PERMIT

In the event of any change in control or ownership of facilities from which the authorized discharge emanate, the Permittee must notify the succeeding owner or controller of the existence of this permit by letter, a copy of which must be forwarded to Ecology.

A. Transfers by Modification

Except as provided in paragraph (B) below, this permit may be transferred by the Permittee to a new owner or operator only if this permit has been modified or revoked and reissued under 40 CFR 122.62(b)(2), or a minor modification made under 40 CFR 122.63(d), to identify the new Permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

B. Automatic Transfers

This permit may be automatically transferred to a new Permittee if:

1. The Permittee notifies Ecology at least 30 days in advance of the proposed transfer date.

2. The notice includes a written agreement between the existing and new Permittees containing a specific date transfer of permit responsibility, coverage, and liability between them.

3. Ecology does not notify the existing Permittee and the proposed new Permittee of its intent to modify or revoke and reissue this permit. A modification under this subparagraph may also be minor modification under 40 CFR 122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.

G8. REDUCED PRODUCTION FOR COMPLIANCE

The Permittee, in order to maintain compliance with its permit, must control production and/or all discharges upon reduction, loss, failure, or bypass of the treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

G9. REMOVED SUBSTANCES

Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must not be resuspended or reintroduced to the final effluent stream for discharge to state waters.

G10. DUTY TO PROVIDE INFORMATION

The Permittee must submit to Ecology, within a reasonable time, all information which Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology upon request, copies of records required to be kept by this permit.

G11. OTHER REQUIREMENTS OF 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G12. ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G13. PAYMENT OF FEES

The Permittee must submit payment of fees associated with this permit as assessed by Ecology.

G14. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit is deemed guilty of a crime, and upon conviction thereof must be punished by a fine of up to

$10,000 and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit may incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to $10,000 for every such violation. Each and every such violation is a separate and distinct offense, and in case of a continuing violation, every day's continuance is deemed to be a separate and distinct violation.

G15. UPSET

Definition – "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limits if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

A. An upset occurred and that the Permittee can identify the cause(s) of the upset.

B. The permitted facility was being properly operated at the time of the upset.

C. The Permittee submitted notice of the upset as required in Condition S3.E.

D. The Permittee complied with any remedial measures required under S4.C of this permit.

In any enforcement action the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G16. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G17. DUTY TO COMPLY

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G18. TOXIC POLLUTANTS

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G19. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit must, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment must be a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or by both.

G20. COMPLIANCE SCHEDULES

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

G21. SERVICE AGREEMENT REVIEW

The Permittee must submit to Ecology any proposed service agreements and proposed revisions or updates to existing agreements for the operation of any wastewater treatment facility covered by this permit. The review is to ensure consistency with chapters 90.46 and 90.48 RCW as required by RCW 70.150.040(9). In the event that Ecology does not comment within a 30-day period, the Permittee may assume consistency and proceed with the service agreement or the revised/updated service agreement.

APPENDIX A

LIST OF POLLUTANTS WITH ANALYTICAL METHODS, DETECTION LIMITS AND QUANTITATION LEVELS

The Permittee must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for permit and application required monitoring unless:

- Another permit condition specifies other methods, detection levels, or quantitation levels.
- The method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136.

If the Permittee uses an alternative method, not specified in the permit and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

If the Permittee is unable to obtain the required DL and QL in its effluent due to matrix effects, the Permittee must submit a matrix-specific detection limit (MDL) and a quantitation limit (QL) to Ecology with appropriate laboratory documentation.

When the permit requires the Permittee to measure the base neutral compounds in the list of priority pollutants, it must measure all of the base neutral pollutants listed in the table below. The list includes EPA required base neutral priority pollutants and several additional polynuclear aromatic hydrocarbons (PAHs). The Water Quality Program added several PAHs to the list of base neutrals below from Ecology's Persistent Bioaccumulative Toxics (PBT) List. It only added those PBT parameters of interest to Appendix A that did not increase the overall cost of analysis unreasonably.

Ecology added this appendix to the permit in order to reduce the number of analytical "non-detects" in permit-required monitoring and to measure effluent concentrations near or below criteria values where possible at a reasonable cost.

CONVENTIONAL PARAMETERS

Pollutant & CAS No. ***(if available)***	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)** [2] ***µg/L unless specified***
Biochemical Oxygen Demand	SM5210-B		2 mg/L
Chemical Oxygen Demand	SM5220-D		10 mg/L

Pollutant & CAS No. ***(if available)***	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
Total Organic Carbon	SM5310-B/C/D		1 mg/L
Total Suspended Solids	SM2540-D		5 mg/L
Total Ammonia (as N)	SM4500-NH3-B and C/D/E/G/H		20
Flow	Calibrated device		
Dissolved oxygen	SM4500-OC/OG		0.2 mg/L
Temperature (max. 7-day avg.)	Analog recorder or Use micro-recording devices known as thermistors		0.2º C
pH	SM4500-H^+ B	N/A	N/A

NONCONVENTIONAL PARAMETERS

Pollutant & CAS No. (if available)	**Recommended Analytical Protocol**	**Detection (DL)[1] µg/L unless specified**	**Quantitation Level (QL)[2] µg/L unless specified**
Total Alkalinity	SM2320-B		5 mg/L as CaCO3
Chlorine, Total Residual	SM4500 Cl G		50.0
Color	SM2120 B/C/E		10 color units
Fecal Coliform	SM 9221E,9222	N/A	Specified in method - sample aliquot dependent
Fluoride (16984-48-8)	SM4500-F E	25	100
Nitrate + Nitrite Nitrogen (as N)	SM4500-NO3- E/F/H		100
Nitrogen, Total Kjeldahl (as N)	SM4500-N_{org}B/C and SM4500NH_3-		300

Pollutant & CAS No. (if available)	Recommended Analytical Protocol	Detection (DL)[1] µg/L unless specified	Quantitation Level (QL)[2] µg/L unless specified
	B/C/D/EF/G/H		
Soluble Reactive Phosphorus (as P)	SM4500- PE/PF	3	10
Phosphorus, Total (as P)	SM 4500 PB followed by SM4500-PE/PF	3	10
Oil and Grease (HEM)	1664 A or B	1,400	5,000
Salinity	SM2520-B		3 practical salinity units or scale (PSU or PSS)
Settleable Solids	SM2540 -F		100
Sulfate (as mg/L SO_4)	SM4110-B		200
Sulfide (as mg/L S)	SM4500-S^2F/D/E/G		200
Sulfite (as mg/L SO_3)	SM4500-SO3B		2000
Total Coliform	SM 9221B, 9222B, 9223B	N/A	Specified in method - sample aliquot dependent
Total dissolved solids	SM2540 C		20 mg/L
Total Hardness	SM2340B		200 as CaCO3
Aluminum, Total (7429-90-5)	200.8	2.0	10
Barium Total (7440-39-3)	200.8	0.5	2.0
BTEX (benzene +toluene + ethylbenzene + m,o,p xylenes)	EPA SW 846 8021/8260	1	2
Boron Total (7440-42-8)	200.8	2.0	10.0
Cobalt, Total (7440-48-4)	200.8	0.05	0.25
Iron, Total (7439-89-6)	200.7	12.5	50
Magnesium, Total (7439-95-4)	200.7	10	50

Pollutant & CAS No. (if available)	Recommended Analytical Protocol	Detection (DL)[1] µg/L unless specified	Quantitation Level (QL)[2] µg/L unless specified
Molybdenum, Total (7439-98-7)	200.8	0.1	0.5
Manganese, Total (7439-96-5)	200.8	0.1	0.5
NWTPH Dx	Ecology NWTPH Dx	250	250
NWTPH Gx	Ecology NWTPH Gx	250	250
Tin, Total (7440-31-5)	200.8	0.3	1.5
Titanium, Total (7440-32-6)	200.8	0.5	2.5

PRIORITY POLLUTANTS

Pollutant & CAS No. *(if available)*	Recommended Analytical Protocol	Detection (DL)[1] *µg/L unless specified*	Quantitation Level (QL) [2] *µg/L unless specified*
METALS, CYANIDE & TOTAL PHENOLS			
Antimony, Total (7440-36-0)	200.8	0.3	1.0
Arsenic, Total (7440-38-2)	200.8	0.1	0.5
Beryllium, Total (7440-41-7)	200.8	0.1	0.5
Cadmium, Total (7440-43-9)	200.8	0.05	0.25
Chromium (hex) dissolved (18540-29-9)	SM3500-Cr EC	0.3	1.2
Chromium, Total (7440-47-3)	200.8	0.2	1.0
Copper, Total (7440-50-8)	200.8	0.4	2.0
Lead, Total (7439-92-1)	200.8	0.1	0.5
Mercury, Total (7439-97-6)	1631E	0.0002	0.0005

Pollutant & CAS No. ***(if available)***	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
Nickel, Total (7440-02-0)	200.8	0.1	0.5
Selenium, Total (7782-49-2)	200.8	1.0	1.0
Silver, Total (7440-22-4)	200.8	0.04	0.2
Thallium, Total (7440-28-0)	200.8	0.09	0.36
Zinc, Total (7440-66-6)	200.8	0.5	2.5
Cyanide, Total (57-12-5)	335.4	5	10
Cyanide, Weak Acid Dissociable	SM4500-CN I	5	10
Cyanide, Free Amenable to Chlorination (Available Cyanide)	SM4500-CN G	5	10
Phenols, Total	EPA 420.1		50
ACID COMPOUNDS			
2-Chlorophenol (95-57-8)	625	1.0	2.0
2,4-Dichlorophenol (120-83-2)	625	0.5	1.0
2,4-Dimethylphenol (105-67-9)	625	0.5	1.0
4,6-dinitro-o-cresol (534-52-1) (2-methyl-4,6,-dinitrophenol)	625/1625B	1.0	2.0
2,4 dinitrophenol (51-28-5)	625	1.0	2.0
2-Nitrophenol (88-75-5)	625	0.5	1.0
4-nitrophenol (100-02-7)	625	0.5	1.0
Parachlorometa cresol (59-50-7) (4-chloro-3-methylphenol)	625	1.0	2.0
Pentachlorophenol (87-86-5)	625	0.5	1.0

Pollutant & CAS No. ***(if available)***	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
Phenol (108-95-2)	625	2.0	4.0
2,4,6-Trichlorophenol (88-06-2)	625	2.0	4.0
VOLATILE COMPOUNDS			
Acrolein (107-02-8)	624	5	10
Acrylonitrile (107-13-1)	624	1.0	2.0
Benzene (71-43-2)	624	1.0	2.0
Bromoform (75-25-2)	624	1.0	2.0
Carbon tetrachloride (56-23-5)	624/601 or SM6230B	1.0	2.0
Chlorobenzene (108-90-7)	624	1.0	2.0
Chloroethane (75-00-3)	624/601	1.0	2.0
2-Chloroethylvinyl Ether (110-75-8)	624	1.0	2.0
Chloroform (67-66-3)	624 or SM6210B	1.0	2.0
Dibromochloromethane (124-48-1)	624	1.0	2.0
1,2-Dichlorobenzene (95-50-1)	624	1.9	7.6
1,3-Dichlorobenzene (541-73-1)	624	1.9	7.6
1,4-Dichlorobenzene (106-46-7)	624	4.4	17.6
Dichlorobromomethane (75-27-4)	624	1.0	2.0
1,1-Dichloroethane (75-34-3)	624	1.0	2.0
1,2-Dichloroethane (107-06-2)	624	1.0	2.0

Pollutant & CAS No. ***(if available)***	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
1,1-Dichloroethylene (75-35-4)	624	1.0	2.0
1,2-Dichloropropane (78-87-5)	624	1.0	2.0
1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene) (542-75-6)[3]	624	1.0	2.0
Ethylbenzene (100-41-4)	624	1.0	2.0
Methyl bromide (74-83-9) (Bromomethane)	624/601	5.0	10.0
Methyl chloride (74-87-3) (Chloromethane)	624	1.0	2.0
Methylene chloride (75-09-2)	624	5.0	10.0
1,1,2,2-Tetrachloroethane (79-34-5)	624	1.9	2.0
Tetrachloroethylene (127-18-4)	624	1.0	2.0
Toluene (108-88-3)	624	1.0	2.0
1,2-Trans-Dichloroethylene (156-60-5) (Ethylene dichloride)	624	1.0	2.0
1,1,1-Trichloroethane (71-55-6)	624	1.0	2.0
1,1,2-Trichloroethane (79-00-5)	624	1.0	2.0
Trichloroethylene (79-01-6)	624	1.0	2.0
Vinyl chloride (75-01-4)	624/SM6200B	1.0	2.0
BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)			
Acenaphthene (83-32-9)	625	0.2	0.4
Acenaphthylene (208-96-8)	625	0.3	0.6

Pollutant & CAS No. ***(if available)***	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
Anthracene (120-12-7)	625	0.3	0.6
Benzidine (92-87-5)	625	12	24
Benzyl butyl phthalate (85-68-7)	625	0.3	0.6
Benzo(*a*)anthracene (56-55-3)	625	0.3	0.6
Benzo(b)fluoranthene (3,4-benzofluoranthene) (205-99-2) [4]	610/625	0.8	1.6
Benzo(j)fluoranthene (205-82-3) [4]	625	0.5	1.0
Benzo(k)fluoranthene (11,12-benzofluoranthene) (207-08-9) [4]	610/625	0.8	1.6
Benzo(r,s,t)pentaphene (189-55-9)	625	0.5	1.0
Benzo(*a*)pyrene (50-32-8)	610/625	0.5	1.0
Benzo(*ghi*)Perylene (191-24-2)	610/625	0.5	1.0
Bis(*2-chloroethoxy)*methane (111-91-1)	625	5.3	21.2
Bis(*2-chloroethyl*)ether (111-44-4)	611/625	0.3	1.0
Bis(*2-chloroisopropyl*)ether (39638-32-9)	625	0.3	0.6
Bis(*2-ethylhexyl*)phthalate (117-81-7)	625	0.1	0.5
4-Bromophenyl phenyl ether (101-55-3)	625	0.2	0.4

Pollutant & CAS No. ***(if available)***	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
2-Chloronaphthalene (91-58-7)	625	0.3	0.6
4-Chlorophenyl phenyl ether (7005-72-3)	625	0.3	0.5
Chrysene (218-01-9)	610/625	0.3	0.6
Dibenzo (a,h)acridine (226-36-8)	610M/625M	2.5	10.0
Dibenzo (a,j)acridine (224-42-0)	610M/625M	2.5	10.0
Dibenzo(a-*h*)anthracene (53-70-3)(1,2,5,6-dibenzanthracene)	625	0.8	1.6
Dibenzo(a,e)pyrene (192-65-4)	610M/625M	2.5	10.0
Dibenzo(a,h)pyrene (189-64-0)	625M	2.5	10.0
3,3-Dichlorobenzidine (91-94-1)	605/625	0.5	1.0
Diethyl phthalate (84-66-2)	625	1.9	7.6
Dimethyl phthalate (131-11-3)	625	1.6	6.4
Di-n-butyl phthalate (84-74-2)	625	0.5	1.0
2,4-dinitrotoluene (121-14-2)	609/625	0.2	0.4
2,6-dinitrotoluene (606-20-2)	609/625	0.2	0.4
BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)			
Di-n-octyl phthalate (117-84-0)	625	0.3	0.6
1,2-Diphenylhydrazine (*as Azobenzene*) (122-66-7)	1625B	5.0	20
Fluoranthene (206-44-0)	625	0.3	0.6
Fluorene (86-73-7)	625	0.3	0.6

Pollutant & CAS No. ***(if available)***	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
Hexachlorobenzene (118-74-1)	612/625	0.3	0.6
Hexachlorobutadiene (87-68-3)	625	0.5	1.0
Hexachlorocyclopentadiene (77-47-4)	1625B/625	0.5	1.0
Hexachloroethane (67-72-1)	625	0.5	1.0
Indeno(*1,2,3-cd*)Pyrene (193-39-5)	610/625	0.5	1.0
Isophorone (78-59-1)	625	0.5	1.0
3-Methyl cholanthrene (56-49-5)	625	2.0	8.0
Naphthalene (91-20-3)	625	0.3	0.6
Nitrobenzene (98-95-3)	625	0.5	1.0
N-Nitrosodimethylamine (62-75-9)	607/625	2.0	4.0
N-Nitrosodi-n-propylamine (621-64-7)	607/625	0.5	1.0
N-Nitrosodiphenylamine (86-30-6)	625	0.5	1.0
Perylene (198-55-0)	625	1.9	7.6
Phenanthrene (85-01-8)	625	0.3	0.6
Pyrene (129-00-0)	625	0.3	0.6
1,2,4-Trichlorobenzene (120-82-1)	625	0.3	0.6
DIOXIN			
2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (176-40-16) (2,3,7,8	1613B	1.3 pg/L	5 pg/L

Pollutant & CAS No. ***(if available)***	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
TCDD)			
PESTICIDES/PCBs			
Aldrin (309-00-2)	608	0.025	0.05
alpha-BHC (319-84-6)	608	0.025	0.05
beta-BHC (319-85-7)	608	0.025	0.05
gamma-BHC (58-89-9)	608	0.025	0.05
delta-BHC (319-86-8)	608	0.025	0.05
Chlordane (57-74-9) [5]	608	0.025	0.05
4,4'-DDT (50-29-3)	608	0.025	0.05
4,4'-DDE (72-55-9)	608	0.025	0.05[10]
4,4' DDD (72-54-8)	608	0.025	0.05
Dieldrin (60-57-1)	608	0.025	0.05
alpha-Endosulfan (959-98-8)	608	0.025	0.05
beta-Endosulfan (33213-65-9)	608	0.025	0.05
Endosulfan Sulfate (1031-07-8)	608	0.025	0.05
Endrin (72-20-8)	608	0.025	0.05
Endrin Aldehyde (7421-93-4)	608	0.025	0.05
Heptachlor (76-44-8)	608	0.025	0.05
Heptachlor Epoxide (1024-57-3)	608	0.025	0.05
PCB-1242 (53469-21-9) [6]	608	0.25	0.5
PCB-1254 (11097-69-1)	608	0.25	0.5
PCB-1221 (11104-28-2)	608	0.25	0.5

Pollutant & CAS No. ***(if available)***	**Recommended Analytical Protocol**	**Detection (DL)[1]** ***µg/L unless specified***	**Quantitation Level (QL)[2]** ***µg/L unless specified***
PCB-1232 (11141-16-5)	608	0.25	0.5
PCB-1248 (12672-29-6)	608	0.25	0.5
PCB-1260 (11096-82-5)	608	0.13	0.5
PCB-1016 (12674-11-2) [6]	608	0.13	0.5
Toxaphene (8001-35-2)	608	0.24	0.5

1. Detection level (DL) or detection limit means the minimum concentration of an analyte (substance) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR part 136, Appendix B.

2. Quantitation Level (QL) also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10^n, where n is an integer. (64 FR 30417). ALSO GIVEN AS:

   > The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency December 2007).

3. NWTPH Dx - Northwest Total Petroleum Hydrocarbons Diesel Extended Range – see http://www.ecy.wa.gov/biblio/97602.html

4. NWTPH Gx - Northwest Total Petroleum Hydrocarbons Gasoline Extended Range – see http://www.ecy.wa.gov/biblio/97602.html

5. 1, 3-dichloroproylene (mixed isomers) You may report this parameter as two separate parameters: cis-1, 3-dichlorpropropene (10061-01-5) and trans-1, 3-dichloropropene (10061-02-6).

6. Total Benzofluoranthenes - Because Benzo(b)fluoranthene, Benzo(j)fluoranthene and Benzo(k)fluoranthene co-elute you may report these three isomers as total benzofluoranthenes.

7. Chlordane – You may report alpha-chlordane (5103-71-9) and gamma-chlordane (5103-74-2) in place of chlordane (57-74-9). If you report alpha and gamma-chlordane, the DL/PQLs that apply are 0.025/0.050.

8. PCB 1016 & PCB 1242 – You may report these two PCB compounds as one parameter called PCB 1016/1242.