Lake Whatcom Water & Sewer District

Board Meeting Access Information

Next Meeting: Wed January 29, 2025
8:00 a.m.

Meeting Access

Meetings are held in person at our Administrative offices at 1220 Lakeway Drive in Bellingham. If you prefer to attend remotely, access information is below.

Join the meeting from your computer, tablet smartphone:

https://meet.goto.com/lwwsd/boardmeeting

You can also dial in using your phone.

Call: +1 (224) 501-3412 **Access Code:** 596-307-141
*Press *6 to mute/unmute your microphone*

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Attending a Meeting

Lake Whatcom Water & Sewer District's regular Board meetings take place on the second Wednesday of each month at 6:30 pm and the last Wednesday of each month at 8:00 am.

Meetings are open to the public per the Open Public Meetings Act.

All meetings are hybrid, available in person or online. If you wish to observe a meeting, but do not plan to actively participate, you may attend anonymously. Turn off your mic & camera, and change your display name to "Observation Only."

Public Comment Periods

Public comment periods are built in to the agenda, one near the beginning of the meeting and one near the end.	Commissioners will listen, but will not respond or engage in dialogue during the comment period. Direct questions or requests are noted by staff for follow-up.	For the sake of time, and to leave plenty of time for scheduled agenda items, public comments are limited to 3 minutes per person and 45 minutes per comment period.	Comments may be submitted at any time through mail, email, our online contact form, or by phone.

For more information about communicating with the Board of Commissioners, please visit our website!

Questions?

If you have questions about attending an upcoming meeting, please contact Administrative Assistant Rachael Hope at rachael.hope@lwwsd.org or 360-734-9224.

LAKE WHATCOM WATER AND SEWER DISTRICT
1220 Lakeway Drive
Bellingham, WA 98229

REGULAR MEETING OF THE BOARD OF COMMISSIONERS

AGENDA

January 29, 2025
8:00 a.m. – Regular Session

1. CALL TO ORDER

2. ROLL CALL

3. PUBLIC COMMENT OPPORTUNITY
   At this time, members of the public may address the Board of Commissioners. Please state your name and address prior to making comments and limit your comments to three minutes. For the sake of time, each public comment period will be limited to 45 minutes.

4. ADDITIONS, DELETIONS, OR CHANGES TO THE AGENDA

5. CONSENT AGENDA

6. SPECIFIC ITEMS OF BUSINESS
   A. Sudden Valley Water Treatment Plant Chlorine Contact Basin Design Presentation
   B. Resolution No. 900—Lake Whatcom Management Program 2025-2029 Work Plan Adoption
   C. Water Right No. CG1-23449C Status

7. OTHER BUSINESS

8. STAFF REPORTS
   A. General Manager
   B. Engineering Department
   C. Finance Department
   D. Operations Department

9. PUBLIC COMMENT OPPORTUNITY

10. EXECUTIVE SESSION
Executive Session per RCW 42.30.110(1)(g): To review the performance of a public employee (General Manager performance evaluation) – *15 minutes*

11. ADJOURNMENT

AGENDA BILL Item 5	**Consent Agenda**			
DATE SUBMITTED:	January 23, 2025	MEETING DATE:	January 29, 2025	
TO: BOARD OF COMMISSIONERS		FROM: Rachael Hope		
GENERAL MANAGER APPROVAL				
ATTACHED DOCUMENTS		1. See below		
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☒	INFORMATIONAL/OTHER ☐

****TO BE UPDATED 01.28.2025****

BACKGROUND / EXPLANATION OF IMPACT

- Minutes for the January 8, 2025 Regular Board Meeting
- Payroll for Pay Period #02 (01.04.2025 through 01.17.2025) totaling $55,047.69
- Benefits for Pay Period #02 totaling $60,089.87
- Payroll taxes for 4th Quarter 2024 totaling $12,361.10
- Accounts Payable Vouchers total to be added

FISCAL IMPACT

Fiscal impact is as indicated in the payroll/benefits/accounts payable quantities defined above. All costs are within the Board-approved 2025-2026 Budget.

RECOMMENDED BOARD ACTION

Staff recommends the Board approve the Consent Agenda.

PROPOSED MOTION

A recommended motion is:

"I move to approve the Consent Agenda as presented."

1220 Lakeway Dr • Bellingham, WA 98229

REGULAR SESSION OF THE BOARD OF COMMISSIONERS

Minutes

January 8, 2025

Board President Todd Citron called the Regular Session to order at 6:30 p.m.

Attendees:	Commissioner Todd Citron	General Manager Justin Clary
	Commissioner John Carter (v)	Engineering Manager Greg Nicoll
	Commissioner Jeff Knakal (v)	Finance Manager Jenny Signs
	Commissioner David Holland (v)	Operations Manager Jason Dahlstrom
	Recording Secretary Rachael Hope	District Legal Counsel Bob Carmichael

No public were in attendance. Attendees noted with a (v) attended the meeting virtually.

Consent Agenda

Action Taken

Holland moved, Knakal seconded, approval of:

- **Minutes for the December 11, 2024 Special Board Meeting**
- **Payroll for Pay Period #26 (12.07.2024 through 12.20.2024) totaling $49,755.04**
- **Benefits for Pay Period #26 totaling $55,563.04**
- **Accounts Payable Vouchers totaling $104,174.50**
- **Payroll for Pay Period #01 (12.21.2024 through 01.03.2025) totaling $48,841.00**
- **Benefits for Pay Period #01 totaling $56,941.34**
- **Accounts Payable Vouchers totaling $151,108.32**

Motion passed.

Election of Board Officers

Clary recalled that the District operates under the authority of Revised Code of Washington (RCW) Title 57, Water-Sewer Districts, which states in section 57.12.010 that "the board shall annually elect one of its members as president and another as secretary." The District has historically fulfilled this statutory obligation during its first meeting of the calendar year.

Action Taken

Knakal moved, Holland seconded, to appoint Commissioner Citron as District Board president and Commissioner Carter as District Board secretary for the 2025 calendar year. Motion passed.

Appointment of Board Representatives to the District's Investment Committee

Clary further recalled that Chapter 2.14 of the District's administrative code establishes an Investment Committee, which is comprised of the finance manager/treasurer, general manager, and two commissioners.

Duties of the committee include, at a minimum, quarterly review of the District's investment portfolio and rate structure and annual review of the District's investment policy.

Action Taken
Knakal moved, Holland seconded, to appoint Commissioners Holland and Knakal t as the Board's representatives on the District's Investment Committee for the 2025 calendar year. Motion passed.

Appointment of Board Representatives to the Whatcom County Council of Governments & Lake Whatcom Management Program Policy Group

Clary further recalled that the District annually appoints a representative to serve on the Whatcom County Council of Governments and a representative to serve on the Lake Whatcom Management Program Policy Group. Discussion followed.

Action Taken
Holland moved, Carter seconded, to appoint Commissioner Knakal to serve as the District's representative on both the Whatcom County Council of Governments and the Lake Whatcom Management Program Policy Group for the 2025 calendar year. Motion passed.

Board of Commissioners Meeting Date/Time Discussion

In alignment with the District's Administrative Code; the Board of Commissioners meets at 6:30 p.m. on the second Wednesday of each month and at 8:00 a.m. on the last Wednesday of each month. A discussion on the Board's meeting schedule was conducted during the December 11 regular meeting, with a request to further discuss the topic in early 2025. To assist the Board in its discussion, staff provided a table that defines the meeting times and days of boards and councils in the region. Discussion followed, and the Board decided to keep the current meeting schedule in place.

2025 General Manager Initiatives

Clary explained that as a component of the annual performance evaluation process, the general manager provides the Board with a memorandum of accomplishments for the prior year, as well as proposes initiatives beyond the day-to-day operation of the District for the coming year. The 2024 performance report including 2025 initiatives submitted to the Board in October 2024 was provided in the meeting packet, as during the completion of the associated performance evaluation, the Board indicated a desire to discuss the proposed initiatives in early 2025. Discussion followed.

General Manager's Report

Clary updated the Board on several topics, including the District's new Maintenance Worker 1, concrete curing at the Division 7 Reservoir Replacement Project, restoration work of sewer mains crossing Beaver Creek, and the District's continued excellent safety record with no time-loss injuries in 2024. Clary also touched on the recent partnering of the District with CivicPlus in developing a notification system to allow rapid notice to customers regarding various District projects, occurrences, or emergencies. Discussion followed.

With no further business, Citron adjourned the regular session at 7:06 p.m.

_____ Attest: _____

Board President, Todd Citron Recording Secretary, Rachael Hope

Minutes approved by motion at ☐ Regular ☐ Special Board Meeting on _____

CHECK REGISTER

PAYROLL

Lake Whatcom W-S District

Time: 13:59:52 Date: 01/21/2025

01/23/2025 To: 01/23/2025

Trans	Date	Type	Acct #	Chk #	Claimant	Amount	Memo
176	01/23/2025	Payroll	5	EFT		292.98	01/04/2025 - 01/17/2025 PR02
177	01/23/2025	Payroll	5	EFT		292.98	01/04/2025 - 01/17/2025 PR02
178	01/23/2025	Payroll	5	EFT		3,675.38	01/04/2025 - 01/17/2025 PR02
179	01/23/2025	Payroll	5	EFT		3,215.77	01/04/2025 - 01/17/2025 PR02
180	01/23/2025	Payroll	5	EFT		3,897.05	01/04/2025 - 01/17/2025 PR02
181	01/23/2025	Payroll	5	EFT		1,915.39	01/04/2025 - 01/17/2025 PR02
183	01/23/2025	Payroll	5	EFT		2,236.06	01/04/2025 - 01/17/2025 PR02
184	01/23/2025	Payroll	5	EFT		3,492.72	01/04/2025 - 01/17/2025 PR02
185	01/23/2025	Payroll	5	EFT		442.27	01/04/2025 - 01/17/2025 PR02
186	01/23/2025	Payroll	5	EFT		2,684.54	01/04/2025 - 01/17/2025 PR02
187	01/23/2025	Payroll	5	EFT		2,476.63	01/04/2025 - 01/17/2025 PR02
188	01/23/2025	Payroll	5	EFT		439.47	01/04/2025 - 01/17/2025 PR02
189	01/23/2025	Payroll	5	EFT		3,002.94	01/04/2025 - 01/17/2025 PR02
190	01/23/2025	Payroll	5	EFT		2,888.51	01/04/2025 - 01/17/2025 PR02
191	01/23/2025	Payroll	5	EFT		3,356.77	01/04/2025 - 01/17/2025 PR02
192	01/23/2025	Payroll	5	EFT		2,214.37	01/04/2025 - 01/17/2025 PR02
193	01/23/2025	Payroll	5	EFT		1,793.73	01/04/2025 - 01/17/2025 PR02
194	01/23/2025	Payroll	5	EFT		2,849.04	01/04/2025 - 01/17/2025 PR02
195	01/23/2025	Payroll	5	EFT		4,169.19	01/04/2025 - 01/17/2025 PR02
196	01/23/2025	Payroll	5	EFT		3,428.68	01/04/2025 - 01/17/2025 PR02
197	01/23/2025	Payroll	5	EFT		4,441.81	01/04/2025 - 01/17/2025 PR02
182	01/23/2025	Payroll	5	16012		1,841.41	01/04/2025 - 01/17/2025 PR02
		401 Water Fund				15,799.10	
		402 Sewer Fund				39,248.59	
						55,047.69	Payroll: 55,047.69

I do hereby certify, under penalty of perjury, that the above is an unpaid, just, and due obligation as described herein, and that I am authorized to certify this claim.

Sign _____ **Date** 1/22/2025

General Manager, Justin Clary

Board Authorization - The duly elected board for this district has reviewed the claims listed and approved the payment by motion at the meeting listed below:

_____

Board President, Todd Citron

Attest : _____

Recording Secretary, Rachael Hope

Approved by motion at _____ **Regular** ____ **Special Board Meeting on** _____

Date Approved

Trans	Date	Type	Acct #	Chk #	Claimant	Amount	Memo
198	01/23/2025	Payroll	5	EFT	DEPARTMENT OF RETIREMENT SYSTEMS	6,319.50	Pay Cycle(s) 01/23/2025 To 01/23/2025 - DCP; Pay Cycle(s) 01/23/2025 To 01/23/2025 - ROTH DCP
199	01/23/2025	Payroll	5	EFT	UNITED STATES TREASURY	19,645.18	941 Deposit for Pay Cycle(s) 01/23/2025 - 01/23/2025
200	01/23/2025	Payroll	5	EFT	WA ST PUBLIC EMP RET PLAN 2	9,620.20	Pay Cycle(s) 01/23/2025 To 01/23/2025 - PERS 2
201	01/23/2025	Payroll	5	EFT	WA ST PUBLIC EMP RET PLAN 3	3,450.97	Pay Cycle(s) 01/23/2025 To 01/23/2025 - PERS 3
202	01/23/2025	Payroll	5	EFT	WA ST SUPPORT ENFORCEMENT REGISTERY	958.00	Pay Cycle(s) 01/23/2025 To 01/23/2025 - SUP ENF
203	01/23/2025	Payroll	5	16013	AFLAC	315.28	Pay Cycle(s) 01/23/2025 To 01/23/2025 - AFLAC PRE-TAX; Pay Cycle(s) 01/23/2025 To 01/23/2025 - AFLAC POST-TAX
204	01/23/2025	Payroll	5	16014	AFSCME LOCAL	382.80	Pay Cycle(s) 01/23/2025 To 01/23/2025 - UNION DUES; Pay Cycle(s) 01/23/2025 To 01/23/2025 - UNION FUND
205	01/23/2025	Payroll	5	16015	HRA VEBA TRUST (PAYEE)	590.00	Pay Cycle(s) 01/23/2025 To 01/23/2025 - VEBA
206	01/23/2025	Payroll	5	16016	WA ST HEALTH CARE AUTHORITY	18,807.94	Pay Cycle(s) 01/23/2025 To 01/23/2025 - PEBB MEDICAL; Pay Cycle(s) 01/23/2025 To 01/23/2025 - PEBB ADD LTD; Pay Cycle(s) 01/23/2025 To 01/23/2025 - PEBB SMK Surcharge; Pay Cycle(s) 01/23/2025 To 01/23

401 Water Fund	44,579.32			
402 Sewer Fund	15,510.55			
	60,089.87	Payroll:	60,089.87	

Trans	Date	Type	Acct #	Chk #	Claimant	Amount	Memo

I do hereby certify, under penalty of perjury, that the above is an unpaid, just, and due obligation as described herein, and that I am authorized to certify this claim.

Sign _____ **Date** 1/22/2025

General Manager, Justin Clary

Board Authorization - The duly elected board for this district has reviewed the claims listed and approved the payment by motion at the meeting listed below:

_____

Board President, Todd Citron

Attest : _____

Recording Secretary, Rachael Hope

Approved by motion at _____ Regular ____ Special Board Meeting on _____

Date Approved

4th Qtr 2024
Payroll Taxes

CHECK REGISTER

Lake Whatcom W-S District

Time: 08:45:40 Date: 01/22/2025

01/27/2025 To: 01/27/2025

Trans	Date	Type	Acct #	Chk #	Claimant	Amount	Memo
213	01/27/2025	Payroll	5	16017	EMPLOYMENT SECURITY DEPARTMENT	139.89	4th Quarter Unemployment: 10/01/2024 - 12/31/2024
214	01/27/2025	Payroll	5	16018	EMPLOYMENT SECURITY DEPT PAID FAMILY & MEDICAL LEAVE	2,610.33	Pay Cycle(s) 10/03/2024 To 10/03/2024 - PFMLA; Pay Cycle(s) 10/17/2024 To 10/17/2024 - PFMLA; Pay Cycle(s) 10/31/2024 To 10/31/2024 - PFMLA; Pay Cycle(s) 11/14/2024 To 11/14/2024 - PFMLA; Pay Cycle(s)
215	01/27/2025	Payroll	5	16019	EMPLOYMENT SECURITY DEPT. WA CARES FUND	2,674.65	Pay Cycle(s) 10/03/2024 To 10/03/2024 - LTC; Pay Cycle(s) 10/17/2024 To 10/17/2024 - LTC; Pay Cycle(s) 10/31/2024 To 10/31/2024 - LTC; Pay Cycle(s) 11/14/2024 To 11/14/2024 - LTC; Pay Cycle(s) 11/27/2
216	01/27/2025	Payroll	5	16020	WA ST DEPT OF LABOR AND IND	6,936.23	4TH Quarter L&I: 10/01/2024 - 12/31/2024

401 Water Fund	9,830.51		
402 Sewer Fund	2,530.59		
	12,361.10	Payroll:	12,361.10

I do hereby certify, under penalty of perjury, that the above is an unpaid, just, and due obligation as described herein, and that I am authorized to certify this claim.

Sign _____ **Date** 1/22/2025

General Manager, Justin Clary

Board Authorization - The duly elected board for this district has reviewed the claims listed and approved the payment by motion at the meeting listed below:

_____

Board President, Todd Citron

Attest : _____

Recording Secretary, Rachael Hope

Approved by motion at _____ **Regular** ____ **Special Board Meeting on** _____

Date Approved

AGENDA BILL Item 6.A	**Chlorine Contact Basin Replacement Alternative Selection**			
DATE SUBMITTED:	January 22, 2025	MEETING DATE:	January 29, 2025	
TO: BOARD OF COMMISSIONERS		FROM: Greg Nicoll, P.E., District Engineer		
GENERAL MANAGER APPROVAL				
ATTACHED DOCUMENTS		1. DRAFT Chlorine Contact Basin Replacement Project Report		
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☐	INFORMATIONAL /OTHER ☒

BACKGROUND / EXPLANATION OF IMPACT

The District provides potable water to its South Shore water system, which includes the Sudden Valley and Geneva communities, wholly by water treated at its Sudden Valley Water Treatment Plant (SVWTP). The SVWTP was originally constructed as part of the Sudden Valley development in the early 1970s. An essential component of the SVWTP system is the chlorine contact basin (CCB) that was constructed in 1994. The CCB is outfitted with internal baffling that provides filtered water the necessary chlorine contact time, as regulated by the Washington State Department of Health (DOH), for adequate disinfection under current operating flow rates prior to conveyance to the public via the District's water distribution system.

In 2016, BHC Consultants performed a seismic vulnerability assessment of the District's steel reservoirs, including the CCB. The assessment identified structural deficiencies with the CCB that would prohibit the CCB from surviving a significant earthquake. Subsequent assessments of the CCB's treatment capacity were performed by Gray & Osborne, Inc. (G&O) in 2017 and 2020, which recommended construction of a new CCB that can provide sufficient chlorine contact time for full design flow (2.0 million gallons per day [mgd]). As a result, the District identified the need to replace the existing CCB with a new CCB that meets current seismic standards and that is sized to accommodate full design flow of the SVWTP. To assist with funding this project, the District applied for and was awarded a FEMA Hazard Mitigation Grant (HMG), which will fund 87.5% of the estimated project budget that was included in the application ($1,963,000).

Following award of the FEMA HMG, the District selected G&O to design the new CCB. G&O's first task was completion of an alternative analysis of various alternatives for configuration and materials of construction for the new CCB. This alternative analysis, which is further described in the attached draft Project Report, identified a total of

eight material and configuration alternatives, including welded steel, bolted stainless steel, glass panel, and various configurations of concrete. Each alternative was evaluated based on capital cost, life cycle cost, adaptability, redundancy, operational impact, and aesthetics. The two highest scoring alternatives are:

- Alternative 1B: Concrete Rectangular with one train with a capacity of 1,400 gallons per minute (gpm) (capital cost estimate = $3,007,000).
- Alternative 1D: Concrete rectangular with two trains with a combined capacity of 1,400 gpm and a capacity of 700 gpm with one train out of service (capital cost estimate = $3,515,000).

Prior to completion of construction cost estimates, District staff identified Alternative 1D as the preferred alternative due to the added operational flexibility it provides and the attached draft Project Report also identifies Alternative 1D as the preferred alternative. However, upon receipt of the construction cost estimates, District staff determined that the higher capital cost associated with Alternative 1D would put an unmanageable financial burden on the District budget, both short and long term. In light of the anticipated budget implications, District staff is now recommending Alternative 1B as the preferred alternative and, subject to concurrence from the board, the Project Report will be revised to reflect this change.

Alternative 1B will be capable of providing sufficient contact time at a flow rate of 2.0 MGD, which matches the capacity of the rest of the SVWTP. In addition, concrete reservoirs require little to no maintenance that would require taking the basin out of service so it is unlikely that the redundancy provided by Alternative 1D will be required over the 80-100 year expected life of the CCB. Based on a review of the District's budget and 15-year capital improvement plan, at the estimated project cost, Alternative 1B can be constructed within the District's financial capacity using a combination of grants, loans and District funds as further described in the Fiscal Impact section below.

This presentation will provide discussion of the alternatives considered, the analysis completed and the recommended alternatives. The financial impact of the project and next steps will also be further discussed during the board meeting.

FISCAL IMPACT

The project budget included in the FEMA Hazard Mitigation Grant application, which was prepared and submitted in 2021, is $1,963,000. The estimated project cost for the preferred alternative included in the attached draft Project Report is $3,007,000.

The project budget included in the grant application was developed based on estimates prepared in 2021, prior to unprecedented escalation of construction costs that resulted in an increase of approximately 30% over a two-year period. The estimate was also completed prior to alternative analysis and evaluation of life cycle costs and was based on construction of a new welded steel reservoir, which has a lower capital cost than the preferred rectangular concrete alternative. However, as

discussed further in the project report, a welded steel reservoir has a much higher life cycle cost than concrete due to a shorter design life and the need to periodically take the reservoir out of service for recoating.

There is an approximate $1,000,000 funding gap between the estimated project cost and available grants and budgeted District funds. To fill this gap, District staff has requested additional grant funds from FEMA and Washington State Emergency Management Department. However, it is uncertain if or when additional grant funds may become available. In light of that funding uncertainty, District staff has further evaluated the District's water system budget and the 15-year capital improvement plan, and determined that the project can be funded with current grant funds, additional loans and District funds while maintaining a manageable debt service ratio and the needed operating reserves over the 15-year planning horizon. The proposed funding scenario is provided in Table 1 below.

TABLE 1
Project Funding

Funding Source	Current Budget		Proposed Budget	
	Percent	Amount	Percent	Amount
FEMA HM Grant	75%	$1,472,250	48.9%	$1,472,250
WA EMD HM Grant Match	12.5%	$245,375	8.2%	$245,375
Loan	0%	$0	33.3%	$1,000,000
District Funds	12.5%	$245,375	9.6%	$289,375
Total	$1,963,000		$3,007,000	
Estimated Project Cost	$3,007,000			
Balance	($1,044,000)		$0	

If the proposed funding scenario is amenable to the Board, District staff will identify alternatives for loans and will prepare an amendment to the 2025-2026 Budget and present to the Board for approval at a future meeting.

APPLICABLE EFFECTIVE UTILITY MANAGEMENT ATTRIBUTE(S)
Product Quality
Enterprise Resiliency
Infrastructure Strategy and Performance
Operational Optimization
Financial Viability

RECOMMENDED BOARD ACTION
No action is recommended at this time. However, staff requests concurrence from the Board to proceed with design of the recommended alternative.

PROPOSED MOTION
Not applicable.

LAKE WHATCOM WATER AND SEWER DISTRICT

WHATCOM COUNTY **WASHINGTON**

CHLORINE CONTACT BASIN REPLACEMENT PROJECT REPORT

G&O #24487
JANUARY 2025

Gray & Osborne, Inc.
CONSULTING ENGINEERS

LAKE WHATCOM WATER AND SEWER DISTRICT

WHATCOM COUNTY **WASHINGTON**

CHLORINE CONTACT BASIN REPLACEMENT PROJECT REPORT

G&O #24487
JANUARY 2025

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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CHAPTER 1

INTRODUCTION

INTRODUCTION AND PURPOSE

The Lake Whatcom Water and Sewer District contracted with Gray & Osborne (G&O) in May of 2024 to provide predesign consulting services for their Sudden Valley Water Treatment Plant Chlorine Contact Basin Replacement Project.

The existing SVWTP was originally constructed in 1972 and has undergone several upgrades since that time. The SVWTP is a rapid rate direct filtration facility and utilizes a welded steel reservoir to provide chlorine contact time for treated water prior to entry in to the distribution system. Currently, the SVWTP does not maintain chlorine contact redundancy, and has noted that the existing coating system on the CCB is in fair/poor condition. Furthermore, the existing CCB does not meet current seismic design or reliability standards. To address these issues, the District applied for, and has received funding through the Federal Emergency Management Agency (FEMA) to design and construct a new, replacement CCB. The project to replace the existing CCB has been divided up into three phases: Predesign, Design, and Construction Management.

As part of the Predesign phase, this report is intended to fulfill the requirements of Washington Administrative Code (WAC) 246-290-110 for a Project Report and provides information on the project, describes and analyzes various project alternatives, and provides preliminary design criteria for design and construction of the new CCB. The report is generally outlined as follows:

- Chapter 2 includes a description of background information, the existing facilities, and a summary of previous work and analysis.
- Chapter 3 provides more information on planning considerations for the Project, including existing facility analysis and projections, and regulatory/permitting considerations.
- Chapter 4 includes a description of design alternatives and recommendations for the proposed design.
- Chapter 5 provides a summary of design considerations and various project parameters critical for project success.

CHAPTER 2

PROJECT BACKGROUND

INTRODUCTION

The Lake Whatcom Water & Sewer District (District) owns and maintains public water and sewer systems that serve residential and commercial customers in Whatcom County, Washington. One of these systems maintained by the District is the South Shore Water System. The South Shore system is a Group A water system with a green operating permit (Washington State Department of Health (DOH) Water System ID 959101) that serves approximately 11,000 customers (approximately 3,984 calculated connections).

As part of the South Shore Water System, the District owns and operates the Sudden Valley Water Treatment Plant (SVWTP), which treats water from Lake Whatcom via rapid rate direct filtration technology. This WTP provides service to the Sudden Valley and Geneva areas, both of which are within the South Shore Water System.

In 2017, Gray & Osborne, Inc. (G&O) performed a tracer study at the SVWTP to confirm the chlorine contact time parameters assumed by the District in their disinfection calculations required by DOH. Through this study, G&O identified that some of the assumed parameters were no longer correct for the current hydraulic flow regime within the CCB. Furthermore, the District concluded that they lacked sufficient redundancy for the CCB should the tank ever need to be taken offline for maintenance.

In 2016, BHC Consultants performed a seismic evaluation of the CCB. Through this analysis, they identified several deficiencies requiring significant modifications to bring the CCB up to current seismic design standards.

In 2019, G&O conducted a condition assessment of all treatment components at the SVWTP, including the CCB. Through this investigation G&O determined that the coating system on the CCB was in poor condition and, in some areas, had already failed. Furthermore, the basin lacked alarm redundancy and suitable security features.

Between 2019 – 2022, G&O completed an alternatives analysis report that analyzed each treatment component in use at the SVWTP including the CCB. Through this analysis, G&O identified alternatives for providing the required chlorine contact time while also addressing the reliability, redundancy, coating, and seismic deficiencies of the existing basin.

To address these deficiencies, the District considered two separate alternatives: rehabilitate the existing CCB or replace the basin with a new, larger tank. Ultimately, the District elected to proceed with design and construction of a new CCB because of the lower life cycle cost and added value a new tank would provide when compared to

rehabilitation of an existing tank. A new tank would also improve the system's resiliency. After this decision was made, the District investigated potential options and funding sources for replacement of the CCB. In 2023, the District was awarded a Hazard Mitigation Grant through the Federal Emergency Management Agency (FEMA) which provides funds for predesign, design, and construction services to replace the existing CCB with a new, larger tank.

EXISTING FACILITIES

WATER TREATMENT PLANT

The existing WTP is a rapid-rate, direct filtration plant with a rated capacity of 2.0 million gallons per day (mgd) but currently operates at approximately 1.0 mgd (700 gpm). The WTP is housed in a partially below grade concrete building located at 25 Morning Beach Drive in Bellingham, Washington approximately 1 mile northeast of the intersection of Lake Whatcom Boulevard and Marigold Drive. The facility was constructed in 1972 and has undergone several improvement projects since that time, and was most recently upgraded in 1992. The WTP provides coagulation, flocculation, filtration, disinfection, and chlorine contact time before treated water is pumped to the distribution system and storage reservoirs. Figure 2-1 provides a process flow diagram for the treatment process, and each of the individual components of the treatment process is briefly described below. The existing WTP site plan, piping plan, and topography are shown in Figures 2-2 and 2-3.

- Raw Water Intake
    - Withdraws water from Lake Whatcom.
    - Approximately 300 feet from shoreline. Anchored at a depth of approximately 70 feet below the water surface.
- Raw Water Pumps
    - Two 20-hp centrifugal pumps (1,400 gpm @ 25 feet TDH).
    - VFD motor starters.
- Flocculation
    - 9,000-gallon welded steel tank with three interior baffle plates (under-over-under).

LAKE WHATCOM

pH, TEMPERATURE, ZETA POTENTIAL, TURBIDITY

RAW WATER FLOW METER

FM

COAGULANT (ALUM)

STATIC MIXER

FLOCCULATION TANK

CHLORINE

WTP BUILDING

RAW WATER PUMPS 1 & 2

FILTER 1

FILTER 2

FILTER 3

FILTER 4

CHLORINE

TURBIDITY

FILTER DISTRIBUTION BOX

SODA ASH

CLEARWELL

CLEARWELL PUMPS 1 & 2

pH, TEMPERATURE, TURBIDITY

BACKWASH SUPPLY

TO MORNING BEACH LIFT STATION

BACKWASH BASIN

BACKWASH PUMPS 1 & 2

TO DIVISION 22 RESERVOIR

TO DIVISION 7 RESERVOIR

pH TEMPERATURE TURBIDITY CHLORINE

DISTRIBUTION SYSTEM

FINISHED WATER PUMP HOUSE

DIVISION 22 FINISHED WATER PUMPS

DIVISION 7 FINISHED WATER PUMPS

CHLORINE CONTACT BASIN (CCB)

0 1"

ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

LAKE WHATCOM WATER AND SEWER DISTRICT

CHLORINE CONTACT BASIN REPLACEMENT PROJECT REPORT

FIGURE 2-1

EXISTING SUDDEN VALLEY WTP PROCESS FLOW DIAGRAM

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Lake Whatcom Water and Sewer District\24487.00 SVWTP Chlorine Contact Basin Improvements\01 Design\Planset\General\PROCESS FLOW.dwg, 1/3/2025 11:50 AM, BERNIE HAYDEN

L:\Lake Whatcom Water and Sewer District\624487.00 SVWTP Chlorine Contact Basin Improvements\01 Design\Planset\Civil\PRO_SITE_P.dwg, 1/3/2025 11:50 AM, BERNIE HAYDEN

TO MORNING BEACH LIFT STATION

EX. 48" Ø MH NO. 1028
RIM=320.76
IE=319.40 10" PVC E
IE=320.34 10" PVC S
IE=319.40 10" PVC W

EX. 48" Ø MH NO. 1282
RIM=321.61
IE=309.16 10" PVC E
IE=308.91 10" PVC W

ASPHALT SURFACING, TYP.

GRAVEL SURFACING, TYP.

GRASS SURFACING, TYP.

EX. 48" Ø MH NO. 1244
RIM=324.13
IE=311.23 8" PVC E
IE=311.48 6" HDPE S
IE=311.13 10" PVC W

EX. 48" Ø MH NO. 1243
RIM=322.67
IE=314.82 8" PVC W

FROM LAKE WHATCOM SOURCE

CONCRETE SURFACING, TYP.

DIVISION 22 METERING VAULT

FINISHED WATER PUMP BUILDING

DIESEL TANK

RETAINING WALL

EVERGREEN TREE, TYP.

DECIDUOUS TREE, TYP.

CHLORINE CONTACT BASIN (CCB)

EX. 48" Ø MH NO. 1310
RIM=325.89
IE=320.19 10" PVC SW

BACKWASH STORAGE BASINS

EX. 48" Ø MH NO. 1298
RIM=326.57
IE=328.66 8" PVC S
IE=315.27 10" PVC NE

DIVISION 7 METERING VAULT

UNDERGROUND SVWTP

TO DIVISION 7 RESERVOIR

60'

40'

40' 20' 0 40' 80'
SCALE: 1"=40'

0 1"
ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

LAKE WHATCOM WATER AND SEWER DISTRICT

CHLORINE CONTACT BASIN REPLACEMENT PROJECT REPORT

FIGURE 2-2

EXISTING SUDDEN VALLEY WTP SITE & PIPING PLAN

Gray & Osborne, Inc.
CONSULTING ENGINEERS

ASPHALT SURFACING, TYP.

GRAVEL SURFACING, TYP.

GRASS SURFACING, TYP.

CONCRETE SURFACING, TYP.

FINISHED WATER PUMP BUILDING

DIESEL TANK

CHLORINE CONTACT BASIN (CCB)

UNDERGROUND SVWTP

RETAINING WALL

EVERGREEN TREE, TYP.

DECIDUOUS TREE, TYP.

BACKWASH STORAGE BASINS

40' 20' 0 40' 80'

SCALE: 1"=40'

0 1"

ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

LAKE WHATCOM WATER AND SEWER DISTRICT

CHLORINE CONTACT BASIN REPLACEMENT PROJECT REPORT

FIGURE 2-3

EXISTING SUDDEN VALLEY WTP SITE & TOPOGRAPHY PLAN

Gray & Osborne, Inc.
CONSULTING ENGINEERS

L:\Lake Whatcom Water and Sewer District\24487.00 SVWTP Chlorine Contact Basin Improvements\01 Design\Planset\Civil\PRO_SITE_P.dwg, 1/3/2025 11:50 AM, BERNIE HAYDEN

- Rapid Rate Filter Units
    - Two units, each with two filters (four filters total).
    - Surface area of 63 sf each unit, and rated for up to 6 gpm/sf.
- Clearwell
    - 20,520-gallon concrete basin located below the main floor of the SVWTP.
- Clearwell Pumps
    - Two 20-hp vertical turbine pumps (1,400 gpm @ 43 feet TDH).
    - Controlled via water level within the clearwell as measured by a pressure transducer.
    - Full Voltage Non-Reversing (FVNR) motor starters.
- Chorine Contact Basin
    - See full description and discussion below.
- Finished Water Pumps
    - Two 100-hp centrifugal pumps (700 gpm @ 445 feet TDH) pump from CCB to Division 7 Reservoir.
        - Current pump flow capacity is 800 gpm; however, future modifications will reduce the capacity to 700 gpm, as shown.
    - Two 150-hp centrifugal pumps (700 gpm @ 608 feet TDH) pump from CCB to Division 22 Reservoirs.
    - Controlled via pressure transducers within the respective Division 7 and Division 22 reservoirs.
    - Soft-start motor starters.

In general, all of the treatment facilities components are in good or fair condition.

Auxiliary power to the facility is provided by a diesel generator located within the Finished Water Pump Building (FWPB). The generator is fed from a fuel tank located immediately south of the FWPB. The fuel tank is sized to provide full SVWTP operation for up to 96 hours. The generator is rated for 450-kW output and is sized to operate the SVWTP in the event electrical service is interrupted. The generator is also sized to operate the Afternoon Beach Sewer Pump Station, which is located approximately 300 feet west of the FWPB.

The existing WTP facility is not secured with fencing and access to the facility is not

controlled or restricted, primarily because the SVWTP and FWPB share a parking lot with Morning Beach Park. Additionally, the FWPB structure includes two restrooms on the west end of the building that are public restrooms and serve park visitors. Access to the water treatment areas of the SVWTP and FWPB require keyed entry and all doors to District facilities are outfitted with intrusion switches. The CCB access ladder is outfitted with a ladder panel which restricts access to the CCB. Lastly, the diesel generator fuel tank is surrounded by 6-foot tall wood fencing. The District recently replaced the existing glass storefront on the WTP Building with a heavy duty coiling door to provide additional security and provide greater access to the main floor of the structure.

Typically, the SVWTP operates for 10 to 12 hours per day. Operations staff visit the SVWTP daily to initiate operation, supervise treatment operations, perform maintenance, and monitor water quality parameters. The filters are typically backwashed once per day during summer months, but can require two backwash cycles per day during seasonal lake mixing that occurs in the winter when raw water turbidity is higher. Filter backwash water flows by gravity to the backwash setting basin and then is pumped to the Afternoon Beach Sewer Pump Station. From here, the backwash water is pumped to a manhole near the intersection of Morning Beach Drive and Barnview Drive where it enters the District's gravity conveyance system. The wastewater is then pumped to the City of Bellingham's Wastewater Treatment Plant for treatment via several lift stations within the conveyance system.

EXISTING CHLORINE CONTACT BASIN

The WTP utilizes the CCB to provide chlorine contact time to achieve disinfection requirements for filtered water prior to introduction to the distribution system. Design information for the CCB is provided in Table 2-1.

TABLE 2-1

Existing CCB Tank Summary

Parameter	Value
Type	Circular, Welded Steel
Year Built	1994
Diameter (feet)	40
Base Elevation (feet)	336.0
Overflow Elevation (feet)	360.0
Volume (gallons)	225,000
Gallons per foot	9,400
Inlet and Outlet Configuration	Vertical, 10-inch perforated riser
Baffle Configuration	Three, Steel Plate
Access	2 – 36" manway (at grade) 1 – 24" access hatch (roof)
Minimum Water Height (feet)	16.5(1)
Residence Time (minutes)	320(2)

(1) As directed by DOH to provide minimum desired CT for finished water. Current minimum water level setpoint is 17.9 feet.
(2) Calculated at typical operational flow of 700 gpm.

Water enters the CCB via a diffuser riser at one end and flows in a serpentine fashion between three steel baffles to the outlet diffuser. The inlet diffuser consists of a 10-inch diameter PVC pipe with 25 2-inch diameter holes drilled at 9.25 inches on center. The outlet diffuser riser consists of a 10-inch diameter PVC pipe with fifty 2-inch diameter holes drilled at 9.25 inches on center. These risers act to promote consistent flow throughout the full depth of the water column from the inlet to the outlet. The CCB has both exterior and interior coatings. The CCB is inspected every 5 years and was most recently inspected in 2024.

The CCB utilizes two pressure switches (one duty, one redundant) for high-level alarm indication within the tank. The switch communicates the alarm signal to the WTP programmable logic controller (PLC) which relays the alarm to WTP staff via the District's Supervisory Control and Data Acquisition (SCADA) system.

There are three primary concerns with the existing CCB structure. First is the condition of the existing structure and coating system. In 2020, the coating system was investigated as part of the SVWTP WTP Assessment Project. Through this investigation, the exterior coatings were found to be in poor condition, and in some areas of the roof, have failed. The interior coatings were determined to be in fair condition with evidence of mild to significant corrosion present. Second, according to a structural investigation completed by BHC Consultants in 2016, the CCB was found to be seismically deficient in two critical design parameters. The District's third concern is regarding redundancy. If the CCB were to fail, or must be taken offline for extended periods of time for

maintenance (e.g., seismic and/or coating upgrades), there are currently no contingency plans for how the District would maintain sufficient CT or water quality for water delivered to the distribution system. Methods do exist for providing temporary CT during this period, but they are cumbersome, extremely expensive, and would be difficult to design and coordinate given the existing hydraulics at the SVWTP.

PREVIOUS WORK

SVWTP TRACER STUDY

In 2017, G&O performed a tracer study at the SVWTP to confirm the chlorine contact time parameters assumed by the District in their disinfection calculations required by DOH. Through this study, G&O identified that some of the assumed parameters were no longer correct for the current hydraulic flow regime within the CCB. Furthermore, the District concluded that they lacked sufficient redundancy for the CCB should the tank ever need to be taken offline for maintenance. Findings from this study are provided in the *Lake Whatcom Water & Sewer District (PWS 959101) – South Shore Water Treatment Plant Disinfection Contact Time Tracer Study Report* by Gray & Osborne in November 2016.

SVWTP SEISMIC ANALYSIS

In December 2016, a seismic evaluation of the WTP Reservoir was performed by BHC Consultants (*Lake Whatcom Water and Sewer District Reservoir Seismic Vulnerability Assessment Technical Report*). Two deficiencies were identified, including inadequate uplift resistance of the foundation and lack of piping flexibility. The retrofit recommended in the report to address the foundation uplift deficiency is to construct a widened foundation ring wall.

SVWTP ALTERNATIVES ANALYSIS

In late 2019, the District contracted with G&O to complete a condition assessment and alternatives analysis for the existing SVWTP. The project included a physical condition assessment of the structural, mechanical, electrical, and process equipment at the plant, and identified both short- and long-term alternatives for SVWTP modifications. As part of this project, G&O authored nine separate technical memoranda analyzing various systems in operation at the SVWTP. These memoranda covered the following topics:

- TM20434-1, Existing Pump Performance Assessment
- TM20434-2, Chlorine Contact Basin Coating Assessment
- TM20434-3, Tier 2/3 Seismic Evaluation
- TM20434-4, Chemical Systems Analysis
- TM20434-5, Filtration Systems Analysis
- TM20434-6, Disinfection System Analysis
- TM20434-7, Backwash System Analysis

- TM20434-8, Structural & Architectural Systems Analysis
- TM20434-9, Equipment Risk Assessment

These memoranda, in conjunction with the physical assessment report (*SVWTP Condition Assessment Report, Gray & Osborne, July 20*20), were combined to develop three large-scale alternatives for modifications at the SVWTP ranging from minor maintenance improvements to full-scale replacement. These three alternatives were described and analyzed in the *SVWTP Alternatives Analysis Report*, completed by G&O in September 2022.

SVWTP CONDITION ASSESSMENT

In 2020, the District contracted with G&O to conduct a thorough condition assessment of the SVWTP and associated facilities. This assessment included an on-site investigation of the process, electrical, architectural, civil, and structural components of the buildings, and provided recommendations (both high and medium priority) that will improve facility operation and extend the lifetime of the facility. Both the field observations and recommendations were summarized in the *Sudden Valley Water Treatment Plant Assessment Report* by Gray & Osborne in July, 2020.

For the existing CCB, the assessment noted the following:

- The interior coating system is in fair condition, but should be replaced between 2025-2030 (5 to 10 years from date of publication). As part of this recoating process, the interior wall and roof members should be seal welded to minimize corrosion in areas difficult to coat, and the entire structure should be stripe-coated prior to coating.

- The exterior coating system is in fair/poor condition and should be replaced between 2025-2030 (5 to 10 years from date of publication).

- The existing roof vent should be replaced to address corrosion.

- An additional roof top access hatch should be installed to provide an additional access/inspection point.

- Security improvements such as removing the existing ladder guards, installing padlock covers, and installing additional tamperproof components should be completed.

- Seismic deficiencies with the tank should be addressed.

CHAPTER 3

PLANNING CONSIDERATIONS

INTRODUCTION

WAC 246-290-110 for a project report stipulates that the historical and projected demands must be analyzed to ensure that the proposed system can accommodate both current and projected loads and demands. This chapter provides an analysis of the historical and projected demands, and also discusses regulatory and permitting issues associated with the project.

HISTORICAL AND PROJECTED SYSTEM DEMANDS

Water system demands were fully investigated as part of the District's Water System Comprehensive Plan (WCP) completed by Wilson Engineering in 2018 and the Water Use Efficiency Plan by Wilson Engineering (November 2021). The historical and projected water system demands noted in the WCP do not impact the proposed project because the capacity of the proposed modifications will be limited to the rated treatment capacity of the SVWTP. The WCP identified that the projected combined maximum day demand for the Sudden Valley & Geneva water systems is 1,215,500 gallons per day (gpd), while the rated treatment capacity for the SVWTP is 2,016,000 gpd (1,400 gpm).

SOURCE CAPACITY

Source capacity is addressed within the WCP. This project will not impact the capacity of the District's existing source(s).

WATER RIGHTS

The District currently maintains surface water rights for Lake Whatcom with an instantaneous withdrawal limit of 3.4 cfs (1,528 gpm). Given that the instantaneous treatment capacity of the SVWTP is 1,400 gpm, the District's existing instantaneous water right is adequate for the planning period.

The District currently maintains surface water rights for Lake Whatcom with an annual withdrawal limit of 1,800 acre-feet per year (586,532,000 gallons per year). If we estimate that the SVWTP operates at 1,400 gpm for 12 hours per day each day of the year – a value that is extremely conservative – this will result in an annual withdrawal of 367,920,000 gallons per year. This value is below the District's annual withdrawal water right, and as such, the District's existing water right is adequate for the planning period.

As described in the District's most recent WSP, the District recently completed a water rights self-assessment, and determined that the existing permitted and certificated water rights it holds are sufficient for the current twenty year planning period.

REGULATORY CONSIDERATIONS

As with any project that affects the equipment used to provide potable water to a municipal water system, regulatory and permitting concerns must be addressed. The section below summarizes the regulatory efforts needed to complete the proposed project. Additional design/construction permitting issues and concerns are discussed in Chapter 5.

WASHINGTON STATE DEPARTMENT OF HEALTH

Per WAC 246-290-110, a Project Report must be submitted to the Washington State Department of Health (DOH) for any modification or addition to a water system. This report is intended to fulfill the requirements of WAC 246-290-110.

CONSTRUCTION DOCUMENTS

Per WAC 246-290-120, Construction Documents must be submitted to DOH for review and approval prior to constructing modifications or additions to a water system. Plans and specifications will be submitted prior to beginning construction of the project.

When approved by DOH, construction documents (Plans, Specifications, Forms, etc.) will be advertised publicly via a public forum for bidding by responsive, responsible contractors. If awarded, the project will then be constructed as shown on these Plans and as defined by the Contract Specifications.

Upon completion of the Project, the District or their representative must submit a Project Completion Form for DOH review and filing.

STATE ENVIRONMENTAL POLICY ACT (SEPA)

Per RCW 43.21C and WAC 197-111, all government agencies must consider the environmental impacts of a proposed project. The District has elected to act as lead agency for the SEPA review and notification process. A SEPA checklist and supporting documentation have been prepared for this project and are included in Appendix A. Additional SEPA documentation will be provided as required by the associated permitting agencies, and may include site plans and stormwater modification plans.

PERMITTING

Permitting is discussed in Chapter 5.

CHAPTER 4

PROJECT ALTERNATIVES

INTRODUCTION

This chapter provides information on critical design elements and alternatives considered for the project. Also, in order to ensure that the District optimizes the value for completed improvements, and that the improvements will serve the District's short- and long-term needs, this chapter also provides information on alternatives that were considered for specific components of the project.

RESERVOIR SIZING ANALYSIS

EXISTING CT DESCRIPTION

Surface water systems in Washington must provide a minimum level of CT to protect water quality and ensure disinfection of treated water. CT is a term that describes the level of disinfection and is equal to the product of the chlorine residual (C) and the residence time (T) within the contact basin. The residence time is a function of the flow through the basin, minimum volume of water within the contact basin, and the baffling efficiency (BE) of the basin. The CT provided by a WTP based on the factors above is then compared to the CT that is required. The CT required for disinfection is based on the temperature of the water, its pH, and the chlorine dose rate. In general, as water temperature decreases, or as pH increases for a constant chlorine dose, additional CT is required. For compliance with Washington State Department of Health regulations, the ratio of the CT provided to the CT required – referred to as the Inactivation Ratio (IR) – must be more than 1.0 at all times on all days during WTP operation.

As noted above, Gray & Osborne previously conducted a formal CT disinfection tracer study on the District's CCB. Prior to conducting the tracer study, the District utilized a BE for the CCB of 0.7 which is a typical value assumed for baffled tanks. However, empirical data collected during the tracer study showed an average BE value of 0.35.

The data analysis and recommendations report for the tracer study conducted on the CCB at the WTP in 2017 recommended that the District utilize a revised BE of 0.3, which is less than the previously used value of 0.7. The report also recommended that the District consider modifying their CT calculation to include unused clearwell volume, maintain a minimum volume of water in the CCB, and increase the target chlorine residual during the cold winter months. As a result of the tracer study, WTP staff made several operational changes in order to ensure that they consistently provide suitable disinfection of treated water leaving the WTP. These changes included maintaining a consistent flow through the plant of 700 gpm and increasing the target chlorine residual dose from 0.6 to 0.8 mg/L.

Since 2017, the WTP staff have made additional changes to help ensure they are meeting disinfection requirements. These changes include further increasing the target chlorine residual to 1.5 mg/L, and calculating the residence time through the CCB using a flow of 900 gpm. This higher flow was determined by DOH to be more representative of the maximum flows through the CCB upon startup of either set of finished water pumps. At this chlorine residual target, the District's most recent annual cost for purchase of chlorine was approximately $23,000 for 2023-2024 (October through October).

Table 4-1 provides a summary of the theoretical CT provided by the CCB for a range of flows and water depths after the most recent changes described above were enacted. The table shows that for the full range of potential flows through the WTP, the current BE of 0.3, and the current chlorine concentration of 1.5 mg/L, the SVWTP provides adequate disinfection for flows below approximately 1,300 gpm at water volumes above the minimum value as directed by DOH (17.9 feet). The IR values below match well with recent water treatment summary reports provided by WTP staff.

For flows above approximately 1,300 gpm, the IR appears to drop below 1.0, which indicates that the CT provided by the WTP is lower than the required value. In practice, this condition does not occur because the maximum operating flow for the WTP is limited to 1,000 gpm by staff - even during summer periods when demand for water is highest. it is important to note that the Sudden Valley WTP does not have any recent IR violations.

TABLE 4-1

Existing CCB CT Summary

Flow (gpm)	Water Depth (ft)	Water Volume (gallons)	Baffling Efficiency, BE	Contact Time, T (min)[(1)]	Chlorine Residual (mg/L)	CT Provided	CT Required[(2)]	Inactivation Ratio[(3)]
500	17.9	168,250	0.3	101.0	1.5	151.4	60	2.52
700	17.9	168,250	0.3	72.1	1.5	108.2	60	1.80
900	17.9	168,250	0.3	56.1	1.5	84.1	60	1.40
1,000	17.9	168,250	0.3	50.5	1.5	75.7	60	1.26
1,200	17.9	168,250	0.3	42.1	1.5	63.1	60	1.05
1,400	17.9	168,250	0.3	36.1	1.5	54.1	60	0.90
500	21.8	204,900	0.3	122.9	1.5	184.4	60	3.07
700	21.8	204,900	0.3	87.8	1.5	131.7	60	2.20
900	21.8	204,900	0.3	68.3	1.5	102.5	60	1.71
1,000	21.8	204,900	0.3	61.5	1.5	92.2	60	1.54
1,200	21.8	204,900	0.3	51.2	1.5	76.8	60	1.28
1,400	21.8	204,900	0.3	43.9	1.5	65.9	60	1.10

(1) Calculated as water volume/flow rate.

(2) From published tables as well as well as historical WTP Monthly Summary Report Forms. Historically, the CT required for the SVWTP ranges from 50 to 60. A value of 60 is used within this report to account for the CT required during cold winter months.

(3) Calculated as CT Provided / CT Required and must be greater than 1 for compliance.

CT ANALYSIS

To determine the optimal size for the proposed tank, a CT sensitivity analysis was completed. The first step in this analysis was to calculate the volume of the tank required to provide a range of IR values over the range of anticipated flows for both circular and rectangular basins.

The primary difference between circular and rectangular basins is the baffling efficiency. Higher baffling efficiencies are typically achievable with baffled rectangular basins because of their higher length/width ratio, length/depth ratio, and cross sectional velocities through the interior channels and the uniformity that can be achieved in baffling rectangular tanks. Previous work from Gray & Osborne and DOH have identified that these parameters correlate well with determining the estimated baffling efficiency, and that higher values (especially cross sectional velocities) lead to better baffling efficiencies.

Table 4-2 summarizes this analysis for both basin shapes.

TABLE 4-2

Proposed Tank Volume Analysis

Inactivation Ratio	CT Required	CT Provided	Chlorine Residual (mg/L)	Contact Time Required (min)	Baffling Efficiency, BE	Flow (gpm)	CT (Water) Volume Required (gal)[(1)]
Circular Basin							
1.00	60	60	0.7	86	0.3	700	200,000
1.25	60	75	0.7	107	0.3	700	250,000
1.50	60	90	0.7	129	0.3	700	300,000
1.75	60	105	0.7	150	0.3	700	350,000
2.00	60	120	0.7	171	0.3	700	400,000
1.00	60	60	0.7	86	0.3	1,000	285,700
1.25	60	75	0.7	107	0.3	1,000	357,100
1.50	60	90	0.7	129	0.3	1,000	428,600
1.75	60	105	0.7	150	0.3	1,000	500,000
2.00	60	120	0.7	171	0.3	1,000	571,400
1.00	60	60	0.7	86	0.3	1,400	400,000
1.25	60	75	0.7	107	0.3	1,400	500,000
1.50	60	90	0.7	129	0.3	1,400	600,000
1.75	60	105	0.7	150	0.3	1,400	700,000
2.00	60	120	0.7	171	0.3	1,400	800,000

TABLE 4-2 – (continued)

Proposed Tank Volume Analysis

Inactivation Ratio	CT Required	CT Provided	Chlorine Residual (mg/L)	Contact Time Required (min)	Baffling Efficiency, BE	Flow (gpm)	CT (Water) Volume Required (gal)[(1)]
Rectangular Basin							
1.00	60	60	0.7	86	0.7	700	85,714
1.25	60	75	0.7	107	0.7	700	107,143
1.50	60	90	0.7	129	0.7	700	128,571
1.75	60	105	0.7	150	0.7	700	150,000
2.00	60	120	0.7	171	0.7	700	171,429
1.00	60	60	0.7	86	0.7	1,000	122,449
1.25	60	75	0.7	107	0.7	1,000	153,061
1.50	60	90	0.7	129	0.7	1,000	183,673
1.75	60	105	0.7	150	0.7	1,000	214,286
2.00	60	120	0.7	171	0.7	1,000	244,898
1.00	60	60	0.7	86	0.7	1,400	171,429
1.25	60	75	0.7	107	0.7	1,400	214,286
1.50	60	90	0.7	129	0.7	1,400	257,143
1.75	60	105	0.7	150	0.7	1,400	300,000
2.00	60	120	0.7	171	0.7	1,400	342,857

(1) CT volume is the volume of water that must be maintained in the tank during WTP operations.

For this analysis, we assumed a range of IR values between 1.0 (minimum) and 2.0 (more conservative) to calculate the CT that must be provided by the tank. Next, assuming a chlorine residual of 0.7, which matches the original concentration of chlorine prior to the tracer study, is the desired level of chorine to optimize water aesthetics with disinfection safety, and closely matches the residual of a majority of water systems across Washington State, we calculated the contact time that would be required to achieve the desired CT. Lastly, this value was used with the estimated baffling efficiency and a range of operational flows for the WTP to calculate the volume of water that would be required. The range of flows selected spans the current maximum operating flow (700 gpm) up to the maximum rated capacity for the WTP (1,400 gpm). The baffling efficiency was assumed based on published values assigned to baffled tanks with different footprints, as well as our experience with conducting tracer studies at 32 surface water treatment plants in Washington State from 2016 to 2019. As a results of this study, we found that a baffling efficiency of 0.3 to 0.4 is typical for baffled circular basins similar to the SVWTP's existing CCB, and that baffling efficiencies of 0.6 to 0.7 are achievable for rectangular, baffled basins.

The data in Table 4-2 show that for circular basins, the CT (water) volume required to provide disinfection in the range of flows and for the range of IR values is between 200,000 and 800,000 gallons. For rectangular basins, the range of CT (water) volumes drops to 86,000 to 343,000.

More specifically, the optimal volume, which provides the best combination of maximum disinfection (IR greater than 1), minimal operational cost for chlorine, minimal risk (IR values between 1.25 to 1.50), and minimal size is between 300,000 to 500,000 gallons for circular basins and 150,000 to 250,000 gallons for rectangular basins. Table 4-3 provides a more specific analysis for tanks within this size range, and any adjustments needed to the chlorine residual to meet the target IR.

TABLE 4-3

Proposed Tank Volume Analysis Summary

Flow (gpm)	CT (Water) Volume (gal)	Baffling Efficiency, BE	Contact Time, T (min)	Chlorine Residual (mg/L)	CT Provided	CT Required	Inactivation Ratio
Circular Basin							
700	300,000	0.3	128.6	0.7	90.0	60	1.50
1,000	300,000	0.3	90.0	0.7	63.0	60	1.05
1,400	300,000	0.3	64.3	1.0	64.3	60	1.07
700	350,000	0.3	150.0	0.7	105.0	60	1.75
1,000	350,000	0.3	105.0	0.7	73.5	60	1.23
1,400	350,000	0.3	75.0	0.8	60.0	60	1.00
700	400,000	0.3	171.4	0.7	120.0	60	2.00
1,000	400,000	0.3	120.0	0.7	84.0	60	1.40
1,400	400,000	0.3	85.7	0.7	60.0	60	1.00
700	450,000	0.3	192.9	0.7	135.0	60	2.25
1,000	450,000	0.3	135.0	0.7	94.5	60	1.58
1,400	450,000	0.3	96.4	0.7	67.5	60	1.13
700	500,000	0.3	214.3	0.7	150.0	60	2.50
1,000	500,000	0.3	150.0	0.7	105.0	60	1.75
1,400	500,000	0.3	107.1	0.7	75.0	60	1.25
Rectangular Basin							
700	150,000	0.7	150	0.7	105.0	60	1.75
1,000	150,000	0.7	105	0.7	73.5	60	1.23
1,400	150,000	0.7	75	0.8	60.0	60	1.00
700	200,000	0.7	200	0.7	140.0	60	2.33
1,000	200,000	0.7	140	0.7	98.0	60	1.63
1,400	200,000	0.7	100	0.7	70.0	60	1.17
700	250,000	0.7	250	0.7	175.0	60	2.92
1,000	250,000	0.7	175	0.7	122.5	60	2.04
1,400	250,000	0.7	125	0.7	87.5	60	1.46

Table 4-3 shows that for circular basins, a water volume between 350,000 to 400,000 gallons, combined with a small increase in chlorine residual at 1,400 gpm represents the optimal balance between size, chlorine cost, risk, and disinfection. For rectangular basins, a water volume between 150,000 to 250,000 gallons appears to be optimal. These tanks provide adequate factors of safety for disinfection while minimizing chlorine consumption required to provide that disinfection. Additionally, minimizing the overall tank volume minimizes the capital costs required to construct the tank.

It is important to note that the IR values calculated above are minimum values, and because the disinfection contact time provided by the WTP clearwell as well as the transmission main downstream of the finished water pumps are not currently included in the WTP CT calculations, the value above is conservative. In reality, the CT provided, and subsequently, the IR value, will be higher than the values listed in Table 4-3. To take advantage of this, the District could consider including either or both of these CT components in any future calculations.

Based on the analysis above and the results in Table 4-2 and Table 4-3, a target water volume of 350,000 gallons for circular basins and 250,000 gallons for rectangular basins will be used in the alternative analysis provided in the following section(s).

RESERVOIR MATERIAL ALTERNATIVES

The following sections highlight three different construction materials suitable for potable water storage tanks.

CONCRETE

Concrete is ubiquitous in civil infrastructure construction and is utilized for storage tanks, buildings, and foundations, among other uses. Concrete is a strong, long-lasting material that can be poured into any desired shape and requires minimal maintenance. Additionally, concrete structures can be partially or fully buried – which is especially useful with sloped topography. Lastly, additives can be included in the mix design in order to customize the concrete material for the application.

Concrete reservoirs are viable for potable water storage and do not require coatings for corrosion protection. Concrete is also easy to clean and maintain and can be formed into any desired shape. Concrete is a very cost-effective material; however, the labor required for forming and placing of concrete is higher than some other common construction materials.

For this project, we will consider both circular and rectangular basins, each of which has specific advantages and disadvantages. Descriptions for these tanks are provided as Alternative 1A, 1B, and 1C below.

GLASS PANEL

Glass panel reservoirs are circular and are constructed using glass coated steel sheets. While the steel sheet provides structural integrity, the glass coating and sealants provide exceptional corrosion protection. These glass fused panels come in a variety of colors from the manufacturing facility and their composition is such that no re-coating of the tank is required for the life of the structure.

For glass panel tanks, an engineer will work with the manufacturing facility to design the structure, the panels are fabricated, shipped to the project location, and then the tank is erected on site atop a specifically designed concrete foundation slab. Installation time for this type of storage tank is lower than concrete or welded steel materials because the panels are prefabricated and simply bolted together onsite.

The cost of a glass panel tank is often higher than concrete or steel, but life-cycle costs are competitive. These materials are slightly more sensitive to damage and are not easily modified after installation; however, they are easy to clean.

For this project, we will consider a cylindrical, fused glass panel tank as described in Alternative 2 below.

STEEL

Welded Steel

Similar to concrete, steel is ubiquitous in the construction industry and has a variety of uses. For potable water storage, welded carbon steel is very common and in most applications provides a good balance between longevity and maintenance costs. This type of vessel includes manufacture of preformed steel sheets, shipment to the project location, field welding of the panels, then anchoring to a concrete foundation. Carbon steel, even when coated, is subject to corrosion and is highly dependent on weld quality and surface preparation prior to coating. Furthermore, the vessel typically must be removed from service every 20 to 30 years for coating inspection and reapplication.

Bolted Stainless Steel

Stainless steel (Type 304 or Type 316) is also available for construction of water storage tanks. However, because of the difficulty in welding stainless steel, potable water storage tanks made from this material are typically bolted similar to the glass fused tanks described above. Most water holding structures constructed from stainless steel are constructed from Type 304 materials. Stainless steel is significantly more expensive than carbon steel, but when the absence of a required coating system is considered, they can be cost-competitive for some applications and sizes.

For this project, we will consider a both a welded steel vessel with high-quality coating system as well as a Type 304 bolted stainless steel tank. These alternatives are described in Alternative 3A, 3B, and 3C below.

RESERVOIR DESIGN ALTERNATIVES

SELECTION CRITERIA

Before discussing the design alternatives, it is important to highlight the key criteria that any alternative must address. These criteria, identified by District staff, along with their respective weighting factors, are as listed below:

- Life-cycle Cost (0.25)
- Redundancy (0.25)
- Capital Cost (0.20)
- Impact to Operations (0.15)
- Aesthetics (0.10)
- Adaptability (0.05)

For the District, the three most critical criteria are life-cycle costs, redundancy, and capital costs. To keep rates competitive with neighboring utility districts, and to provide the best value to its customers, the District is interested in minimizing both capital and life-cycle costs of any alternative that is to be considered. While capital costs are particularly important when considering the District's cash-flow and debt service, life-cycle costs, which include all of the costs anticipated to occur over the lifetime of a facility are particularly critical when considering the alternative that provides the best overall "value" to the District and its customers. Redundancy is also critical in order to increase the resiliency of the water treatment facilities and to account for periods where critical equipment must be taken offline for maintenance. Regardless of the construction materials, all equipment/facilities must be maintained and in some instances, this maintenance can't be performed with the facility in service. Having a contingency plan for these periods is a critical feature for selection/design of any facilities required to provide continuous water service.

As previously noted, the District currently does not have a formal contingency plan for how to provide CT should the existing CCB be taken offline for maintenance or in the event of an emergency. This is especially relevant as the existing CCB was found to have several structural seismic deficiencies. Although temporary accommodations can be made, they are cumbersome, very expensive, and will require significant design coordination prior to execution. Furthermore, providing resiliency for water service is a key goal for the agency that is providing funding for this project, the Federal Emergency Management Agency (FEMA). One of these agency's tenets is to reduce exposure to risk for critical infrastructure, and providing alternatives that meet the intent of this tenet will be a key selection criteria for the District when considering the alternatives described below.

BASELINE DESIGN CRITERIA

Each of the following alternatives will be constructed west/south of the existing CCB as shown in the corresponding site plans and each will include an access road that will connect to Morning Beach Drive, and extend around the tank.

Site work and site security will be provided with new galvanized chain link fencing. Fencing will proceed from the SW corner of the FWPB and will proceed west, south, and eventually will meet the existing fencing at the WTP to provide a secure perimeter around the tank(s) and generator assembly. Three manual, single swing, pedestrian gates and one manual, double swing vehicle gate secured with padlocks are included in the scope at this point in time. Additional security improvements such as cameras or other video/recording technology will be evaluated by the District separately from this project.

Each of the following alternatives will also include piping required to connect to the existing CCB inlet piping as well as the existing CCB discharge piping prior to the finished water pumps. Both inlet and outlet piping will be Class 52 ductile iron pipe and fittings to match existing materials and will include full joint restraint along the entire alignment. New valves will be provided at the points of connection to the existing piping to allow full isolation. Additionally, flexible couplings suitable for direct burial will be provided to account for seismic vibration and/or settling. Lastly, new inlet and outlet piping would include a sampling tap to facilitate completion of a tracer study that will verify the baffling efficiency for the tank. For the drain piping, new ductile iron piping will be provided, and a new, larger, utility structure will be installed at the location of the existing structure. All existing pipes to this structure will then be reconnected.

For consistency, each of the circular tank alternatives considered below will include the following components:

- Roof mounted vent with insect screen;
- Three, stainless steel, 36" x 36", roof mounted, lockable, hinged access hatches;
- Two, grade level, bolted, 36-inch diameter, swinging access hatches (AWWA D100);
- Exterior and interior access ladder with ladder guard (exterior only) and Saf-T-Climb safety device;

- Five or six internal baffles.
    - For glass panel, steel, and circular concrete tanks, baffles will be Hypalon® plastic with metal framing. A portion of the baffles within concrete rectangular reservoirs will also be Hypalon.
- Perforated inlet and outlet risers, similar to those located in the existing CCB;
- Three, embedded, rooftop, flanged sleeves to allow for testing, sampling, or instrumentation; and
- One, 8-inch sidewall overflow fitting.

The rectangular concrete tank considered below will include the following components:

- Roof mounted vent with insect screen;
- Four, stainless steel, 36" x 36", lockable, hinged access hatches;
- Exterior access ladder with ladder guard and Saf-T-Climb safety device;
- Internal, cast-in place concrete baffles; and
- Four, embedded, flanged sleeves to allow for testing, sampling, or instrumentation.

ALTERNATIVE 1A – CONCRETE CYLINDER RESERVOIR

Alternative 1A includes construction of a concrete, cylindrical water tank. Design information for the proposed tank in this alternative is provided in Table 4-4.

TABLE 4-4

Alternative 1A Tank Summary

Parameter	Value
Type	Circular
Material	Concrete
Diameter (feet)	50.0
Base Elevation (feet)	336.0
Overflow Elevation (feet)	360.0
Overflow Height (feet)	24.0
Operating Water Height (feet)	23.0
Operating Water Volume (gallons)(1)	337,800
Gallons per foot	14,687
Inlet and Outlet Configuration	Vertical, 12-inch perforated risers
Baffle Configuration	7-Channel (6 baffles) Hypalon w/metal frame

(1) Usable gallons below the Operating Water Height.

Alternative 1A includes construction of an above-grade, concrete, cylindrical tank using pre-fabricated forms by a company specializing in concrete tank construction (e.g., Baker Silo). In our area, this construction technique represents the most cost effective construction method for cylindrical concrete tanks up to 50 foot diameter. The tank would rest on a concrete foundation, similar to the existing CCB. Figure 4-1 provides a site plan for Alternative 1A.

The tank would include the features highlighted in the baseline criteria above, which include interior baffles. These baffles would be fully and tightly secured to the tank walls and floor and would hang from the roof. With these baffles, the proposed tank should achieve a baffling efficiency of 0.3 to 0.4. After construction completion, a tracer study should be conducted in order to field verify this baffling efficiency and a report submitted to DOH.

With this alternative, the District should be able to utilize the desired chlorine residual of 0.7 for flows up to approximately 1,180 gpm. For flows above 1,180 gpm, additional chlorine (0.2 ppm) would be needed to provide the required CT value.

At this point in time, it is not anticipated that Alternative 1A would require any modifications to the existing WTP equipment, including Finished Water Pumps or Clearwell Pumps.

Advantages to this alternative are that the concrete tank does not require coating, is a durable and long-lasting material, and is easily constructible. This alternative addresses the District's desired goal for redundancy because concrete is a long-lasting, low-maintenance material and does not require that the structure be taken offline for maintenance or cleaning.

Disadvantages for these types of tanks are prone to small drip leaks and are not aesthetically pleasing unless stained. Staining concrete tanks is feasible, but it is important to note that the costs below do not include concrete staining.

The estimated project cost for this alternative is $2,977,000 which includes contingency (30%), Washington State Sales Tax (9.0%), project design and construction management (25%), and project administration and permitting (5%). A budgetary cost estimate for this alternative is provided in Appendix A.

ALTERNATIVE 1B – CONCRETE RECTANGULAR RESERVOIR (1-TRAIN)

Alternative 1B includes construction of a concrete, rectangular water tank. Design information for the proposed tank in this alternative is provided in Table 4-5.

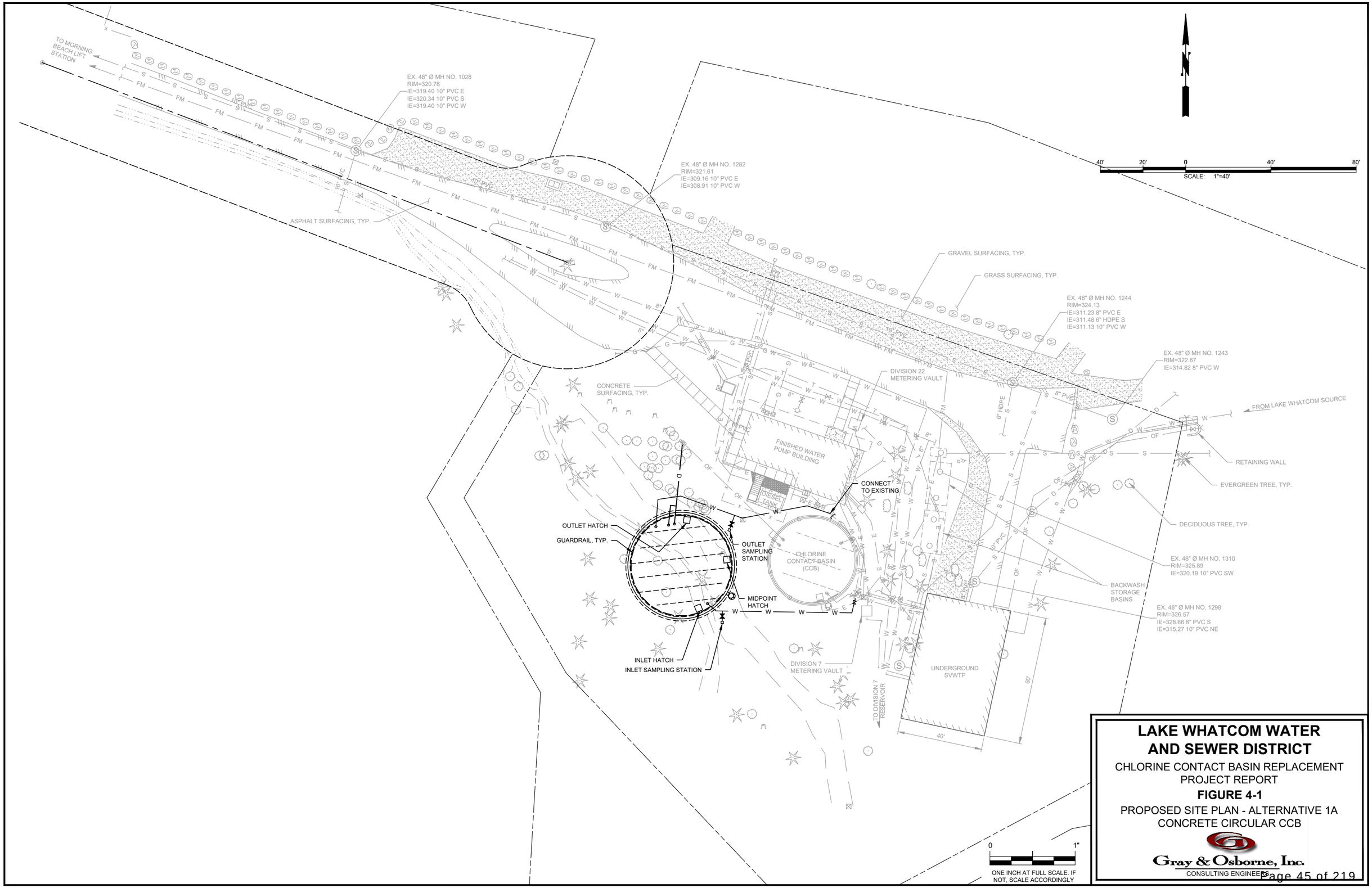
TABLE 4-5

Alternative 1B Tank Summary

Parameter	Value
Type	Rectangular
Material	Concrete
Width (feet)(1)	35.0
Length (feet)(1)	40.0/48.0
Base Elevation (feet)	336.0
Overflow Elevation (feet)	360.0
Overflow Height (feet)	24.0
Operating Water Height (feet)	23.0
Operating Water Volume (gallons)(2)	222,850
Gallons per foot	9,689
Inlet and Outlet Configuration	Floor Penetration
Baffle Configuration	8-Channel (7 baffles) Concrete (10" thickness) Hypalon HDPE curtain

(1) Interior dimension. Second number (where applicable) includes equalization basin width.

(2) Usable gallons below the Operating Water Height.



LAKE WHATCOM WATER AND SEWER DISTRICT

CHLORINE CONTACT BASIN REPLACEMENT
PROJECT REPORT

FIGURE 4-1

PROPOSED SITE PLAN - ALTERNATIVE 1A
CONCRETE CIRCULAR CCB

Gray & Osborne, Inc.
CONSULTING ENGINEERS

Alternative 1B includes construction of a concrete, rectangular tank using traditional cast-in-place forms. The tank would rest on a concrete foundation similar to the existing CCB. The tank would be located above grade in order to maintain the same hydraulic grade-line as the existing CCB. Figure 4-2 provides a site plan for Alternative 1B.

The tank would include the features highlighted in the baseline criteria above with few exceptions. For this tank, interior baffles would be created using cast-in-place concrete walls and Hypalon HDPE baffles. These baffles would then also serve to support the proposed roof of the tank. With these baffles, the proposed tank should achieve a baffling efficiency of 0.6 to 0.7. After construction completion, a tracer study should be conducted in order to field verify this baffling efficiency and a report submitted to DOH. The tank would also include an equalization basin at the discharge end. This basin will be separated from the channeled CCB tank by a downward opening weir gate. This gate will ensure that the CT volume within the CCB remains constant during WTP operation. The equalization basin provides equalization volume to accommodate fluctuations in flows to and from the CCB by the finished water pumps and the clearwell transfer pumps. The equalization basin volume will be approximately 20,350 gallons for this alternative.

With this alternative, the District should be able to utilize the desired chlorine residual of 0.7 for flows up to 1,400 gpm (Table 4-3). The proposed tank in this alternative would have a single path or "train" for water through the structure. Although highly unlikely, if the tank needed to be taken offline, the District would be required to provide temporary CT or cease treatment operations until the tank could be put back into service.

At this point in time, it is not anticipated that Alternative 1B would require any modifications to the existing WTP equipment, including Finished Water Pumps or Clearwell Pumps; however, Alternative 1B would allow the District to utilize the proposed concrete structure for future WTP expansions, if desired. Specifically, a previous investigation completed as part of the *SVWTP Alternatives Analysis* noted the option to locate a new WTP facility atop the new CCB. This new WTP would include new filter units, electrical gear, and all of the current components within the current structure needed for water treatment, while the existing structure would be repurposed for chemical feed, chemical storage, and other supporting uses. It is important to note that construction of a new WTP atop a rectangular, concrete CCB would require that the CCB be at least partially buried in order to provide for vehicle and pedestrian access. If the proposed CCB is partially or fully buried, the new tank would be at a different hydraulic grade line from the existing CCB, which would limit the use of the existing CCB in the event that the proposed tank must be taken offline. Furthermore, the additional excavation and shoring required for construction of this basin would increase the project and tanks costs highlighted below. For the purposes of this analysis, the proposed CCB in Alternative 1B is located above grade in order to maintain an identical hydraulic grade line as the existing CCB.

Advantages to this alternative are concrete does not require coating, is a durable and long-lasting material, and is easily constructed. This alternative addresses the District's desired goal for redundancy because concrete is a long-lasting, low-maintenance material and does not require that the structure be taken offline for maintenance or cleaning.

Disadvantages for these types of tanks are that they are not aesthetically pleasing unless stained, and are more costly and labor-intensive to construct. Staining concrete tanks is feasible, but it is important to note that the costs below do not include concrete staining.

The estimated project cost for this alternative is $2,918,000 which includes contingency (30%), Washington State Sales Tax (9.0%), project design and construction management (25%), and project administration and permitting (5%). A budgetary cost estimate for this alternative is provided in Appendix A.

ALTERNATIVE 1C – CONCRETE RECTANGULAR RESERVOIR (2-TRAIN, 1,400 GPM)

Alternative 1C includes construction of a rectangular concrete water tank. Design information for the proposed tank is provided in Table 4-6.

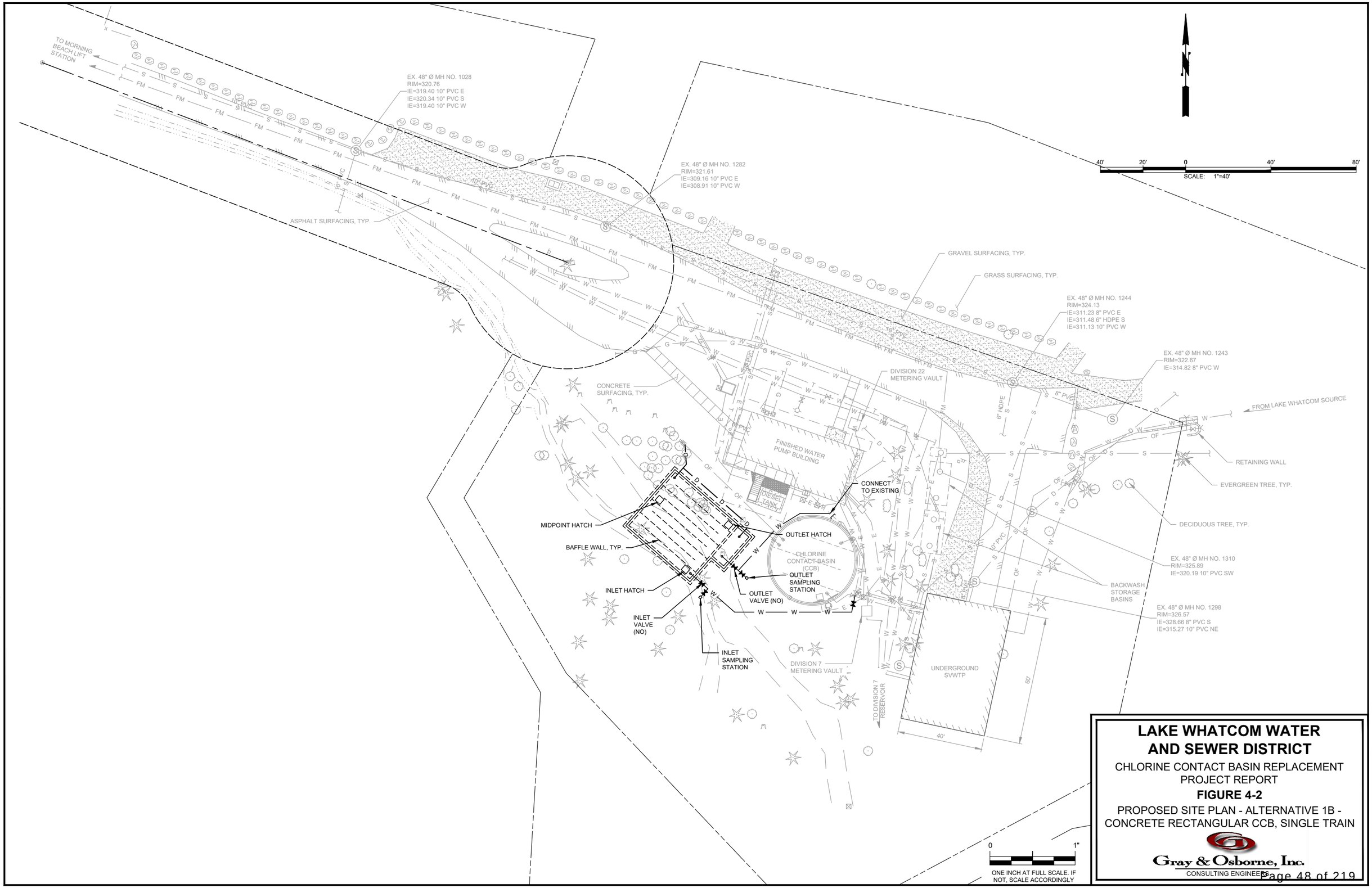
TABLE 4-6

Alternative 1C Tank Summary

Parameter	Value
Type	Rectangular
Material	Concrete
Width (feet)(1)	32.0
Length (feet)(1)	84.0/92.0
Base Elevation (feet)	336.0
Overflow Elevation (feet)	356.0
Overflow Height (feet)	20
Operating Water Height (feet)	19
Operating Water Volume (gallons)(2)	382,020 (2-Trains) 191,010 (1-Train)
Gallons per Foot	20,106 (2-Train) 10,053 (1-Train)
Inlet and Outlet Configuration	Floor Penetration
Baffle Configuration	8-Channel, 7 baffles (2-Train) 4-Channel, 3 baffles (1-Train) Concrete (10" thickness) Hypalon HDPE curtain

(1) Interior dimension. Second number (where applicable) includes equalization basin width.

(2) Usable gallons below the Operating Water Height.



LAKE WHATCOM WATER AND SEWER DISTRICT

CHLORINE CONTACT BASIN REPLACEMENT PROJECT REPORT

FIGURE 4-2

PROPOSED SITE PLAN - ALTERNATIVE 1B - CONCRETE RECTANGULAR CCB, SINGLE TRAIN

Gray & Osborne, Inc.
CONSULTING ENGINEERS

Alternative 1C includes construction of a concrete, rectangular tank using traditional cast-in-place forms. The tank would rest on a concrete foundation similar to the existing CCB. The tank would be located above grade, but would have a slightly lower hydraulic grade than the existing CCB. The difference between Alternative 1C and Alternative 1B is that Alternative 1C provides full and complete redundancy by offering two separate treatment trains, each capable of treating the entire 1,400 gpm flow. Figure 4-3 provides a site plan for Alternative 1C.

The tank would include the features highlighted in the baseline criteria above with few exceptions. In Alternative 1B, the tank has a single inlet end and a single outlet end. For Alternative 1C, the basin footprint will be divided into two sections of equal area/volume. Under normal operation, both trains will be operated in series to provide the maximum level of CT possible. However, for cleaning or maintenance, a sluice gate and several isolation valves between the two trains may be closed in order to remove one train from service for cleaning, repairs, or maintenance. These operational schematics are shown in Figure 4-5. Interior baffles would be created using cast-in-place concrete walls and Hypalon HDPE baffles. These baffles would then also serve to support the proposed roof of the tank. With these baffles, the proposed CCB in either configuration (1-train or 2-train) should achieve a baffling efficiency of 0.6 to 0.7. After construction completion, a tracer study should be conducted in order to field verify this baffling efficiency and a report submitted to DOH. The tank would also include an equalization basin at the discharge end. This basin will be separated from the channeled CCB tank by a downward opening weir gate. This gate will ensure that the CT volume within the CCB remains constant during WTP operation. The equalization basin provides equalization volume to accommodate fluctuations in flows to and from the CCB by the finished water pumps and the clearwell transfer pumps. The equalization basin volume will be approximately 20,940 gallons for this alternative.

With this alternative, the District will be able to utilize the desired chlorine residual of 0.7 for flows up to 1,400 gpm (Table 4-3) with either 1-train or 2-trains in operation. Under normal operations with two trains in service, the District may even consider reducing their target chlorine residual to 0.5 or 0.6 mg/l in order to reduce chemical consumption costs.

Similar to Alternative 1B, it is not anticipated that Alternative 1C would require any modifications to the existing WTP equipment, including Finished Water Pumps or Clearwell Pumps. The District could utilize the proposed structure to house new WTP equipment as described in Alternative 1B. For the purposes of this analysis, the proposed CCB in Alternative 1C is located above grade in order to maintain a similar hydraulic grade line as the existing CCB; however, since this proposed structure will replace the existing CCB and provide full and complete redundancy, the hydraulic grade line has been reduced to slightly reduce capital costs for the project.

Advantages to this alternative are concrete does not require coating, is a durable and long-lasting material, and is easily constructed. This alternative addresses the District's desired goal for redundancy because concrete is a long-lasting, low-maintenance material and does not require that the structure be taken offline for maintenance or cleaning. Furthermore, this alternative provides full and complete redundancy for the CCB for flows up to 1,400 gpm.

Disadvantages for these types of tanks are that they are not aesthetically pleasing unless stained, and are more costly and labor-intensive to construct. Staining concrete tanks is feasible, but it is important to note that the costs below do not include concrete staining.

The estimated project cost for this alternative is $4,372,000 which includes contingency (30%), Washington State Sales Tax (9.0%), project design and construction management (25%), and project administration and permitting (5%). A budgetary cost estimate for this alternative is provided in Appendix A.

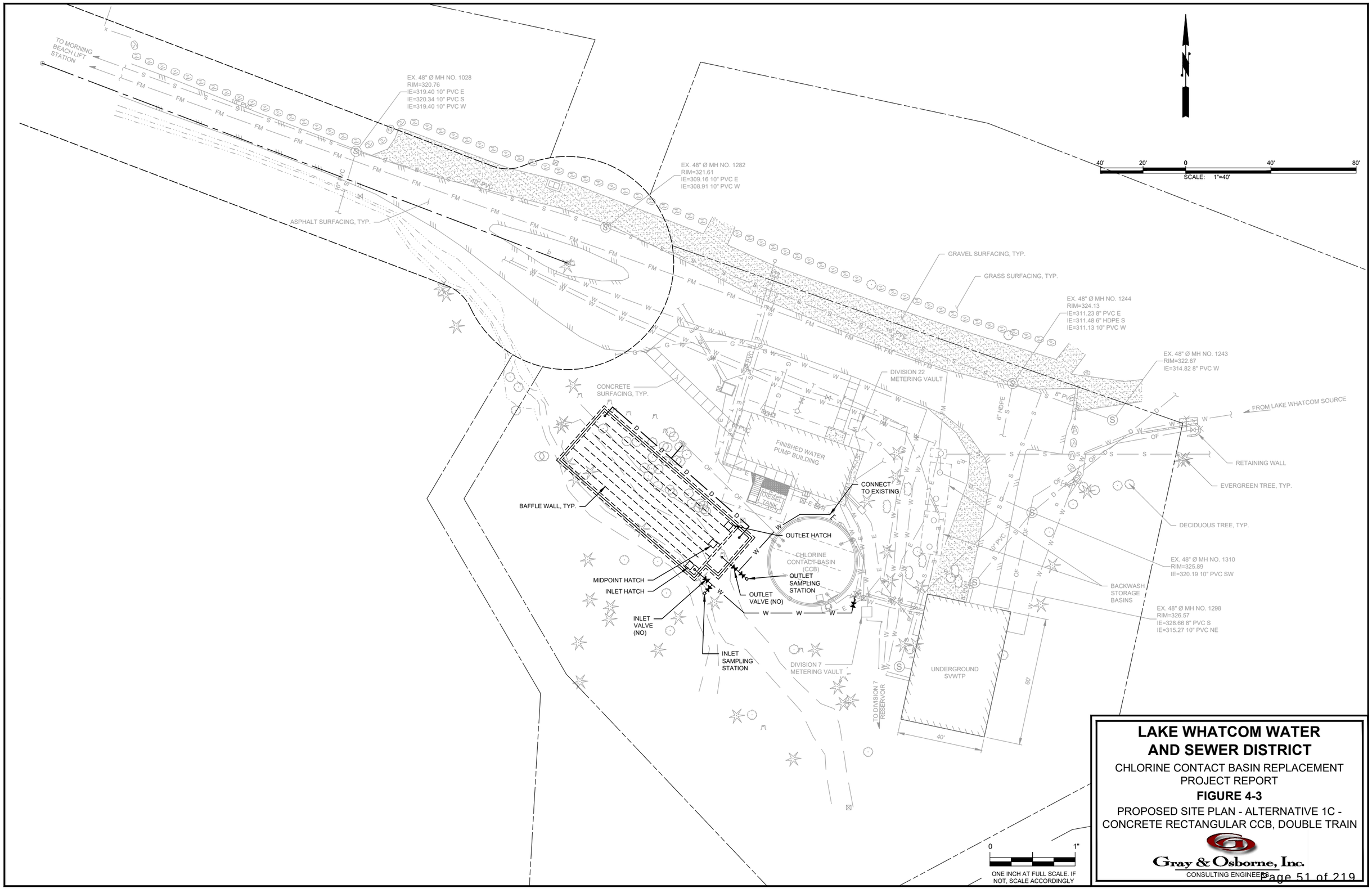
ALTERNATIVE 1D – CONCRETE RECTANGULAR RESERVOIR (2-TRAIN, 700 GPM)

Alternative 1D includes construction of a rectangular concrete water tank. Design information for the proposed tank in this alternative is provided in Table 4-7.

TABLE 4-7

Alternative 1D Tank Summary

Parameter	Value
Type	Rectangular
Material	Concrete
Width (feet)[(1)]	32.0
Length (feet)[(1)]	50.0/58.0
Base Elevation (feet)	336.0
Overflow Elevation (feet)	356.0
Overflow Height (feet)	20
Operating Water Height (feet)	19
Operating Water Volume (gallons)[(2)]	222,860 (2-Trains) 111,430 (1-Train)
Gallons per Foot	11,729 (2-Train) 5,864 (1-Train)
Inlet and Outlet Configuration	Floor Penetration
Baffle Configuration	8-Channel, 7 baffles (2-Train) 4-Channel, 3 baffles (1-Train) Concrete (10" thickness) Hypalon HDPE curtain



LAKE WHATCOM WATER AND SEWER DISTRICT

CHLORINE CONTACT BASIN REPLACEMENT PROJECT REPORT

FIGURE 4-3

PROPOSED SITE PLAN - ALTERNATIVE 1C - CONCRETE RECTANGULAR CCB, DOUBLE TRAIN

Gray & Osborne, Inc.
CONSULTING ENGINEERS

(1) Interior dimension. Second number (where applicable) includes equalization basin width.
(2) Usable gallons below the Operating Water Height.

Alternative 1D includes construction of a rectangular concrete tank using traditional cast-in-place forms. The tank would rest on a concrete foundation similar to the existing CCB. The tank would be located above grade, but would have a slightly lower hydraulic grade than the existing CCB. The difference between Alternative 1D and Alternative 1C is that Alternative 1D provides full and complete redundancy for flows up to 700 gpm. The entire CCB when operating in series is capable of treating the entire 1,400 gpm flow. Figure 4-4 provides a site plan for Alternative 1D.

The tank would include the features highlighted in the baseline criteria above with few exceptions. In Alternative 1B, the tank has a single inlet end and a single outlet end. For Alternative 1D, the basin footprint will be divided into two sections of equal area/volume. Under normal operation, both trains will be operated in series to provide the maximum level of CT possible. However, for cleaning or maintenance, a sluice gate and several isolation valves between the two trains may be closed in order to remove one train from service for cleaning, repairs, or maintenance. These operational schematics are shown in Figure 4-5. Interior baffles would be created using cast-in-place concrete walls and Hypalon HDPE baffles. These baffles would then also serve to support the proposed roof of the tank. With these baffles, the proposed CCB in either configuration (1-train or 2-train) should achieve a baffling efficiency of 0.6 to 0.7. After construction completion, a tracer study should be conducted in order to field verify this baffling efficiency and a report submitted to DOH. The tank would also include an equalization basin at the discharge end. This basin will be separated from the channeled CCB tank by a downward opening weir gate. This gate will ensure that the CT volume within the CCB remains constant during WTP operation. The equalization basin provides equalization volume to accommodate fluctuations in flows to and from the CCB by the finished water pumps and the clearwell transfer pumps. The equalization basin volume will be approximately 20,940 gallons for this alternative.

With this alternative, the District will be able to utilize the desired chlorine residual of 0.7 for flows up to 700 gpm (Table 4-3) with 2-trains in operation. Under normal operations with two trains in service, the District may even consider reducing their target chlorine residual to 0.5 or 0.6 mg/l in order to reduce chemical consumption costs.

Similar to Alternative 1B, it is not anticipated that Alternative 1D would require any modifications to the existing WTP equipment, including Finished Water Pumps or Clearwell Pumps. The District could utilize the proposed structure to house new WTP equipment as described in Alternative 1B. For the purposes of this analysis, the proposed CCB in Alternative 1D is located above grade in order to maintain a similar hydraulic grade line as the existing CCB; however, since this proposed structure will replace the existing CCB and provide full and complete redundancy, the hydraulic grade line has been reduced to slightly reduce capital costs for the project.

Advantages to this alternative are concrete does not require coating, is a durable and long-lasting material, and is easily constructed. This alternative addresses the District's desired goal for redundancy because concrete is a long-lasting, low-maintenance material and does not require that the structure be taken offline for maintenance or cleaning. Furthermore, this alternative provides full and complete redundancy for the CCB for typical operational flows (700 gpm).

Disadvantages for these types of tanks are that they are not aesthetically pleasing unless stained, and are more costly and labor-intensive to construct. Staining concrete tanks is feasible, but it is important to note that the costs below do not include concrete staining. Another disadvantage is that to accommodate the full WTP design flow, both trains must remain in service.

The estimated project cost for this alternative is $3,515,000 which includes contingency (30%), Washington State Sales Tax (9.0%), project design and construction management (25%), and project administration and permitting (5%). A budgetary cost estimate for this alternative is provided in Appendix A.

ALTERNATIVE 2 – GLASS PANEL RESERVOIR

Alternative 2 includes construction of a bolted glass-fused steel cylindrical water tank. Design information for the proposed tank in this alternative is provided in Table 4-8.

TABLE 4-8

Alternative 2 Tank Summary

Parameter	Value
Type	Circular
Material	A36 Steel w/glass fused coating
Diameter (feet)	47.6
Base Elevation (feet)	336.0
Overflow Elevation (feet)	360.0
Overflow Height (feet)	24.0
Operating Water Height (feet)	23.0
Operating Water Volume (gallons)(1)	306,150
Gallons per Foot	13,311
Inlet and Outlet Configuration	Vertical, 12-inch perforated riser
Baffle Configuration	5-Channel (6 baffles) Hypalon w/steel frame

(1) Usable gallons below the Operating Water Height.

TO MORNING BEACH LIFT STATION

EX. 48" Ø MH NO. 1028
RIM=320.76
IE=319.40 10" PVC E
IE=320.34 10" PVC S
IE=319.40 10" PVC W

EX. 48" Ø MH NO. 1282
RIM=321.61
IE=309.16 10" PVC E
IE=308.91 10" PVC W

ASPHALT SURFACING, TYP.

GRAVEL SURFACING, TYP.

GRASS SURFACING, TYP.

EX. 48" Ø MH NO. 1244
RIM=324.13
IE=311.23 8" PVC E
IE=311.48 6" HDPE S
IE=311.13 10" PVC W

EX. 48" Ø MH NO. 1243
RIM=322.67
IE=314.82 8" PVC W

FROM LAKE WHATCOM SOURCE

RETAINING WALL

EVERGREEN TREE, TYP.

DECIDUOUS TREE, TYP.

EX. 48" Ø MH NO. 1310
RIM=325.89
IE=320.19 10" PVC SW

BACKWASH STORAGE BASINS

EX. 48" Ø MH NO. 1298
RIM=326.57
IE=328.66 8" PVC S
IE=315.27 10" PVC NE

CONCRETE SURFACING, TYP.

DIVISION 22 METERING VAULT

FINISHED WATER PUMP BUILDING

DIESEL TANK

CONNECT TO EXISTING

BAFFLE WALL, TYP.

OUTLET HATCH

CHLORINE CONTACT BASIN (CCB)

OUTLET SAMPLING STATION

OUTLET VALVE (NO)

MIDPOINT HATCH

INLET HATCH

INLET VALVE (NO)

INLET SAMPLING STATION

DIVISION 7 METERING VAULT

UNDERGROUND SVWTP

TO DIVISION 7 RESERVOIR

40'

60'

40' 20' 0 40' 80'
SCALE: 1"=40'

0 1"
ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

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FIGURE 4-4

PROPOSED SITE PLAN - ALTERNATIVE 1D - CONCRETE RECTANGULAR CCB, DOUBLE TRAIN

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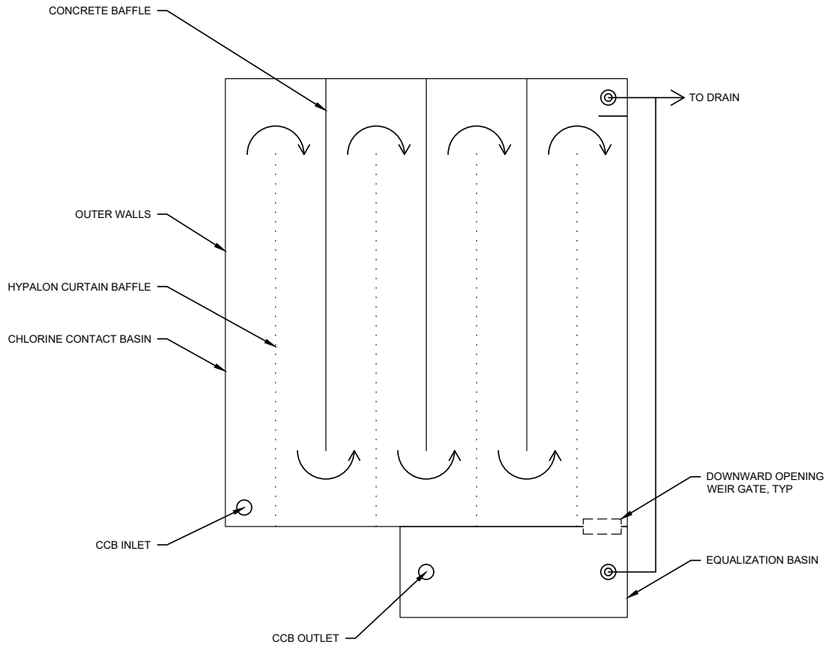
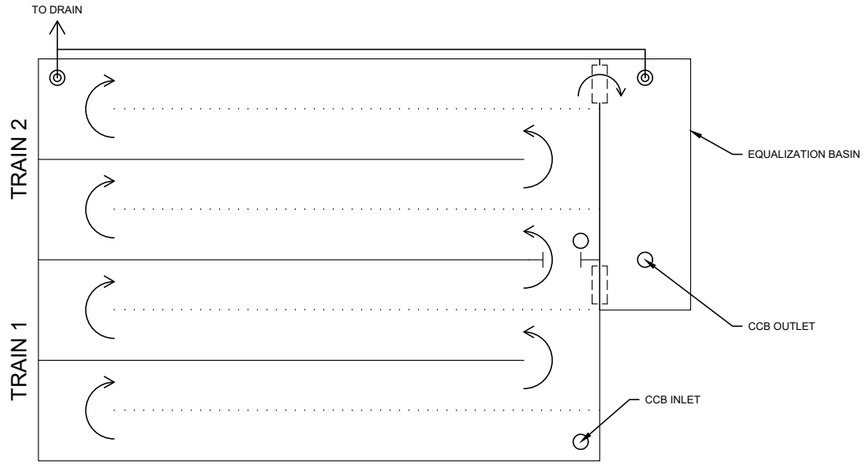
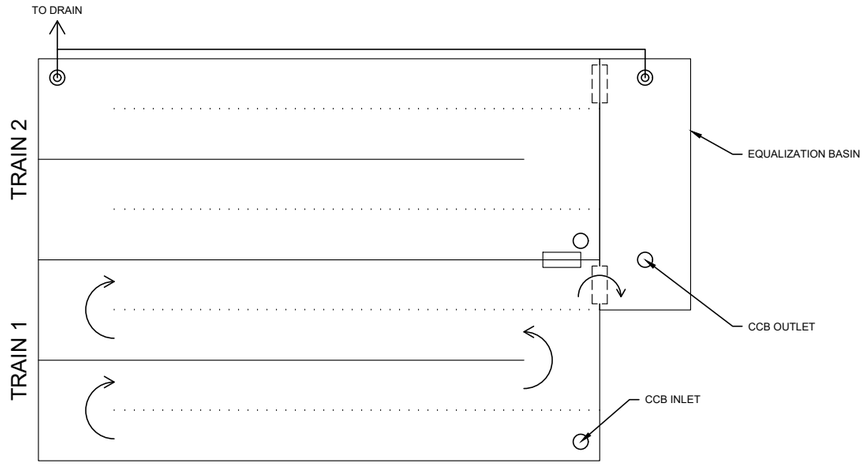


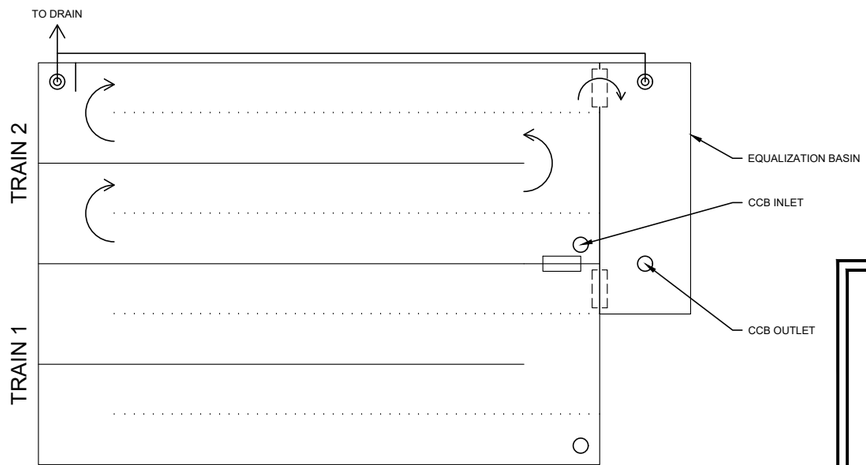
1-TRAIN OPTION (ALTERNATIVE 1B)



SCENARIO 1:
NORMAL OPERATION
2 TRAINS IN SERVICE



SCENARIO 2:
TEMPORARY OPERATION
TRAIN 1 IN SERVICE



SCENARIO 3:
TEMPORARY OPERATION
TRAIN 2 IN SERVICE

2-TRAIN OPTION (ALTERNATIVE 1C & 1D)

LEGEND

- WATER FLOW PATH
- DRAIN
- SLUICE GATE, OPEN
- SLUICE GATE, CLOSED
- DOWNWARD OPENING WEIR GATE, OPEN
- DOWNWARD OPENING WEIR GATE, CLOSED

0 1"
ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

LAKE WHATCOM WATER AND SEWER DISTRICT

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FIGURE 4-5

ALTERNATIVE 1B, 1C & 1D OPERATIONAL SCHEMATIC

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Alternative 2 includes construction of a bolted glass-fused steel cylindrical tank. The tank would rest on a concrete foundation similar to the existing CCB. The tank would be located above grade in order to maintain the same hydraulic grade-line as the existing CCB in order to provide redundancy. Figure 4-6 provides a site plan for Alternative 2.

The tank would include the features highlighted in the baseline criteria above, which include interior baffles. These baffles would be fully and tightly secured to the tank walls and floor and would hang from the roof. With these baffles, the proposed tank should achieve the desired baffling efficiency of 0.3. After construction completion, a tracer study should be conducted in order to field verify this baffling efficiency and a report submitted to DOH.

With this alternative, the District should be able to utilize the desired chlorine residual of 0.7 for flows up to approximately 1,070 gpm. For flows above 1,070 gpm, additional chlorine (0.1 to 0.2 ppm) would be needed to provide the required CT value.

At this point in time, it is not anticipated that Alternative 2 would require any modifications to the existing WTP equipment, including Finished Water Pumps or Clearwell Pumps.

Advantages to this alternative are that the tanks do not require coating.

Disadvantages for these types of tanks are that they are expensive, require a specialized contractor for installation, and eventually must be taken offline for maintenance to address the sealant at the panel ends. It is noteworthy that this alternative does not address one of the District's key criteria of redundancy in the event that the tank must be taken offline for maintenance.

The estimated project cost for this alternative is $3,029,000 which includes contingency (30%), Washington State Sales Tax (9.0%), project design and construction management (25%), and project administration and permitting (5%). A budgetary cost estimate for this alternative is provided in Appendix A.

ALTERNATIVE 3A – WELDED STEEL

Alternative 3A includes construction of a welded steel cylindrical water tank. Design information for the proposed tank in this alternative is provided in Table 4-9.

TABLE 4-9

Alternative 3A Tank Summary

Parameter	Value
Type	Circular
Material	A36 Steel
Diameter (feet)	50
Base Elevation (feet)	336.0
Overflow Elevation (feet)	360.0
Overflow Height (feet)	24.0
Operating Water Height (feet)	23.0
Operating Water Volume (gallons)(1)	337,800
Gallons per Foot	14,687
Inlet and Outlet Configuration	Vertical, 12-inch perforated riser
Baffle Configuration	5-Channel (6 baffles) Hypalon w/steel frame

(1) Usable gallons below the overflow invert.

Alternative 3A includes construction of a welded steel cylindrical tank. The tank would rest on a concrete foundation similar to the existing CCB. The tank would be located above grade in order to maintain the same hydraulic grade-line as the existing CCB in order to provide redundancy. Figure 4-7 provides a site plan for Alternative 3A.

The tank would include the features highlighted in the baseline criteria above, which include interior baffles. These baffles would be fully and tightly secured to the tank walls and floor and would hang from the roof. With these baffles, the proposed tank should achieve the desired baffling efficiency of 0.3. After construction completion, a tracer study should be conducted in order to field verify this baffling efficiency and a report submitted to DOH.

With this alternative, the District should be able to utilize the desired chlorine residual of 0.7 for flows up to approximately 1,180 gpm. For flows above 1,180 gpm, additional chlorine (0.1 to 0.2 ppm) would be needed to provide the required CT value.

At this point in time, it is not anticipated that Alternative 3A would require any modifications to the existing WTP equipment, including Finished Water Pumps or Clearwell Pumps.

Advantages to this alternative are that welded steel tanks are very common in the Pacific Northwest and do not require specialized installation contractors. Disadvantages for these types of tanks eventually must be taken offline to address corrosion and/or coating deterioration.

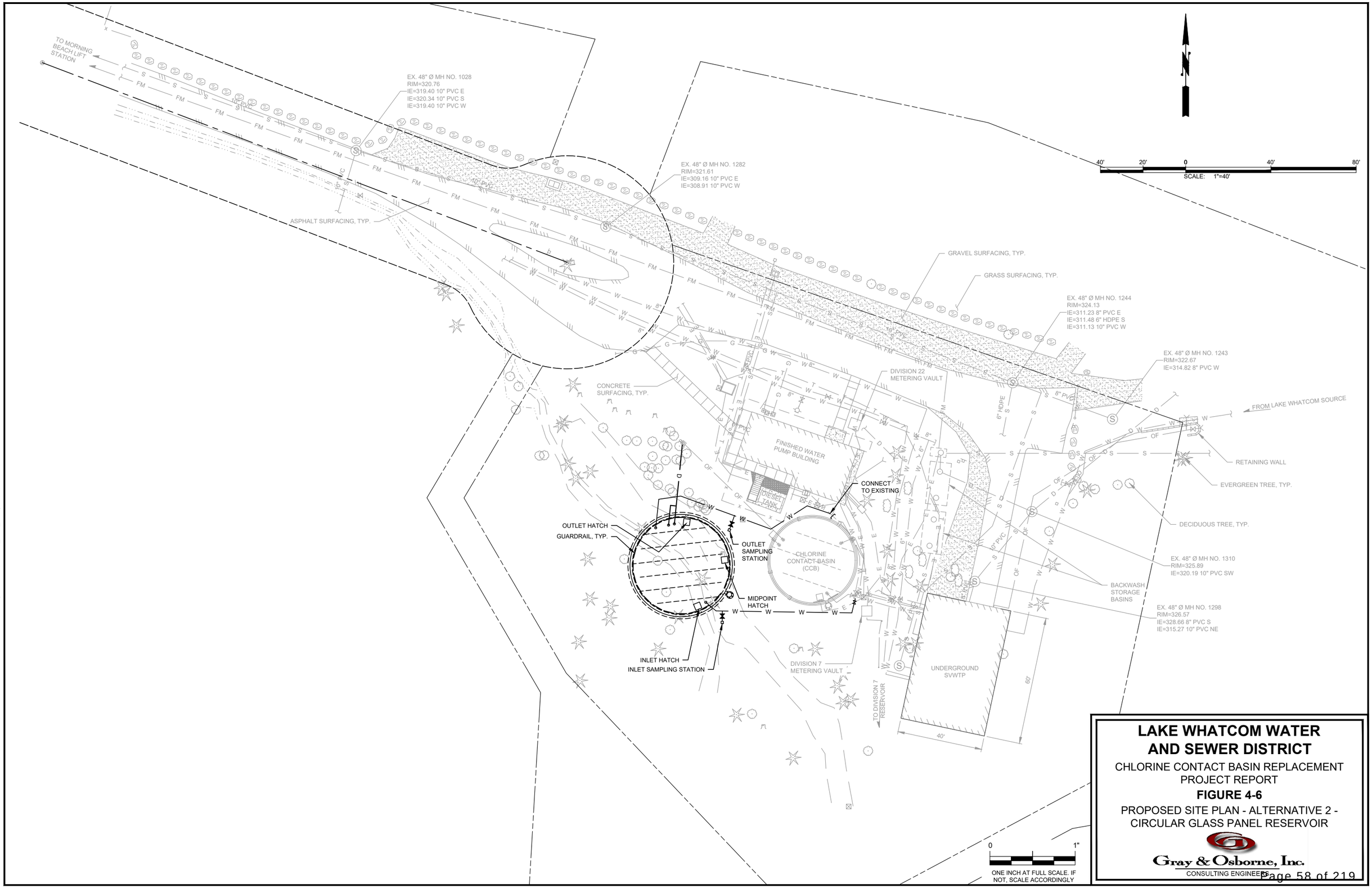

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FIGURE 4-6

PROPOSED SITE PLAN - ALTERNATIVE 2 - CIRCULAR GLASS PANEL RESERVOIR

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CONSULTING ENGINEERS

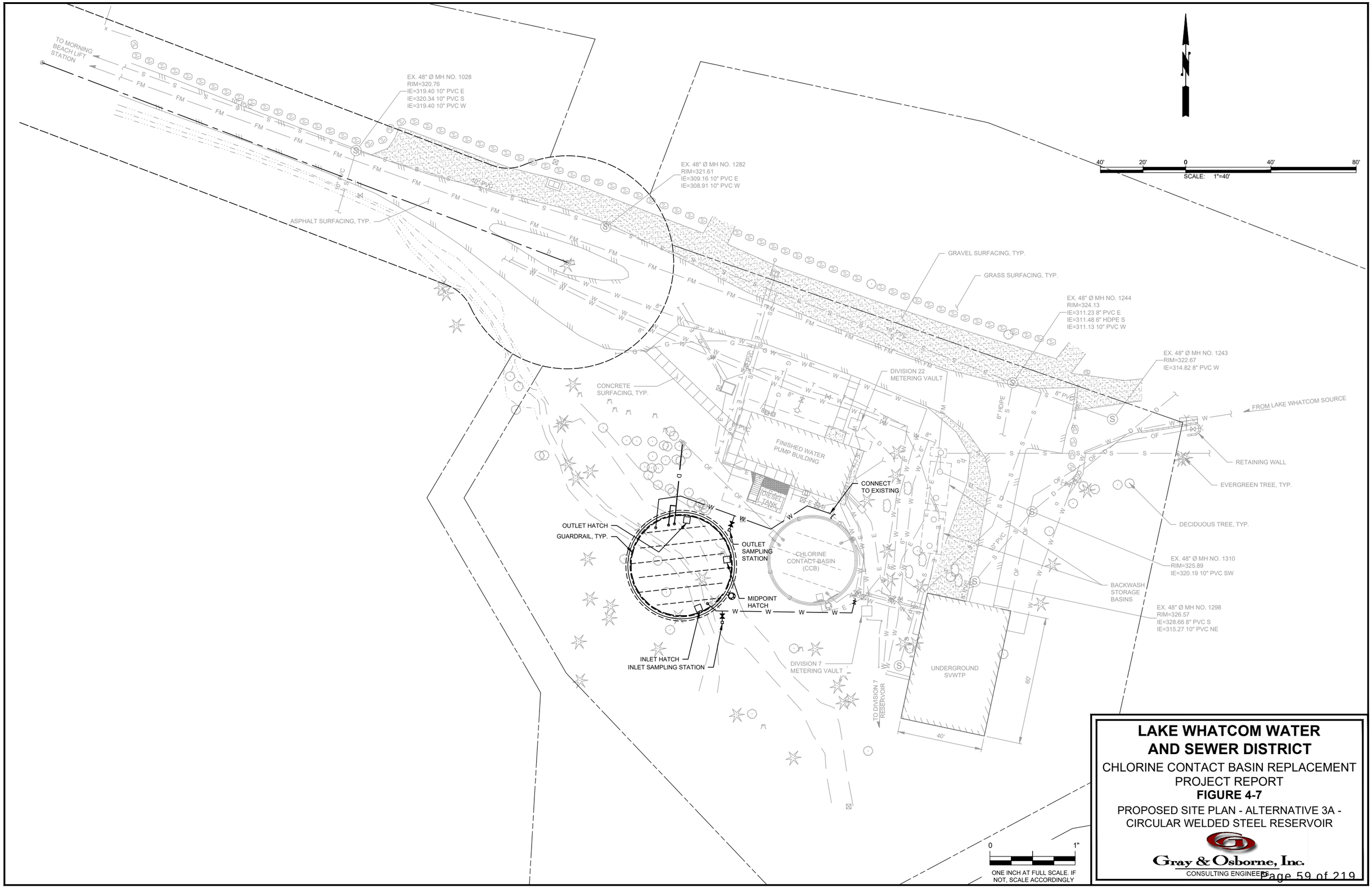

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FIGURE 4-7

PROPOSED SITE PLAN - ALTERNATIVE 3A - CIRCULAR WELDED STEEL RESERVOIR

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The estimated project cost for this alternative is $2,630,000 which includes contingency (30%), Washington State Sales Tax (9.0%), project design and construction management (25%), and project administration and permitting (5%). A budgetary cost estimate for this alternative is provided in Appendix A.

ALTERNATIVE 3B – BOLTED STAINLESS STEEL, 1-TANK

Alternative 3B includes construction of a bolted, 304 stainless steel cylindrical water tank. Design information for the proposed tank in this alternative is provided in Table 4-10.

TABLE 4-10

Alternative 3B Tank Summary

Parameter	Value
Type	Circular
Material	304SS
Diameter (feet)	49.2
Base Elevation (feet)	336.0
Overflow Elevation (feet)	360.0
Overflow Height (feet)	24.0
Operating Water Height (feet)	23.0
Operating Water Volume (gallons)(1)	327,080
Gallons per Foot	14,221
Inlet and Outlet Configuration	Vertical, 12-inch perforated riser
Baffle Configuration	5-Channel (6 baffles) Hypalon w/steel frame

(1) Usable gallons below the Operating Water Height.

Alternative 3B includes construction of a bolted 304 stainless steel, cylindrical tank. The tank would rest on a concrete foundation similar to the existing CCB. The tank would be located above grade in order to maintain the same hydraulic grade-line as the existing CCB. Figure 4-8 provides a site plan for Alternative 3B.

The tank would include the features highlighted in the baseline criteria above, which include interior baffles. These baffles would be fully and tightly secured to the tank walls and floor and would hang from the roof. With these baffles, the proposed tank should achieve the desired baffling efficiency of 0.3. After construction completion, a tracer study should be conducted in order to field verify this baffling efficiency and a report submitted to DOH.

With this alternative, the District should be able to utilize the desired chlorine residual of 0.7 for flows up to approximately 1,150 gpm. For flows above 1,150 gpm, additional chlorine (0.1 to 0.2 ppm) would be needed to provide the required CT value.

At this point in time, it is not anticipated that Alternative 3B would require any modifications to the existing WTP equipment, including Finished Water Pumps or Clearwell Pumps.

Advantages to this alternative are that the stainless steel tank does not require coating and is a durable and long-lasting material. Disadvantages for these types of tanks are that they are expensive, require a specialized contractor for installation, and must be taken offline periodically for maintenance.

The estimated project cost for this alternative is $2,659,000 which includes contingency (30%), Washington State Sales Tax (9.0%), project design and construction management (25%), and project administration and permitting (5%). A budgetary cost estimate for this alternative is provided in Appendix A.

ALTERNATIVE 3C – BOLTED STAINLESS STEEL, 2-TANKS

Alternative 3C includes construction of two bolted, 304 stainless steel cylindrical water tanks. Design information for each tank in this alternative is provided in Table 4-11.

TABLE 4-11

Alternative 3C Tank Summary(1)

Parameter	Value
Type	Circular
Material	304SS
Diameter (feet)	40.0
Base Elevation (feet)	336.0
Overflow Elevation (feet)	360.0
Overflow Height (feet)	24.0
Operating Water Height (feet)	23.0
Operating Water Volume (gallons)(2)	216,200
Gallons per Foot	9,400
Inlet and Outlet Configuration	Vertical, 12-inch perforated riser
Baffle Configuration	5-Channel (6 baffles) Hypalon w/steel frame

(1) Values listed are for each individual tank.
(2) Usable gallons below the Operating Water Height.

Alternative 3C includes construction of two bolted 304 stainless steel, cylindrical tanks. Both tanks would be constructed as part of the same project – presumably in 2025 or 2026 – but construction would be phased to allow the District to maintain continuous treatment operations. Phase I will include construction of one new tank west of the existing CCB. Once that tank is constructed, inspected, tested, and accepted, the existing

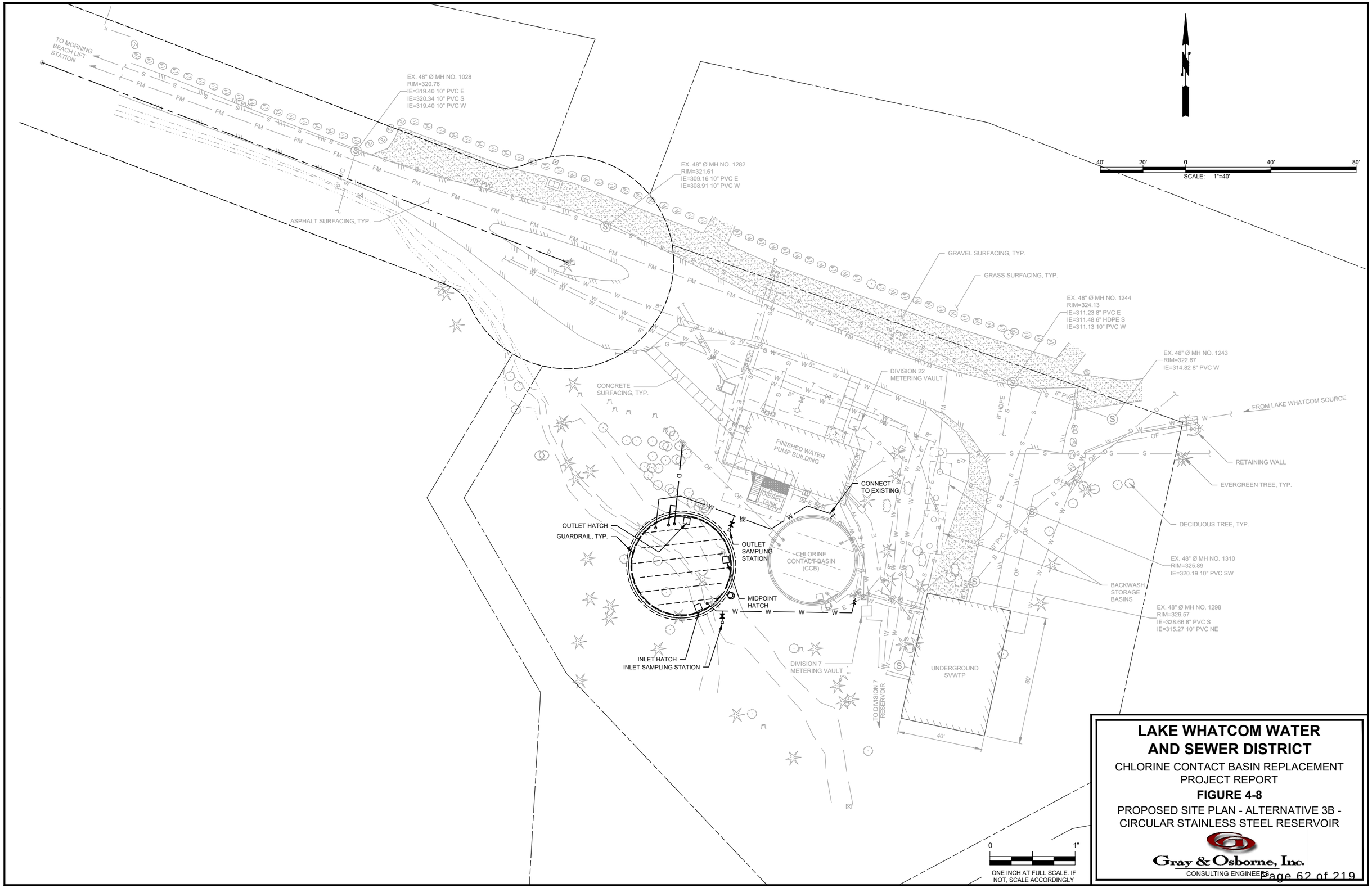

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FIGURE 4-8

PROPOSED SITE PLAN - ALTERNATIVE 3B - CIRCULAR STAINLESS STEEL RESERVOIR

Gray & Osborne, Inc.
CONSULTING ENGINEERS

CCB will be demolished and a second tank of equal volume and dimensions will be constructed in the location of the existing CCB. Figure 4-9 provides a site plan for Alternative 3C.

The tanks would rest on concrete foundations similar to the existing CCB. The tanks would be located above grade in order to maintain the same hydraulic grade-line as the existing CCB.

Each tank would include the features highlighted in the baseline criteria above, which include interior baffles. These baffles would be fully and tightly secured to the tank walls and floor and would hang from the roof. Under normal operations, the tanks would be operated in series. This would result in an estimated baffling efficiency of 0.5. Piping and valves would be installed to allow each tank to be taken out of service without any interruptions in WTP production. After construction completion, a tracer study should be conducted in order to field verify this baffling efficiency and a report submitted to DOH.

With this alternative and both tanks operating in series, the District will be able to utilize the desired chlorine residual of 0.7 mg/L for flows up to approximately 1,400 gpm. If one of the tanks must be taken offline for service, the baffling efficiency will decrease to 0.3 and the District will be able to utilize the desired chlorine residual of 0.7 mg/L for flows up to approximately 750 gpm. For flows above 750 gpm, additional chlorine (0.1 to 0.2 ppm) would be needed to provide the required CT value.

At this point in time, it is not anticipated that Alternative 3C would require any modifications to the existing WTP equipment, including Finished Water Pumps or Clearwell Pumps.

Advantages to this alternative are that the stainless steel tank does not require coating and is a durable and long-lasting material. This alternative addresses the District's desired goal for redundancy because two tanks are proposed – providing full CT redundancy in the event that one of the CCBs must be taken offline for maintenance or cleaning.

Disadvantages for these types of tanks are that they are expensive and require a specialized contractor for installation.

The estimated project cost for this alternative is between $3,907,000 – $4,389,000 depending in when the second reservoir is constructed (2025 or 2035). These estimates include contingency (30%), Washington State Sales Tax (9.0%), project design and construction management (25%), and project administration and permitting (5%). A budgetary cost estimate for this alternative is provided in Appendix A.

EXISTING CCB

Regardless of which, if any, of the options above are pursued, the District must also decide on modifications to the existing CCB. While implementation of these modifications is outside the scope of the current project, it is important to understand what options are available and their future capital costs, and operational cost impacts.

We have identified four alternatives for existing CCB modifications below for District consideration.

CCB Alternatives

Alternative CCB1 – Convert CCB to a Backwash Recycle Tank

Alternative CCB1 would convert the existing CCB into a filter backwash recycle tank. This conversion would help the District optimize use of their existing water right(s) and would minimize water sent to the wastewater system. Under normal operations, each filter is backwashed once per day, which generates approximately 59,000 gallons of wastewater. This wastewater is then pumped/drained to the City of Bellingham (City) Wastewater Treatment Plant via the District's gravity conveyance system and associated lift stations.

Because the District pays a fee to the City for wastewater treatment (per gallon), and because operation of the District lift stations incurs additional electrical, operational, and maintenance costs, reducing the volume of water sent to the City for treatment will reduce the District's annual operating costs.

The backwash recycle tank would accept filter backwash and provide a quiescent environment to allow filtered particles to settle to the bottom of the tank, leaving clear supernatant water above. This clear supernatant water can then be refiltered and sent to the distribution system. Sediments and/or filter media collected in the tank would accumulate and would be removed by the District as part of a regular maintenance program (usually every 6 to 12 months) depending on sediment loading. These sediments would then be deposited to the wastewater collection system for additional treatment and removal, or could be deposited at an offsite waste handling facility.

To convert the existing CCB, the tank would need to be removed from service and both the interior and exterior surfaces should be cleaned, prepared, and coated. The existing interior baffles would be removed, and the existing inlet and outlet piping would be reconfigured to accommodate the new backwash water composition. The District could consider completing seismic upgrades to the tank as well; however, these seismic upgrades are not as critical because the tank will not be necessary for WTP operation.

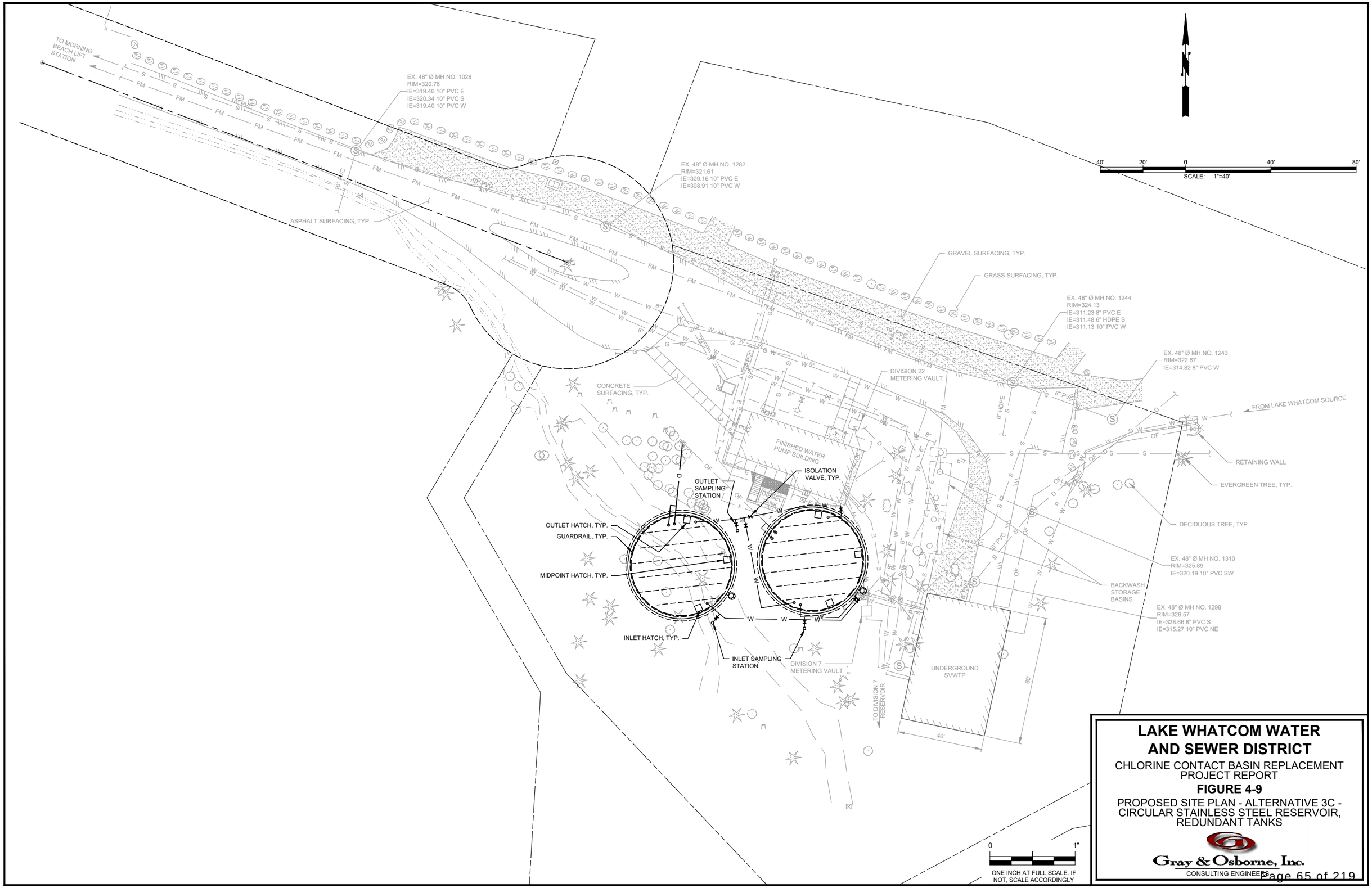

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FIGURE 4-9

PROPOSED SITE PLAN - ALTERNATIVE 3C - CIRCULAR STAINLESS STEEL RESERVOIR, REDUNDANT TANKS

Gray & Osborne, Inc.
CONSULTING ENGINEERS

Advantages of Alternative CCB1 are that the District would reduce net wastewater generation, which would reduce overall operating costs. Additionally, the recycle tank would allow full utilization of the District's existing water right(s). A backwash recycle tank would also allow the District to backwash all four filters consecutively. Currently, filters are backwashed in order; however, WTP staff must wait for the existing backwash tank to empty before backwashing additional filters – a process that takes several hours. By utilizing the existing CCB as a backwash recycle tank, this wait time would be eliminated.

Disadvantages of this option are that the District would continue to operate without a redundant CCB. In the event that the new CCB needed to be removed from service, the backwash recycle tank could be converted back into a CCB; however, this process would take time and would require full cleaning of the tank, reinstallation of baffles, and disinfection. This basin could be used without baffles, but new CT calculations would be required and would be based off a significantly lower flow (ie. <700 gpm).

Alternative CCB2 – Utilize the Existing CCB as a Redundant/Supplemental Tank

Alternative CCB2 would utilize and maintain the existing CCB in usable condition as a redundant/supplemental CCB tank.

To utilize the existing CCB as a supplemental tank to provide additional finished water CT, the tank would need to be removed from service and both the interior and exterior surfaces should be cleaned, prepared, and coated. The District could also consider completing seismic upgrades to the tank as well; however, these seismic upgrades are not as critical because the tank will not be necessary for WTP operation. No modifications to the interior baffles and/or inlet/outlet piping would be required.

To utilize the existing CCB as a spare tank in the event that the new CCB must be removed from service, it should be removed from service, cleaned, and assessed. Local or spot coating failures should be addressed, and the District could consider completing seismic improvements.

Advantages of this option are that the tank would be ready to use quickly if needed. It would also provide the District with redundancy should either CCB need to be taken offline for service.

Disadvantages of this alternative include the high capital cost to rehabilitate the existing CCB with new coatings and seismic improvements. Additionally, the District will continue to discharge all backwash water to the wastewater collection system, and will continue to have operational times restricted by the small volume of the existing backwash water tank unless this issue is addressed by a separate capital improvement project.

Alternative CCB3 – Remove Existing CCB

Alternative CCB3 includes removal of the existing CCB. Under this alternative, the existing CCB would be demolished and the site would be restored for future use.

Advantages of this option are the relatively low capital cost, and the fact that the existing CCB footprint would then be available for other District projects.

Disadvantages of this alternative include continued discharge of all backwash water to the wastewater collection system, and continued restriction of operational times by the small volume of the existing backwash water tank unless this issue is addressed by a separate capital improvement project. Lastly, the District would continue to function with minimal operational flexibility should the new CCB need to be removed from service for repairs or maintenance.

Alternative CCB4 – No CCB Modifications

Option 4 includes no modifications to the existing CCB. The CCB would remain in place, but would not be utilized or maintained. With time, this would relegate the existing tank as unusable, and it would likely require extensive rehabilitation in order to be brought back into service.

Advantages of this option are the low capital cost.

Disadvantages of this alternative include continued discharge of all backwash water to the wastewater collection system, and continued restriction of operational times by the small volume of the existing backwash water tank unless this issue is addressed by a separate capital improvement project. Lastly, the District would continue to function with minimal operational flexibility should the new CCB need to be removed from service for repairs or maintenance.

Implementation of the District's preferred option to address future use or removal of the existing CCB is outside the scope of the current CCB replacement project; however, lifecycle costs relative to continuing WTP backwash for treatment by the City are provided for consideration.

CCB Option 1

TABLE 4-12

50-Year Life Cycle Backwash Water Analysis

Parameter	Cost[(1)]
Treatment Cost to City of Bellingham	$5,954,728
Power Cost to Puget Sound Energy	$1,977,074
Total	**$7,931,802**

(1) Cost is based on backwash water volume of 21,572,000 gallons.

TABLE 4-13

50-Year Life Cycle Impact to Sewer Lift Stations

Lift Station	Pump Hours	Pump Years
Afternoon Beach	51,362	5.9
Ranch House	44,942	5.1
Sudden Valley	39,948	4.6
Flat Car	16,342	1.9
Beaver	13,935	1.6

CHAPTER 5

PROJECT RECOMMENDATIONS AND DESIGN CRITERIA

INTRODUCTION

This chapter provides more specific information about the alternatives and provides recommendations and critical design criteria for the recommended alternative.

ALTERNATIVE SUMMARY AND RECOMMENDATIONS

SUMMARY AND ANALYSIS

Table 5-1 provides a summary and comparison for the alternatives discussed in Chapter 4.

TABLE 5-1

Project Alternative Summary

Alternative	Description	Volume[1]	Tank Cost	Project Cost	50-Year Life Cycle Cost[2]
1A	Concrete, Cylindrical	337,800	$965,000	$2,977,000	$2,070,500
1B	Concrete, Rectangular (1-Train)	222,860	$980,000	$3,007,000	$2,085,000
1C	Concrete, Rectangular (2-Train, 1,400 gpm)	382,020[3] 191,010[4]	$1,666,000	$4,482,000	$3,273,300
1D	Concrete, Rectangular (2-Train, 700 gpm)	222,860[3] 111,430[4]	$1,148,000	$3,515,000	$2,755,000
2	Glass Panel	306,150	$991,000	$3,029,000	$5,727,310
3A	Steel, Welded	337,800	$795,000	$2,630,000	$6,929,300
3B	304SS, Bolted (1-Tank)	327,080	$810,000	$2,659,000	$5,546,300
3C	304SS, Bolted (2-Tank)	432,380[5] 216,200[6]	$1,400,000 $1,615,000	$3,907,000 $4,389,000	$3,757,300 $4,088,400

(1) Usable storage volume below the tank overflow connection.
(2) Cost is for tank and foundation only and does not include other project components.
(3) With both trains in service.
(4) With single train in service.
(5) For construction of second tank in 2025. Similar for all values in this row.
(6) For construction of second tank in 2035. Similar for all values in this row.

Within Table 5-1, the Tank Cost column includes the cost of both the foundation and tank material, including installation/construction. Other project costs are included within the Project Cost column and include items such as site work, electrical, site security, additional piping and system connections, etc. In general, project components other than the foundation and tank material are all similar across all projects. As such, the cost of the tank is the primary driver for any differences in project costs.

Also, it is important to note that Alternatives 2, 3A, and 3B include an additional cost to account for a temporary CT system that would be required for the duration of time the proposed CCB is offline. For estimating purposes, this system includes approximately 1,450 linear feet of 36-inch diameter PVC piping. It is assumed that this piping will be installed at grade in the open field adjacent to the WTP, and assumes some costs for additional pumping accommodations that will be needed to continue service to both the Division 22 and Division 7 reservoirs that feed the distribution system. Temporary CT could also be provided through ultraviolet disinfection or even temporary storage facilities, but for the purposes of this exercise, the costs of these alternative disinfection techniques are assumed to be equal in cost, or more expensive.

Fifty-year life cycle costs were prepared using the following assumptions:

Alternatives 1A and 1B

- For years 0-25, assumes 1 hour per week for inspection, brush clearing, maintenance;
- For years 26-50, assumes 2 hours per week for inspection, brush clearing, maintenance;
- For years 0-25, every 5 years, assumes 80 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;
- For years 26-50, every 5 years, assumes 120 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;
- Assumes billing rate of $100 per manhour; and
- Assumes 2 percent inflation for years 0-25 and 3 percent inflation for years 25-50.

Alternatives 1C and 1D

- For years 0-25, assumes 2 hours per week for inspection, brush clearing, maintenance;
- For years 26-50, assumes 3 hours per week for inspection, brush clearing, maintenance;
- For years 0-25, every 5 years, assumes 160 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;
- For years 26-50, every 5 years, assumes 240 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;
- Assumes billing rate of $100 per manhour; and
- Assumes 2 percent inflation for years 0-25 and 3 percent inflation for years 25-50.

Alternative 2

- For years 0-25, assumes 1 hour per week for inspection, brush clearing, maintenance;
- For years 26-50, assumes 2 hours per week for inspection, brush clearing, maintenance;
- For years 0-25, every 5 years, assumes 40 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;
- For years 26-50, every 5 years, assumes 80 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;
- For years 0-50, every 20 years, assumes $100,000 to remove/repair existing seam and bolt sealant;
- Assumes billing rate of $100 per manhour;
- Assumes 2 percent inflation for years 0-25 and 3 percent inflation for years 25-50; and

- For years 0-50, every 20 years, assumes an additional $1,000,000 to furnish and install temporary CT system required during tank maintenance period.

Alternative 3A

- For years 0-25, assumes 1 hour per week for inspection, brush clearing, maintenance;
- For years 26-50, assumes 2 hours per week for inspection, brush clearing, maintenance;
- For years 0-25, every 5 years, assumes 40 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;
- For years 26-50, every 5 years, assumes 80 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;
- For years 0-50, every 25 years, assumes $350,000 to remove/repair coating system;
- Assumes billing rate of $100 per manhour;
- Assumes 2 percent inflation for years 0-25 and 3 percent inflation for years 25-50; and
- For years 0-50, every 25 years, assumes an additional $1,000,000 to furnish and install temporary CT system required during tank maintenance period.

Alternative 3B

- For years 0-25, assumes 1 hour per week for inspection, brush clearing, maintenance;
- For years 26-50, assumes 2 hours per week for inspection, brush clearing, maintenance;
- For years 0-25, every 5 years, assumes 40 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;

- For years 26-50, every 5 years, assumes 80 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;
- For years 0-50, every 20 years, assumes $100,000 to remove/repair existing seam and bolt sealant;
- Assumes 2 percent inflation for years 0-25 and 3 percent inflation for years 25-50;
- Assumes billing rate of $100 per manhour; and
- For years 0-50, every 20 years, assumes an additional $1,000,000 to furnish and install temporary CT system required during tank maintenance period.

Alternative 3C

The notes below were developed assuming that both new tanks would be constructed in 2025.

- For years 0-25, assumes 2 hours per week for inspection, brush clearing, maintenance;
- For years 26-50, assumes 3 hours per week for inspection, brush clearing, maintenance;
- For years 0-25, every 5 years, assumes 80 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;
- For years 26-50, every 5 years, assumes 160 hours for pressure washing. Assumes additional $25,000 for dive inspection, cleaning, and maintenance;
- For years 0-50, every 20 years, assumes $200,000 to remove/repair existing seam and bolt sealant;
- Assumes billing rate of $100 per manhour; and
- Assumes 2 percent inflation for years 0-25 and 3 percent inflation for years 25-50.

Alternative Selection

Table 5-2 provides a decision matrix and scoring for each of the alternatives. A summary of the scoring methodologies is provided below for each critical design criteria.

Lifecycle Cost

The alternative with the highest life-cycle cost is given the lowest score (1 point), while the alternatives with the lowest life-cycle costs are given the highest score (5 points). Scoring is then provided relative to the life-cycle cost between the highest and lowest value.

Redundancy

The alternatives that provide full and complete redundancy are given the highest scores (5 points), while alternatives that do not provide any redundancy are given the lowest scores (1 point). Alternatives that do not provide full redundancy, but that require minimal downtime or maintenance, or can be cleaned and inspected while in service are assigned 3 points.

Capital Cost

The alternative with the highest capital cost is given the lowest score (1 point), while the alternatives with the lowest capital costs are given the highest score (5 points). Scoring is then provided relative to the capital cost between the highest and lowest value.

Operational Impact

The alternative with the lowest impact to the WTP operations is given the highest score, while the alternative with the most significant impact to WTP operations is given the lowest score. Operational impact is measured by the accommodations needed to take the tank offline for maintenance and/or cleaning.

Aesthetics

Concrete alternatives are given the lowest aesthetic score, stainless steel alternatives are given the next highest score, and painted/glass fused alternatives are given the highest aesthetic score.

Adaptability

The alternatives that are most highly adaptable are given the highest score (5 points). The remaining alternatives are not adaptable and receive the lowest score (1 point). For this exercise, adaptable alternatives are those that can be repurposed for additional WTP

structures/storage in the future. Alternative 1C is given the highest score because it has the largest footprint.

TABLE 5-2

CCB Improvements Decision Matrix

Criteria	Factor	Alternative No.							
		1A	1B	1C	1D	2	3A	3B	3C
Lifecycle Cost	0.25	5	5	3	4	1	1	1	3
Redundancy	0.25	3	3	5	4	1	1	1	5
Capital Cost	0.20	3	3	1	2	3	5	5	1
Operational Impact	0.15	4	4	5	5	2	2	2	5
Aesthetics	0.10	2	3	3	3	5	5	4	4
Adaptability	0.05	1	4	5	5	1	1	1	1
Adjusted Score	-	3.45	3.70	3.50	3.70	1.95	2.35	2.25	3.40
Rank	-	4	1	3	1	8	6	7	5

RECOMMENDATIONS

Given the scoring shown in Table 5-2, Alternative 1B and Alternative 1D are the highest scoring alternatives. Either of these alternatives will provide a long-lasting, effective, and adaptable chlorine contact basin; however, only Alternative 1D provides redundancy commensurate with the potable water demand anticipated for the Sudden Valley and Geneva water systems. As such, we recommend that the District proceed with design and construction of Alternative 1D.

New CCB

A new, rectangular, concrete CCB as described in Alternative 1D will provide the desired redundancy, provide improved and more consistent disinfection performance, will simplify finished water pumping operations, will simplify the CT calculations, and will provide a foundation for any future WTP construction improvements including relocation.

As shown in Table 5-1, Alternative 1D has a relatively high capital cost when compared with the remaining alternatives; however, lifecycle costs are significantly lower than Alternatives 2 and 3. Although the overall lifecycle costs for Alternatives 1A and 1B are lower than Alternative 1D, these alternatives do not provide an equivalent level of redundancy.

Finished Water Pumping Electrical

In addition to the options described above for the existing CCB, the District may also wish to consider optimizing their treatment operations through installation of variable frequency drives (VFD) on their existing clearwell and finished water pumps. These VFDs would allow District staff to match incoming plant and filter flows to the discharge flows from both the clearwell and CCB. This equipment would help simplify CT calculations, would reduce pump cycling, and should reduce energy consumption by matching the pump motor speed to only what is needed to maintain system operation.

These electrical upgrades could be completed with any new CCB project, or could be completed as a separate, stand-alone project. This replacement would require significant coordination and phasing during replacement as the WTP may need to facilitate several shut-down periods. It may be beneficial to complete this work during the winter months when demand for water is typically lowest.

At this point in time, the District is planning for upgrades to the finished water pumps to be completed in 2028, and upgrades to the clearwell transfer pumps to be completed in 2030.

PROJECT DESIGN CRITERIA

RESERVOIR DESIGN CRITERIA

Design criteria for the proposed CCB are highlighted in Table 5-3. The dimensions for the proposed CCB are recommended in order to minimize water column height, optimize cross sectional velocity through the channels, and to provide a lower structure which will reduce the amount of site work needed to help ensure easy vehicle access the top of the future CCB. The dimensions are preliminary at this stage of the project, but were selected based on the available space of the area west of the existing CCB. The structure was designed for flows up to 1,400 gpm with both trains in service, and for flows up to 700 gpm with one train in service - all at normal chlorine residuals. For flows above 700 gpm with one train in service, it is assumed that additional chlorine could be added. Lastly, it was assumed that any cleaning/maintenance that will remove one train from service could be scheduled for time periods where water demand is low (i.e., winter months).

TABLE 5-3

Recommended Alterative Design Criteria Summary

Parameter	Value
Type	Rectangular
Material	Concrete
Width (feet)(1)	32.0
Length (feet)(1)	50.0
Depth(1)	22.0
Base Elevation (feet)	336.0
Overflow Elevation (feet)	356.0
Overflow Height (feet)	20.0
Operating Water Height (feet)	19.0
Operating Water Volume (gallons)(2)	222,860 (2-Trains) 111,430 (1-Train)
Gallons per foot	11,729 (2-Train) 5,864 (1-Train)
Inlet and Outlet Configuration	Perforated Riser
Effluent Level Control	Downward Opening Weir Gate
Equalization Basin Volume	24,500 gallons(4)
Baffle Configuration	8-Channel, 7 baffles (2-Train) 4-Channel, 3 baffles (1-Train)
Baffling Efficiency	0.6 (700 gpm)(3) 0.72 (1,400 gpm)(3)

(1) Interior dimension.
(2) Volume of water at the operating water height.
(3) Must be verified via tracer study after project completion.
(4) At "Pump On" setpoint.

RESERVOIR SITE DESIGN

A proposed site plan for the recommended alternative was provided in Figure 4-4.

Grading and Earthwork

For this project, the new tank will require additional site grading. A large area must be cleared to provide space for the new tank, piping, and vehicle access road.

Grading is particularly critical at this site because of the large hill and steep slopes that are immediately south of the WTP. Atop this slope is a residential neighborhood, and this project should include significant geotechnical investigation to confirm that the project can be constructed in this area without disrupting these residences.

Additionally, it is important to note that Whatcom County has a limited construction window for ground disturbing activities within the Lake Whatcom watershed. These time periods must be considered when bidding and sequencing the construction of the project.

Vehicle Access

As part of the grading that will occur as described above, a new vehicle access road will be constructed allowing access to, and around the new CCB. The road will be 12 feet wide, asphalt pavement or gravel surfacing, and will begin from Morning Beach Drive and continue southeast around the tank.

Site Stormwater

This project will create new impervious surface and new pollution generating impervious surfaces, both of which will require stormwater mitigation. The specific stormwater mitigation facilities are dependent on the final area of new and replaced impervious surfaces, but new components are likely to include both flow control and treatment facilities.

The existing site does appear to include a drainage ditch that runs along the bottom of the slope. This ditch is dry during the summer months and helps divert any drainage water away from the site. This ditch will need to be restructured as part of the site development plan.

As part of the geotechnical study that will be completed for the project, we recommend completion of an infiltration test at the site to gauge the feasibility of stormwater infiltration. If infiltration is feasible, it can significantly reduce the cost of any required stormwater facilities.

Additionally, G&O will prepare a Stormwater Technical Information Report (TIR) to highlight the stormwater requirements, provide information on modelling assumptions and parameters, describe the level and type of mitigation that is required, and to highlight how the design of the project will address these requirements.

Geotechnical Considerations

A formal geotechnical analysis has not been completed at the site at this point in time. The most recent geotechnical analysis was completed by Cascade Geotechnical Inc. in 1992. While the large scale geology of the site has not likely changed since this analysis, localized changes and/or a current status of the existing hillside should be considered with regards to current building codes and the District's current level of risk tolerance.

G&O plans to enlist PanGEO, Inc., a local geotechnical engineering consultant, to complete a formal geotechnical analysis for the site as part of the project design phase.

Once the District has selected a tank material, size, and location, PanGEO will complete their work which includes a review of previous work, geotechnical borings, sample collection/analysis, and a summary report that will highlight design and seismic code parameters. These key design parameters will then be transmitted to the tank manufacturer and/or structural engineer prior to tank design. The report will also address the stability of the hillside and the potential need for any hillside stabilization and/or retaining walls.

Site Hazard Considerations

Current site hazards include geotechnical instability of the hillside and security from damage/vandalism from the public.

Geotechnical considerations for the adjacent hillside will be addressed during the geotechnical investigation described above.

Site security issues will be address during project design and will include installation of fencing, restricted access gates, and infrastructure that can support video surveillance, if desired.

RESERVOIR STRUCTURAL DESIGN CONSIDERATIONS

The proposed CCB will be built in accordance with the 2021 International Building Code, and will be designed for all current seismic, wind, and snow loads for our region. The structure will contain metal reinforcement and will be designed to accommodate future water treatment filters and other WTP facilities atop the lid, if desired. In this way, the District will have the option to expand existing WTP operations to a new building if desired.

Figures 5-1 and 5-2 provide a plan and section view of the proposed CCB, respectively.

CCB INLET/OUTLET PIPING

Inlet and outlet piping will be ductile iron or stainless steel materials, and each pipe will protrude through the CCB slab. From this point, a perforated inlet riser will be assembled in order to facilitate even flow across the full operating water height.

Outlet piping will be located within the equalization basin and will protrude slightly through the basin floor. From here, the floor will be sloped to the corners with grout to provide a full draining basin.

Inlet and outlet piping will also contain sampling station connections to allow for sampling and analysis. These stations will be above grade and prefabricated by the manufacturer to facilitate easy installation. An example of these stations is Kupferle

Eclipse 88-SS. These stations will greatly simplify sample collection and completion of the CCB tracer study that will be conducted to verify the basin's baffling efficiency.

CT CONSIDERATIONS

Given the dimensions stated above for the proposed CCB, CT calculations are summarized in Table 5-4.

TABLE 5-4

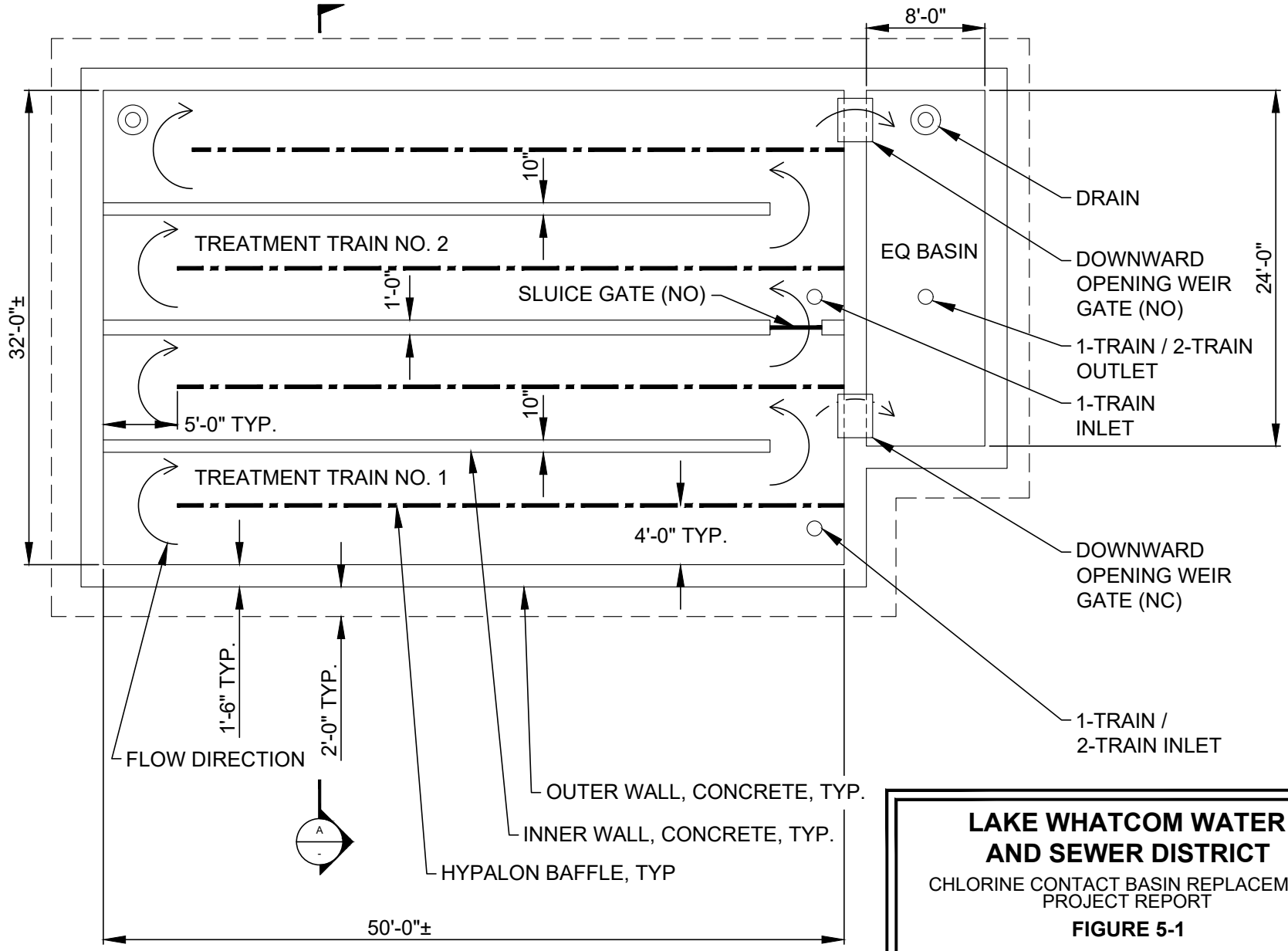
Recommended Alternative CT Analysis Summary

Flow (gpm)	Operating Volume (gal)	Operating Depth (ft)	Baffling Efficiency, BE	Contact Time, T (min)	Chlorine Residual (mg/L)	CT Provided	CT Required	Inactivation Ratio
Normal Operations (2-Train)								
700	222,860	19	0.6	191.0	0.7	133.7	60	2.23
800				167.1	0.7	117.0	60	1.95
900				148.6	0.7	104.0	60	1.73
1,000				133.7	0.7	93.6	60	1.56
1,100				121.6	0.7	85.1	60	1.42
1,200				111.4	0.7	78.0	60	1.30
1,300				102.9	0.7	72.0	60	1.20
1,400				95.5	0.7	66.9	60	1.11
Temporary Operations (1-Train)								
700	111,430	19	0.6	95.5	0.7	66.9	60	1.11
800				83.6	*0.7*	58.5	*60*	*0.98*
900				74.3	*0.7*	52.0	*60*	*0.87*
1,000				66.9	*0.7*	46.8	*60*	*0.78*
1,100				60.8	*0.7*	42.5	*60*	*0.71*
1,200				55.7	*0.7*	39.0	*60*	*0.65*
1,300				51.4	*0.7*	36.0	*60*	*0.60*
1,400				47.8	*0.7*	33.4	*60*	*0.56*

Table 5-4 shows that with 2 trains operating, the proposed CCB can meet the CT requirements for flows up to 1,400 with a chlorine residual of 0.7 mg/L. In the event that 1 train must be taken offline and the WTP is forced to operate with only 1 train in service, the CCB can meet the CT requirements for flows up to approximately 780 gpm. During time periods where 1 train must be offline, the District may utilize one of the following options:

1. Limit WTP flows to 780 gpm, which can easily be accomplished during the winter months when demand for water is low;

2. If flows above 780 gpm are required, the District may increase the chlorine residual. To accommodate flows up to 1,400 gpm, the District would need to increase the chlorine residual to approximately 1.3 mg/L.



5' 2.5' 0 5' 10'
SCALE: 1"=5'

0 1"
ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

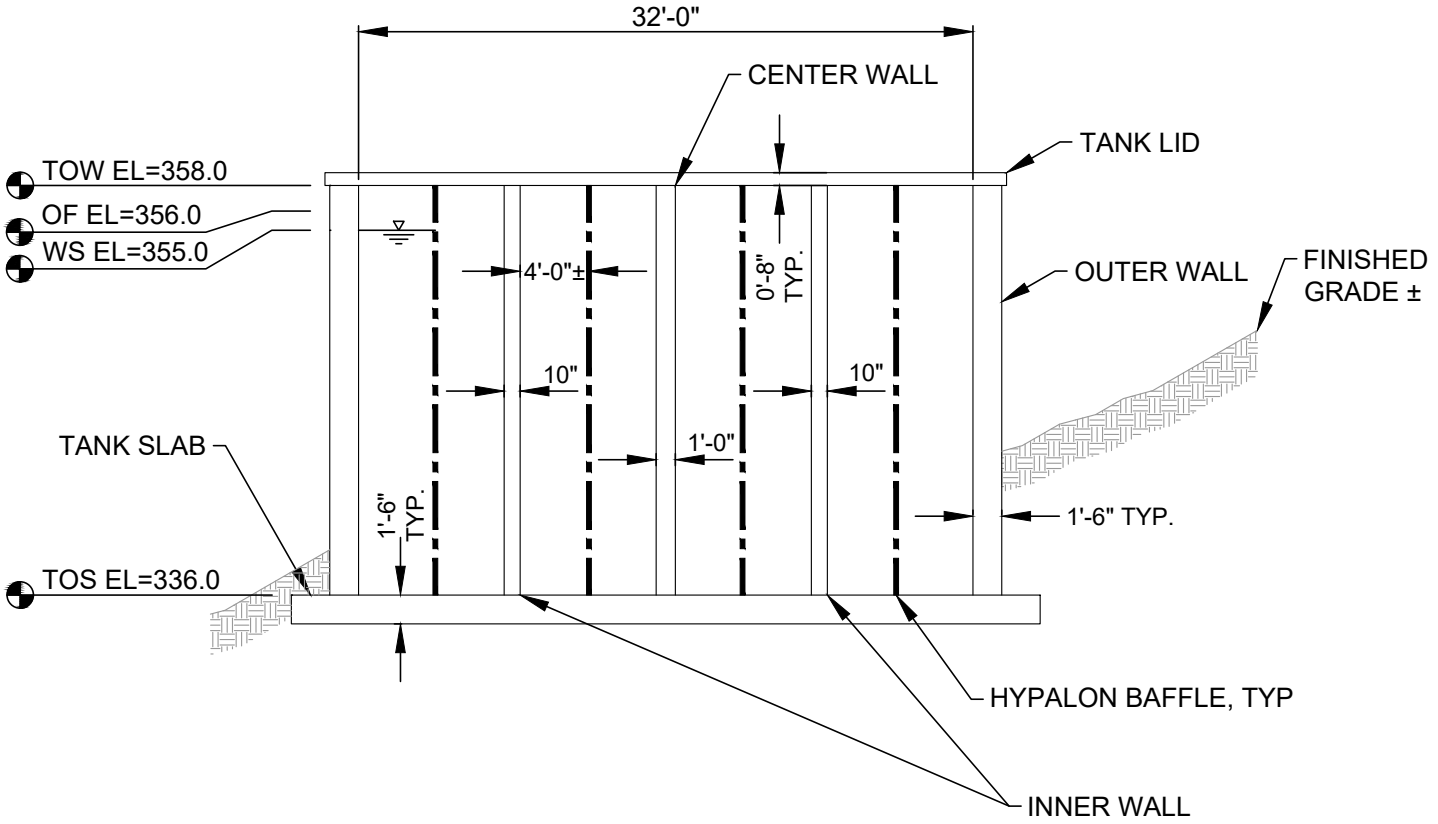
LAKE WHATCOM WATER AND SEWER DISTRICT

CHLORINE CONTACT BASIN REPLACEMENT PROJECT REPORT

FIGURE 5-1

PROPOSED CCB PLAN (ALTERNATIVE 1D)

Gray & Osborne, Inc.
CONSULTING ENGINEERS



SECTION A

SCALE: 1"=5'-0"

5' 2.5' 0 5' 10'
SCALE: 1"=5'

0 1"
ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

LAKE WHATCOM WATER AND SEWER DISTRICT

CHLORINE CONTACT BASIN REPLACEMENT PROJECT REPORT

FIGURE 5-2

PROPOSED CCB SECTION

Gray & Osborne, Inc.
CONSULTING ENGINEERS

Because the District will be required to update their CT calculations after completion and testing of the new CCB, we also recommend that they update the calculations to include credit from the Clearwell, piping between the Clearwell and the CCB, the CCB, and the proposed Equalization Basin. These updated calculations will represent the most accurate depiction of the CT provided by the WTP. If the CT calculations are updated as described above, it will increase the allowable flow through the CCB with 1 train in service up to approximately 850 gpm.

Lastly, it is important to note that a tracer study will be required for the new CCB to validate the baffling efficiency. A tracer study was previously completed at the WTP in 2016 and 2017. Prior to completion of the study, DOH will review and approve the protocols for the study. DOH will also review and comment on the tracer study analysis report that summarizes the findings and documents the recommended CT calculations for the WTP. The 2 to 4 day study will have minimal impact on treatment operations, and will be coordinated with WTP staff prior to execution.

SEISMIC PIPING CONNECTIONS

Inlet and outlet piping connections will include specialty fittings that will allow for ground settlement. These "flexible" fittings can accommodate up to 12 inches of settlement and will be selected based on the findings of the geotechnical report.

In addition to these fittings, earthquake valves will also be installed. These valves sense a significant drop in pressure, or high flows from the tank – both of which indicate a significant main break. If these conditions are detected, the valve will close to save as much water as possible in the event it is needed for an emergency. The valve can then be reopened by staff after the situation has been remedied.

INLET/OUTLET DRAIN VAULTS

For piping leading into and out of the tank, valves and other appurtenances will be installed within concrete vaults to provide easy access for maintenance. Vaults will be provided with clamshell style hatches to facilitate component replacement. Vaults will also include sumps with drains and access ladders.

OVERFLOW

The overflow pipe will be sized to drain the maximum flow to the CCB and will discharge to the existing wastewater collection system. Piping will likely be 8-inch or 12-inch ductile iron or stainless steel materials. Overflow piping for the new CCB will connect to the tank drain piping, which will in turn connect to the existing CCB drain piping as described below.

DRAIN

The CCB drain pipe will be sized to drain the maximum flow to the CCB and will discharge to the existing CCB drain piping. The existing piping connects the existing CCB to the wastewater conveyance system via a large air gap located west of the existing Finished Water Pump Building. This water eventually flows by gravity to the Afternoon Beach Lift Station. Piping will be 6-inch or 8-inch diameter ductile iron or stainless steel materials. Drain piping will be equipped with an isolation valve located within a concrete vault.

VENT

A screened vent will be provided to allow air exchanges upon filling and drawing down the CCB. The vent will be sized to prevent roof damage during rapid air withdrawal in case of catastrophic main break.

Because additional site security fencing will be installed on this project the CCB vent will be a non-security type unit.

ACCESS

Access to the base of the tank will be provided by a paved path around the full perimeter of the tank. The path will be 12 to 16 feet wide to allow for vehicle travel.

Access to the top of the tank will be provided using ladders and/or ramps built to grade.

If desired, and based on final lid elevation for the CCB, access to the top of the tank will be provided via ladder. The ladder will be affixed to the sidewall of the tank and will include a safety cage, fall protection system, and ladder guard security panel. The fall protection system will include both a harness restraint system and “Ladder Up” safety post at the top of the ladder.

HATCHES

Hatches are provided at basins to allow for inspection, access to the tank interior, sampling, and access to instrumentation. Rooftop hatches are typically corrosion resistant materials and include shrouds to prevent rainwater intrusion and security devices to prevent unauthorized access.

The proposed CCB will include up to six rooftop hatches. Hatches will be located at the inlet, outlet, and midpoint of each CT train, and other locations as desired by the District. Each hatch will be 36" x 36", and will be aluminum or stainless steel materials. Hatches will be raised above grade and will be installed with gaskets and shrouds to prevent entry of rainwater or bugs. Hatches will also include padlock hasps.

RAIN GUTTERS AND DOWNSPOUTS

No rain gutters or downspouts will be provided for the proposed CCB.

WATER LEVEL INDICATION

Water level measurement will be provided by in-situ sensors and transmitters located within the tank. These could be either ultrasonic level sensors or submersible pressure transmitters.

The proposed CCB will include at least two sensors (one per treatment train), and at least one sensor within the equalization basin. For the treatment trains, these two sensors will provide redundancy for the system. For the equalization basin, the District could also consider installing a redundant sensor.

The tank will also include a water level indicator mounted to the exterior of the tank.

SAMPLING STATIONS

As described in the inlet/outliet piping section, sampling stations will be included to this project. These stations will be located above grade, and will allow sampling of inlet and outlet water for either mode of operation (1-train or 2 train).

COATING

No coatings are proposed for the CCB. The District could consider coating or staining the CCB if desired, but this would increase capital costs and life-cycle costs if additional coatings are provided after 20-30 years.

CATHODIC PROTECTION

Cathodic protection can be used on steel reservoirs to extend the expected life of reservoir coating systems. With well-applied, modern reservoir coating systems, cathodic protection systems do not provide significant benefit during the first few years of reservoir service.

Because the proposed CCB is concrete construction, cathodic protection will not be utilized.

SYSTEM CONTROL

System control will be provided via the WTPs existing Programmable Logic Controller (PLC) and SCADA system, and will utilize the new instrumentation described previously.

Water level will be maintained at a constant level within the CCB via two downward opening weir gates. These gates will be at the tail end of each treatment train as shown in Figure 5-1, and will be set at the desired operating height. If two treatment trains are being utilized, the gate at the end of train 1 will be raised completely. Water will then proceed through the full flow path, over the gate at the end of Train 2, and into the equalization basin. Utilizing these types of gates in this fashion will ensure a constant water level within the CCB, which greatly simplifies the WTPs CT calculations and helps ensure consistent CT performance. If either train must be removed from service, the sluice gate and downward opening weir gates shown in Figure 5-1 will be adjusted as needed to facilitate the desired operation.

Operationally, the raw water pumps will move water from the WTP intake, through the filters, and into the clearwell at a constant rate as desired by the operations staff. The clearwell pumps will then move water from the clearwell through the CCB at a constant rate. This rate will be manually adjusted during the startup and commissioning phase to approximately equal the rate of flow from the equalization basin achieved by the finished water pumps. If at any time, the water level in the clearwell or equalization basin reaches a user-adjustable low setpoint, the corresponding pumps will de-energize. These pumps will then restart automatically when the water level in the clearwell and/or CCB reaches the appropriate starting level.

The type of operational control described above will be required until the finished water and clearwell transfer pumps/motor starters are replaced with variable frequency drive motor starters. These replacement projects are currently scheduled to take place in 2028 (finished water pumps) and 2030 (clearwell transfer pumps). After these units are replaced, the clearwell pumps will then move water from the clearwell through the CCB at a variable rate, as required in order to maintain a relatively constant water level within the clearwell. The finished water pumps will then pump water from the equalization basin to their respective distribution system reservoirs at a variable rate as required in order to maintain a relatively constant water level within the equalization basin.

ELECTRICAL AND TELEMETRY

Electrical

The WTP has sufficient electrical service capacity for the proposed instrumentation and the existing electrical service will be reused. No significant electrical loads are proposed as part of this project.

Telemetry

No significant changes are proposed to controls, operation, or telemetry system as a result of this project. The District will continue to operate and monitor the WTP and all associated equipment per their current standards and protocols.

Modifications to the existing SCADA system will be required to accommodate the new instruments and modified control scheme. A control narrative will be included as part of the project design and will be enacted by the District's preferred system integrator/programmer.

TRANSMISSION MAIN

No modifications will be made to the existing transmission mains or distribution system.

STARTUP AND TESTING

A startup and testing plan will be required as part of the construction document package. The general contractor must provide a plan for component and system startup, and will be required to operate the facility under normal operating conditions, in conjunction with District staff, for a period of 7 to 21 calendar days. Individual systems may be tested after installation; however, the complete system may not be commissioned until all systems are operational and the project has been deemed substantially complete by the Owner and/or their engineer. The startup plan must include key information such as contact information for the equipment representatives, a contingency plan in the event of failures such as leaks, power failures, etc., design flows and operational parameters. Furthermore, the technical performance specifications for each critical piece of equipment will require that a trained representative is present during system startup.

Prior to startup, all components and/or equipment in contact with finished water will be disinfected in accordance with AWWA and DOH regulations. Testing will be provided by the contractor and results will be provided to the District and/or Engineer for review prior to system connection/startup. No water will be sent to the distribution system until the components have been thoroughly disinfected and satisfactory testing results have been obtained.

The tank will be leak tested under the supervision of the tank manufacturer. For this, all drains and outlets will be closed, and water will be transferred to the tank using the clearwell transfer pumps. Testing will proceed in accordance with Hydraulic Institute Standards. Any leaks will be immediately addressed by the Contractor.

OPERATION AND MAINTENANCE

It is not anticipated that operational and/or maintenance activities will change as a result of this project.

Pumping equipment, instrumentation, chemical dosing equipment, and electrical equipment will continue to be maintained in accordance with the manufacturer's recommendations, or as required. The District maintains a full operational staff and the facility is regularly tested, inspected, and cleaned to maintain its operation.

New equipment will be added to the District's regular maintenance schedule, which includes both preventive and restorative maintenance procedures.

STAFFING

This project does not add any additional treatment or monitoring requirements. As such, the District should be able to accommodate operation and maintenance of the proposed facility with their existing staff and no new FTEs are required to serve this project.

The District currently maintains a full staff of employees and water system specialists with a range of operator and water distribution system certifications that will operate and maintain the facility.

RELIABILITY

As previously discussed, Alternative 1C provides full and complete redundancy for water treatment operations. With the exception of a catastrophic failure of the CCB, there is no condition in which both trains of the CCB must be taken offline.

SAMPLING AND MONITORING

This project does not affect sampling and monitoring requirements for this facility. The District will continue to continuously monitor chlorine residual, pH, and temperature prior to entry into the distribution system.

As described previously, CCB inlet and outlet sampling stations will be installed. If desired by the District, or as directed by DOH, the project could also include hard-piped sampling connections from the CCB inlet and outlet piping that discharge within the existing WTP. This would allow for continuous and convenient monitoring of water both prior to and after disinfection.

The existing water service to the chlorine building will not be modified as part of this project.

PERMITTING AND REGULATORY CONSIDERATIONS

WASHINGTON STATE DEPARTMENT OF HEALTH

Per WAC 246-290-110, a Project Report must be submitted to the Washington State Department of Health (DOH) for any modification or addition to a water system. This report is intended to fulfill the requirements of WAC 246-290-110.

Per WAC 246-290-120, Construction Documents must be submitted to DOH for review and approval prior to constructing modifications or additions to a water system. Plans and specifications will be submitted prior to beginning construction of the project.

After construction completion, a Project Construction Completion Report must be submitted to DOH for review and filing.

STATE ENVIRONMENTAL POLICY ACT (SEPA)

Per RCW 43.21C and WAC 197-111, all government agencies must consider the environmental impacts of a proposed project. The District has elected to act as lead agency for the SEPA review and notification process. A SEPA checklist and supporting documentation have been prepared for this project and are included in Appendix A. Additional SEPA documentation will be provided as required by the associated permitting agencies, and may include a landscaping plan, site plan, and/or stormwater plan.

WHATCOM COUNTY

The facility is located outside of City of Bellingham city limits, but is within Whatcom County. As such, Whatcom County will serve as the primary permitting agency. At the 30 percent design level, the District will coordinate a pre-application meeting with Whatcom County permitting officials to discuss the permits necessary and the submittal requirements for these permits.

At this point in time, we anticipate that the following Whatcom County permits will be necessary:

- Building permit
- Site grading/development permit
- Stormwater permit

Ideally, these permits will be procured by the District and provided to the Contractor as part of the bidding documentation. However, if this is not feasible, the Contractor may be tasked with finalizing the building permits, which will be paid for by the District.

County permitting procedures can require many months to complete. As such, we highly recommend the District conduct a pre-application meeting with County staff, and also conduct regular (e.g., monthly) meetings to ensure the project is permitted and can continue according to the desired schedule.

CONSTRUCTION PERMITTING

As part of the construction process, additional electrical and plumbing permits will also be required. These permits will be acquired by the Contractor who is selected to complete the construction work.

PROJECT COST

The proposed facility improvements are estimated to cost $3,730,000, which includes construction, design, contingency, sales tax, permits, and construction management. A preliminary project cost estimate is provided in Appendix B.

PROJECT FUNDING

The District has received funds for the project through the Federal Emergency Management Agency (FEMA) Grant No. D24-048-Revised. Additional funds needed for project completion will be provided by the District.

PROJECT SCHEDULE

A milestone schedule for completion of the project is provided below. This schedule is subject to change based on agency review periods, changes in design scope, construction timing, availability of funding, and other factors.

Project Report to DOH	January 2025
DOH Review Comments to District	March 2025
Completion of 30 Percent Design	April 2025
Whatcom County Pre-Application Meeting	May 2025
Completion of 60 Percent Design	July 2025
Completion of 90 Percent Design	September 2025
Construction Plans to DOH	September 2025
Project Advertisement	November 2025
Project Award	December 2025
Project Construction	April 2026 – January 2027
Project Closeout	February 2027

APPENDIX A

DRAFT SEPA CHECKLIST

SEPA[1] Environmental Checklist

Purpose of checklist

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization, or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. **You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown.** You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to **all parts of your proposal**, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for lead agencies

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B, plus the Supplemental Sheet for Nonproject Actions (Part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in "Part B: Environmental Elements" that do not contribute meaningfully to the analysis of the proposal.

[1] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/Checklist-guidance

A.Background

Find help answering background questions[2]

1. **Name of proposed project, if applicable:**

   Lake Whatcom Water & Sewer District CCB Replacement Project

2. **Name of applicant:**

   Lake Whatcom Water & Sewer District

3. **Address and phone number of applicant and contact person:**

   Greg Nicoll, P.E., District Engineer, Lake Whatcom Water & Sewer District

   Greg.nicoll@lwwsd.org

   360-734-9224

4. **Date checklist prepared:**

   12/26/24

5. **Agency requesting checklist:**

   Whatcom County

6. **Proposed timing of schedule (including phasing, if applicable):**

   Pre-Design, 2024

   Design & Permitting, 2025

   Construction, Startup, & Testing, 2026

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

   None at this time.

8. **List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.**

   Project will include a full geotechnical investigation, to be completed in 2025.

9. **Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.**

   None known at this time.

10. **List any government approvals or permits that will be needed for your proposal, if known.**

    Whatcom County Building Permit.

[2] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-A-Background

11. **Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)**

    The District proposed to construct a new chlorine contact basin for disinfection of potable water prior to entry into the distribution system. The project will also include associated site work, electrical work, and mechanical/piping work.

12. **Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.**

    Sudden Valley Water Treatment Plant

    25 Morning Beach Drive

    Bellingham, WA 98229

    Latitude: 48°43'1.52"N

    Longitude: 122°19'1.80"W

B.Environmental Elements

1. Earth

Find help answering earth questions[3]

a. **General description of the site:**

    The site is a mix of flat, open grass area and steep timbered hillside.

Circle or highlight one: Flat, rolling, hilly, steep slopes, mountainous, other:

b. **What is the steepest slope on the site (approximate percent slope)?**

    Approximately 40% slope

[3] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-b-environmental-elements/environmental-elements-earth

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them, and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

In 1992, soils generally consisted of uncontrolled fill overlying old colluvium. Uncontrolled fill appeared to be soil that had been disturbed, possibly during past logging operations. The site lies in an area mapped as the Chuckanut Formation. Each test pit consisted of brown silty sand/sandy silt with roots and minor to some moist to wet gravel. Pockets of blue clay and clasts of sandstone were also noted.

Additional geotechnical investigation will be completed in 2025.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

None visible.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Approximately 3,000 square feet will be impacted as part of this project.

f. Could erosion occur because of clearing, construction, or use? If so, generally describe.

Erosion could occur; however, construction will include appropriate TESC measures to reduce/eliminate erosion. This will include straw, straw wattle, silt fence, plastic covers, and/or catch basin inserts.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Approximately 20 percent of the site will be covered after completion of the project.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any.

Construction will include appropriate TESC measures to reduce/eliminate erosion. This will include straw, straw wattle, silt fence, plastic covers, and/or catch basin inserts.

2. Air

Find help answering air questions[4]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Air quality will be impacted by exhaust from construction vehicles. No other impacts are anticipated. Impacts to air quality will be mitigated by not idling construction vehicles when not in use.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

None known at this time.

c.

d. Proposed measures to reduce or control emissions or other impacts to air, if any:

Impacts to air quality will be mitigated by not idling construction vehicles when not in use.

3. Water

Find help answering water questions[5]

a. Surface:

Find help answering surface water questions[6]

1. Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Lake Whatcom is adjacent to the project site, and lies approximately 350 feet to the east. Many rivers, streams, creeks, and other similar water bodies flow into and out of Lake Whatcom.

2. Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No. All work will occur outside of the area described above.

[4] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-Air
[5] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-3-Water
[6] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-3-Water/Environmental-elements-Surface-water

3. **Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.**

   None anticipated at this time.

4. **Will the proposal require surface water withdrawals or diversions? Give a general description, purpose, and approximate quantities if known.**

   No, the project will not require withdrawals or diversions.

5. **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

   No, the project lies outside the 100-year floodplain.

6. **Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

   No discharges to surface waters are anticipated.

b. Ground:

Find help answering ground water questions[7]

1. **Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give a general description, purpose, and approximate quantities if known.**

   No groundwater extraction is anticipated as part of this project.

2. **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (domestic sewage; industrial, containing the following chemicals…; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

   No septic tank waste disposal is anticipated as part of this project.

[7] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-3-Water/Environmental-elements-Groundwater

c. Water Runoff (including stormwater):

1. **Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

   Water runoff will be from new impervious surfacing, including both concrete and asphalt pavement surfaces. Runoff from concrete will sheet flow to adjacent grade. Runoff from asphalt pavement will be collected, detained, treated, and released onsite.

2. **Could waste materials enter ground or surface waters? If so, generally describe.**

   Waste materials are not anticipated to enter surface waters.

3. **Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.**

   Natural drainage patters will not be affected by this project.

e. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

Runoff from concrete will sheet flow to adjacent grade. Runoff from asphalt pavement will be collected, detained, treated, and released onsite.

4. Plants

Find help answering plants questions

a. Check the types of vegetation found on the site:

☒ **deciduous tree: alder, maple, aspen, other**

☒ **evergreen tree: fir, cedar, pine, other**

☒ **shrubs**

☒ **grass**

☐ **pasture**

☐ **crop or grain**

☐ **orchards, vineyards, or other permanent crops.**

☐ **wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other**

☐ **water plants: water lily, eelgrass, milfoil, other**

☐ **other types of vegetation**

b. What kind and amount of vegetation will be removed or altered?

Evergreen and deciduous trees will be removed as part of this project. Approximately 30-50 trees, ranging in size from 2-inch caliper to 18-inch caliper will be removed. Various wild shrubs and groundcover will also be removed.

c. List threatened and endangered species known to be on or near the site.

See Section 5 below.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any.

There is no new landscaping proposed as part of this project.

e. List all noxious weeds and invasive species known to be on or near the site.

There are several noxious weeks listed for Whatcom County. They are available for viewing at:

https://search.yahoo.com/yhs/search/?hspart=pty&hsimp=yhsbrowser_wavebrowser&grd=1&param2=57c00030-3be9-44bd-8b2c-7af210403134&param3=wav~US~appfocus1~&param4=igwtsNpqRFjUKEUXascfA-lp0-bb6-brwsr-obx~Chrome~Whatcom+County+Noxious+weeds+list~B2D7D7656EB4E5153688637C8FBF7B49~Win10&param1=20230901&p=Whatcom+County+Noxious+weeds+list&type=A1-brwsr-~2023-35~

5. Animals

Find help answering animal questions[8]

a. List any birds and other animals that have been observed on or near the site or are known to be on or near the site.

Examples include:

- **Birds: hawk, heron, eagle, songbirds, other:**
- **Mammals: deer, bear, elk, beaver, other:**
- **Fish: bass, salmon, trout, herring, shellfish, other:**

b. List any threatened and endangered species known to be on or near the site.

- North American Wolverine
- Marbled Murrelet
- Yellow Billed Cuckoo
- Bull Trout
- Dolly Varden
- Monarch Butterfly

[8] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-5-Animals

c. Is the site part of a migration route? If so, explain.

No.

d. Proposed measures to preserve or enhance wildlife, if any.

None proposed at this time.

e. List any invasive animal species known to be on or near the site.

None known at this time.

6. Energy and natural resources

Find help answering energy and natural resource questions[9]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Energy needs will not change and will be met by the site's existing electrical service.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

There would be no potential effect on solar facilities.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any.

None proposed at this time. Energy needs are extremely low.

7. Environmental health

Health Find help with answering environmental health questions[10]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur because of this proposal? If so, describe.

There are no additional health hazards introduced as a result of this project.

1. Describe any known or possible contamination at the site from present or past uses.

None known at this time.

2. Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

[9] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-6-Energy-natural-resou
[10] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-7-Environmental-health

None known at this time.

3. **Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.**

   Small volumes of diesel fuel may be stored onsite to fuel construction vehicles. After construction activities are complete, no new fuel or toxic material storage is proposed.

   Small volumes of chlorine gas are stored onsite and used for potable water disinfection. Volumes will not increase/decrease as a result of this project.

4. **Describe special emergency services that might be required.**

   None known at this time.

5. **Proposed measures to reduce or control environmental health hazards, if any.**

   Any diesel fuel utilized onsite will be stored within a secondary containment area to protect against spills.

b. Noise

1. **What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?**

   None known. Area is local access only, and very quiet.

2. **What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site)?**

   Noise generated would be from vehicles and equipment during construction. No additional long-term noise would be created.

3. **Proposed measures to reduce or control noise impacts, if any:**

   Construction activities will only be allowed during normal working hours (700AM – 500PM).

8. Land and shoreline use

Find help answering land and shoreline use questions[11]

a. **What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.**

   Currently, the site is used for water treatment activities. The proposed project will not alter this use.

[11] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-8-Land-shoreline-use

The adjacent site is a public access park and beach park. The proposed project will not alter or affect this use.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses because of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or non-forest use?

No, this site is not a farmland.

1. **Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how?**

   This project will not affect or be affected by adjacent farmland.

c. Describe any structures on the site.

The site is home to several existing structures. They include:

- Partially buried concrete treatment building
- Above grade, welded steel water storage tank
- Above grade, wood frame pump and electrical building

d. Will any structures be demolished? If so, what?

No structures will be demolished as part of this project.

e. What is the current zoning classification of the site?

Rural Community (RR3)

f. What is the current comprehensive plan designation of the site?

Rural Community

g. If applicable, what is the current shoreline master program designation of the site?

The site is outside of the shoreline master program designation. Nearby areas adjacent to Lake Whatcom are designated as “Conservation”.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

No people would reside in the project. Up to four persons would work in the completed project.

j. Approximately how many people would the completed project displace?

The project would not displace any people.

k. Proposed measures to avoid or reduce displacement impacts, if any.

Not applicable.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any.

None at this time.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

None at this time.

9. Housing

Find help answering housing questions[12]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

No housing units would be provided.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Not applicable.

c. Proposed measures to reduce or control housing impacts, if any:

None proposed at this time.

10. Aesthetics

Find help answering aesthetics questions[13]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The height of the proposed structure is 19 feet, some of which, may be buried depending on the final design. The proposed structure is concrete material.

b. What views in the immediate vicinity would be altered or obstructed?

No views would be altered by the project.

c. Proposed measures to reduce or control aesthetic impacts, if any:

None at this time.

[12] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-9-Housing
[13] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-10-Aesthetics

11. Light and glare

Find help answering light and glare questions[14]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

No glare or light will be produced by this project.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None at this time.

d. Proposed measures to reduce or control light and glare impacts, if any:

None at this time.

12. Recreation

Find help answering recreation questions

a. What designated and informal recreational opportunities are in the immediate vicinity?

Picnicking, beaching, water activities (kayaking, canoing, etc.) and other outdoor park activities are available in the vicinity.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No activities would be displaced.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None at this time.

13. Historic and cultural preservation

Find help answering historic and cultural preservation questions[15]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

[14] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-11-Light-glare
[15] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-13-Historic-cultural-p

None known at this time.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

None known at this time.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

None proposed at this time. The site has been previously disturbed by construction activities.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

None proposed at this time.

14. Transportation

Find help with answering transportation questions[16]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Morning Beach Drive is adjacent to the project location.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No, the site is not served by public transit.

c. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle, or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No, existing facilities will not require improvement.

d. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No, the project will not utilize these modes of transportation.

e. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of

[16] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-14-Transportation

the volume would be trucks (such as commercial and non-passenger vehicles). What data or transportation models were used to make these estimates?

No new vehicle trips will be created as a result of this project.

f. Will the proposal interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

The project will have no affect on these products.

g. Proposed measures to reduce or control transportation impacts, if any:

None at this time.

15. Public services

Find help answering public service questions[17]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No additional public services would be needed.

b. Proposed measures to reduce or control direct impacts on public services, if any.

None proposed at this time.

16. Utilities

Find help answering utilities questions[18]

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:

Electricity, gas, water, garbage, telephone, and sewer are available onsite.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

No new utilities are proposed for this project.

C.Signature

Find help about who should sign[19]

[17] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-b-environmental-elements/environmental-elements-15-public-services
[18] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-b-environmental-elements/environmental-elements-16-utilities
[19] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-C-Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

X _____

Type name of signee: Greg Nicoll, P.E.

Position and agency/organization: District Engineer, Lake Whatcom Water & Sewer District

Date submitted:

D.Supplemental sheet for nonproject actions

Find help for the nonproject actions worksheet[20]
Do not use this section for project actions.

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. **How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?**

    - **Proposed measures to avoid or reduce such increases are:**

2. **How would the proposal be likely to affect plants, animals, fish, or marine life?**

    - **Proposed measures to protect or conserve plants, animals, fish, or marine life are:**

3. **How would the proposal be likely to deplete energy or natural resources?**

[20] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-d-non-project-actions

- **Proposed measures to protect or conserve energy and natural resources are:**

4. **How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection, such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?**

   - **Proposed measures to protect such resources or to avoid or reduce impacts are:**

5. **How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?**

   - **Proposed measures to avoid or reduce shoreline and land use impacts are:**

6. **How would the proposal be likely to increase demands on transportation or public services and utilities?**

   - **Proposed measures to reduce or respond to such demand(s) are:**

7. **Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.**

APPENDIX B

BUDGETARY PROJECT COST ESTIMATES

Lake Whatcom Water & Sewer District

CCB Improvements Project

Preliminary Project Cost Estimate - Alternative 1A, Cylindrical Concrete Tank

November 21, 2024

No.	Item	Quantity		Unit Cost		Total
1	Mobilization/Demobilization	1	LS	$ 146,000	$	146,000
2	Minor Changes	1	LS	$ 20,000	$	20,000
3	Clearing & Grubbing	1	LS	$ 25,000	$	25,000
4	Dewatering	1	LS	$ 50,000	$	50,000
5	Erosion Control	1	LS	$ 15,000	$	15,000
6	Trench Excavation Safety Systems	1	LS	$ 15,000	$	15,000
7	Reservoir Foundation	1	LS	$ 165,000	$	165,000
8	Reservoir	1	LS	$ 800,000	$	800,000
9	Site Piping Improvements	1	LS	$ 120,000	$	120,000
10	Earthwork & Site Improvements	1	LS	$ 100,000	$	100,000
11	Electrical Improvements	1	LS	$ 100,000	$	100,000
12	Control, Programming, & Telemetry	1	LS	$ 45,000	$	45,000

Subtotal	$	1,601,000
Contingency (30%)	$	480,000
Subtotal	$	2,081,000
Sales Tax (9%)	$	187,000
Subtotal	$	2,268,000
Project Design and Construction Management (25%)	$	567,000
Subtotal	$	2,835,000
Project Adminstration & Permitting (5%)	$	142,000
Total Project Cost	**$**	**2,977,000**

Lake Whatcom Water & Sewer District

CCB Improvements Project

Preliminary Project Cost Estimate - Alternative 1B, Rectangular Concrete Tank (1-Train)

November 21, 2024

No.	Item	Quantity		Unit Cost		Total
1	Mobilization/Demobilization	1	LS	$ 147,000	$	147,000
2	Minor Changes	1	LS	$ 20,000	$	20,000
3	Clearing & Grubbing	1	LS	$ 25,000	$	25,000
4	Dewatering	1	LS	$ 50,000	$	50,000
5	Erosion Control	1	LS	$ 15,000	$	15,000
6	Trench Excavation Safety Systems	1	LS	$ 15,000	$	15,000
7	Reservoir Foundation	1	LS	$ 255,000	$	255,000
8	Reservoir	1	LS	$ 725,000	$	725,000
9	Site Piping Improvements	1	LS	$ 120,000	$	120,000
10	Earthwork & Site Improvements	1	LS	$ 100,000	$	100,000
11	Electrical Improvements	1	LS	$ 100,000	$	100,000
12	Control, Programming, & Telemetry	1	LS	$ 45,000	$	45,000

Subtotal	$	1,617,000
Contingency (30%)	$	485,100
Subtotal	$	2,102,100
Sales Tax (9%)	$	189,189
Subtotal	$	2,291,289
Project Design and Construction Management (25%)	$	572,822
Subtotal	$	2,864,111
Project Adminstration & Permitting (5%)	$	143,206
Total Project Cost	**$**	**3,007,317**

Lake Whatcom Water & Sewer District

CCB Improvements Project

Preliminary Project Cost Estimate - Alternative 1C, Rectangular Concrete Tank (2-Train)

November 21, 2024

No.	Item	Quantity		Unit Cost	Total
1	Mobilization/Demobilization	1	LS	$ 219,000	$ 219,000
2	Minor Changes	1	LS	$ 20,000	$ 20,000
3	Clearing & Grubbing	1	LS	$ 25,000	$ 25,000
4	Dewatering	1	LS	$ 50,000	$ 50,000
5	Erosion Control	1	LS	$ 15,000	$ 15,000
6	Trench Excavation Safety Systems	1	LS	$ 15,000	$ 15,000
7	Reservoir Foundation	1	LS	$ 435,000	$ 435,000
8	Reservoir	1	LS	$ 1,231,000	$ 1,231,000
9	Site Piping Improvements	1	LS	$ 155,000	$ 155,000
10	Earthwork & Site Improvements	1	LS	$ 100,000	$ 100,000
11	Electrical Improvements	1	LS	$ 100,000	$ 100,000
12	Control, Programming, & Telemetry	1	LS	$ 45,000	$ 45,000

Subtotal	$	2,410,000
Contingency (30%)	$	723,000
Subtotal	$	3,133,000
Sales Tax (9%)	$	281,970
Subtotal	$	3,414,970
Project Design and Construction Management (25%)	$	853,743
Subtotal	$	4,268,713
Project Adminstration & Permitting (5%)	$	213,436
Total Project Cost	**$**	**4,482,149**

Lake Whatcom Water & Sewer District

CCB Improvements Project

Preliminary Project Cost Estimate - Alternative 1D, Rectangular Concrete Tank (2-Train, 700 gpm)

December 27, 2024

No.	Item	Quantity		Unit Cost		Total
1	Mobilization/Demobilization	1	LS	$ 172,000	$	172,000
2	Minor Changes	1	LS	$ 20,000	$	20,000
3	Clearing & Grubbing	1	LS	$ 50,000	$	50,000
4	Dewatering	1	LS	$ 75,000	$	75,000
5	Erosion Control	1	LS	$ 15,000	$	15,000
6	Trench Excavation Safety Systems	1	LS	$ 15,000	$	15,000
7	Reservoir Foundation	1	LS	$ 290,000	$	290,000
8	Reservoir	1	LS	$ 858,000	$	858,000
9	Site Piping Improvements	1	LS	$ 150,000	$	150,000
10	Earthwork & Site Improvements	1	LS	$ 100,000	$	100,000
11	Electrical Improvements	1	LS	$ 100,000	$	100,000
12	Control, Programming, & Telemetry	1	LS	$ 45,000	$	45,000

Subtotal	$	1,890,000
Contingency (30%)	$	567,000
Subtotal	$	2,457,000
Sales Tax (9%)	$	221,130
Subtotal	$	2,678,130
Project Design and Construction Management (25%)	$	669,533
Subtotal	$	3,347,663
Project Adminstration & Permitting (5%)	$	167,383
Total Project Cost	**$**	**3,515,046**

Lake Whatcom Water & Sewer District

CCB Improvements Project

Preliminary Project Cost Estimate - Alternative 2, Glass Panel Tank

November 21, 2024

No.	Item	Quantity		Unit Cost		Total
1	Mobilization/Demobilization	1	LS	$ 148,000	$	148,000
2	Minor Changes	1	LS	$ 20,000	$	20,000
3	Clearing & Grubbing	1	LS	$ 25,000	$	25,000
4	Dewatering	1	LS	$ 50,000	$	50,000
5	Erosion Control	1	LS	$ 15,000	$	15,000
6	Trench Excavation Safety Systems	1	LS	$ 15,000	$	15,000
7	Reservoir Foundation	1	LS	$ 220,000	$	220,000
8	Reservoir	1	LS	$ 771,000	$	771,000
9	Site Piping Improvements	1	LS	$ 120,000	$	120,000
10	Earthwork & Site Improvements	1	LS	$ 100,000	$	100,000
11	Electrical Improvements	1	LS	$ 100,000	$	100,000
12	Control, Programming, & Telemetry	1	LS	$ 45,000	$	45,000

Subtotal	$	1,629,000
Contingency (30%)	$	488,700
Subtotal	$	2,117,700
Sales Tax (9%)	$	190,593
Subtotal	$	2,308,293
Project Design and Construction Management (25%)	$	577,073
Subtotal	$	2,885,366
Project Adminstration & Permitting (5%)	$	144,268
Total Project Cost	**$**	**3,029,634**

Lake Whatcom Water & Sewer District

CCB Improvements Project

Preliminary Project Cost Estimate - Alternative 3A, Cylindrical Welded Steel Tank

November 21, 2024

No.	Item	Quantity		Unit Cost	Total
1	Mobilization/Demobilization	1	LS	$ 129,000	$ 129,000
2	Minor Changes	1	LS	$ 20,000	$ 20,000
3	Clearing & Grubbing	1	LS	$ 25,000	$ 25,000
4	Dewatering	1	LS	$ 50,000	$ 50,000
5	Erosion Control	1	LS	$ 15,000	$ 15,000
6	Trench Excavation Safety Systems	1	LS	$ 15,000	$ 15,000
7	Reservoir Foundation	1	LS	$ 220,000	$ 220,000
8	Reservoir	1	LS	$ 575,000	$ 575,000
9	Site Piping Improvements	1	LS	$ 120,000	$ 120,000
10	Earthwork & Site Improvements	1	LS	$ 100,000	$ 100,000
11	Electrical Improvements	1	LS	$ 100,000	$ 100,000
12	Control, Programming, & Telemetry	1	LS	$ 45,000	$ 45,000

Subtotal	$ 1,414,000
Contingency (30%)	$ 424,200
Subtotal	$ 1,838,200
Sales Tax (9%)	$ 165,438
Subtotal	$ 2,003,638
Project Design and Construction Management (25%)	$ 500,910
Subtotal	$ 2,504,548
Project Adminstration & Permitting (5%)	$ 125,227
Total Project Cost	**$ 2,629,775**

Lake Whatcom Water & Sewer District

CCB Improvements Project

Preliminary Project Cost Estimate - Alternative 3B, Cylindrical Stainless Steel Tank (Single)

November 21, 2024

No.	Item	Quantity		Unit Cost	Total
1	Mobilization/Demobilization	1	LS	$ 130,000	$ 130,000
2	Minor Changes	1	LS	$ 20,000	$ 20,000
3	Clearing & Grubbing	1	LS	$ 25,000	$ 25,000
4	Dewatering	1	LS	$ 50,000	$ 50,000
5	Erosion Control	1	LS	$ 15,000	$ 15,000
6	Trench Excavation Safety Systems	1	LS	$ 15,000	$ 15,000
7	Reservoir Foundation	1	LS	$ 150,000	$ 150,000
8	Reservoir	1	LS	$ 660,000	$ 660,000
9	Site Piping Improvements	1	LS	$ 120,000	$ 120,000
10	Earthwork & Site Improvements	1	LS	$ 100,000	$ 100,000
11	Electrical Improvements	1	LS	$ 100,000	$ 100,000
12	Control, Programming, & Telemetry	1	LS	$ 45,000	$ 45,000

Subtotal	$ 1,430,000
Contingency (30%)	$ 429,000
Subtotal	$ 1,859,000
Sales Tax (9%)	$ 167,310
Subtotal	$ 2,026,310
Project Design and Construction Management (25%)	$ 506,578
Subtotal	$ 2,532,888
Project Adminstration & Permitting (5%)	$ 126,644
Total Project Cost	**$ 2,659,532**

Lake Whatcom Water & Sewer District

CCB Improvements Project

Preliminary Project Cost Estimate - Alternative 3C, Cylindrical Stainless Steel Tank (2-Tank)

November 21, 2024

No.	Item	Quantity		Unit Cost	Total
1	Mobilization/Demobilization	1	LS	$ 191,000	$ 191,000
2	Minor Changes	1	LS	$ 20,000	$ 20,000
3	Clearing & Grubbing	1	LS	$ 25,000	$ 25,000
4	Dewatering	1	LS	$ 50,000	$ 50,000
5	Erosion Control	1	LS	$ 15,000	$ 15,000
6	Trench Excavation Safety Systems	1	LS	$ 15,000	$ 15,000
7	1^{o} Reservoir Foundation	1	LS	$ 150,000	$ 150,000
8	1^{o} Reservoir	1	LS	$ 550,000	$ 550,000
9	2^{o} Reservoir Foundation	1	LS	$ 150,000	$ 150,000
10	2^{o} Reservoir	1	LS	$ 550,000	$ 550,000
11	Site Piping Improvements	1	LS	$ 120,000	$ 120,000
12	Earthwork & Site Improvements	1	LS	$ 110,000	$ 110,000
13	Electrical Improvements	1	LS	$ 110,000	$ 110,000
14	Control, Programming, & Telemetry	1	LS	$ 45,000	$ 45,000

Subtotal	$	2,101,000
Contingency (30%)	$	630,300
Subtotal	$	2,731,300
Sales Tax (9%)	$	245,817
Subtotal	$	2,977,117
Project Design and Construction Management (25%)	$	744,279
Subtotal	$	3,721,396
Project Adminstration & Permitting (5%)	$	186,070
Total Project Cost	**$**	**3,907,466**

* For this cost estimate, it is assumed that both the 1^{o} Reservoir and the 2^{o} Reservoir will be built in 2025 (+/-).

Lake Whatcom Water & Sewer District

CCB Improvements Project

Preliminary Project Cost Estimate - Alternative 3C, Cylindrical Stainless Steel Tank (2-Tank)

November 21, 2024

No.	Item	Quantity		Unit Cost	Total
1	Mobilization/Demobilization	1	LS	$ 215,000	$ 215,000
2	Minor Changes	1	LS	$ 20,000	$ 20,000
3	Clearing & Grubbing	1	LS	$ 25,000	$ 25,000
4	Dewatering	1	LS	$ 50,000	$ 50,000
5	Erosion Control	1	LS	$ 15,000	$ 15,000
6	Trench Excavation Safety Systems	1	LS	$ 15,000	$ 15,000
7	1^{o} Reservoir Foundation	1	LS	$ 150,000	$ 150,000
8	1^{o} Reservoir	1	LS	$ 550,000	$ 550,000
9	2^{o} Reservoir Foundation	1	LS	$ 200,000	$ 200,000
10	2^{o} Reservoir	1	LS	$ 715,000	$ 715,000
11	Site Piping Improvements	1	LS	$ 130,000	$ 130,000
12	Earthwork & Site Improvements	1	LS	$ 110,000	$ 110,000
13	Electrical Improvements	1	LS	$ 110,000	$ 110,000
14	Control, Programming, & Telemetry	1	LS	$ 55,000	$ 55,000

Subtotal	$	2,360,000
Contingency (30%)	$	708,000
Subtotal	$	3,068,000
Sales Tax (9%)	$	276,120
Subtotal	$	3,344,120
Project Design and Construction Management (25%)	$	836,030
Subtotal	$	4,180,150
Project Adminstration & Permitting (5%)	$	209,008
Total Project Cost	**$**	**4,389,158**

* For this cost estimate, it is assumed that the 1^{o} Reservoir will be built in 2025 (+/-), and the 2^{o} Reservoir will be built in 2035 (+/-).

AGENDA BILL Item 6.B	**Resolution No. 900 Lake Whatcom Management Program 2025-2029 Work Plan**			
DATE SUBMITTED:	January 8, 2025	MEETING DATE:	January 29, 2025	
TO: BOARD OF COMMISSIONERS		FROM: Justin Clary, General Manager		
GENERAL MANAGER APPROVAL				
ATTACHED DOCUMENTS		1. Resolution No. 900 2. Lake Whatcom Management Program 2025-2029 Work Plan		
TYPE OF ACTION REQUESTED		RESOLUTION ☒	FORMAL ACTION/ MOTION ☐	INFORMATIONAL/ OTHER ☐

BACKGROUND / EXPLANATION OF IMPACT

Due to observed deterioration of the water quality in Lake Whatcom, the Lake Whatcom Water and Sewer District, City of Bellingham, and Whatcom County entered into an interlocal agreement in 1998 that formally created the Lake Whatcom Management Program (LWMP). The LWMP's primary goal is to improve lake water quality by jointly implementing programs affecting the Lake Whatcom watershed.

Since its creation, LWMP partners have developed and implemented five (5) five-year work plans focused on the following program areas: land preservation; stormwater; land use; monitoring and data; hazardous materials; recreation; aquatic invasive species; utilities and transportation; education and engagement; and administration (based upon feedback during implementation of the 2020-24 work plan, two more program areas have been added: climate action and forest management). With the most recent work plan (2020-2024) approaching expiration, the LWMP interjurisdictional coordinating team (ICT) began development of a successor work plan in early 2024. The outcome of the ICT's effort, which included significant public comment, has been developed to reflect current conditions and regulatory requirements while maintaining the LWMP's overarching goal of continued improvement of lake water quality. The LWMP policy group met on December 20, 2024, to review the draft work plan. The City of Bellingham Council and Whatcom County Council are scheduled to consider adoption a joint resolution approving the work plan during their January 27 and January 28 regularly scheduled meetings, respectively.

FISCAL IMPACT

No fiscal impact is associated with approval of the resolution.

APPLICABLE EFFECTIVE UTILITY MANAGEMENT ATTRIBUTE(S)

Community Sustainability
Water Resource Sustainability
Stakeholder Understanding & Support

RECOMMENDED BOARD ACTION

Staff recommends adoption of Resolution No. 900.

PROPOSED MOTION

A recommended motion is:

> "I move to adopt the Resolution No. 900 as presented."

LAKE WHATCOM WATER AND SEWER DISTRICT
RESOLUTION NO. 900

A Joint Resolution of the Bellingham City Council, Whatcom County Council, and Lake Whatcom Water and Sewer District Board of Commissioners Adopting the Lake Whatcom Management Program 2025-2029 Work Plan

WHEREAS, in 1992 and again in 1998 the City of Bellingham, Whatcom County and the precursor to the Lake Whatcom Water and Sewer District jointly formed the Lake Whatcom Management Program (LWMP) and thereby declared their intention to work together to protect and manage Lake Whatcom; and

WHEREAS, the three Lake Whatcom Joint Management Program jurisdictions have adopted five previous five-year plans that have provided an essential framework for program cooperation and implementation of joint activities and have resulted in improved water quality and environmental conditions at the lake; and

WHEREAS, the Lake Whatcom Management Program 2025-2029 Work Plan defines the major activities and investments needed to continue improving and protecting water quality in the lake and its tributary streams and watershed health during the next five years through twelve established program areas: land preservation, stormwater, land use, monitoring and data, hazardous materials, recreation, aquatic invasive species, utilities and transportation, education and engagement, administration, climate action, and forest management; and

WHERAS, Lake Whatcom Management Program staff developed the LWMP 2025-2029 Work Plan to address TMDL requirements, preserve and protect Lake Whatcom water quality and watershed health and provide for tracking and reporting outcomes, and

WHEREAS, the draft 2025-2029 LWMP Work Plan was shared with the public for public comment from July 25, 2024 to August 25, 2024; and

WHEREAS, staff have incorporated public comments into the 2025-2029 Work Plan and provided responses to each of the 307 comments in a publicly available comment matrix; and

WHEREAS, The Lake Whatcom Policy Group includes representatives from the Bellingham City Council, Whatcom County Council, the Lake Whatcom Water and Sewer District Board of Commissioners, and the Sudden Valley Community Association Board and provides informal feedback to staff. Staff provided overviews, presentations, and updates to the Lake Whatcom Policy Group on February 1, 2024, April 24, 2024, June 5, 2024, July 10, 2024, September 18, 2024 and December 20, 2024 and received feedback and guidance.

WHEREAS, the Water Resources Advisory Board (WRAB) is a City of Bellingham Advisory Board charged with helping to inform and guide the City's planning and policy regarding the protection and management of water resources, including municipal water, sewer, surface and stormwater systems, controls, rates, and drinking water source protection. Staff provided updates, presentations and discussions on the LWMP 2025-2029 Work Plan on July 23, 2024, September 24, 2024, and November 26, 2024; and

WHEREAS, on November 26, 2024, the WRAB approved a resolution supporting City Council approval of the Lake Whatcom Management Program 2025-2029 Work Plan.

NOW, THEREFORE, BE IT RESOLVED THAT:
The Board of Commissioners of the Lake Whatcom Water and Sewer District hereby adopt the Lake Whatcom Management Program 2025-2029 Work Plan as the framework for joint management of the lake and for achieving necessary milestones to improve water quality in the lake.

ADOPTED by the Board of Commissioners of Lake Whatcom Water and Sewer District, Whatcom County, Washington, at a regular meeting thereof, on the 29th day of January, 2025.

_____
Todd Citron, President, Board of Commissioners

Attest:

_____
Rachael Hope, Recording Secretary

Approved as to form:

_____
Robert Carmichael, Attorney for the District

Photo by Katheryn Moran

Lake Whatcom Management Program **2025-2029** Work Plan

JANUARY 2025

Prepared by the Lake Whatcom Interjurisdictional Coordinating Team

ACKNOWLEDGEMENTS

Lake Whatcom Management Committee

Satpal Sidhu, Whatcom County Executive
Kim Lund, City of Bellingham Mayor
Justin Clary, Lake Whatcom Water and Sewer District General Manager

Interjurisdictional Coordinating Team

Meghan Bugaj, City of Bellingham
Aaron Burkhart, City of Bellingham
Stefanie Cilinceon, City of Bellingham
Justin Clary, Lake Whatcom Water and Sewer District
Cathy Craver, Whatcom County
Amy Dearborn, City of Bellingham
Chris Elder, Whatcom County
Holly Faulstich, Whatcom County
Riley Grant, City of Bellingham
Bryan Hatchell, City of Bellingham
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Michael Parelskin, City of Bellingham
Jason Porter, City of Bellingham
Kate Rice, Whatcom County
Becky Snijder van Wissenkerke, Whatcom County
Gary Stoyka, Whatcom County
Cliff Strong, Whatcom County
Steve Sundin, City of Bellingham
Christ Thomsen, Whatcom County
Peg Wendling, City of Bellingham

Contributing Entities

City of Bellingham
Whatcom County
Lake Whatcom Water and Sewer District
Sudden Valley Community Association
Western Washington University Institute for Watershed Studies
City of Bellingham Water Resources Advisory Board

Table of Contents

Introduction

Since time immemorial, Lake Whatcom has played an important role in the quality of life for the people and ecosystems surrounding it. The Lake Whatcom watershed was first inhabited and utilized by Coast Salish tribes, who cared for the land long before European settlers arrived. Today, Lake Whatcom is the drinking water source for more than 100,000 people, valuable habitat for plants and animals unique to our region, a recreational destination for outdoor enthusiasts, and home to more than 19,000 people (see Appendix for more Lake Whatcom facts).

Improving the health of the lake and its surrounding forests and ecosystems while balancing human activities is no small task. Watershed residents and visitors play a critical role in this effort through stewardship of this shared resource. The Lake Whatcom Management Program (LWMP) brings together local governments who work with organizations and the community to promote stewardship and take cooperative action to restore water quality, protect environmental health and preserve healthy forests in the watershed.

Statement from County Executive, City Mayor, District General Manager

As leaders of Whatcom County, the City of Bellingham, and the Lake Whatcom Water and Sewer District, we stand by our organizations' long-standing commitment to restore, protect, and preserve Lake Whatcom's water quality and ecological health under a changing climate.

This updated work plan builds on over three decades of coordinated work and an impressive list of on-the-ground projects that are fulfilling our commitments to make steady progress in protecting and improving the lake.

We are committed to working with our staff and the community to accomplish the work identified in this work plan, while also understanding that this work is adaptive and may shift to respond to changes that arise in the next five years.

Our partnership is strong, and we continue to make progress on achieving a clean and protected source of drinking water for people and a healthy ecosystem.

Kim Lund
Bellingham Mayor

Justin Clary
District General Manager

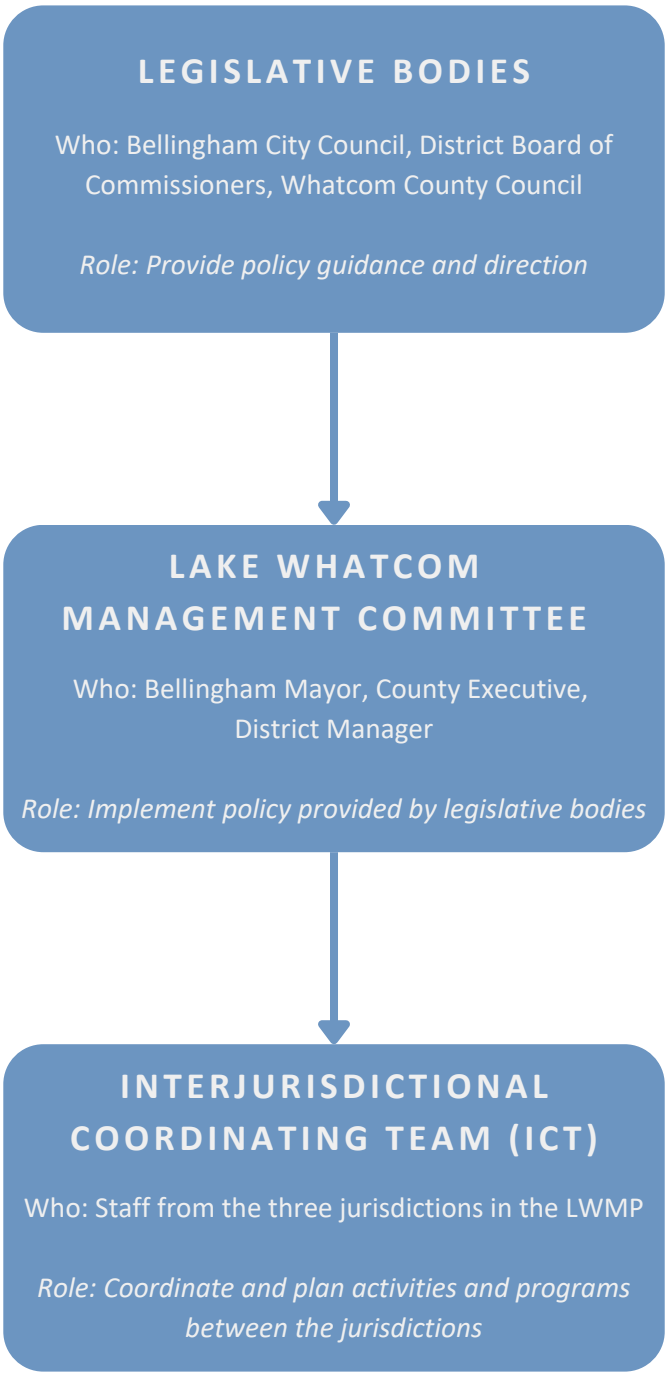
Satpal Singh Sidhu
County Executive

Organizational Structure

The LWMP is a coordinated effort between the City of Bellingham, Whatcom County, and Lake Whatcom Water and Sewer District (District), who work together to address challenges in the Lake Whatcom watershed. The LWMP is made up of a variety of staff and elected officials who each play a role in helping protect Lake Whatcom. The legislative bodies of each of the three jurisdictions provide policy guidance and direction for the LWMP.

This guidance informs the policies that are implemented by the Lake Whatcom Management Committee, which consists of the City of Bellingham Mayor, Whatcom County Executive, and Lake Whatcom Water and Sewer District General Manager. The guidance provided by the legislative bodies also informs the work of countless staff, including those that make up the Interjurisdictional Coordinating Team (ICT). ICT staff work across the three jurisdictions to plan and coordinate projects, programs, and activities as part of the LWMP.

Every five years, these staff create a coordinated LWMP work plan that provides a broad overview of the upcoming work between the three jurisdictions, which elected officials review and approve. Staff then document the work completed in the watershed each year through annual progress reports that include a summary of reporting metrics.



Program History

The LWMP had its beginnings in the 1980s and early 1990s, when the cumulative deterioration of Lake Whatcom's water quality from historic and ongoing land use in the watershed was documented and brought to the attention of agencies and the community. In response, a joint resolution was passed by the City of Bellingham, Whatcom County, and the Lake Whatcom Water and Sewer District in 1992 to organize efforts to address the most serious threats to the watershed. This comprehensive approach to managing the lake became the basis of the LWMP, which was established by Interlocal Agreement in 1998.

The work of the LWMP is guided by the general goals established in the 1992 Joint Resolution, which include:

- Recognizing and managing Lake Whatcom and its watershed as the major drinking water reservoir for Whatcom County
- Protecting, preserving, and enhancing water quality and managing water quantity to ensure long-term sustainable supplies for a variety of uses
- Prioritizing protection over treatment in managing Lake Whatcom and its watersheds
- Managing water quantity to sustain long-term efficient use of the water
- Ensuring there are opportunities for public comment and participation in policy and management program development
- Promoting public awareness and responsible individual actions
- Promoting learning, research, and information opportunities which better our understanding of the watershed system, the impacts of activities, and benefits of potential policies implemented

Learn more about the history of the LWMP in the Program Development and Accomplishments Timeline in the Appendix.

Management Challenges

Overview

In 1998, Lake Whatcom was placed on Washington's 303(d) list for polluted water bodies because it failed to meet state water quality standards for dissolved oxygen. In addition, 11 tributaries to Lake Whatcom were added to the list for failing to meet state water quality standards for fecal coliform bacteria. As a result, the Washington Department of Ecology completed the Lake Whatcom Watershed Total Phosphorus and Bacteria Total Maximum Daily Load (TMDL) water quality study and improvement reports, which were approved by the U.S. Environmental Protection Agency in 2016.

A TMDL represents the maximum pollutant amount that a water body can receive and still meet water quality standards. A TMDL plan is a requirement of the federal Clean Water Act for a 303(d)-listed water body. These TMDL documents inform our current cleanup plan for Lake Whatcom. Specific cleanup requirements are included in the respective National Pollutant Discharge Elimination System (NPDES) Phase II Municipal Stormwater Permits for the City and County. These NPDES permits set requirements for municipalities to address stormwater runoff in areas determined to have population densities reaching urban standards.

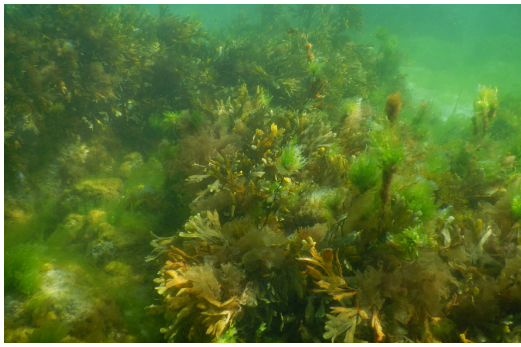
To meet the foundational goals set in the 1992 Joint Resolution and the requirements of the 2016 TMDL, the LWMP partners work together and with the community to overcome challenges in the watershed by obtaining and applying the best available science, engaging the most knowledgeable local experts, and building a strong coalition amongst all who enjoy the benefits of Lake Whatcom.

The program strives to ensure that public dollars are spent responsibly and to the greatest benefit of the community and our quality of life by addressing the main challenges facing the lake and its watershed through long-term management strategies. Some of the greatest management challenges that the LWMP responds to are described in the following section.

Photo by Jeffrey Barclay

Management Challenges

Phosphorus Runoff from Human Activities



Runoff from developed areas enters the lake, changing water chemistry and disrupting the natural balance of the ecosystem. One pollutant of particular concern is phosphorus, which is a naturally occurring nutrient found in soils, sediments, and organic material. It stimulates plant growth and is essential for animal and plant life; however, too much phosphorus from human activities can promote excessive algae growth.

When algae die, the decomposition process depletes oxygen in the lake, which threatens the health of aquatic species and leads to additional phosphorus being released from lake sediments. Excess phosphorus has resulted in Lake Whatcom failing to meet state standards for dissolved oxygen levels. Some types of algae can produce toxins that may cause health issues for swimmers and pets. Furthermore, algae can impact water quality taste and odor, clog water intake structures, and interfere with water treatment, resulting in higher water treatment costs.

Excess phosphorus is primarily transported to Lake Whatcom through stormwater runoff from erosion, fertilizers and pesticides, organic materials (e.g., leaves, grass clippings, and other compost), animal waste, deforestation, and phosphorus-based soaps and detergents.

Addressing Water Treatment Impacts

To address the potential impact of algae growth on water treatment processes, the City built a Dissolved Air Flotation (DAF) pretreatment system at its Water Treatment Plant in 2018 to remove algae.

On natural landscapes, stormwater slowly seeps into the ground and pollutants are filtered by forests and soils before the stormwater enters nearby water bodies.

On developed surfaces, such as roads, roofs, driveways, and yards, stormwater picks up excess phosphorus generated by human activities and then flows unimpeded into the nearest ditch or storm drain leading directly to the lake.

Management Challenges

Phosphorus Runoff from Human Activities (continued)

Many LWMP activities focus on reducing excess phosphorus levels in Lake Whatcom, including:

Adopting stormwater and land use regulations to reduce phosphorus pollution.

Constructing, operating, and maintaining stormwater treatment facilities.

Providing residential retrofit programs to reduce phosphorus pollution from existing developed lots.

Preserving land in the watershed to reduce development and other land disturbance activities.

Educating Lake Whatcom residents and visitors about the actions they can take to reduce phosphorus entering the lake.

Management Challenges

Excess Bacteria Levels

Bacteria levels exceed water quality standards in 11 tributaries to Lake Whatcom. Many of these tributaries flow through developed areas. The Washington Department of Ecology tests for specific types of bacteria that are commonly associated with residential areas, from sources like leaking septic systems, sewer system overflows, and pet and livestock waste left exposed to rainfall.

The TMDL requires that the City and County address the sources of these pollutants to protect public health in and around these streams and their outlets.

Fortunately, many of the practices that we implement to reduce phosphorus also help to reduce bacteria entering the streams or the lake. These include:

- Some stormwater treatment facilities
- Behavior change campaigns about managing animal waste at home and in public spaces
- Education to homeowners about proper maintenance of septic systems
- Land use regulations and forest management strategies that are designed to ensure that land use activities do not further exacerbate these problems

Management Challenges

Additional Challenges

Excess phosphorus and bacteria levels are two of the greatest concerns for the LWMP because of their significant potential to impact water quality. However, there are other challenges that the LWMP responds to as well, including:

Recreation throughout the watershed, from boating to hiking and mountain biking, can damage forests, cause erosion, harm water quality, disturb critical wildlife habitat, and introduce invasive species. The LWMP has program areas focused on both Land Preservation and Recreation with the goal of preserving land that can support passive or low-impact recreation and discouraging high-impact recreational activities.

Aquatic invasive species (AIS) pose a significant long-term risk to all uses of Lake Whatcom. An infestation of AIS such as zebra and quagga mussels would result in significant changes to the lake ecosystem, taste and odor of treated drinking water, and beaches. An infestation would require expensive maintenance of public and private water treatment infrastructure. To prevent the spread of AIS, the LWMP has had a dedicated AIS prevention program since 2012 that includes boat inspections, decontamination, and education.

Climate models indicate that the Pacific Northwest is warming and will continue to do so because of excess greenhouse gas emissions from human activities. Higher average annual temperatures, higher average summer temperatures, drier summers, and longer and more frequent extreme heat events will impact water quality and forest health in the Lake Whatcom watershed. The LWMP will build upon its current work to increase climate mitigation, adaptation, and resilience in the watershed in response to climate impact assessments.

The Lake Whatcom watershed is a desirable place to live and visit because of its beauty and access to recreational opportunities. Impacts that threaten the lake and its watershed can negatively affect quality of life. All the work that the LWMP does to protect watershed health and to encourage residents and visitors to reduce their impact on the lake can improve quality of life for everyone.

Five-Year Work Plans

Every five years the LWMP partners work together to develop a work plan that is intended to serve as a broad overview of the work that will be completed to protect Lake Whatcom over the next five-year period. Each work plan identifies priority program areas, objectives, and strategies to help guide the work that we plan to complete.


Photo by Richard Binder

Although this document outlines many of the efforts that the LWMP partners anticipate over the next five years, it is not a comprehensive list. Many programs have individual internal work plans created each year that include details and timelines for the work. Some of these individual work plans and documents are cited in the resources section of each program area later in this document.

To provide more detail about the work completed in the Lake Whatcom watershed, the LWMP publishes annual progress reports and five-year accomplishment reports that include reporting metrics. There is also more information about Lake Whatcom programs and projects published on our joint LWMP website and shared through our quarterly e-newsletter.

LWMP Website: lakewhatcom.whatcomcounty.org

Adaptive Management

The development of each new work plan is informed by current information, technology, community priorities, policies, weather patterns, staff capacity, and more. To make sure we are using best available science, the LWMP contracts with the Western Washington University Institute for Watershed Studies to monitor Lake Whatcom water quality and produce annual reports.

These reports help us understand how water quality is changing over time and identify specific concerns to include in our work. Additionally, the City and County utilize the lake loading model (HFAM) and the lake response model (CE-QUAL W2) to determine how much phosphorus is estimated to enter into the lake, and how that affects dissolved oxygen levels. The City and County are required by Ecology through the TMDL to update these models to track what is occurring in the lake and inform potential management options to reduced phosphorus loading in order to meet water quality standards. These management options are developed into tasks in the work plan.

Other information that we use to help inform our work include results from five-year surveys sent to all Lake Whatcom watershed residents, reports of existing residential housing units and potential developable lands in the watershed, annual Aquatic Invasive Species reports and more, which are all available on our website.

Program focus has evolved and expanded over time in response to new threats. As these threats are identified, solutions to address them are incorporated into subsequent work plans. In the 1990s, threats from forest harvest and forest practices were a major concern. In 1998, reducing phosphorus in stormwater entering the lake became a primary focus when Lake Whatcom was placed on Washington State's list of polluted water bodies due to low dissolved oxygen levels. By 2012, concern over threats from invasive mussels led to a new collaborative Aquatic Invasive Species program.

Recently, it has become more apparent that impacts from climate change amplify threats to Lake Whatcom and raise concerns about wildfire risk and climate resilience. Some concerns have also re-emerged about forest practices and ensuring that we are using strategies that reduce water quality impacts and wildfire risk. In response, we have added Climate Action and Forest Management as two new program areas in the 2025-2029 Work Plan. Consequently, current management efforts are now focused in twelve program areas to comprehensively address watershed health.

2025-2029 Work Plan Program Areas

The 2025–2029 LWMP Work Plan is the sixth, five-year plan to date. It will guide actions to reduce the amount of phosphorus reaching the lake and address other watershed issues over the next five years. Consistent with previous plans, this work plan is organized by program areas, each with specific goals and planned activities. The 2020-2024 LWMP Work Plan focused efforts in 10 program areas. This 2025-2029 Work Plan includes those same program areas and adds Climate Action and Forest Management. As LWMP partners, the City of Bellingham, Whatcom County, and the Lake Whatcom Water and Sewer District are the leads responsible for accomplishing the work described in this plan.

Additional partners play important roles to help achieve work plan goals. Key partners include Sudden Valley Community Association, Washington State Departments of Ecology and Natural Resources, Western Washington University's Institute for Watershed Studies, Whatcom Conservation District, and Whatcom Land Trust. Below is a summary of the 12 program areas outlined in this work plan.

1. Land Preservation

Increase the amount of preserved and restored land to reduce development and other land disturbance to protect watershed health and fish and wildlife habitat.

2. Stormwater Management

Reduce the amount of phosphorus and bacteria entering the lake each year by using best management practices to collect, treat, and manage runoff from developed areas in the watershed.

3. Land Use

Prevent and minimize water quality impacts from new development and redevelopment.

4. Monitoring and Data

Collect and analyze sufficient data needed to protect water quality and reduce pollution in Lake Whatcom, reduce uncertainty in loading and response models, and guide management decisions.

5. Hazardous Materials

Prevent water quality impacts from improper storage and handling of hazardous materials and ensure that spill prevention and response programs adequately protect water quality.

6. Recreation

Provide access to recreational opportunities that are consistent with watershed health, water quality, and land management goals.

7. Aquatic Invasive Species

Prevent new aquatic invasive species (AIS) introductions to Lake Whatcom and reduce impacts associated with established invasive species.

8. Utilities & Transportation

Minimize water quality and quantity impacts from water, sewer, and transportation systems.

9. Education & Engagement

Increase awareness of Lake Whatcom challenges and protection efforts among watershed residents and visitors and promote engagement in behaviors that protect water quality.

10. Administration

Implement the LWMP 2025-2029 Work Plan and provide opportunities for public input.

11. Climate Action

Build climate resilience and adaptation within the Lake Whatcom watershed and Lake Whatcom Managment Program.

12. Forest Management

Increase forest management strategies that improve forest health, protect lake water quality, and minimize the risk of catastrophic wildfire.

Tracking Progress

Reporting metrics are data that LWMP partners use to track the progress of programs and on-the-ground activities or to measure communication and outreach efforts. Reporting metric updates are provided in annual progress reports and the five-year accomplishments reports.

Work plan reporting metrics are not intended to provide an overall evaluation of Lake Whatcom watershed health or water quality trends. This type of long-term evaluation occurs separately through efforts such as Western Washington University's Institute for Watershed Studies Lake Whatcom Monitoring Project, which helps inform our work.

Different program areas measure progress in different ways. For example, a comprehensive Lake Whatcom Watershed Survey was established in 2018 to help evaluate the effectiveness of outreach efforts and to inform future work plan priorities. The survey was repeated in early 2024 and will continue to be repeated every five years. The results provide information on watershed residents' attitudes, knowledge, and behaviors regarding Lake Whatcom protection. When applicable to specific activities included in this work plan, key metrics from this survey are also included as reporting metrics.

In addition, progress made in our stormwater management program area is demonstrated by tracking efforts by the City of Bellingham and Whatcom County to meet Total Maximum Daily Load (TMDL) targets for reducing phosphorus and bacteria loading to the lake.

There are also many other reporting metrics throughout the work plan to help track progress of other efforts.

Photo by David Lucas

Land Preservation

GOAL: Increase the amount of preserved and restored land to reduce development and other land disturbance to protect watershed health and fish and wildlife habitat.

2025-2029 Estimated Investments: $28.4 million

Summary

The LWMP acquires lands for the protection of watershed health through reconveyance, the City's Lake Whatcom Land Acquistion and Preservation Program, and other methods, while allowing passive recreation opportunities where appropriate.

Objectives

1.1 Property Protection

Acquire property using a variety of methods, such as purchase, conservation easements, and donations to prevent development and other land use disturbances that degrade the natural functions of the watershed.

1.1.1 Purchase watershed properties based on evaluation criteria, availability, and seller interest.

1.1.2 Evaluate the use of other programs to augment the watershed acquisition program to purchase watershed properties.

1.1.3 Share information about the acquisition program with watershed property owners to encourage program participation.

ALL PROTECTED
LAKE WHATCOM
WATERSHED PROPERTIES

Including Reconveyance, City Acquisitions, and Other

12,596 acres as of 2024

Reporting Metrics

- Number of new acres acquired or otherwise protected per year
- Number of development units removed from the watershed per year
- Total cumulative acres in protected status updated annually
- Number of property owners contacted per year

Land Preservation

GOAL: Increase the amount of preserved and restored land to reduce development and other land disturbance to protect watershed health and fish and wildlife habitat.

2025-2029 Estimated Investments: $28.4 million

1.2 Property Management

Manage acquired watershed properties to improve natural functions that protect water quality and fish and wildlife habitat.

1.2.1 Implement management plans that address restoration needs, passive recreation, and vegetation management needs for all acquired properties.

1.2.2 Update property management and use guidelines to guide the programs and actions taken to manage and protect watershed properties. The new document will clarify City response to requests for recreational development on City-managed properties.

Reporting Metrics

- Number of acres managed per year and type of management activities

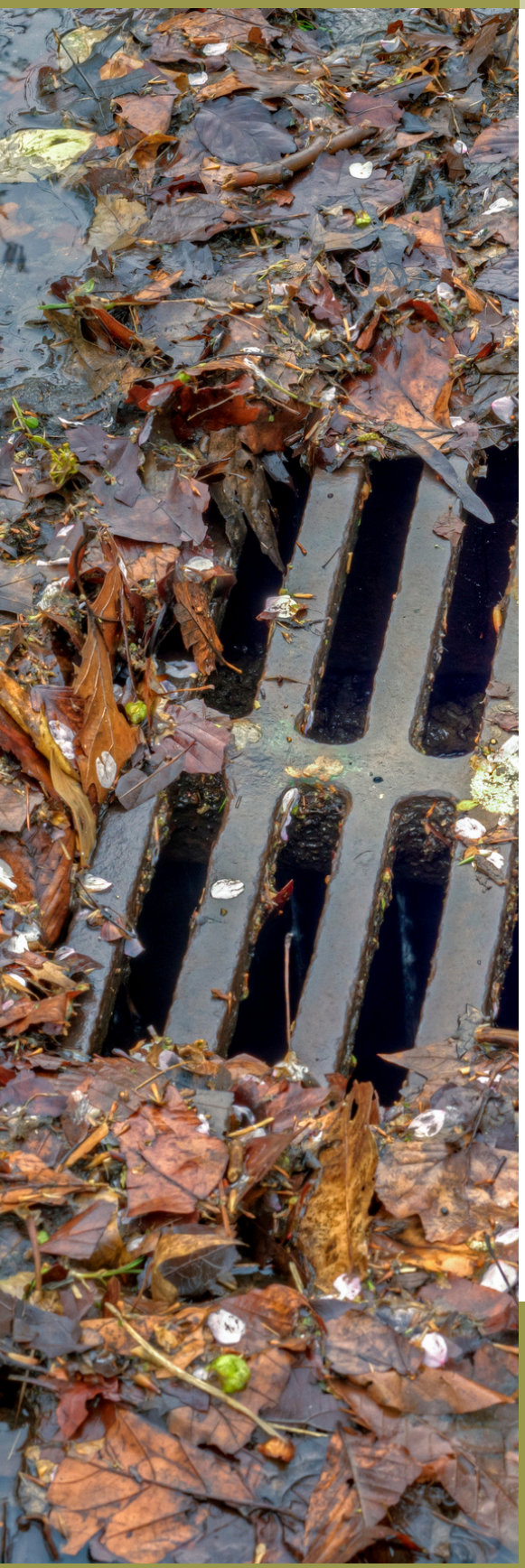
Relevant Resources

- Lake Whatcom Land Acquisition and Preservation Program
- Interactive Lake Whatcom Watershed Protected Properties Map
- Whatcom County Parks & Recreation Reconveyance

Stormwater Management

GOAL: Reduce the amount of phosphorus and bacteria entering the lake each year by using best management practices to collect, treat, and manage runoff from developed areas in the watershed.

2025-2029 Estimated Investments: $14.2 million



Summary

The LWMP addresses stormwater pollution by working with experts in the fields of engineering and water chemistry, as well as landowners throughout the watershed, to develop treatment strategies including preventing pollution at its source, filtering stormwater though native soils and vegetation, and treating it using engineered stormwater facilities and other emerging technologies.

Objectives

2.1 Capital Improvement Projects

Construct and retrofit capital facilities that treat stormwater runoff to reduce water quality and quantity impacts.

2.1.1 Construct new capital stormwater facilities and rebuild aging facilities and infrastructure in accordance with capital improvement and retrofit plans adopted by the City of Bellingham and Whatcom County.

2.1.2 Pursue funding opportunities, including grants, for projects identified in capital or retrofit plans.

Reporting Metrics

- Pounds of phosphorus reduced per year through phosphorus treatment and flow control capital projects
- Percentage of upland development draining to public outfalls managed by capital stormwater facilities
- Number of publicly-owned outfalls that have best-available capital stormwater treatment within their tributary basin

Stormwater Management

GOAL: Reduce the amount of phosphorus and bacteria entering the lake each year by using best management practices to collect, treat, and manage runoff from developed areas in the watershed.

2025-2029 Estimated Investments: $14.2 million

2.2 Residential Stormwater Solutions

Work with landowners to address unmanaged runoff and phosphorus from private properties around Lake Whatcom.

2.2.1 Provide technical and/or financial assistance for residential-scale retrofits of private property that result in phosphorus-limiting or flow-limiting projects and encourage voluntary stewardship by landowners.

2.2.2 Encourage the implementation of stormwater treatment practices, including infiltration and media filtration, on private properties through outreach, technical assistance, and barrier removal. Support, through incentives and technical assistance, the proper construction and maintenance of voluntary installations.

2.2.3 Encourage the conversion of non-native landscape and lawn to native forested areas and promote the preservation of forested areas through incentives and permanent conservation agreements with landowners.

2.2.4 Provide inspections and/or technical assistance to owners of private stormwater facilities and document performance toward water quality improvements for properly maintained systems.

2.2.5 Provide resources and staff support to educate owners of private stormwater facilities about system needs and maintenance.

2.2.6 Develop and disseminate Lake Whatcom watershed-specific stormwater education messaging that encourages residents to act to protect water quality, including using phosphorus-free fertilizer.

Reporting Metrics

- Pounds of phosphorus reduced per year through voluntary residential improvements
- Number of properties with completed residential stormwater projects per year
- Number of square feet of private property improved through voluntary residential projects per year
- Number of private stormwater facility inspections completed per year
- Proportion of watershed residents who are knowledgeable about water quality impacts and engage in behaviors to reduce these impacts, as measured every five years through the Lake Whatcom Watershed Survey

Stormwater Management

GOAL: Reduce the amount of phosphorus and bacteria entering the lake each year by using best management practices to collect, treat, and manage runoff from developed areas in the watershed.

2025-2029 Estimated Investments: $14.2 million

2.3 Public Stormwater Facilities and Infrastructure

Operate, inspect, and maintain all public stormwater facilities and infrastructure.

2.3.1 Conduct regular inspection and maintenance of public stormwater facilities.

2.3.2 Complete an evaluation of the effectiveness of Operations and Maintenance (O&M) procedures for stormwater flow control and treatment facilities. Develop a list of recommended improvements to O&M practices and procedures to increase phosphorus and bacteria reductions.

2.3.3 Complete an evaluation of the effectiveness of pollutant management activities on public lands throughout the watershed. Develop a list of recommended best practices for public land management for phosphorus and bacteria control.

2.3.4 Adopt an Enhanced Maintenance Plan to maximize phosphorus and bacteria reductions and begin implementation of this plan.

Reporting Metrics

- Pounds of phosphorus reduced per year through operations and maintenance activities

Stormwater Management

GOAL: Reduce the amount of phosphorus and bacteria entering the lake each year by using best management practices to collect, treat, and manage runoff from developed areas in the watershed.

2025-2029 Estimated Investments: $14.2 million

2.4 Integrate Water Quality Improvements Across Program Areas

Provide assistance to other program areas to achieve water quality improvement goals.

2.4.1 Provide technical assistance and consulting to other program areas and estimate water quality benefits gained through combined efforts and partnerships.

2.4.2 Develop a consistent and understandable way of estimating relative water quality benefits achieved by other relevant program areas.

2.4.3 Develop metrics for phosphorus reductions for mass per unit time (Lbs P/yr).

Relevant Resources

- Lake Whatcom Management Program Capital Improvement Projects
- City of Bellingham 2020 Surface and Stormwater Comprehensive Plan
- Whatcom County Lake Whatcom Comprehensive Stormwater Plan
- Lake Whatcom Comprehensive Plan: Stormwater Capital Program Update for Whatcom County, 2017
- Homeowner Incentive Program
- Neighborhood Native Landscaping Program

Land Use

GOAL: Prevent and minimize water quality impacts from new development and redevelopment.

2025-2029 Estimated Investments: $1.8 million

Summary

The LWMP utilizes land use regulations and reporting metrics to minimize water quality and quantity impacts from development and redevelopment activities in the Lake Whatcom watershed.

Objectives

3.1 Development

Develop, enforce, and comply with land use goals, policies and development regulations, including Bellingham Municipal Code 16.80 and Whatcom County Code 20.51, in order to protect water quality and quantity.

3.1.1 Coordinate with Lake Whatcom partners when developing or revising development regulations and create consistent development regulations between jurisdictions where feasible.

3.1.2 Track building and development activities in the watershed through a publicly accessible Buildout Report, published every five years, to inform goals, policies, and regulations.

3.1.3 Monitor newly established Native Vegetation Protection Areas (NVPA) for five years to ensure success as required by City code.

3.1.4 Provide outreach to watershed residents to increase understanding of and compliance with land use and stormwater regulations.

3.1.5 Evaluate how effectively changes to development regulations preserve and restore land that is currently available for development or other land disturbance and use this evaluation to inform future revisions to regulations.

Land Use

GOAL: Prevent and minimize water quality impacts from new development and redevelopment.

2025-2029 Estimated Investments: $1.8 million

Reporting Metrics

- Acres of phosphorus-neutral properties developed or re-developed in accordance with land use regulations.
- Acres of developed surface treated by phosphorus-limiting Best Management Practices (BMPs) installed to meet requirements of land use regulations.
- Acres of newly established Native Vegetation Protection Areas (NVPAs) through new development and redevelopment in the City, and Protective Native Growth Areas (PNGAs) in the County.
- Proportion of watershed residents who are knowledgeable about seasonal construction, special building, and clearing regulations measured every five years through the Lake Whatcom Watershed Survey.

Relevant Resources

- City of Bellingham watershed regulations:
  - Bellingham Municipal Code (BMC) 16.80 (Lake Whatcom Reservoir Regulatory Chapter)
  - BMC 15.42 (Stormwater Regulations)
  - BMC 16.55 (Critical Areas Ordinance)
  - Title 22 (Shoreline Master Program)
- Whatcom County watershed regulations:
  - Whatcom County Code (WCC) 20.51 (Lake Whatcom Watershed Overlay District, Stormwater Regulations, and Tree Removal)
  - WCC 16.16 (Critical Areas Ordinance)
  - Title 23 (Shoreline Management Program)
- Lake Whatcom Watershed Build-Out Analysis Reports

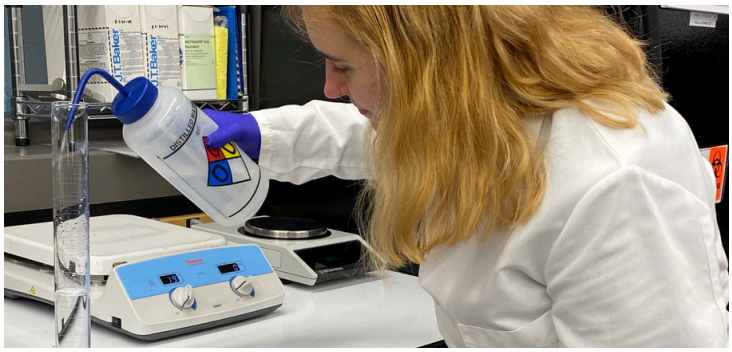
Monitoring and Data

GOAL: Collect and analyze sufficient data needed to protect water quality and reduce pollution in Lake Whatcom, reduce uncertainty in loading and response models, and guide management decisions.

2025-2029 Estimated Investments: $3 million

Summary

The LWMP works to implement studies, conduct monitoring, and improve modeling programs to further understand water quality and pollution sources in the Lake Whatcom watershed. Key efforts include lake and tributary monitoring, evaluating effectiveness of existing Best Management Practices (BMPs), updating load and response models, and managing data.



Objectives

4.1 Water Quality Monitoring

Monitor Lake Whatcom and its tributaries to understand long-term changes and inform management decisions.

4.1.1 Contract with Western Washington University Institute for Watershed Studies to collect samples and provide annual reports regarding water quality and trends in Lake Whatcom and tributaries.

4.1.2 Evaluate monitoring results and trends monthly and determine policy implications.

4.1.3 Conduct Lake Whatcom Climate Vulnerability Assessment.

4.1.4 Provide annual data input for loading and response models.

Reporting Metrics

- Number of lake water quality samples collected per year
- Number of tributary water quality samples collected per year

Monitoring and Data

GOAL: Collect and analyze sufficient data needed to protect water quality and reduce pollution in Lake Whatcom, reduce uncertainty in loading and response models, and guide management decisions.

2025-2029 Estimated Investments: $3 million

4.2 Stormwater Monitoring

Conduct monitoring to evaluate stormwater facilities for their effectiveness at removing phosphorus and fecal coliform.

4.2.1 Collect samples from stormwater facilities that measure phosphorus and fecal coliform levels.

4.2.2 Use data to develop recommendations to improve removal of phosphorus and fecal coliform by stormwater facilities; update Best Management Practices (BMPs) as needed.

Reporting Metrics

- Number of stormwater samples collected per year
- Amount of phosphorus and fecal coliform removed by stormwater facilities annually

4.3 Phosphorus Loading and Response Models

Continue to support data collection needed to improve accuracy of phosphorus loading and lake response models.

4.3.1 Collect high quality streamflow, water quality, and weather data.

4.3.2 Evaluate additional data needs and studies regarding phosphorus loading and models (e.g., groundwater inflow, internal loading, etc.).

Reporting Metrics

- Number and types of samples collected per year

Monitoring and Data

GOAL: Collect and analyze sufficient data needed to protect water quality and reduce pollution in Lake Whatcom, reduce uncertainty in loading and response models, and guide management decisions.

2025-2029 Estimated Investments: $3 million

4.4 Baseline Data

Manage and develop summaries of monitoring data and reports.

4.4.1 Summarize monitoring studies and reports and make information publicly accessible.

4.4.2 Maintain and update data catalog.

4.4.3 Track the status of Ecology-approved Quality Assurance Project Plans.

Relevant Resources

- Lake Whatcom Annual Monitoring Reports
- Lake Whatcom Tributary Monitoring Program Phase 3 Report (2021)

Hazardous Materials

GOAL: Prevent water quality impacts from improper storage and handling of hazardous materials and ensure that spill prevention and response programs adequately protect water quality.

2025-2029 Estimated Investments: $115,000

Summary

The LWMP promotes the proper management of hazardous materials to prevent pollution from entering stormwater systems. Whatcom County, City of Bellingham, and Lake Whatcom Water and Sewer District field staff are trained in pollution prevention, illicit discharge identification, investigation, and response.

Trained staff are responsible for responding to spills County, City and District-wide. These efforts are especially important in the Lake Whatcom watershed to protect our community's drinking water source.

Objectives

5.1 Hazardous Materials Removal

Facilitate removal of hazardous materials from watershed residences.

5.1.1 Promote and provide education on proper use, storage, and disposal of hazardous materials.

Reporting Metrics

- Proportion of watershed residents who are knowledgeable about proper hazardous materials disposal measured every five years through the Lake Whatcom Watershed Survey.

5.2 Spill Prevention and Response

Protect water quality by providing adequate spill prevention, response, and disposal programs.

5.2.1 Continue to detect and respond to reports of illicit discharges, connections, and improper disposal, including spills into stormwater systems and sewer systems.

Hazardous Materials

GOAL: Prevent water quality impacts from improper storage and handling of hazardous materials and ensure that spill prevention and response programs adequately protect water quality.

2025-2029 Estimated Investments: $115,000

5.2 Spill Prevention and Response (continued)

5.2.2 Educate watershed residents and visitors on how to prevent and report spills using Whatcom County Pollution Reporting and the City of Bellingham's Stormwater Hotline or SeeClickFix.

5.2.3 Review spill response procedures and reporting protocols.

5.2.4 Conduct ongoing field staff training regarding spill prevention and response.

Reporting Metrics

- Number and type of spills, illicit discharges, or hazardous material incidents reported in the watershed, and incident specific responses
- Proportion of watershed residents who are knowledgeable about how to report spills, measured every five years through the Lake Whatcom Watershed Survey
- Number of staff trained in spill prevention and response per year

Relevant Resources

- Whatcom County Emergency Management Plan
- Whatcom County Disposal of Toxics
- Whatcom County Pollution Reporting: (360) 778-6230
- City of Bellingham Pollution Reporting/Stormwater Hotline: (360) 778-7979
- City of Bellingham SeeClickFix

Recreation

GOAL: Provide access to recreational opportunities that are consistent with watershed health, water quality, and land management goals.

2025-2029 Estimated Investments: $6.2 million

Summary

The City of Bellingham and Whatcom County Parks and Recreation Departments continue to manage park usage and facilities in the Lake Whatcom watershed. Both jurisdictions work to limit recreation impacts to water quality through activities like providing pet waste stations, maintaining and retrofitting stormwater facilities, educating park visitors, and maintaining trails.

Objectives

6.1 Recreational Facilities

Manage recreational facilities to reduce impacts to lake water quality while supporting recreational opportunities, where appropriate.

6.1.1 Operate and maintain existing recreational amenities (including boat launch, parking, swimming dock, signage, picnic sites, shelters, community building, park pavilion, information kiosks, trash and dog waste receptacles, and restrooms) with a goal of improving water quality and explore options to provide these additional water quality improvement options at facilities where they do not currently exist.

6.1.2 Implement Integrated Pest Management (IPM) strategies in public parks that are low maintenance and nutrient-free.

6.1.3 Infiltrate or treat stormwater from recreational areas following stormwater Best Management Practices (BMPs).

6.1.4 Ensure recreational opportunities and special events offered through third-party vendors comply with LWMP and water quality goals and land use regulations.

Reporting Metrics

- Number of pet waste stations maintained
- Number of acres of City and County-owned recreational areas managed using IPM strategies
- Number of acres of impervious surface on City and County-owned recreational areas that follow stormwater BMPs

Recreation

GOAL: Provide access to recreational opportunities that are consistent with watershed health, water quality, and land management goals.

2025-2029 Estimated Investments: $6.2 million

6.2 Trails

Manage trails and park roads to reduce impacts to water quality.

6.2.1 Build and maintain trails in accordance with approved Whatcom County and City of Bellingham plans and trail design standards, appropriate BMPs, and regulatory requirements to prevent erosion and ensure runoff is infiltrated and/or treated before reaching a water body.

6.2.2 Identify, remove, and restore unauthorized trails, prioritizing the most impactful trails to water quality first.

6.2.3 Connect trails to other parks, trails, facilities, and transportation networks if consistent with watershed health, and water quality land management goals.

6.2.4 Provide trailhead amenities such as restrooms, dog waste stations, and information kiosks, where needed to reduce water quality impacts to the lake.

6.2.5 Install directional signs on trails to discourage off-trail usage.

Reporting Metrics

- Miles of trails maintained with an emphasis on minimizing water quality impacts
- Miles of unauthorized, user-built trails decommissioned per year
- Number of trailhead amenities added that minimize water quality impacts
- Number of directional signs installed

Recreation

GOAL: Provide access to recreational opportunities that are consistent with watershed health, water quality, and land management goals.

2025-2029 Estimated Investments: $6.2 million

6.3 Boating

Minimize impacts from boating on Lake Whatcom while maintaining access to the lake. *See Program Area 7 for AIS prevention*.

6.3.1 Educate boaters about water quality.

6.3.2 Educate boaters about boating rules on the lake.

6.3.3 Encourage the use of electric-powered boats.

6.3.4 Educate boaters about use and location of public restrooms.

Reporting Metrics

- Educational materials provided about water quality concerns, AIS, boating rules, electric-powered boats, and public restrooms

6.4 Public Access

Provide low-impact public access opportunities.

6.4.1 Maximize use of existing parks, launches, and trails for public access when possible.

6.4.2 Maintain bike lanes and transit services to provide access to recreational facilities that are consistent with watershed health and land management goals.

6.4.3 Maintain and develop access to key viewpoints in the watershed that are consistent with watershed health and land management goals.

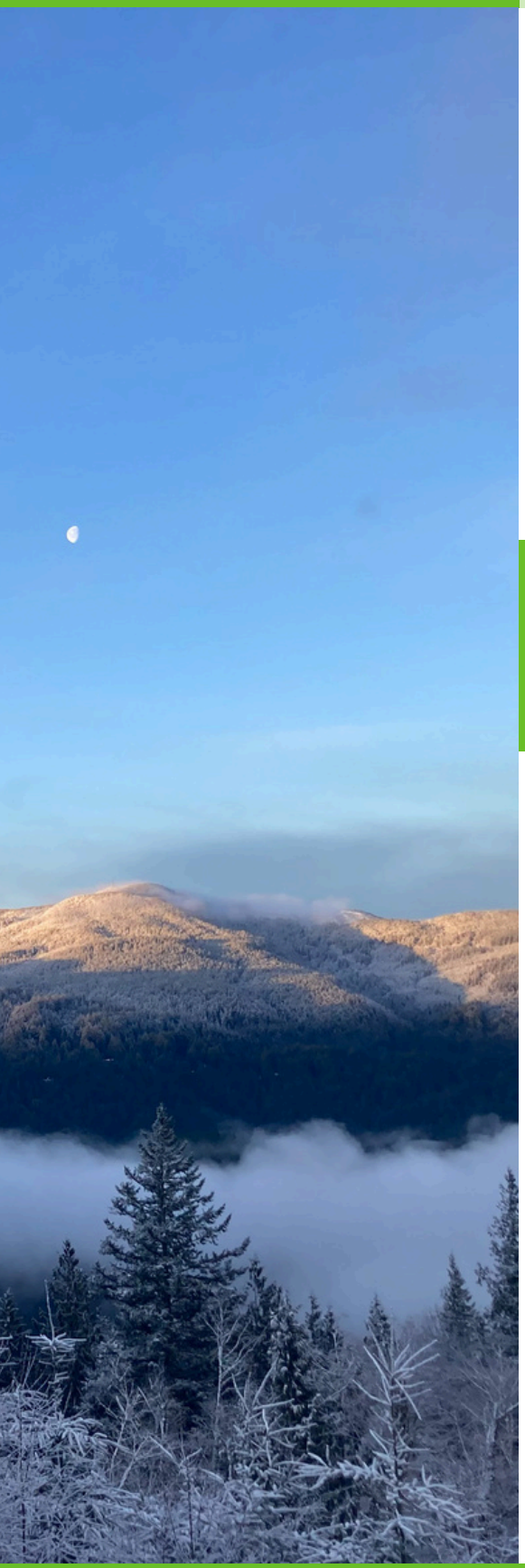
Reporting Metrics

- Estimated number of individuals using parks and trails in the watershed per year

Recreation

GOAL: Provide access to recreational opportunities that are consistent with watershed health, water quality, and land management goals.

2025-2029 Estimated Investments: $6.2 million



6.5 Public Information and Stewardship

Provide watershed stewardship information to recreational users.

6.5.1 Educate watershed residents and visitors about recreational practices that protect water quality and those that negatively impact water quality.

6.5.2 Engage recreational user groups (e.g. hikers, mountain bikers, horseback riders, boaters, etc.) in practices that protect water quality and those that negatively impact water quality.

Reporting Metrics

- Number and type of informational materials sent to watershed residents per year (see Program Area 9: Education & Engagement)
- Number of interpretive or informational materials installed, maintained, or distributed per year

Relevant Resources

- Whatcom County Parks and Recreation - Reconveyance
- Lookout Mountain Forest Preserve and Lake Whatcom Park Recreational Trail Plan
- Whatcom County Comprehensive Parks, Recreation and Open Space Plan
- City of Bellingham Comprehensive Parks, Recreation and Open Space Plan

Aquatic Invasive Species

GOAL: Prevent new aquatic invasive species (AIS) introductions to Lake Whatcom and reduce impacts associated with established invasive species.

2025-2029 Estimated Investments: $4.4 million

Summary

The LWMP launched the AIS Prevention Program in 2012 with the goal of preventing the introduction of zebra and quagga mussels and other aquatic invasive species to Lake Whatcom.

Through the program, all boats must be inspected by trained staff and receive a permit prior to recreating on Lake Whatcom. AIS staff also monitor a few Whatcom County lakes to detect the presence and absence of new AIS infestations.

Objectives

7.1 Prevention

Implement prevention programs to minimize introduction and spread of AIS into Lake Whatcom and nearby waterbodies.

7.1.1. Implement mandatory watercraft inspection and decontamination program at Lake Whatcom and Lake Samish.

7.1.2 Inform watershed residents, boaters, and other lake visitors about AIS issues and engage them in prevention activities through informational materials, online education tools (including AIS Awareness Course), community events and public meetings, and in-person conversations during inspections.

7.1.3 Increase signage at informal hand launch locations.

7.1.4 Continue regular boat patrols by Whatcom County Sheriff's Office to provide boater and AIS education and enforcement.

Aquatic Invasive Species

GOAL: Prevent new aquatic invasive species (AIS) introductions to Lake Whatcom and reduce impacts associated with established invasive species.

2025-2029 Estimated Investments: $4.4 million

7.1 Prevention (continued)

7.1.5 Evaluate operational changes that may decrease risk or increase efficiency and coordinate with other jurisdictions when implementing changes to ensure effective outcomes.

Reporting Metrics

- Number of watercraft inspections conducted per year
- Number of watercraft decontaminations conducted per year
- Number of people who completed the online AIS Awareness Course per year
- Number of non-boating visitors interacted with at check stations per year
- Proportion of watershed residents who are knowledgeable about AIS and compliance with inspection requirements, measured every five years through the Lake Whatcom Watershed Survey
- Number of sheriff patrols on Lake Whatcom and Lake Samish to enforce AIS compliance

7.2 Early Detection and Monitoring

Implement comprehensive aquatic invasive species monitoring program for Lake Whatcom and nearby waterbodies.

7.2.1 Conduct regular zebra and quagga mussel monitoring events in Whatcom County waters.

7.2.2 Monitor for new introductions and the extent and density of established aquatic invasive species through activities such as aquatic plant surveys, shoreline monitoring events, trapping and water sampling.

7.2.3 Continue to implement a voluntary AIS monitoring and reporting program for Lake Whatcom.

Reporting Metrics

- Number of zebra and quagga mussels identified per year
- Number of new AIS introductions per year
- Number and type of surveys, monitoring events, and sampling completed each year

Aquatic Invasive Species

GOAL: Prevent new aquatic invasive species (AIS) introductions to Lake Whatcom and reduce impacts associated with established invasive species.

2025-2029 Estimated Investments: $4.4 million

7.3 Management and Response

Establish effective plans for managing and responding to new infestations in a timely manner.

7.3.1 Develop an AIS Rapid Response Plan for Lake Whatcom.

7.3.2 Identify management tools and Best Management Practices (BMPs) that could be implemented in Lake Whatcom to address potential new invasive species of concern.

7.3.3 Coordinate and collaborate with staff from state and regional agencies and organizations when developing and implementing control and mitigation strategies.

Relevant Resources

- Lake Whatcom Aquatic Invasive Species Program Annual Reports and Documents
- Whatcom Boat Inspections
- Aquatic Invasive Species Awareness Course
- Inspection Results Story Map
- Whatcom Boat Inspections Hotline: (360) 778-7975
- Bellingham Municipal Code (BMC) 12.12.280 (Aquatic Invasive Species)
- Whatcom County Code (WCC) 2.27A (Aquatic Invasive Species)

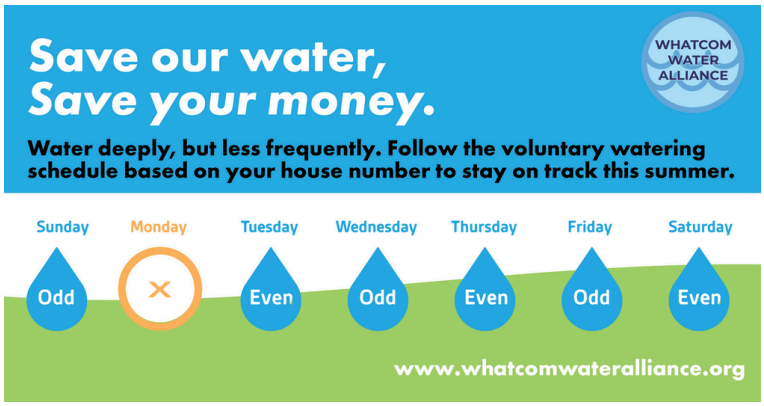
Utilities and Transportation

GOAL: Minimize water quality and quantity impacts from water, sewer, and transportation systems.

2025-2029 Estimated Investments: $7.7 million

Summary

The LWMP supports responsible management of public infrastructure that serves watershed residents, which is critical in mitigating impacts to Lake Whatcom's water quality. Proactive maintenance of water, sewer, and road infrastructure within the watershed, coupled with effective water supply management and public education, can reduce water quality impacts.



Objectives

8.1 Water Utilities

Manage water supply systems to minimize water quality and quantity impacts.

8.1.1 Conduct water audits to detect and repair water system leaks.

8.1.2 Encourage water-use efficiency through outreach and rebate programs offered by the City of Bellingham for City residents and Whatcom Water Alliance for County residents.

Reporting Metrics

- Estimated gallons of water conserved in the City of Bellingham and Lake Whatcom Water and Sewer District service areas per year
- Proportion of watershed residents who are knowledgeable of water conservation concerns related to water supply from Lake Whatcom, measured every five years through the Lake Whatcom Watershed Survey
- Number of households that receive drinking water from Bellingham's Water Treatment Plant, the District's water systems, or directly from Lake Whatcom that participate in residential rebate programs each year

Utilities and Transportation

GOAL: Minimize water quality and quantity impacts from water, sewer, and transportation systems.

2025-2029 Estimated Investments: $7.7 million

8.2 Sewage Utilities

Reduce water quality degradation from sanitary sewer and on-site sewage (OSS or septic) systems.

8.2.1 Provide sewer service to areas with OSS systems when appropriate.

8.2.2 Maintain and replace sewer infrastructure to reduce the potential of sewage overflows.

8.2.3 Enforce OSS system operation and maintenance regulations, maintain OSS database, respond to failing systems, and offer financial assistance to repair or replace failing septic systems.

Reporting Metrics

- Average monthly compliance rate (%) of OSS in the Lake Whatcom watershed per year
- Proportion of OSS by evaluation results (satisfactory; maintenance needed; failure) in the Lake Whatcom watershed per year
- Summary of OSS failures in the Lake Whatcom watershed per year
- Number of sewer overflows in the Lake Whatcom watershed per year
- Number of sewer overflows that reach Lake Whatcom per year

8.3 Roads and Transportation

Maintain transportation systems to protect water quality and inform watershed residents and visitors about alternative transportation opportunities.

8.3.1 Employ road design standards and associated stormwater treatment to reduce impacts to water quality.

8.3.2 Perform enhanced maintenance actions (i.e., additional street sweeping, more frequent cleaning of catch basins, etc.) to reduce impacts to water quality.

Utilities and Transportation

GOAL: Minimize water quality and quantity impacts from water, sewer, and transportation systems.

2025-2029 Estimated Investments: $7.7 million

8.3 Roads and Transportation (continued)

8.3.3 Encourage watershed residents and visitors to use alternative transportation in the watershed.

8.3.4 Work with Whatcom Transit Authority to preserve and promote public transit routes.

Reporting Metrics

- Pounds of phosphorus removed by street sweeping
- Number of catch basins cleaned and repaired
- Proportion of watershed residents who have used alternative methods of transportation in the past year, measured every five years through the Lake Whatcom Watershed Survey

Relevant Resources

City of Bellingham Resources

- Drinking Water Quality Reports
- Water Conservation Resources
- Water System Plan
- Pedestrian Master Plan
- Bicycle Master Plan

Lake Whatcom Water and Sewer District Resources

- Consumer Confidence Reports
- Water System Comprehensive Plan
- Sewer Comprehensive Plan

Whatcom County Resources

- Whatcom County Code (WCC) 24.05 (On-Site Sewage System Regulations)
- Bicycle/Pedestrian Resources

General Resources

- Community Energy Challenge
- Whatcom Smart Trips
- Whatcom Water Alliance

Education and Engagement

GOAL: Increase awareness of Lake Whatcom challenges and protection efforts among watershed residents and visitors and promote engagement in behaviors that protect water quality.

2025-2029 Estimated Investments: $1.3 million

Summary

The LWMP educates and engages community members on lake protection and pollution prevention by providing information, offering incentives, and removing barriers to help people take action. Education and engagement (i.e., outreach) work plan objectives are divided into three types:

- **General Lake Whatcom** outreach activities are designed to reach a general audience and provide a broad array of information about the Lake Whatcom watershed.
- **Program area-specific outreach** activities apply to a specific target audience and often include assistance or incentives to help community members take a specific action to protect Lake Whatcom. Outreach activities are listed both in relevant program areas and in the Education and Engagement section.
- **Community-wide** outreach activities are incorporated into education and engagement efforts that target a broader, community-wide audience, but which also may benefit Lake Whatcom.

Objectives

9.1 General Lake Whatcom Education and Engagement

Provide education about Lake Whatcom and the LWMP programs in place to protect watershed health.

9.1.1 Share informational materials about Lake Whatcom, its watershed, and LWMP activities to watershed residents, property owners, visitors, community members, and elected officials.

9.1.2 Maintain and update information and resources on the jointly managed LWMP website.

Education and Engagement

GOAL: Increase awareness of Lake Whatcom challenges and protection efforts among watershed residents and visitors and promote engagement in behaviors that protect water quality.

2025-2029 Estimated Investments: $1.3 million

9.1 General Lake Whatcom Education and Engagement (continued)

9.1.3 Measure watershed residents' understanding of watershed issues and adoption of stewardship practices at least once every five years through the Lake Whatcom Watershed Survey and use the results to adapt programs, direct resources more effectively, and develop programming for topics in program areas where additional education is needed.

9.1.4 Provide education and engagement for program-specific activities included in this work plan, in addition to those specified under 9.2, to increase awareness about these activities.

Reporting Metrics

- Number and type of information materials sent to watershed residents per year
- Number of unique visitors to Lake Whatcom Management Program website per year
- Number of participants in the Lake Whatcom Watershed Survey every five years
- Level of watershed residents' knowledge of and participation in key stewardship practices, measured every five years through the Lake Whatcom Watershed Survey

9.2 Program Area-Specific Education and Engagement

The following program area-specific education and engagement activities are also listed under their respective program areas. Any reporting metrics for these activities can also be found under the respective program areas.

Land Preservation

1.1.3 Share information about the acquisition program with watershed property owners to encourage program participation.

Education and Engagement

GOAL: Increase awareness of Lake Whatcom challenges and protection efforts among watershed residents and visitors and promote engagement in behaviors that protect water quality.

2025-2029 Estimated Investments: $1.3 million

9.2 Program Area-Specific Education and Engagement (continued)

Stormwater Management

2.2.3 Encourage the conversion of non-native landscape and lawn to native forested areas and promote the preservation of forested areas through incentives and permanent conservation agreements with landowners.

2.2.5 Provide resources and staff support to educate owners of private stormwater facilities about system needs and maintenance.

2.2.6 Develop and disseminate Lake Whatcom watershed-specific stormwater education messaging that encourages residents to act to protect water quality, including using phosphorus-free fertilizer.

Land Use

3.1.4 Provide outreach to watershed residents to increase understanding of and compliance with land use and stormwater regulations.

Hazardous Materials

5.1.1 Promote and provide education on proper use, storage, and disposal of hazardous materials.

5.2.2 Educate watershed residents and visitors on how to prevent and report spills through Whatcom County Pollution Reporting and the City of Bellingham's Stormwater Hotline or SeeClickFix.

Recreation

6.3.1 Educate boaters about water quality.

6.3.2 Educate boaters about boating rules on the lake.

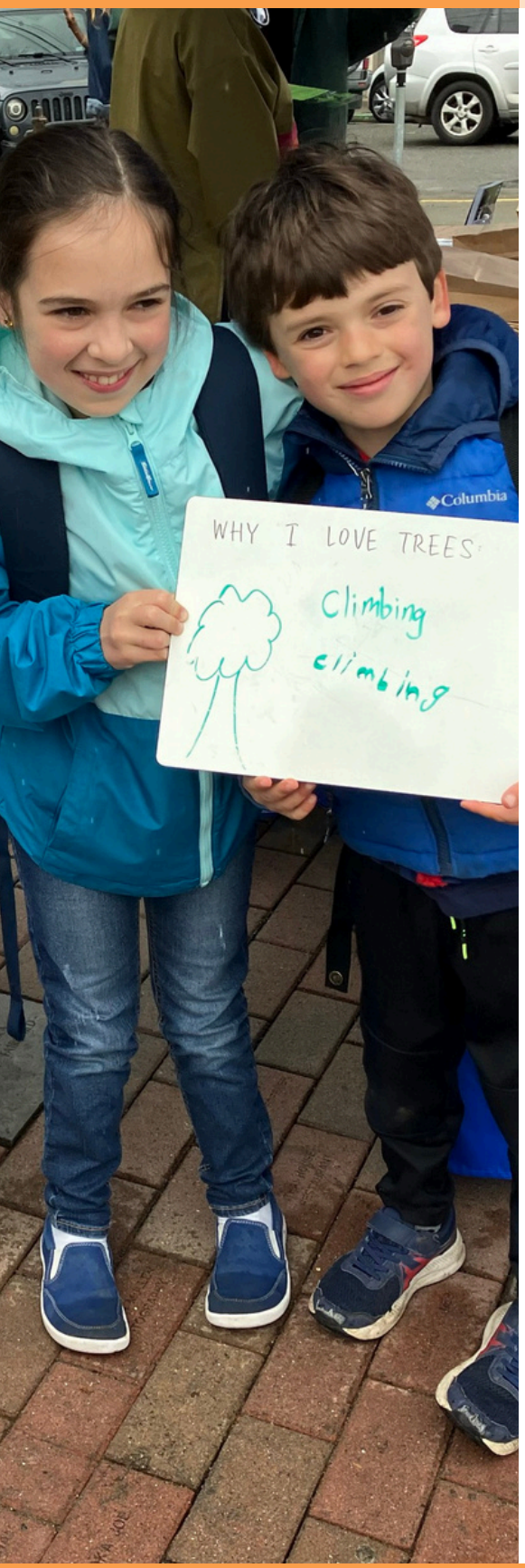
6.3.3 Encourage the use of electric-powered boats.

6.3.4 Educate boaters about use and location of public restrooms.

Education and Engagement

GOAL: Increase awareness of Lake Whatcom challenges and protection efforts among watershed residents and visitors and promote engagement in behaviors that protect water quality.

2025-2029 Estimated Investments: $1.3 million



9.2 Program Area-Specific Education and Engagement (continued)

Recreation (continued)

6.5.1 Educate watershed residents and visitors about recreational practices that protect water quality and those that negatively impact water quality.

6.5.2 Engage recreational user groups (e.g. hikers, mountain bikers, horseback riders, boaters, etc.) in practices that protect water quality and those that negatively impact water quality.

Aquatic Invasive Species

7.1.2 Inform watershed residents, boaters, and other lake visitors about AIS issues and engage them in prevention activities through informational materials, online education tools (including AIS Awareness Course), community events and public meetings, and in-person conversations during inspections.

Utilities and Transportation

8.1.2 Encourage water-use efficiency through outreach and rebate programs offered by the City of Bellingham for City residents and Whatcom Water Alliance for County residents.

8.3.3 Encourage watershed residents and visitors to use alternative transportation in the watershed.

Administration

10.2.1 Provide notice of public meetings and other opportunities for public involvement on the LWMP website.

Climate Action

11.1.2 Create educational materials based off of results from the Lake Whatcom Climate Vulnerability Assessment.

Forest Management

12.4.1 Engage in partnerships to encourage wildfire risk assessments and mitigation and promote climate resilience on public and private land in the Lake Whatcom watershed.

Education and Engagement

GOAL: Increase awareness of Lake Whatcom challenges and protection efforts among watershed residents and visitors and promote engagement in behaviors that protect water quality.

2025-2029 Estimated Investments: $1.3 million

9.2 Program Area-Specific Education and Engagement (continued)

Forest Management (continued)

12.4.2 Engage in partnerships to educate watershed residents about wildfire preparedness.

See Reporting Metrics in respective program areas.

9.3 Community-wide Education and Engagement with Lake Whatcom Benefit

The following community-wide education and engagement activities target a broader, community-wide audience but may also benefit Lake Whatcom.

9.3.1 Pet waste: Programs that support pet waste pick up at home and in parks.

9.3.2 Car care: Awareness efforts to prompt vehicle owners to wash their vehicles at a car wash and regularly check for and promptly fix leaks.

9.3.3 Yard care: Educate and encourage residents to use natural yard care practices.

9.3.4 On-site sewage (OSS) system maintenance: Support proper maintenance of OSS systems (septic systems).

9.3.5 Youth education: Provide youth education about water treatment and water conservation principles.

Reporting Metrics

- Measured every five years through the Lake Whatcom Watershed Survey:
  - Proportion of watershed residents who pick up pet waste on walks and at home
  - Proportion of watershed residents who use watershed-friendly vehicle care practices
  - Proportion of watershed residents who choose not to use chemical weed killers on their yard
  - Proportion of watershed residents who use 0% phosphorus fertilizer
  - Proportion of watershed residents who maintain their septic systems
- Number of students who participate in youth education programs each year, including the Bellingham Water School Program offered by the City to fifth grade students in the Bellingham School District

Education and Engagement

GOAL: Increase awareness of Lake Whatcom challenges and protection efforts among watershed residents and visitors and promote engagement in behaviors that protect water quality.

2025-2029 Estimated Investments: $1.3 million

Relevant Resources

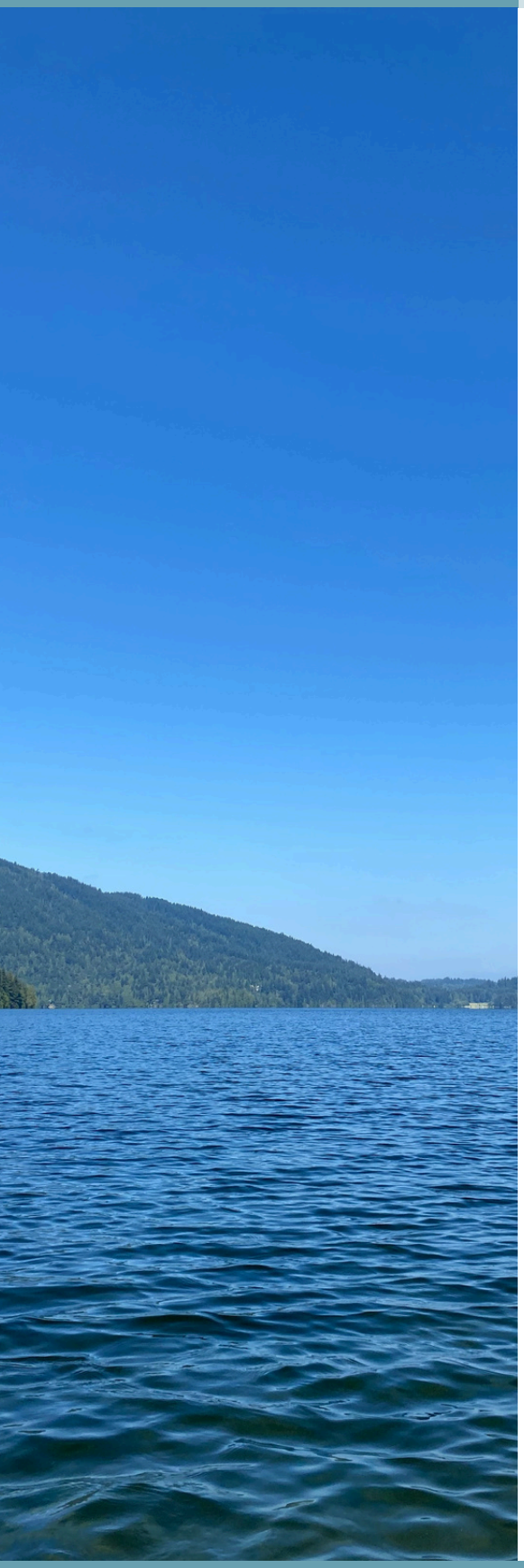
Lake Whatcom Management Program Resources

- Lake Whatcom Management Program Website
- Lake Whatcom Watershed Five-Year Survey Findings
- City of Bellingham Lake Whatcom Stewardship
- City of Bellingham We Scoop Program
- Bellingham Water School Program
- Lake Whatcom Homeowner Incentive Program
- Neighborhood Native Landscaping Program
- Whatcom County Scooping Ambassador Program

Administration

GOAL: Implement the LWMP 2025-2029 Work Plan and provide opportunities for public input.

2025-2029 Estimated Investments: $1 million



Summary

The City of Bellingham, Whatcom County, Lake Whatcom Water and Sewer District, and other partners collaborate regularly to implement shared LWMP goals to protect Lake Whatcom. Meeting facilitation, reporting, budget development, and other administrative activities are all critical to the success of the program.

Objectives

10.1 Meeting Coordination

Coordinate and provide staff support for LWMP meetings and information-sharing opportunities.

10.1.1 Hold meetings of the Lake Whatcom Joint Policy Group to discuss Lake Whatcom policy topics and provide guidance and direction to staff.

10.1.2 Hold annual Joint Councils and Commission meeting to discuss LWMP Work Plan and accomplishments.

10.1.3 Hold Joint Councils and Commission work sessions as needed to discuss technical policy questions.

10.1.4 Hold monthly meetings of the Lake Whatcom Data Management Team to address issues related to monitoring, modeling, Total Maximum Daily Load (TMDL) requirements, and other data management.

10.1.5 Hold monthly meetings of the Lake Whatcom Interjurisdictional Coordinating Team (ICT) to oversee work plan implementation efforts and work product development.

10.1.6 Hold Lake Whatcom Management Committee (Executive Team) meetings as needed to provide staff with administrative direction.

Administration

GOAL: Implement the LWMP 2025-2029 Work Plan and provide opportunities for public input.

2025-2029 Estimated Investments: $1 million

10.1 Meeting Coordination (continued)

10.1.7 Engage the Bellingham Water Resources Advisory Board as appropriate.

Reporting Metrics

- Number and type of meetings held per year

10.2 Public Information

Coordinate education and engagement efforts by LWMP staff and partners. Inform the community about opportunities for involvement in public meetings, comment periods, and decision-making processes.

10.2.1 Provide notice of public meetings and other opportunities for public involvement on the LWMP website.

10.2.2 Provide periodic updates to the Bellingham City Council, Whatcom County Council, and Lake Whatcom Water and Sewer District Board of Commissioners.

10.2.3 Conduct public presentations as needed.

10.3 Work Plans and Reports

Support development of work plans, presentations, and reports.

10.3.1 Oversee the development of the LWMP five-year work plan and annual LWMP progress and monitoring reports.

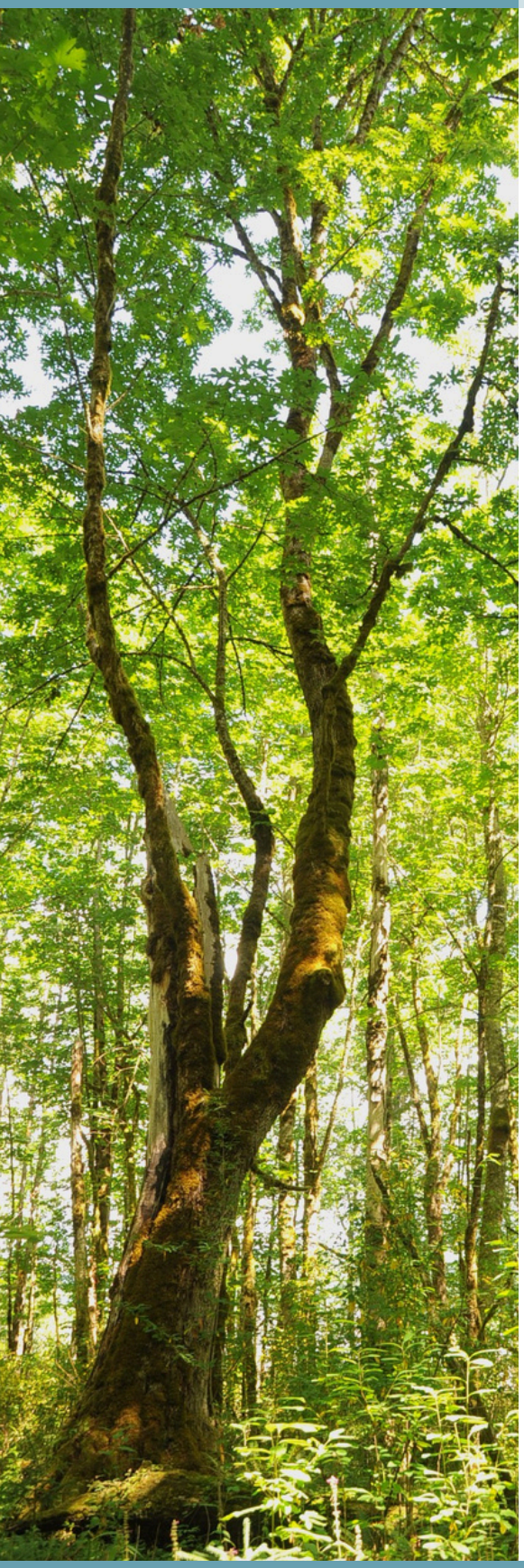
10.3.2 Oversee performance measure tracking and reporting and work with the Lake Whatcom Joint Policy Group to gather feedback on performance goals as needed.

10.3.3 Develop 2030-2034 Lake Whatcom TMDL Implementation Tasks.

Administration

GOAL: Implement the LWMP 2025-2029 Work Plan and provide opportunities for public input.

2025-2029 Estimated Investments: $1 million



10.4 Funding

Establish work plan funding needs and strategy to support work plan implementation.

10.4.1 Seek funding necessary to implement LWMP programs.

10.4.2 Identify and pursue grant funding as opportunities arise.

10.4.3 Manage County's stormwater fee rolls and City's Lake Whatcom Property Acquisition Program funds.

10.5 Regulatory Agencies

Support work plan implementation by communicating with agencies.

10.5.1 Communicate with regulatory agencies regarding Lake Whatcom water quality, natural resources, and land use activities in the watershed.

10.6 Contracts

Oversee a variety of consultant and contractor projects, contracts, and work products.

10.6.1 Manage and oversee all contracts with consultants and contractors.

Relevant Resources

- 1992 Lake Whatcom Joint Resolution
- Lake Whatcom Management Program Work Plans and Progress Reports
- Lake Whatcom Meeting Announcements and News
- Lake Whatcom Management Program Contacts
- Lake Whatcom Stormwater Utility
- Lake Whatcom Joint Policy Group Meeting Materials

Climate Action

GOAL: Build climate resilience and adaptation within the Lake Whatcom watershed and Lake Whatcom Management Program.

2025-2029 Estimated Investments: $675,000

Summary

The LWMP works to build resilience and adapt to negative impacts caused by changes in ecological and environmental parameters associated with a changing climate, including increased temperatures and measurable variations from historical rainfall patterns. The LWMP also supports actions that reduce greenhouse gas emissions and encourages residents and visitors to adopt climate-friendly behaviors.

Climate action work plan components are divided into two types:

- **General Lake Whatcom** activities focus on adaptation and resilience in the Lake Whatcom watershed.
- **Program area-specific** activities are each attached to a specific program area.

The following objectives detail how the work of the LWMP addresses climate action.

Objectives

11.1 General Climate Action

Assess and address climate impacts in the Lake Whatcom watershed.

11.1.1 Conduct a comprehensive Lake Whatcom Climate Vulnerability Assessment to assess the impacts of climate change on the Lake Whatcom watershed and the LWMP.

11.1.2 Create educational materials based off of results from the Lake Whatcom Climate Vulnerability Assessment.

Reporting Metrics

- Complete Lake Whatcom Climate Vulnerability Assessment
- Number and type of educational materials created

Climate Action

GOAL: Build climate resilience and adaptation within the Lake Whatcom watershed and Lake Whatcom Management Programs.

2025-2029 Estimated Investments: $675,000

11.2 Program Area-Specific Climate Actions

Integrate climate action into other areas of LWMP work by assessing and addressing climate impacts for applicable program areas.

11.2.1 Land Preservation: Continue to acquire properties and conservation easements for preservation and restoration that can contribute to carbon storage and forest resilience.

11.2.2 Stormwater Management: Adapt stormwater design standards and capital facility planning to accommodate changes in rainfall patterns and increased peak flow events.

11.2.3 Monitoring and Data: Ensure data collection, monitoring, and modeling efforts consider climate change.

11.2.4 Recreation: Address high-use and high-impact uses of recreational lands during extreme temperature events.

11.2.5 Aquatic Invasive Species: Assess potential impacts of infestations from new species that may be facilitated by increasing temperature.

11.2.6 Utilities and Transportation: Encourage use of zero or low-carbon transportation options in the watershed, including public transit, bikeways, pedestrian connections, car sharing programs, EVs, electric-powered boats, and similar.

11.2.7 Forest Management: Assess wildfire risk and implement wildfire risk reduction programs across the watershed.

See Reporting Metrics in respective program areas.

Relevant Resources

- City of Bellingham Climate Protection Action Plan
- Whatcom County Climate Action Plan
- Washington State Climate Resilience Strategy
- Washington State Department of Natural Resources (DNR) Climate Resilience Plan

Forest Management

GOAL: Increase forest management strategies that improve forest health, protect lake water quality, and minimize the risk of catastrophic wildfire.

2025-2029 Estimated Investments: $2.1 million

Summary

The LWMP supports responsible management of public forestland and provides education to private forestland owners about wildfire risks and preparedness.

Objectives

12.1 Forest Management Plans

Support development and implementation of sound forest management plans.

12.1.1 Create and implement Forest Management Plans (FMP) for County and City-owned forestland in the Lake Whatcom watershed.

12.1.2 Implement existing City plans for forest thinning to improve structural diversity and health.

12.2 Forest Practices Review

Review and comment on Washington State Department of Natural Resources (DNR) and private forestry activities to minimize adverse impacts to water quality.

12.2.1 Actively participate in the Interjurisdictional Committee (IJC) and review and comment on DNR forestry activities.

12.2.2 Review and comment on private forest practice applications.

12.2.3 Track and publicly report permitted forest practice activities (including harvests, replanting, road building and abandonment, and herbicide spraying).

Reporting Metrics

- Acres of timber harvested and replanted on forestlands per year
- Acres of land treated with herbicides on forestlands per year

Forest Management

GOAL: Increase forest management strategies that improve forest health, protect lake water quality, and minimize the risk of catastrophic wildfire.

2025-2029 Estimated Investments: $2.1 million

12.3 Forest Roads

Manage forest roads on City and County-owned lands to reduce impacts to water quality.

12.3.1 Maintain and abandon City and County-managed forest roads using recommendations from the upcoming Lake Whatcom Forest Management Plan.

Reporting Metrics

- Feet of forest roads maintained
- Feet of forest roads abandoned

12.4 Wildfire Preparedness and Risk Assessments

Inform watershed residents about resources and programs to address wildfire risk.

12.4.1 Engage in partnerships to encourage wildfire risk assessments and mitigation and promote climate resilience on public and private land in the Lake Whatcom Watershed.

12.4.2 Engage in partnerships to educate watershed residents about wildfire preparedness.

Reporting Metrics

- Proportion of watershed residents who are knowledgeable about wildfire risk reduction work, measured every five years through the Lake Whatcom Watershed Survey
- Number of watershed residents who have participated in a wildfire risk assessment

Relevant Resources

- Whatcom County Wildland Fire Action Plan
- DNR Lake Whatcom Landscape Plan 2004

2025-2029 Work Plan Cost Estimates

The table below has estimated costs for each program area. This is what the LWMP anticipates spending in 2025-2029. Annual expenditures are reported each year in the LWMP Progress Reports.

Program Area	Staff Costs	Capital Costs	Other Costs	5-Year Total
Land Preservation	$2,036,115	$26,000,000	$387,000	$28,423,615
Stormwater Management	$2,463,916	$8,030,000	$3,857,000	$14,350,916
Land Use	$1,825,000	-	-	$1,825,000
Monitoring and Data	$641,550	-	$2,435,500	$3,077,050
Hazardous Materials	$114,850	-	-	$114,850
Recreation	$2,612,000	$3,088,000	$500,000	$6,200,000
Aquatic Invasive Species	$3,826,831	-	$614,375	$4,441,206
Utilities and Transportation	$2,019,768	$3,460,000	$2,230,100	$7,709,868
Education and Engagement	$735,000	-	$544,300	$1,311,800
Administration	$1,014,360	-	-	$1,014,360
Climate Action	$375,000	-	$300,000	$675,000
Forest Management	$568,000	$270,000	$1,300,000	$2,138,900
LWMP Work Plan Total	**$18,265,773***	**$40,848,000**	**$12,073,792****	**$71,187,565**

*Staff costs include actual budgeted staff costs for each program area (including benefits).

**Other costs include supplies, materials, equipment, consultant fees, interfund charges, taxes, bank charges, and procedural costs.

2025-2029 Work Plan Funding Sources

Program Area	Partner	Funding Sources
Land Preservation	Whatcom County	Conservation Futures Fund
	City of Bellingham	Lake Whatcom Property Acquisition Fees
	Lake Whatcom Water and Sewer District	Not applicable
Stormwater Management	Whatcom County	Real Estate Excise Taxes, Flood Control Zone District Taxes, Stormwater Utility Fees, Road Fund, Grants
	City of Bellingham	Stormwater Utility Fees, Portion of Lake Whatcom Property Acquisition Fees, Grants
	Lake Whatcom Water and Sewer District	Utility Fees
Land Use	Whatcom Couty	Development Fees, General Fund
	City of Bellingham	Development Fees, General Fund
	Lake Whatcom Water and Sewer District	Not applicable
Monitoring and Data	Whatcom County	Flood Control Zone District Taxes, Stormwater Utility Fees, Road Fund
	City of Bellingham	Stormwater Utility Fees, Water Utility Fees
	Lake Whatcom Water and Sewer District	Utility Fees
Hazardous Materials	Whatcom County	Solid Waste Excise Taxes, Flood Control Zone District, Road Fund, Grants
	City of Bellingham	Stormwater Utility Fees, Water Utility Fees
	Lake Whatcom Water and Sewer District	Not applicable

2025-2029 Work Plan Funding Sources

Continued from previous page

Program Area	Partner	Funding Sources
Recreation	Whatcom County	Conservation Futures Fund, General Fund, Real Estate Excise Taxes, Parks Special Revenue Fund
	City of Bellingham	Greenways Taxes, General Fund
	Lake Whatcom Water and Sewer District	Utility Fees
Aquatic Invasive Species	Whatcom County	Flood Control Zone District Taxes
	City of Bellingham	Water Utility Fees, Boat Inspection Fees
	Lake Whatcom Water and Sewer District	Utility Fees
Utilities and Transportation	Whatcom County	Road Fund
	City of Bellingham	Street Funds, Utility Fees
	Lake Whatcom Water and Sewer District	Utility Fees
Education and Engagement	Whatcom County	Flood Control Zone District Taxes, Stormwater Utility Fees, Road Fund
	City of Bellingham	Stormwater Utility Fees, Water Utility Fees
	Lake Whatcom Water and Sewer District	Utility Fees
Administration	Whatcom County	Flood Control Zone District Taxes, Road Fund, Stormwater Utility Fees
	City of Bellingham	Stormwater Utility Fees, Water Utility Fees
	Lake Whatcom Water and Sewer District	Utility Fees

2025-2029 Work Plan Funding Sources

Continued from previous page

Program Area	Partner	Funding Sources
Climate Action	Whatcom County	General Fund, Flood Control Zone District Taxes
	City of Bellingham	Water Utility Fees
	Lake Whatcom Water and Sewer District	Not applicable
Forest Management	Whatcom County	General Fund, Flood Control Zone District Taxes
	City of Bellingham	Water Utility Fees
	Lake Whatcom Water and Sewer District	Not applicable

Lake Whatcom Facts

Population and Drinking Water Supply

- Lake Whatcom is the drinking water source for over 100,000 Whatcom County residents, which is about half the county's population.
- Lake Whatcom provides drinking water for the City of Bellingham, Lake Whatcom Water and Sewer District, several smaller water districts and associations, and homes that draw water directly from the lake.
- The City of Bellingham withdraws water from the lake's middle basin through a 1,200-foot wooden pipeline that leads to the water treatment plant in Whatcom Falls Park.
- The Lake Whatcom Water and Sewer District withdraws water from the lake's Basin No. 3 at approximately 70 feet below the water surface and is treated at the water treatment plant in the Sudden Valley Community Association's Morning Beach Park.
- About 19,000 people live in the Lake Whatcom watershed (2020 estimate).
- Approximately 33% of the watershed population lives within the City of Bellingham and approximately 67% live outside city limits in unincorporated Whatcom County.

Physical Characteristics

- Lake Whatcom is about ten miles long and just over one mile wide at its widest point.
- Lake Whatcom's total shoreline is about 30 miles long.
- Lake Whatcom's surface area is about 5,000 acres with 92% outside of city limits.
- Lake Whatcom is made up of three distinct basins that hold about 250 billion gallons of water.
- Lake Whatcom's natural outflow is to Whatcom Creek and Bellingham Bay. The City of Bellingham controls the lake level with a small dam at the outlet draining to Whatcom Creek. When the lake level reaches 314.94 feet above mean sea level, the City is obligated to release water through the control dam.
- Lake Whatcom's watershed covers about 56 square miles (36,000 acres) with 97% outside of city limits.
- Lake Whatcom is fed by 36 streams (many do not flow year-round). Major streams include Silver Beach, Carpenter, Olsen, Smith, Anderson, Brannian, and Austin Creeks. Lake Whatcom also periodically receives water diverted from the Middle Fork Nooksack River by the City of Bellingham to meet water supply needs.
- Lake Whatcom's deepest point is 334 feet below the surface.

Program Development and Accomplishments Timeline

1992 - 1999

1992: Joint Resolution adopted to establish common goals for Lake Whatcom watershed
1992: City stormwater capital improvement program began
1993: Sudden Valley Community Association began density reduction program to remove 1,400 potential dwelling units
1998: Lake Whatcom Management Program (LWMP) established by Interlocal Agreement
1998: Lake Whatcom placed on Washington's list of polluted water bodies due to low dissolved oxygen levels; Tributary creeks listed for high bacteria levels; Total Maximum Daily Load (TMDL) process began
1999: County Water Resource Protection Overlay District and Stormwater Special District established
1999: LWMP 1999 Work Plan adopted

2000 - 2004

2000: LWMP 2000-2004 Work Plan adopted
2000: City stormwater capital improvement program expands to address phosphorus
2000: Interjurisdictional Coordinating Team (ICT) created to coordinate activities and programs between jurisdictions
2001: City adopted first land use regulations for new development on properties that drain to Basin 1 (Lake Whatcom Reservoir Regulatory Chapter [BMC 16.80])
2001: City stormwater utility established; provides funding for Lake Whatcom protection
2001: City Lake Whatcom Watershed Land Acquisition and Preservation Program began
2001: City Watershed Advisory Board established
2002: County rezone reduced 1,800 potential dwelling units
2004: Lake Whatcom Landscape Plan adopted by State Legislature that provides additional protections for harvesting on Department of Natural Resources lands in the watershed

2005 - 2009

2005: LWMP 2005-2009 Work Plan adopted
2005: City and County passed phosphorus fertilizer ban
2005: City and County banned boats with carbureted 2-stroke engines
2006: County stormwater capital improvement program with focus on phosphorus treatment began
2008: Lake Whatcom Joint Policy Group formed
2008: City Residential Stormwater Retrofit Program began
2009: City amended the Lake Whatcom Reservoir Regulatory Chapter

Program Development and Accomplishments Timeline

Continued from previous page

2010 - 2014

2010: LWMP 2010-2014 Work Plan adopted
2011: Homeowner Incentive Program launched
2012: Aquatic Invasive Species Prevention Program began
2013: County amended Title 20 to create the Lake Whatcom Watershed Overlay District to reduce impacts from development and land use activities
2014: Sudden Valley Community Association joined Joint Policy Group
2014: Department of Natural Resources (DNR) finalized reconveyance of 7,800 acres in the watershed to Whatcom County Parks

2015 - 2019

2015: LWMP 2015-2019 Work Plan adopted
2016: Lake Whatcom TMDL for phosphorus and fecal coliform approved by Environmental Protection Agency (EPA)
2016: New phosphorus loading model developed
2017: Homeowner Incentive Program revised and expanded
2019: Update of lake response model initiated
2019: County Lake Whatcom Stormwater Utility established to provide funding for Lake Whatcom protection
2019: City and County National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permits issued (TMDL response requirements included in the new permit)

2020 - 2024

2020: LWMP 2020-2024 Work Plan adopted
2021: City-developed Phosphorus-Optimized Stormwater Treatment (POST) system formally approved for use by the Department of Ecology's Technical Assessment program
2021: Whatcom County Sheriff's Office implements regular boat patrols on Lake Whatcom and Lake Samish to enforce compliance with AIS permits and regulations
2022: Neighborhood Native Landscaping Program launches in unincorporated Whatcom County
2022: Park Place Water Quality Facility rebuilt to meet highest-known phosphorus reduction performance using POST media system
2023: City of Bellingham Water Resources Advisory Board established
2024: City and County National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permits issued

AGENDA BILL Item 6.C	**Water Right No. CG1-23449C Status**			
DATE SUBMITTED:	January 23, 2025	MEETING DATE:	January 29, 2025	
TO: BOARD OF COMMISSIONERS		FROM: Justin Clary, General Manager		
GENERAL MANAGER APPROVAL				
ATTACHED DOCUMENTS		1. none		
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☐	INFORMATIONAL/ OTHER ☒

BACKGROUND / EXPLANATION OF IMPACT

In 2006, the Lake Whatcom Water and Sewer District (District) entered into an agreement with the Lake Whatcom Residential & Treatment Center (LWRTC) to extend the District's Group A Public Water System (Agate Heights System; DOH System ID 52957) to serve the LWRTC's facility located at 3400 Agate Heights Road. A condition of the agreement was LWRTC's transfer of ownership of its water distribution system, groundwater wells, and groundwater water right (Water Right Certificate No. G1-23449C) to the District. The Bill of Sale associated with the agreement was executed in 2009.

In 2010, Wilson Engineering, on behalf of the District, filed with Ecology an Application for Change/Transfer of Water Right to transfer Water Right No. G1-23449C from the LWRTC well (Well ID No. AFM098) to the District's 10-inch diameter well (Well ID No. AGQ477 referred to as the Giesbrecht Well) serving its Agate Heights water system.

With nearly 15 years having passed since the application was filed with the Washington State Department of Ecology (Ecology) and significant District staff turnover having occurred during that time, current District staff had incorrectly understood that the water right transfer had been completed. However, in review of the Whatcom County Coordinated Water System Plan that is currently under revision, the subject water right transfer was noted as *pending*. With the recent recognition of the outstanding status of the transfer, District staff met with Ecology on January 22 to discuss the transfer application status and means of expediting its completion.

Due to current workload and the pending WRIA No. 1 adjudication, Ecology staff could not provide a timeline for the application to be processed under the *traditional review process* and recommended the District consider Ecology's *cost reimbursement process*. Cost reimbursement processing is an option for expedited water right processing, but requires the applicant to pay the full cost of processing the application

(this includes both costs incurred by Ecology and contracting with an Ecology-approved consultant). Based upon their understanding of the District's application during the January 22 meeting, Ecology staff indicated proceeding through the cost reimbursement process would be relatively straightforward (likely a *Phase 2 contract* rather than a *Phase 1 contract* used for more complex applications), would cost approximately $10,000-15,000 for Ecology processing and an estimated similar amount for an Ecology-approved consultant, and would take 12-18 months to complete. Ecology staff also noted that, with the WRIA No. 1 adjudication pending, starting the process as soon as possible is advised. That said, Ecology staff indicated that there is a relatively strong likelihood of a positive outcome, though there are a couple of protests (Lummi Nation and Y Squalicum Water Association) to the transfer that would need to be addressed.

Staff feel it valuable to the Board to provide context relative to other District water rights that are associated with the Agate Heights water system. Water Right No. G123449C is a *certificated* water right for 18 gallons per minute (gpm), which equates to approximately 9.5 million gallons per year (for context, the Agate Heights Treatment Plant produced 3.0 million gallons in 2024). The District's two other Agate Heights system-related rights are permitted rights already affixed to the Giesbrecht Well with a combined rate of 420 gpm (220.8 million gallons per year, should the District be able to put the full permitted right to beneficial use in the future).

FISCAL IMPACT

The estimated cost to proceed with cost reimbursement processing the District application would be $20,000-30,000, which is not included in the 2025-26 Budget. There is, however, $52,000 budgeted for decommissioning of the LWRTC's groundwater wells (one of which Water Right No. G1-23449C is attached to). With the outstanding water right transfer, the District may wish to postpone decommissioning until the transfer is complete.

APPLICABLE EFFECTIVE UTILITY MANAGEMENT ATTRIBUTE(S)

Infrastructure Strategy & Performance
Water Resource Sustainability

RECOMMENDED BOARD ACTION

No formal action is recommended at this time.

PROPOSED MOTION

No applicable.

AGENDA BILL Item 8.A	**General Manager's Report**			
DATE SUBMITTED:	January 23, 2025	MEETING DATE:	January 29, 2025	
TO: BOARD OF COMMISSIONERS		FROM: Justin Clary, General Manager		
GENERAL MANAGER APPROVAL				
ATTACHED DOCUMENTS		1. General Manager's Report		
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☐	INFORMATIONAL /OTHER ☒

BACKGROUND / EXPLANATION OF IMPACT
Updated information from the General Manager in advance of the Board meeting.

FISCAL IMPACT
None.

RECOMMENDED BOARD ACTION
None required.

PROPOSED MOTION
None.

LAKE WHATCOM WATER AND SEWER DISTRICT

General Manager's Report

Upcoming Dates & Announcements

Regular Meeting – Wednesday, January 29, 2025 – 8:00 a.m.

Important Upcoming Dates

Lake Whatcom Water & Sewer District			
Regular Board Meeting	Wed Feb 12, 2025	6:30 p.m.	Board Room/Hybrid
Employee Staff Meeting	Thu Feb 13, 2024	8:00 a.m.	Board Room/Hybrid Commissioner Carter to attend
Investment Comm. Meeting	Wed Jan 29, 2025	10:00 a.m.	Board Room/Hybrid
Safety Committee Meeting	Thur Feb 27, 2025	8:00 a.m.	Board Room
Lake Whatcom Management Program			
Policy Group Meeting	Wed Feb 5, 2025	3:00 p.m.	City of Bellingham Pacific St Ops Center, Rm 111/Hybrid
Joint Councils Meeting	Wed Apr 2, 2025	6:00 p.m.	Bellingham City Council Chambers, 210 Lottie Street
Other Meetings			
WASWD Section III Meeting	Tues Feb 11, 2025	6:00 p.m.	Bob's Burgers 8822 Quil Ceda Pkwy, Tulalip, WA
Whatcom Water Districts Caucus Meeting	Wed Feb 19, 2025	2:00 p.m.	Remote Attendance
Whatcom County Council of Governments Board Meeting	Wed May 14, 2025	3:00 p.m.	Council of Governments Offices 314 E Champion Street/Hybrid

Committee Meeting Reports

Safety Committee:

- The committee met on January 23; discussion included the status of the County permit for installing fall protection at the North Point lift station, the status on the review of safety programs and completion of online safety training, and requesting a L&I facilities consultation in 2025.

Investment Committee:

- A committee meeting has not been held since the last board meeting.

Upcoming Board Meeting Topics

- SVWTP chlorine contact basin design professional services agreement amendment
- Flat Car sewer lift station reverse flow project public works contract award
- Lake Whatcom Boulevard Sewer Interceptor Cure-In-Place-Pipe project public works contract award
- Strategic Asset Management Plan presentation
- Whatcom County on-site sewage system regulation/investigation update
- Division 22-1 Reservoir FEMA hazard mitigation grant agreement approval

2025 Initiatives Status

Administration and Operations

Water Right Adjudication

- Represent the District in the water right adjudication process to ensure that its certificated and permitted rights are protected.
  The Whatcom County Superior Court approved the adjudication summons and court claim form on December 3, 2024; the District is awaiting receipt of adjudication documents from Ecology, which are anticipated Spring 2025.

Safety Program Update

- Continue systematic review and revision of District's safety programs by updating nine programs in 2025.
  Staff are scheduled to review the asbestos cement pipe handling, confined space, and lock-out/tag-out programs by Spring.

APWA Accreditation

- Initiate work towards multi-year effort to gain American Public Works Association accreditation.
  The accreditation team met on December 17 and have initiated review and completion of accreditation practices.

Financial Management

- Improve financial sustainability and forecasting over 6- and 20-year planning horizons through the Waterworth financial modeling platform.
  To be initiated.

Management Team Development

- Continue professional development of the management team.
  The general manager has approved management team member attendance of trainings and conferences in 2025 pertinent to each's role with the District.

Emergency Response/System Security

Emergency Readiness

- Continue use of Whatcom County Department of Emergency Management services to hold tabletop and/or field emergency response exercises.
  To be initiated.

Community/Public Relations

General

- Website
  The District's web content is reviewed and updated on a regular basis.
- Social Media
  Posts are made to District Facebook, LinkedIn, and Nextdoor pages regularly; Nextdoor is also regularly monitored for District-related posts.
- Press Releases
  To be initiated.

Intergovernmental Relations

- *J Clary was interviewed by the William D Ruckelshaus Center on January 8 regarding its statewide municipal water use study.*
- *J Clary attended the WASWD Section III meeting on January 14.*
- *J Clary attended the Whatcom Water Alliance planning meeting on January 15.*
- *J Clary and G Nicoll met with Ecology staff regarding the water right cost reimbursement program on January 22.*
- *J Clary is scheduled to chair the Whatcom Water Alliance meeting on January 28.*

Lake Whatcom Water Quality

Lake Whatcom Management Program

- Participate in meetings of Lake Whatcom Management Program partners.
  J Clary attended a LWMP management team meeting on January 8, data group meeting on January 9, and the interjurisdictional coordinating team meeting on January 16, and participated in the City of Bellingham's aquatic invasive species rapid response program development on January 16.

LAKE WHATCOM WATER & SEWER DISTRICT

1220 Lakeway Drive
Bellingham, WA, 98229

(360) 734-9224
Fax 738-8250

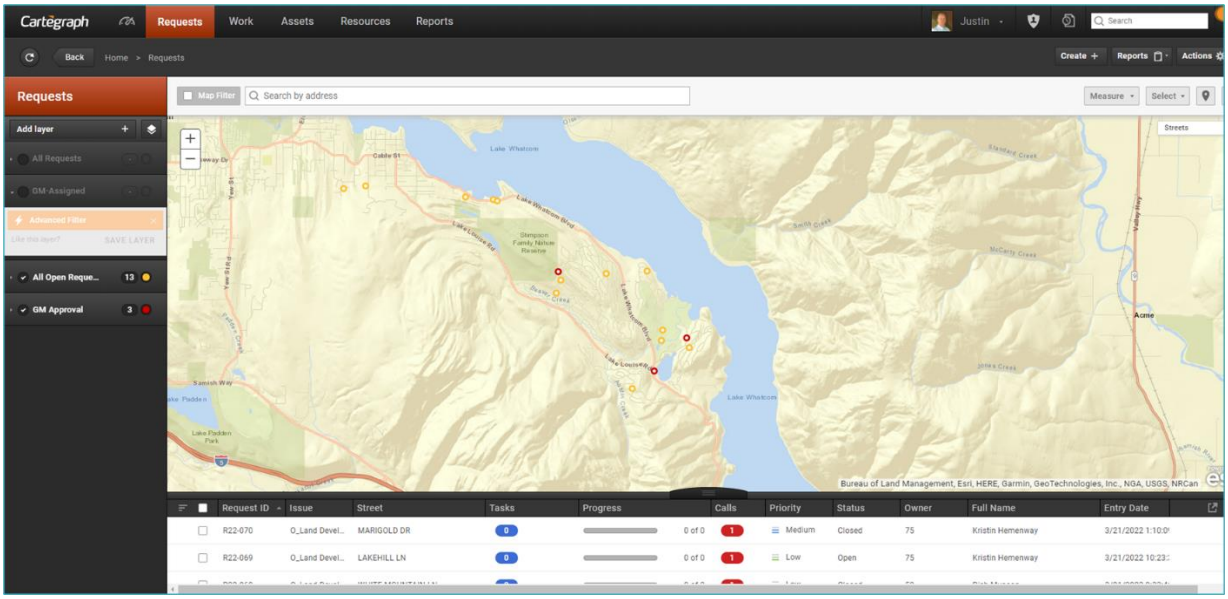
MEMORANDUM

To: Board of Commissioners Date: January 22, 2025

From: Justin Clary, General Manager

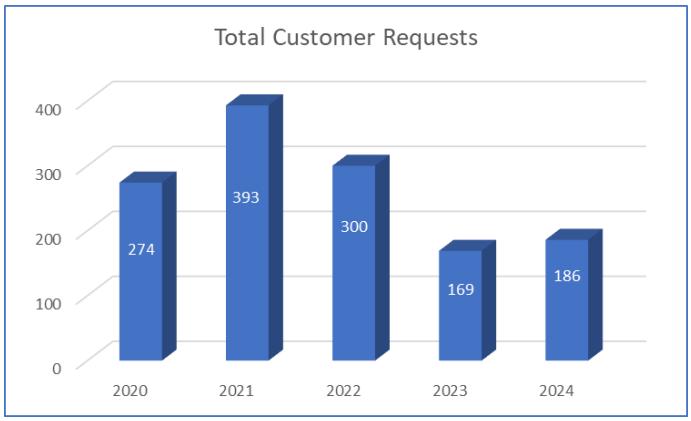
RE: Customer Responsiveness Analysis

Though the District has used the Cartegraph asset management software for nearly two decades, only over the past few years has the *request management* feature of the software been fully utilized. The request management feature (see figure below) allows for tracking of external requests (e.g., customer complaints, development inquiries, etc.) specific to a location/property through resolution. With this feature, when a request is received, an identification number (e.g., R24-001) and issue category (e.g., W[ater]_Pressure, S[ewer]_Leak/overflow, etc.) are created and the task is assigned to an appropriate District employee. A description of the issue and customer contact information are also entered into the request, as well as summaries of District response efforts to the issue. With five years of complete data (2020-2024), request volume and category trends have now been analyzed, as well as District responsiveness (a key component of customer service) from request receipt through closure. The purpose of this memorandum is to provide a summary and analysis of requests the District has processed since 2020.



Analysis of Requests

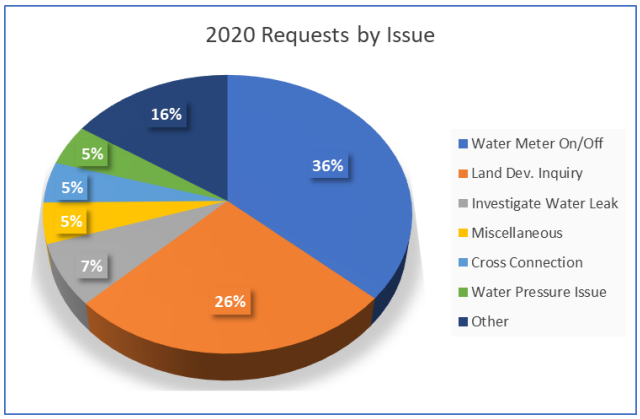
The total number of customer requests processed annually during the five-year analysis period peaked at 393 in 2021 and has since held relatively stable at just below 200 for the past couple years. Following are a few considerations regarding the drop from 2020-2022 to 2023-2024:

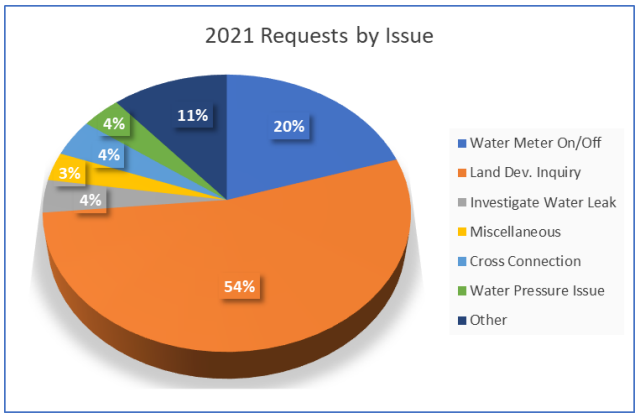


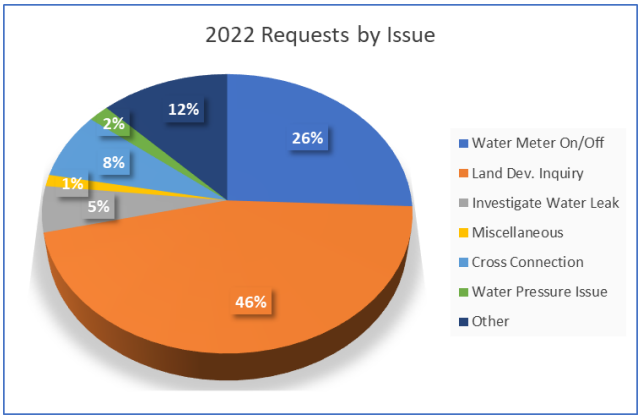
- Development Inquiries. Development inquiries make up a sizable percentage of the overall request volume (as is discussed further below). The District did not begin tracking development inquiries in Cartegraph until the middle of 2020, which likely impacted that year's total. Similarly, inflation that negatively affected the home construction industry nationally over the past couple of years likely also impacted the number of development inquiries (210, 137, 111, and 88 development-related inquires processed in 2021, 2022, 2023, and 2024, respectively) in the District.
- Voluntary Billing Suspension Policy Change. Historically, the District managed voluntary billing suspension requests through Cartegraph, with two requests created for each billing suspension (one to dispatch staff to turn off the water meter and a second to turn it back on). Prior to April 2021, accounts were allowed to be suspended indefinitely. However, with adoption of Resolution No. 874 (April 28, 2021) accounts were limited to four months per year under suspension. Then, with the adoption of Resolution No. 888 (February 22, 2023) the voluntary billing suspension policy was eliminated. This policy shift has significantly reduced the number of water meter on/off requests (100, 79, 77, 7, and 0 requests processed in 2020, 2021, 2022, 2023, and 2024, respectively).

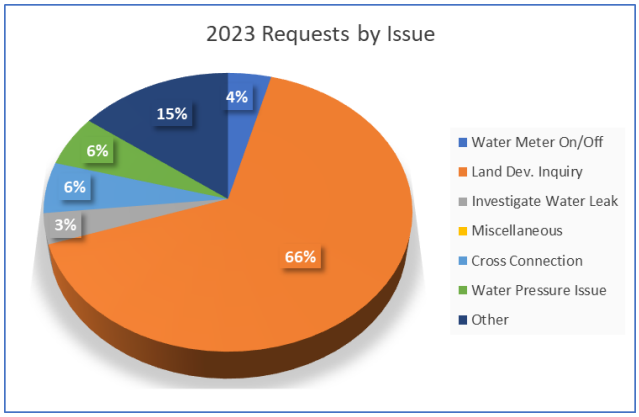
Issues Generating Requests

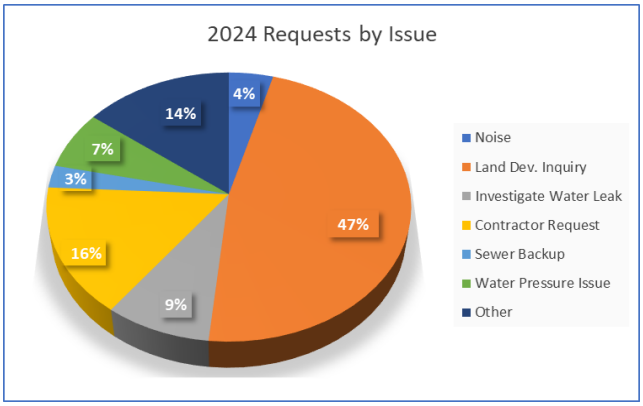
To better track customer request trends, each request is entered as one of 26 issue categories (e.g., W[ater]_Pressure, S[ewer]_Leak/overflow, etc.) The following pie charts present the annual percentage of the top six issues submitted by District customers. 2024 witnessed a shift from prior years in some issues that previously ranked in the top five. For example, Water Meter On/Off requests dropped to 0 based upon past board policy action, and Contractor Requests jumped from four total over the prior four years combined to 29 in 2024 (possibly a shift in how staff code requests when received). Also of note was the Development Inquiries dropped both in quantity and percentage of all requests received in 2024.


2020 Requests by Issue
36%
26%
7%
5%
5%
5%
16%
Water Meter On/Off
Land Dev. Inquiry
Investigate Water Leak
Miscellaneous
Cross Connection
Water Pressure Issue
Other


2021 Requests by Issue
20%
54%
4%
3%
4%
4%
11%
Water Meter On/Off
Land Dev. Inquiry
Investigate Water Leak
Miscellaneous
Cross Connection
Water Pressure Issue
Other

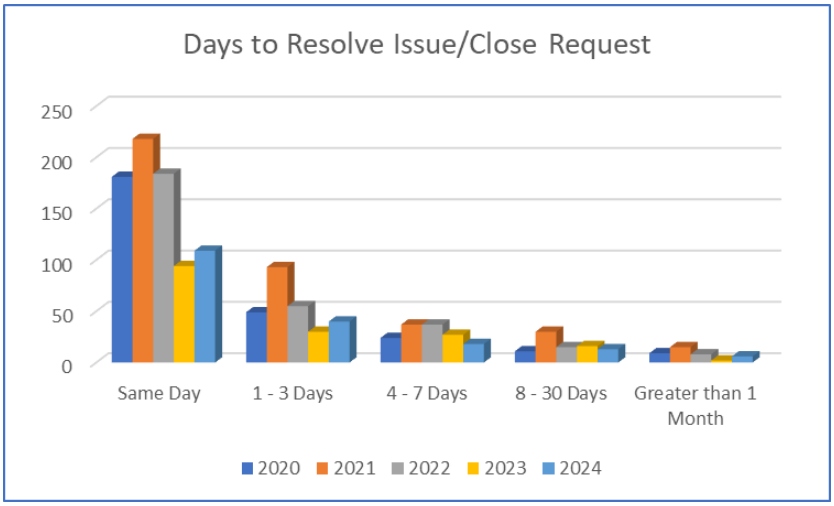

2022 Requests by Issue
26%
46%
5%
1%
8%
2%
12%
Water Meter On/Off
Land Dev. Inquiry
Investigate Water Leak
Miscellaneous
Cross Connection
Water Pressure Issue
Other


2023 Requests by Issue
4%
66%
3%
6%
6%
15%
Water Meter On/Off
Land Dev. Inquiry
Investigate Water Leak
Miscellaneous
Cross Connection
Water Pressure Issue
Other


2024 Requests by Issue
4%
47%
9%
16%
3%
7%
14%
Noise
Land Dev. Inquiry
Investigate Water Leak
Contractor Request
Sewer Backup
Water Pressure Issue
Other

Request Resolution Trends

District responsiveness to addressing customer requests is a key criterion in assessing customer service. Over the five-year analysis period, the majority (approximately 90%) of all requests received were resolved within a week of the customer's expectations (with approximately 60% resolved the day on which they were received). As with all data, there are a few considerations that may affect the findings:



- Responsiveness is tracked in calendar days, which may skew responsiveness longer than actual (e.g., a request received on a Friday and resolved on a Monday would be reflected as three days to resolution).
- The type of request can impact overall responsiveness data (for example, a higher-than-normal number of cross connection control inquiries, which tend to take multiple days to resolve, would affect the overall responsiveness trend).
- There are typically a handful of requests whose closure is dependent upon other entities. For example, in 2024 there were three requests whose closure was delayed significantly (approximately 90 days each) as the District waited for the Sudden Valley Community Association board to approve sewer lateral extensions for new homes through SVCA open space.

Conclusions

Though analysis of customer request volumes and trends over a five-year period that included fairly significant external changes (e.g., pandemic, escalating inflation) and internal policy shifts (e.g., elimination of voluntary billing suspension policy), the data does allow for the start of a longer-term analysis of trends. Through use of this and future data, the District will be able to identify potential trends and revise workloads and/or District resources to serve our customers more efficiently.

2022-2027 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Executive Department Goals	2022	2023	2024	2025	2026	2027
1.	**Facilitate achievement of annually established Board inititatives**						
	Workload Indicators						
	- Meetings with management team to attain Board initiatives	49	44	45			
	- Reporting on the status of completion of Board initiatives	22	22	23			
	- Annual number of Board initiatives	13	13	12			
	- Annual number of Board meetings/work sessions held	25	23	26			
	Performance Measures						
	- Completion of initiatives within Board/staff agreed timelines	11/13	11/13	12/12			
2.	**Biennial EUM self-assessment and update to strategic plan**						
	Workload Indicators						
	- Draft departmental strategic plans by June 30 of even-numbered years			complete			
	- Financial forecast updated biennially (even-numbered years)			complete			
	- Balanced budget presented to the Board biennially	complete		complete			
	Performance Measures						
	- Complete strategic plan and financial forecast by Sep 1 (even-numbered years)			complete			
3.	**Pursue implementation of performance management throughout operations**						
	Workload Indicators						
	- Review literature associated with potential approaches		complete	complete			
	- Meet with applicable vendors/consultants representing potential approaches		no	no			
	- Departmental operational reviews to identify optimization opportunities		no	no			
	Performance Measures						
	- Number of performance management approaches analyzed		1	0			
	- Number of meetings with vendors/consultants		0	0			
	- Budgetary allocation supporting implementation of performance management		$0	$0			
	- Implementation of performance management approach		no	no			

2022-2027 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Executive Department Goals	2022	2023	2024	2025	2026	2027
4.	**Overhaul records management system**						
	Workload Indicators						
	- Review literature associated with potential approaches	complete					
	- Meet with applicable vendors/consultants representing potential approaches	complete					
	- Departmental operational reviews to identify optimization opportunities	complete					
	Performance Measures						
	- Number of records management committee meetings held	0	3				
	- Number of presentations to Board on topic	1	1				
	- Budgetary allocation supporting acquisition of new system/software	$5,000	$30,000				
	- Implementation of new system		complete				
5.	**Expand intergovernmental relations program**						
	Workload Indicators						
	- Participation in LWMP data group, ICT, policy group, and joint councils meetings	yes	yes	yes			
	- Participation in WWA, WUCC, COG, and Whatcom Water Districts meetings	yes	yes	yes			
	- Participation in WASWD and WSRMP meetings	yes	yes	yes			
	- Meet with City, County, SVCA, and SWFA staff	yes	yes	yes			
	- Attendance of WASWD and IACC conferences	yes	yes	yes			
	- Presentation at SVCA board meetings	no	no	no			
	Performance Measures						
	- Annual budgetary allocation supporting organization memberships	complete	complete	complete			
	- Number of LWMP meetings attended	29	26	39			
	- Number of WWA, WUCC, COG, and Whatcom Water Districts meetings attended	15	21	21			
	- Number of meetings with City, County, SVCA, and SWFA staff	13	20	18			
	- Number of conferences attended	3	2	3			
	- Number of presentations to SVCA board	0	0	0			

2022-2027 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Executive Department Goals	2022	2023	2024	2025	2026	2027
6.	**Expand public relations program**						
	Workload Indicators						
	- Update of District website						
	- Issuance of press releases and Facebook posts on a regular basis	yes	yes	yes			
	- Active participation in community events	yes	yes	yes			
	Performance Measures						
	- Completion of website udpated by December 31, 2025						
	- Completion of Board discussion on District rebranding						
	- Number of Facebook likes/followers	153/168	163/188	174/209			
	- Number of press releases issued	5	5	4			
	- Number of Facebook posts	51	50	54			
	- Number of community events participated in	6	3	6			

2022-2027 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Finance Department Goals	2022	2023	2024	2025	2026	2027
1.	**Commit to excellence to improve performance standards and enhance professional growth and development**						
	Workload Indicators						
	- Meet with each department member and perform SWOTs within their positions	yes	no	no			
	- Review each job description within department on a regular basis and seek opportunities for cross-training	complete	no	no			
	- Identify professional trainings & webinars that align w/ job duties for each employee	yes	ongoing	ongoing			
	- Work with Board to develop Public Financial Professionals Appreciation Week	not being pursued					
	- Issue weekly updates to staff re: policies, procedures, events & ongoing projects	44	47	49			
	- Increase number of finance staff meetings	9	31	35			
	Performance Measures						
	- Complete comprehensive SWOT analysis	complete					
	- Implement strategies identifed through completion of analysis	in progress					
	- Number of trainings and webinars attended by staff	17	4				
	- Implementation of cross-training and development tracking system	complete					
	- Adoption of Public Finance Professionals Appreciation Week	not being pursued					
	- Number of weekly updates issued by Finance Manager	44	47	49			
	- Number of staff meetings and engagement activities	13	31	35			
2.	**Improve financial sustainability and forecasting**						
	Workload Indicators						
	- Work sessions to develop biennial budget process	complete		9			
	- Development and routine evaluation of forecasting model	in progress	in progress	In Progress			
	- Routine evaluation of financial policies	complete	in progress	In Progress			
	- Routine evaluation of investments	yes	yes	yes			
	- Number of financial webinars, seminars, and conferences attended	22	38	32			

2022-2027 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Finance Department Goals	2022	2023	2024	2025	2026	2027
	Performance Measures						
	- Transition to a biennial budget	complete					
	- Overhead and personnel costs align with sustainable rate revenue by increasing proportionately to rate increase	yes	yes	yes			
	- Forecasting model is utiilized on a regular basis for "what if" situations, budgeting, and forecasting	in progress	in progress	In Progress			
	- Financial policies are kept current and practiced to align with current industry best practices and standards	yes	yes	yes			
	- Investment revenue increases	yes	yes	yes			
	- Financials and financial policies comply with State Auditor's Office	yes	yes	yes			
3.	**Develop and implement a supplemental utility customer assistance program**						
	Workload Indicators						
	- Meet with state and local agencies to develop program and seek funding for program	complete					
	- Meet with applicable vendors/consultants representing potential approaches	complete					
	- Meet with GM and hold work sessions with Board to develop and adopt program	no					
	Performance Measures						
	- Number of meeting with state and local agencies	3					
	- Number of meetings with GM	2					
	- Number of work sessions with the Board	0					
	- Implementation of program	cancelled					

2022-2027 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

Finance Department Goals	2022	2023	2024	2025	2026	2027
4. **Maximize and utilize technology to improve workflow**						
Workload Indicators						
- Meet with service providers to better understand the capabilities of Springbrook	in progress					
- Meet with service providers to investigate potential transition to a different financial management system	complete					
- Develop cost-benefit analysis of Springbrook vs. other system	complete					
- Analyze systems' ability to acc. growth needs, workflow improvement & reporting	complete					
- Increase staff and management trainings	5	6	7			
Performance Measures						
- Implementation of alternative system or more detailed use of Springbrook	complete					
- Implementation of document management software	ongoing	ongoing	ongoing			
- Number of staff and management trainings held and increased by use of software	5	6	7			

2022-2027 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Engineering Department Goals	2022	2023	2024 YTD	2025	2026	2027
1.	**Enhance oversight, management, maintenance, and resiliency of business information, infrastructure SCADA, and cybersecurity systems**						
	Workload Indicators						
	- Number of IT consultant support tickets generated	140	62	341			
	- Number of IT consultant computer engineer support hours billed	141	56.75	262			
	- Number of SCADA on-call support consultant hours billed	42.6	171.38	132.9			
	- Number of SCADA, telemetry, electrical engineer consultant hours billed	0	0	0			
	- Number of physical/virtual servers	2/10	2/10	2/13			
	- Number of terabytes of backup storage utilized	4.97	4.55	1.75			
	- Number of managed on-premise business applications	6	6	5			
	- Number of telemetry communication and control systems issues reported	17	40	4			
	Performance Measures						
	- Develop tracking methods to collect workload indicator numbers over time	complete					
	- Develop internal tech memo analyzing job description functions	in progress		Cancelled			
	- Fund new position				Cancelled		
2.	**Improve water/sewer permitting process and status lookups for application, issuance, inspection, and completion**						
	Workload Indicators						
	- Number of water/sewer permits processed annually	31	26	27			
	- Est. number of permitting-related email exchanges/telephone calls received	124	90	108			
	- Number of locations (electronic/paper) permitting info is entered/tracked	8	8	8			
	Performance Measures						
	- Explore/research systems and develop implementation costs	in progress					
	- Develop tech memo to document various options, labor efficiency gains	in progress					
	- Program implementation			subject to funding			
3.	**Increase field inspection/condition grading of assets; improve accuracy of asset locations documented in GIS**						
	Workload Indicators						
	- Number of assets field located by GPS	298	6973	377			
	- Number of assets inspected and assigned condition rating	661	548	77			
	- Number of asset locations updated in GIS	0	0	779			
	- Number of assets in Cartegraph with active Overall Condition Index decay curves	6,281	15,040	15,040			

2022-2027 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

Engineering Department Goals	2022	2023	2024 YTD	2025	2026	2027
Performance Measures						
- Develop tech memo to est. labor available if other resources allocated to land development			in progress			
- Revise administrative staff job descriptions			in progress			
- Hire temporary GIS/engineering intern to assist with field inspection/GPS		cancelled				

2022-2027 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Operations Department Goals	2022	2023	2024 YTD	2025	2026	2027
1.	**Ensure continuity of potable water production that meets or exceeds regulatory requirements**						
	Workload Indicators						
	- Number of required water system reports submitted to agencies	54	72	72			
	- Number of water treatment plant samples collected/analyzed	27	2,582	2,544			
	- Number of water distribution system samples collected/analyzed	1,552	1,392	1,386			
	- Number of hours performing equipment calibration and maintenance	1,062	1,006	1,034			
	- Number of hours inventorying and preparing treatment chemicals	99	120	120			
	Performance Measures						
	- Meet all Department of Health water quality requirements	yes	yes	yes			
	- Annual receipt of Treatment Optimization Program (TOP) award	yes	yes	yes			
	- Annual issuance of Consumer Confidence Reports by state deadline	yes	yes	yes			
	- Number of annual water quality customer complaints received	1	0	0			
	- Operating Permit is color green	yes	yes	yes			
2.	**Sustain, and as applicable enhance, utility efficiency and resiliency through proactive maintenance of electrical systems and SCADA instrumentation**						
	Workload Indicators						
	- Scheduled inspections of electrical cabinets, components and assoc. equipment	10	68	25			
	- Scheduled repair of electrical cabinents, components and assoc. equipment	15	36	13			
	- SCADA hardware/software installation and maintenance	8	18	11			
	- Communication 'fails' requiring followup	TBD	270	38			
	- Execution of annual contract for generator inspection/maintenance	no	Yes	Yes			
	Performance Measures						
	- Number of inspections (per year)	10	68	25			
	- Number of repairs (per year)	15	36	13			
	- Labor hours spent maintaining/repairing SCADA systems	TBD	248	137.4			
	- Number of repairs required from communications provider	TBD	25	8			
	- Number of generators inspected/maintained per year	0	18	19			

2022-2027 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

Operations Department Goals	2022	2023	2024 YTD	2025	2026	2027
3. Ensure the effective and reliable collections and conveyance of sewage out of the watershed through routine inspection and prevent maintenance						
Workload Indicators						
- Sewer lift stations inspected (weekly)	714	748	572			
- Submersible pumps inspected (annually)	63	55	23			
- Suction lift stations maintained (annually)	30	9	14			
- Wetwells cleaned (annually)	54	12	3			
- Labor hours expended televising/inspecting and cleaning sewer mains	381.5	204	137			
- Manholes inspected (annually)	77	55	32			
- Labor hours expended to clean/inspect air relief valves	87	126	99			
Performance Measures						
- Number of sewer system overflows (per year)	3	4	1			
- Number of lift station 'true' fail alarms (per year)	TBD	40	14			
- Trend of maintaining annual lift station energy (pumping efficiencies)	TBD	TBD	TBD			
- Trend of reducing costs associated with pump repairs	$305,869	$18,165	$42,584			
- Miles of sewer main televised/inspected (per year)	6.57	4.1	1.26			
- Miles of sewer main cleaned (per year)	0.76	0.16	0.49			
- Downward trend of volume of I&I conveyed to City of Bellingham	TBD	TBD	TBD			

2022-2027 Strategic Business Plan Implementation Status
Lake Whatcom Water and Sewer District

	Operations Department Goals	2022	2023	2024 YTD	2025	2026	2027
4.	**Ensure the maximum operable life of District water infrastructure**						
	Workload Indicators						
	- Number of water valves exercised (annually)	0	352	335			
	- Number of water mains flushed (annually)	132	440	356			
	- Number of pressure reducing valves inspected (annually)	88	34	46			
	- Number of pressure reducing valves repaired/rebuilt (annually)	0	11	12			
	- Number of reservoirs inspected (annually)	18	16	11			
	Performance Measures						
	- Number of valves failing to operate properly	0	4	1			
	- Number of distribution system water quality violations (per year)	0	0	0			
	- Levels of disinfection byproducts monitored justifing reduced monitoring	yes	yes	yes			
	- Number of customer complaints regarding water pressure (per year)	6	4	12			
	- Miles of water main flushed (per year)	20.88	438	356			
	- Number of reservoirs requiring repair	18	2	2			
5.	**Maintain level-of-service expectations relative to development services**						
	Workload Indicators						
	- Water/sewer connection inquiries processed	22	100	82			
	- Water/sewer connection permits issued	28	20	26			
	- Pre-construction meetings attended	22	30	21			
	- Inspections conducted	34	20	40			
	- New water service installations	9	13	8			
	Performance Measures						
	- Number of permits issued within 5 working days (per year)	28	20	26			
	- Number of inspections completed per year	34	20	40			
	- Number of water connections made within 10 working days of request (per year)	9	13	8			

Lake Whatcom Water & Sewer District
Engineering Department Report

Prepared for the January 29, 2025 Board Meeting
Data Compiled 1/23/25

Status of Water and System Capacities				
	South Shore ID# 95910	Eagleridge ID# 08118	Agate Heights ID# 52957	Johnson Well ID# 04782
DOH Approved ERUs	**	85	81	2
Connected ERUs	3988	68	46	2
Remaining Capacity (ERUs)	**	17	35	0
Permitted ERUs Under Construction	35	0	0	0
Pre-paid Connection Certificates & Expired Permit	12	0	3	0
Water Availabilities (trailing 12 months)	62	0	0	0
Subtotal - Commitments not yet connected	109	0	3	0
Available ERUs	****	**17**	**32**	**0**

** Per DOH, water system capacity is sufficient for buildout. Oct 2018
Agate Heights approved ERUs increased from 57 to 81 with DOH approval on August 10, 2021

Annual Reports		
Name Of Report	**Deadline**	**Completed**
Report Number of Sewer ERUs to City of Bellingham Prepared by: Greg Nicoll	January 15	
Other Reports		
Name Of Report	**Deadline**	**Last Completed**
Water Right Permit No. G1-22681 Development Extension	Next Due February 15,2033	Time Extension Granted July 15, 2024
Water Right Permit No. S1-25121 Development Extension	Due Every 10 Years Next Due March 30, 2033	Time Extension granted May 3, 2024

SUMMARY OF CAPITAL IMPROVEMENT PROJECTS

Updated: 1/23/2025

Prepared by: G. Nicoll

LEGEND:

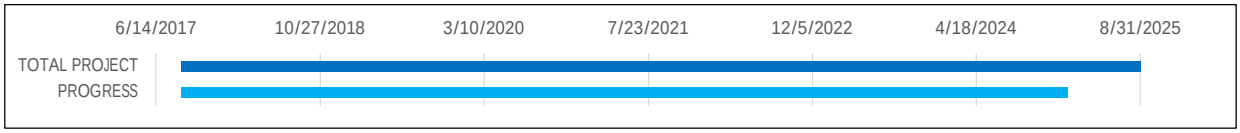
WATER	SEWER	SHARED

MAJOR PROJECTS IN CONSTRUCTION:

C2111 - DIVISION 7 RESERVOIR REPLACEMENT

Project Summary:	Replace existing steel reservoir with two concrete reservoirs and provide seismic improvements.
Project Status:	Construction has resumed with the start of construction of the eastern reservoir. To date, the foundation is complete and approximately 1/2 of the reservoir wall height has been poured. It is anticipated that the eastern tank will be complete by early February and the western tank will be complete by early March.

PROJECT SCHEDULE

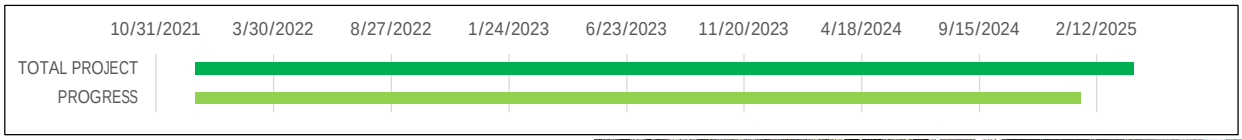


Budget Summary	
Budget:	$ 3,301,000.00
Spent to Date:	$ 1,362,269.59
Balance:	$ 1,938,730.41
Budget Year:	2021

C2112 - ROCKY RIDGE AND LAKEWOOD PUMP STATIONS REHABILITATION

Project Summary:	Replace existing pumps, enclosures, controls and power service.
Project Status:	All ground disturbing work was completed prior to the close of the watershed work window and the contractor has demobilized. Delivery of the lift stations has been delayed. Staff has worked hard to minimize delays and delivery is now scheduled for late February. Contract time has been paused. Completion now anticipated in mid March. District is not financially impacted by this delay.

PROJECT SCHEDULE



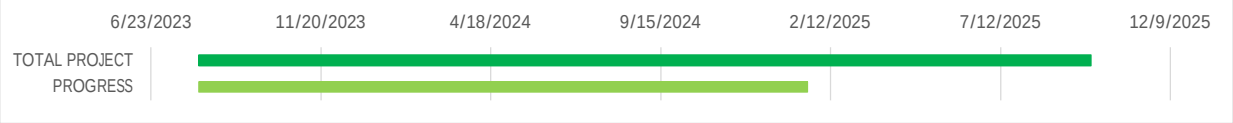
Budget Summary	
Budget:	$ 2,116,353.00
Spent to Date:	$ 1,143,568.40
Balance:	$ 972,784.60
Budget Year:	2021

MAJOR PROJECTS IN DESIGN:

C2113 - FLAT CAR PUMP STATION REVERSE FLOW TO SUDDEN VALLEY PUMP STATION

Project Summary:	Construct a utility bridge across Beaver Creek and install new piping from Flat Car, across the new bridge to an existing bypass connection that will allow Flat Car PS to pump to the detention basin in the event of an emergency.
Project Status:	The District advertised a public works solicitation for the bridge construction component of the project on January 15 and bids are due February 18. Construction is scheduled to start with the opening of the watershed work window on June 1, 2025.

PROJECT SCHEDULE

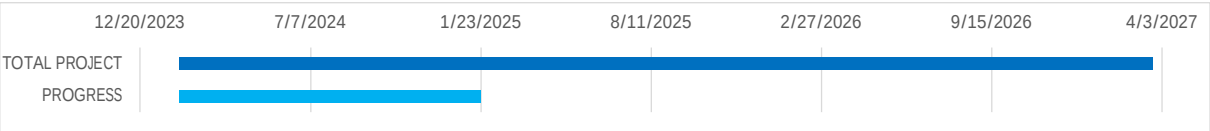


Budget Summary	
Budget:	$ 153,000.00
Spent to Date:	$ 101,471.09
Balance:	$ 51,528.91
Budget Year:	2021

C2316 - SUDDEN VALLEY WTP CHLORINE CONTACT BASIN REPLACEMENT

Project Summary:	Replace existing chlorine contact basin with a new basin that will include seismic restraints and will be sized for sufficient contact time at buildout flows. (FEMA Hazard Mitigation Grant 5395-10R).
Project Status:	The draft pre-design report has been completed and District staff and the design team have agreed upon a recommended design, which will be presented to the board at the January 29, 2025 board meeting. With concurrence from the Board, staff will proceed with preparing a contract amendment with Gray & Osborne to proceed with design of the preferred alternative.

PROJECT SCHEDULE



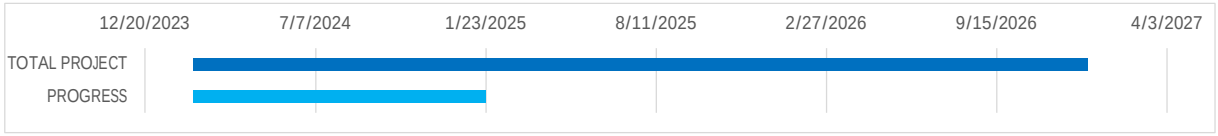
Budget Summary	
Budget:	$ 1,963,000.00
Spent to Date:	$ 51,289.60
Balance:	$ 1,911,710.40
Budget Year:	2024-2026

87.5% grant funded

C2402 - SVWTP PUMPHOUSE AND GENEVA RESERVOIR SEISMIC UPGRADES

Project Summary:	Construct improvements at the SV WTP Finished Water Pump Building and the Geneva Reservoir to improve seismic resiliancy of critical infrastructure (FEMA Hazard Mitigation Grant 5395-10R).
Project Status:	The design team is proceeding with preliminary design of the seismic improvements to the SV WTP Finished Water Pump Building and the Geneva Reservoir. First tasks were a site inspection by the structural design team to confirm and document existing conditions and geotechnical investigations to determine underlying soil conditions. These tasks were completed in December and the team is now working on structural evaluation and preliminary design.

PROJECT SCHEDULE



Budget Summary	
Budget:	$ 1,399,640.00
Spent to Date:	$ 22,673.68
Balance:	$ 1,376,966.32

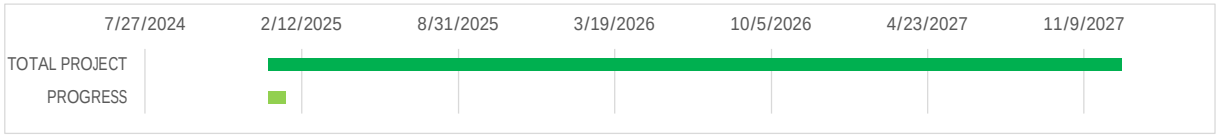
95% grant funded

Budget Year: 2024-2026

C2510 - AGATE BAY SEWER LIFT STATION REHABILITATION

Project Summary:	Agate Bay Lift Station is one of the last remaining original sewer lift stations that has not been rehabilitated and this project will renovate this station, which could include reconfiguration to a submersible station.
Project Status:	District Engineering staff intends to complete preliminary design as well as all civil and mechanical design in house. Staff is currently preparing the predesign report, including evaluation of current infrastructure, current and projected future flows, sizing calculations and evaluation of alternatives for reconfiguration.

PROJECT SCHEDULE



Budget Summary	
Budget:	$ 146,000.00
Spent to Date:	$ -
Balance:	$ 146,000.00

Pre-design only

Budget Year: 2025-2027

OTHER ACTIVE PROJECTS:

C2511: Lake Whatcom Boulevard Interceptor Cured In Place Pipe

Status: This is the fourth phase of a project to reline a portion of the Lake Whatcom Boulevard Interceptor to remove fouling and improve capacity of the pipe. This project will reline approximately 840 linear feet of existing 14" diameter ductile iron force main. The project was advertised for bid in January with bids due in mid-February.

Budget Year: 2025 Projected Completion: August 2025

Budget Summary

Budget: $ 195,000.00 Spent to Date: $ - Balance: $ 195,000.00

PROJECTS COMPLETED IN PAST 12 MONTHS

Project #	Project Name	Budget	Spent	Balance
C 2303	SVWTP Alum System Replacement	$ 88,000.00	$ 74,405.95	$ 13,594.05
C 2304	Eagleridge Diesel Fuel Tank Replacement	$ 25,000.00	$ 12,222.48	$ 12,777.52
M 2410	Midnight Court Sewer Repair	O&M	$ 41,001.00	N/A
A 2210	Reservoir and WTP Site Security Assessment	$ 50,000.00	$ 50,000.00	$ -
C 2203/2231	Div 30 Booster, SV Lift Station PLC/UPS Improvements	$ 344,643.00	$ 314,670.54	$ 29,972.46
M 2120	November 2021 Flood Event Response	$ -	$ 271,928.83	$ (271,928.83)
C 1802	Delesta, Edgewater and Euclid Lift Stations	$1,816,583.06	$ 1,762,153.54	$ 54,429.52
C 2308	Div 30 Reservoir Cathodic Protection	$ 36,000.00	$ 27,795.14	$ 8,204.86
M 2309	Reservoir Inspection and interior cleaning	$ 41,000.00	$ 27,308.80	$ 13,691.20

AGENDA BILL Item 8.C		**Finance Department Report**		
DATE SUBMITTED:	January 15, 2025	MEETING DATE:	January 29, 2025	
TO: BOARD OF COMMISSIONERS		FROM: Jennifer Signs, Finance Manager		
GENERAL MANAGER APPROVAL				
ATTACHED DOCUMENTS		1. Fourth Quarter 2024 Financial Report 2. December 2024 Utility Account Adjustments		
TYPE OF ACTION REQUESTED		RESOLUTION ☐	FORMAL ACTION/ MOTION ☐	INFORMATIONAL /OTHER ☒

BACKGROUND / EXPLANATION OF IMPACT

Updated information regarding District finances in advance of the Board meeting.

FISCAL IMPACT

None

APPLICABLE EFFECTIVE UTILITY MANAGEMENT ATTRIBUTE(S)

Financial Viability

RECOMMENDED BOARD ACTION

None required.

PROPOSED MOTION

None

Quarterly Financial Report
Fourth Quarter 2024

Lake Whatcom Water and Sewer District
Bellingham, Washington

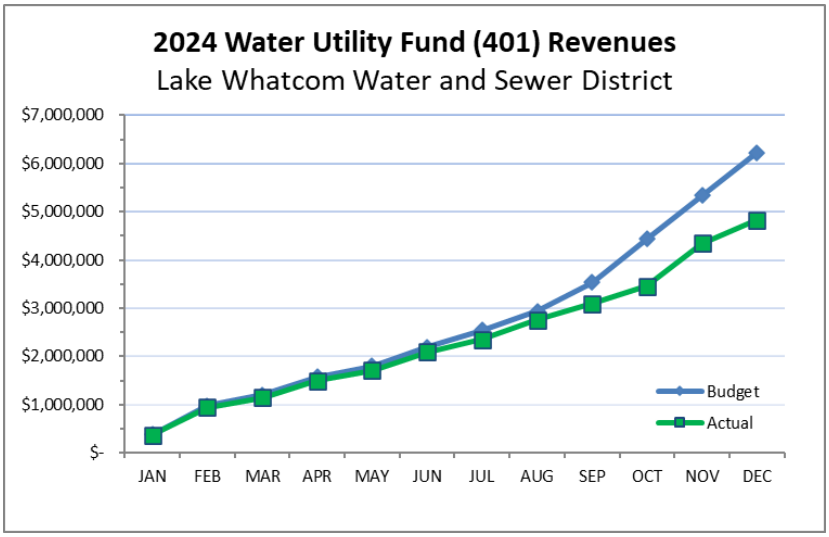
Summary

Lake Whatcom Water and Sewer District's (District) adherence to conservative and fiscally responsible financial practices allowed the District to successfully close 2024 with fund balances to support operations and capital needs in the new year. Noteworthy financial events during the fourth quarter of 2024 included the adoption of the 2025-2026 Biennial Budget and 6-Year Capital Improvement Plan, notice from S&P Global Ratings indicating the District's bond rating had been reinstated at AA- and receipt of all outstanding grant pay requests from the Department of Homeland Security (FEMA) for nearly $900,000 supporting construction of the Division 7 Reservoirs.

The District has received three Hazard Mitigation Grants from FEMA to fund critical infrastructure projects: the replacement of Division 7 Reservoir, replacement of the chlorine contact basin at the Sudden Valley Water Treatment Plant (SVWTP), and seismic upgrades to the SVWTP booster station and Geneva Reservoir. In total, these grants account for approximately $4.8 million dollars for design, permitting and construction in the upcoming biennium. Along with these grants, the District received FEMA approval in the fourth quarter for funding the replacement of Division 22-1 Reservoir.

The District's investment portfolio remained strong throughout the year, earning approximately $219,000 in interest distributed equally between the Water and Sewer utility funds. However, it is anticipated that as the District continues work on the above cited capital projects, it will use these investment earnings to serve as a bridge between capital expenditures and receipt of grant reimbursements to limit impacts to the operating funds.

Water Utility Fund (Fund 401)

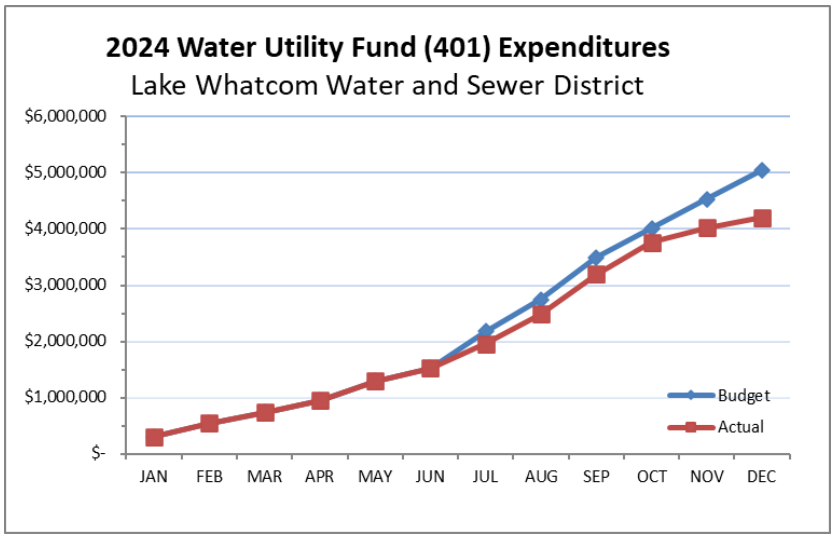


Revenues in the Water Utility Fund lagged projections ($4,834,151 actual vs. $6,228,613 budgeted) through the end of the year. This is attributable to outstanding grant funds and loan proceeds that were budgeted for but not received due to construction lagging budget expectations. As mentioned in the summary, the District has several grants that fund large capital projects whose revenues won't be received until work is completed allowing for funds to be requested. This creates a lag in projections vs. actual. However, these funds have been planned for in the 2025-2026 Biennial Budget and will be used to complete the capital projects associated with these grants. Also mentioned in the summary, the District received approximately $900,000 in the fourth quarter associated with

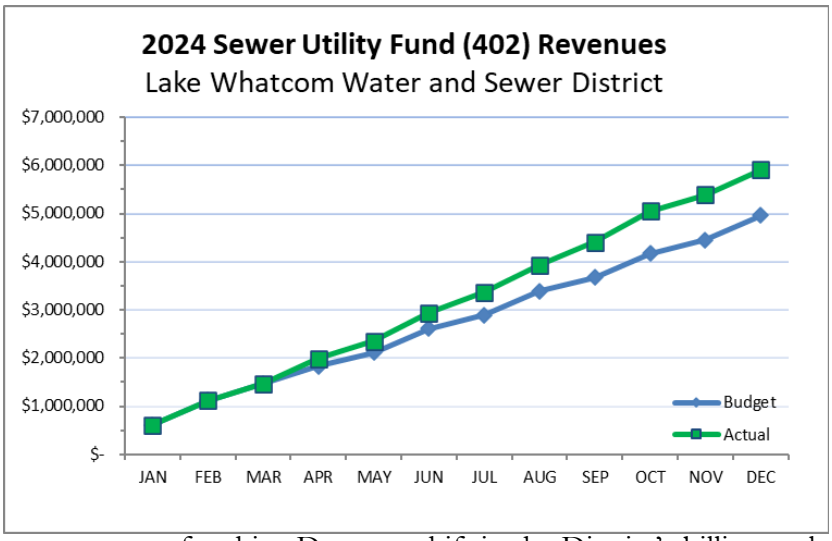
those reimbursable capital expenses. With that being said, water sales revenue realatively aligned with budgeted projections at the end of the year ($3,244,855 actual vs. $3,161,387 budgeted). Other items of note related to the District's water revenue include General Facilities Charges revenue, which closed the year above projections ($246,173 actual vs. $104,058 budgeted). It has been the practice of the District to conservately plan for this revenue, which is associated with new system connnections, due to the unknowns surrounding development within the District. Lastly, the District's investment portfolio performed well throughout 2024 which resulted in greater interest earnings than anticipated ($109,680 actual vs. $64,091 budgeted).

The District continues to manage its investment portfolio strategically to take advantage of higher interest rates and ensure liquidity as capital expenses were significant in 2024 and will continue into the coming years. Investment earnings in the fourth quarter for the Water Utility Fund totaled approximately $23,632, which is a decrease from the third quarter. It is projected that investment earnings will continue to decrease with anticipated rate cuts from the Federal Open Market Committee (FOMC) and the District's need to use investment funding for capital projects. Ultimately, the District's revenues remained sufficient to support operations, capital, and debt service obligations throughout 2024 while maintaining full funding of all reserves.

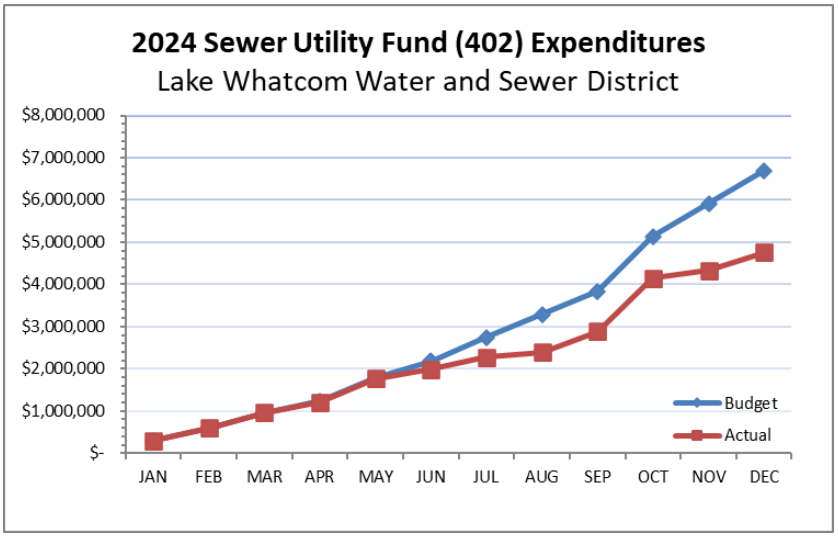
Expenditures in the Water Utility fund also lagged projections through the end of the year ($4,207,572 actual vs. $5,055,466). This is largely due to capital project costs that were budgeted for but have yet been expended due to project completion lagging. Budgeted capital costs for 2024 were $1,978,138 and actual costs closed the year at $1,344,489. However, the District's operating costs remained under budget as well ($2,648,044 actual vs. $2,856,556 budgeted). The District's adherence and dedication to operating within budget constraints was reflected throughout the year. These savings weren't attributed to one single line item but several line items within the operating budget. Lastly, the District met all debt service obligations in the Water Utility fund during the year paying both principal and interest on loans.



Sewer Utility Fund (Fund 402)



Sewer Utility Fund revenues outpaced projections in the second half of the year. Actual revenue for 2024 was $5,909,424 vs. $4,961,533 budgeted. Sewer revenue was significantly higher than budgeted projections due to several factors. First, the District had been slightly underbudgeting sewer service revenue in the past. However, in the future, this will track more closely as adjustments were made to 2025-2026 Biennial Budget to account for this. Due to a shift in the District's billing cycle beginning in 2024, the District also collected more revenue in the first two months of the year due to overlaps in the billing due dates. Also, similar to the Water Utility Fund, the Sewer Utility Fund recognized more revenue generated from General Facility Charges than what was budgeted. General Facility Charge revenue totaled $308,699 vs. $122,324 budgeted. Interest revenue in the Sewer Utility Fund also outpaced budgeted projections ($109,680 actual vs. $64,091 budgeted). Lastly, the District was able to transfer $126,209 from the Bond Reserve fund into the Sewer Utility Fund in October which went toward making the October debt service payment on the outstanding 2016 bond. This is discussed further in the District Fund Balance section of this report.



Sewer Utility Fund expenditures lagged projections at the close of the year by approximately 25%. This is largely due to capital projects that were budgeted as part of the District's capital improvement plan but were not completed ($1,409,512 actual vs. $2,729,500). Significant costs associated with Rocky Ridge and Lakewood lift station improvements are anticipated to be realized in the first quarter of 2025 the project is completed. As mentioned in the Water Utility Fund, operating expenditures in the Sewer Utility Fund also lagged projections ($3,032,178 actual vs. $3,317,988 budgeted). This again is attributed to cost savings within multiple lines of the budget rather

than a single line item. Lastly, the District issued its annual debt service payment on the outstanding bonds in the fourth quarter in the amount of $562,463. Total debt service for 2024 was $644,925.

District Fund Balances

The District manages its monies within five funds: Water Utility Fund (401), Sewer Utility Fund (402), Sewer Contingency Reserve Fund (425), Water Contingency Reserve Fund (426), and Bond Reserve Fund (460). Within the Water Utility and Sewer Utility funds are system reinvestment funds (i.e., funds dedicated to capital projects) and debt service funds associated with the respective utility. The following discussion summarizes the activity associated with each fund through 2024.

Water Utility Fund (Fund 401)

The Water Utility Fund, which serves as the primary operating fund for the District's water utility, derives most of its revenue from rates charged to water customers. Fund expenditures are comprised of general operating expenses (personnel salary and benefits, professional services, utilities, etc.), payments relative to debt service on past capital improvement projects, and expenditures on water system reinvestment-defined equipment and projects. Also managed within the Water Utility Fund are monies allocated towards an operating reserve, which is equal to the cost of operating the water utility for 90 days ($664,000). The fund entered 2024 with a balance of $1,541,238 and increased to $2,167,817 by the end of the year. This increase in fund balance was anticipated through the receipt of grant revenue in the fourth quarter. However, the District anticipates the balance to decrease in the coming years as large capital projects are completed and fund balances are expended.

Sewer Utility Fund (Fund 402)

Like the Water Utility Fund, the Sewer Utility Fund serves as the primary operating fund for the District's sewer utility. Revenues are comprised primarily of rates charged to sewer customers, and expenditures consist of general operating expenses (personnel salary and benefits, professional services, utilities, etc.), payments relative to debt service on past capital improvement projects, and expenditures on sewer system reinvestment-defined equipment and projects. Also managed within the fund are monies allocated towards an operating reserve, which is equal to the cost of operating the sewer utility for 60 days ($521,000). The fund entered 2024 with a balance of $4,012,484 and increased to $4,835,293 through the end of the year. The overall fund balance is anticipated to increase in an effort to build fund balances for significant future capital projects in the coming months and years.

Sewer Contingency Reserve (Fund 425)

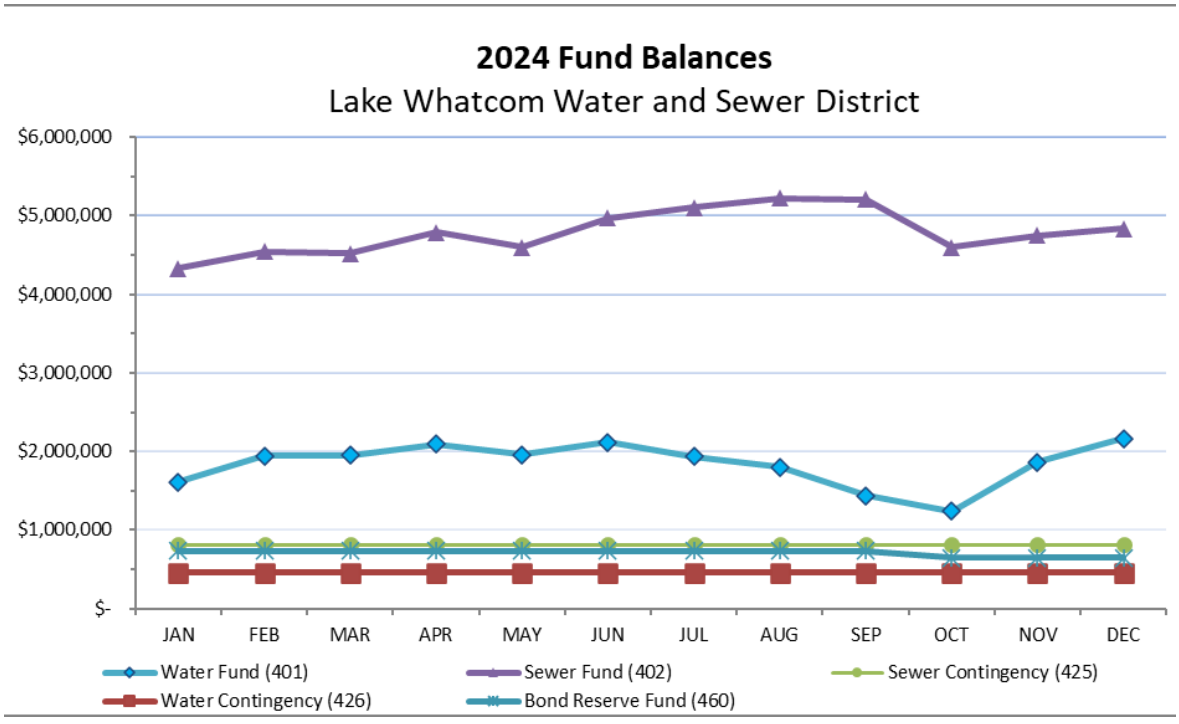
A sewer contingency reserve is maintained in accordance with District financial policies at one percent of the sewer utility infrastructure replacement cost ($815,000). This fund provides for paying for unanticipated costs that may be incurred by the Sewer Utility. The Sewer Contingency Reserve was fully funded throughout 2024.

Water Contingency Reserve (Fund 426)

A water contingency reserve is maintained in accordance with District financial policies at one percent of the water utility infrastructure replacement cost ($460,000). This fund provides for paying for unanticipated costs that may be incurred by the Water Utility. The Water Contingency Reserve was fully funded throughout 2024.

Bond Reserve Fund (Fund 460)

The District's Bond Reserve Fund is a restricted fund associated with covenants of the 2016 bond sale. It was fully funded at $646,125 at the end of 2024. As mentioned in the Sewer Utility Fund section of this report, in October the District reduced this fund by $126,209 to use allowed funds to make the debt service payment. The District is required to maintain the Maximum Amount Due (MAD) for the remainder of the bond. As the District moves closer to paying this debt in full, the balance within this fund will be reduced in the coming years. Lastly, in the fourth quarter the District set up a designated account with Washington Federal to hold funds associated with this fund balance. This was done to create transparency and accountability of funds associated with the bond.



District Cash and Investments

In accordance with its financial policies, the District invests its funds in a manner that meets the primary objectives of safety, liquidity, and yield. As of the close of 2024, the District's long-term and short-term investments were relatively equal with approximately $3.54 million invested in short-term accounts (LGIP & Public Funds Account) and approximately $3.50 million invested in long-term holdings (US Bank Safekeeping). This strategy allows the District's investment portfolio to obtain the highest rate of return in budgetary and economic cycles while maintaining the necessary liquidity to meet operating and capital needs. The following contains a summary of the District's cash and investments through December 31, 2024.

INVESTMENTS/CASH AS OF 12/31/2024

Petty Cash	$ 1,600	
Cash	$ 1,218,130	
Debt Service Account	$ 646,125	
Public Funds Account	$ 30,953	2.940%
WA Federal	**$ 1,896,808**	
Local Gov't Investment Pool	**$ 3,517,918**	4.602%

		PRINCIPAL COST	MARKET VALUE	MATURITY DATE	YIELD
US Treasury Note	Non-callable	$ 498,359	$ 500,000	Jan-25	1.125%
US Treasury Note	Non-callable	$ 499,082	$ 536,000	Apr-25	4.921%
US Treasury Note	Non-callable	$ 499,512	$ 543,000	Jul-25	4.783%
US Treasury Note	Non-callable	$ 747,615	$ 810,000	Dec-25	4.440%
US Treasury Note	Non-callable	$ 797,274	$ 855,000	Jan-26	3.950%
US Treasury Note	Non-callable	$ 467,667	$ 500,000	Jun-26	4.500%
US Bank Safekeeping		**$ 3,509,509**	**$3,744,000**		
TOTAL		**$ 8,924,235**			

USE OF FUNDS:		
Bond Reserve - Restricted	$ 646,125	
Contingency - Assigned	$ 1,275,000	
Operating Reserves	$ 1,185,000	
Operating Assigned	$ 5,818,110	
		$ 8,924,235

Fund Balance Summary		
Water Utility Fund (401)	$ 2,167,817	
Sewer Utility Fund (402)	$ 4,835,293	
Sewer Contingency Fund (425)	$ 815,000	
Water Contingency Fund (426)	$ 460,000	
Bond Reserve Fund (460)	$ 646,125	
		$ 8,924,235

LAKE WHATCOM WATER AND SEWER DISTRICT
DECEMBER 2024 Utility Account Adjustments

Sudden Valley Adjustments		
Late Fee Credits	$	337.47
High Use/Leak Credits	$	417.98
North Shore/Geneva		
Late Fee Credits	$	47.02
High Use/Leak Credits	$	-
Total Account Adjustments	$	802.47

Lake Whatcom Water & Sewer District
Operations & Maintenance Department Report

Prepared for the January 29, 2025 Board Meeting
Data Compiled 1/23/25

State Required Report Status													
Monthly Reports													
Name Of Report		**Completed**											
Chlorination Report Agate Heights Prepared by: K Cook	Postmarked by the 10th of month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
		x											
Surface Water Treatment Rule Report (SVWTP) Prepared by: K Cook	Postmarked by the 10th of month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
		x											
Annual Reports													
Name Of Report	**Deadline**	**Completed**											
WA State Cross Connection Report Prepared by: R Munson	May												
OSHA 300 Log Prepared by: R Munson	February 1												
Water Use Efficiency Performance Report Prepared by: K Cook	July 1												
Community Right to Know (Hazardous Materials) Prepared by: R Munson	March 31												
Northwest Clean Air Emissions Report	February 1												
Consumer Confidence Reports Prepared by: K Cook	June 30	Geneva		SV		EagleR		Agate Ht					
Other Reports													
Name Of Report	**Deadline**	**Last Completed**											
CPR/First Aid Training Coordinated by: R Munson	Due Biennially Next Due 2025	*Scheduled for Feb 27, 2025*											
Flagging Card Training Coordinated by: R Munson	Due Triennially Next Due 2025	May 19, 2022											

Safety Program Summary Completed by Rich Munson	
Summary of Annual Safety Training *2024/25 Testing Period - Dec 2024 to April 4, 2025*	
	% Complete
Engineering - Managers	
Engineering - Staff	
Field Crew - Managers	
Field Crew - Staff	
Office - Managers	
Office - Staff	
Overall	**#DIV/0!**

Safety meetings for the field crew take place every Thursday at 8 a.m.

Dates of Completed Safety Committee Meetings		
1.23.25		

Summary of Work-Related Injuries & Illnesses	Current Month	2025	2024	2023	2022	2021
Total Number of Work Related Injuries Defined as a work related injury or illness that results in: Death Medical treatment beyond first aid Loss of consciousness Significant injury or illness diagnosed by a licensed health care professional Days away from work (off work) Restricted work or job transfer	0	0	0	0	0	0
Total Number of Days of Job Transfer or Restriction (light duty or other medical restriction)	0	0	0	0	0	0
Total Number of Days Away from Work (at home, in hospital, not at work)	0	0	0	0	0	0
Near Misses	0	0	0	0	0	0

Safety Coordinator Update

Status of District Water and Sewer Systems
Prepared by Jason Dahlstrom - Operations and Maintenance Manager
1/29/2025 Board Meeting

Safety Activities

1. No time-loss injuries or near misses.
2. Daily safety reminders directly relevant to the day's tasks. Weekly safety trainings based on District specific safety programs.
3. Jobsite tailgate meetings by project lead.

Water Utility Activities

Water Treatment Plants

1. Sudden Valley
    a. Plant is operating well, averaging 0.5 million gallons per day (MGD) at 700 GPM.
    b. Water use is consistent with typical seasonal usage.
2. Agate Heights
    a. Plant is operating well.
    b. Water use is consistent with typical seasonal usage.

Distribution System

1. 2 water main leaks repaired this month
2. O&M/Engineering met with Wilson to review operations plan for new Div 7 reservoirs prior to going online

Sewer Utility Activities

Lift Stations

1. Repair work due to windstorm at Par sewer lift station completed
2. Priming lock loop installed at Edgewater sewer lift station

Collection System

1. Nothing new to report

Fleet

Vehicles

1. New service truck ETA 1/2025 - C2306
2. New service truck pricing and availability underway – V2502

Equipment

1. All equipment is functional.

Facilities

1. Standby generator maintenance/inspection has been completed. Reports from technician are being received. Initial reports indicate slight oil dilution.

Training

1. G Soto at Advanced Electrical Troubleshooting
2. M Pianki started as Maintenance Worker 1 on 1/6/25

Development

1. There are 6 permits currently in stages of development