CASCADE WATER ALLIANCE

Water System Plan

Adopted November 19, 2025

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Acknowledgements

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Certification

Cascade Water Alliance
2025 Water Plan

The Water System Plan for Cascade Water Alliance has been prepared under the direction of the following Registered Professional Engineer.

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Abbreviations and Acronyms

Abbreviation or Acronym	Definition
2012 Joint Agreement	*2012 Cascade Water Alliance Joint Municipal Utility Services Agreement*
2025 Market-Priced Agreement	*2025 Agreement for Market-Priced Wholesale Water Supply Between the City of Tacoma, Department of Public Utilities, Water Division and Cascade Water Alliance*
2025 Wholesale Agreement	*2025 Agreement for Wholesale Water Supply Between the City of Tacoma, Department of Public Utilities, Water Division and Cascade Water Alliance*
AFY	Acre-feet per year
BIP	Bellevue-Issaquah Pipeline
BKR	Bellevue-Kirkland-Redmond
Block Contract	*2nd Amended and Restated Declining Block Water Supply Agreement Between the City of Seattle and Cascade Water Alliance*
Board	Cascade Water Alliance Board of Directors
Cascade	Cascade Water Alliance
CERU	Cascade equivalent residential units
CFS	Cubic feet per second
CIP	Capital improvement program
CWSP	Coordinated Water System Plans
DOH	Washington State Department of Health
ERU	Equivalent residential units
Four Cities	Auburn, Bonney Lake, Buckley, and Sumner
GDPC	Gallons per day per capita
GPD	Gallons per day
GPM	Gallons per minute
MGD	Millions of gallons per day

Abbreviation or Acronym	Definition
MIT	Muckleshoot Indian Tribe
PSE	Puget Sound Energy
PTI	Puyallup Tribe of Indians
RCFC	Regional capital facilities charge
R&R	Repair and replacement
SPU	Seattle Public Utilities
SMP	Cascade's Shortage Management Plan
TCP	Tacoma-Cascade Pipeline
TPU	Tacoma Public Utilities
WRLTR	White-River Lake Tapps Reservoir
WRMA	White River Management Agreement
WSCP	Seattle Public Utilities' Water Shortage Contingency Plan

Executive Summary

Cascade Water Alliance (Cascade) is a municipal corporation formed under the authority of the Joint Municipal Utility Services Act (Chapter 39.106 RCW) to provide water supply to its Members: Bellevue, Issaquah, Kirkland, Redmond, Sammamish Plateau Water, Skyway Water & Sewer District, and Tukwila. Cascade's mission is to provide safe, clean, and reliable water to its Members in a cost-effective and environmentally responsible way through regional leadership and strong relationships.

This Water System Plan fulfills Cascade's responsibility to submit a water system plan to the Washington State Department of Health (DOH). In addition, it supplements information on regional supply presented in each Member's individual water system plan.

Cascade contracts with Seattle Public Utilities (SPU) for delivery of water to its Members, receiving 33.3 million gallons per day (MGD) annual average. The current contract (Block Contract) contains a declining block of supply that will be reduced in stages, beginning in 2040. In addition to its SPU supply contract, four Members of Cascade have independent water supplies, with a total average annual day capacity of 9.53 MGD.

In 2009, Cascade purchased the White River-Lake Tapps Reservoir Project (WRLTR Project) from Puget Sound Energy (PSE), with a plan to develop the reservoir as a source of future municipal water. Water rights originally issued in December 2010 authorize Cascade to produce 48.5 MGD as an annual average for municipal supply deliveries. This water right augments Cascade's current supplies to meet its Members' long-range supply needs and also provides the opportunity to improve reliability of water supplies for the Central Puget Sound region, particularly in the context of climate change concerns.

Water demand in the Cascade service area has been relatively stable since 2000, ranging from approximately 32 to 37 MGD. Looking forward, total annual average water demand is projected to remain around 37 MGD through 2030 before beginning a gradual rise to 39.3 MGD by 2045. While Cascade's population and employment are expected to grow 31% between 2025 and 2045 (1.2% per year), its water demand is projected to increase by much less, just 6.5% (0.3% annually). The collective effects of adopting conservation rate structures, increasing water rates, updated federal and state plumbing codes and appliance efficiency standards, Cascade's conservation programs, and improved water system operations have resulted in a steady decline in water consumption per capita for SPU's regional system.

The combination of supply from SPU and Members' independent supplies will provide approximately 42 MGD through 2039, which is enough to meet Cascade's projected demand. However, once the Block Contract amount from SPU begins to decline, that will no longer be the case, and Cascade will need an additional source of water to meet demand after 2041. Figure ES-1 illustrates this.

Figure ES-1. Cascade Demand Forecast Under Current Block Contract (2023-2045)

Based on SPU's, TPU's, and City of Everett's current water system plans, water supply in the region should be ample through at least 2060. Cascade's business model calls for the use of available regional water to bridge demand until the Lake Tapps Reservoir is developed for municipal supply. Cascade estimates it would take a minimum of 20 years to plan and develop the Lake Tapps Reservoir, so in July 2021, Cascade's Board of Directors (Board) directed staff to pursue supply contracts with SPU and TPU.

After nearly three years of discussions with SPU and TPU, in May 2024, Cascade's Board directed staff to develop new supply contracts with TPU. Both SPU's and TPU's proposed contract terms would allow Cascade to cost-effectively defer development of the Lake Tapps Reservoir. However, TPU's proposal offered longer supply certainty, greater financial benefit, and an opportunity to move towards a regionalized water system.

In March 2025, Cascade and TPU finalized and signed two separate and complementary agreements: the Agreement for Market-Priced Wholesale Water Supply (2025 Market-Priced Agreement) and the Wholesale Water Supply Agreement (2025 Wholesale Agreement). The 2025 Market-Priced Agreement provides temporary supply through 2062 while the 2025 Wholesale Agreement provides permanent supply. Figure ES-2 shows Cascade's projected demand and supply through 2045 with TPU supply. Although the figure shows TPU supply available in 2026, Cascade plans to phase into TPU's delivery starting in 2041, as supply from SPU's Block Contract gradually declines below what is needed to meet Cascade's demand. By 2060, Cascade will receive 24 MGD on average from TPU. After 2062, Cascade will receive up to 15 MGD peak day from TPU.

Figure ES-2. Cascade Demand and Supply Forecast with TPU Supply (2023-2045)

Given the two new supply agreements with TPU, Cascade anticipates needing to have the Lake Tapps Reservoir in service by the early 2060s. In the 2018 Transmission and Supply Plan Extension, Cascade projected developing the reservoir as early as the mid-to-late 2030s.

Cascade is responsible for constructing the facilities necessary to connect Cascade's system with the TPU system by way of the Cascade Supply Program (CSP). The CSP will be the largest program undertaken by Cascade and involves miles of transmission and distribution mains, storage facilities, a chlorination station, and more in the future. In Phase 1 of the program, the focus will be on the Tacoma Cascade Transmission Line (TCTL), approximately 25-30 miles of pipe, which will deliver water from Tacoma's Pipeline 5 to Cascade Members. In addition to the TCTL, a storage facility (or facilities) and a re-chlorination station will be constructed.

Over the next two to three years, Cascade will focus on developing the CSP Project Report. The CSP Project Report will be the scope of work that forms the basis of design and requirements to construct the facilities necessary to connect the Cascade and TPU systems. This Water System Plan covers the same period as Cascade's facilities planning phase of the CSP.

Once the CSP Project Report is completed, Cascade will commence design, environmental, and permitting work for Phase 1 of the CSP. Construction of the TCTL is anticipated to start around 2032.

The capital needs for the CSP, as well as for upgrading or replacing assets in the WRLTR Project, will be met through a variety of funding sources, including existing funding streams and potential future funding opportunities. As part of its fiscal policies, Cascade will develop a project funding plan specific to the CSP, which will further refine the plan for the funding sources as well as potential federal or state grant and loan programs.

Cascade's overall financial position is strong, with sufficient liquidity to finance operations and sufficient debt capacity to finance future capital asset acquisitions. Cascade is financed by equity and long-term debt. Since Cascade serves its Members on a wholesale basis, its rates and charges do not include retail rates. Cascade's charges to Members reflect the fixed nature of much of Cascade's costs, whether currently under SPU's Block Contract or as anticipated with debt service related to financing the CSP. As a means of mitigating financial risk, Cascade's rate structure is primarily fixed in nature.

Consistent with its fiscal policies, Cascade updates its 10-year rate forecast on a biennial basis as part of its budget process. Additionally, Cascade prepares a long-term financial forecast at least once every 10 years.

This Water System Plan is organized into six chapters.

- Chapter 1: Cascade's history, membership, service area, supply commitment to Members, governance, organizational structure, regulatory compliance, and relationships to Member's Water System Plans.

- Chapter 2: Cascade's current contracted supply, infrastructure, Member supplies, water quality regulatory compliance, shortage management, water rights self-assessment, and related plans and agreements.

- Chapter 3: Cascade's historical, current, and projected water demand; future sources of supply; and reclaimed water.

- Chapter 4: Cascade's water efficiency program and water savings goal.

- Chapter 5: Cascade's capital planning and improvement program for the WRLTR Project, the Bellevue-Issaquah Pipeline (BIP), and the CSP.

- Chapter 6: Cascade's financials, including total cost of providing water service and the mechanisms through which Cascade recovers these costs, funds new improvements, and demonstrates the financial viability of Cascade both currently and in the long term.

Once Cascade completes the CSP Project Report, it will develop and submit a new 10-year Water System Plan to DOH with a planned submittal date of September 30, 2029. The alternatives for sizing and routing transmission facilities and other key recommendations from the CSP Project Report will be incorporated into Cascade's next Water System Plan. Cascade will communicate regularly with DOH on the progress of its CSP Project Report and the anticipated timeline for its next 10-year Water System Plan.

Chapter 1. Cascade Overview

Cascade Water Alliance (Cascade) is unique among Washington water suppliers in that it serves exclusively as a wholesale supplier to its Members. Its mission is to provide safe, clean, and reliable water to its Members in a cost-effective and environmentally responsible way through regional leadership and strong relationships.

This chapter provides background information on Cascade and summarizes its history, membership, service area, supply commitment to Members, governance, and organizational structure. It also briefly describes Members' regulatory compliance and the relationship between Cascade's and Members' water system plans.

1.1. History

Cascade was formed in April 1999 as a public body via an Interlocal Agreement. From 1999 through 2012, Cascade functioned as a watershed management partnership to provide essential governmental functions on its Members' behalf. In 2011, the Washington Legislature enacted the Joint Municipal Utility Services Act (Chapter 39.106 RCW), which provides for the conversion of an existing intergovernmental entity formed under the Interlocal Cooperation Act into a joint municipal utility services authority.

On July 12, 2012, Cascade completed the necessary steps to convert to a joint municipal utility services authority and become a municipal corporation, no longer functioning as a watershed management partnership.

Cascade's purposes are listed in the 2012 Cascade Water Alliance Joint Municipal Utility Services Agreement ("2012 Joint Agreement") and generally include: contracting with other regional water suppliers on behalf of its Members; developing and operating water supply facilities; providing regional water conservation services; and planning for the water needs of its Members (including long-range and short-term plans for emergencies or water shortages).

Water deliveries from Cascade began on January 1, 2004. Cascade delivers water to its Members entirely on a wholesale basis. Each Member is responsible for distributing water to its residents, businesses, and other retail customers. Members own and operate their local distribution systems for these purposes. Some Members also have independent water supplies and meet a portion of their demands separately from the wholesale supply provided by Cascade.

1.2. Membership and Service Area

Cascade currently has seven Members: Bellevue, Issaquah, Kirkland, Redmond, Sammamish Plateau Water, Skyway Water & Sewer District, and Tukwila. All seven Members participated in the formation of Cascade. Covington Water District was a founding Member of Cascade but withdrew from Cascade in 2012.

Cascade's current service area for delivery of wholesale water supplies is located entirely within the boundaries of King County, Washington. The service area may change from time to time, as Member water systems adjust their service area boundaries. The current service area is shown in Figure 1.1.

Based on data from the Puget Sound Regional Council, the combined population of the Cascade service area was estimated to be 405,000 people in 2023, as seen in Table 1.1. The population shown below refers to population within each Member's water service area and differs from City limits and City populations. This data, in addition to households, employment, and Cascade Equivalent Residential Units (CERUs) are used to forecast water demand and are discussed in Chapter 3.

Table 1.1: Cascade Service Area Population

Member	2023 Population
Bellevue	162,200
Issaquah	29,000
Kirkland	49,200
Redmond	85,600
Sammamish Plateau Water	59,300
Skyway Sewer & Water District	12,500
Tukwila	7,500
Total	**405,300**

1.3. Supply Commitment to Cascade Members

Cascade Members are parties to the 2012 Joint Agreement. The agreement outlines Cascade's water supply commitment to its Members and is summarized as follows:

- Cascade must provide a full supply commitment to each of the current Members and meet each Member's water needs, except for the portion met by the Member's independent supply and subject to certain limitations (as outlined below).
- Cascade is obligated to provide water supply to the entire service area of each Member.
- Cascade is not obligated to provide water supply to service area expansions in or outside the urban growth boundary, unless Cascade agrees to this.
- Cascade's full supply commitment to its Members is subject to water shortages, Cascade's ability to implement its Water System Plan, and each Member's audited independent supply. If Cascade cannot fully meet its Members' needs during a shortage, Members share the shortage per Cascade's Shortage Management Plan.
- Cascade must provide for supply system development to meet the needs of additional water customers of Members, subject to consistency with applicable state law, Cascade's Water System Plan, orderly asset development, reasonable cost, and financing capacity.

Figure 1.1: Cascade's Service Area Map

1.4. Governance and Organizational Structure

Cascade is governed by a Board of Directors (Board) consisting of one representative appointed by each Member. Members can also appoint alternates to the Board. Each Board Member and Alternate Board Member must be an elected official of the Member organization.

The Board has authority over all actions taken by Cascade. The 2012 Joint Agreement defines voting procedures and also indicates certain actions that require ratification by the elected bodies of each Cascade Member.

Figure 1.2. Organizational Chart

Cascade's approved staff positions for 2025-2026 are shown in the organizational chart in Figure 1.2. Staff members are employees of Cascade and are neither elected officials nor employees of Cascade's Member agencies. Staff members carry out functions of the organization, coordinate with Cascade Member staff, and oversee services provided by consultants, contractors, and other external service providers.

Cascade purchases its water from SPU, and local distribution is handled by Cascade Members, as described in Chapter 2. Because of this, Cascade's functions do not include direct operation of municipal water supply facilities, and Cascade is not required to maintain operator certification for any of its employees under DOH regulations.

1.5. Regulatory Compliance by Cascade Members

Each Cascade Member is responsible for complying with state, local, and federal regulations regarding public water supply within its individual service area. Members delegate a portion of these responsibilities to Cascade, including water sources, treatment of water supplies, and regional storage and transmission facilities. Some of these responsibilities, in turn, are implemented through Cascade's contract for regional supply from SPU (see Chapter 2).

Cascade Members operate and maintain their individual water distribution systems. This includes, as applicable, water treatment for their independent water sources, maintenance of water quality within their reservoirs and distribution systems, and local monitoring of water quality conditions (some monitoring is shared with regional water suppliers).

1.6. Relationship to Members' Water System Plans

Each Cascade Member is responsible under State law to prepare a water system plan every 10 years. Within their respective water system plans, each Cascade Member is individually responsible for system-specific information. However, regional planning for water supply sources is delegated to Cascade, documented in this Water System Plan, and summarized in the individual Member water system plans submitted to the DOH.

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Chapter 2. Current Water Supplies and Operations

This chapter summarizes Cascade's current contracted supply, Cascade-owned infrastructure, Cascade Member supplies, water quality regulatory compliance, Cascade's shortage management plan, Cascade's water rights self-assessment, and related plans and agreements. Projections of future water demand, current water usage, and water supplies for future uses are covered separately in Chapter 3.

2.1 Contracted Supply

Cascade contracts with SPU for delivery of water to its Members. The current Block Contract (2nd Amended and Restated Declining Block Water Supply Agreement Between the City of Seattle and Cascade Water Alliance) became effective on January 1, 2004 and was amended in 2008 and again in 2013. The contract contains a declining block of supply that will be reduced in stages, beginning in 2040. It also includes a supplemental block that is available to Cascade through 2044. Supply quantities are shown in Table 2.1. The Block Contract allows for higher peak usage quantities, based on peaking factors identified in Table 2.2.

Table 2.1: Supply Quantities in SPU Declining Block Contract

Year	Size of Block (in MGD)		
	Base	Supplemental	Total
2004-2023	30.3	3	**33.3**
2024-2029	29.3	4	**33.3**
2030-2034	26.8	6.5	**33.3**
2035-2039	24.3	9	**33.3**
2040	24.3	7	**31.3**
2041	24.3	5	**29.3**
2042	24.3	3	**27.3**
2043	24.3	2	**26.3**
2044	24.3	1	**25.3**
2045	24.3	0	**24.3**
2046	23.3	0	**23.3**
2047-2063	1 less than prior year	0	**1 less than prior year**
2064	5.3	0	**5.3**

Table 2.2: Peaking Allowances in SPU Declining Block Contract

Period	Peaking Factor
Peak Season Factor[1]	1.35
Peak Month	1.69
Peak Week	1.86
Peak Day	2.00

Peak Season: June 1 through September 30

Under the Block Contract, SPU is responsible for maintaining and operating source, treatment, transmission, and storage facilities needed to deliver the contracted supply, as well as regulatory compliance for those facilities.

Water is drawn from SPU's Cedar and Tolt River watersheds and delivered to individual Cascade Members at approximately 35 delivery points along SPU's various transmission pipelines, including portions of SPU's Tolt and Cedar transmission systems. SPU is required to provide water that meets state and federal drinking water quality standards at the delivery points.

Each delivery point has a wholesale meter that measures deliveries to individual Members. Both SPU and Cascade track total deliveries to Cascade Members on a monthly basis. Some of the water received by individual Members is wheeled through the Members' distribution system to another Member. For example, some of the water delivered to Kirkland is wheeled to Redmond, and some of the water delivered to Bellevue is wheeled to Redmond and Issaquah.

Consistent with its supply contracts, Cascade provides a wholesale level of service to its Members. It does not provide service that meets all retail service level obligations, such as fire flow or emergency backup.

The SPU delivery points also represent interties in the context of Washington requirements for water system plans. Table 2.3 lists these supply interties. Some Members also have interties among themselves that are used to move a portion of the SPU supply from one Member service area to another. These are referred to as Member-to-Member interconnections. Cascade Members also have emergency interties with adjacent water systems to provide water in the event of emergency water shortages. These local interties are identified in the individual Member's water system plans.

In addition to its SPU Block Contract, Cascade contracts with TPU for up to eight (8) MGD of water supply (Amended and Restated Agreement for the Sale of Wholesale Water or 2012 TPU Agreement). To date, Cascade has not requested any water under this agreement. Planned future use of TPU supply is discussed in Chapter 3. Cascade and TPU plan to construct system interconnections for delivery and acceptance of TPU water supply, which would be detailed and proposed in a future water system plan or Project Report for the Cascade Supply Program (CSP).

Table 2.3: Interties Between Cascade Members and SPU (from Management Agreement #11, Exhibit II)

Exhibit II

CASCADE POINTS OF DELIVERY[1], MINIMUM HYDRAULIC GRADIENTS, AND MAXIMUM FLOW RATES OF WATER SUPPLIED

POINT OF DELIVERY (POD)							MINIMUM HYDRAULIC GRADIENT UPSTREAM OF SEATTLE METER (FEET NAVD-88 Datum) [3]	MAXIMUM FLOW UP TO WHICH HYDRAULIC GRADIENT IS GUARANTEED UNDER THE AGREEMENT [3] [4] (gpm)
SEATTLE METER LOCATION	CASCADE MEMBER OPERATING DOWNSTREAM OF POD	SEATTLE STATION NUMBER	SEATTLE PIPELINE SEGMENT NUMBER	SEATTLE METER SIZE (IN.)	CASCADE MEMBERS SERVED	SIZE OF CASCADE MEMBER METER(S), (IN.) [2]		
132nd Ave. NE & NE 113th Street	Kirkland	74	1	10"	Kirkland, Redmond	12"	555	3,540
132nd Ave. NE & NE 85th Street	Kirkland	75	1	16"	Kirkland, Redmond	None	535	4,890
140th Ave. NE & NE 70th Street	Kirkland	72	2	12"	Kirkland, Redmond	12"	520	1,430
140th Ave. NE & 40th Street	Bellevue	65	2	10"	Bellevue, Redmond	18"	500	15,500
132nd Ave. NE & Bel-Red Road	Bellevue	62	2	12"	Bellevue	12"	470	
132nd Ave. NE & NE 24th Street	Bellevue	63	2	10"	Bellevue	12"/8" [5]	455	
140th Ave NE & NE 8th Street	Bellevue	198	2	12"	Bellevue	12"	460	
152nd Ave. NE & NE 8th Street	Bellevue	61	2	24"	Bellevue, Redmond	16"	460	
145th Pl SE & SE 28th Street	Bellevue	58	3	12"	Bellevue	16"	470	4,400
14509 SE Newport Way	Bellevue	60	3	10"	Bellevue, Issaquah	12"	525	
14509 SE Newport Way	Bellevue	182	3	10"	Bellevue, Issaquah, Sammamish Plateau	12"/8"/8" [6]	525	5,810
132nd Ave SE & SE 26th ST	Bellevue	59	8	8"	Bellevue	8"	425	2,725
128th Ave. SE & Newport Way	Bellevue	56	8	8"	Bellevue	8"	435	
128th Ave SE & SE 56th ST	Bellevue	47	8	8"	Bellevue	6"	440	
128th Ave SE & Newport Way	Bellevue	55	8	6"	Bellevue	6"	435	
128th Ave SE & SE 70th ST	N/A	52	8	12"	Bellevue	N/A	445	1700 [7]

Exhibit II

CASCADE POINTS OF DELIVERY[1], MINIMUM HYDRAULIC GRADIENTS, AND MAXIMUM FLOW RATES OF WATER SUPPLIED

POINT OF DELIVERY (POD)							MINIMUM HYDRAULIC GRADIENT UPSTREAM OF SEATTLE METER (FEET NAVD-88 Datum) [3]	MAXIMUM FLOW UP TO WHICH HYDRAULIC GRADIENT IS GUARANTEED UNDER THE AGREEMENT [3] [4] (gpm)
SEATTLE METER LOCATION	CASCADE MEMBER OPERATING DOWNSTREAM OF POD	SEATTLE STATION NUMBER	SEATTLE PIPELINE SEGMENT NUMBER	SEATTLE METER SIZE (IN.)	CASCADE MEMBERS SERVED	SIZE OF CASCADE MEMBER METER(S), (IN.) [2]		
East Channel Bridge Pipeline & 108th Ave. SE	Bellevue	66	9	8"	Bellevue	4"/10"	420	2,200
124th Ave SE & SE 38 PL	Bellevue	124	9	8"	Bellevue	8"	425	
Cornell Ave S & S 112th Street	Skyway	172	4	6"	Skyway	None	375	Backup service [8]
84th Ave. S & S 134th Street	Skyway	1	10	8"	Skyway	None	455	210
Beacon Ave S & S 124th Street	Skyway	5	10	8"	Skyway	8"	455	720
W Marginal Place & S 102nd ST	Tukwila	170	5	12"	Tukwila	12"	300	300
51st Ave S & S Leo Street	Tukwila	169	12	8"	Tukwila	8"	455	70
47th Ave S & S Victor Street	Tukwila	173	12	6"	Tukwila	6"	425	Backup service
South Center Parkway & Tukwila Parkway	Tukwila	13	13	10"	Tukwila	10"	460	800
West Valley Hwy & S 162nd Street	Tukwila	14	13	8"	Tukwila	8"	460	Backup service
Christensen Rd. & Baker Rd	Tukwila	15	13	8"	Tukwila	10"	460	840
53rd Ave S & S 160th Street	Tukwila	16	13	6"	Tukwila	6"	460	20
E Marginal Way & S 112th Street	Tukwila	183	15	12"	Tukwila	12"	445	900
7749 E Marginal Way S	Tukwila	168	20	12"	Tukwila	12"	N/A	Backup service [8]
Trilogy Parkway NE & NE 125 Street (East meter)	Redmond	164	28	10"	Redmond, Sammamish Plateau	16"	610	2,900
Trilogy Parkway NE & NE 125 Street (West Meter)	Redmond	186	28	10"	Redmond, Sammamish Plateau	16"	610	

Exhibit II

CASCADE POINTS OF DELIVERY[1], MINIMUM HYDRAULIC GRADIENTS, AND MAXIMUM FLOW RATES OF WATER SUPPLIED

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SEATTLE METER LOCATION	CASCADE MEMBER OPERATING DOWNSTREAM OF POD	SEATTLE STATION NUMBER	SEATTLE PIPELINE SEGMENT NUMBER	SEATTLE METER SIZE (IN.)	CASCADE MEMBERS SERVED	SIZE OF CASCADE MEMBER METER(S), (IN.) [2]		
160th Ave NE & NE 104th Street	Redmond	165	28	10"	Redmond	16"	515	2,420
NE 172nd Street & Tolt Pipeline No. 2	Redmond	185	28	6"	Redmond	16"	515	
							TOTAL:	51,375

Notes:

1. All Points of Delivery (PODs) provide a wholesale level of service. Seattle bears no responsibility for retail service level obligations, such as fire flow or emergency backup.
2. This column is for informational purposes only, i.e., there are no related terms or conditions under the Agreement. Cascade will be responsible for providing Seattle with updated Cascade Member information from time to time.
3. These minimum hydraulic gradients and maximum flows relate to contractual conditions under the Agreement, but do not necessarily reflect practical or operational limits at particular PODs.
4. Except as provided in Note 7 below, all or some of the maximum flows allocated to each POD may be reallocated to another POD on the same Pipeline Segment Number, including those PODs designated as Backup Services. In that case, minimum hydraulic gradients are not guaranteed.
5. Flow branches into two metered Bellevue pipelines downstream of Station 63.
6. The 12" Bellevue meter is located at 4112 161st Ave SE. The two 8" meters that each serve Issaquah and the Sammamish Plateau are located at 16104 SE Newport Way in a single meter vault.
7. The maximum flow shown is the portion serving Bellevue via Coal Creek Utility District. All or a portion of this maximum flow may be reallocated from this POD to other PODs on the same Pipeline Segment Number, but additional flows from other PODs may not be reallocated to this POD.
8. When a Backup Service is the only POD on a Pipeline Segment Number, the Cascade Member operating the Backup Service can re-allocate all or portions of the maximum flows from other PODs it operates to that Backup Service, regardless of Pipeline Segment Number. In that case minimum hydraulic gradients are not guaranteed.

2.2 Cascade-Owned Infrastructure

To perform its responsibilities for regional water deliveries, Cascade purchased the BIP from Bellevue and Issaquah in 2004 and 2006, respectively. Currently, the BIP is the only piece of infrastructure Cascade owns that is used to deliver municipal water supply to end users. Its location is shown in Figure 2.1.

The BIP conveys water from SPU's Tolt Eastside Supply Line and Eastside Reservoir to Issaquah and Sammamish Plateau Water. It is made of ductile iron, is 24-inches in diameter, is approximately 7.2 miles long, and extends from near the easterly city limits of Bellevue, along the south side of Interstate 90, and continues through Issaquah to its terminus at the Sammamish Plateau Water turnout. The portion of the BIP located within Bellevue was constructed in the 1960s. The remainder of the BIP was constructed in 2000 and became operational in 2006.

Cascade has agreements with Bellevue and Sammamish Plateau Water to maintain the BIP. Bellevue maintains 1.20 miles of the BIP, and Sammamish maintains the remaining 5.93 miles.

Cascade's adopted 2025-2030 CIP includes a project to relocate a portion of the BIP. This is being driven by the Washington State Department of Transportation's Lewis Creek culvert replacement project, which will require relocation of the BIP.

Beyond 2030, Cascade expects the BIP will need new valves and seismic upgrades to pipe segment joints. In 2020, Cascade completed a Risk and Resiliency Assessment (RRA) of the BIP as part of the America's Water Infrastructure Act (AWIA). The RRA determined the costs of mitigation measures to address potential threats to the BIP, such as seismic events, outweigh the benefits. Given this, Cascade plans to make improvements when repairs are needed.

Cascade also owns the WRLTR Project in Pierce County. This resource is available for future production of drinking water supply and is discussed in Chapter 3.

Figure 2.1. Bellevue-Issaquah Pipeline

2.3 Cascade Member Supplies

Four Cascade Members (Issaquah, Redmond, Sammamish Plateau Water, and Skyway Water & Sewer District) have independent water supplies. These supplies are used only within the service area of the Member (except as noted in Members' individual water system plans).

Each of the independently supplied Members has water rights or supply contracts, or both, separate from Cascade. These are documented in each Member's individual water system plan and submitted to DOH.

For purposes of planning long-range supplies for Cascade as a whole, Cascade recognizes the availability of the water supplies of the independently supplied Members. Since Members face constraints on pumping in some places and at some times, the amount considered by Cascade is not always the same as the quantity authorized in Member water rights. Cascade Members owning independent supply have committed to meeting production requirements pursuant to the 2012 Joint Agreement and the Cascade Code. Independent supply quantities are listed in Table 2.4 below. These quantities come from Cascade's 2022 audits of Member independent supplies.

Table 2.4. Member Independent Supply Capacity (MGD)

	Annual Average Day	Peak-Season Day	Peak Day Capacity
Issaquah†	1.74 MGD	2.96 MGD	3.70 MGD
Redmond	2.60 MGD	3.51 MGD	3.90 MGD
Sammamish Plateau Water	4.89 MGD	7.90 MGD	9.88 MGD
Skyway Water & Sewer District	0.30 MGD	0.50 MGD	0.63 MGD
Total	**9.53 MGD**	**14.87 MGD**	**18.11 MGD**

† Issaquah independent supply is currently reduced during the planning, design, and construction of a water treatment facility for PFAS.

2.4 Water Quality Regulatory Compliance

As described earlier, water supplies currently used by Cascade Members include a combination of independent supplies owned and operated by Members and regional supply contracted by Cascade from SPU.

For Member independent supplies, all water treatment, water quality monitoring, and associated reporting under state and federal drinking water regulations are the responsibility of the respective Members who own and operate the supply. In addition, all seven Members have responsibility for maintaining and reporting water quality within their local distribution systems.

Under the 2012 Joint Agreement, Cascade is responsible to its Members for delivering water that meets state and federal standards at the point of delivery from Cascade to the Member. Currently, most of the points of delivery are taps along SPU's transmission pipelines. Article V of Cascade's contract with SPU stipulates SPU shall "supply water to Cascade that meets or

exceeds federal and state drinking water quality standards, as those standards may change from time to time". Cascade communicates regularly with SPU and Cascade Members regarding water quality conditions and monitoring. SPU performs all treatment, monitoring, and regulatory reporting of water quality conditions with regard to the regional supply.

2.5 Shortage Management Plan

Cascade's Shortage Management Plan (SMP) outlines how Cascade will respond to a shortage affecting its regional water supply. Cascade's primary role in the event of a water shortage is to coordinate between Cascade Members and SPU. Therefore, the SMP focuses on communication and coordination actions.

The SMP identifies four stages of water curtailment, reflecting increasingly severe shortage conditions that match the stages from SPU's Water Shortage Contingency Plan (WSCP). These are the Advisory Stage, Voluntary Stage, Mandatory Stage, and Emergency Curtailment Stage. For each stage of curtailment, Cascade's SMP identifies objectives, triggers, public messages, communication actions, and operating actions that are specific to Cascade. The SMP also identifies a range of actions that Cascade Members and their retail water customers can take to reduce water usage.

Under the 2012 Joint Agreement, Cascade Members "must respond to water shortages in a collective, shared fashion". The agreement allows the Cascade Board to impose penalty charges or a disproportionate reduction in supply on any Cascade Member who does not comply with the SMP during a shortage. However, the agreement also indicates Members are not required to impose Cascade's SMP in areas not served by Cascade's regional supply, and Members with independent supply may decline to participate in Cascade's shortage management program without penalty if they cease taking Cascade water during the period of the emergency or shortage.

A complete copy of Cascade's SMP is included in Exhibit A.

2.6 Water Right Self-Assessment

In 2009, Cascade purchased the WRLTR Project from PSE as the key element of Cascade's long-term water supply portfolio. The reservoir serves as a potential source of municipal water, and it not only provides an insurance policy for future needs but also allows Cascade Members to be a part of future regional water supply decisions. Currently, Cascade operates the reservoir and relies on claim S2-160882CL and associated certificate of change S2-CV1-2P168(B) to fill the Lake Tapps Reservoir, maintain reservoir levels, and protect fish and wildlife.

This section evaluates the water rights held by Cascade. Water rights held by SPU, TPU, and Cascade Members are evaluated in those entities' respective water system plans.

2.6.1 History of the White River-Lake Tapps Reservoir Project Water Rights

- 2003: The Washington Department of Ecology (Ecology) published three Draft Reports of Examination (ROEs) for three water right applications filed by PSE to facilitate development of its White River Hydroelectric Project as a municipal water supply. The 2003 ROEs were remanded back to Ecology when PSE announced it was ceasing hydropower generation at that location.

- 2005: PSE submitted a change/transfer application for its pre-code water right claim. All water right applications were included in the assets acquired by Cascade from PSE for Cascade's WRLTR Project. The purchase of the WRLTR Project closed in December 2009.

- 2006: Ecology issued a Draft ROE (in response to the remand of the 2003 ROEs) and took public comment. Cascade proposed adjustments and additional mitigation measures for the WRLTR Project, and Ecology issued new Draft ROEs for review and comment in 2010. Specifically, Cascade amended the applications to reduce the total quantity to be diverted from the White River and the reservoir from 100 cubic feet per second (cfs) and 72,400 acre-feet (PSE's original request) down to 75 cfs and 54,300 acre-feet.

- 2008-2010: Cascade entered into a set of agreements, the terms of which were incorporated into the Draft ROEs:

    - **Tribal Agreement**: August 2008: Cascade entered into the 2008 White River Management Agreement (WRMA) with the Puyallup Tribe of Indians (PTI) and the Muckleshoot Indian Tribe (MIT), which established parameters related to the management of the White River flows. The WRMA Recommended Flow Regime for the White River was included in the water rights (described below).

    - **Lake Tapps Homeowners Agreement**: May 2009: Cascade entered into the 2009 Agreement Regarding Lake Tapps Between Cascade Water Alliance and the Lake Tapps Community. The 2009 Agreement includes Cascade's commitment to the maintenance of Lake Tapps Reservoir's surface level within a range of elevations called "Normal Full Pool" during an extended Recreational Season, which were included in the water rights (described below).

    - **Four Cities Letter and Agreement**. February 2010: Cascade and the Cities of Auburn, Bonney Lake, Buckley, and Sumner (Four Cities) entered into the 2010 Lake Tapps Area Resources Agreement that provides for the Regional Reserved Water Program for the Lake Tapps Region. This program was included in a portion of the water rights (described below) as a mechanism for a portion of Cascade's water rights to be used by the cities to mitigate impacts of their application for new water rights or changes to existing water rights.

- September 2010: Ecology issued final ROEs approving the WRLTR Project.

- December 2010: Ecology issued final water right permits providing for Cascade to divert water from the White River, store water in the Lake Tapps Reservoir, and withdraw water for both municipal water supply and a reservation of water. These water rights are listed in Table 2.5, and the place of use for municipal supplies is shown in Figure 2.2. Cascade agreed to dramatically reduce the quantity of water that could be diverted into the Lake Tapps Reservoir and to donate the majority of the perfected, historical water right used to fill the Lake Tapps Reservoir.

- 2014: Cascade and Ecology entered the Lake Tapps Trust Water Rights Agreement. Under this agreement, Cascade took actions to satisfy Condition 19 of the water rights issued in December 2010, including the following:

    - Cascade made a permanent donation to the Trust Water Rights Program and deeded to Ecology a portion of Surface Water Claim 160882 in an instantaneous quantity of 988 cfs and an annual quantity of 684,571 acre-feet.

    - Cascade donated to the Trust Water Rights Program on a temporary basis a portion of Surface Water Claim 160882 in the annual quantity of 154,751 acre-feet per year (AFY). Cascade retains the right to divert and use some or all of the temporary donation in the event of adverse conditions. Cascade relies on claim S2-160882CL and associated certificate of change S2-CV1-2P168(B) to fill the Lake Tapps Reservoir, to maintain reservoir levels, and to protect of fish and wildlife.

- June 2015: Ecology issued a Superseding Certificate of Change of Water Right, Number S2-CV1-2P168(B), amending the diversion right under Claim Number 160822 to 246,710 AFY.

- February 23, 2022: Ecology granted an Extension Request for Water Right Permit Nos. S2-29920, R2-29935, and S2-29934 with a development schedule extended as follows:

    Beginning Construction: December 31, 2065, conditioned upon:

    The permittee is required to provide Ecology progress reports every five (5) years beginning December 31, 2027. Progress reports will consist of describing efforts made on project in the previous five (5) year period and if the project is progressing on schedule. Any changes in point of contact must also be updated.

The Water Rights are attached as Exhibit B. The Source Type, Source Location, Purpose of Use, and Place of Use are included in Table 2.5 and Figures 2.2 (Schematic) and 2.3 (Place of Use Map). In addition, Exhibit C includes the Water Rights Self-Assessment.

Table 2.5. Lake Tapps Water Rights Issued to Cascade Water Alliance

Number	Source Type	Source Location	Purpose of Use	Place of Use
Permit S2-29920(A) (Priority date June 20, 2000)	Surface water	White River	Authorizes diversion of up to 54,300 acre-feet per year for municipal water supply, including for industrial and commercial purposes.	See Figure 2.3
Permit R2-29935 (Priority Date September 15, 2000)	Surface water	White River	Authorizes storage of water in the Lake Tapps Reservoir limited to 46,700 acre-feet.	Lake Tapps Reservoir
Permit S2-29934 (Priority Date September 15, 2000)	Surface water	Lake Tapps Reservoir	Authorizes withdrawal of up to 54,300 acre-feet per year from in the Lake Tapps Reservoir for municipal water supply, including for industrial and commercial purposes.	See Figure 2.3
S2-CV1-2P168(B) (S2-160882CL) (Priority Date 1895) As reduced by Water Right Trust Program donations	Surface water	White River	Authorizes withdrawal of 246,710 acre-feet per year to provide recreational water levels in the Lake Tapps Reservoir, maintain the reservoir in the winter, and protect and enhance fish and wildlife.	Lake Tapps Reservoir
Permit S2-29920(B) (Priority date June 20, 2000, but junior to Permit No. S2-29920(A))	Surface water	White River	Establishes a Regional Reserved Water Program to be used by Auburn, Bonney Lake, Buckley, and Sumner as a mechanism for a portion of Cascade's water rights to be used by the cities to mitigate impacts of their application for new water rights or changes to existing water rights.	White River

Figure 2.2: Schematic of Cascade's Water Rights

Figure 2.3. Place of Use Map

Figure 2.3 shows Place of Use for Permit No. S2-29920(A) and Permit No. S2-29934. The place of use for these water rights "is the combined service areas described in the most recent Water System Plans approved by the Washington State Department of Health for Cascade Water Alliance, the City of Seattle and the City of Tacoma."

2.7 Related Plans and Agreements

Several agreements affect Cascade's water system planning, current supplies, and operations. These include:

- Cascade's **2012 Joint Agreement** serves as the foundational agreement that created Cascade and guides its activities.

- **Membership Audit Acceptance Agreements** were developed to establish the quantity of supply that those Members having their own water supplies will produce. The Members that have local supplies are listed in Table 2.4. Each audit establishes a commitment by the Member to produce a certain quantity of water for its own needs.

- **BIP Agreements** with Bellevue and Sammamish Plateau Water designates the two Members to perform operations, maintenance, repair, and emergency response services for the BIP.

- The **Block Contract** with SPU provides for purchase of water on a wholesale basis, as described in Section 2.1. It includes the terms and conditions associated with this water supply.

- The **2025 TPU Agreements** provide for the purchase of water on a wholesale basis starting in 2041, as supply from SPU's Block Contract declines. The two separate and complementary agreements; the Agreement for Market-Priced Wholesale Water Supply (2025 Market-Priced Agreement) and the Wholesale Water Supply Agreement (2025 Wholesale Agreement) replaced the 2012 TPU Agreement. Since the new agreements are for future supply, they are discussed in Chapter 3.

In addition to agreements, the following plans affect Cascade's planning, supplies, and operations.

- **SPU's 2019 Water System Plan** outlines its programs to provide safe and reliable drinking water throughout its retail and wholesale service area. The plan identifies Cascade as a wholesale customer and describes the Block Contract. The plan includes sections on SPU's water resources, water quality and treatment program, and the transmission system that delivers water to Cascade and other wholesale customers.

- **TPU's 2018 Water System Plan** outlines TPU's programs to provide safe and reliable drinking water throughout its retail and wholesale service area. The plan identifies Cascade as a wholesale customer within its service area.

- **Member Water Systems Plans**. Each Cascade Member is responsible under State law for preparing a water system plan every 10 years. However, regional planning for water supply sources is delegated to Cascade, documented in this Water System Plan, and summarized in the individual Member water system plans submitted to DOH.

- **County and City Land Use Plans**. County and city land use plans determine the extent and nature of development that can occur on lands within King County and its many cities. Land use plans also provide a means to implement provisions of Washington's Growth Management Act. Each of the five cities that is a member of Cascade has a land use plan (comprehensive plan). King County's land use plan regulates development in areas that are outside the various cities, including unincorporated lands within the water service areas of Cascade's Members.

    - The **Coordinated Water System Plans** (CWSP) affecting the Cascade service area include East King County and Skyway Water & Sewer District. The East King County CWSP was prepared in 1989 and updated in 1996. It identified water supply needs in the eastern part of the county and developed a list of supply options to potentially meet those needs. It addressed expected growth and development, design standards, service areas, satellite system management, and additional topics. Cascade Members in the area addressed by this plan include Bellevue, Issaquah, Kirkland, Redmond, and Sammamish Plateau Water. The East King County Regional Water Association is dissolving in 2025.

    - The **Skyway Coordinated Water System Plan** was prepared in 1988 and updated in 1999. It defines water service area boundaries in an area where Seattle, Tukwila, Renton Water District 125, and Skyway Water & Sewer District provide water to the public. It contains provisions for transferring service from one water system to another, reestablishing boundary lines, and resolving service area disputes. Service area changes are made from time to time but do not require an update or amendment of the plan.

Chapter 3. Water Demand and Future Supplies

This chapter summarizes Cascade's water demand and future supply. Specifically, it describes current demand and production, historical water consumption, projected demand through 2045, future water supplies through 2045 and beyond, and reclaimed water as a potential source of supply.

3.1. Water Demand and Production

Water demand in the Cascade service area has been relatively stable since 2000, ranging from approximately 32 to 37 MGD despite population and employment growth in the service area. Figure 3.1 shows total average-day demands, including both water purchased by Cascade and water obtained from Cascade Member independent supplies. It also shows that much of the year-to-year variation over Cascade's past 24 years can be explained by summer weather with cooler and/or wetter peak seasons roughly correlated with lower water demand.

Figure 3.1. Average Daily Water Demand, Temperatures, and Rainfall

Sources: Cascade records of water purchased from SPU 2004-2023; SPU records of deliveries to Cascade Members 2000-2003, and data provided annually by Cascade Members on their independent supply production. National Weather Service. Note that: (1) the demand of more than 1 MGD from the part of Coal Creek Utility District annexed by Bellevue in 2004 is included for the years 2000-2003 and (2) demand from Covington Water District, a Cascade member until 2012, is not included.

Table 3.1. Demand and Supply

	Annual Average (MGD)
Cascade Demand	35.1
Available SPU Supply	33.3
Available Member Independent Supply	9.5
Surplus (Deficit)	**7.7**

Water use in the Puget Sound region and the Cascade service area exhibits a summer peaking pattern. Higher temperatures and drier conditions in the summer induce various activities that increase water demand, the most significant being landscape irrigation. Figure 3.2 displays the monthly pattern of water demand from both Member independent supplies and the Cascade regional supply contracted from SPU in the most recent year for which data is available, 2023. Also shown are the one-month and four-month peak factors. Figure 3.3 shows the same for the average over the period 2005-2023.

Figure 3.2. Monthly Pattern of Water Demand

Figure 3.3. Demand from Cascade Members (2005-2023 Average)

3.2. Historical Water Consumption

For most of this region's history, water consumption increased with population growth. However, that link was broken around 1990 when consumption reached its highest level. Since then, water consumption has declined despite continued population growth. Currently, regional consumption is lower than it has been since the 1950's when the population served was only half of what it is now. Figure 3.4 displays the Seattle Regional System[1] water consumption and population since 1930. While population has steadily risen, water demand leveled off during the 1980's before dropping off sharply in 1992 due to a drought and mandatory curtailment measures. Since then, the combined effects of higher water and sewer rates, new federal and state plumbing codes, utility conservation programs, and improved system operations have kept water consumption significantly below pre-1990 levels. Between 1990 and 2023, consumption decreased by 28% while population increased by 46%. Total water consumption per person is now 50% less than it was in 1990. After 20 years of steady decline, regional system water consumption leveled off around 2010 and has remained relatively flat since then.

[1] Historical consumption and population data in the Seattle Regional System include all Cascade Members except Issaquah and Sammamish Plateau Water.

Figure 3.4. Total Seattle Regional Water System Annual Demand (1930-2022)

* Adjusted to reflect that some wholesale customers have other sources of supply in addition to what they purchase from SPU.

Figure 3.5 shows the population and water consumption of current Cascade Members since it was formed in 1999. While the population has grown by 53%, water consumption has been essentially flat over the whole period, averaging 35 MGD. This suggests the rate at which water use efficiency has been improving (due to efficiency codes and standards, Cascade conservation programs, increasing water rates, and other factors) has roughly offset the impact of forces putting upward pressure on water consumption (growth in population and the economy). As a result, water demand per capita has declined by 33%.

Figure 3.5. Cascade Water Demand and Population (2000-2023)

3.3. Projected Demand

Long-term water demand forecasting is critical for water system planning. Cascade adopted a forecast model known as a “variable flow factor model”. This model incorporates the best features of various model types found in applicable literature. Like simple “fixed flow factor” models, the Cascade model is easy to understand and has relatively modest data requirements. However, like more complex econometric models, the model reflects the impacts of variables such as price, income, and conservation on water use factors over time. This approach takes advantage of past econometric analysis to provide estimates of how price and income affect demand. A separate end-use model is used to estimate the impacts of plumbing code and appliance efficiency standards on water use factors over time.

A key driver of the forecast is the future growth of households and employment as projected by the Puget Sound Regional Council (PSRC) in its latest “Land Use Vision” forecast released in 2023. For each Cascade Member, the model calculates current levels of water consumption per household or per employee in the single family, multifamily, and non-residential sectors and then projects how those flow factors are expected to change over time due to increased water rates, growth in household income, and efficiency codes and standards for water fixtures and appliances. The forecasts of flow factors are applied to the corresponding forecast of households or employment to obtain sector forecasts, which are summed up along with a forecast of non-revenue water, for each member. Member forecasts are then summed up to obtain the total Cascade forecast of demand. More detail on the methodology is provided in Exhibit D. This demand forecast was developed prior to Member comprehensive plan updates, zoning changes in response to House Bill 1110

(Middle Housing), and any PSRC updates post-2023. Cascade intends to update its demand forecast methodology as part of its future water system planning to incorporate these anticipated updates.

Figure 3.6. Cascade Water Demand Forecast (2023-2045)

Cascade's water demand forecast is presented above in Figure 3.6. Total annual average water demand is projected to remain essentially flat at around 37 MGD through 2030 before beginning a gradual rise to 39.3 MGD by 2045. The combination of supply from SPU and Members' independent supplies will provide about 42 MGD through 2039 and enough to meet Cascade's projected demand. However, once the Block begins to decline (as described in Section 2.1), that will no longer be the case. Under the current Block Contract, Cascade will need an additional source of water to meet demand after 2041.

While Cascade's population and employment are expected to grow 31% over the 20-year forecast period (1.2% per year), its water demand is projected to increase by much less, just 6.5% (0.3% annually) through 2045.[2] This is because most of the factors in the model (with the exception of household income) that influence water use have a dampening effect on demand and are thus expected to offset much of the impact of demographic and economic growth. This is a phenomenon that has already been experienced in the region since the mid-1980s. As discussed earlier in this chapter and shown in Figure 3.7, the combined effects of adopting conservation rate structures, increasing water rates, federal and state plumbing codes and appliance efficiency standards, utility conservation

[2] Note this is in contrast to Cascade Members' forecasts of their own demand. The sum of Member forecasts through 2040 grows at about 1.2% per year, the same as the underlying growth rate in forecast population suggesting most Members use constant flow factor models in their own forecasting. In addition to methodological differences, it is common to observe differences between forecasts developed for regional supply and retail-level demands, as the retail-level forecast necessarily includes more conservatism regarding where growth will occur.

programs, and improved water system operations have resulted in a steady decline in water consumption per capita for the Seattle regional system, dropping from 161 gallons per day per capita (GPDPC) in 1985 to 76 GPDPC in 2020 – more than a 50% decline. Less historical data is available for Cascade's service area, but since the late 1990s, consumption per capita has decreased by one third. The forecast model projects continued decline, though not as steeply as before, from 89 gallons per day (GPD) in 2023 to 73 GPD in 2045.

Figure 3.7. Actual and Forecast Water Consumption Per Capita

Cascade is currently developing new plans for its future water use efficiency program. At this point, the longer-term savings goals of this program have not been determined, and therefore, the demand forecast does not try to account for the possible effects of the program on demand. More generally though, Cascade has long been involved in encouraging even more efficient water fixture and appliance codes and standards, including the more rigorous statewide code that went into effect in 2021. The impact of current and anticipated future efficiency codes and standards is reflected in the forecast of Cascade demand which, by 2045, is 5.1 MGD less than what it would otherwise be.

3.3.1. Dealing with Uncertainty

Forecasting water demand is a speculative endeavor. Displaying the forecast as a line on a graph implies a degree of certainty that does not exist; Cascade's water demand in 2045 will most likely *not* be exactly 39.3 MGD. It is better to think of the forecast as a range of possible values that widens with time. The challenge is to define and quantify the uncertainty and put reasonable bounds around the forecast.

The forecast of water demand itself is based on forecasts of other factors that affect it (growth in income, water prices, households, employment, and the use of more water efficient fixtures and

appliances), all of which are subject to uncertainty. Similarly, uncertainty surrounds the model's assumptions about price and income elasticities. The baseline demand forecast represents Cascade's best guesses about the future. However, it is prudent, especially in long-term planning, to consider the many uncertainties that could cause demand to be different from what is projected in the baseline forecast.

Uncertainty has been modeled by positing probability distributions for each source of uncertainty. These distributions are inputs to an aggregate uncertainty model employing a Monte Carlo simulation[3] to characterize uncertainty associated with the baseline demand forecast.

The results of the Monte Carlo simulation are displayed in Figure 3.8. The bands indicate the range of uncertainty associated with the baseline forecast. Each band represents a percentage increase from the band immediately below it in the probability that actual demand will be equal to or less than the level shown. For example, the bottom of the lowest band represents the first percentile, meaning there is an estimated 1% chance actual demand will be at or below that level (i.e., 33.1 MGD in 2045) and, thus, a 99% chance it will be above. The top of the uppermost band is the 99th percentile, corresponding to an estimated 99% probability that actual demand will be at or below that level (i.e., 44.4 MGD in 2045).

Figure 3.8. Water Demand Forecast with Ranges of Uncertainty (2023-2045)

* Percentiles represent the probability that demand is less than the value shown. Ranges reflect uncertainty in projected household, employment, price and income growth; price and income elasticities; and conservation.

The green line in Figure 3.8 represents the water available to Cascade through the current SPU Block Contract (33.3 MGD) plus Cascade Members' own independent supplies (8.7 to 9.3 MGD). It shows that beginning in 2040, the SPU block will decline by 2.0 MGD a year

[3] A Monte Carlo simulation calculates multiple scenarios of a model by repeatedly sampling values from the probability distributions for the uncertain variables. The data generated from the simulation can be represented as probability distributions or confidence intervals.

through 2042 and then 1.0 MGD each year thereafter. Total water from these sources is expected to drop from 42.4 MGD in 2039 to 33.6 MGD in 2045. The graph reveals that once the SPU block begins ramping down, Cascade's water demand soon surpasses the available supply. Under the baseline demand forecast, this will happen in 2041. Even when taking the full range of demand uncertainty as modeled above into account, additional supply would be needed sometime between 2039 and 2045. This relatively narrow window is due to being in the declining block portion of the SPU Block Contract.

3.4. Future Supplies

As described in Section 3.3, supply under the current SPU Block Contract, in combination with Members' independent supplies, is sufficient to meet demand until about 2041. Without a source of supply to supplement SPU's declining Block Contract, Cascade would need to develop and put the Lake Tapps Reservoir in service by the early 2040s.

3.4.1. Supply Through 2045

Based on SPU's, TPU's, and Everett's current water system plans, water supply in the region should be ample through 2060. Cascade's business model calls for the use of available regional water to bridge demand until the Lake Tapps Reservoir is developed. With an estimated 20-year planning horizon to develop the Lake Tapps Reservoir, in July 2021, Cascade's Board directed staff to pursue potential supply contracts with SPU and TPU. The objectives of the contract discussions were as follows:

1. 20-year (or longer) extension of contract supply.
2. Extension sufficient to defer development of the Lake Tapps Reservoir.
3. Reasonable and predictable costs.
4. Net economic and/or rate benefit versus developing Lake Tapps Reservoir.
5. Flexibility to allow for future variation in supply and demand.
6. Possible further extensions if mutually beneficial given supply/demand status.
7. Possible partnership opportunities for assets of regional significance.

In May 2024, after nearly three years of discussions with both SPU and TPU, Cascade's Board directed staff to develop a new supply contract with TPU. SPU and TPU both proposed contract terms that would allow Cascade to cost-effectively defer development of the Lake Tapps Reservoir. However, TPU's proposal offered longer supply certainty, greater financial benefit, and an opportunity to move towards a regionalized water system.

In March 2025, Cascade and TPU finalized and signed two separate and complementary agreements – the Agreement for Market-Priced Wholesale Water Supply (2025 Market-Priced Agreement) and the Wholesale Water Supply Agreement (2025 Wholesale Agreement). Cascade plans to phase into TPU's delivery, starting around 2041, as supply from SPU's Block Contract declines and demand begins to exceed SPU's contractual supply.

The following are key supply terms in each agreement:

- 2025 Market-Priced Agreement (temporary supply)
  - Restates and replaces the 2012 TPU Agreement that provides up to eight (8) MGD of water.
  - Provides water supply from 2041 through 2062 and may be extended upon mutual agreement.
  - Provides up to 12 MGD annual average and 17.5 MGD peak day water supply.

- 2025 Wholesale Agreement (permanent supply)
  - Commences on the agreement signature date and remains in effect until TPU ceases making wholesale water sales.
  - Provides up to 15 MGD peak day water supply.

Cascade is responsible for constructing the facilities necessary to connect Cascade's system with the TPU system. More information on the capital planning activities Cascade will embark upon in the next few years is provided in Chapter 5, Section 5.3.

In addition to the existing supply from SPU and new supply from TPU, Cascade will continue to rely on Members' independent supplies to meet future demand. Independent supply yields are expected to remain between 8.7 to 9.3 MGD. Figure 3.9 shows the combined sources of supply and forecasted demand through 2045. Although the figure shows TPU supply available in 2026, Cascade plans to phase into TPU's delivery starting in 2041, as supply from SPU's Block Contract gradually declines below what is needed to meet Cascade's demand. By 2060, Cascade will receive 24 MGD on average from TPU. After 2062, Cascade will receive up to 15 MGD peak day from TPU.

Figure 3.9. Cascade Water Demand and Supply Forecast (2023-2045)

3.4.2. Supply After 2045

As described in Chapter 2, as part of the WRLTR Project, Cascade acquired the Lake Tapps Reservoir in 2009 for future use as a municipal water supply. Water rights originally issued in December 2010 authorize Cascade to produce 48.5 MGD as an annual average for municipal supply deliveries. This water right augments Cascade's supplies to meet its Members' long-range supply needs and also provides the opportunity to improve reliability of water supplies for the Central Puget Sound region, particularly in the context of climate change concerns.

Water from the Lake Tapps Reservoir is not currently used for drinking water supply. With the two new supply agreements in place with TPU, Cascade anticipates needing the Lake Tapps Reservoir to be in service by the early 2060s. Figure 3.10 illustrates long-term demand and supply projections.

Figure 3.10. Cascade Water Demand and Supply Forecast (Through 2099)

Note: The long-term demand forecast is an extrapolation from the 2045 forecast.

When the time comes to develop the reservoir for drinking water supply, Cascade plans to develop the necessary water treatment and delivery infrastructure in phases over time. The first phase will include construction of a water transmission line and partial development of water treatment capacity. Beginning with commencement of water diversions to the water transmission line, Cascade will install an approved measuring device and record and report consistent with condition 15 in the Lake Tapps Reservoir water rights permits. Additional water treatment capacity, if needed, will then be developed at a later phase. However, the ultimate phasing of the Lake Tapps Reservoir project will be determined by Cascade's needs, driven by actual growth in demand as well as any increases in other supplies over time.

Cascade will seek opportunities to defer construction of both phases of the Lake Tapps Reservoir to spread the costs of infrastructure development over a longer time. For example, there may be opportunities to contract for additional supplies from SPU and TPU in the future.

Additionally, Cascade will continue to explore measures to reduce peak season demand, which may extend the timeframe for the Lake Tapps Reservoir development. These supply opportunities, a lower growth in demand, or a combination of these factors, could delay the need for the Lake Tapps Reservoir project well beyond the 2060s.

3.5. Reclaimed Water

King County's Brightwater Treatment Plant near Woodinville and South Treatment Plant in Renton produce reclaimed water that could be delivered to customers in Cascade's Member service areas if regional and local transmission and other associated infrastructure are available or could be developed. Potential end users within the area include parks, golf courses, and commercial sites with large, irrigated landscapes[4]. Currently, King County delivers reclaimed water to Tukwila from its South Treatment Plant for use at sport fields.

Opportunities from the Brightwater and South Treatment Plants face obstacles, primarily the cost of installing distribution mains to decentralized customers. These mains are often redundant in that they duplicate the function of water lines that deliver potable water to these same customers. Since reclaimed water can be used only for limited purposes, and since the primary use is irrigation that occurs only during the summer months, it is more costly on a per-unit basis to deliver reclaimed water than potable water. Any distribution of reclaimed water within the Member service area will need to be coordinated to ensure water quality, efficient system operation, and financial sustainability and affordability for all water customers.

To develop an approach to coordinate the distribution and use of reclaimed water in Cascade Members' service areas, Cascade and King County entered into an Agreement to Coordinate Reclaimed Water in January 2019. In July 2025, this agreement was replaced by the Amended and Restated Agreement to Coordinate Reclaimed Water between Cascade and King County. This amended agreement recognizes that King County has a current initiative to update its Regional Wastewater Services Plan (RWSP), including reclaimed water policies. This effort will likely take several years. The King County Regional Water Quality Committee is currently working on how to approach policy changes in the RWSP, with many Cascade Members actively engaged in that forum. The amended agreement commits King County to coordinate and collaborate with Cascade in the update to the reclaimed water policies.

3.6. Snoqualmie Aquifer Project

On October 8, 2025, Ecology approved the transfer of interests in two Snoqualmie Aquifer Project (SAP) water right applications from the East King County Regional Water Association (EKCRWA) to Cascade. The transfer of interests from EKCRWA to Cascade results in Cascade and SPU becoming co-applicants on the water right applications.

The SAP is a water supply project that would take groundwater from the aquifer near North Bend to supplement Snoqualmie River flows in the summer. The water would then be withdrawn

[4] Many large irrigation users in the region have their own independent water sources (e.g., wells or rights to withdraw water from the Sammamish River), so delivering reclaimed water to those users would not reduce demand for potable water from the Cascade system.

north of Carnation, treated at a new treatment facility, and connected to regional water transmission facilities. It was estimated to yield about 16 MGD total. The water right applications were originally developed in the 1990's, but the applications were never developed any further. EKCRWA is dissolving as a regional water association.

In 2019, Ecology began reviewing its backlog of water right applications and expressed its interest in some action on the applications or for the applicants to withdraw the applications. SPU has included the SAP in its list of projects to study in its current Future Water Supplies Alternatives Study. SPU is estimating the completion of this study by the end of 2026, and Cascade and SPU have begun preliminary discussions on whether and how to pursue SAP feasibility, including negotiation of an interlocal agreement to guide joint efforts on the SAP applications.

Chapter 4. Water Efficiency Program

Water efficiency is a critical part of Cascade's water management strategy. As noted earlier, Cascade makes the best use of existing water supplies before developing expensive, new sources of supply. Water efficiency helps ensure a safe, reliable supply of drinking water to support Cascade Members' quality of life and economies. This chapter provides information on Cascade's Water Efficiency Program goals, savings, and highlights.

4.1. Program Goal and Savings

Cascade's water efficiency goal is 500,000 GPD saved from 2020 to 2029. Cascade's Water Efficiency Program has yielded the following results from 2020 to 2024.

Table 4.1. Water Efficiency Annual Savings

Year	Savings (GPD)
2020	48,316
2021	37,092
2022	11,553
2023	21,466
2024	80,404
Total	**198,811**
% of Savings Goal	**40%**

4.2. Program Highlights

Cascade's Water Efficiency Program benefits thousands of Member residents, students, businesses, schools, agencies, parks, and more by providing training, education, support, and hardware. The following are highlights of the program.

- **Cascade Gardener:** Cascade offers free classes and other resources to help homeowners manage their landscapes for greater water efficiency and sustainability. Cascade offers several online classes each year on a wide range of landscaping, irrigation, and gardening topics, all with a theme of water conservation integrated into the presentation. Cascade also provides walking tours at demonstration gardens and in-person classes at local nurseries. Cascade's website offers many documents and videos on sustainable landscaping, irrigation efficiency, and other gardening topics to help residents have beautiful landscapes while saving water.

- **Problem-Based Learning for Water Systems:** Cascade partners with the Sustainability Ambassadors to provide in-depth learning opportunities into the study of water for teachers and students. This program offers teacher training labs, curriculum design support, student-impact projects, video resources, and more. The program has been acknowledged by all four school districts within Cascade's service area for its effectiveness. The program reaches 5,000-6,000 students and teachers per year.

- **Classroom Water Education:** Cascade provides classroom water education for grades K-12 through its partner, Nature Vision, on a variety of topics including the global water crisis, salmon cycles, watershed ecology, water conservation, and soil science. Some teachers utilize the Blue Team option, where an educator works with the classroom over a period of weeks on more in-depth projects, such as stream monitoring or watershed restoration. The program reaches 11,000–12,000 students and teachers per year.

- **Northwest Flower and Garden Festival:** Cascade is the prime sponsor of "The Container Showdown" at the annual Northwest Flower and Garden Festival in Seattle. Cascade also has a station at the event. The festival is the largest of its kind in the nation, and Cascade promotes water efficiency and natural yard care to thousands of people.

- **Rebates:** Cascade partners with PSE on rebates and direct installation of selected fixtures and appliances like clothes washers, showerheads, shower valves, and tub spout diverters. These installations provide long-term, reliable savings for Cascade.

- **Turf Out:** In 2025, Cascade launched a turf removal program called "Turf Out", which encourages residents to remove a portion of their irrigated turfgrass and replace it with native or drought-tolerant plants. Cascade provides numerous resources to help residents accomplish this task, including online classes, workshops, written materials, and videos.

- **We Need Water:** Cascade's social media campaign is called "We Need Water", and it resides on Cascade's website, YouTube channel, Instagram, and Facebook. Cascade offers a gardening newsletter, landscape and gardening classes, water conservation tips, information on upcoming events, and more. Cascade has worked with many partners and Members to align its social media strategy for the benefit of all parties. In 2024, Cascade engaged with approximately 650,000 people through its social media platforms.

- **Soil and Water Stewardship:** Cascade co-created and partners with Tilth Alliance to deliver the Soil and Water Stewardship program, which provides free training for residents on urban food growing, sustainable landscaping practices, rainwater harvesting, drip irrigation, and other water-related topics. Residents who go through the program become stewards for water efficiency and sustainable landscaping in their communities. The program currently impacts hundreds of residents per year.

- **Home Water Audit:** The Cascade Home Water Audit is designed for students to explore water use in the home and learn how to conserve. The tool developed by Cascade allows water savings to be converted to energy savings and avoided greenhouse gas emissions to show how water is related to climate change.

- **Free Conservation Items:** Cascade offers free conservation items, like showerheads, toilet leak detection dye, and rain gauges on its website for customers of Member agencies.

- **Irrigation System Assessments:** Cascade provides free assessments and reports for irrigation systems at commercial, multifamily, and institutional properties. The assessment is a deep dive into each zone of the irrigation system and documents the location of irrigation hardware and any problems found. Cascade often works with the accounts for an extended time to help the customer implement the recommendations in the report.

- **Community Events:** Cascade participates in community events throughout its Member service areas. Cascade has a station at these events where it educates community members about water conservation, distributes water conservation devices, and answers questions about water supply. Cascade engages with thousands of residents each year at community events.

4.3. 2025 Water Use Efficiency Goal Meeting

Cascade most recently held a public meeting on its water use efficiency goal on November 3, 2025 at its office (11400 SE 8th Street, Suite 400, Bellevue, WA 98004). Cascade sought the public's input on setting a goal of 500,000 GDP for the period 2020-2029. Exhibit G includes the notices that were posted on Cascade's website and DOH's WUE Goal Setting Public Forum Information website as well as the meeting agenda and minutes.

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Chapter 5. Capital Planning

This chapter presents the capital planning and improvements necessary to meet the system needs identified in previous chapters. Cascade adopts a six-year Capital Improvement Program (CIP) as part of its biennial budget process and develops forecasted capital needs through this Water System Plan's planning period (current to 2045). These capital needs consist of: 1) maintaining the existing WRLTR Project; 2) maintaining the BIP; and 3) planning for and constructing the facilities to connect to TPU's system.

5.1. White River-Lake Tapps Reservoir

The purpose of the WRLTR Project's forecasted capital needs is to maintain infrastructure integrity and functionality for current operations and for future use as a drinking water source. The primary objectives are to:

- Protect existing assets from failure.
- Ensure the highest value to Cascade Members through safe and efficient management of existing infrastructure.
- Meet all regulatory requirements and operating agreements.

Cascade's systematic approach to the WRLTR Project's forecasted capital needs first requires a good understanding of the condition of the century-old infrastructure and subcomponents that were originally designed and operated for the purpose of hydroelectric power production (not drinking water production). It then calls for evaluating the trade-offs between repair, rehabilitation, and replacement options for each project. Next, it requires developing a plan of action, developing a list of projects grouped by implementation timelines, obtaining funding, receiving Board approval, and implementing the approved portfolio of projects.

A preliminary list of potential WRLTR planning activities and capital projects through 2045 includes the following (not prioritized):

- **Backflow Preventer Improvements:** Rehabilitate and repair the Backflow Preventer.

- **Communications Improvements**: Replace, expand, or make other improvements to the fiber network that links several major facilities at the WRLTR Project.

- **Dike 9 and Dike 10 Seismic Upgrades:** Install new structural reinforcements to improve seismic stability and reduce seepage at Dike 9 and Dike 10.

- **Dike Improvements – Other:** Make miscellaneous improvements regarding dike seepage and structural integrity on all dikes impounding the reservoir and in the upper flowline.

- **Facilities Master Plan**: Develop a Facilities Master Plan that comprehensively addresses short-, medium-, and long-term facility needs, including optimization of existing facilities.

- **Fish Screen Facility Improvements:** Rehabilitate or replace the mechanical cleaning systems.

- **Forebay Improvements:** Replace the existing roof, decking, and mechanical and electrical controls at the forebay, and rehabilitate the valves.

- **Headworks Facilities Improvements**: Implement the Facilities Master Plan for the headworks area.

- **Headworks Intake Miscellaneous Improvements:** Provide improvements based on operational necessity after completion of the Phase 3 Headworks Intake Modifications Project.

- **Lake Tapps Reservoir Dike Instrumentation Improvements:** Replace piezometers, flow weirs, and slope stability monitoring equipment.

- **Penstock Improvements:** Perform a feasibility study on methods to control flow or make internal improvements that are conducive to dry and wet cycles; rehabilitate internal coating and external protection of penstocks.

- **Powerhouse Seismic Upgrades:** Perform a seismic analysis to evaluate risks during a seismic event and implement the recommendations.

- **Powerhouse Site Improvements:** Evaluate and make necessary improvements to the plunge pool, parking areas, tailrace retaining wall, and operations center facilities.

- **Powerhouse Valve Improvements:** Replace the existing valve No. 1 with a new flow control and energy dissipation valve.

- **SCADA and Security Upgrades**: Upgrade end-of-life equipment and software to meet future standards.

- **Standpipes Seismic Upgrades:** Perform a corrosion and seismic analysis to evaluate risks during a seismic event and implement the recommendations.

- **Tunnel Intake Improvements:** Replace the existing gate house structure, tunnel intake gate valve, and control systems.

- **Valve House Improvements**: Rehabilitate or replace the existing 66-inch cone valve.

In mid-2025, Cascade completed an evaluation of the potential impacts of climate change on the WRLTR system. The evaluation focused on providing improved projections of changes in streamflow for the White River and the potential impacts on the reservoir's firm yield of 96% reliability. As noted earlier, Water Right Permit S2-29920(A) authorizes diversion of

54,300 acre-feet per year (equivalent to an annual average of 48.5 MGD for public water supply from the White River into the Lake Tapps Reservoir).

Cascade's consultant modeled 20 statistically downscaled climate change scenarios to project their potential impact on water supply reliability, expressed as firm yield. They also modeled five groups of adaptation strategies to evaluate their ability to offset the impacts of climate change on firm yield. The modeling found that the combination of several long-term adaptations could markedly improve water supply reliability. Cascade plans to update its climate modeling for inclusion in its next water system plan.

With the exception of climate change impacts on future firm yield, Cascade has not evaluated the impacts climate change may have on other parts of the WRLTR system. Future studies will assess which extreme weather events are likely to pose challenges to Cascade's other critical assets.

5.2. Bellevue-Issaquah Pipeline (BIP)

Cascade's adopted 2025-2030 CIP includes two capital projects:

- **Meter Replacement:** Cascade is responsible for the cost of replacement of existing meters on the BIP.
- **Lewis Creek Crossing – BIP Relocation:** Washington State Department of Transportation's Lewis Creek culvert replacement project will require relocation of the BIP.

Beyond 2030, Cascade expects the BIP will need new valves and seismic upgrades to pipe segment joints. In 2020, Cascade completed a Risk and Resiliency Assessment (RRA) of the BIP as part of the America's Water Infrastructure Act (AWIA). The RRA determined the costs of mitigation measures to address potential threats to the BIP, such as seismic events, outweigh the benefits. Given this, Cascade plans to make improvements when repairs are needed.

Cascade has not evaluated the impacts climate change may have on the BIP. Extreme events that lead to flooding, landslides, sink holes, and/or power outages could impact the operation and integrity of the BIP. Cascade will collaborate with Member agencies to evaluate these and other scenarios prior to submittal of Cascade's next Water System Plan.

5.3. Cascade Supply Program (CSP)

As described in Section 3.4.1, Cascade and TPU recently executed two new supply agreements. Cascade's 2012 Transmission Supply Plan considered the new facilities that would be required to deliver TPU-provided water to Cascade Members using a new pipeline known as the Tacoma-Cascade Pipeline (TCP). The TCP Program has been re-envisioned, and the conveyance required to deliver TPU water to Cascade Members is now called the Cascade Supply Program (CSP). This transmission line and associated infrastructure is Phase I of the CSP. Cascade will be responsible for planning and constructing the final alignment of the Tacoma Cascade Transmission Line (TCTL) by 2041. Phase II of the CSP will comprise

additional distribution to Member agencies; planning will not begin until the late 2030's. Phase III of the CSP will include transmission from the Lake Tapps Reservoir once a water treatment plant (WTP) is operational.

The CSP will involve constructing a transmission pipeline, regional distribution pipelines, and associated facilities. At this early planning stage, the following program elements are anticipated: a transmission line connecting to TPU's Second Supply Line (Pipeline No. 5) to the south and a new storage tank and/or the existing BIP to the north, a chlorination facility, booster pump station(s), storage facility(s), and connections (Figure 5.1).

Cascade has hired key staff for the CSP program who will work with the consulting community to plan, design, and manage the CSP program and support environmental review, permitting, and property acquisition. Starting in 2025, Cascade plans to secure the following services either as stand-alone contracts or a combination of contracts:

- Program and engineering support services to provide strategic and tactical programs and engineering support services to Cascade through the duration of the project. This includes development of a Project Execution Plan, a Project Procurement Plan, and other documents as required.

- Development of a CSP Project Report (or Project Scope Statement) that will form the basis and requirements for the CSP project design.

- Development of an Operations and Flow Allocation Plan that identifies the amount of water and methods of transfer from the CSP to Cascade Members' distribution systems. This plan will form the basis for system requirements and the development of the Project Report.

- Franchise and right-of-way support services to evaluate potential permanent and temporary real property needs and alternatives and (following design and environmental and permitting review) assist in acquiring all real property rights that are needed for the program.

The CSP Project Report relies on a number of studies and investigations including a Pipeline Materials Evaluation, Operations and Flow Allocation Plan, Tank Site and Hydraulics Evaluation, and an Environmental Impact Statement, which will take some time to develop or obtain. Cascade anticipates submitting its 10-year Water System Plan to DOH, on or before September 30, 2029. The alternatives for sizing and routing transmission facilities and other key recommendations from the CSP Project Report will be incorporated into Cascade's next Water System Plan.

Design, environmental, and permitting services for the TCTL and associated facilities and connections will commence upon completion of the CSP Project Report. Construction is anticipated to start as early as 2033 and continue until 2041. A high-level map of the CSP, with potential route corridors, is shown in Figure 5.1.

Figure 5.1. Map of Potential Future Water Supply System (Subject to Change)

Note: The western "Future Transmission Pipeline and Pump Station" alignment is included in this Figure because it was an alignment option in Cascade's 2012 Transmission and Supply Plan

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Chapter 6. Financial Programs

The purpose of the financial program is to demonstrate the financial viability of Cascade throughout the planning horizon, including the delivery of the forecasted capital needs identified in this plan. The analysis of viability considers historical performance, the sufficiency of revenues to meet current and future cost and policy obligations, and the cost of delivering the forecasted capital needs. Additionally, this chapter provides a review of Cascade's current rate structure with respect to rate adequacy, equity, promotion of water conservation, and overall rate affordability.

General principles, listed below, guide this Chapter and provide the basis for this analysis.

- **Adherence to Fiscal Policies**: Cascade has a set of specific rules and procedures that guide its financial management. It periodically reviews and refines these policies to maintain a viable financial program responsive to Members' needs.

- **Conservative Analysis**: This analysis contains various assumptions regarding customer growth, capital costs, operating costs, cost escalation, and a number of other factors. The projections in this analysis aim to be financially conservative to facilitate sensible financial planning. While conservatism in planning is achieved by planning for substantial growth in demands, financial conservatism is achieved by planning for low growth and primary reliance on existing sources of revenue.

6.1 Recent Financial Performance and Condition

Cascade's overall financial position is strong, with sufficient liquidity to finance operations and sufficient debt capacity to finance future capital asset acquisitions. Cascade is financed by equity and long-term debt.

Cascade's Statement of Operating Revenue and Expenses and Changes in Net Assets is presented in Table 6.1, for the period from 2019 to 2023. Currently, Cascade has two primary groups of operating expenses:

- **Cost of Water Sold**: As discussed in Chapter 2, Cascade purchases water from SPU under a 2013 Agreement for water supply. This Block Contract has relatively limited variability due to the block nature of the agreement. Year-to-year variation in expenses is a function of SPU's actual costs but is attenuated by the utility-basis rate structure of the agreement.

- **Other Operating Costs**: Other expenses include Cascade's administration, conservation program, communications and intergovernmental affairs, and operating costs associated with the Lake Tapps Reservoir.

Cascade serves Member agencies on a wholesale basis. As such, its revenues are not directly made up of retail service rates. Cascade charges to Members reflect the fixed nature of much of

Cascade's costs, whether currently under block supply contracts or as anticipated with debt service related to financing the capital program. As a means of mitigating financial risk and providing predictability and stability to its Members, Cascade's rate structure is primarily fixed in nature. Member agencies pay for wholesale supply and transmission through a common structure of charges based primarily on their growth and historical demand.

- **Water Sales or Demand Shares**: Water sales are based on each Member's share of overall peak season demand, on a rolling three-year basis, referred to as demand shares. All operating revenue requirements that are not recovered by administrative dues or conservation charges are recovered through demand shares.

- **Administrative Dues**: Cascade's administrative costs are allocated to Members based on their overall potential demand, as measured by CERUs. The amount generated from this charge in any given year is limited by contract to 9% of total revenues.

- **Conservation Charges**: This charge recovers the costs associated with administering Cascade's conservation program. Like administrative dues, the conservation charge is based on an allocation of costs to Members on a CERU basis.

- **Regional Capital Facility Charges, or RCFCs**: RCFCs are a non-operating revenue, shown as capital contributions on Table 6.1. This charge is imposed as a one-time charge to Members for new connections in their systems. As a growth-based charge, this is the most volatile revenue source for Cascade.

Cascade's rates are discussed in more detail in Section 6.3.

Key findings from the historical financial performance of Cascade include:

- Operating revenue has increased smoothly over the past five years, consistent with Cascade's adopted policies regarding rate stability.

- Operating expenses have been similarly stable, with variability in the cost of water sold falling within anticipated ranges.

- Capital expenditures have been similarly stable over the five-year period.

- Overall, Cascade's financial performance has been consistently positive.

Table 6.1. Statement of Revenue and Expenses and Changes in Net Assets

	2023	*2022*	*2021*	*2020*	*2019*
Water sales	$ 40,045,925	$ 39,192,467	$ 38,603,204	$ 37,567,001	$ 36,412,424
Administrative dues	3,776,170	3,741,337	3,382,456	3,339,859	3,286,899
Conservation program	793,621	744,873	737,121	829,230	821,152
Total Operating Revenue	**44,615,716**	**43,678,677**	**42,722,781**	**41,736,090**	**40,520,475**
Cost of water sold	23,969,284	20,383,649	21,351,878	22,920,840	24,087,405
Other operating costs	13,875,410	12,396,041	12,761,649	12,756,852	12,605,692
Total Operating Expenses	**37,844,694**	**32,779,690**	**34,113,527**	**35,677,692**	**36,693,097**
Operating Income (Loss)	**6,771,022**	**10,898,987**	**8,609,254**	**6,058,398**	**3,827,378**
Nonoperating expenses	(328,913)	(3,911,194)	(3,714,865)	(2,292,108)	(3,467,561)
Capital (expenses) contributions	7,930,410	7,797,757	9,597,571	6,613,609	5,870,640
Change in Net Assets	**14,372,519**	**14,785,550**	**14,491,960**	**10,379,899**	**6,230,457**
Net assets, beginning of year	137,102,621	122,317,071	107,825,111	97,445,212	91,214,755
Net Assets, End of Year	**$ 151,475,140**	**$ 137,102,621**	**$ 122,317,071**	**$ 107,825,111**	**$ 97,445,212**

Cascade's balance sheet for the same five-year period from 2019 to 2023 is presented in Table 6.2. Current assets increased in 2023 compared to 2022, with the majority attributed to an increase in cash and cash equivalents. Net capital assets decreased with the increase in capital projects, offset by the amortization of water contracts. Long-term liabilities decreased in 2023 due to payments to TPU and bond principal. Investments in capital assets net of related debt increased as capital projects increased and related debt decreased. Unrestricted net assets, which consist of accumulated assets that do not meet the definition of investments in capital assets, net of related debt or restricted assets increased in 2023 as overall net position increased.

Table 6.2. Balance Sheet

	2023	*2022*	*2021*	*2020*	*2019*
Current assets	$ 36,936,453	$ 31,416,719	$ 26,865,253	$ 24,384,221	$ 22,321,130
Net capital assets	238,812,750	241,757,370	245,114,710	249,412,616	254,170,546
Other assets	28,513,256	27,830,735	30,043,422	26,816,579	28,954,842
Total Assets	**$ 304,262,459**	**$ 301,004,824**	**$ 302,023,385**	**$ 300,613,416**	**$ 305,446,518**
Deferred Outflows of Resources	**1,248,830**	**1,472,889**	**1,699,259**	**2,032,711**	**1,441,330**
Current liabilities	$ 22,008,075	$ 15,033,685	$ 17,124,891	$ 16,559,207	$ 16,835,945
Long-term liabilities	131,999,738	150,300,477	164,227,158	178,261,809	192,606,691
Total Liabilities	**154,007,813**	**165,334,162**	**181,352,049**	**194,821,016**	**209,442,636**
Deferred Inflows of Resources	**28,336**	**40,930**	**53,524**	**-**	**-**
Invested in capital assets, net of related debt	91,065,434	84,940,155	74,892,575	66,614,167	62,145,537
Restricted for-					
Debt service	12,414,284	12,232,965	13,007,070	13,381,158	15,514,470
Unrestricted	47,995,422	39,929,501	34,417,426	27,829,786	19,785,205
Total Net Position	**151,475,140**	**137,102,621**	**122,317,071**	**107,825,111**	**97,445,212**

Table 6.3 summarizes year-end fund balances held by Cascade for each of the last five fiscal years, 2019 through 2023. Cascade currently meets or exceeds all internal policy standards (e.g., working capital) and external requirements (e.g., bond covenants) for fund balances.

Table 6.3. Fund Balances	**2023**	**2022**	**2021**	**2020**	**2019**
Operating	$ 14,083,315	$ 10,945,348	$ 6,526,910	$ 11,776,193	$ 11,393,586
Construction	18,045,531	17,213,500	17,282,365	12,688,824	11,933,742
Regional Capital Facilities Charges	0	0	291	1,986	8,224
Bond	12,830,923	12,764,742	12,698,069	12,684,681	15,474,281
Rate Stabilization	2,280,573	2,156,574	2,135,768	2,120,981	2,089,597
Water Supply Development Fund	10,882,594	8,088,013	5,000,000	0	0
	$58,122,937	**$51,168,176**	**$43,643,402**	**$39,272,664**	**$40,899,429**

*The Water Supply Development Fund was established in 2021, and the Regional Capital Facilities Charges fund was eliminated.

6.2 Financial Outlook and Capital Funding

Cascade's long-term financial forecast is developed based on its historical financial performance, guided by adopted fiscal policies, and considering known and anticipated future expenses, including the capital needs discussed in Chapter 5.

6.2.1 Fiscal Policies

Cascade's fiscal policies provide the foundation and assurance of Cascade's long-term financial viability. The key fiscal policies that guide development of Cascade's financial forecast are discussed below. Complete fiscal policies are adopted in the Cascade Code. Generally, the fiscal policies promote:

- Financial integrity and stability
- Rate equity
- Efficiency and conservation

Minimum Fund Balances

Utility reserves serve multiple functions; they can be used to address variability and timing of expenditures and receipts; occasional disruptions in activities, costs, or revenues; utility debt obligations; and many other functions. The collective use of individual reserves helps to limit Cascade's exposure to revenue shortfalls, meet long-term capital obligations, and reduce the potential for bond coverage defaults.

Cascade's policies set different target balances by fund, based on the potential risk each reserve is intended to address. These are summarized in Table 6.4 below.

Table 6.4. Summary of Fund Target Balance Policies

Fund	Target Balance
Operating Fund	50 days of budgeted annual operating expense
Rate Stabilization Fund	5% of operating revenues
Construction Fund	Adequate to meet ongoing construction projects and obligations
Bond Reserve Account	Maximum annual debt service
Bond Debt Service Account	Accrued principal and interest on outstanding bonds
Water Supply Development Fund	Based on planned accrual of funds to meet equity-funding requirement of Cascade Supply Program

Financial Planning

Cascade's fiscal policies have been developed with anticipation of the major investment needed to develop a new water supply source, as discussed in the preceding Chapters. The key provisions to ensure stable, reliable, and flexible capital funding are summarized in Table 6.5.

Table 6.5. Summary of Key Financial Planning Policies

Policy	Description
Limits on Use of Debt	Total debt shall not exceed 80% of net book value
Debt Service Coverage	Maintain coverage no less than 1.25 times total annual debt service
Rate Smoothing	Smooth rate adjustments over at least a five-year period
Recover Growth Costs from Growth	Establish regional capital facilities charges
Operating Costs	Estimated new operating costs of planned improvements must be considered

6.2.2 Operating Forecast

Consistent with its fiscal policies, Cascade biennially updates its 10-year rate forecast as part of its budget process. Additionally, Cascade prepares a longer-term financial forecast at least once every 10 years. Cascade's financial and rate forecast is informed by:

- Existing operating revenue and expenses, as discussed in Section 6.1.
- The structure of Cascade's water supply contracts with SPU and TPU.
- Demand forecasts as discussed in Chapter 3.
- Capital needs as outlined in Chapter 5, including estimated associated operating costs.
- Cascade fiscal policies discussed in Section 6.2.1.

Key assumptions used to develop the financial forecast of expenses and revenues include:

- Long-term general inflation of 3.0% per year.
- Long-term water supply contract cost escalation of 3.0% per year, for both Seattle and Tacoma purchased water.
- Long-term construction cost escalation of 3.5% per year.
- Growth in net CERUs of 1,150 per year.
- Revenue bond financing at a long-term average of 4.5%.

Cascade maintains a number of separate funds consistent with its fiscal policies to achieve consistent financial management outcomes. The Operating Fund is the primary fund for operational revenues and expenditures, as well as transfers to and from other funds in support of their purposes, including current and planned capital expenditure and debt service. The Operating Fund financial forecast for the planning period is summarized in Figure 6.1. In addition to the assumptions mentioned above, this chart reflects new operating expenditures associated with new facilities, transfers associated with both direct cash-funding and debt service payments, and the rate increases to Cascade Member charges necessary to meet annual revenue requirements and fiscal policies.

As shown in Figure 6.1, Cascade's operating expenditures are forecasted to remain stable over the planning period. Transfers from the Operating Fund for construction and debt service are anticipated to increase significantly during the planning period, in support of the facilities discussed in Chapter 5.

The annual operating revenue increases shown in Figure 6.1 include the increases necessary to ensure revenue sufficiency for meeting operating expenses and maintaining operating fund minimums, as well as annual transfers in support of construction, debt service, and other fund targets.

Figure 6.1. Operating Fund Forecast, with Inflation

6.2.3 Capital Forecast

As discussed in Section 5.3, Cascade forecasts significant new capital facilities during the planning period. These forecasted capital needs, including forecasted construction cost inflation, are summarized in Figure 6.2.

Figure 6.2. Forecasted Capital Needs, by Year, with Inflation

These capital needs will be met through a variety of sources of funds, including existing funding streams and potential future funding opportunities. For purposes of developing a balanced and conservative financial forecast, Cascade has developed a capital forecast that relies only on known available funding sources, rather than including potentially lower cost but unsecured sources such as federal or state grant and loan programs. Those unsecured funding sources are excluded only for purposes of conservatism in forecasting, and Cascade intends to pursue potential capital funding opportunities which could contribute to lowering the cost to its Members. Sources of capital funding included in this forecast include:

- RCFCs
- Member Charges
- Interest earnings
- Use of the Water System Development Fund
- Revenue bond proceeds

As part of its fiscal policies, Cascade will develop a Project Funding Plan specific to the CSP which will further refine the plan for the above funding sources, as well as for potential federal or state grant and loan programs.

The forecasted breakdown of sources of capital funds is shown in Figure 6.3. The forecasted sources of funds by year are presented in Exhibit E. Debt service on new debt proceeds will be paid for by Member charges and use of RCFC revenues. Consistent with its fiscal policies, Cascade's financial forecast plans to avoid an accumulation of debt that exceeds 80%.

Figure 6.3. Forecasted Sources of Capital Funds, 2025-2045

6.3 Cascade Rate and Charge Structure

Cascade serves Member agencies on a wholesale basis. As such, its rates and charges do not include retail rates. Cascade's charges to Members reflect the fixed nature of much of Cascade's costs, whether currently under block supply contracts or as anticipated with debt service related to financing of the capital program. As a means of mitigating financial risk, Cascade's rate structure is primarily fixed in nature. Member agencies pay for wholesale supply and transmission through a common structure of charges based primarily on their growth (CERUs) and historical demand (demand shares).

Cascade Equivalent Residential Units (CERUs). The CERU was established as a means of standardizing Cascade's Member base, given potential variations in the way each Member defines an equivalent residential unit (ERU). Each Member's CERU count is based on the number of retail connections it serves and the size of those connections. Industry-accepted meter flow factors provide the basis for the CERU conversion.

The CERU methodology currently uses the following basis for estimation:

Table 6.6. CERU Conversion Factors

Meter Size	Flow Rate	CERUs
5/8 x 3/4 and 3/4 inch	20 GPM	1.0
1 inch	50 GPM	2.5
1.5 inch	100 GPM	5.0
2 inch	160 GPM	8.0
3 inch	320 GPM	16.0
4 inch	500 GPM	25.0
6 inch	1,000 GPM	50.0
8 inch	1,600 GPM	80.0

For commercial or industrial meters sized four inches or larger, Cascade reserves the right to determine CERUs based on specific water demands and requirements.

Fire sprinkler and deduct meters are not counted as CERUs, and no RCFC is imposed since these meters do not increase system demand.

Demand Shares. While the CERU provides a means of estimating average capacity requirements, it does not address levels of actual usage of regional water by each Member or variations of usage patterns among Members. Cascade uses a three-year rolling history of regional demand to define demand shares as a basis for Member charges, with adjustments to this history for special cases as defined by the Cascade Board. A Member's demand share is established as the greater of:

- Average daily demand (in MGD) from Cascade during the peak season, defined as June through September; or

- Average daily demand (in MGD) from Cascade for the entire calendar year; or

- An amount determined by the Cascade Board to address special circumstances such as those involving new Members or Members relying on Cascade investments in system facilities to extend or expand service.

Cascade collects revenue from Members through four separate charges. These include:

- **Administrative Dues** are based on budgeted administrative costs for 2025 and 2026 and actual CERU counts as of January 1 of the previous year. For 2025, actual CERU counts are based on data reported by Members for year-end 2023. For 2026, estimated CERU counts add assumed Member CERU growth for 2024. These are based on the Cascade estimate of CERU total growth of 1,150 CERUs budgeted for 2024. This growth of 1,150 CERUs is then subjectively allocated to Members based on recent growth experience. The administrative dues are expressed in terms of a charge per CERU. Members pay administrative dues based on the number of CERUs they serve. The contractual limit on administrative dues is 9% of total revenue requirements. For 2025, the charge is constrained by this limit while for 2026, the charge falls below this limit at 8.97%.

- **Conservation Charges** are also based on CERU counts for the two budget years. The 2025 and 2026 conservation charges reflect the budgeted conservation program for each year.

- **Demand Share Charges** are based on a rolling three-year demand history. Demand Share charges account for the majority (roughly 85% to 90%) of Cascade's rate revenue and are solely based on actual historical data. For 2025, this is based on actual histories for 2021-2023. For 2026, the average incorporates estimated 2024 Member demands. These estimates are based on the most recent three-year average demand, adjusted for estimated changes in CERU demands and for estimated growth in Member customer base. Based on previous Board action, minimum demand shares are assigned for two agencies, Sammamish Plateau Water and Issaquah, and are applied in lieu of actual history if they exceed the related calculated value. For both years, these Members exceed the adopted minimum.[5]

- **Regional Capital Facilities Charges (RCFCs)** are charged based on reported growth in customer base. RCFCs are relatively volatile and are not relied on for Cascade operations. For 2025 and 2026, 100% of RCFCs will continue to be transferred to construction. This summary does not project RCFCs or establish payment obligations in advance of actual growth. While Cascade develops its

[5] The Board adopted a resolution that reduces the minimum demand shares after the end of the 2024 fiscal year to 0.25 MGD for Issaquah and Sammamish Plateau Water. This amount is consistent with minimum flow requirements needed to maintain water quality in the BIP.

budgets and plans based on expected connections, Members are not obligated to pay RCFCs except as growth occurs.

As a wholesale purveyor, Cascade does not directly administer retail customer assistance programs. It provides technical assistance as requested by its Members in support of their retail customer assistance programs and rate affordability.

As a wholesale purveyor, Cascade does not directly set retail water rates. While Cascade's water supply costs are currently fixed in nature, the allocation of these costs to Members through the Demand Share Charge, which is based on a rolling average of peak season demand, results in a rate structure with approximately 85% to 90% of charges based on peak usage. This results in a rate structure that heavily incentivizes water efficiency.

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