2021

WATER SYSTEM PLAN

LIMITED UPDATE

Public Utility District No. 1 of Skagit County
1415 Freeway Drive
Mount Vernon, WA 98273
(360) 424-7104
skagitpud.org

May 2022

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Approval of the

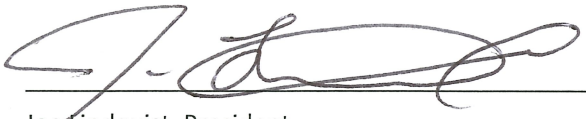
2021 Water System Plan Limited Update

for Public Utility District No. 1 of Skagit County

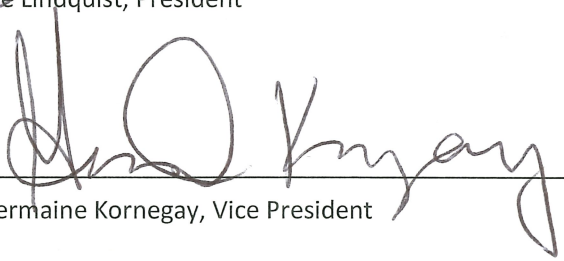
by

Board of Commissioners

Public Utility District No. 1 of Skagit County



Joe Lindquist, President



Germaine Kornegay, Vice President

Andrew Miller, Secretary

Signed this 10th day of May 2022

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CERTIFICATE OF ENGINEER

PUBLIC UTILITY DISTRICT NO. 1 OF SKAGIT COUNTY

2021 WATER SYSTEM PLAN LIMITED UPDATE

The technical material and data contained in the plan were prepared under the supervision and direction of the undersigned, whose seal as a professional engineer licensed to practice as such, is affixed below.

4/27/2022

_____

Mark Handzlik, P.E.
Engineering Manager

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FIGURES

APPENDICES

1 EXECUTIVE SUMMARY

On February 26, 2020, Public Utility District #1 of Skagit County (District) staff conducted a teleconference with the Washington State Department of Health (DOH) staff to discuss the contents of a Water System Plan (WSP) Limited Update. A recent rule adopted by DOH allows a WSP to be approved by DOH for ten years instead of six years (WAC 246-290-100(9)). DOH approved the District's current 2013 WSP on September 30, 2014. Through preplanning discussions with DOH, the District would like to request a four-year limited water system update that extends the 2013 WSP to 2024. With guidance from DOH, the existing 2013 WSP was updated with current and projected information.

The District submitted a request for a four-year extension to the 2013 WSP in September 2020, and then revised the request to a one-year extension in February 2021. On March 15, 2021, DOH approved the District's request to extend the life of the 2013 WSP for one year until March 15, 2022. The one-year extension did not make changes to the District's water system service areas. The District is now requesting the additional three years of the four-year request for a limited water system plan update. This update will supersede the original 2020 submittal for a four-year limited update, as well as the revised submittal for a one-year update submitted in February 2021.

The following areas in this update will support this request to extend the approval to a 10-year planning period:

- Discuss and update the District's Service Area text and maps.
- Update and redefine the Judy System Retail Service Area versus Future Service Area in text and maps.
- Update and redefine satellite system retail service areas in text and maps.
- Update and include SEPA documentation
- Discuss extending Water Use Efficiency (WUE) Goals.
- Update Water Rights Evaluation.
- Update and include separate Water Right Self-Assessment Forms for each District system.
- Update the Cultus Mountain Watershed Management Plan (Appendix E)
- Update the Emergency Response Plan Table of Contents (Appendix K)
- Update the Accident Prevention Plan Summary Table of Contents (Appendix O)
- Discuss any changes in water quality treatment and include updated Coliform Monitoring Plans.
- Discuss changes and updates in Operations and Maintenance since the formation of the District's original 2013 WSP.

- Summarize accomplishments and project developments since the formation of the District's original 2013 WSP.
- Discuss financial updates such as the recently completed Rate Study and the commitment by Commissioners and staff on a five-year Rate Plan.
- Provide an update on all District owned systems

The primary changes to the 2013 WSP and the one-year limited update to that plan are related to clarifications of the District's service areas. These changes, including revised mapping, are more fully described in Chapters 2, 3, 7, and 12:

- Reduction of the District's Judy System retail service area to exclude areas determined by the District as not viable for the provision of retail water supply in a timely and reasonable manner due to topographic, engineering, and cost constraints. These areas are redesignated to be within the District's Coordinated Water System Plan (CSWP)/future service area.
- Expansion of the Judy system retail service area in the Conway, Little Mountain Road, and Lake McMurray areas to accommodate anticipated growth and requests for service.
- The proposed adjustments to the Judy system retail service area shall have no effect on the external boundary of the District's CWSP service area boundary, or the provision of District retail water service to existing and new retail service area customers.
- Expansion of the respective retail service areas and place of use of the water rights serving the District's Alger, Cedargrove, Rockport, and Skagit View Village satellite water systems. These service area expansions will enable limited new connections in close proximity to the water supply facilities of these satellite water systems and recognize a small number of previously allowed connections.
- Approval of the related water rights place of use and retail service area expansions shall occur upon approval of the WSP plan update by DOH and legal authority provided pursuant to RCW 90.03.386(2) and RCW 90.03.260.
- The areas where the satellite water system retail service area and place of use expansions are proposed shall occur in areas currently designated as the District's CWSP/future service area. The proposed satellite system retail service area expansion shall have no effect on the external boundary of the District's CWSP service area boundary, or the provision of District retail water service to existing satellite system customers.

Finally, water rights tables and the water rights self-assessment forms for the Judy system have been updated to reflect recently approved water rights documents.

As a general note, if an item is referenced in this document or its appendices and cannot be found, then the reference can be found in the District's 2013 Water System Plan. Unedited sections of the 2013 WSP are not repeated in this 2021 Water System Plan Limited Update.

2 System Description

The following sections are replaced:

2.4 Service Area

The following sections are added:

2.4.1 Service Area Modifications

Figures 2-2 and 2-3 have been revised, and Figures 2-2a, 2-2b, 2-3a through 2-3d have been added.

2.4 Service Area

The District is authorized by RCW 54.04.030 to operate water systems within and outside Skagit County, Washington. This statute gives the District county-wide service authority and sets the legal boundaries of the District at, but not limited to, the boundaries of the county. Consistent with this authority, the place of use of its water rights, and the District's status as a municipal water supply system under RCW 90.03.115, the District's existing service area (i.e., retail service areas and future service area) covers Skagit County except for those areas claimed and served by other public water systems.

The designated service area boundaries for each water system were agreed upon by the District and the other water utilities participating in the Skagit County Coordinated Water System Plan (CWSP) process. As evidenced by the 2000 CWSP, the District is generally recognized as the most capable regional water purveyor in Skagit County. The formal Service Area Agreement for Skagit County, developed for the CWSP, is included as Appendix D, along with the service agreements from the other contracts into which the District has entered for the purchase or sale of water.

The CWSP service area boundaries were established prior to passage of the Municipal Water Law (MWL) in 2003. The MWL required the District, as a municipal water supply system, to designate its retail service area(s). Within such retail service areas, the District has a statutory duty to serve new and existing connections, subject to specified exceptions.

A duty to serve does not exist within all areas of the District's CWSP service area, or more specifically those areas designated as the future service area. A future service area is defined by DOH to be a specific area a water system plans to provide water service as determined by a written agreement (i.e., CWSP) between purveyors under chapter 70.116 RCW and chapter 246-293 (WAC 246-290-010). The District's future service area therefore represents the physical area that falls between its mapped and designated retail service areas and the District's external and mapped CWSP boundary.

In accordance with the MWL and related DOH regulations, this WSP designates and maps the District's respective retail service areas for its Judy System and individual satellite systems, its wholesale service area, and its CWSP/future service area.

The District's Judy System has a retail service area that includes Mount Vernon, Burlington, and Sedro-Woolley as well as surrounding communities such as Bow Hill, Bay View, Fir Island, Conway, Big Lake, and Clear Lake. The updated retail service area for the Judy System is shown in Figures 2-2 and 2-3.

The retail service areas for each of the District's satellite systems were established at the time of LUD formation or acquisition consistent with each system's respective water rights. Updated satellite retail service areas are shown in Figures 2-2, 2-2a, 2-2b, 2-3, and 2-3a through 2-3d

The District provides wholesale water service from the Judy System to the North Fir Island Water Association and Samish Farms Water Association; these entities purchase water to serve their mostly residential customer base. These remote wholesale water service areas fall within the Judy System retail service area described in Figure 2-2. The District has agreements with each of its wholesale customers, and those agreements are discussed in detail in Chapter 3 (Related Plans, Agreements, and Policies). The location of each wholesale customer is shown in Figure 2-2.

The District provides irrigation water to Skagit County Drainage and Irrigation District (DID) #15 and Skagit County Consolidated Diking Improvement District (CDID) #22 when feasible under temporary emergency change drought authorizations. The District is authorized to provide irrigation water pursuant to Chapter 54 RCW and Department of Ecology Pol-2030.

The District is in the process of negotiating with the City of Anacortes to transfer ownership of the Fidalgo Island water system (PWSID 00932 Y) to the City of Anacortes. When this transfer is finalized, the District's service area would be revised and withdrawn in the vicinity of the Fidalgo Island water system.

As discussed in more detail below and in Chapters 3 and 7 of this WSP, the District proposes to modify the physical scope and boundaries of its CWSP/future service area, Judy System retail service area, and four satellite system retail service areas depicted in its 2013 WSP. Applicants for water service are therefore encouraged to consult the District's retail service area map provided on its website to determine whether their property falls within the District's retail or future service areas. The District's website will be updated to reflect these changes following DOH approval of this WSP.

2.4.1 Service Area Modifications

The District proposes to expand its Judy System retail water service area in order to accommodate anticipated growth and requests for service in the Conway, Little Mountain Road, and Lake McMurray areas. The Judy System retail service area expands as necessary to accommodate growth and development. Expansion shall occur in a manner consistent with the District's retail service area policies and capacity of the Judy System facilities and water rights.

The District also proposes to clarify boundaries of the Judy System retail service area described in its 2013 WSP to an area that more accurately reflects topographic, engineering, and cost constraints that affect water service feasibility. This revised retail service area includes new and planned main extensions that can be served by the Judy System. To this end, new maps have been developed that delineate the District's modified retail service area and CWSP/future service area. Figures 2-2 and 2-3 have been revised to reflect these proposed changes to the Judy System retail service area and CWSP/future service area.

The proposed Judy System retail service area clarification, which is reflected in Figures 2-2 and 2-3, shall have no effect on the District's existing and currently mapped CWSP boundary. However, the area that falls between the District's CWSP boundary and its revised retail service area boundary shall now be designated as the District's future service area, consistent with the MWL and implementing DOH regulations (WAC 246-290-100).

In accordance with the Skagit County CWSP, the District will receive applications from Skagit County for water service within its adjusted and designated future service area. The provision of retail water service to potential customers falling within this future service area shall occur subject to the District determining whether such service can be provided in a "timely and reasonable manner" consistent with applicable District policy and criteria cited in this WSP. The subject of "timely and reasonable manner" is further discussed in Chapter 3.

If the District determines a requested service falling within its designated future service area can be provided in a manner consistent with its policies on timely and reasonable service, the area pertaining to the requested service shall be converted from future to retail service area and consequently served. In the event the District determines that retail water service cannot be provided in a timely and reasonable manner, the applicant will be so advised and referred to an adjacent purveyor if available.

In addition to the Judy System retail service area adjustments, the District intends to expand the place of use of the water rights serving four District satellite systems (Alger, Rockport, Cedargrove, and Skagit View Village) and their respective retail service areas. This adjustment will enable limited new and previously allowed connections in close proximity to the existing water systems. Approval of such water right and service area expansions shall occur: (1) upon approval of the WSP by the Washington State Department of Health and legal authority provided pursuant to RCW 90.03.386(2) and RCW 90.03.260; and (2) in a manner consistent with the terms, conditions, and capacity of the District's satellite system water rights as described in Chapter 7.

Figures 2-2, 2-2a, 2-3, and 2-3a through 2-3d describe the District's above-referenced service area adjustments, including the clarifications to the Judy System retail service area, the satellite system retail service areas, and the District's CWSP/future service area.

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Alger Satellite System
Retail Service Area

Samish Farms Water Assn
Wholesale Service Area

Upper Skagit Tribe

Potlatch Beach Satellite System
Retail Service Area

Judy System Retail Service Area

Fidalgo Island Satellite System
Retail Service Area

Swinomish Tribe

N Fir Island Water Association
Wholesale Service Area

Skagit County

Figure 2-2.

District Water Systems And Adjacent Water Purveyors West County

2021 WSP LIMITED UPDATE

0 1.25 2.5 5 Miles

NAD 1983 StatePlane Washington North FIPS 4601 Feet

District Retail Service Areas

District CWSP Future Service Area

Adjacent Water Purveyors (Smaller Water Systems Not Shown)

- Tribal Water Systems
- City of Anacortes
- Blanchard Edison Water Assn. Inc.
- Del Mar Community Service
- Holiday Hideaway Water Co
- La Conner Water Dept
- Leif Erickson Rec Assoc
- North Fir Island Water Association
- Samish Farms Water Assn
- Shelter Bay Community Inc

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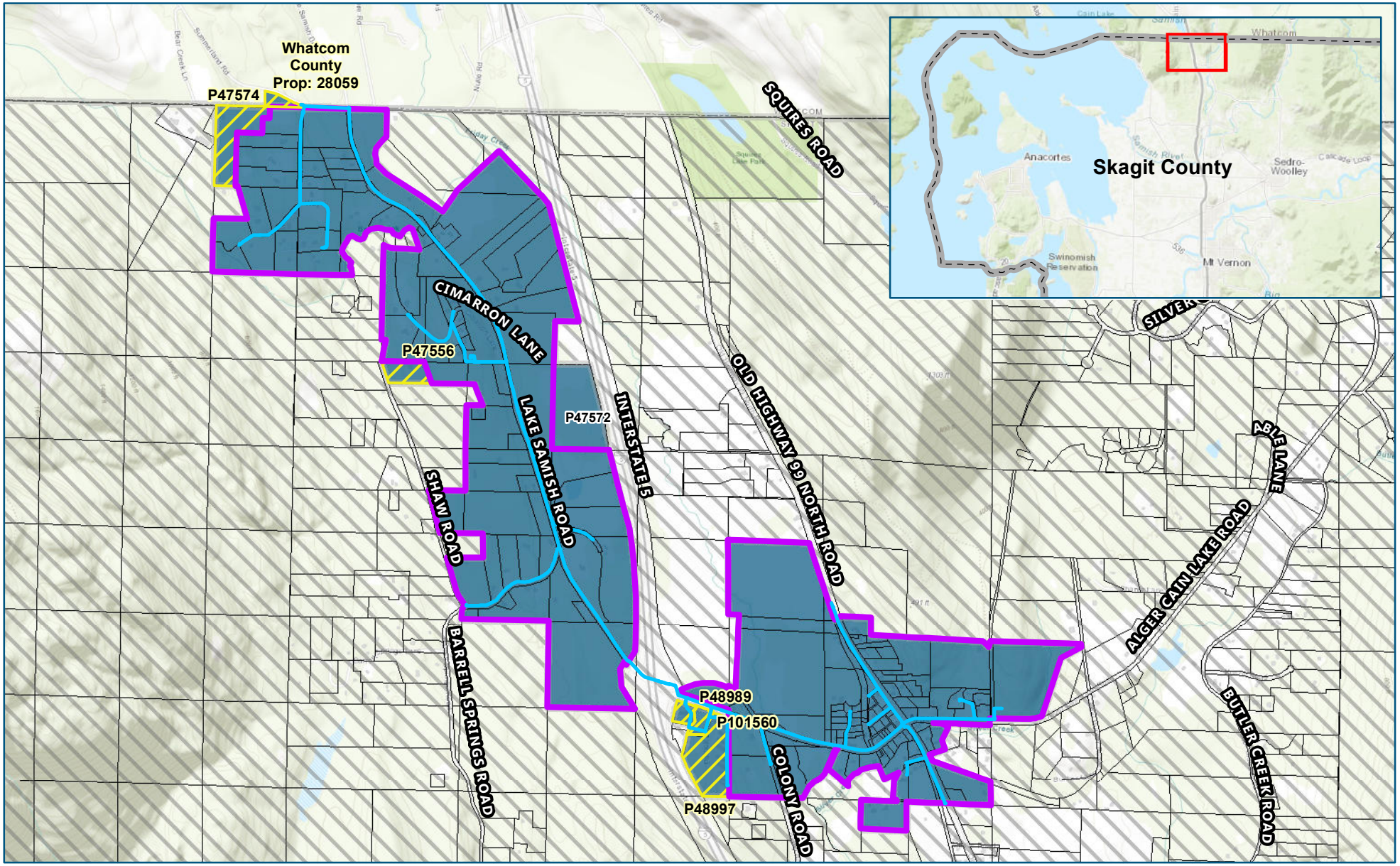

Figure 2-2a.

Alger Satellite Water System

2021 WSP Limited Update

0 0.25 0.5 1 Miles

NAD 1983 StatePlane Washington North FIPS 4601 Feet

- Existing Main
- LUD Boundary
- Parcels Currently Served outside of LUD and Within Updated District Retail Service Area
- Updated District Retail Service Areas
- District CWSP Future Service Area
- County Parcels

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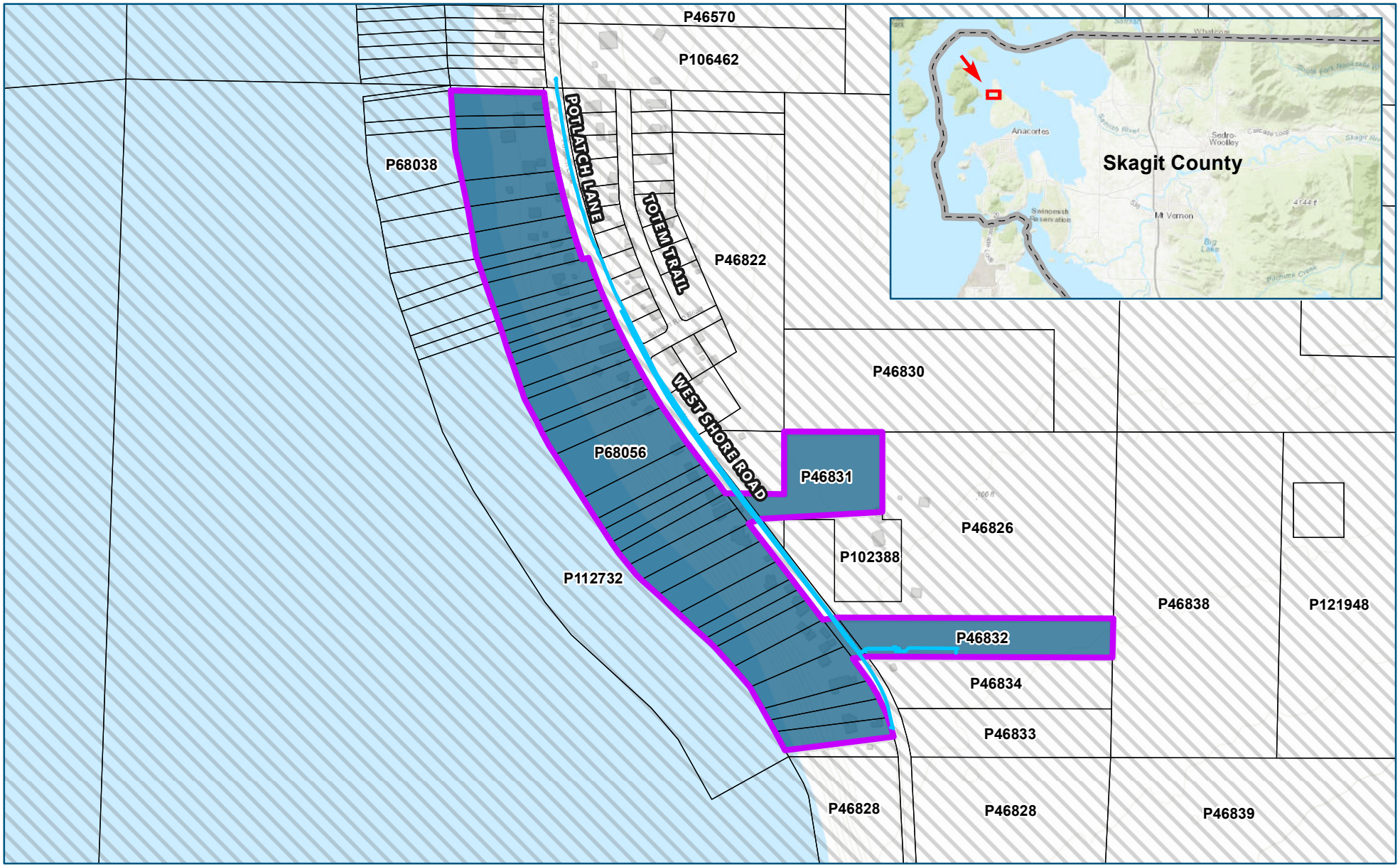

Figure 2-2b.

Potlatch Beach Satellite Water System

2021 WSP Limited Update

0 250 500 1,000 Feet

NAD 1983 StatePlane Washington North FIPS 4601 Feet

- Existing Main
- LUD Boundary
- Parcels Currently Served outside of LUD and Within Updated District Retail Service Area
- Updated District Retail Service Areas
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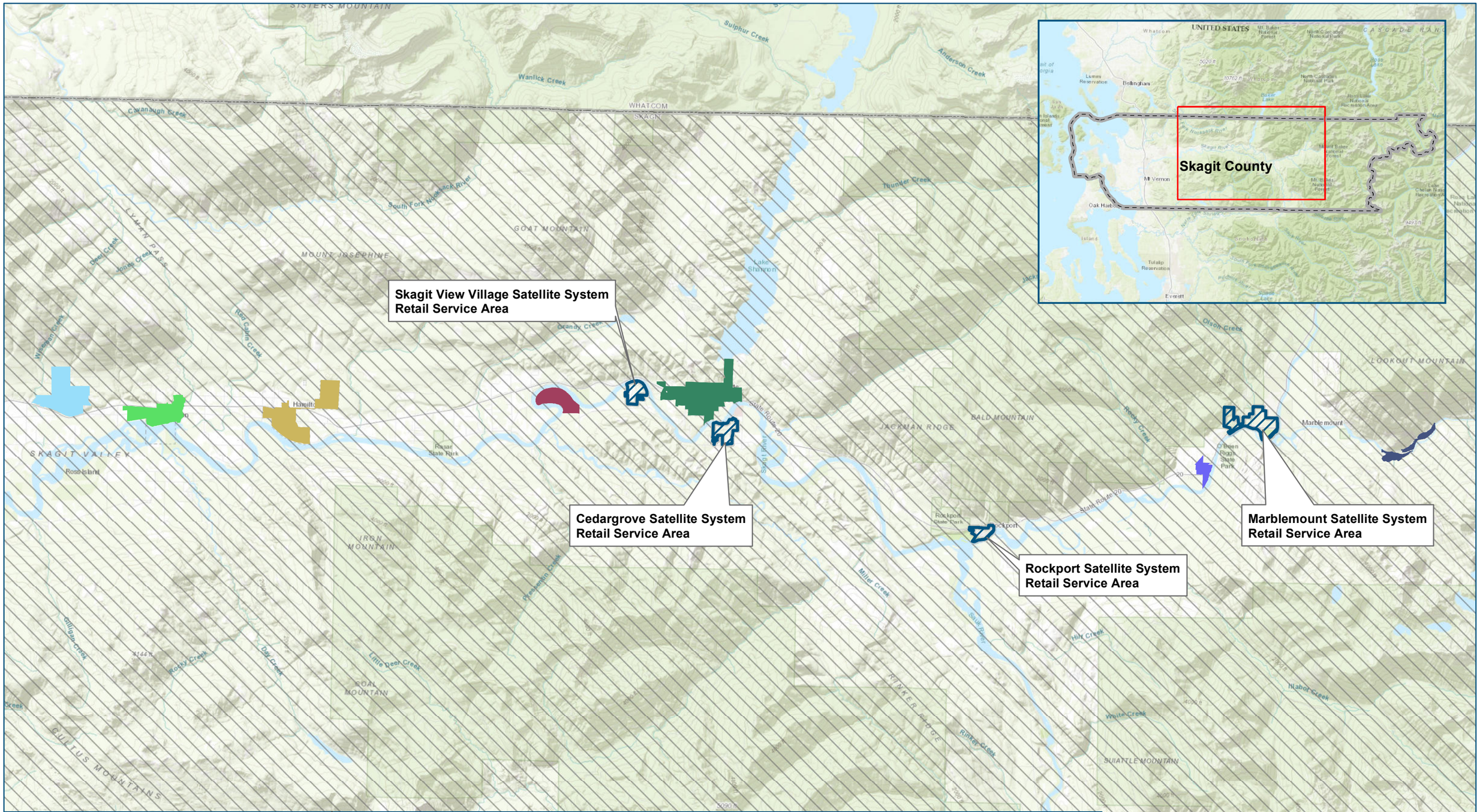

Figure 2-3.

District Water Systems And Adjacent Water Purveyors East County

2021 WSP LIMITED UPDATE

0 1 2 4 Miles

NAD 1983 StatePlane Washington North FIPS 4601 Feet

District Retail Service Areas

District CWSP Future Service Area

Adjacent Water Purveyors (Smaller Water Systems Not Shown)

- BACUS ROAD #1
- CAPE HORN MAINTENANCE COMPANY
- CASCADE RIVER COMMUNITY CLUB
- CONCRETE UTILITIES
- Glacier Peak Resort and Winery
- HAMILTON WATER DEPARTMENT
- LYMAN WATER DEPARTMENT

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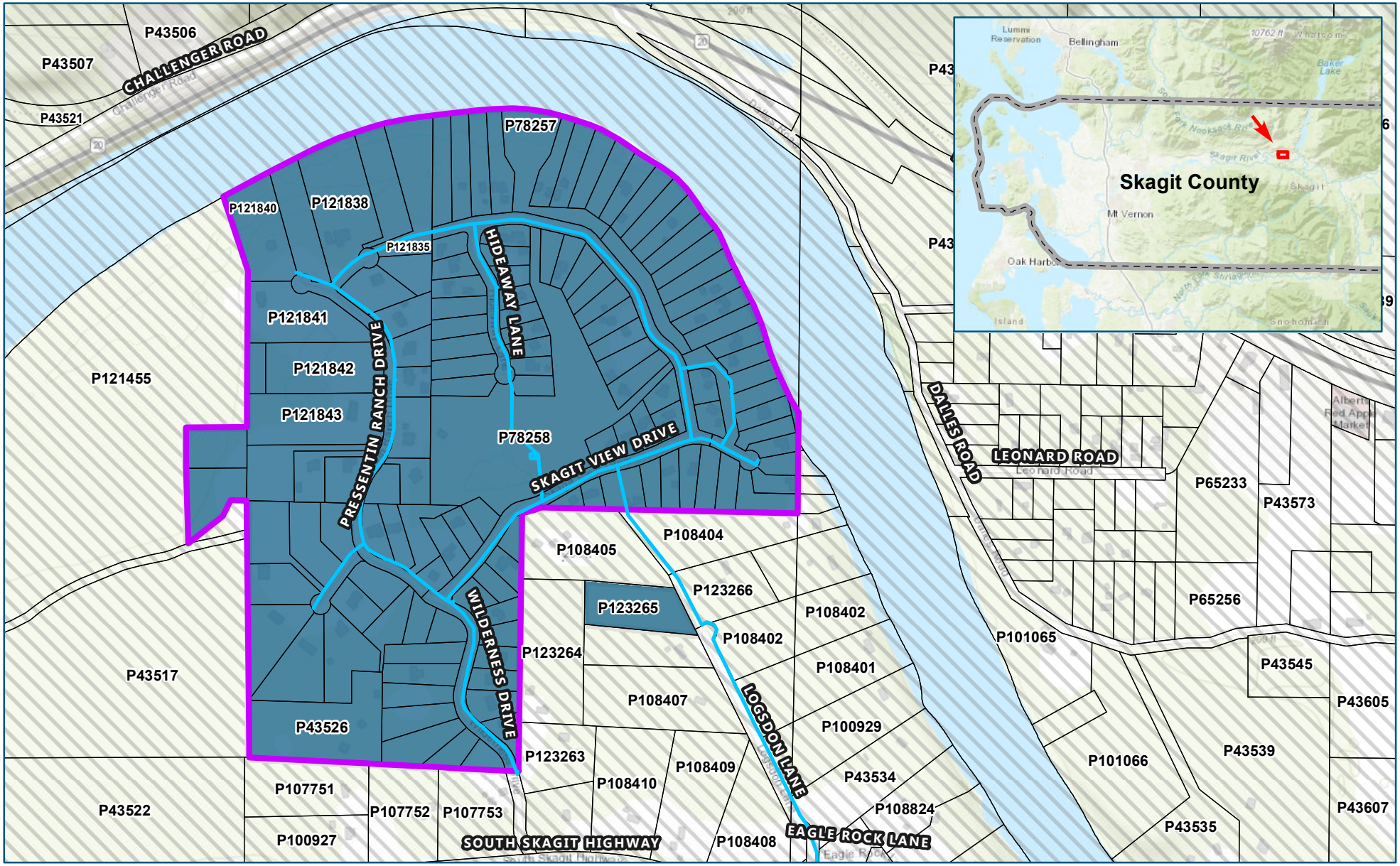

Figure 2-3a.

Skagit View Village Satellite Water System

2021 WSP Limited Update

0 250 500 1,000 Feet

NAD 1983 StatePlane Washington North FIPS 4601 Feet

- Existing Main
- LUD Boundary
- Parcels Currently Served outside of LUD and Within Updated District Retail Service Area
- Updated District Retail Service Areas
- District CWSP Future Service Area
- County Parcels

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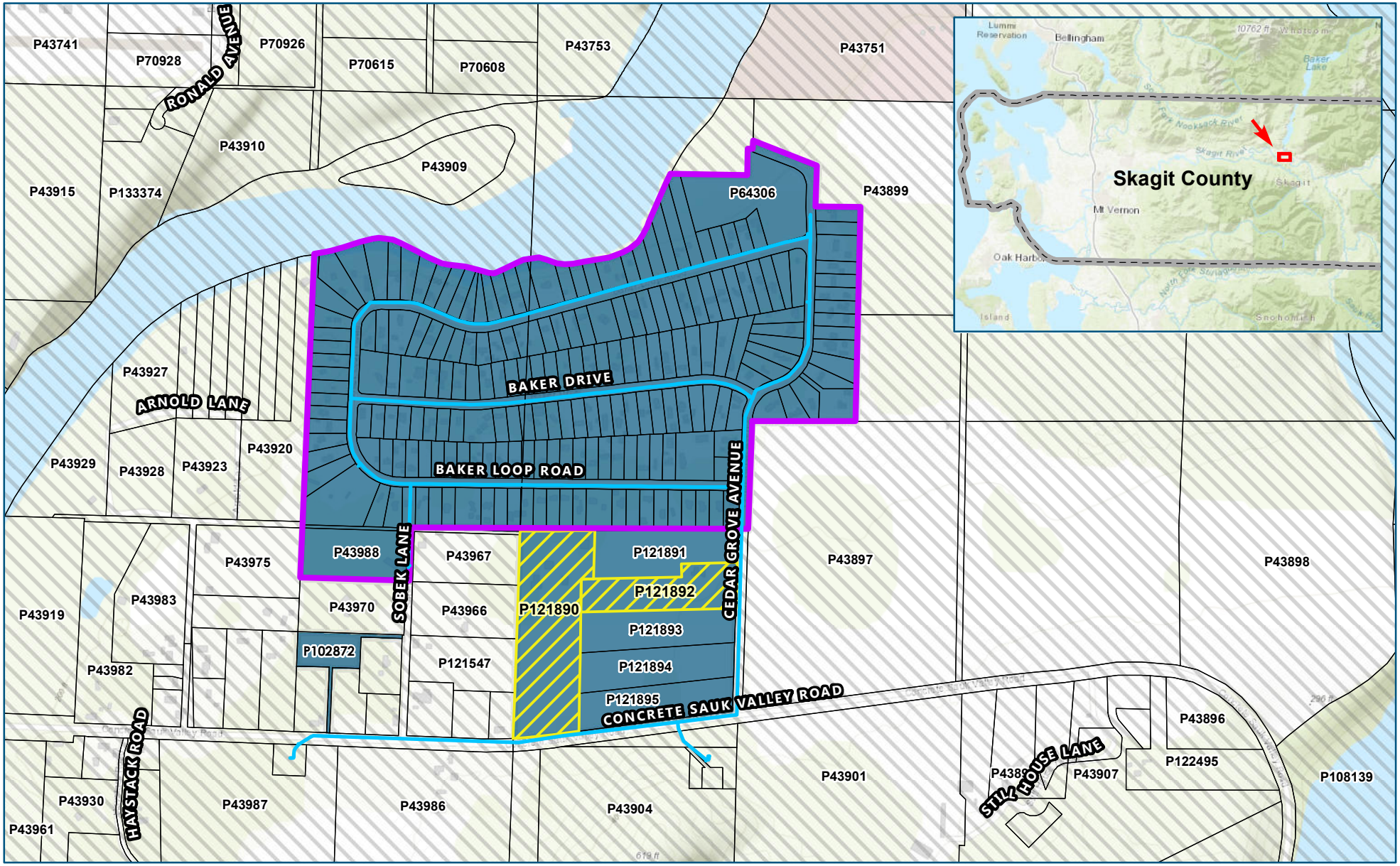

Figure 2-3b.

Cedargrove Satellite Water System

2021 WSP Limited Update

This map was created from available public records and existing map sources, not from field surveys. While great care was taken in this process, maps from different sources rarely agree as to the precise location of geographic features. The relative positioning of map features to one another results from combining different map sources without field verification.

The PUD #1 of Skagit County disclaims any warranty of merchantability or warranty of fitness of this map for any particular purpose, either expressed or implied. No representation or warranty is made concerning the accuracy, currency, completeness or quality of data depicted on this map. Any user of this map assumes all responsibility for use thereof, and further agrees to hold the PUD #1 of Skagit County harmless from any damage, loss, or liability arising from the use of this map.

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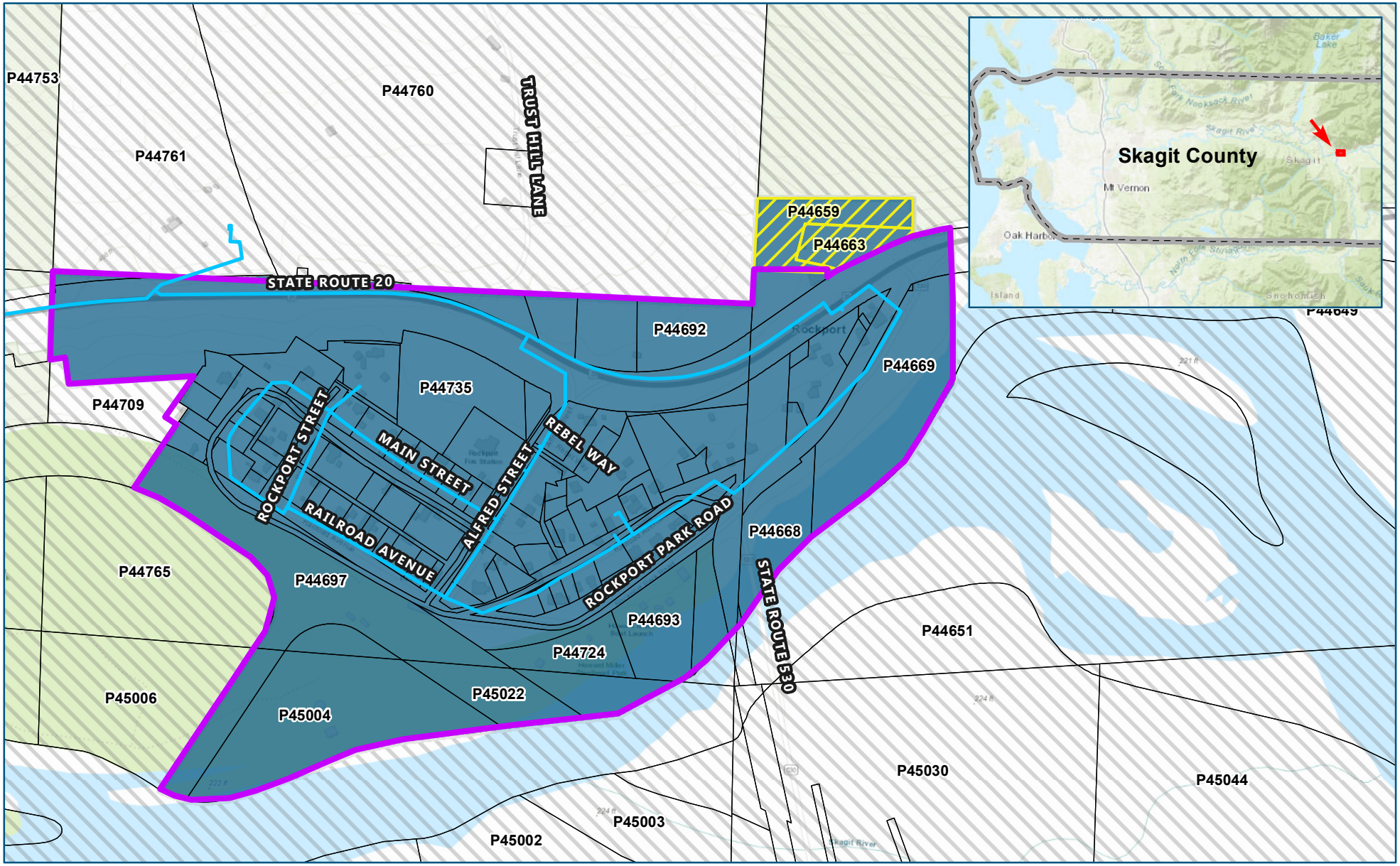

Figure 2-3c.

Rockport Satellite Water System

2021 WSP Limited Update

0 250 500 1,000 Feet

NAD 1983 StatePlane Washington North FIPS 4601 Feet

- Existing Main
- LUD Boundary
- Parcels Currently Served outside of LUD and Within Updated District Retail Service Area
- Updated District Retail Service Areas
- District CWSP Future Service Area
- County Parcels

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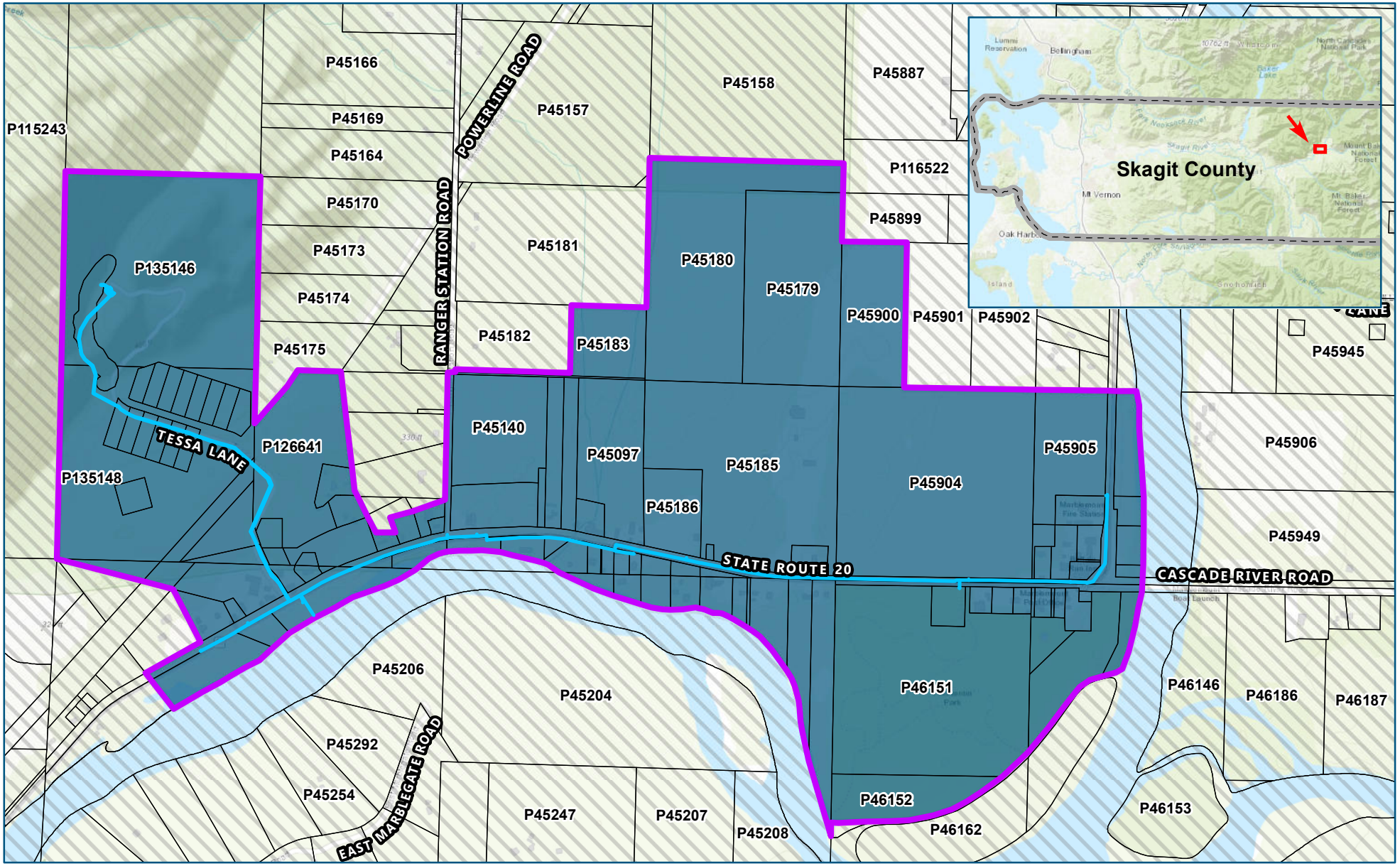

Figure 2-3d.

Marblemount Satellite Water System

2021 WSP Limited Update

N

0 500 1,000 2,000 Feet

NAD 1983 StatePlane Washington North FIPS 4601 Feet

- Existing Main
- LUD Boundary
- Parcels Currently Served outside of LUD and Within Updated District Retail Service Area
- Updated District Retail Service Areas
- District CWSP Future Service Area
- County Parcels

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3 Related Plans, Agreements, and Policies

The following sections are replaced:

3.1.1 Existing Service Area Characteristics
3.1.1.1 Timely and Reasonable
3.1.1.5 Priority Service Areas

3.1 Service Area Authority

3.1.1 Existing Service Area Characteristics

The District is authorized by RCW 54.04.030 to operate water systems within and outside the boundaries of Skagit County, Washington. This statute gives the District county-wide water supply planning and service authority and sets its legal boundaries to provide water service (subject to the 2000 CWSP). The future, retail, and wholesale service areas described in the District's approved water system plans, and the place of use of its municipal purpose water rights have been established to be consistent with the CWSP and the Municipal Water Law (MWL).

The District and other water utilities participating in the CWSP have agreed on the designated service areas boundaries for each water system. The CWSP describes how existing systems that are "adjacent" to a proposed development are given the first option to provide service.

The District's current service areas (i.e., retail service areas, wholesale service area, and future service area) encompass much of the County, except for those areas already claimed and served by another public water system, in accordance with the 2000 CWSP. These other systems have priority to provide water service to adjacent new development proposals located within one-half mile of their respective service areas designated by the CWSP.

If service is declined by an adjacent water system, or it is determined by Skagit County pursuant to RCW 70A.100.060 that the water system cannot provide water service in a timely and reasonable manner, the District is responsible for providing new water service under the CWSP. The provision of such service by the District, however, is contingent on its ability to do so in a timely and reasonable manner and the Municipal Water Law (MWL) retail service area criteria discussed below. The formal CWSP Service Area Agreement is included in Appendix D.

Municipal Water Law: Rules and Related Policies

In 2003, the MWL was passed by the Washington State Legislature. The MWL and related DOH rules (WAC 246-290-100) changed how municipal water suppliers are to describe their water system service area within their Water System Plan. To this end, the DOH rules were adopted in 2008 and later amended in 2016 to provide definitions of how an "existing service area", "retail service area"

and “future service area” are to be described within a Water System Plan and to set out the legal obligations associated with such service areas.

Under the MWL, municipal water supply systems were prescribed a statutory duty to serve new connections falling within a retail service area if the following criteria can be met:

- Sufficient capacity exists to serve water in a safe and reliable manner,
- Service can be provided in a manner consistent with provisions of adopted land use plans and development regulations that reasonably relate to water service,
- Sufficient water rights exist to provide the service, and
- Service can be provided in a timely and reasonable manner.

The MWL did not define “timely and reasonable” for designated retail service areas. DOH has determined per rule guidance, however, that municipal water suppliers are responsible for identifying the “timely and reasonable” criteria for their retail service areas within their Water System Plan.

Service Areas: Retail Service Area

According to the MWL, retail service area is defined by DOH rule to mean “the specific area defined by the municipal water supplier where, as noted above, the municipal water supplier has a duty to provide service to all new service connections as set forth in RCW 43.20.260.“

The Judy System has a designated retail service area that includes Mount Vernon, Burlington, and Sedro-Woolley as well as surrounding communities such as Bow Hill, Bay View, Fir Island, Conway, Big Lake, and Clear Lake. Figures 2-2 and 2-3 show the Judy System retail service area and CWSP future service area.

Retail service areas and the water rights for each of the District’s remote satellite systems have been established, as shown in Figures 2-2, 2-2a, 2-2b, 2-3, and 2-3a through 2-3d. Retail service areas for the Alger, Rockport, Cedargrove, and Skagit View Village satellite systems are proposed for expansion consistent with authority granted under RCW 90.03.386(2). This adjustment will enable limited new and previously allowed water service connections located outside of the original water right place of use and retail service areas for these systems.

The District is in the process of negotiating with the City of Anacortes to transfer ownership of the Fidalgo Island water system (PWSID 00932 Y) to the City of Anacortes. When this transfer is finalized, the District’s service area would be revised and withdrawn in the vicinity of the Fidalgo Island water system.

The District has acquired funding from the Washington State capital budget to design a waterline extension along Little Mountain Road south of the City of Mount Vernon. The District is also pursuing similar funding for construction costs. One of the primary purposes of this project is to provide a water source to landowners with limited water availability due to the Skagit Instream Flow Rule. Two additional potential projects with similar benefits have also been identified. To accommodate these projects the District, as an element of this WSP, intends to expand the retail service area for the Judy System within its future service area, which falls within the District's CWSP service area. Future expansions of District retail service areas may occur due to similar projects.

The District may extend a retail service area to any area of Skagit County not identified as the service area of another public water system if said area falls within the District's future service area as designated by the CWSP and can be served in a manner consistent with applicable District policies and MWL provisions.

Service Areas: Future Service Area

Under the MWL and implementation rules, a future service area is generally defined as a specific area where a public water system is authorized to provide service by agreement among purveyors, but where retail water service may not be currently available or provided. A purveyor has no duty to serve within areas designated as future service area that are unserved and fall outside of a designated retail service area.

The District's future service area encompasses much of the county except for those areas already claimed and served by another public water system. As outlined in the CWSP Service Area Agreement (see Appendix D), the District may serve any area within the county not already a designated service area of another approved water utility within the CWSP, subject to the capacity of the District to provide such service in a timely and reasonable manner.

Due to factors including physical topography, remote locations, low population density, and distance from existing sources and facilities, there may be circumstances where water service to all areas within the County is simply not feasible. The District has in the past discussed the extension of District water service with the Samish Water District around Lake Samish in Whatcom County and has been approached by utilities in Island County and San Juan County regarding satellite service. Any potential customer(s) outside Skagit County has the opportunity to have its area annexed into the service territory of the District, provided its area is contiguous with the District's existing service boundary.

Service Areas: Wholesale Service Area

A municipal water supplier may designate a wholesale water service area within a Water System Plan or update. In this regard, a wholesale water system means "a public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another public water system. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems" (WAC 246-290-010).

The District provides wholesale water from the Judy System to the North Fir Island Water Association and Samish Farms Water Association. These entities purchase water to serve their mostly residential customer base, and their water service areas fall within the Judy System retail service area described in Figure 2-2. The District's wholesale supply and existing water system customers shall be unaffected by the proposed service area changes discussed in this WSP update.

Retail Service Area Adjustments and Clarifications

2013 Water System Plan (WSP) text inadvertently included and referenced the entire county (i.e., the entirety of the District's CSWP-claimed service area), less claimed service areas of other purveyors, as its "retail service area." This "retail service area" reference did not correspond to other WSP text and service area maps that accurately described: (1) the Judy System retail service area; 2) the retail service areas of the District's seven Satellite Water Systems; and (3) the remainder area of Skagit County that represents the District's future service area (within its CSWP service area boundary).

The District seeks in this WSP to clarify the physical scope of its retail and future service areas, and document through the text below and revised WSP mapping its intent to:

1. Convert areas that currently fall within its future water service areas to be designated as part of the Judy System retail service area that are anticipated for future development.

   The purpose of this retail service area expansion is to accommodate anticipated water system growth in the Little Mountain Road, Conway, and Lake McMurray areas. These areas of retail service area expansion as shown in Figure 2-2 depict the correct and updated Judy System retail service area and corresponding adjustment to the District's future service area. At this time, the water transmission lines and other necessary infrastructure to effect delivery of Judy System water to these areas proposed for retail service expansion have yet to be constructed. The District, however, anticipates funding for such projects to occur over the next 4 to 6 years through legislative appropriation, developer funded extensions, or other funding sources.

2. Re-designate as future service area certain areas formerly falling within the Judy System retail service area that have been determined as not feasible to serve in a timely and reasonable manner.

The re-designated areas were formerly described and mapped in the 2013 WSP as falling within the Judy System retail service area. Such areas have been determined by the District to be impractical to serve in a timely and reasonable manner due to topographic, cost, and engineering factors. Figures 2-2 and 2-3 update and delineates the Judy System retail service area boundaries and corresponding modifications to the District's CWSP/future service area.

3. Expand the water rights place of use and retail service area(s) of four satellite systems (Alger, Rockport, Cedargrove, and Skagit View Village) pursuant to RCW 90.03.386(2) and RCW 90.03.260(4).

   These four systems have sufficient supply and operational capacity to extend retail service to a limited number of new and previously allowed services located in close proximity to the satellite system water mains and related facilities with no effective access to public water supply. The satellite system water rights place of use expansions are more specifically described in Chapter 7 of this plan.

3.1.1.1 Timely and Reasonable

An individual or developer seeking public water system service within a municipal water supplier's future service area based on the CWSP is required to receive water service from a designated utility but is entitled to appeal this requirement if such service cannot be provided within a timely and reasonable manner. For purposes of the Skagit CWSP, an existing purveyor is unable to provide water service in a timely manner if such service cannot be provided to an applicant within one hundred twenty days (RCW 70.116.060(3b)).

For purposes of its retail and future service areas, the District considers water service to be "timely and reasonable" if it can be provided within 120 calendar days of all fees being paid, subject to the policies stated within the District's Water Policy Manual (Section 2: General Terms, Conditions, and Policies) and the service area policies stated below:

1. If the extent of water service requested requires construction of major facilities such as the replacement or installation of new storage tanks, wells, booster pumps, or transmission or distribution mains, the time associated with construction and permitting will be added to the 120 days. The time period will commence after the payment of fees.

2. Construction of water facilities is subject to design review and approval at state and local levels. The "construction time" includes state and local permitting, construction season considerations, and coordination with other planned infrastructure projects such as roads, sewers, lights, etc. "Construction time" activities are in addition to the 120-day period.

3. Upon request, a letter of water-availability indicating the conditions for the provision of service will be drafted and sent to the new customer before the start of the 120-day period. The District's water service policies are defined in the Water Policy Manual (Appendix G). A customer is responsible for paying for appropriate connections charges and costs of extending or upgrading facilities.

4. If an appeal is requested, it will be evaluated per the terms of the 2000 CWSP appeal procedure.

3.1.1.5 Priority Services Areas

The District will provide retail water service to those customers desiring water service so long as the improvements meet the provisions of the water policy manual, and water can be provided in a timely and reasonable manner.

In coordination with Skagit County, the District has identified high-priority areas for the provision of water service. These priorities include the following:

1. Service to Urban and Urban Growth Areas; and
2. Service to areas with pre-existing higher rural density land use designations AND either of the following two types of flow constraints:
    a. Instream flow constraints due to limited access to on-site water supplies under Skagit and Stillaguamish instream flow rules (Chapters 173-503 and 173-505 WAC, respectively); or
    b. Low-flow basins identified in Skagit County's Critical Areas Ordinance (Skagit County Code 14.24).

Responsibilities for public water systems within flow sensitive basins are described in Skagit County Code 12.48.060(1).

The pre-existing higher rural density land use designations have corresponding Skagit County Comprehensive Plan designations that recognize these areas (i.e., limited areas of more intensive rural development (LAMIRD), as authorized by RCW 36.70A.070(5)(d)(i)).

4 PLANNING DATA AND WATER DEMAND FORECASTING

This chapter discusses the planning data and water demand forecast information used to assess the current and future capabilities of the District's water system over the next four years. It discusses current population trends in the water service area and corresponding water use characteristics, including demand, consumption, and related factors used to develop the District's demand forecast for the 20-year planning period.

The following sections are amended:

4.1.2 Future Population Projection
4.2.1 Demand
4.3.1 Customer Consumption Forecast
4.3.2 System Demand Forecast

Table 4-2 has been updated
Table 4-12 has been updated
Table 4-13 has been updated
Table 4-14 has been updated
Figure 4-1 has been updated
Figure 4-3 has been updated

4.1 Population Data

4.1.2 Future

As directed by state statute RCW 43.62.035, every 5 years the Office of Financial Management (OFM) prepares a reasonable range of population growth forecasts for Washington counties required to comply with the Growth Management Act (GMA). The population forecasts are projected for a 20-year period and include a low, medium, and high estimates. The medium-level projection represents OFM's estimate of the most likely population projection for the county. Skagit County is required to plan under the GMA. The updated OFM low, medium, and high forecasts for Skagit County for 2020, 2030, and 2040 are presented in Table 4-2.

Table 4-2. Updated OFM Population Projections for Skagit County Based on the 2010 Census

Census 2010	OFM Projection	2020	10-year Growth Rate (2010–2020)	2030	10-year Growth Rate (2020–2030)	2040	10-year Growth Rate (2030–2040)
116,901	Low	118,117	1.0%	127,387	7.8%	138,164	8.5%
	Medium	130,705	11.8%	146,880	12.4%	164,760	12.2%
	High	146,280	25.0%	175,328	19.8%	206,280	17.7%

*This table is updated with 2017 OFM projections. This contains the most current projections

As a comparison, the District's 2013 Water System Plan provided population forecasts from OFM using the 2010 census data, and from the 2000 Coordinated Water System Plan (CWSP). Table 4-3 shows the projections made by OFM and the CWSP for 2020.

Table 4-3. Updated Previous OFM and CWSP Population Projections for Skagit County

Census 2010	Projection Rates	OFM 2020 Projection	2000 CWSP Projection	Estimated Census 2020
116,901	Low	118,117	118,153	130,450
	Medium	130,705	125,510	
	High	146,280	136,644	

As evidenced by Table 4-3, the estimated census population for 2020 was between the low and medium growth rates for the OFM projections and above the medium growth rate for the CWSP (a very outdated projection). As mentioned earlier, the actual population growth rates are considered, along with historical growth information of the District's customers, to determine the future meter growth rate and the water demand forecast.

4.2 Water Usage Characteristics

4.2.1 System Demand

Figure 4-1 shows a history of water demand since the District's 2013 WSP. The water system demand includes production from the District's water treatment plant and water purchased from the City of Anacortes through interties. The average annual system demand from 2004 through 2012 was 2,908 million gallons. The average annual system demand over the past 9 years (2011-2019) was 2,980 million gallons. The reduction in water taken from Anacortes stems from the installation of the Josh Wilson Road transmission main being installed in 2013.

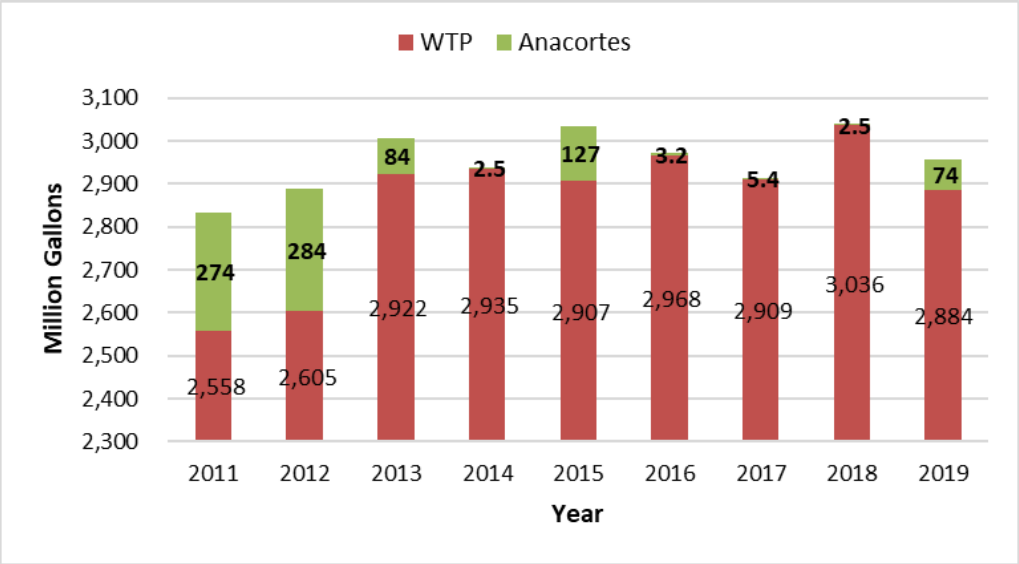

Figure 4-1. Annual Water Consumption (2011-2019)

4.3 Water Demand Forecast

4.3.1 Customer Consumption Forecast

The development of the District's water consumption forecast is based on an estimation of the increase/decrease in number of metered services, using OFM population data and historical District customer growth information as a reference, and then calculating the total Maximum Day Demand (MDD) of the system for each year in the reporting period using the average water use factor from 2015 through 2019 of 150.0 gpd/ERU.

Based on the historical customer growth rate at the District over the past 4 to 5 years, the projected customer growth rate was estimated for each of the District's meter classes. Table 4-12 shows the previous estimated increase/decrease in number of metered services, as well as the current forecasted increase/decrease in number of metered services for residential, multi-family residential, and commercial/industrial customer classes and the total anticipated growth for the Judy System. For this WSP update, only the residential, multi-family residential, and commercial/industrial customer classes are shown because these classes increased the most, and the other classes have not experienced significant changes since the District's 2013 WSP.

The three main customer classes (residential, multi-family, and commercial/industrial) are forecasted to increase approximately 1.0% per year until 2024 and through to 2041 based on historical growth, which differs from straight population growth projections. This projection coincides with the meter growth since the District's 2013 WSP. The other customer classes are forecasted to increase at

different rates, but continue similar trends forecasted in the District's 2013 WSP. The overall forecasted rate at which additional meters are added to the system is 1.0% per year from 2021 to 2041.

Table 4-13 shows an updated summary of the increase/decrease in the number of metered services and annual water consumption for each customer class for this planning period. Table 4-13 also uses the updated water use factor of 150.0 gpd/ERU, down from 160.3 gpd/ERU (previous 2013 plan), to determine the ERU growth rate for each year for each class category from 2021 to 2041. The summary total of the increase/decrease in the number of metered services, the annual usage, and the ERU growth is shown totaled on the right side of the table.

	Year	Residential			Multi-Family			Commercial and Industrial			Government		Farms		Irrigation		Fire Protection		Resale		Other		Manifold (Non-Irrigation)		Statement No-Bill		Total		
		Quantity		Change (%)	Quantity		Change (%)	Quantity		Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity	Change (%)	Quantity		Change (%)
Actual Original	2007	18,792		2.6%	1,223		1.2%	1,752		1.4%	175	0.0%	124	2.5%	174	5.5%	150	20.0%	2	0.0%	10		4	0.0%	6		22,402		2.6%
	2008	19,048		1.4%	1,220		-0.2%	1,764		0.7%	182	4.0%	123	-0.8%	179	2.9%	106	-29.3%	2	0.0%	10		4	0.0%	6	0.0%	22,634		1.0%
	2009	19,232		1.0%	1,222		0.2%	1,770		0.3%	182	0.0%	125	1.6%	183	2.2%	130	22.6%	2	0.0%	10		4	0.0%	6	0.0%	22,856		1.0%
	2010	19,324		0.5%	1,222		0.0%	1,763		-0.4%	187	2.7%	124	-0.8%	184	0.5%	80	-38.5%	2	0.0%	9		3	-25.0%	6	0.0%	22,895		0.2%
	2011	19,363		0.2%	1,217		-0.4%	1,760		-0.2%	186	-0.5%	126	1.6%	181	-1.6%	93	16.3%	2	0.0%	10		3	0.0%	7	16.7%	22,938		0.2%
	2012	19,469		0.5%	1,209		-0.7%	1,776		0.9%	186	0.0%	124	-1.6%	182	0.6%	103	10.8%	2	0.0%	12		4	33.3%	8	14.3%	23,063		0.5%
	2013	19,566		0.5%	1,215	1,209	0.5%	1,785	1,739	0.5%	188	1.1%	124	0.0%	183	0.5%	104	1.0%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	23,179		0.5%
Original Forecast / Updated Actual	2014	~~19,723~~	21,405	9.4%	~~1,225~~	1,209	0.0%	~~1,799~~	1,747	0.5%	190	1.1%	125	0.8%	186	1.6%	106	1.9%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~23,368~~	24,982	7.8%
	2015	~~19,881~~	20,383	-4.8%	~~1,235~~	1,227	1.5%	~~1,814~~	1,842	5.4%	190	0.0%	128	2.4%	201	8.1%	382	260.4%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~23,844~~	24,367	-2.5%
	2016	~~20,040~~	20,587	1.0%	~~1,244~~	1,232	0.4%	~~1,828~~	1,844	0.1%	192	1.1%	125	-2.3%	199	-1.0%	396	3.7%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~24,038~~	24,589	0.9%
	2017	~~20,200~~	20,762	0.9%	~~1,246~~	1,234	0.2%	~~1,843~~	1,837	-0.4%	189	-1.6%	123	-1.6%	200	0.5%	411	3.8%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~24,226~~	24,770	0.7%
	2018	~~20,362~~	21,035	1.3%	~~1,256~~	1,247	1.1%	~~1,857~~	1,846	0.5%	189	0.0%	124	0.8%	203	1.5%	420	2.2%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~24,425~~	25,078	1.2%
Current	2019	~~20,525~~	21,221	0.9%	~~1,266~~	1,250	0.2%	~~1,872~~	1,858	0.7%	190	0.5%	127	2.4%	203	0.0%	430	2.4%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~24,627~~	25,293	0.9%
Original Forecast/ Updated Forecast	2020	~~20,730~~	21,433	1.0%	~~1,279~~	1,263	1.0%	~~1,891~~	1,877	1.0%	192	1.0%	127	0.3%	206	1.5%	436	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~24,876~~	25,548	1.0%
	2021	~~20,937~~	21,648	1.0%	~~1,292~~	1,275	1.0%	~~1,910~~	1,895	1.0%	194	1.0%	128	0.3%	209	1.5%	443	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~25,127~~	25,806	1.0%
	2022	~~21,146~~	21,864	1.0%	~~1,305~~	1,288	1.0%	~~1,929~~	1,914	1.0%	196	1.0%	128	0.3%	212	1.5%	450	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~25,380~~	26,066	1.0%
	2023	~~21,358~~	22,083	1.0%	~~1,318~~	1,301	1.0%	~~1,948~~	1,933	1.0%	198	1.0%	128	0.3%	215	1.5%	456	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~25,636~~	26,329	1.0%
	2024	~~21,571~~	22,303	1.0%	~~1,331~~	1,314	1.0%	~~1,968~~	1,953	1.0%	200	1.0%	129	0.3%	219	1.5%	463	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~25,895~~	26,594	1.0%
	2025	~~21,787~~	22,527	1.0%	~~1,344~~	1,327	1.0%	~~1,987~~	1,972	1.0%	202	1.0%	129	0.3%	222	1.5%	470	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~26,156~~	26,862	1.0%
	2026	~~22,005~~	22,752	1.0%	~~1,358~~	1,340	1.0%	~~2,007~~	1,992	1.0%	204	1.0%	129	0.3%	225	1.5%	477	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~26,420~~	27,133	1.0%
	2027	~~22,225~~	22,979	1.0%	~~1,371~~	1,354	1.0%	~~2,027~~	2,012	1.0%	206	1.0%	130	0.3%	229	1.5%	484	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~26,686~~	27,407	1.0%
	2028	~~22,447~~	23,209	1.0%	~~1,385~~	1,367	1.0%	~~2,048~~	2,032	1.0%	208	1.0%	130	0.3%	232	1.5%	492	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~26,956~~	27,684	1.0%
	2029	~~22,672~~	23,441	1.0%	~~1,399~~	1,381	1.0%	~~2,068~~	2,052	1.0%	210	1.0%	130	0.3%	236	1.5%	499	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~27,228~~	27,963	1.0%
	2030	~~22,899~~	23,676	1.0%	~~1,413~~	1,395	1.0%	~~2,089~~	2,073	1.0%	212	1.0%	131	0.3%	239	1.5%	507	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~27,503~~	28,245	1.0%
	2031	~~23,128~~	23,912	1.0%	~~1,427~~	1,409	1.0%	~~2,110~~	2,094	1.0%	214	1.0%	131	0.3%	243	1.5%	514	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~27,780~~	28,530	1.0%
	2032	~~23,359~~	24,151	1.0%	~~1,441~~	1,423	1.0%	~~2,131~~	2,115	1.0%	216	1.0%	131	0.3%	246	1.5%	522	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~28,061~~	28,818	1.0%
	2033	~~23,592~~	24,393	1.0%	~~1,456~~	1,437	1.0%	~~2,152~~	2,136	1.0%	218	1.0%	132	0.3%	250	1.5%	530	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~28,344~~	29,109	1.0%
	2034	~~23,828~~	24,637	1.0%	~~1,470~~	1,451	1.0%	~~2,174~~	2,157	1.0%	221	1.0%	132	0.3%	254	1.5%	538	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~28,630~~	29,403	1.0%
	2035	~~24,067~~	24,883	1.0%	~~1,485~~	1,466	1.0%	~~2,195~~	2,179	1.0%	223	1.0%	132	0.3%	258	1.5%	546	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~28,919~~	29,700	1.0%
	2036	~~24,307~~	25,132	1.0%	~~1,500~~	1,480	1.0%	~~2,217~~	2,200	1.0%	225	1.0%	133	0.3%	261	1.5%	554	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~29,211~~	30,000	1.0%
	2037	~~24,550~~	25,383	1.0%	~~1,515~~	1,495	1.0%	~~2,240~~	2,222	1.0%	227	1.0%	133	0.3%	265	1.5%	562	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~29,506~~	30,303	1.0%
	2038	~~24,796~~	25,637	1.0%	~~1,530~~	1,510	1.0%	~~2,262~~	2,245	1.0%	230	1.0%	133	0.3%	269	1.5%	571	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~29,804~~	30,609	1.0%
	2039	~~25,044~~	25,894	1.0%	~~1,545~~	1,525	1.0%	~~2,285~~	2,267	1.0%	232	1.0%	134	0.3%	273	1.5%	579	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~30,106~~	30,918	1.0%
	2040	~~25,294~~	26,153	1.0%	~~1,561~~	1,540	1.0%	~~2,307~~	2,290	1.0%	234	1.0%	134	0.3%	278	1.5%	588	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~30,410~~	31,230	1.0%
	2041	~~25,547~~	26,414	1.0%	~~1,576~~	1,556	1.0%	~~2,330~~	2,313	1.0%	236	1.0%	134	0.3%	282	1.5%	597	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~30,717~~	31,546	1.0%
	2042	~~25,803~~	26,678	1.0%	~~1,592~~	1,571	1.0%	~~2,354~~	2,336	1.0%	239	1.0%	135	0.3%	286	1.5%	606	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~31,027~~	31,864	1.0%
	2043	~~26,061~~	26,945	1.0%	~~1,608~~	1,587	1.0%	~~2,377~~	2,359	1.0%	241	1.0%	135	0.3%	290	1.5%	615	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~31,341~~	32,186	1.0%
	2044	~~26,321~~	27,214	1.0%	~~1,624~~	1,603	1.0%	~~2,401~~	2,383	1.0%	244	1.0%	135	0.3%	295	1.5%	624	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~31,658~~	32,512	1.0%
	2045	~~26,585~~	27,487	1.0%	~~1,640~~	1,619	1.0%	~~2,425~~	2,407	1.0%	246	1.0%	136	0.3%	299	1.5%	633	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~31,978~~	32,840	1.0%
	2046	~~26,850~~	27,762	1.0%	~~1,657~~	1,635	1.0%	~~2,449~~	2,431	1.0%	249	1.0%	136	0.3%	303	1.5%	643	1.5%	2	0.0%	12	0.0%	4	0.0%	8	0.0%	~~32,301~~	33,172	1.0%

Table 4-12. Meter Growth Forecast

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	Year	Residential			Multi-Family			Commercial and Industrial			Government			Farms			Irrigation			Fire Protection			Resale			Other			Total			Metered Consumption		Production Requirements	
		Meter Quantity	Annual Usage (MG)	GPD/M (ERU value)	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Meter Quantity	Annual Usage (MG)	ERU Quantity	Average Day Demand (ADD)	Maximum Day Demand (MDD)	Avgerage Day Demand (ADD)	Maximum Day Demand (MDD)
Actual Original	2007	18,792	1152.01	167	1,223	415.30	6,774	1,752	702.03	11,452	175	72.56	1,184	124	119.37	1,947	174	141.84	2,314	150	0.78	13	4	38.50	628	10	8.38	137	22,404	2,650.77	43,240	7.24	15.19	8.05	16.88
	2008	19,048	1112.84	160	1,220	408.38	6,990	1,764	733.55	12,556	182	68.65	1,175	123	127.85	2,188	179	107.10	1,833	106	97.59	1,670	4	32.00	548	10	6.99	120	22,636	2,694.95	46,128	7.36	11.88	8.01	12.93
	2009	19,232	1211.59	172	1,222	421.17	6,685	1,770	736.79	11,695	182	74.36	1,180	125	125.58	1,993	183	118.12	1,875	130	0.41	7	4	40.76	647	10	7.68	122	22,858	2,736.47	43,437	7.48	13.31	7.95	14.16
	2010	19,324	1135.45	161	1,222	403.20	6,862	1,763	746.47	12,704	187	74.98	1,276	124	119.78	2,039	184	81.16	1,381	80	0.49	8	2	35.76	609	9	5.70	97	22,895	2,602.98	44,300	7.11	12.01	7.92	13.37
	2011	19,363	1062.23	150	1,217	388.35	7,079	1,760	731.97	13,343	186	60.07	1,095	126	118.18	2,154	181	74.45	1,357	93	0.47	9	2	33.43	609	10	82.42	1,502	22,938	2,551.55	46,511	6.97	11.52	7.74	12.79
	2012	19,469	1084.05	152	1,209	387.49	6,959	1,776	759.55	13,641	186	65.45	1,175	124	115.46	2,074	182	81.24	1,459	103	0.28	5	2	32.79	589	12	7.90	142	23,063	2,534.21	45,513	6.92	11.00	7.98	12.68
		2007-2012 Average:		160.302																															
	2013	19,566	23,255	~~1147.58~~ 1081.47	~~160.3~~ 127.1	~~1,215~~ 1,209	~~402.73~~ 397.36	~~6,864~~ 8,544	~~1,785~~ 1,739	~~743.69~~ 803.04	~~12,676~~ 17,268	188	71.24	1,214	124	120.71	2,057	183	102.05	1,739	104	0.46	8	2	35.54	606	12	7.43	127	~~23,179~~ 26,816	~~2,631.41~~ 2,619.29	~~44,857~~ 31,690	~~7.19~~ 7.16	~~12.44~~ 12.38	8.08	13.98
Original Forecast / Updated Actual	2014	~~19,723~~ 21,405	~~1156.76~~ 1097.62	~~160.3~~ 140.1	~~1,225~~ 1,209	~~405.95~~ 397.79	~~6,919~~ 7,757	~~1,799~~ 1,747	~~749.64~~ 769.56	~~12,777~~ 15,007	190	72.00	1,227	125	121.69	2,074	186	103.72	1,768	106	0.47	8	2	35.54	606	12	7.43	127	~~23,368~~ 24,982	~~2,653.18~~ 2,605.81	~~45,228~~ 28,714	~~7.25~~ 7.12	~~12.54~~ 12.32	~~8.05~~ 7.95	~~13.93~~ 13.76
	2015	~~19,881~~ 20,383	~~1166.01~~ 1163.19	~~160.3~~ 155.9	~~1,235~~ 1,227	~~409.19~~ 404.82	~~6,974~~ 7,094	~~1,814~~ 1,842	~~755.64~~ 730.44	~~12,879~~ 12,800	190	72.00	1,227	128	124.61	2,124	201	112.08	1,910	382	1.69	29	2	35.54	606	12	7.43	127	~~23,844~~ 24,367	~~2,684.18~~ 2,651.79	~~45,757~~ 26,072	~~7.33~~ 7.25	~~12.69~~ 12.53	~~8.06~~ 8.01	~~13.94~~ 13.87
	2016	~~20,040~~ 20,587	~~1175.34~~ 1108.41	~~160.3~~ 147.1	~~1,244~~ 1,232	~~412.47~~ 369.84	~~7,030~~ 6,869	~~1,828~~ 1,844	~~761.68~~ 803.87	~~12,982~~ 14,931	192	72.75	1,240	125	121.69	2,074	199	110.97	1,891	396	1.75	30	2	35.54	606	12	7.43	127	~~24,038~~ 24,589	~~2,699.61~~ 2,632.24	~~46,020~~ 27,914	~~7.38~~ 7.19	~~12.76~~ 12.44	~~8.11~~ 8.06	~~14.02~~ 13.95
	2017	~~20,200~~ 20,762	~~1184.74~~ 1166.87	~~160.3~~ 153.6	~~1,246~~ 1,234	~~413.14~~ 371.37	~~7,042~~ 6,608	~~1,843~~ 1,837	~~767.78~~ 724.18	~~13,086~~ 12,885	189	71.62	1,221	123	119.74	2,041	200	111.52	1,901	411	1.82	31	2	35.54	606	12	7.43	127	~~24,226~~ 24,770	~~2,713.32~~ 2,610.08	~~46,254~~ 25,572	~~7.41~~ 7.13	~~12.83~~ 12.34	~~8.15~~ 7.70	~~14.09~~ 13.32
Current	2018	~~20,362~~ 21,035	~~1194.22~~ 1139.65	~~160.3~~ 148.0	~~1,256~~ 1,247	~~416.44~~ 356.99	~~7,098~~ 6,589	~~1,857~~ 1,846	~~773.92~~ 694.20	~~13,191~~ 12,813	189	71.62	1,221	124	120.71	2,057	203	113.20	1,929	420	1.86	32	2	35.54	606	12	7.43	127	~~24,425~~ 25,078	~~2,734.93~~ 2,541.18	~~46,622~~ 25,522	~~7.47~~ 6.94	~~12.93~~ 12.01	~~8.21~~ 7.65	~~14.21~~ 13.23
	2019	~~20,525~~ 21,221	~~1203.77~~ 1112.01	~~160.3~~ 143.2	~~1,266~~ 1,250	~~419.77~~ 343.42	~~7,155~~ 6,554	~~1,872~~ 1,858	~~780.11~~ 721.71	~~13,296~~ 13,773	190	72.00	1,227	127	123.63	2,107	203	113.20	1,929	430	1.90	32	2	35.54	606	12	7.43	127	~~24,627~~ 25,293	~~2,757.35~~ 2,530.83	~~47,004~~ 26,498	~~7.53~~ 6.91	~~13.03~~ 11.96	~~8.28~~ 7.60	~~14.32~~ 13.15
		2014-2019 Average:		149.0																															
	2020	~~20,730~~ 21,433	~~1215.81~~ 1134.64	~~160.3~~ 149.0	~~1,279~~ 1,263	~~423.97~~ 382.94	~~7,226~~ 7,023	~~1,891~~ 1,873	~~787.91~~ 745.82	~~13,429~~ 13,678	192	72.72	1,239	127	123.94	2,113	206	114.90	1,958	436	1.93	33	2	35.54	606	12	7.43	127	~~24,876~~ 25,544	~~2,784.14~~ 2,619.84	~~47,461~~ 26,925	~~7.61~~ 7.16	~~13.16~~ 12.38	~~8.36~~ 7.87	~~14.46~~ 13.61
	2021	~~20,937~~ 21,648	~~1227.97~~ 1145.99	~~160.3~~ 149.0	~~1,292~~ 1,275	~~428.21~~ 386.76	~~7,299~~ 7,093	~~1,910~~ 1,888	~~795.79~~ 751.78	~~13,564~~ 13,787	194	73.44	1,252	128	124.25	2,118	209	116.62	1,988	443	1.96	33	2	35.54	606	12	7.43	127	~~25,127~~ 25,798	~~2,811.21~~ 2,643.77	~~47,922~~ 27,152	~~7.68~~ 7.22	~~13.29~~ 12.50	~~8.44~~ 7.94	~~14.60~~ 13.73
	2022	~~21,146~~ 21,864	~~1240.25~~ 1157.45	~~160.3~~ 149.0	~~1,305~~ 1,288	~~432.49~~ 390.63	~~7,372~~ 7,164	~~1,929~~ 1,903	~~803.75~~ 757.80	~~13,699~~ 13,898	196	74.18	1,264	128	124.56	2,123	212	118.37	2,018	450	1.99	34	2	35.54	606	12	7.43	127	~~25,380~~ 26,054	~~2,838.55~~ 2,667.94	~~48,388~~ 27,382	~~7.76~~ 7.29	~~13.42~~ 12.61	~~8.52~~ 8.01	~~14.74~~ 13.86
	2023	~~21,358~~ 22,083	~~1252.65~~ 1169.02	~~160.3~~ 149.0	~~1,318~~ 1,301	~~436.82~~ 394.54	~~7,445~~ 7,236	~~1,948~~ 1,918	~~811.79~~ 763.86	~~13,836~~ 14,009	198	74.92	1,277	128	124.87	2,128	215	120.14	2,048	456	2.02	34	2	35.54	606	12	7.43	127	~~25,636~~ 26,313	~~2,866.17~~ 2,692.34	~~48,859~~ 27,613	~~7.83~~ 7.36	~~13.55~~ 12.73	~~8.61~~ 8.08	~~14.89~~ 13.98
	2024	~~21,571~~ 22,303	~~1265.18~~ 1180.71	~~160.3~~ 149.0	~~1,331~~ 1,314	~~441.19~~ 398.48	~~7,520~~ 7,308	~~1,968~~ 1,934	~~819.90~~ 769.97	~~13,975~~ 14,121	200	75.67	1,290	129	125.19	2,134	219	121.95	2,078	463	2.05	35	2	35.54	606	12	7.43	127	~~25,895~~ 26,575	~~2,894.08~~ 2,716.98	~~49,335~~ 27,847	~~7.91~~ 7.42	~~13.68~~ 12.84	~~8.69~~ 8.16	~~15.03~~ 14.11
	2025	~~21,787~~ 22,527	~~1277.83~~ 1192.52	~~160.3~~ 149.0	~~1,344~~ 1,327	~~445.60~~ 402.47	~~7,595~~ 7,381	~~1,987~~ 1,949	~~828.10~~ 776.13	~~14,114~~ 14,234	202	76.42	1,303	129	125.50	2,139	222	123.78	2,110	470	2.08	35	2	35.54	606	12	7.43	127	~~26,156~~ 26,839	~~2,922.27~~ 2,741.86	~~49,816~~ 28,083	~~7.98~~ 7.49	~~13.81~~ 12.96	~~8.77~~ 8.23	~~15.18~~ 14.24
	2026	~~22,005~~ 22,752	~~1290.61~~ 1204.45	~~160.3~~ 149.0	~~1,358~~ 1,340	~~450.06~~ 406.49	~~7,671~~ 7,455	~~2,007~~ 1,965	~~836.38~~ 782.34	~~14,256~~ 14,348	204	77.19	1,316	129	125.81	2,144	225	125.63	2,141	477	2.11	36	2	35.54	606	12	7.43	127	~~26,420~~ 27,106	~~2,950.75~~ 2,766.99	~~50,301~~ 28,321	~~8.06~~ 7.56	~~13.95~~ 13.08	~~8.86~~ 8.31	~~15.33~~ 14.37
	2027	~~22,225~~ 22,979	~~1303.51~~ 1216.49	~~160.3~~ 149.0	~~1,371~~ 1,354	~~454.56~~ 410.56	~~7,748~~ 7,529	~~2,027~~ 1,980	~~844.75~~ 788.60	~~14,398~~ 14,462	206	77.96	1,329	130	126.13	2,150	229	127.52	2,173	484	2.14	36	2	35.54	606	12	7.43	127	~~26,686~~ 27,376	~~2,979.52~~ 2,792.36	~~50,792~~ 28,562	~~8.14~~ 7.63	~~14.08~~ 13.20	~~8.95~~ 8.38	~~15.48~~ 14.50
	2028	~~22,447~~ 23,209	~~1316.55~~ 1228.66	~~160.3~~ 149.0	~~1,385~~ 1,367	~~459.10~~ 414.66	~~7,825~~ 7,605	~~2,048~~ 1,996	~~853.19~~ 794.91	~~14,542~~ 14,578	208	78.74	1,342	130	126.44	2,155	232	129.43	2,206	492	2.17	37	2	35.54	606	12	7.43	127	~~26,956~~ 27,648	~~3,008.59~~ 2,817.98	~~51,287~~ 28,804	~~8.22~~ 7.70	~~14.22~~ 13.32	~~9.03~~ 8.46	~~15.63~~ 14.64
	2029	~~22,672~~ 23,441	~~1329.71~~ 1240.94	~~160.3~~ 149.0	~~1,399~~ 1,381	~~463.69~~ 418.81	~~7,903~~ 7,681	~~2,068~~ 2,012	~~861.73~~ 801.27	~~14,688~~ 14,695	210	79.53	1,355	130	126.76	2,161	236	131.37	2,239	499	2.20	38	2	35.54	606	12	7.43	127	~~27,228~~ 27,923	~~3,037.96~~ 2,843.85	~~51,788~~ 29,050	~~8.30~~ 7.77	~~14.36~~ 13.44	~~9.12~~ 8.54	~~15.78~~ 14.77
	2030	~~22,899~~ 23,676	~~1343.01~~ 1253.35	~~160.3~~ 149.0	~~1,413~~ 1,395	~~468.33~~ 423.00	~~7,982~~ 7,758	~~2,089~~ 2,028	~~870.34~~ 807.68	~~14,834~~ 14,812	212	80.32	1,369	131	127.08	2,166	239	133.34	2,273	507	2.24	38	2	35.54	606	12	7.43	127	~~27,503~~ 28,201	~~3,067.63~~ 2,869.97	~~52,293~~ 29,297	~~8.38~~ 7.84	~~14.50~~ 13.57	~~9.21~~ 8.62	~~15.93~~ 14.91
	2031	~~23,128~~ 23,912	~~1356.44~~ 1265.89	~~160.3~~ 149.0	~~1,427~~ 1,409	~~473.01~~ 427.23	~~8,062~~ 7,835	~~2,110~~ 2,044	~~879.05~~ 814.14	~~14,983~~ 14,931	214	81.13	1,383	131	127.39	2,171	243	135.34	2,307	514	2.27	39	2	35.54	606	12	7.43	127	~~27,780~~ 28,481	~~3,097.60~~ 2,896.35	~~52,804~~ 29,547	~~8.46~~ 7.91	~~14.64~~ 13.69	~~9.30~~ 8.70	~~16.09~~ 15.04
	2032	~~23,359~~ 24,151	~~1370.01~~ 1278.55	~~160.3~~ 149.0	~~1,441~~ 1,423	~~477.74~~ 431.50	~~8,143~~ 7,913	~~2,131~~ 2,061	~~887.84~~ 820.65	~~15,133~~ 15,050	216	81.94	1,397	131	127.71	2,177	246	137.37	2,341	522	2.31	39	2	35.54	606	12	7.43	127	~~28,061~~ 28,764	~~3,127.88~~ 2,922.99	~~53,321~~ 29,799	~~8.55~~ 7.99	~~14.78~~ 13.82	~~9.39~~ 8.78	~~16.25~~ 15.18
	2033	~~23,592~~ 24,393	~~1383.71~~ 1291.33	~~160.3~~ 149.0	~~1,456~~ 1,437	~~482.52~~ 435.82	~~8,224~~ 7,993	~~2,152~~ 2,077	~~896.72~~ 827.22	~~15,284~~ 15,171	218	82.76	1,411	132	128.03	2,182	250	139.43	2,377	530	2.34	40	2	35.54	606	12	7.43	127	~~28,344~~ 29,051	~~3,158.47~~ 2,949.89	~~53,842~~ 30,054	~~8.63~~ 8.06	~~14.93~~ 13.94	~~9.48~~ 8.86	~~16.41~~ 15.32
	2034	~~23,828~~ 24,637	~~1397.54~~ 1304.24	~~160.3~~ 149.0	~~1,470~~ 1,451	~~487.35~~ 440.17	~~8,306~~ 8,073	~~2,174~~ 2,094	~~905.68~~ 833.84	~~15,437~~ 15,292	221	83.58	1,425	132	128.35	2,188	254	141.52	2,412	538	2.37	40	2	35.54	606	12	7.43	127	~~28,630~~ 29,340	~~3,189.37~~ 2,977.05	~~54,369~~ 30,311	~~8.71~~ 8.13	~~15.16~~ 14.07	~~9.58~~ 8.94	~~16.57~~ 15.46
	2035	~~24,067~~ 24,883	~~1411.52~~ 1317.29	~~160.3~~ 149.0	~~1,485~~ 1,466	~~492.22~~ 444.58	~~8,390~~ 8,153	~~2,195~~ 2,111	~~914.74~~ 840.51	~~15,591~~ 15,414	223	84.42	1,439	132	128.67	2,193	258	143.65	2,448	546	2.41	41	2	35.54	606	12	7.43	127	~~28,919~~ 29,632	~~3,220.59~~ 3,004.48	~~54,901~~ 30,570	~~8.80~~ 8.21	~~15.31~~ 14.20	~~9.67~~ 9.02	~~16.73~~ 15.61
	2036	~~24,307~~ 25,132	~~1425.63~~ 1330.46	~~160.3~~ 149.0	~~1,500~~ 1,480	~~497.14~~ 449.02	~~8,473~~ 8,235	~~2,217~~ 2,128	~~923.89~~ 847.23	~~15,747~~ 15,538	225	85.26	1,453	133	128.99	2,199	261	145.80	2,485	554	2.45	42	2	35.54	606	12	7.43	127	~~29,211~~ 29,927	~~3,252.13~~ 3,032.18	~~55,439~~ 30,833	~~8.89~~ 8.28	~~15.46~~ 14.33	~~9.76~~ 9.10	~~16.89~~ 15.75
	2037	~~24,550~~ 25,383	~~1439.89~~ 1343.76	~~160.3~~ 149.0	~~1,515~~ 1,495	~~502.11~~ 453.51	~~8,558~~ 8,317	~~2,240~~ 2,145	~~933.13~~ 854.01	~~15,905~~ 15,662	227	86.12	1,468	133	129.32	2,204	265	147.99	2,522	562	2.48	42	2	35.54	606	12	7.43	127	~~29,506~~ 30,225	~~3,284.00~~ 3,060.15	~~55,982~~ 31,097	~~8.97~~ 8.36	~~15.61~~ 14.46	~~9.86~~ 9.19	~~17.06~~ 15.90
	2038	~~24,796~~ 25,637	~~1454.29~~ 1357.20	~~160.3~~ 149.0	~~1,530~~ 1,510	~~507.13~~ 458.05	~~8,644~~ 8,400	~~2,262~~ 2,162	~~942.46~~ 860.84	~~16,064~~ 15,787	230	86.98	1,482	133	129.64	2,210	269	150.21	2,560	571	2.52	43	2	35.54	606	12	7.43	127	~~29,804~~ 30,526	~~3,316.19~~ 3,088.40	~~56,531~~ 31,364	~~9.06~~ 8.44	~~15.77~~ 14.60	~~9.96~~ 9.27	~~17.23~~ 16.04
	2039	~~25,044~~ 25,894	~~1468.83~~ 1370.77	~~160.3~~ 149.0	~~1,545~~ 1,525	~~512.20~~ 462.63	~~8,730~~ 8,484	~~2,285~~ 2,179	~~951.88~~ 867.73	~~16,224~~ 15,914	232	87.85	1,497	134	129.96	2,215	273	152.46	2,599	579	2.56	44	2	35.54	606	12	7.43	127	~~30,106~~ 30,830	~~3,348.71~~ 3,116.92	~~57,085~~ 31,634	~~9.15~~ 8.52	~~15.92~~ 14.73	~~10.05~~ 9.36	~~17.39~~ 16.19
	2040	~~25,294~~ 26,153	~~1483.52~~ 1384.48	~~160.3~~ 149.0	~~1,561~~ 1,540	~~517.33~~ 467.25	~~8,817~~ 8,569	~~2,307~~ 2,196	~~961.40~~ 874.67	~~16,386~~ 16,041	234	88.73	1,512	134	130.29	2,221	278	154.75	2,638	588	2.60	44	2	35.54	606	12	7.43	127	~~30,410~~ 31,137	~~3,381.57~~ 3,145.73	~~57,645~~ 31,906	~~9.24~~ 8.59	~~16.08~~ 14.87	~~10.15~~ 9.44	~~17.56~~ 16.34
	2041	~~25,547~~ 26,414	~~1498.35~~ 1398.33	~~160.3~~ 149.0	~~1,576~~ 1,556	~~522.50~~ 471.93	~~8,906~~ 8,655	~~2,330~~ 2,214	~~971.01~~ 881.67	~~16,550~~ 16,169	236	89.61	1,527	134	130.61	2,226	282	157.07	2,677	597	2.64	45	2	35.54	606	12	7.43	127	~~30,717~~ 31,447	~~3,414.77~~ 3,174.82	~~58,211~~ 32,181	~~9.33~~ 8.67	~~16.23~~ 15.01	~~10.25~~ 9.53	~~17.74~~ 16.49
	2042	~~25,803~~ 26,678	~~1513.34~~ 1412.31	~~160.3~~ 149.0	~~1,592~~ 1,571	~~527.73~~ 476.65	~~8,995~~ 8,741	~~2,354~~ 2,232	~~980.72~~ 888.72	~~16,716~~ 16,299	239	90.51	1,543	135	130.94	2,232	286	159.42	2,717	606	2.68	46	2	35.54	606	12	7.43	127	~~31,027~~ 31,760	~~3,448.30~~ 3,204.19	~~58,783~~ 32,459	~~9.42~~ 8.75	~~16.39~~ 15.15	~~10.35~~ 9.62	~~17.91~~ 16.64
	2043	~~26,061~~ 26,945	~~1528.47~~ 1426.43	~~160.3~~ 149.0	~~1,608~~ 1,587	~~533.00~~ 481.41	~~9,085~~ 8,829	~~2,377~~ 2,250	~~990.53~~ 895.83	~~16,883~~ 16,429	241	91.41	1,558	135	131.27	2,237	290	161.82	2,758	615	2.72	46	2	35.54	606	12	7.43	127	~~31,341~~ 32,077	~~3,482.19~~ 3,233.85	~~59,360~~ 32,739	~~9.51~~ 8.84	~~16.55~~ 15.29	~~10.46~~ 9.71	~~18.09~~ 16.80
	2044	~~26,321~~ 27,214	~~1543.76~~ 1440.70	~~160.3~~ 149.0	~~1,624~~ 1,603	~~538.33~~ 486.23	~~9,176~~ 8,917	~~2,401~~ 2,268	~~1000.44~~ 903.00	~~17,052~~ 16,560	244	92.33	1,574	135	131.60	2,243	295	164.24	2,799	624	2.76	47	2	35.54	606	12	7.43	127	~~31,658~~ 32,396	~~3,516.42~~ 3,263.81	~~59,944~~ 33,022	~~9.61~~ 8.92	~~16.72~~ 15.43	~~10.56~~ 9.80	~~18.27~~ 16.95
	2045	~~26,585~~ 27,487	~~1559.19~~ 1455.10	~~160.3~~ 149.0	~~1,640~~ 1,619	~~543.72~~ 491.09	~~9,267~~ 9,006	~~2,425~~ 2,286	~~1010.44~~ 910.22	~~17,222~~ 16,693	246	93.25	1,589	136	131.93	2,249	299	166.71	2,841	633	2.80	48	2	35.54	606	12	7.43	127	~~31,978~~ 32,719	~~3,551.00~~ 3,294.06	~~60,533~~ 33,308	~~9.70~~ 9.00	~~16.88~~ 15.57	~~10.66~~ 9.89	~~18.44~~ 17.11
	2046	~~26,850~~ 27,762	~~1574.79~~ 1469.65	~~160.3~~ 149.0	~~1,657~~ 1,635	~~549.15~~ 496.00	~~9,360~~ 9,096	~~2,449~~ 2,304	~~1020.55~~ 917.50	~~17,395~~ 16,826	249	94.18	1,605	136	132.26	2,254	303	169.21	2,884	643	2.84	48	2	35.54	606	12	7.43	127	~~32,301~~ 33,045	~~3,585.94~~ 3,324.61	~~61,129~~ 33,596	~~9.80~~ 9.08	~~17.05~~ 15.71	~~10.77~~ 9.98	~~18.63~~ 17.27

Table 4-13. Water Consumption Growth Forecast with Conservation

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4.3.2 System Demand Forecast

The water demand is calculated in the same manner as the 2013 WSP, which is based on the system demand and not customer consumption.

Distribution system leakage is down since the 2013 WSP from 13.3% to 8.4% (rolling 3-year average, 2017 to 2019). The District's goal will continue to maintain distribution system leakage of 10% or less in the following years.

Table 4-13 shows the customer consumption of the Judy System for each year, as well as the system demand requirements, which is the overall water demand. For 2019, the total metered customer consumption was 6.91 MGD, whereas the actual water system demand requirement was determined to be 7.60 MGD.

The average yearly Maximum Day peaking factor of 1.73 has not changed from the District's 2013 WSP.

4.3.4 System Demand Summary

Table 4-14 shows the updated water system demand forecast based on the data discussed in this chapter and accounting for water use efficiency measures. Results from Tables 4-12 and 4-13 for the first year and last year during this amended Water Use Efficiency Plan period are as follows:

Table 4-14. Updated Water Demand Summary

Year	Period	Updated Demand w/out Conservation (MGD)	Updated Demand w/ Conservation (MGD)
2020	Avg Day Demand	7.90	7.90
2024	Avg Day Demand	8.19	8.18

The efficiency measures that can be quantified do not make a significant impact on the overall Average Day Demand (ADD). However, there are some other measures, see Table 5-5, that will be implemented that are not quantifiable but will help reduce the ADD. Those efficiency measures cannot be quantified and therefore, are not included in the calculations for the water system demand summary.

The water treatment plant treatment capacity of 24 mgd has not been revised from the 2013 WSP (section 2.6.2), however section 10.1.1.8 of this limited update describes how the filter loading rates limit the WTP's firm capacity to 21 mgd. Figure 4-3 displays the updated demand forecast for this limited update tracking below the values forecasted by the 2013 WSP. The water rights total of 35.8 mgd (26.56 mgd/40.1 cfs not subject to Skagit River instream flows) and water treatment capacity of 21 mgd are sufficient to address the updated 2041 MDD of 16.49 mgd described in Table 4-13. In

2020, the District completed a WTP condition assessment. One product of that study is a list of prioritized future capital improvements that will increase the capacity and meet any potential regulatory changes in the future. Most of the projects are moved out of the planning horizon in this limited update.

Figure 4-3 shows the updated projected Average Day Demand and Maximum Day Demand of the Judy System during the next 20-year reporting period.

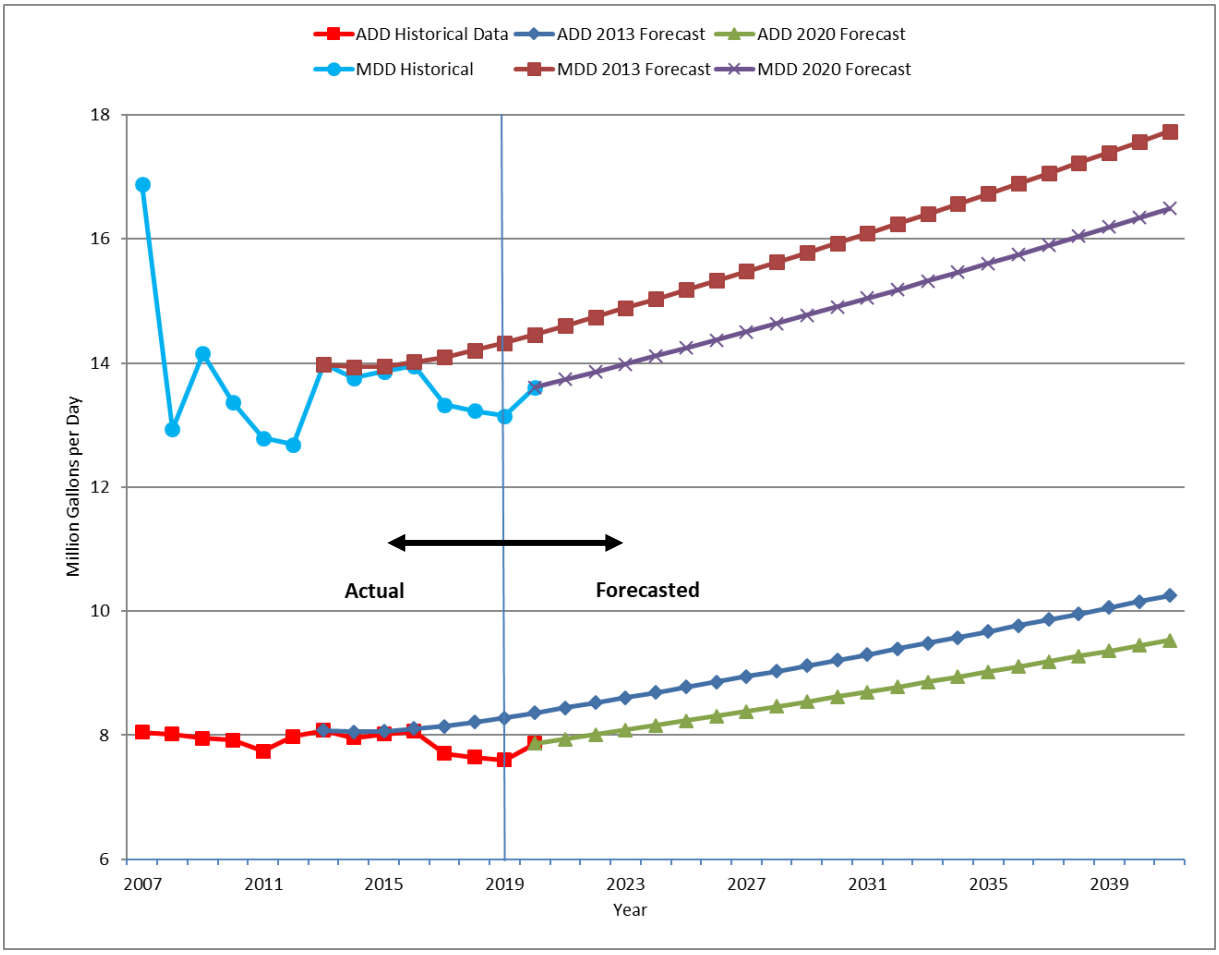

Figure 4-3. Consumption Forecast Summary (With Conservation)

5 WATER USE EFFICIENCY

The following sections are amended:

5.3.1 Goals
5.3.2 Measures
5.3.3 Estimated Savings
5.3.4 Effect on Demand

Tables 5-5 and 5-6 have been revised.

The District is extending its Water Use Efficiency program for this Limited WSP update through 2024.

5.3 2020-2024 Water Use Efficiency Program

5.3.1 Goals

1. **Save a total of 4.29 million gallons of water by 2024**
2. **Keep distribution system leakage (DSL) to 10% or less of total water produced per year.**

5.3.2 Measures

The District's conservation program for 2020–2024 consists of the same ten measures as listed in the2013 WSP and Table 5-4. All measures will be implemented during Years 1-4 of the updated plan. The program reflects a continuation of the measures in the District's 2014–2019 program.

Table 5-4. 2020–2024 Water Use Efficiency Measures

Measure Number	Measure	New/ Existing
1	Public Outreach	Existing
2	Indoor Retrofit Kits	Existing
3	Shower Timers	Existing
4	School Outreach	Existing
5	Toilet Leak Kits	Existing
6	Soil Moisture Meters	Existing
7	Rain Barrel Program	Existing
8	System Leak Detection & Repair	Existing
9	Bill Showing Consumption History	Existing
10	Large Meter Testing	Existing

5.3.3 Estimated Savings

The estimated savings and costs of the conservation program are shown in the updated Table 5-5. At full program implementation at the end of 2024 (five-year total), it is estimated that the program will have saved approximately 4.29 million gallons.

The program will be funded through rate increases and is included in the updated budget discussed in Chapter 11. The savings achieved by the program, and the corresponding progress toward reaching the District's savings goal, will be estimated by tracking the number of devices distributed and multiplying them by their per-unit savings.

Table 5-5. Estimated Savings Achieved by 2020–2024 WUE Program

Measure	Estimated Average Annual Savings (gallons per year)				
	2020	2021	2022	2023	2024
Public Outreach	N/Q	N/Q	N/Q	N/Q	N/Q
Indoor Retrofit Kits	265,020	530,040	795,060	1,060,080	1,325,100
Shower Timers	N/Q	N/Q	N/Q	N/Q	N/Q
School Outreach	N/Q	N/Q	N/Q	N/Q	N/Q
Toilet Leak Kits	N/Q	N/Q	N/Q	N/Q	N/Q
Soil Moisture Meters	N/Q	N/Q	N/Q	N/Q	N/Q
Rain Barrel Program	21,000	42,000	63,000	84,000	105,000
System Leak Detection & Repair	N/Q	N/Q	N/Q	N/Q	N/Q
Bill Showing Consumption History	N/Q	N/Q	N/Q	N/Q	N/Q
Large Meter Testing	N/Q	N/Q	N/Q	N/Q	N/Q
Annual Total	286,020	572,040	858,060	1,144,080	1,430,100
Cumulative Total	--	--	--	--	4,290,300

*N/Q = Not Quantifiable

2020–2024 WUE Program Measure Assumptions

The numbers listed in Table 5-5 are based on the following assumptions:

a. 25 indoor retrofit kits sold per year

b. 80% implementation rate

c. Household use based on 2.52 people per household

d. Shower times based on the national average of 8.2 minutes per shower

e. Showerhead/faucet flow rates multiplied by 0.675 to obtain average actual flow rates

f. Showerheads/faucets, post 1994 rated at 2.5 gallons per minutes

g. 35 rain barrels sold/distributed per year

h. Rain barrel turnover rate at 11 times per year

5.3.4 Effect on Consumption

It is anticipated that the conservation program will be implemented evenly over the 4-year extended planning period; that is, one-fourth of the devices will be sold each year with savings accumulating over time. The cumulative annual savings, as well as its relationship to the consumption forecast, is provided in Table 5-6.

Table 5-6. Updated Savings Schedule and Impact on Average Demand

Year	Projected Consumption without Conservation (ADD gpd)	Cumulative Annual Savings (gal. per year)	Projected Consumption with Conservation (ADD gpd)	Consumption Reduction (Percent)
2020	7,897,723	286,020	7,896,942	0.01%
2021	7,969,793	572,040	7,968,230	0.019%
2022	8,042,566	858,060	8,040,222	0.029%
2023	8,116,049	1,144,080	8,112,923	0.039%
2024	8,190,249	1,430,100	8,186,342	0.048%

ADD=Average Day Demand; gpd=gallons per day

6 System Analysis

The following sections are amended:

6.2 Right Analysis

Table 6-3 has been updated

6.2 Water Right Analysis

As described in Chapter 4, the current (2019) ADD is 7.60 MGD, which equates to 8,536 acre-feet per year (afy), with a MDD of 13.14 MGD, which equates to 20.33 cubic feet per second (cfs) on a continuous basis. The updated 20-year (2041) forecast indicates an ADD of 9.57 MGD, which equates to 10,749 afy, and an MDD of 16.55 MGD, which equates to 25.61 cfs on a continuous basis. The updated forecast at the expiration of the MOA in 2046 indicates an ADD of 10.02 MGD, which equates to 11,255 afy, and an MDD of 17.33 MGD, which equates to 26.81 cfs on a continuous basis.

By comparing the District's water rights to the existing and projected system demands for the 4-year and 20-year planning periods, it can be seen that the District continues to have adequate water rights to meet these projected system demands. The District also has adequate water rights to meet projected system demands at the expiration of the MOA in 2046, however, the water rights will be nearing capacity.

Changes to the District's water rights since the 2013 WSP are described in Chapter 7 and an updated water rights self-assessment form is included in Appendix A. Table 6-3 provides an updated summary of the comparison of water rights to current and forecasted demands.

Unknown factors may result in additional future demand, such as new industrial or residential development beyond what is currently forecasted. The potential for these unknown demand needs has not been factored into the District's current demand forecasting, but any impacts are anticipated to primarily affect demand beyond the 20-year horizon.

Table 6-3. Comparison of Water Rights to Existing and Future Demand

	Existing Water Rights		Existing and Projected Demands			
	Partially Subject to Instream Flow Rules	Exempt from Instream Flow Rules	2012 (Actual)	2019 (~~Forecast~~)/ (Actual)	2041 (Forecast)	2046 (Forecast)
Average Day Demand-ADD (MGD)	35.80	26.56	7.98	~~8.29~~ / 7.60	9.57	10.02
Maximum Day Demand-MDD (MGD)	35.80	26.56	12.68	~~14.33~~ / 13.14	16.55	17.33
Continuous use based on MDD (cfs)	55.39	40.10	19.62	~~22.17~~ / 20.33	25.61	26.81
Annual Withdrawal-Qa (afy)	19,117.4	18,755	8,963	~~9,311~~ / 8,536	10,749	11,255

7 System Reliability, Water Rights, and Source Water Protection

The following sections are replaced:

Introduction
7.3.1 Description of Water Rights

The following sections are amended:

7.5.1 Cultus Mountain Watershed

The following sections are added:

7.2.1 Source of Supply
7.3.3 Water Right Changes
7.3.4 Satellite Water System Place of Use/Service Area Adjustments
7.3.5 Water Right Extension
7.6 Water Resource Alternatives

Tables 7-1 (Judy System Water Rights) and 7-2 (Cumulative Water Rights – Cultus Mountain Diversions) have been revised.

Overview

This chapter provides information about water system reliability, including water rights, water supply, and protection of source waters for the District's water system.

The primary purpose of the District is to provide a sufficient and reliable supply of water to meet the current and projected potable and non-potable demands of District customers, which include manufacturing, industrial, agricultural (e.g. irrigation), and domestic use that occurs within its retail, future, and wholesale service areas. Pursuant to its broad statutory authority under RCW 54 and RCW 90.03.015, the District is defined as a municipal water supplier. Its water rights qualify for municipal water supply purposes due to their beneficial use in serving 15 or more residential customers and governmental and governmental proprietary purposes.

In general terms, the District's water supply is produced from its Judy System and related surface water rights. The District has limited groundwater sources that serve its remote satellite systems, as described in Chapter 12. Emergency/back-up supply for the District's Judy System is provided by multiple interties with the City of Anacortes, as described in Chapter 3.

The District's water supply sources for the Judy System are located on the Skagit River and four Cultus Mountain tributary streams (Gilligan Creek, Mundt Creek, Turner Creek, and Salmon Creek). Water diverted from these tributary sources and the mainstem Skagit River is stored within Judy Reservoir, treated, and then conveyed into the District's water distribution system to serve customers within its designated retail service area, subject to applicable instream flows.

Treatment and transmission of the water are described in Chapter 2 (System Description). Chapter 3 (Related Plans, Agreements, and Policies) describes important agreements such as the 1996 Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for Instream and Out Of Stream Purposes (1996 MOA) and the Joint Operating Agreement between the District and other key parties that affect water use and water rights associated with these sources. This chapter discusses water rights as they relate to water demand, emergency planning, and protection of source waters.

7.2 Source of Supply Analysis

7.2.1 Source of Supply

One of the primary purposes of a water system plan is to ensure that the water system will have sufficient water to meet needs in the foreseeable future. Through the development of a water demand forecast and by comparing it with existing water rights, resource planners can evaluate whether the presently allotted quantity of water will adequately meet expected future growth and demand. This chapter describes the water rights held by the District and shows that the currently allotted quantity of water is sufficient to meet the forecasted demand described in Chapter 4 (Planning Data and Water Demand Forecasting).

A discussion of the comparison of water rights with water demand is provided in Section 6.2. In summary, the District has adequate water rights to meet projected service area demands for 4-year, 10-year, and 26-year planning periods. Consequently, the District has sufficient water rights to meet forecasted demands at the expiration of the 1996 MOA in 2046, which may be extended upon agreement of the parties.

Consistent with the 1996 MOA, the District has gained greater flexibility in the exercise of its Judy System water rights by securing the authority through change applications to add the Skagit River mainstem pump station as an additional point of diversion for its Cultus Mountain tributary water rights. In the same context, the District has also secured approval to change certain groundwater rights to allow surface water diversions from the same Skagit River source. Information regarding the District's water right changes is described in Section 7.3.3.

Table 7-1 lists all of the District's permits, claims, certificates, and pending water right applications relating to its Judy System. As previously noted, all the Judy System water rights constitute rights for municipal water supply purposes in accordance with the Municipal Water Law and are being applied to beneficial use (RCW 90.03.015).

Surface Water Characteristics: Judy Reservoir Source

Judy Reservoir lies in a natural basin, through which Janicki Creek once flowed. The Judy Reservoir system obtains its water from four streams in the Cultus Mountain watershed (Gilligan Creek, Salmon Creek, Turner Creek, and Mundt Creek) and the mainstem Skagit River. The Cultus Mountain watershed starts about two miles due east of Clear Lake. All the streams in the watershed drain eventually to the Skagit River and are subject to instream flows.

Water is collected from the four Cultus Mountain streams at diversion structures and transported to Judy Reservoir through two collector pipelines. The diversion structures are set up on a bypass system, allowing water to flow past the diversion. Instream Flows set by Rule under WAC 173-503 limit the diversion quantities available from each stream based on the month of the year. When the water measured on Cultus tributary gauges does not meet these minimum flows, the District can divert water from its point of diversion on the Skagit River.

With the increase in Judy Reservoir's capacity and a combination of stream flows and river pumping to replenish drawdown, the reservoir has greater potential to stay full during the year and provide more readily available capacity for emergencies.

In 1990, as the Safe Drinking Water Act gained momentum, the District constructed a new filtration plant to meet new treatment requirements. This plant features direct filtration and chlorine dioxide treatment followed by chlorination before distribution. Prior to constructing the filtration plant, the utility needed to treat Judy Reservoir with copper sulfate to kill algae. Unfortunately, that left a slight odor in the water and upset the algae population's natural food chain. After the filtration went online, the District discontinued copper sulfate and allowed the algae to grow naturally. The filtration process now removes all algae.

To address our area's growing and changing needs, the District doubled its water filter plant's capacity at Judy Reservoir in 2009. Along with this expansion, the District constructed a new pumping station on the Skagit River to augment flows from the Cultus tributary, which had been the primary source for our water supply. Pulling water from the Skagit River enables the District to fill Judy Reservoir when fish protection requirements limit diversions from the streams.

The District holds water rights to all Cultus Mountain streams, the Skagit River, two groundwater wells, and the Judy Reservoir storage. Under present and projected operational conditions, the Judy System has sufficient capacity to meet District water needs for at least 50 years.

Hydrogeologic/Groundwater Characteristics

The Skagit River occupies a large, relatively flat alluvial valley that is bounded to the south and east by upland and mountainous terrain. The alluvial valley primarily is underlain by fluvial sand and gravel deposits, and locally preserved lahar runout deposits. Upland areas contain laterally discontinuous bodies of glacial (till and outwash) and interglacial (fluvial and lacustrine) deposits of varying thickness that reflect both terrestrial and shallow marine depositional environments.

Groundwater in unconsolidated aquifers generally flows towards the northwest and west in the direction of the Skagit River and Puget Sound. This generalized flow pattern is likely complicated by the presence of low-permeability confining units that separate discontinuous bodies of aquifer material and act as local groundwater-flow barriers.

Groundwater-flow directions in the sedimentary aquifer likely reflect local topographic relief (radial flow from bedrock highs) and more regional westward flow from the mountains to the Puget Sound. The largest groundwater-level fluctuations observed during the monitoring period (October 2006 through September 2008) occurred in wells completed in the sedimentary aquifer and ranged from about 3 to 27 feet. Water levels in wells completed in unconsolidated hydrogeologic units exhibited seasonal variations ranging from less than 1 to about 10 feet.

The groundwater system within the subbasins received an average (September 1, 2006 to August 31, 2008) of about 92,400 acre-feet or about 18 inches of recharge from precipitation a year. Most of this recharge (65 percent) discharges to creeks, and only about 3 percent is withdrawn from wells. The remaining groundwater recharge (32 percent) leaves the subbasin groundwater system as discharge to the Skagit River and Puget Sound. The groundwater system is capable of providing existing and future reliable water supply for the District's satellite water systems.

7.3 Water Rights Evaluation

7.3.1 Description of Water Rights

The District currently holds nine water right certificates and five water rights in permit status for its Judy System due to the processing of MOA-based change applications for the Judy System, as shown in Table 7-1 and discussed in this chapter. These water right applications, certificates, and changes were documented as part of the 1996 MOA, which is discussed in Chapter 3 (Related Plans, Agreements, and Policies). An additional 7 claims and applications are currently in standby status. Two of these standby water rights (CG1-00128C and G1-25755C) have been temporarily donated to the Washington State Trust Water Right Program.

The signatories of the 1996 MOA agreed not to challenge the District's water rights or water right changes documented in the MOA for a 50-year period from the date of signing. The 1996 MOA also resulted in the establishment of the Skagit River Basin Instream Resources Protection Program Rule in 2001. This rule established instream flows[1] for the mainstem Skagit River and the Cultus Mountain streams (Gilligan Creek, Mundt Creek, Salmon Creek, and Turner Creek).

The river and stream water rights described in the 1996 MOA total a maximum instantaneous quantity[2] (Qi) of 35.8 million gallons per day (MGD). Withdrawals from the streams are subject to instream flow rules. Under the 1996 MOA, withdrawals from the river above an instantaneous quantity of 42.59 cfs are subject to the Skagit River instream flow rules. Under an agreement reached with Ecology in 2020 regarding the District's Mundt Creek water right, the above Qi total of 42.59 cfs was reduced to 40.10 cfs. The 1996 MOA in its entirety is provided in Appendix H, and the cumulative water rights for the Cultus Mountain streams are detailed in Table 7-2.

The District's surface water rights authorize a total additive (non-storage) annual quantity (Qa) of 23,417.4 afy, which is diverted from the Skagit River mainstem and Cultus Mountain tributaries. This annual quantity limit includes 4,300 afy for reservoir/bypass flushing. The District holds separate additive water rights for storage, which authorize a total impoundment of up to 5,750 afy in Judy Reservoir. Additional information related to the District's water rights, including satellite system

[1] The term "instream flow" is used to identify a specific stream flow needed to protect and preserve instream resources and values such as fish, wildlife, and recreation. An instream flow rule is, in essence, a water right for fish and other instream resources. While an instream flow rule does not affect existing water rights, water rights issued after the rule adoption are junior to the instream flow and can only be exercised when the instream flow is being met.

[2] The term "instantaneous quantity", or "Qi", is used to describe the continuous use of water delivered from a source through a diversion. Qi is measured as a rate of flow over some period, usually quantified in terms of cubic feet per second. Qi values related to this discussion have been converted to million gallons per day (MGD) by multiplying the cubic feet per second value by the number of seconds in a 24-hour period.

groundwater rights, is provided in Appendix J, including copies of the specific documents issued by Ecology.

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Table 7-1. Summary of Judy System Water Rights

Cultus Mountain Surface Water Production Rights*

Source	Document	Priority Date	Additive Qi (cfs)	Additive Qa (afy)	Non-Additive Qa (afy)
Gilligan Creek	SWC 411	10/10/1929	1.5	1,086	
Gilligan Creek	S1-00724C	10/30/1963	7.39	2,614	1,086
Mundt Creek	SWC 26	9/28/1917	2.5	1,810	
Mundt Creek	S1-00737C	10/30/1963	5.5	2,076	1,810
Turner Creek	Claim 9333	Pre-1917	4.3	2,300	
Turner Creek	S1-00739C	10/30/1963	6.2	722	2,300
Salmon Creek	Claim 9332	Pre-1917	1.8	307	
		Total Cultus Mountain Surface Water Production Rights:		**10,915**	

Skagit/Groundwater Production Rights**

Source	Document	Priority Date	Additive Qi (cfs)	Additive Qa (afy)	Non-Additive Qa (afy)
Skagit River Ranney Well	GWP 3350	5/12/1954	8.91	6,400	
Sedro Woolley Well	GWP 2911	3/26/1953	2	1,440	
		Total Skagit/Groundwater Production Rights:		**7,840**	

Storage/Reservoir Rights

Source	Document	Priority Date	Acre-feet
Judy Reservoir	Vol 18, 8738	1/16/1946	1,500
Judy Reservoir	R1-00673C	4/24/1963	4,250
		Total Storage/Reservoir Rights:	**5,750**

Permits-1996 MOA Related**

Source	Document	Priority Date	Additive Qi (cfs)	Additive Qa (afy)	Non-Additive Qa (afy)	Status
Gilligan Creek/Skagit River	S1-25129P	11/16/1987	13.15		3700	Permitted
Mundt Creek/Skagit River	S1-27861	10/22/1997	18.56		3886	Permitted
Turner Creek/Skagit River	S1-27862P	10/22/1997	6.6		3022	Permitted
Salmon Creek/Skagit River	S1-18219P	10/30/1963	4		307	Permitted
Skagit River	S1-27860	10/22/1997	12.8	362	5071	Permitted

Total Additive Non-Storage Annual Production Quantity*: 19,117.4 afy**

Total Storage Rights Quantity (acre-feet stored when reservoir is filled to NOPL): 5,750 af

Total Authorized (1996 MOA)/Additive Instantaneous Quantity***: 55.39 cfs**

Other Certificates and Claims (Standby/Reserve)

Source	Document	Priority Date	Qi (cfs)	Qa (afy)
Rock Springs Creek	Claim 009334	pre-1917	0.2	40
Pigeon Creek	Claim 009335	pre-1917	0.2	40
Unnamed creek	Claim 009336	pre-1917	0.1	20
Cold Springs Creek	Claim 009337	pre-1917	0.2	40
East Fork Nookachamps Creek	Claim 009338	pre-1917	1.1	110
Samish River Park	G1-00128C	7/25/1971	0.33	30
Mountain View	G1-25755C	6/26/1990	41 gpm	3.8

*The Skagit River has been added as an additional source for water rights associated with the Cultus Mtn. streams. Diversions from the stream sources under these water rights are subject to Cultus Mountain Instream Flows.

** Skagit groundwater rights cited below changed to surface water diversions pursuant to 1996 MOA and reverted to permit status per water right changes approved in 2001.

***The District has a total (non-storage) annual quantity limit of 23,417.4 afy from the Cultus Mountain Streams and the Skagit River, including 4,300 afy for reservoir bypass flushing. The District also has additive storage rights totaling 5,750 af.

****Diversions from the stream sources under these water rights are subject to Cultus Mountain Instream Flows and diversions from the Skagit River are subject to Skagit River Instream Flows.

*****1996 Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for Instream and Out of Stream Purposes (1996 MOA). Total combined instantaneous water right available from the river, streams, or a combination of both is 55.39 cfs (35.8 mgd). The District is further authorized under its senior Cultus Mountain and Skagit River water rights and the 1996 MOA to divert a total of 40.10 cfs from the Skagit River when Skagit River instream flows are not being met. The Skagit River has been added as an additional source for water rights associated with the Cultus Mtn. streams

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Table 7-2. Cumulative Water Rights – Cultus Mountain Diversions*

Source	Document	Qi (cfs)	Additive Qa** (afy)
Gilligan Creek	SWC 411	1.5	1,086
	S1-00724C	7.39	2,614
	S1-25129P	13.15	
	Gilligan Creek Subtotal	**22.04**	**3,700**
Mundt Creek	SWC 26	2.5	1,810
	S1-00737C	5.5	2,076
	S1-27861	18.56	
	Mundt Creek Subtotal	**26.56**	**3,886**
Turner Creek	Claim 9333	4.3	2,300
	S1-00739C	6.2	722
	S1-27862P	6.6	
	Turner Creek Subtotal	**17.1**	**3,022**
Salmon Creek	Claim 9332	1.8	307
	S1-18219P	4	
	Salmon Creek Subtotal	**5.8**	**307**

*Subject to the 1996 Memorandum of Agreement Regarding Utilization of Skagit River Basin Water Resources for Instream and Out of Stream Purposes (1996 MOA). Total combined water right available from the river, streams, or a combination of both is 55.39 cfs (35.8 mgd). Withdrawals from the Cultus Mountain Streams (Gilligan, Mundt, Turner, and Salmon Creeks) are subject to Cultus Mountain Instream Flows. The Skagit River has been added as an additional source for water rights associated with the Cultus Mtn. streams

**Total production/additive water right Qa of 19,117.4 afy per S1-00737 excluding additive storage rights of 5,750 afy. The total Qa of 23,417.4 afy authorized pursuant to the ROE/Certificate for S1-00737 (Mundt Creek) includes 4,300 afy of water designated for Judy Reservoir flushing flow.

7.3.3 Water Right Changes

The District has implemented water right changes prescribed and authorized in the 1996 MOA pertaining to its Gilligan Creek, Mundt Creek, Skagit River, Salmon Creek, and Turner Creek surface water sources. These specific changes enable the District to divert authorized instantaneous and annual quantities from either its Cultus Mountain sources or the Skagit mainstem pump station, subject to applicable instream flows being met at either point(s) of diversion, and a 1996 MOA Qi limit of 55.39 cfs/35.80 mgd. The District is further authorized under its senior Cultus Mountain and Skagit River water rights and the 1996 MOA to divert a total of 40.10 cfs from the Skagit River when Skagit River instream flows are not being met. The beneficial use schedule prescribed for all 1996 MOA changes runs to December 23, 2046, which reflects the 50-year term of the MOA.

7.3.3.1 Surface Right Changes: Alternate Points of Diversion and New Permits

Water right changes occurred in 2001 to add the Skagit River as a second source to the existing Cultus Mountain tributary water rights, and are described in Table 7-1 (SWC 411, S1-00724C, SWC 26, S1-00737C, Claim 9333, S1-00739C, Claim 9332). Diversions from the Cultus Mountain stream sources under these water rights are subject to Cultus Mountain Instream Flows, and diversions from the Skagit River under these water rights are not subject to minimum instream flows.

The changes described below are distinct and separate from the water right changes that occurred in 2001 to add the Skagit River as a second source to the existing Cultus Mountain tributary water rights and changing existing groundwater rights for use at the Skagit pump station. In this regard, the primary purpose of these water right changes was to achieve the full hydraulic capacity of the Cultus Mountain stream diversion facilities when applicable instream flows are being met. For the water right changes described below, diversions from the Cultus Mountain streams are subject to Cultus Mountain Instream Flows and diversions from the Skagit River are subject to Skagit River Instream Flows.

GILLIGAN CREEK: S1-25129

On August 27, 2013, Ecology approved the District's application to divert water from Gilligan Creek or the Skagit River in the amount of 13.15 cfs (Qi) and 3,700 afy (Qa) when applicable instream flows are being met at either point of diversion. If flows are not being met at either point of diversion, the applicable water diversions shall cease. The filing date of this water right change was November 16, 1987.

SALMON CREEK: S1-*18219

On August 27, 2013, Ecology approved the District's application to divert water from Salmon Creek or the Skagit River in the amount of 4.0 cfs (Qi) and 307 afy (Qa) when applicable instream flows are being met at either point of diversion. If flows are not being met at either point of diversion, the applicable water diversions shall cease. The filing date of this water right change was October 30, 1963.

TURNER CREEK: S1-27862

On August 27, 2013, Ecology approved the District's application to divert water from Turner Creek or the Skagit River in the amount of 6.6 cfs (Qi) and 3,022 afy (Qa) when applicable instream flows are being met at either point of diversion. If flows are not being met at either point of diversion, the applicable water diversions shall cease. The filing date of this water right change was October 22, 1997.

SKAGIT RIVER: S1-27860

On October 22, 2020, Ecology approved the District's amended application to divert water from the Skagit River in the amount of 12.8 cfs (Qi), 5,071 afy (non-additive Qa), and 362 afy (additive Qa) when instream flows are being met at the Skagit River pump station. If flows are not being met at the point of diversion, the water diversions shall cease. The filing date of this water right change was October 22, 1997.

MUNDT CREEK: S1-27861

On October 22, 2020, Ecology approved the District's amended application to divert water from Mundt Creek or the Skagit River in the amount of 18.56 cfs (Qi) and 3,886 afy (Qa) when applicable instream flows are being met at either point of diversion. If flows are not being met at either point of diversion, the applicable water diversions shall cease. The filing date of this water right change was October 22, 1997.

7.3.3.2 Groundwater Right Changes: Allowing Surface Water Diversion

In addition to the surface water changes described above, the District also processed water right changes to GWP 3350 (Ranney Well) and GWP 2911 (Sedro-Wooley Well) in 2001 under the 1996 MOA. The Skagit River pump station was authorized as the new point of diversion for both groundwater rights. Neither of these water rights is subject to instream minimum flows.

SKAGIT RIVER RANNEY WELL: GWP 3350

On March 12, 2001, Ecology approved the District's application to divert groundwater quantities authorized under GWP 3350 from the Skagit River in the amount of 8.91 cfs (Qi) and 6,400 afy (Qa). The filing date of this water right change was November 4, 1997.

SEDRO-WOOLEY WELL: GWP 2911

On March 12, 2001, Ecology approved the District's application to divert groundwater quantities authorized under GW 2911P from the Skagit River in the amount of 2.0 cfs (Qi) and 1,440 afy (Qa). The filing date of this water right change was November 4, 1997.

7.3.3.3 Temporary Drought Change Authorizations

2015 Authorizations

S1-25129P & GWP 3350

On June 15, 2015, Ecology issued the District a Temporary Drought Change Authorization (Change) for Water Rights S1-25129P and GWP 3350. The Change authorized the District to temporarily transfer up to 20 cfs and 39.67 acre-feet of water to downstream points of diversion operated by Skagit County Drainage and Irrigation Improvement District #15 and Skagit County Consolidated Diking Improvement District #22. The temporary change ran for 24-hours from June 16, 2015, until June 17, 2015.

On July 8, 2015, Ecology issued the District a Temporary Drought Change Authorization (Change) for Water Right S1-25129P. The Change authorized the District to temporarily transfer up to 5 cfs and 445.5 acre-feet of water to downstream points of diversion operated by Skagit County Drainage and Irrigation Improvement District #15 and Skagit County Consolidated Diking Improvement District #22. The temporary change ran from July 8, 2015, until September 30, 2015.

2019 Authorizations

GWP 3350

On August 9, 2019, Ecology issued the District a Temporary Drought Change Authorization (Change) for Water Right GWP 3350. The Change authorized the District to temporarily transfer up to 8.91 cfs and 194 acre-feet of water to downstream points of diversion operated by Skagit County Drainage and Irrigation Improvement District #15. The temporary change ran from August 10, 2019, until August 31, 2019.

CS1-00739C

On August 9, 2019, Ecology issued the District a Temporary Drought Change Authorization (Change) for Water Right GWP 3350. The Change authorized the District to temporarily transfer up to 5.6 cfs and 122 acre-feet of water to downstream points of diversion operated by Skagit County Drainage and Consolidated Diking Improvement District #22. The temporary change ran from August 10, 2019, until August 31, 2019.

2021 Authorizations

S1-00739C

On August 13, 2021, Ecology issued the District a Temporary Drought Change Authorization (Change) for Surface Water Right S1-00739C. The Change authorized the District to temporarily transfer up to 5.6 cfs (Qi) cfs and 183 acre-feet (Qa) of water over 33 days, subject to a 12 hour daily use beneficial use limit, to downstream points of diversion operated by Skagit County Consolidated Diking Improvement District #22.

The temporary change was authorized to run from August 14, 2021 to September 15, 2021. The Swinomish, Upper Skagit, Sauk Suiattle, and Samish Tribes were advised of the proposed change by the District before the date of issuance and made no comment. On September 14, 2021, Ecology approved an extension in time through October 15, 2021.

GWP 3350

On August 13 2021, Ecology issued the District a Temporary Drought Change Authorization (Change) for Ground Water Right Permit (GWP) 3350. The Change authorized the District to temporarily transfer up to 8.91 cfs and 291 acre-feet of water over 33 days, subject to a 12 hour daily beneficial use limit, to downstream points of diversion operated by Skagit County Drainage and Irrigation Improvement District #15.

The temporary change was authorized to run from August 14, 2021 to September 15, 2021. The Swinomish, Upper Skagit, Sauk Suiattle, and Samish Tribes were advised of the proposed change by the District before the date of issuance and made no comment.

The District is continuing to work with local irrigation districts to address seasonal water supply and drought shortages in conjunction with Ecology NWRO officials.

7.3.4 Satellite System Service Area/Place of Use Expansions

As described in Chapters 2, 3 and 12 of this plan, the District is the primary Satellite Management Agency for Skagit County. Among the seven (7) satellite systems owned and operated by the District, the District proposes to expand the place of use and retail service areas of the following four satellite systems:

- Alger: GWC 3885
- Cedargrove: G1-25994C
- Rockport: G1-25509
- Skagit View Village: G1-27063

These water systems have water right and system capacity that exceeds projected buildout within their respective LUD boundaries. Updated Water System Physical Capacity Analysis reports for these systems are located in Appendix T, and this analysis is discussed in greater detail in Chapter 12. The place of use and retail service area expansions described below shall enable the District to extend retail service to a limited number of new and previously allowed connections located in close proximity to the existing satellite water systems that have limited legal or practical access to alternative domestic water supply.

Pursuant to adoption and approval of this plan, and consistent with MWL provisions RCW 90.03.386(2) and RCW 43.20.260 as applicable, the District is authorized to expand the place of use and retail service areas of the satellite system water rights referenced below, as noted above, and in Figures 2-2a and 2-3a through 2-3c. The District reserves the right to make further service area modifications as authorized by law and warranted by future satellite system operations and circumstances.

Alger Satellite System (PWSID 01400K)

The District's Alger Satellite System currently serves approximately 144 connections (130 residential and 14 non-residential) and is authorized by DOH to serve a total of 219 connections. The Alger system is provided water by a single well and certificated municipal purpose water right (GWC 3885) with a priority date of September 21, 1960. The water right, which is applied to continuous beneficial use and is in good standing, authorizes an instantaneous quantity (Qi) of 100 gpm and an annual quantity (Qa) of 100 afy. The place of use is designated as the "Community of Alger, Skagit County, Washington."

In accordance with RCW 90.03.386(2), the District proposes to expand the service area of the Alger system and place of use of GWC 3885 to include six (6) connections already in effect and one property located within 400 feet of an Alger water line. The additional connections fall within the Qi and Qa authorized by the Alger system water right.

As discussed in Chapter 12 and Appendix T, the Water System Physical Capacity Analysis report for the Alger system identified an insufficiency in well pump capacity for the total approved connections. The District plans to explore options for increasing the pumping rate at the well to better facilitate

operation of the system. The approved capacity of 219 connections is proposed to remain while the District explores options to address these deficiencies. However, the District will not allow the water system to exceed 145 connections/186 ERUs until a solution is implemented. Improvements are anticipated to be completed prior to completion of the next water system plan update in 2025. In the interim, the source is sufficient to address MDD for the current number of connections and the addition of 1 ERU related to the request for new service outside the LUD boundary. The place of use and retail service area expansions are reflected in figure 2-2a.

Pursuant to RCW 90.03.386(2), the District has determined that the proposed place of use expansion is consistent with applicable land use plans and policies.

Cedargrove Satellite System (PWSID 119174)

The District's Cedargrove Satellite System currently serves approximately 168 residential connections and is authorized by DOH to serve a total of 466 connections. The Cedargrove system is provided water by a single well and certificated municipal purpose water right (G1-25994C) with a priority date of December 5, 1990. The water right, which is applied to continuous beneficial use and is in good standing, authorizes an instantaneous quantity (Qi) of 262 gpm and an annual quantity (Qa) of 53.8 afy. The place of use is designated as "Cedargrove LUD No. 10, within NE quarter of Section 15 and the NW quarter of Section 14, all within Township 8E Ranger 4E, Skagit County."

In accordance with RCW 90.03.386(2), the District proposes to expand the service area of the Cedargrove system and place of use of G1-25994C to include two (2) connections already in effect and 5 properties adjacent to a Cedargrove water line. The additional connections fall well within the water system's operational capacity and the Qi and Qa authorized by the Cedargrove system water right. The place of use/retail service area expansions are reflected in figure 2-3b.

Pursuant to RCW 90.03.386(2), the District has determined that the proposed place of use expansion is consistent with applicable land use plans, development regulations, and policies.

Rockport Satellite System (PWSID 736006)

The District's Rockport Satellite System currently serves approximately 72 connections (66 residential and 6 non-residential) and is authorized by DOH to serve a total of 106 connections. The Rockport system is provided water by a single well and a certificated municipal purpose water right (G1-25509C) with a priority date of August 25, 1989.

The water right, which is applied to continuous beneficial use and in good standing, authorizes a total instantaneous quantity (Qi) of 95 gpm and an annual quantity (Qa) of 19 afy. The place of use is designated as "Skagit County Local Utility District No. 11, Town of Rockport, within SE quarter Section 26, SW quarter Section 25 and north half NE quarter Section 35, all north of Skagit River, all in Township 3N, Ranger 9E, W.M., Skagit County."

In accordance with RCW 90.03.386(2), the District proposes to expand the service area of the Rockport system and place of use of G1-25509C to include two (2) connections already in effect and adjacent to an existing water line. The additional connections fall well within the system's

operational capacity and Qi and Qa authorized by the Rockport system water right. The place of use/retail service area expansions are reflected in figure 2-3c.

Pursuant to RCW 90.03.386(2), the District has determined that the proposed place of use expansion is not inconsistent with applicable land use plans, development regulations, and policies.

Skagit View Village Satellite System (PWSID 968795)

The District's Skagit View Village Satellite System currently serves approximately 88 connections (87 residential and 1 non-residential) and is authorized by DOH to serve a total of 128 connections. The Skagit View Village system is provided water by a single well and municipal purpose water right (G1-20763P) with a priority date of July 24, 1973.

The water right, which is applied to continuous beneficial use and is in good standing, authorizes an instantaneous quantity (Qi) of 200 gpm and an annual quantity (Qa) of 38.4 afy. 80 gpm of the Qi is subject to Skagit River instream flow conditions. The place of use is designated as "Divisions 1, 2, 3, 4, 5, 7, 8,9,10,11,12,13, and 14 of the Wilderness Village Planned Unit Residential Development as modified and approved by the Skagit County Board of Commissioners April 28, 1997".

In accordance with RCW 90.03.386(2), the District proposes to expand the service area of the Skagit View Village system and place of use of G1-27063P to include 1 property adjacent to a View Village water line. The additional connection falls well within the water system's operational capacity and the Qi and Qa authorized by the Skagit View Village system water right, subject to instream flows. The place of use and retail service area expansions are reflected in figure 2-3a.

Pursuant to RCW 90.03.386(2), the District has determined that the proposed place of use expansion is not inconsistent with applicable land use plans and policies. As described in Chapter 12, the District is proposing to increase the DOH-approved number of connections for the Skagit View Village system to 131.

7.3.5 Skagit View Village Water Right Extension (G1-207763)

On April 28, 2021, the Department of Ecology granted the District a 15-year extension to put water to full beneficial use under Groundwater Permit G1-20763P which serves the District's Skagit View Village Satellite water system. Pursuant to the permit extension, the District shall submit a proof of appropriation by April 30, 2036, unless good cause exists for the District to seek a further extension of this water right. The extension included a restatement of prior operating and reporting conditions provided under the Permit (See Appendix J).

7.5 Source Water Protection

7.5.1 Cultus Mountain Watershed

The Cultus Mountain Watershed Plan has been updated and is provided in a revised Appendix E

7.6 Water Resource Alternatives

7.6.1 Wastewater Reuse

The best potential for water reuse comes not from the District's existing potable water customers but rather from its non-potable water customers. Consequently, water saved by implementing additional water reuse in partnership with its non-potable customers could provide additional non-potable water or potable water. Such water would require treatment for use in the District's potable systems. At this point, no cost-effective water reuse projects have been identified by the District.

7.6.2 Desalination

Although desalination is a technique that can be used to develop additional potable water supply, the District has not evaluated the process in detail due to its existing supply position. The District has, however, installed a reverse osmosis desalination plant to serve potable water customers on Guemes Island. The process was selected because of problems with saltwater intrusion of the groundwater supply and because of the high cost to bring another water supply to the remote location. Desalination remains a water supply option, albeit an expensive one.

8 WATER QUALITY

The following Section is updated:

8.3.11.2 District's Status

8.3 Current Water Quality Regulation

8.3.11 Total Coliform Rule

8.3.11.2 District's Status

The District's Coliform Monitoring plans for the Judy System and all Satellite Systems have been updated and are included in Appendix M.

Judy System pressure zones 180, 415, 463, 645, and 684 contain less than 100 services in each pressure zone. The Fidalgo system's pressure zones that do not currently have sample sites each have less than 100 services per zone. The PUD's past practice has been to establish monitoring in pressure zones with more than 100 services. The PUD will be exploring options to establish sampling stations in these smaller pressure zones, with a priority placed on zones with the highest number of services.

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9 Operations and Maintenance

The following sections are amended:

9.1.2 Finance Manager/Treasurer
9.1.4 Community Relations Manager
9.1.7.3 Maintenance Superintendent
9.5 Asset Management
9.7.2 Organization
9.8.1 Overview

The following sections are added:

9.1.8.4 Distribution Superintendent
9.5.1 Goals
9.5.2 Staffing
9.5.3 Asset Inventory
9.5.4 Cityworks EAMS

9.1 Water System Management and Personnel

9.1.2 Finance Manager/Treasurer

The Finance Manager/Treasurer, as appointed by the District Commissioners, is responsible for overall financial management. The Finance Manager/Treasurer provides the overall direction for fiscal and accounting functions in accordance with the policies and objectives of the District and in compliance with legal and regulatory limitations. The Finance Manager/Treasurer manages the customer service department as well. As a member of the General Manager's management team, the Finance Manager/Treasurer participates in short- and long-term planning to support the District's mission and vision. The Finance Manager/Treasurer develops and maintains systems and procedures that conform to generally accepted accounting principles within the confines of governing laws and District resolutions.

9.1.4 Community Relations Manager

The District now has a full-time Community Relations Manager. The Community Relations Manager strengthens and maintains strong working relationships between the District, its customer/owners, and the general public. The responsibilities of the Community Relations Manager are responses to media inquiries and news releases to keep the community informed about District issues and activities. Additional responsibilities include providing evening and weekend on-call duty to meet public information responsibilities regarding water outages and emergencies such as fires and

accidents, as well as promoting Salmon Festival, tours at the Water Treatment Plant, and Science and Technology night at the high school.

9.1.7.3 Maintenance Superintendent

Reporting to the Operations Manager, the Maintenance Superintendent is responsible for managing the Maintenance Division to maintain the District's infrastructure. The Maintenance Superintendent provides supervision to the Maintenance Division to repair, replace, and construct extensions of the water system. The Maintenance Superintendent ensures that service interruptions are coordinated with customer and other departments by providing sufficient advance notice, coordinates on-call response to emergency situations and restoration of service and assists with interpretation and/or revisions to District policy, practices, and procedures.

9.1.8.4 Distribution Superintendent

Reporting to the Operations Manager, the Distribution Superintendent is responsible for the day-to-day operation and oversight of the District's water transmission, distribution, and metering systems. The Distribution Superintendent recommends staffing levels and coordinates the schedule to ensure 24-hour responses to emergencies or outages of the distribution SCADA system. The Distribution Superintendent also provides technical expertise and support to the overall water distribution system, and in conjunction with other District departments, resolves issues to ensure long-term quality and continuity of water service to each customer. Overall, the Distribution Superintendent ensures proper operation of systems through the timely maintenance and repair of water main control valves, reservoirs, pump stations, meters, and other equipment, facilities, or appurtenances. The Distribution Superintendent oversees the distribution, flushing, and meter departments, ensuring compliance with District, state, and federal requirements, and coordinates with the general public and other departments to identify, address, and follow-up with water quantity and quality situations.

9.5 Asset Management

The District has implemented a functional asset management database from which assets can be adequately tracked and routinely maintained. To build upon this, the District has also implemented a software program called Cityworks, an enterprise asset management system (EAMS). Cityworks operates as a GIS-centric asset management program that standardizes data and allows users to reuse, coordinate, and share information efficiently and effectively by making the GIS geodatabase the asset registry. At this time, the District has focused the asset registry on hard assets such as pipes, valves, hydrants, and treatment systems. Soft assets such as permits, licenses, easements, and other land use activities may be implemented later.

9.5.1 Goals

To help prioritize future goals, the District Asset Management Program developed a roadmap to identify and guide projects over the next 4 years. The roadmap is meant to guide the work of the

Asset Management Program to move the District from its current state to its desired, future state. The roadmap aims to leverage the District's current resources and technology. The end goal of the roadmap is to write a formal asset management plan that will guide the District's asset management activities. The following goals outlined in this section are highlights from the full Asset Management Roadmap and will facilitate the preparation for an asset management plan. Each goal is listed with its estimated year of completion.

2020 - Complete District GIS Asset Portfolios

There are asset portfolios that are incomplete, specifically: distribution control assets and fiber optic network assets. Each of the listed portfolios is in differing states of completion. Priority is to complete the distribution control asset portfolio, followed by the fiber optic network assets.

2020 - Externally Available Maps and Apps Repository

A water system map viewer has been made available on the skagitpud.org website and has been met with great success. The map viewer allows customers the ability to research the feasibility of developing property. Engineering firms also use the map viewer to assist in their design work. The success of the water system viewer could be expanded upon to engage and provide more resources to the public; a few examples are as follows: Flushing notifications provided in a web map format; a planned capital projects web map could assist in our coordination efforts; water quality complaints handled with a web application and funneled into Cityworks as a service request; water availability requests filled out online and forwarded to the Engineering Department. These are all examples of what could be hosted from our enterprise GIS and made available to the public.

2020 – Quality Assurance and Quality Control (QAQC) on Existing and Future Cityworks Solutions

To maintain quality on existing and future Cityworks work/asset management solutions, QA/QC procedures should be created to monitor and maintain quality control of workflows and data collection.

2021 – Formulate Asset Management Steering Committee

Asset management is not limited to a single department or work group. Mature asset management programs involve coordination of nearly all departments. To facilitate management sound planning and prioritization and streamline efforts, a steering committee composed of asset responsible department heads should be set up.

2021 – Standard Operating Procedure (SOP) for all District Departments Using Cityworks

SOPs should be created to guide each District department's use of Cityworks. SOPs are helpful in training users for new workflows and will be available to reference when questions arise.

2021 - Cityworks-NorthStar Integration

Integrate Cityworks with NorthStar to pass service orders initiated in NorthStar to Cityworks Mobile for the meter department. This integration will eliminate the current paper service order workflow, and allow meter department personnel to utilize map routing, add comments, and close out service orders in the field.

2021 - Build Improved 1:1 hydraulic model with extended period simulation

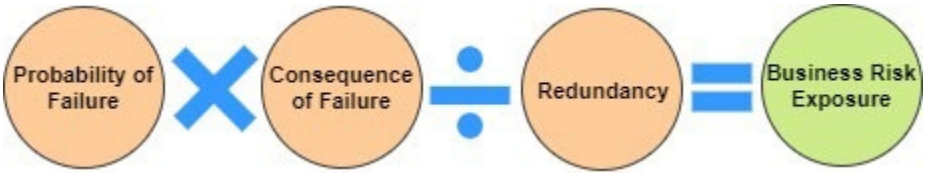
The District's hydraulic model reads from a GIS database. Currently, this database is maintained separately from the production GIS database, and this creates a doubling of efforts. The hydraulic model can be configured as a 1:1 model read from the production GIS database so that it doesn't need to be manually updated. After the model has been configured 1:1, the staff can configure the model for the following:

1. Static simulation
2. Extended period simulation.

2022 - Define Levels of Service

Levels of service (LOS) set the bar for how well the District provides its range of services. LOS can be broadly categorized as customer-based and operational-based. Another way to consider LOS is external and internal. Defined LOS is integral to a strategic asset management plan. The GIS/Asset Program Lead will work with the Asset Management Steering Committee to define LOS.

2022 - Define Current State of all Major Assets



The necessary fields to calculate the business risk exposure of District assets will need to be built into all GIS asset portfolios. The fields are populated with a mixture of spatial analysis outputs from GIS and Cityworks condition/maintenance scores. Water mains are undergoing a multi-phased implementation to assign business risk exposure scores that will be used to prioritize capital improvement projects. The Water Treatment Plant (WTP) recently underwent a condition assessment which resulted in condition score values stored in the WTP asset portfolio. Distribution control assets will follow after WTP assets. A component of a strategic asset management plan is the current state of assets; once the current state is defined, it can be fed into a final written asset management plan.

2023 - Write Strategic Asset Management Plan

The final step of this 4-year roadmap is to write a strategic asset management plan. The GIS/Asset Program Lead will work with the Asset Management Steering Committee to determine the best course of action. A strategic asset management plan will help to answer the six over-arching questions in an asset management plan:

- What do we own?
- What condition is it in?
- What is it worth?
- What do we need to do to it?
- When do we need to do it?
- What will it cost?

9.5.2 Staffing

In 2018, the District formalized a team of 5 District employees dedicated to supporting asset management functions. Each position and their respective job responsibilities are outlined in the table below.

Positions Supporting Asset Management Activities
GIS/Asset Program Lead
Leads, directs, and tasks the GIS/Asset Program Team
GIS Analyst
Performs analysis and administration of GIS asset portfolios
Data Technician
Edits and maintains GIS asset portfolios and archives related documents
Asset Analyst
Administrates and supports asset management system processes using Cityworks
Locater Technician
Performs field locating, verification, and GPS collection of assets

9.5.3 Asset Inventory

A primary goal of any asset management program is to provide an accurate and reliable water system map that uses the asset database to provide accurate coordinates for the assets. The District has already completed the activities required for the construction of water distribution and water treatment asset databases that are linked with the GIS system. The District utilizes 6 survey-grade Global Positioning System (GPS) units to update, maintain, and collect new coordinate information on the water meters, valves, fire hydrants and pipe fittings. Whenever possible, underground asset coordinates are captured, along with crossing utilities, before they are buried so that the precise bury depth is known. Coordinates are collected and posted in real-time to the District's asset database; this has eliminated any lead time for displaying newly installed individual assets and installation

projects in the District's water system map. Assets are updated, created, maintained, and displayed in real-time throughout the entire organization.

9.5.4 Cityworks EAMS

One of the many values of an EAMS is the ability to coordinate and prioritize preventative and reactive maintenance. The District utilizes the Cityworks software to streamline and record inspections on valves, meters, hydrants, pipes, and treatment assets. Maintenance work orders are generated for all system repairs and allow for recording observations and pictures. Cityworks provides the ability for a truly mobile workforce. All maintenance activities are efficiently dispatched to field personnel tablets, effectively eliminating the need to hand out or record information on paper. To track asset costs, the District chose to integrate Cityworks with its financial software to record actual costs of maintaining individual assets attached to work orders.

Recording information from inspections and work orders will assist the District in determining the remaining service life of an asset, which in turn, will help to focus time and money on those assets that need replacement, rather than operating that asset to failure or replacing it before it was necessary. One of the important areas where Cityworks will be valuable is to record condition information on existing transmission and distribution piping so that the District can adjust its capital replacement programs to better focus on long-range strategies while meeting immediate demands. The District has begun a multiphase implementation to select and prioritize capital improvement projects using data sourced from Cityworks and GIS asset data. Proposed projects will be prioritized based on business risk exposure factors such as consequence of failure, likelihood of failure, and redundancy. In the meantime, the District has developed a modified approach to its annual pipe replacement, as discussed in Section 10.2.

9.7 Safety Procedures

9.7.2 Organization

The District has historically contracted with a Safety Coordinator, but in 2018 a full-time Safety and Risk Coordinator was hired. The District's safety programs are guided by the Safety and Risk Coordinator, who also works with a Safety Committee, which is composed of staff from several functional work groups.

The committee is organized with a Chair, Secretary, and regular members. Each term is 2 years, and the number of members is typically seven voting members and the Safety and Risk Coordinator acting as an ex-officio member with no regular voting authority. Members are required to meet once a quarter to approve minutes, review recent incidents, voice safety concerns, and consider new procedures. Safety and health training are assigned to work groups based on the type of work and hazards faced by employees within each group.

9.8 Cross-Connection Control Program

9.8.1 Overview

This section remains the same with the exception that the District, with the approval of the Commission, recently adopted a Cross Connection Control Policy (CCCP) Manual. Some highlights include:

- All new non-residential meters require premise isolation
- All new residential meters with land over five acres require premise isolation
- The agricultural rate is tied to meeting CCC requirements
- A new incentive program for existing customers

See Appendix P for the CCCP Manual.

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10 CAPITAL IMPROVEMENT PROGRAM (CIP)

The following sections are replaced:

10.1.1 Water Treatment Plant Program

10.1.2 Transmission Pipeline Program

10.1.3 Distribution Pipeline Program

10.1.4 Storage Tank Program

10.1.5 Fiber Optic Program

The following section is added:

10.1.6 Miscellaneous Capital Projects

The District completed several projects listed in the 2013 Water System Plan. These projects are listed in the following table.

Completed Projects		
No.	**Project Description**	**Completed**
P-1	Fir Island Road Pipeline Replacement	2015
P-2	Josh Wilson Road Improvements	2017
P-3	North 30th Street and Digby Road Pipeline	2016
P-5	McLean Road Pipeline Replacement	2019-2020
P-6	Best Road Pipeline Replacement	2019
R-1	East Division Street Reservoir and Pump Station	2018
FO-1	Josh Wilson Road Fiber	2017
O-2	Dukes Hill Pump Station	2015
O-3	Cedar Hills Booster Station Replacement	2015
O-4	WTP Chemical Feed System Replacement	2017
	Annual Pipe Replacement	2014-2019

10.1 Major CIP Project Development

10.1.1 Pipeline Projects with Water Treatment Plant Projects

The District owns and operates several water treatment facilities. The largest facility is the Judy Water Treatment Plant [WTP], located adjacent to Judy Reservoir, which provides potable water to the Judy distribution system (PWS ID#79500E). This WTP is a direct filtration plant that was initially commissioned in 1990 with a significant expansion in 2008.

10.1.1.1 MO13-6 Dry Scrubber Retrofit

The Judy WTP utilizes chlorine gas for its disinfection processes delivered in multiple 1-ton cylinders. Regulations require a chlorine gas scrubber system to treat an unintentional gas release. The existing chlorine scrubber is 30 years old, utilizing sodium hydroxide to neutralize chlorine gas in a wet scrubbing process and the equipment is at its end of useful life. Current chlorine scrubbing technology utilizes an activated carbon medium in a dry scrubbing process, which is a safer process. A dry scrubber system can be retrofit onto the existing chlorine gas ventilation system.

10.1.1.2 MO20-1 Raw Water Pump Station Replacement

The existing raw water pumping system for the District's WTP is 30 years old and uses an antiquated control system that is inefficient and damages the pumps. Because of space constraints and operational requirements, it was decided to construct a new, stand-alone Raw Water Pump Station [RWPS] adjacent to the existing pump building. This will allow the existing RWPS and WTP to operate mostly unimpeded during the construction of the new pump station.

10.1.1.3 MO20-2 Backwash Pump Replacement

The existing backwash pumps at the WTP are at the end of their useful life, becoming unreliable due to pump and motor wear and degradation. The backwash system is a critical process within the water treatment plant. Failure of the backwash system would result in an inability to deliver treated water to our customers. The purpose of this project is to replace the failing, 30-year-old, backwash pumping system to improve operational control and energy efficiency.

10.1.1.4 MO20-3 Potlatch Reverse Osmosis (RO) Replacement

The District's Potlatch Beach #1 water system (PWS ID#69034L) utilizes a reverse osmosis treatment system to remove salt from a brackish water well. The existing RO plant is over 20 years old and near the end of its useful life. A new, smaller RO treatment unit will utilize the latest high-efficiency reverse osmosis technology.

10.1.1.5 MO20-4 SCADA System Replacement

The SCADA system at the Judy WTP is a compilation of analog legacy and newer, digital components. Component failures occur routinely. The legacy SCADA system needs to be replaced entirely with an

integrated control system that can be expanded as the WTP is expanded to meet current and future supply needs.

10.1.1.6 MO20-5 Dedicated Power Feed from the PSE Norlum Substation

The existing power feed to the District's Skagit River Diversion [SRD] Pump Station is limited, resulting in the District's inability to utilize the facilities' full capacity and utilize a better rate structure. Also, the electrical power supply to the Judy WTP is sometimes unreliable, especially during winter storms. A dedicated electrical feed from PSE's Norlum substation would provide adequate and more reliable power supply for the SRD and a redundant but primary feed to the Judy WTP.

10.1.1.7 MO20-6 Disinfection Study

The Judy WTP utilizes chlorine gas in its disinfection processes. The Washington State Department of Labor & Industries has requested that all users of chlorine gas evaluate if other options are available and feasible. A potential option is to use sodium hypochlorite as a disinfection chemical. This conversion will require modification at the water treatment plant.

The first phase of this project is a disinfection study that will evaluate the advantages and disadvantages of using chlorine gas or sodium hypochlorite as a disinfectant for the Judy Water System. This evaluation may recommend disinfection system modifications that will give rise to additional capital projects.

10.1.1.8 MO20-7 Filtration Conversion and Optimization

Currently, the Judy WTP utilize two different filter backwash processes. The original Filters 1-4 utilize a surface wash process to break up the filter mat. Filters 5-8, constructed during the 2008 expansion, utilize an air scour to break up the entire filter bed. It is advantageous to have a consistent filter operation. Therefore, this project will convert and rehabilitate the older Filters 1-4 to an air scour backwash system to match the backwash operation of Filters 5-8.

Filter optimization can expand the WTP's firm capacity. The filters are regulated to operate at a loading rate of 4.2 gpm/SF. This limits the WTP's firm capacity to 21 MGD. Increasing the filter loading rate to 6.0 gpm/SF could increase the WTP's firm capacity to 30 MGD, which matches the designed hydraulic capacity of the treatment plant. To permit this loading rate increase, the District will need to perform a filter surveillance and optimization study to better understand and improve filter operation.

10.1.1.9 MO20-8 Equipment Replacement – Flocculators & Recycle Basin

Several mechanical components throughout the WTP are near the end of their useful life and need to be replaced. This project involves replacing the various mechanical equipment that has been identified during the WTP Condition Assessment. Specific equipment includes the flocculators in the Flocculation Basins and the control panel and level control system in the Recycle Basin. Other miscellaneous mechanical equipment may also be replaced to increase reliability and functionality.

10.1.1.10 MO20-9 Clearwell Recoating

This project involves the three finished water clearwells at the WTP. It is anticipated that one Clearwell will be recoated each year for three consecutive years. During the recoating process, any structural deficiencies can be identified and corrected.

10.1.1.11 MO20-10 Concrete Maintenance – Crack Injection & Caulking

The WTP's concrete structures are experiencing cracking as a result of age and fatigue. Crack injection, caulking of expansion joints, and other concrete related repairs will increase the life span of the WTP.

10.1.1.12 MO20-11 Carbon Dioxide (CO_2) Tank Replacement

The CO_2 tank is located outside and is experiencing environmental corrosion. This tank should be replaced. The CO_2 is used to generate chlorine dioxide, which is used as a pretreatment disinfectant. This chemical generation process and injection can occur near the Raw Water Pump Station and does not need to be located at the WTP facilities.

10.1.1.13 MO20-12 WTP Building Seismic Improvements

The WTP and RWPS buildings were designed in the 1980s. Seismic design requirements have become more stringent in recent years. To improve facility resiliency and operator safety, these buildings should be assessed for seismic reinforcement. Specific examples include anchoring the room trusses to the interior walls. The District shall contract with a seismic retrofit consultant to evaluate the facilities and design seismic reinforcing.

10.1.1.14 MO20-13 Finished Water Flow Meter

The original finished water meter failed, so WTP operators have relied on the raw water meter to control all chemical feed systems. This situation is not advantageous for some chemical feed systems, especially those systems that are added late in the treatment train. Other processes, such as filter backwash operations, alter the finished water flow rate. The installation of a new finished water flow meter would allow the operators to use it to control some chemical feed systems more accurately.

10.1.1.15 MO20-14 Lagoon Solids Handling Improvements

The existing earthen lagoons at the WTP are an inefficient use of space compared to concrete lagoon basins with vertical walls. The project would replace the north lagoon with two concrete lagoons that would increase solids handling capacity within the same footprint. Also, a polymer addition process could be added to improve solids dewatering.

10.1.1.16 MO20-15 WTP Electrical System Upgrade

The existing electrical system at the WTP is at capacity for the current processes. To consider new or additional processes, a new electrical system will need to be installed. Most likely, a new electrical building will be required to keep the WTP in service during construction. The new electrical system will include a new backup generator dedicated to the WTP.

10.1.1.17 MO20-16 Disinfection System Replacement

The Disinfection Study will provide some direction for the future disinfection strategy for the WTP. Additional studies and pilot testing will be required to define the future disinfection strategy and processes. Once the plan is refined, new disinfection processes will be designed, installed, tested, and commissioned.

10.1.1.18 MO20-17 Instrumentation Flow Meters

This project involves installing flow meters for chemical feed systems at the WTP. Additional controls may also be installed to improve process operations. In addition, flow meter feedback and control systems will be standardized.

10.1.1.19 MO20-18 Clearwell Seismic Expansion Joints

Clearwell 3 has flexible couplings on the inlet and outlet piping; however, Clearwells 1 & 2 do not. This project involves installing flexible coupling on the inlet and outlet piping for Clearwells 1 & 2.

10.1.1.20 MO20-19 Lagoon and Solids Handling Expansion

The lagoons at the WTP will eventually be required to handle an expected increase in solids from existing and new treatment processes. To accomplish this expected increase, the south earthen lagoon will be removed and converted to three concrete lagoons for expanded capacity on the same footprint. Second, mechanical dewatering processes will be considered to reduce the volume of waste disposal.

10.1.2 Transmission Pipeline Program

Transmission pipelines provide the backbone for the Judy distribution system. Transmission pipelines are typically larger than 14 inches, convey water from the District's Judy WTP, and have limited direct connections. The following are proposed transmission pipeline projects.

10.1.2.1 MT13-4 Judy Reservoir to Mount Vernon Transmission Pipeline - Phase 2

This project is to replace the District's existing 24-inch transmission pipeline that was installed in 1961. The existing pipeline is near the end of its useful life and has experienced ruptures as recently as May 2020. A new 36-inch welded-steel transmission pipeline will extend from the District's Judy WTP to Mount Vernon, connecting to the Phase 1 transmission pipeline installed in 2009.

10.1.2.2 MT20-1 Judy Reservoir to Sedro Woolley Transmission Pipeline – Phase 2 (Top of Hill)

This project is the replacement of an existing 30-inch transmission pipeline, installed in 1970, from the WTP to the southerly terminus of the 36-inch Emergency Repair pipeline (Phase 1) that was installed in 2015. This phase incorporates approximately 6,500 LF of 36-inch transmission pipeline.

10.1.2.3 MT13-9 Judy Reservoir to Sedro Woolley Transmission Pipeline – Phase 3 (River Crossing)

This project is the replacement of the existing aerial crossing over the Skagit River from South Skagit Highway to River Road east of Sedro-Woolley. Though referred to as Phase 3, this project will proceed before Phase 2 since it is currently the vulnerable segment of this transmission pipeline. The existing 20-inch aerial water line, installed in 1957, will reach its hydraulic capacity within the next decade, depending on growth and water demand within the service area north of the Skagit River. The new water line size, alignment, and method of installation (aerial or bored) have not been determined.

10.1.2.4 MT20-2 Judy Reservoir to Sedro Woolley Transmission Pipeline – Phase 4

This project is the replacement of an existing transmission pipeline from the Skagit River crossing into Sedro-Woolley. This phase incorporates an undetermined length of 24-inch to 36-inch transmission pipeline. The next Water System Plan update will refine the scope of this project.

10.1.3 Distribution Pipeline Program

The District's distribution system is aging, and several older pipes are undersized for their service requirements. As a result, the replacement of existing pipelines is the primary focus of the projects described in this section. The District is also refining its process for selecting replacement pipelines based on a business risk exposure model that is currently being developed using asset management tools and techniques. The following are the pipeline replacement projects the District is considering.

10.1.3.1 MP13-7 Burkland/Cedardale Road Pipeline

This project is located on Burkland Road, John Nelson Road, and Cedardale Road in rural Skagit County, south of Mount Vernon, between Stackpole Road and State Route 534 (SR 534). The project will replace an existing 8-inch AC pipe installed in 1962 to help improve system pressures and

capacity to the Conway area and Fir Island. The existing pipe is undersized and creates a bottleneck in delivering adequate capacity to this area. A portion of the existing pipeline between East Johnson Road and SR 534 is in a 25-foot easement across active farmland. Access to this easement is limited during most months due to high groundwater levels and farming activities. There are no services on this segment of the pipeline, so it is an option to construct a new line on an alternative alignment along Cedardale Road. This alternative option would provide better accessibility and utility.

10.1.3.2 MP20-1 Little Mountain Road Pipeline

This project is to address limited water availability in an area affected by minimum instream flows on the Skagit River basin. The District has requested funds from the state capital budget to help residents access a legally available water source. Existing groundwater users may also connect to the pipeline, which would reduce impacts to tributary instream flows. Little Mountain Road Pipeline project is the first opportunity for the District to address this problem. The project begins in the southeast corner of the City of Mount Vernon and extends approximately 2.9 miles east through unincorporated Skagit County to the Big Lake service area, connecting to another existing part of the District's water system. The project will install a 12-inch water main along Little Mountain Road and Blackburn Road. There are approximately 32 vacant properties adjacent to the proposed waterline, and it is estimated that approximately 68 new homes could be constructed if landowners fully developed their properties.

10.1.3.3 MP20-2 Bored and Cased Crossings

This project comprises of six bored and cased crossings underneath State Route 9 and 20. Each of these crossings replaces existing water lines that are undersized. Crossings are distributed between the cities of Burlington and Sedro-Woolley and the community of Clear Lake. The six borings will be constructed as a single project.

10.1.3.4 MP20-3 Sky Ridge Pipeline and Booster Pump Station Replacement

This project replaces existing water pipelines along Olympic Place and Sky Ridge Place within the Sky Ridge development in Skagit County south of Mount Vernon. The original water system within this development was installed in 1956. The 6-inch AC pipes are at risk of failing, potentially causing extensive property damage within this hillside development.

10.1.3.5 MP20-4 College Way Pipeline Replacement

This project replaces the existing water pipeline along East College Way from Urban Avenue to North LaVenture Road, including crossings at Leigh Way, Windsor Drive, and N. 18th Street. Existing pipelines in this area consist of 8-inch AC pipe installed in the 1960s and 1970s.

10.1.3.6 MP20-5 Skagit Country Club Pipeline Replacement

This project replaces existing water pipelines along Eagle Drive, Fairway Drive, and Country Club Drive within the Skagit Golf & Country Club residential development. Existing pipelines in this area consist of small-diameter AC, PVC, and plastic pipe installed in the 1960s and 1970s.

10.1.3.7 MP20-6 NW Burlington Pipeline Replacement

This project replaces existing pipelines in a residential and commercial area in northwest Burlington. Pipeline replacement will occur on Avon Avenue (SR 20), N. Spruce Street, N. Walnut Street, N. Oak Street, N. Cherry Street, N. Pine Street, N. Anacortes Street, and Magnolia Avenue. Existing pipelines in this area consist of a variety of small diameter pipe installed in the 1960s and 1970s.

10.1.3.8 MP20-7 MV Belmont / Clarmont Pipeline Replacement

This project replaces existing pipelines on Belmont Terrace, Clarmont Place, E. Montgomery Street, and N. 18th Street in Mount Vernon. Existing pipelines in this area consist of small-diameter AC and PVC pipe installed in the 1950s and 1960s.

10.1.3.9 MP20-8 West Mount Vernon Pipeline Replacement

This project replaces existing pipelines in West Mount Vernon on N. Wall Street, N. Barker Street, N. & S. Baker Street, W. Lincoln Street, Cosgrove Street, Cascade Street, and Garfield Street. Existing pipelines in this area consist of small-diameter AC and PVC pipe installed in the 1950s and 1960s.

10.1.3.10 MP20-9 Peterson Road Pipeline Replacement

This project replaces an existing pipeline along Peterson Road from Avon Allen road to Pulver Road in Skagit County west of Burlington. The existing pipeline along this road is 6-inch AC pipe installed in 1958.

10.1.3.11 MP20-10 MV Hillcrest District Pipeline Replacement

This project replaces existing water pipelines along S. 10th Street, S. 11th Street, S. 12th Street, S. 13th Street, Hazel Street, and Section Street within the Hillcrest district of Mount Vernon. Existing pipelines in this area consist of small-diameter AC, PVC, and cast-iron pipe installed in the 1940s and 1950s.

10.1.3.12 MP20-11 Bayview Community Pipeline Replacement

This project replaces existing water pipelines along Second Street, Third Street, B Street, and E Street within the Bayview community in Skagit County. Existing pipelines in this area consist of small-diameter AC and plastic pipe originally installed in the 1960s.

10.1.3.13 MP13-8 North Fork Skagit River Crossing

This project is in rural Skagit County, on the North Fork of the Skagit River between Pleasant Ridge and Fir Island. Currently, the District does not have a crossing of the North Fork to connect the water pipelines on Fir Island and Pleasant Ridge. This results in unnecessary shutdowns during periods of construction or leak repair. A new crossing of the North Fork would serve to loop the District's system in this area so that water can be delivered from different directions and reduce the need for system shutdowns and flushing of dead-end lines. Skagit County is proposing to replace the North Fork Bridge at an unspecified future date. The new water line could be built as part of the new bridge construction. However, the District may prefer to install a subsurface crossing of the river so that any issues with the bridge in the future would not impact the water pipeline.

10.1.3.14 MP20-12 Conway to Lake McMurray Extension

Most of the community of Lake McMurray is not served by a community water system. The property owners have either shallow wells or direct connections to the lake. A pipeline installed along State Route 534 starting at English Road would provide water from the Judy System to the Lake McMurray community. The pipeline length is approximately 17,000 LF. The pipeline could directly serve 27 existing homes and 135 potential new homes along the route in addition to the homes and businesses in the Lake McMurray community.

10.1.3.15 MP20-13 South Conway Extension

The District has dead-end pipelines on Cedardale Road and Bulson Road on the southern extent of the Judy System. The property owners in this area are currently served through individual wells. Currently, water availability for new development is severely restricted due to Skagit River instream flow regulations. A pipeline installed along Cedardale Road, Starbird Road, and Bulson Road would complete this pipeline loop. One or more pump stations and possibly a storage tank will be necessary to serve water to this higher elevation area. The pipeline length is approximately 27,000 LF. The pipeline could directly serve 78 existing homes, 38 vacant lots, and 74 potential new homes along the route.

10.1.3.16 MP20-14 Bow Hill to Alger

The Community of Alger is served by the District's Alger Water System, which is supplied by a single well. This system could be connected to the Judy System by a pipeline extension from the Bow Hill Pump Station. The Alger system would be consolidated with the Judy System The pipeline length Is approximately 23,000 LF.

10.1.4 Storage Tank Program

Adequate storage within the water system reduces pump cycling and treatment system size requirement while providing emergency standby and fire-fighting reserves. Storage components within the water system are ideally designed to provide these reserves while maintaining acceptable water quality. The following are proposed storage tank projects that are planned throughout the Judy water distribution system that will help meet the District's storage requirements.

10.1.4.1 MR20-1 Panorama Storage Tank (2.0 MG)

The W1 pumping system that delivers potable water to the District's Judy WTP and the Panorama service area is a closed system that utilized control technology developed in the 1980s. The pumping system is inefficient and is incapable of providing the required 1,500 gpm fire flow at the WTP. The Panorama Storage Tank will provide approximately 1.6 MG of gravity storage to serve the Panorama 705 pressure zone directly. The W1 pumping system will be modified to supply water to this new storage tank directly with the clearwells. Fire suppression storage to meet current requirements will be provided, in addition to equalizing and standby storage.

10.1.4.2 MR13-2 Cascade Ridge Storage Tank (0.1 MG)

This project is in the Cascade Ridge development in south Skagit County. Three glass-lined, bolted steel tanks, installed in 1990, serve this development. The storage tanks are undersized and in need of maintenance. The project will involve the construction of a new, larger storage tank to serve the highest pressure zone and PRV stations to serve lower pressure zones. A preliminary capacity is estimated to be 0.1 MG.

10.1.4.3 MR13-3 Big Lake Storage Tank (0.2 MG, 356-foot HGL)

This project is in the 356 Pressure Zone near Big Lake, east of Mount Vernon. The residential community surrounding Big Lake is still experiencing growth. It is projected that additional storage will be needed. A preliminary capacity is estimated to be 0.2 MG. There is a potential for this storage tank to be a developer-driven project, with the District contributing to increased storage for existing customers. This project will not be fully defined until the status of potential developments in the Big Lake area is finalized.

10.1.4.4 MR13-4 Pleasant Ridge Storage Tank (0.2 MG, 290-foot HGL)

This project is in the Pleasant Ridge area of west Skagit County adjacent to Valentine Road. This area currently does not have a storage tank to provide standby storage or fire suppression capacity. The project will construct a new storage tank at a new 290 Pressure Zone that will serve residents at the higher elevations in this area. A preliminary capacity is estimated to be 0.2 MG. The existing Rudene PS and Bradshaw PS will supply water from the 214 Pressure Zone to the new storage tank.

10.1.4.5 MR13-5 North Sedro Woolley Storage Tank (1.0 MG, 430 / 350-HGL)

This project is in the north or northeast part of Sedro-Woolley and will serve future demands in this area as the population and water demand increase. A preliminary capacity is estimated to be 2.0 MG. The existing Hoogdal Storage Tank (0.1 MG) also serves this area, but it does not provide adequate standby storage as the water demand in this pressure zone increases. A site has not yet been selected for this new storage tank, but preliminary discussions with the Upper Skagit Indian Tribe have occurred recently.

10.1.4.6 MR13-6 Burlington Tank (2.0 MG, 214-foot HGL)

This project is in the north part of Burlington to provide standby and fire suppression storage to Burlington and the rural areas north of State Route 20. A preliminary capacity is estimated to be 2.0 MG. Currently, storage in these areas is provided by the 9th & Highland Reservoir (5.0 MG) in Mount Vernon and the Dukes Hill Reservoir (5.0 MG) in Sedro-Woolley. Still, it would be advantageous if there is local storage to respond to domestic demands. The site for this new reservoir has not been selected, and the timing of this reservoir depends on growth and future water demands for this area. If there is significant growth in this area, then the construction of this reservoir could be accelerated.

10.1.4.7 MR13-7 South Mount Vernon / Skagit County Tank (2.0 MG)

This project is in south Mount Vernon or Skagit County to provide additional standby and fire suppression storage for this service area. Currently, storage in this service area is provided by the 9th & Highland Reservoir (5.0 MG), but eventually, the storage volume in this reservoir will be inadequate. A site for this new reservoir has not been selected, and the timing for this reservoir depends on growth and future water demands in this service area.

10.1.5 Fiber Optic Program

Fiber optic networks are used for supervisory, control, and data acquisition (SCADA) at the District's treatment and distribution facilities. The District has been building out its fiber optic network to eventually replace other forms of communication such as radio and cellular. The following are planned fiber optic installations.

10.1.5.1 FO13-4 9th Street Fiber

This project is to extend the existing fiber system and close existing gaps in the fiber network. Project will be completed following Skagit PUD guidelines and procedures. This project will tie the 9th and Highland Tank into the future fiber system in the Kulshan Trail.

10.1.5.2 FO13-5 Kulshan Trail Fiber

This project is to extend the existing fiber system and close existing gaps in the fiber network. Project will be completed following Skagit PUD guidelines and procedures. This project will extend from the fiber termini at 9th Street extended and Kulshan Trail to North LaVenture Road.

10.1.5.3 FO13-6 Kulshan Avenue Fiber

This project is to extend the existing fiber system and close existing gaps in the fiber network. Project will be completed following Skagit PUD guidelines and procedures. This project will extend along Kulshan Avenue from N. LaVenture road to N. 30th where a fiber system exists.

10.1.6 Miscellaneous Capital Projects

The District has other capital improvement projects that do not fit conveniently into the other categories listed above. These capital projects are described here and include the following.

10.1.6.1 MX20-1 Micro Hydro at the Division Street Booster Pump Station

The District operates numerous pressure-reducing valves throughout the distribution system. These pressure reducing valves can be bypassed by a micro hydro unit that will provide the same function of the pressure reducing valve while generating clean hydroelectric energy. Currently the Division Street Tank Site looks promising. Other sites are still under consideration.

10.1.6.2 MX20-2 PUD Campus Design & Construction

This project is to build a new District campus on the existing site. The main administrative building constructed in 1970 is 27,000 square feet and houses the Administration, Finance, IT, Engineering, Operations, Customer Service and Construction Staff. The current building is nearing the end of its life cycle and needs replacement. The building's roof, heating and ventilation systems in the administration building are currently at or near the end of their useful life. The current building does not meet ADA code and the main floor 2.8' below flood level. The building is at its capacity with 79 employees. The new building will continue to house the Administration, Finance, IT, Engineering, Operations, Customer Service and Construction Staff. The new building will include meeting spaces, offices, and commissioners' chambers. The other existing 5 buildings on site used for storage will be updated as needed.

10.1.6.3 MO13-5 Document Management Software

This project involves implementing a software program that will help automate and manage project files and communication, digitally capture, secure, and organize documents across the enterprise, and support compliance, integrate applications, and drive information security in an environment where multiple people are accessing the information, both in the office and from mobile platforms. The software will also address the storage and archiving of historical files.

10.1.6.4 MO13-8 Badger ORION 5/5 Meter Transmitter Replacement

The project involves all the District's existing 5/8-inch water meters that were installed before 2008. These meters have radio-read technology, and battery life is expected to be approximately 15 to 20 years. This project involves changing the batteries and possibly the entire transmitter on the meters, depending on the options and technology available.

10.1.6.5 MX20-3 Other Agency Coordination Opportunities

These are unspecified projects that arise as part of projects pursued by other agencies. These water system projects may be mandated (e.g., relocation of an existing pipeline that is interfering with another agency's project) or chosen based on mutual benefit (e.g., replace a water pipeline before a

street paving project). A budget of $500,000 per year is set aside to address these unspecified projects by other agencies.

10.1.6.6 MX20-4 Annual Pipe Replacement Infill

As the District's pipes continue to age, additional pipelines begin to show increased leaks and require increased maintenance. Approximately $500,000 to $1,000,000 per year is set aside to address the replacement of these pipelines as well as gridding of the District's system. This is work is a general project category that becomes more refined with specific projects as they approach and need arises. Current projects planned through the life of this WSP include:

- Driver Road Pipe Replacement
- Satterlee Road PRV Relocation
- Bridgeway Reservoir Abandonment and Transmission Connection as SR20
- Satterlee Road, Gibraltar to Mashie Street
- Gauges Slough
- Curtis Street
- Francis Road Pipe Replacement
- LaVenture, Hoag, Martin, Intersection Improvement
- BNSF Casing Modifications
- SR534 (Pioneer Hwy) Fish Passage
- SR538 (College Way) Fish Passage
- Alger I-5 Lake Samish Road Fish Passage
- SR9 and Kalloch Fish Passage
- SR20 at Marblemount Fish Passage

10.1.6.7 Gilligan Creek Road/Intake Slide Repair

This project repairs the access road to the PUD's Gilligan Creek Intake. Repair of the road includes provisions for access to the creek downstream of the intake to allow for stream gauging calibration.

10.1.6.8 WTP Dam Pipe Replacement

The District's Judy system impounds water at the Judy Reservoir, adjacent to the District's Judy Water Treatment Plant (WTP). This raw water is sent to the WTP via two separate outflow pipes. One of the pipes is the primary raw water source and the second pipe is a redundant outflow. This project rehabilitates a secondary outflow from the PUD's "B" Dam which has exhibited minor weeping of water through pipe joints.

10.1.6.9 Alger Well and Booster Pump Improvements

As discussed in Chapter 12, updated analysis has determined that the well pump capacity should be increased at the Alger satellite water system. This project includes evaluation of the well's safe yield by a hydrogeologist, installation of a larger well pump and other required well improvements, and changes to the booster pumps at the 710 and 585 pressure zones.

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11 FINANCIAL PLAN

The following sections are amended:

11.1	Introduction
11.3.1	Financial Plan
11.3.2	Capital Funding Plan
11.3.3	Capital Financing Strategy
11.4	Available Funding Assistance and Financing Resources
11.4.1	District Resources
11.4.1.1	Capital Connection Charges
11.4.1.2	Location Facilities Charges
11.4.2	Outside Resources
11.4.2.1	Grants and Low-Cost Loans
11.4.2.2	Bond Financing
11.5	Financial Forecast
11.5.2	Fiscal Policies
11.5.2.1	Financial Forecast
11.5.3	District Funds and Reserves
11.6	Current and Projected Rates
11.6.1	Current Rates
11.6.2	Projected Rates
11.8	Conclusion

Table 11-3 has been updated
Table 11-4 has been updated
Table 11-6 has been updated
Table 11-7 has been updated
Table 11-9 has been updated

11.1 Introduction

The District's financial forecast considers the historical financial condition, current financial and policy obligations, operation and maintenance needs, and the ability to support the financial impact related to the completion of the capital projects identified in this WSP. Furthermore, this chapter provides a review of the utility's current rate structure for rate adequacy and the promotion of water conservation. Appendix R presents backup documentation related to this financial plan.

11.3 Current Financial Structure

11.3.1 Financial Plan

The District's primary source of funding is derived from ongoing monthly charges for service, with additional revenues coming from miscellaneous revenues, new service installations, interest charges on Local Utility Districts (LUDs), and non-donated plant. The District controls the level of user charges, and the Board of Commissioners establishes user charges as needed to meet financial objectives.

The financial plan can only provide a qualified assurance of financial feasibility if it considers the total system costs of providing water services, both operating and capital. To meet these objectives, the following elements have been completed:

3. **Capital Funding Plan.** Identifies the total Capital Improvement Program (CIP) obligations of the planning period. The plan defines a strategy for funding the CIP, including an analysis of available resources from rate revenues, existing reserves, system development charges, debt financing, and any special resources that may be available (e.g., grants, developer contributions, etc.). The capital funding plan impacts the financial plan through the use of debt financing (resulting in annual debt service) and the assumed rate revenue available for capital funding.
4. **Financial Forecast.** Identifies future annual non-capital costs associated with the operating, maintenance, and administration of the water system. Included in the financial plan is a reserve analysis that forecasts cash flow and fund balance activity along with testing for the satisfaction of actual or recommended minimum fund balance policies. The financial plan ultimately evaluates the sufficiency of utility revenues in meeting all obligations, including cash uses such as operating expenses, debt service, capital outlays, and reserve contributions, as well as any coverage requirements associated with long-term debt.

11.3.2 Capital Funding Plan

The CIP developed for this WSP update identifies $89.7 million in project costs over the 5-year planning horizon and $154 million during the ten-year period. This CIP consists of approximately fifty projects, including annual pipe and vehicle replacement, new pump stations, and pipelines. Costs are stated in 2020 dollars.

A summary of the ten-year CIP is shown in Table 11-3. As shown, each year has varied capital cost obligations depending on construction schedules and infrastructure planning needs. Approximately 58% of the capital costs are included in the 5-year planning period. Table 11-4 provides more detail for the ten-year capital improvement plan.

Table 11-3. 5- and 10-year CIP Summary

Year	Cost
2020	$ 7,475,000
2021	$ 28,377,000
2022	$ 26,864,000
2023	$ 13,780,000
2024	$ 13,238,000
5-Year Total	**$ 89,734,000**
2025-2030	$ 64,061,000
10-Year Total	**$ 153,795,000**

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TABLE 11-4: 10-Year Capital Improvement Plan

CIP No.	Description	Total Project Cost	Project Costs Through 2020	2021	2022	2023	2024	2025	2026 Through 2030
	Water Treatment Program:								
MO13-6	Dry Scrubber Retrofit	$ 460,000		$ 460,000					$ -
MO20-1	Raw Water Pump Station Upgrade	$ 4,000,000	$ 275,000	$ 3,725,000					$ -
MO20-2	Backwash Pump Replacement	$ 1,310,000	$ 5,000	$ 100,000	$ 1,205,000				$ -
MO20-3	Potlatch RO Replacement	$ 60,000		$ 60,000					$ -
MO20-4	SCADA System Replacement	$ 750,000			$ 750,000				$ -
MO20-5	Dedicated Power Feed from the PSE Norlum Substation	$ 4,000,000			$ 250,000	$ 250,000	$ 3,500,000		$ -
MO20-6	Disinfection Study	$ 600,000							$ 600,000
MO20-7	Filter Conversion and Optimization	$ 3,910,000			$ 120,000	$ 860,000	$ 2,930,000		$ -
MO20-8	Equipment Replacement - Floculators & Recycle Basin	$ 540,000			$ 270,000	$ 270,000			$ -
MO20-9	Clearwell Recoating	$ 1,720,000			$ 430,000	$ 430,000	$ 860,000		$ -
MO20-10	Concrete Maintenance - Crack Injection & Calking	$ 250,000						$ 250,000	$ -
MO20-11	Sodium Chlorite & CO2 Tank Replacement	$ 700,000						$ 300,000	$ 400,000
MO20-12	WTP Building Seismic Improvements	$ 840,000							$ 840,000
MO20-13	Finished Water Flow Meter	$ 100,000							$ 100,000
MO20-14	Lagoon Solids Handling Improvements	$ 930,000							$ 930,000
MO20-15	WTP Electrical System Upgrade	$ -							$ -
MO20-16	Disinfection System Replacement	$ -							$ -
MO20-17	Instrumentation Flow Meters	$ -							$ -
MO20-18	Clearwell Seismic Expansion Joints	$ -							$ -
MO20-19	Lagoon and Solids Handling Expansion	$ -							$ -
	Transmission Pipeline Program:								$ -
MT13-4	Judy Res. to MV Transmission - Phase 2	$ 25,500,000	$ 5,816,000	$ 11,000,000	$ 8,684,000				$ -
MT20-1	Judy Res. to SW Transmission - Phase 2 (Top of Hill)	$ 5,500,000							$ 5,500,000
MT13-9	Judy Res. to SW Transmission - Phase 3 (River Crossing)	$ 8,400,000				$ 1,300,000	$ 1,300,000	$ 5,800,000	$ -
MT20-2	Judy Res. to SW Transmission - Phase 4	$ 19,700,000						$ 500,000	$ 19,200,000
	Distribution Pipeline Program:								$ -
MP13-7	Burklund / Cedardale Road Pipeline	$ 3,400,000	$ 43,000	$ 3,357,000					$ -
MP20-1	Little Mountain Road Pipeline	$ 5,200,000	$ 583,000	$ 2,317,000	$ 2,300,000				$ -
	State Grant Deduction	$ (5,200,000)	$ (583,000)	$ (2,317,000)	$ (2,300,000)				$ -
MP20-2	Bored and Cased Crossings	$ 1,000,000	$ 40,000					$ 960,000	$ -
MP20-3	Sky Ridge Pipe and Booster Pump Station Replacement	$ 2,000,000	$ 125,000	$ 1,875,000					$ -
MP20-4	College Way Pipeline Replacement	$ 2,000,000			$ 400,000	$ 1,600,000			$ -
MP20-5	Skagit County Club Pipeline Replacement	$ 2,100,000	$ 30,000			$ 2,070,000			$ -
MP20-6	NW Burlington Pipeline Replacemnent	$ 1,700,000	$ 52,000				$ 1,648,000		$ -
MP20-7	MV Belmont / Clarmont Pipeline Replacement	$ 1,100,000						$ 1,100,000	$ -
MP20-8	West Mount Vernon Pipeline Replacement	$ 1,200,000	$ 1,000						$ 1,199,000
MP20-9	Peterson Road Pipeline Replacement	$ 1,300,000	$ 17,000						$ 1,283,000
MP20-10	MV Hillcrest District Pipeline Replacement	$ 1,700,000	$ 26,000						$ 1,674,000
MP20-11	Bayview Community Pipeline Replacement	$ 1,100,000							$ 1,100,000
MP13-8	North Fork Skagit River Crossing	$ 9,600,000							$ 9,600,000
MP20-12	Conway to Lake McMurray Extension								
MP20-13	South Conway Extension								
MP20-14	Bow Hill to Alger								
	Storage Tank Program:								$ -
MR20-1	Panorama Storage Tank (2.0 MG)	$ 5,100,000	$ 45,000	$ 1,800,000	$ 3,255,000				$ -
MR13-2	Cascade Ridge Storage Tank (0.1 MG)	$ 255,000							$ 255,000
MR13-3	Big Lake Storage Tank (0.2 MG, 356-foot HGL)	$ 510,000							$ 510,000
MR13-4	Pleasant Ridge Area Storage Tank (0.2 MG, 290-foot HGL)	$ 640,000							$ 640,000
MR13-5	North Sedro Woolley Storage Tank (1.0 MG, 430/350-foot HGL)	$ 320,000							$ 320,000
MR13-6	Burlington Tank (2.0 MG, 214-foot HGL)	$ -							$ -
MR13-7	South Mount Vernon - Skagit County Tank (2.0 MG)	$ -							$ -
	Fiber Optic Program:								$ -
FO13-4	9th Street Fiber				$ 80,000				
FO13-5	Kulshan Trail Fiber			$ 76,000					
FO13-6	Kulshan Avenue Fiber			$ 120,000					
	Miscellaneous Capital Improvements:								$ -
MX20-1	Micro Hydro at the Division St. BPS	$ -							$ -
MX20-2	PUD Campus Design & Construction	$ 20,000,000	$ 1,000,000	$ 5,000,000	$ 10,000,000	$ 4,000,000			$ -
MO13-5	Document Management Software	$ 290,000	$ 240,000	$ 50,000					$ -
MO13-8	Badger ORION 5/8 Meter Transmitter Replacement	$ 4,500,000				$ 1,500,000	$ 1,500,000	$ 1,500,000	$ -
MX20-3	Other Agencies Coordination Opportunites	$ 5,000,000		$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	$ 2,500,000
MX20-4	Annual Pipe Replacement Infill	$ 10,000,000		$ 500,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ -	$ 6,500,000
	Total Capital Projects	**$ 154,361,000**	**$ 7,715,000**	**$ 28,623,000**	**$ 26,944,000**	**$ 13,780,000**	**$ 13,238,000**	**$ 10,910,000**	**$ 53,151,000**

Table 11-4. 10-Year Capital Improvement Plan

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11.3.3 Capital Financing Strategy

An ideal capital financing strategy would include the use of grants and low-cost loans when debt issuance is required. However, these resources are limited and competitive in nature and do not provide a reliable source of funding for planning purposes. The District will continue to pursue these funding avenues but assumes bond financing will be needed to fund the proposed CIP. Other than the Drinking Water State Revolving Fund (DWSRF) loan that has already been approved for the Mountain View Consolidation Project and the Public Works Trust Fund Loan (PWTF) received as part of the Judy Reservoir to Mount Vernon Phase 2 Transmission Line Project, revenue bonds have been used as the debt funding instrument in this financial plan. The capital financing strategy developed to fund the CIP identified in this WSP assumes the following funding resources:

- Accumulated cash reserves
- System Development Fund
- Annual cash from rates earmarked for routine capital funding
- Department of Ecology Loan
- DWSRF loan that has been approved
- PWTF loan that has been approved
- Revenue bond financing
- Future State Congressional Funding

The District began 2020 with $10.8 million in the Revenue Fund and an additional $3.6 million in the Major Capital Fund. The financial forecast assumes that funds beyond the Revenue Fund target of 2-1/2 months of operations and maintenance (O&M) expenses plus depreciation are used to fund the CIP. In addition, at least $1.7 million of System Development Funds will be used to fund capital projects.

11.4 Available Funding Assistance and Financing Resources

Feasible long-term capital funding strategies must be defined to ensure that adequate resources are available to fund the projects identified in this WSP. In addition to the District's resources such as accumulated cash reserves, capital revenues, and rate revenues designated for capital purposes, capital needs can be met from outside sources such as grants, low-interest loans, and bond financing. The following is a summary of the District's internal and external resources.

11.4.1 District Resources

Resources appropriate for funding capital needs include accumulated cash in the Major Capital Fund, rate revenues designated for capital spending purposes, and capital-related charges such as the System Development Fee (SDF). The first two resources are discussed in the Fiscal Policies section (11.5.2) of the Financial Forecast. Capital-related charges are discussed below.

11.4.1.1 Capital Connection Charges

A connection charge such as the SDF refers to a one-time charge imposed on new customers as a condition of connecting to the water system. The purpose of the connection charge is two-fold: to promote equity between new and existing customers, and to provide a source of revenue to fund capital projects. Revenue can only be used to fund utility capital projects or to pay debt service incurred to finance those projects. The District currently charges an SDF for all new metered water services. The cost in 2020 is $4,190 for a 5/8-inch meter. The SDF for services larger than 5/8 are charged as multiple of the 5/8-inch SDF. The SDF will increase over each of the next five years in an amount equal to the Engineering News-Record (ENR) Construction Cost Index for Seattle.

11.4.1.2 Location Facilities Charges

While a connection charge is how new customers pay their share of general facilities costs, local facilities funding is used to pay the costs of local facilities that connect each property to the system's infrastructure. Local facilities funding is often overlooked in rate forecasting because it is funded upfront by either connecting customers, developers, or through an assessment to properties, but never from rates.

Several mechanisms can be considered toward funding local facilities. One of the following scenarios typically occurs: (a) the utility charges a connection fee based on the cost of the local facilities (under the same authority as the SDF); (b) a developer funds extension of the system to its development and turns those facilities over to the utility (contributed capital); or (c) a local assessment entity, called a Utility Local Improvement District (ULID/LID) or a Local Utility District (LUD), is set up that collects assessment revenue from benefited properties.

A local facilities charge (LFC) is a variation of the connection charge. It is a District-imposed charge to recover the cost related to service extension to local properties. Often called a front-footage charge and imposed basis on footage of the main "fronting" a particular property, it is usually implemented as a reimbursement mechanism to a District for the cost of a local facility that directly serves a property. It is a form of connection charge and thus can accumulate up to 10 years of interest. It typically applies in instances when no developer-installed facilities are needed through developer extension due to the prior existence of available mains already serving the developing property.

The developer extension is a requirement that a developer installs on-site and sometimes off-site improvements as a condition of extending service. These are in addition to the connection charge

required and must be built to District standards. Part of the agreement between the District and the developer planning to extend service might include a late-comer agreement, resulting in a late-comer charge to new connections to the developer extension.

Late-comer charges are a variation of developer extensions whereby new customers connecting to a developer-installed improvement make a payment to the District based on their share of the developer's cost. The District passes this charge on to the developer who installed the facilities. As part of the developer extension process, this defines the allocation of costs and records late-comer obligations on the title of affected properties. No interest is allowed, and the reimbursement agreement cannot exceed 20 years in duration.

LID/ULID is another mechanism for funding infrastructure that assesses benefited properties based on the special benefit received by the construction of specific facilities. Most often used for local facilities, some ULIDs also recover related general facilities costs. Substantial legal and procedural requirements can make this a relatively expensive process, and there are mechanisms by which a ULID can be rejected.

11.4.2 Outside Resources

This section outlines various grant, loan, and bond opportunities that may be available to the District through federal and state agencies to fund the capital improvement plan identified in the WSP.

11.4.2.1 Grants and Low-Cost Loans

Historically, federal and state grant programs were available to local utilities for capital funding assistance. However, these assistance programs have been substantially reduced in scope and amount or replaced by loan programs. Remaining miscellaneous grant programs are generally lightly funded and heavily subscribed. Nonetheless, even the benefit of low-interest loans makes the effort of applying worthwhile. Grants and low-cost loans for Washington State utilities are available from the Department of Commerce, including two assistance programs that are available to the District.

Public Works Trust Fund (PWTF) – Cities, towns, counties, and special purpose districts are eligible to receive loans from the PWTF for water, sewer, storm, roads, bridges, and solid waste/recycling construction projects to address critical needs. Construction Loans are available only for drinking water, sanitary sewer, stormwater, and solid waste/recycling.

PWTF loans are available at interest rates ranging from 0.50 to 2.00%, depending on the repayment term. The standard loan offer is 1.00% interest repaid over a 20-year term. All loan terms are subject to negotiation and Board approval.

Further detail is available at http://www.pwb.wa.gov.

Drinking Water State Revolving Fund (DWSRF) Loan Program – Funding historically targets the protection of public health, compliance with drinking water regulations, and assistance for small and disadvantaged communities. Low-interest rates provided are 1.0 – 1.5%, and no local match is required.

Further detail is available at:

http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemAssistance/DrinkingWaterStateRevolvingFundDWSRF.

11.4.2.2 Bond Financing

General Obligation Bonds – General Obligation (G.O.) bonds are bonds secured by the full faith and credit of the issuing agency, committing all available tax and revenue resources to debt repayment. With this high level of commitment, G.O. bonds have relatively low-interest rates and few financial restrictions. However, the authority to issue G.O. bonds is restricted in terms of the amount and use of the funds, as defined by the Washington constitution and statute. Specifically, the amount of debt that can be issued is linked to assessed valuation.

The District has the authority to issue G.O. bonds under the authority of RCW 54.24.020. In addition, RCW 54.24.018 states:

> *"In the event the proposed general indebtedness to be incurred will bring the nonvoter approved indebtedness of the public utility district to an amount exceeding three-fourths of one percent of the value of the taxable property of the public utility district, … the proposition of incurring such indebtedness and the proposed plan or system shall be submitted to the qualified electors of said public utility district for their approval or rejection at the next general election held in such public utility district."*

While bonding capacity can limit the availability of G.O. bonds for utility purposes, these can sometimes play a valuable role in project financing. A rate savings may be realized through two avenues: the lower interest rate and related bond costs, and the extension of repayment obligation to all tax-paying properties (not just developed properties) through the authorization of an *ad valorem* property tax levy.

Revenue Bonds – Revenue bonds are commonly used to fund utility capital improvements. The debt is secured by the revenues of the issuing utility. With this limited commitment, revenue bonds typically bear higher interest rates than G.O. bonds and also require security conditions related to the maintenance of dedicated reserves (a bond reserve) and financial performance (added bond debt service coverage). The District agrees to satisfy these requirements by resolution as a condition of the bond sale.

Revenue bonds can be issued in Washington without a public vote. There is no bonding limit, except perhaps the practical limit of the utility's ability to generate sufficient revenue to repay the debt and provide coverage. In some cases, poor credit might make issuing bonds problematic.

11.5 Financial Forecast

The financial forecast, or revenue requirement analysis, forecasts the amount of annual revenue that needs to be generated by user rates. The analysis incorporates operating revenues, O&M expenses, debt service payments, rate-funded capital needs, and any other identified revenues or expenses related to operations. The objective of the financial forecast is to evaluate the sufficiency of the current level of rates. In addition to annual operating costs, the revenue needs also include debt covenant requirements and specific fiscal policies and financial goals of the District.

The analysis determines the amount of revenue needed in a given year to meet that year's expected financial obligations. For this analysis, two revenue sufficiency tests have been developed to reflect the financial goals and constraints of the District: cash needs must be met, and debt coverage requirements must be realized. To operate successfully with respect to these goals, both tests of revenue sufficiency must be met.

Cash Test – The cash flow test identifies all known cash requirements for the District in each year of the planning period. Typically, these include O&M expenses, debt service payments, depreciation funding or directly funded capital outlays, and any additions to specified reserve balances. The total annual cash needs of the District are then compared to projected cash revenues using the current rate structure.

Coverage Test – The coverage test is based on a commitment made by the District when issuing revenue bonds and some other forms of long-term debt. For purposes of this analysis, revenue bond debt is assumed for any needed debt issuance. As a security condition of issuance, the District would be required per covenant to agree that the revenue bond debt would have a higher priority for payment (a senior lien) compared to most other expenditures; the only outlay with a higher claim are O&M expenses. Debt service coverage is expressed as a multiplier of the annual revenue bond debt service payment. For example, a 1.0 coverage factor would imply that no additional cushion is required. A 1.25 coverage factor means revenue must be sufficient to pay O&M expenses, annual revenue bond debt service payments, plus an additional 25% of annual revenue bond debt service payments. The excess cash flow derived from the added coverage, if any, can be used for any purpose, including funding capital projects. Targeting a higher coverage factor can help the District achieve a better credit rating and provide lower interest rates for future debt issues.

In determining the annual revenue requirement, both the cash and coverage sufficiency test must be met, and the test with the greatest deficiency drives the level of required rate increase in any given year.

11.5.2 Fiscal Policies

A summary of the key financial policies employed by the District, as well as those recommended and incorporated in the financial program, is provided below.

Minimum Fund Balances – Operating reserves are designed to provide a liquidity cushion to ensure that adequate cash working capital will be maintained to deal with significant cash balance fluctuations such as seasonal fluctuations in billings and receipts, unanticipated cash expenses, or lower than expected revenue collections. The District's current policy is to maintain a minimum balance in the Revenue Fund equal to 2-1/2 months of O&M plus depreciation.

System Reinvestment – The purpose of system reinvestment funding is to provide for the replacement of aging system facilities to ensure the sustainability of the system for ongoing operation. Each year, the District's assets lose value, and as they lose value, they are moving toward eventual replacement. That accumulating loss in value and future liability is measured for reporting purposes through annual depreciation expense, which is based on the original cost of the asset. While this reported expense reflects the consumption of the existing asset and its initial investment, the replacement of that asset will likely cost much more, factoring in inflation and construction conditions. Therefore, the added annual replacement liability is even higher than the annual depreciation expenses.

Debt Management – It is prudent to consider policies related to debt management as part of a broader utility financial policy structure. Debt management policies should be evaluated and formalized, including the level of acceptable outstanding debt, debt repayment, bond coverage, and total debt coverage targets. The District's existing bond covenants require a minimum 1.25 debt coverage test; however, the goal set by the District is 2.0, which is met throughout the forecast.

11.5.2.1 Financial Forecast

The financial forecast is developed from the 2020 budget documents along with other key factors and assumptions to develop a complete portrayal of the District's annual financial obligations. The following is a list of the key revenue and expense factors and assumptions used to develop the financial forecast:

- **Revenue** – The District has two general revenue sources: revenue from consumptive charges for service (rate revenue) and miscellaneous (non-rate) revenue. In the event of a forecasted annual shortfall, rate revenue can be increased to meet the annual revenue requirement. Non-rate revenues are forecast to increase with customer growth, or not escalate, depending on the nature of the revenue.
- **System Development Fee Revenue** – The current SDF of $4,190 is expected to increase annually based on the construction cost inflation and generate between $1,300,000 in 2020 and

$1,500,000 million in 2024. This money is used to fund growth-related capital projects and debt service incurred to finance those projects.

- **Growth** – Rate revenue is escalated based on the growth rates provided in Chapter 4 of this WSP, which average 1% per year.
- **Expenses** – O&M expense projections are based on the 2020 budget and an inflation forecasted 3.5% for labor costs, 3.5% for construction costs, and 8.0% for benefit costs. Future taxes are calculated based on forecasted revenues and prevailing tax rates.
- **Existing Debt** – At year-end, the District's long-term debt obligation included Revenue Bonds of $13,042,935, low-interest Drinking Water Revolving Fund loans of $10,417,620, Public Works Trust Fund loans of $6,168,922, and a Department of Ecology loan of $1,156,612.
- **Future Debt** – The capital financial strategy developed for this WSP forecasts the need to issue $52.3 million of new debt in two bond offerings of $37.1 million and $15.2 million, respectfully. Other than the existing $7.3 million of low-interest loans that have already been approved, the analysis performed assumes revenue bond financing will be used to fund future CIP needs.
- **Revenue Bond Assumptions** – The forecast assumes a revenue bond interest rate of 5.0%, an issuance cost of 1.5%, and a term of 20 years.
- **Transfer to Capital** – Any Operating Fund balance above the minimum requirement is assumed to be available to fund capital projects and transferred to the Capital Fund. The 2020 Operating Fund balance is expected to end the year at 90 days of O&M expenses plus depreciation, well above the minimum target for that year. The Capital Fund balance is expected to end the year at approximately $25.5 million after issuing bonds.

Although the financial plan is completed for the 10-year time horizon, the rate strategy focuses on the shorter-term planning period of 2020 through 2024 and the corresponding time horizon of this WSP.

Table 11-6 summarizes the annual revenue requirements based on the forecast of revenues, expenditures, fund balances, and fiscal policies.

Table 11-6. 5-Year Financial Forecast

Revenue Requirement	2020	2021	2022	2023	2024
Revenues					
Rate Revenues Under Existing Rates	$ 24,705,676	$ 24,879,450	$ 25,054,962	$ 25,232,229	$ 25,411,268
Non-Rate Revenues	1,595,966	1,661,224	1,677,457	1,714,210	1,731,049
Total Revenues	**$ 26,301,642**	**$ 26,540,675**	**$ 26,732,419**	**$ 26,946,439**	**$ 27,142,317**
Expenses					
Cash Operating Expenses	$ 14,883,907	$ 15,324,040	$ 15,778,517	$ 16,247,818	$ 16,732,446
Existing Debt Service	3,244,750	3,226,916	2,510,963	1,824,330	1,814,877
New Debt Service	3,290,385	3,290,385	4,638,467	4,638,467	4,638,467
Routine Capital Funding	3,041,608	2,339,468	2,610,810	2,693,497	3,089,334
Total Expenses	**$ 24,460,649**	**$ 24,180,810**	**$ 25,538,756**	**$ 25,404,113**	**$ 26,275,124**
Net Surplus (Deficiency)	$ 1,840,993	$ 2,359,865	$ 1,193,663	$ 1,542,326	$ 867,193
Additions to Meet Coverage	-	-	(220,060)	(738,869)	(318,912)
Total Surplus (Deficiency)	**$ 1,840,993**	**$ 2,359,865**	**$ 973,602**	**$ 803,457**	**$ 548,281**
Annual Rate Increase	**5.00%**	**5.00%**	**5.00%**	**5.00%**	**5.00%**
Cumulative Rate Increase	**5.00%**	**10.25%**	**15.76%**	**21.55%**	**27.63%**
Revenues After Rate Increases	$ 25,940,960	$ 27,429,594	$ 29,004,250	$ 30,669,932	$ 32,431,933
Additional Taxes from Rate Increase	62,122	128,247	198,610	273,462	353,069
Net Cash Flow After Rate Increase	**$ 3,014,154**	**$ 4,781,762**	**$ 4,944,341**	**$ 6,706,567**	**$ 7,534,788**
Coverage After Rate Increase: Bonded Debt	3.21	3.54	2.83	3.05	3.27
Coverage After Rate Increase: Total Debt	2.13	2.35	2.25	2.68	2.88

In December of 2019, the Board of Commissioners approved Resolution 2266-19, establishing the rates for the next five-years. Each January 1st, the rates will increase by 5% for the years 2020-2024.

11.5.3 District Funds and Reserves

Table 11-7 shows a summary of the projected Revenue Fund and Major Capital Fund ending balances through 2024 based on the rate forecasts presented above. The combined minimum target balance is based on 2-1/2 months of O&M plus depreciation, and the funds remain above the target throughout the forecast.

Table 11-7. Ending Cash Balance Summary

Fund Balance	2020	2021	2022	2023	2024
Revenue Fund					
Ending Fund Balance	**$ 3,685,322**	**$ 3,810,153**	**$ 3,939,565**	**$ 4,073,740**	**$ 4,212,867**
Actual Days of O&M	*90 days*	*90 days*	*90 days*	*90 days*	*90 days*
Major Capital Fund					
Ending Capital Fund Balance	**$ 25,500,533**	**$ 547,781**	**$ 2,729,774**	**$ 543,277**	**$ 4,005,578**
Minimum Target Balance	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*	*$ 500,000*
Combined Beginning Balance	**$ 7,189,371**	**$ 29,185,855**	**$ 4,357,934**	**$ 6,669,339**	**$ 4,617,018**
Combined Ending Balance	**$ 29,185,855**	**$ 4,357,934**	**$ 6,669,339**	**$ 4,617,018**	**$ 8,218,445**
Ending Total Days of Operating Expenditures	*892 days*	*268 days*	*336 days*	*274 days*	*339 days*
Combined Minimum Target Balance	*4,185,322*	*4,310,153*	*4,439,565*	*4,573,740*	*4,712,867*

11.6 Current and Projected Rates

11.6.1 Current Rates

The District's current rate structure consists of two rate components:

1. A fixed monthly charge based on meter size
2. A variable monthly charge per hundred cubic feet (ccf)

The variable monthly charge has three blocks that include one block for usage up to 3 ccf, a second block for usage between 4 and 100 ccf, and a third block for usage over 100 ccf.

Table 11-9 shows the existing rate structure (2020 – 2024).

Table 11-9. 2020 – 2024 Rate Structure

Description	Fixed Rates				
	2020	2021	2022	2023	2024
	Existing	Proposed			
Meter Size (all classes):					
5/8"	$ 32.38	$ 34.00	$ 35.70	$ 37.48	$ 39.36
	3.9%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
3/4"	$ 32.38	$ 34.00	$ 35.70	$ 37.48	$ 39.36
	3.9%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
1"	$ 53.93	$ 56.62	$ 59.46	$ 62.43	$ 65.55
	6.7%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
1 1/2"	$ 107.52	$ 112.90	$ 118.54	$ 124.47	$ 130.69
	8.8%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
2"	$ 171.72	$ 180.31	$ 189.33	$ 198.79	$ 208.73
	9.7%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
3"	$ 321.96	$ 338.05	$ 354.96	$ 372.70	$ 391.34
	10.3%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
4"	$ 536.11	$ 562.92	$ 591.06	$ 620.62	$ 651.65
	10.6%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
6"	$ 1,072.28	$ 1,125.89	$ 1,182.19	$ 1,241.30	$ 1,303.36
	10.8%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
8"	$ 1,715.36	$ 1,801.13	$ 1,891.18	$ 1,985.74	$ 2,085.03
	10.9%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Description	**Variable Rates (per ccf)**				
Single Family & Duplex w/ Individual Meters					
Block 1 (0-3 ccf)	$ 3.37	$ 3.54	$ 3.72	$ 3.91	$ 4.11
	5.0%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Block 2 (4-100 ccf)	$ 5.31	$ 5.58	$ 5.86	$ 6.15	$ 6.46
	5.0%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Block 3 (101+ ccf)	$ 3.20	$ 3.47	$ 3.76	$ 4.08	$ 4.43
	8.5%	*8.5%*	*8.5%*	*8.5%*	*8.5%*
All Others (except Ag)					
Block 1 (0-3 ccf)	$ 5.31	$ 5.58	$ 5.86	$ 6.15	$ 6.46
	5.0%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Block 2 (4-100 ccf)	$ 5.31	$ 5.58	$ 5.86	$ 6.15	$ 6.46
	5.0%	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Block 3 (101+ ccf)	$ 3.20	$ 3.47	$ 3.76	$ 4.08	$ 4.43
	8.5%	*8.5%*	*8.5%*	*8.5%*	*8.5%*
Agriculture	$ 3.20	$ 3.36	$ 3.53	$ 3.71	$ 3.90
		5.0%	*5.0%*	*5.0%*	*5.0%*

11.6.2 Projected Rates

Rates for the years 2020 – 2024 have been established to increase 5% per year. Rates beyond that period will be assessed as needed based upon the progress made on the capital improvement projects.

11.8 Conclusion

The results of this analysis indicate that rate increases are necessary to fund ongoing operating needs and future debt requirements to fund the CIP. Implementation of these rate increases should provide for continued financial viability while maintaining generally affordable rates.

It is important to remember that the analysis performed in this chapter assumes growth rates from Chapter 4 of this WSP. If the future growth rates change, the proposed annual rate increases may need to be updated and revised.

It is recommended that the District regularly review and update the key underlying assumptions that compose the multi-year financial plan to ensure that adequate revenues are collected to meet the District's total financial obligations.

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12 SATELLITE MANAGEMENT

Section 12.2 is appended as follows:

12.2 District Satellite Systems

As described in Chapters 2, 3 and 7 of this plan, the District is the primary Satellite Management Agency for Skagit County.

The Mountain View water system (PWSID 03774Y) was consolidated into the Judy System in 2020.

The Potlatch Beach water system (PWSID 69034 L) uses saltwater from a marine waterbody as a source of supply. As supported by Ecology's Policy POL 1015, a water right permit is not required for the diversion/withdrawal of saltwater from a marine waterbody. A permit-exempt groundwater well is also used for standby/emergency purposes at the Potlatch Beach water system. As this well is located on an island, it is within the area designated by Ecology as not subject to the Skagit River Instream Flow Rule (WAC 173-503).

As discussed in Chapters 2, 3, and 7, the District proposes in the 2021 WSP Limited Update to expand the place of use and retail service areas of the following four satellite systems:

- Alger: GWC 3885
- Cedargrove: G1-25994C
- Rockport: G1-25509
- Skagit View Village: G1-27063

Updated Water System Physical Capacity Analysis (WSPCA) reports for these four systems are located in Appendix T, and the following is a discussion of each water system in regard to the ability of each water system's physical capacity to support limited expansion of the retail service areas and water rights place of use.

Alger

The revised WSPCAs are based on the current DOH Water System Design Manual and reflect a different analytical approach when compared to the District's 2007 Water System Plan. The following discussion addresses questions from DOH related to the Alger water system:

The Alger WSPCA is based on the well pumping 24-hours on the maximum demand day. The existing availability of unallocated standby storage in the reservoirs allows for maintenance downtime at the source during moderate to high demand conditions.

The booster pump for the 710 pressure zone is 29 gpm, and the pump has an emergency generator that automatically activates during a power outage. The Alger WSPCA calculated an optimum pump

capacity of 52 gpm for this pressure zone. The District intends to increase the booster pump size in this pressure zone and decrease the booster pump size in the 585 pressure zone to better match the existing hydraulics in these two closed service areas. The District's goal is to complete these modifications within the next three years.

The 585 pressure zone does not have a dedicated emergency generator but is configured for a portable generator. This pressure zone is only 65 feet (28 psi) higher than the 520-pressure zone. Therefore, water from the 520-pressure zone can be supplied by gravity to the meters in this zone during a power outage. The theoretical pressure drop of 28 psi results in a minimum meter pressure of 23 psi.

The well has an emergency generator that automatically activates during a power outage.

The Alger water system is currently approved by DOH for 219 connections. The District determined in the 2007 Water System Plan that the 45 gpm sizing of the well pump was the most limiting design element and established the physical capacity of the system at 219 connections. The updated WSPCA calculated the following:

- Current status of 144 connections/185 ERUs
- Adequate transmission and water rights for currently approved 219 connections
- 53 ERUs of excess standby storage
- Available equalizing storage of 16 ERUs
- 2 ERUs of available well pump capacity to meet the calculated MDD

Due to the confirmed 52 gpm capacity of the well pump, the source is sufficient to address MDD for the current number of connections and the addition of 1 ERU related to the request for new service outside the LUD boundary.

The methodology for physical capacity analysis has changed since the District's previous water system planning efforts, and as a result this water system plan limited update has identified deficiencies at the Alger water system to meet the approved capacity. The approved capacity of 219 connections is proposed to remain while the District explores options to address these deficiencies, but the District will not allow the water system to exceed 145 connections/186 ERUs until a solution is implemented. Improvements are anticipated to be completed prior to completion of the next water system plan update in 2025.

The Equalizing Storage (ES) is calculated to have capacity for 16 more ERUs, and the observed ES is calculated to provide a minimum pressure of 29 psi. This existing deficiency in minimum pressure will also be addressed with the increase in the capacity of the well pump.

Improvements to the well pump capacity and revisions to the booster pump capacities at the 710 and 585 pressure zones have been added to the Capital Improvement Program in Chapter 10.

Cedargrove

The Cedargrove water system is currently approved by DOH for 466 connections. The updated Water System Physical Capacity Analysis calculated 168 existing connections (174 ERUs) and capacity for an additional 137 ERUs (limited by the annual water right limit).

Rockport

The Rockport water system is currently approved by DOH for 100 residential connections and 6 non-residential connections. The updated Water System Physical Capacity Analysis calculated 72 existing connections (111 ERUs) and capacity for an additional 6 ERUs (limited by storage). Water rights limitations provide capacity for an additional 11 ERUs.

Skagit View Village

The Skagit View Village water system is currently approved by DOH for 128 connections. The updated Water System Physical Capacity Analysis calculated 88 existing connections (90 ERUs) and capacity for an additional 96 ERUs (limited by storage). Water rights limitations provide capacity for an additional 123 ERUs.

Based on the updated Water System Physical Capacity Analysis, the DOH-approved connections for the Skagit View Village water system are proposed to be increased from 128 to 131 connections.

Table 12-6. Water System Approved Capacity

Water System Name	Proposed for Retail Service Area / Place of Use Expansion	Current Approved Capacity	Revised Capacity	Limiting Factor
Alger	Yes (6 existing / 1 future connection)	219	No Change	Installed pump capacity
Cedargrove	Yes (2 existing / 5 future connections)	466	No Change	Water right limited (311 ERU)
Fidalgo Island	No	Unspecified	No Change	N/A
Marblemount	No	106	No Change	Storage
Potlatch Beach	No	182	No Change	Storage
Rockport	Yes (2 existing connections)	100 residential, 6 non-residential conn.	No Change	Storage
Skagit View Village	Yes (1 future connection)	128	131 conn.	Storage