

WOODINVILLE WATER DISTRICT

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GENERAL MANAGER
Bob Bandarra

15 August 2001

Ms. Peggy Dorothy
Legislative Analyst
King County Utilities and Technology Committee
516 Third Avenue, Room 1200
Seattle, WA 98104-3272

Subject: Woodinville Water District's Comprehensive Water Plan – Chapter 8 Revisions

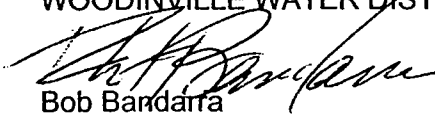
Dear Ms. Dorothy,

My apologies and thanks for your attentiveness. The CIP was documented in a separate excel file which I overlooked. Attached are 6 copies of the revised pages of Chapter 8 (CIP) of the Woodinville Water District Comprehensive Water Plan. The revised pages are intended to "replace" the existing corresponding pages in the plan. Pages 8-1 thru 8-3 have not been modified and are correct as they appear in the plan.

Again, thanks for catching the oversight. Please call if you have any questions.

Sincerely,

WOODINVILLE WATER DISTRICT


Bob Bandarra
General Manager

Cc: Richard Rodriguez, DOH, (revised Chapter 8 pages; 8-4 to 8- 11)
John Medina, District Engineer, (revised Chapter 8 pages; 8-4 to 8- 11)
Andy Soule', CHS Engineers, (revised Chapter 8 pages; 8-4 to 8- 11)

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TABLE 8-1
 20-YEAR CAPITAL IMPROVEMENT PROGRAM BY PROJECT TYPE
 WOODINVILLE WATER DISTRICT

Project ID	Project Year	Project Description	Purpose	1999 Project Cost	Project Year Cost	District Percent	Project Costs - Funding Sources	
							Project Year District Cost	District Present Worth
S-1	2003	<u>Emergency Ground Water Supply</u> Bring existing ground water well on-line as an emergency supply. Includes sodium hypochlorite feed system.	Provide emergency supply	\$ 205,000	\$ 236,000	100%	\$ 236,000	\$ 187,000
S-2	2001	<u>Clearview Transmission Project</u> Construct transmission facilities to transfer Everett Water Treatment Plant supply to the Clearview Reservoir.	Provide alternative source of supply.	\$ 2,200,000	\$ 2,357,000	100%	\$ 2,357,000	\$ 2,098,000
S-3	2014	<u>Snohomish River Regional Water Authority Project</u> Develop source as a partner in SRRWA. (Two alternatives under consideration, higher cost alternative is listed).	Provide alternative source of supply.	\$ 80,000,000	\$ 134,028,000	100%	\$ 134,028,000	\$ 55,925,000
S-4	2001	<u>Lake Tapps Project</u> Development Study	Provide alternative source of supply.	\$ 125,000	\$ 134,000	100%	\$ 134,000	\$ 119,000
S-5	2015	<u>Lake Tapps Project</u> Construction	Provide alternative source of supply.	\$ 24,000,000	\$ 41,616,000	100%	\$ 41,616,000	\$ 16,382,000
Distribution and Transmission				106,530,000	178,371,000		178,371,000	74,711,000

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							Project Year District Cost	District Present Worth
D-1	2002	<u>Zone 4 Supply</u> Parallel the 10-inch line along NE 195th Street from approximately 142nd Ave NE to 132nd Ave NE with 12-inch DI. (3,375 lf)	Provide additional fire flow for school in Zone 4	\$ 365,000	\$ 405,000	100%	\$ 405,000	\$ 340,000
D-2	2005	<u>Zone 4 Distribution System</u> Replace 2,600 lf of 6-inch AC pipe with 8-inch DI along 130th Ave. NE from NE 195th St. to NE 205th St.	AC Replacement; Improve fire flow to northwest portion of service area	\$ 211,000	\$ 259,000	100%	\$ 259,000	\$ 183,000
D-3	2002	<u>Feed to PRV 27/AC Pipe Replacement</u> <u>Schedule 3</u> Replace approximately 6,300 lf of 6-inch AC pipe in Zone 9N with 8- and 10-inch DI in the area circumscribed by NE 201st St., NE 204th St., 149th PL NE and 153rd Ave. NE.	Provide additional fire flow for Zone 5; AC replacement	\$ 735,000	\$ 815,000	100%	\$ 815,000	\$ 684,000
D-4	2002	<u>Feed to PRV 27</u> Replace 450 lf of 6-inch DI with 10-inch DI on 148th Ave. NE from NE 201 St. to NE 202nd St.	Provide additional fire flow for Zone 5	\$ 43,000	\$ 48,000	100%	\$ 48,000	\$ 40,000
D-5	2003	<u>Zone 8 Supply</u> Connect Zone 8 (S. English Hill) with Zone 16 (SW Hollywood) with 3,900 lf of 12-inch main: From existing 8-inch main on 164th Ave NE, located just south of NE 132nd St., to NE 124th St., then northeast along NE 124th Way to connect with the existing 8-inch main.	Add source redundancy to Zone 8.	\$ 422,000	\$ 484,000	100%	\$ 484,000	\$ 383,000

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						District Percent	Project Year District Cost	District Present Worth
D-6	2005	Zone 17 Supply Add PRV to connect Zone 23 to Zone 17.	Provide source redundancy to Zone 17 once Zone 23 system is installed.	\$ 23,000	\$ 28,000	100%	\$ 28,000	\$ 20,000
D-7	2010	Zone 7 Distribution System Replace 930 lf of 6-inch AC with 8-inch DI on 151st Ave NE from 170 feet north of NE 182nd Pl. to Wdinville Duvall Rd.	AC Replacement; Improve fire flow	\$ 75,000	\$ 110,000	100%	\$ 110,000	\$ 58,000
D-8	2010	Zone 7 Distribution System Replace 1,620 lf of 6-inch CI with 8-inch DI on NE 182nd Pl. from 8-inch pipe located approx. 300 feet west of 157th Ave NE to 151st Ave. NE, and north on 151st Ave NE for 170 feet (to AC pipe).	Improve fire flow to dead-end line	\$ 131,000	\$ 192,000	100%	\$ 192,000	\$ 101,000
D-9	2010	Zone 5 Distribution System Replace 2,040 lf of 6-inch AC with 8-inch DI on NE 148th Ave from NE 166th St. to NE 172nd St.	AC Replacement; Improve fire flow	\$ 165,000	\$ 241,000	100%	\$ 241,000	\$ 127,000

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							Project Year District Cost	District Present Worth
D-10	2010	Connection between Zone 9S and Zone 6 Replace 4,600 lf of 6-inch AC pipe that connects Zone 6 and Zone 9S with 10-inch DI: - 168th Ave. NE from NE 141st St. to NE 143rd St. - NE 143rd St. from 168th Ave. NE to 160 PL NE - NE 145th St. from approx. 162nd Ave. NE to 164th Ave. NE - NE 153rd St. from 158th Ave. NE to 164th Ave. NE	Improve connection between zones to better utilize S. Hollywood Reservoir Storage in Zone 6	\$ 439,000	\$ 641,000	100%	\$ 641,000	\$ 338,000
D-11	2010	Zone 6 AC Replacement Replace 7,500 lf of 6-inch AC pipe in Zone 6 with 8-inch DI: - From PRV 22, along NE 153rd St. to 158th Ave NE - 158th Ave. NE from NE 153rd St. continuing along 152nd PL NE to PRV 35	AC Replacement; Strengthen Distribution Grid	\$ 608,000	\$ 888,000	100%	\$ 888,000	\$ 468,000
D-12	2005	Zone 6 Distribution Grid Complete 8-inch pipe on 160 PL NE from NE 143rd St. to NE 145th St.	Strengthen Distribution Grid	\$ 97,000	\$ 120,000	100%	\$ 120,000	\$ 85,000
D-13a	2000	AC Pipe Replacement Schedule 1 Replace approximately 6,000 feet AC pipe with new 8-inch DI pipe along Woodinville-Redmond Road from approximately 136th Ave. NE to NE 145th St.	AC Replacement	\$ 275,000	\$ 284,000	100%	\$ 284,000	\$ 268,000

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							Project Year District Cost	District Present Worth
D-13b	2001	AC Pipe Replacement Schedule 1 See project description above (D-13a). Continue with second year of construction.	AC Replacement	\$ 264,000	\$ 282,000	100%	\$ 282,000	\$ 251,000
D-14a	2000	AC Pipe Replacement Schedule 2A Replace approximately 5,300 feet AC pipe with new 8-inch and 10-inch DI pipe along 187th Ave. NE between NE 159th St. and NE 165th St., and along NE 162nd PL between NE 159th St. and NE 165th St.	AC Replacement	\$ 328,000	\$ 339,000	100%	\$ 339,000	\$ 320,000
D-14b	2001	AC Pipe Replacement Schedule 2A See project description above (D-14a). Continue with second year of construction.	AC Replacement	\$ 314,000	\$ 337,000	100%	\$ 337,000	\$ 300,000
D-15a	2000	AC Pipe Replacement Schedule 4 Replace approximately 14,100 feet AC pipe with new 8-inch and 12-inch DI pipe. Includes approximately 3,600 feet 8-inch pipe along NE 150th Street from about 216th Ave. NE to 232nd Ave. NE, and approximately 10,500 feet of 12-inch pipe along 232nd Ave. NE from approximately NE 149th St. to NE 175th St.	AC Replacement	\$ 675,000	\$ 699,000	100%	\$ 699,000	\$ 659,000
D-15b	2001	AC Pipe Replacement Schedule 4 See project description above (D-15a). Continue with second year of construction.	AC Replacement	\$ 647,000	\$ 693,000	100%	\$ 693,000	\$ 617,000

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D-16a	2000	AC Pipe Replacement Schedule 5 Replace approximately 5,400 6-inch AC pipe with new 8-inch DI pipe along 166th Ave. NE and 170th Ave. NE between NE 195th St. and NE 203rd St.	AC Replacement	\$ 301,000	\$ 312,000	100%	\$ 312,000	\$ 294,000
D-16b	2001	AC Pipe Replacement Schedule 5 See project description above (D-15a). Continue with second year of construction.	AC Replacement	\$ 287,000	\$ 307,000	100%	\$ 307,000	\$ 273,000
Subtotal Distribution				\$ 6,405,000	\$ 7,484,000		\$ 7,484,000	\$ 5,809,000

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							Project Year District Cost	District Present Worth
Storage								
St-1a	2000	Reintree Standpipe - Pre-design Study Evaluate options to optimize operation of Zones 11 and 12.		\$ 20,000	\$ 21,000	100%	\$ 21,000	\$ 20,000
St-1b	2000	Reintree Standpipe - Design Project dependent on results of Pre-design Study. Cost based on construction of 1.3 MG standpipe	Provide 0.5 MG of effective storage volume in Zones 11 and 12; maintain system pressures when Tolt head is low.	\$ 75,000	\$ 78,000	100%	\$ 78,000	\$ 74,000
St-1c	2001	Reintree Standpipe - Construction (see above description)	(see purpose above)	\$ 1,254,000	\$ 1,343,000	100%	\$ 1,343,000	\$ 1,195,000
St-2a	2009	Kingsgate Standpipe - Design Additional 1.0 MG of storage adjacent to existing reservoir.	Provide required storage volume	\$ 60,000	\$ 85,000	100%	\$ 85,000	\$ 47,000
St-2b	2010	Kingsgate Standpipe - Construction (see above description)	(see purpose above)	\$ 965,000	\$ 1,408,000	100%	\$ 1,408,000	\$ 742,000
Subtotal Storage				\$ 2,374,000	\$ 2,935,000		\$ 2,935,000	\$ 2,078,000
Pumping								
P-1a	2000	Kingsgate Pump Station - Pre-design Evaluate system configurations to utilize dead storage from Kingsgate Standpipe	Utilize the dead storage at existing and future Kingsgate Standpipes	\$ 20,000	\$ 21,000	100%	\$ 21,000	\$ 20,000
P-1b	2000	Kingsgate Pump Station - Design Project dependent on Pre-design study. Cost based on 700 gpm P.S. with TDH of 100 ft.	(see purpose above)	\$ 25,000	\$ 26,000	100%	\$ 26,000	\$ 25,000

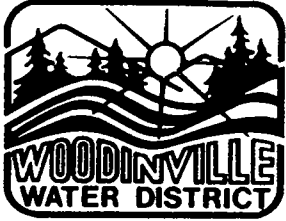
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P-1c	2001	Kingsgate Pump Station - Construction (see above description)	(see purpose above)	\$ 284,000	\$ 304,000	100%	\$ 304,000	\$ 271,000
P-2	2000	Ringhill Pump Station Control Modifications	Optimize operation of the Ringhill Pump Station	\$ 50,000	\$ 52,000	100%	\$ 52,000	\$ 49,000
P-3	2000	South Hollywood Pump Station Construction phase of new pump station.	Utilize the dead storage at South Hollywood Reservoir	\$ 334,000	\$ 346,000	100%	\$ 346,000	\$ 326,000
Subtotal Pumping				\$ 713,000	\$ 749,000		\$ 749,000	\$ 691,000
Miscellaneous Projects								
O-1a	2000	New Administration Building Project Construct new administration building, remodel existing building, construct new inventory and storage building.		\$ 1,500,000	\$ 1,553,000	100%	\$ 1,553,000	\$ 1,465,000
O-1b	2001	New Administration Building Project See project description above (O-1a). Continue with second year of construction.		\$ 3,275,000	\$ 3,508,000	100%	\$ 3,508,000	\$ 3,122,000
Subtotal Miscellaneous Projects				\$ 4,775,000	\$ 5,061,000		\$ 5,061,000	\$ 4,587,000
Total System Improvements				\$ 120,797,000	\$ 194,600,000		\$ 194,600,000	\$ 87,876,000

Cost Estimating Year: 1999
Inflation: 3.5%
Discount Rate: 6.0%

362,391,000 583,800,000 263,628,000
120,797,000 194,600,000 87,876,000

Two more committee staff.



WOODINVILLE WATER DISTRICT

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Legislative Analyst
King County Utilities and Technology Committee
516 Third Avenue, Room 1200
Seattle, WA 98104-3272

Subject: Woodinville Water District's Comprehensive Water Plan – July 2001 Revisions

Dear Ms. Dorothy,

Attached are 6 copies of the revised pages of the Woodinville Water District Comprehensive Water Plan. The revised pages are intended to **"replace"** the existing corresponding pages in the plan. The revisions are in response to a request from the King County Utilities and Technology Committee for the following:

- Revisions to discussions regarding renewal of SPU water supply contract
- Update on the District's intentions toward supplying water to the Trilogy project (formerly Blakely Ridge)
- CIP revisions to reflect increased costs for the new administration building
- CIP revisions to reflect revisions to the source of supply projects

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Please call if you have any questions.

Sincerely,

WOODINVILLE WATER DISTRICT

Bob Bandarra
General Manager

Cc: Richard Rodriguez, DOH, (one revised set)
John Medina, District Engineer, (one rived set)
Andy Soule', CHS Engineers, (one revised set)
Jim Peterson, HDR Engineers, (Chapter 9 only)

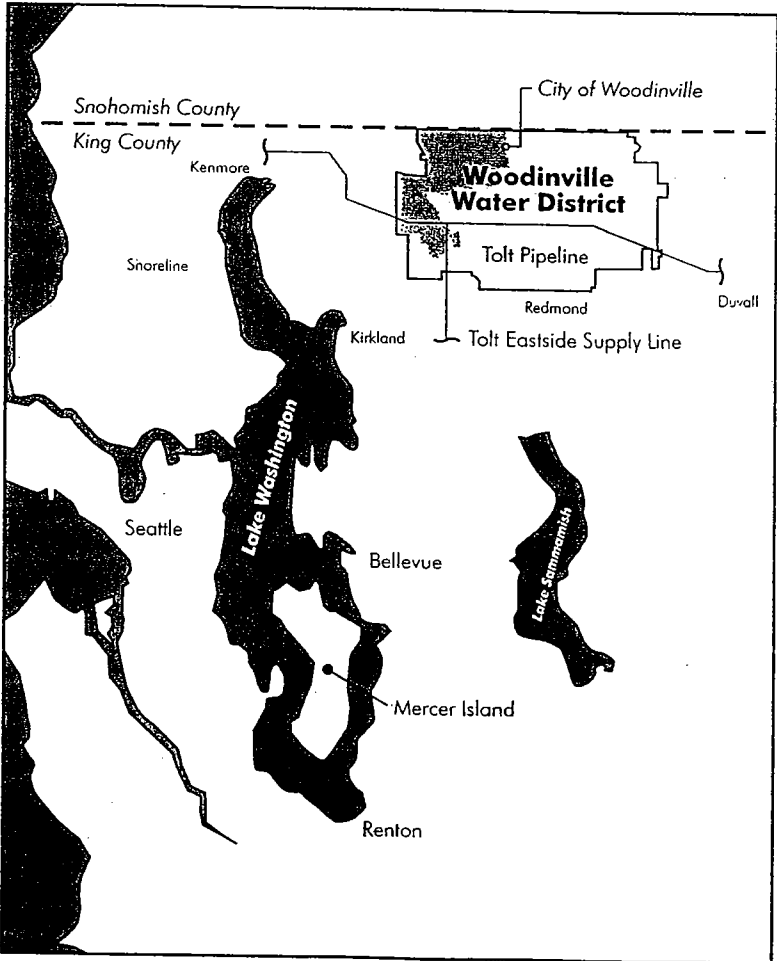
INTRODUCTION

This Comprehensive Water Plan (plan) for the Woodinville Water District (District) presents an evaluation of existing facilities, system operation, water quality, projected water demands, and existing and future requirements. Based on the evaluation, the plan updates the long-range planning strategies, the Capital Improvement Plan (CIP), and financial plan. This plan has been prepared in accordance with the requirements of Washington Administrative Code (WAC) 246-290-100 and the April 1997 Washington Department of Health (DOH) Water System Planning Handbook.

BACKGROUND

The Woodinville Water District, formerly King Water District No. 104, is a municipal corporation which was established by a special election held on August 4, 1959. The King County Board of Commissioners authorized the creation of the District by Resolution No. 20121 on August 17, 1959. The District is located in northeast King County and covers approximately 18,660 acres (29.2 square miles). The District serves the City of Woodinville and portions of unincorporated King County. The location of the service area is shown in Figure 1.

**FIGURE 1
SERVICE AREA LOCATION MAP
WOODINVILLE WATER DISTRICT**



AGENCY COORDINATION

A pre-planning meeting for this plan was held on November 4, 1998. In attendance were project team members from the District, HDR Engineering, and FCSG Group and representatives from DOH, King County Planning, City of Woodinville and Woodinville Fire Life Safety. Seattle Public Utilities (SPU) was invited, but declined to attend. A Planning Data Memorandum consisting of Chapters 1 and 2 of this plan, was submitted and reviewed by DOH, King County Planning, City of Woodinville, Woodinville Fire Life Safety, and SPU in April 1999.

PUBLIC COORDINATION

A copy of the draft plan will be available to the public for review and comment at the District office and at the local public library. The public will be invited to a presentation of the draft plan which will be made to the District Board.

INVENTORY OF EXISTING FACILITIES

Sources of Supply

The District's current primary water source is SPU's South Fork Tolt River Watershed, which is occasionally supplemented by the Cedar River Watershed. The water is purchased directly from SPU, and is supplied via the Tolt Pipeline. Current treatment for the Tolt and Cedar supplies includes fluoridation, chlorination, and pH adjustment through the addition of soda ash and lime for corrosion control. A new 120 MG Tolt River direct filtration treatment facility is scheduled to be operational in 2000. An ozonation facility for the Cedar River Supply is scheduled to be operational in 2004.

The District has nine active taps to the Tolt River supply: eight to the Tolt Pipeline which traverses the District from east to west, and one tap to the Tolt Eastside Supply Line, which diverts a portion of the Tolt River supply to the south.

The District currently owns and maintains an emergency standby well (and site) located in close proximity to the District's Woodinville office properties. The specific purpose of the well is to provide the District and its customers with an alternate source of water in the event a natural disaster (e.g., seismic event) or other unforeseen event disrupts the District's ability to receive a safe and reliable water supply from SPU.

Interties

The District does not have any formal interties with surrounding jurisdictions. However, the District does have informal emergency interties with both the Northshore Utility District and the City of Bothell.

Future interties will be constructed with the City of Redmond at the Trilogy at Redmond Ridge Urban Planned Development and potentially along the southern boundary of the District. The District currently provides water service to several properties just south of the District's boundaries through an interlocal agreement with the City of Redmond. Once Redmond extends its water system northward, and can provide service, the District will transfer service of the customers back to Redmond. At that point, the District anticipates having interties with Redmond at those locations.

There is potential for both formal and informal interties with the Cross Valley Water District. Cross Valley will be taking over several District customers along the Woodinville-Snohomish Road, just north of the King/Snohomish County line, sometime during 2000. The system will be separated by closing an 8-inch zone valve at the county line. This valve may serve as an emergency intertie after Cross Valley assumes service to this area.

Storage and Transmission Distribution

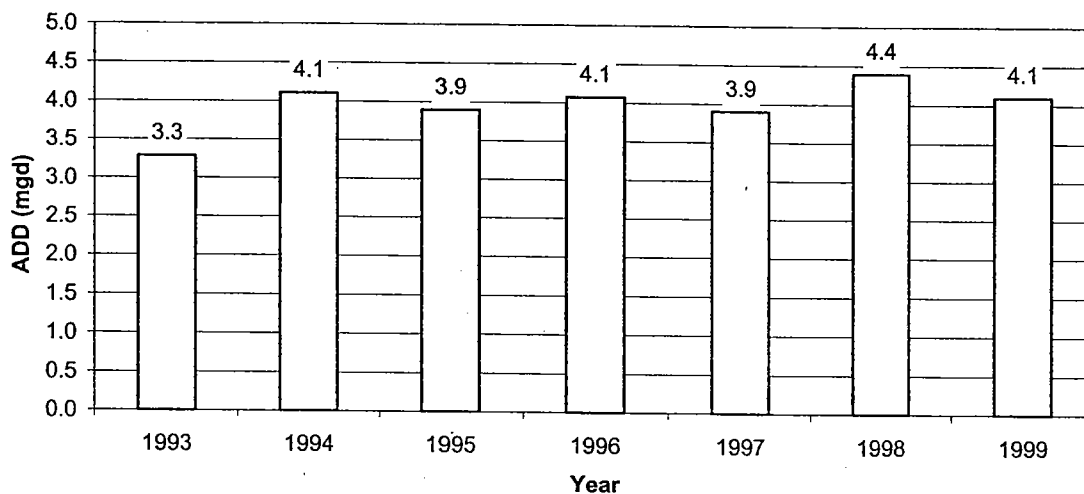
The District's system includes 253 miles of transmission and distribution piping, eight storage facilities, five pump stations (three of which are active and two standbys), and 44 pressure reducing valves (PRVs).

With its varying topography, the District operates several service zones. In some zones, water from the Tolt discharges directly into the system through a PRV. Some of the higher elevation zones require booster pumping to reach service pressures. Storage facilities provide water to meet peak demands allowing the District to maintain a fairly constant flow from the Tolt Pipeline taps. The lower pressure zones are fed directly through PRVs.

EXISTING WATER USE

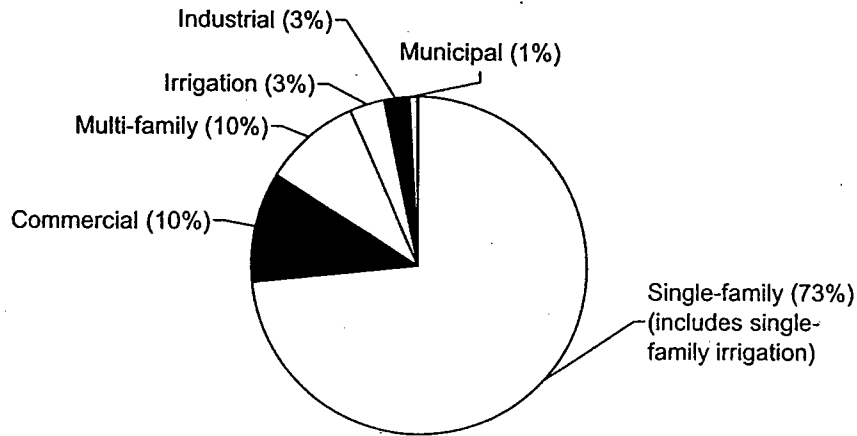
The existing District population is approximately 43,800 (1999 estimate). There are approximately 12,575 service connections (1999 estimate). Annual water usage (as Average Daily Demand (ADD)) from 1993 to 1999 is shown in Figure 2. The maximum ratio of Maximum Day Demand (MDD) to ADD from 1996 to 1999 was 3.0.

**FIGURE 2
HISTORICAL WATER USAGE**



The percentage of annual demand by connection type is illustrated graphically in Figure 3.

FIGURE 3
PERCENTAGE OF ANNUAL WATER DEMAND BY CONNECTION TYPE (1999)



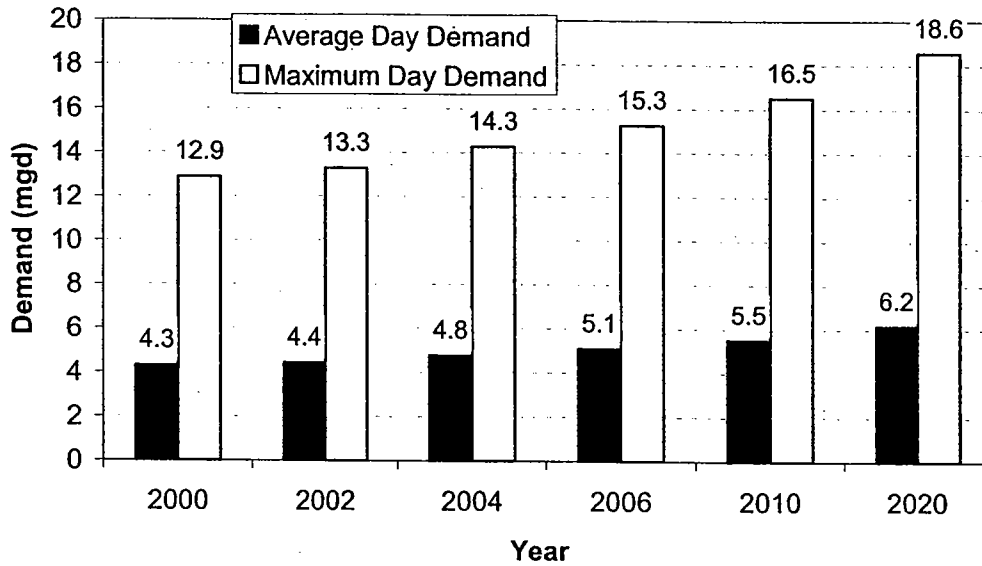
An Equivalent Residential Unit (ERU) represents the amount of water consumed by a typical single-family residence. The average usage in 1997, 1998, and 1999 for a single-family residence was calculated to be 257 gpd, 286 gpd, and 259 gpd respectively.

PROJECTED WATER DEMANDS

Future water demands for the District were estimated by analyzing land use and population. Water demands were calculated by estimating the number of future connections then multiplying that number by the water demand per connection. Water demands were calculated for each service zone and for each connection type (i.e. single-family, multi-family, commercial, industrial, municipal, and irrigation). The demand projection methodology used the integration of GIS zoning and service area mapping, existing demand and connection data, King County and City of Woodinville land use policies, and demographic data from SPU, which are based on Puget Sound Regional Council (PSRC) projections.

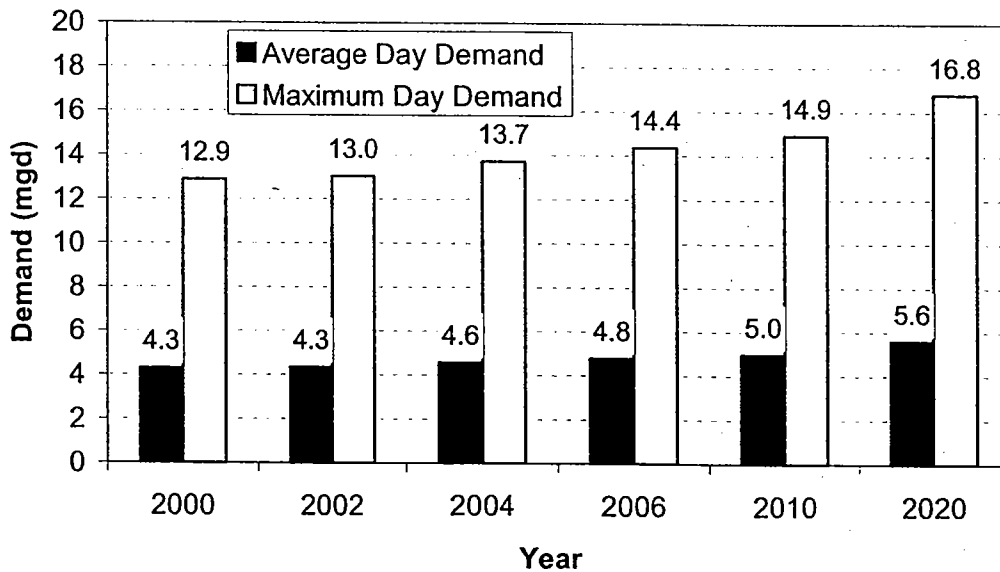
Projected total ADD and MDD for the District are shown in Figure 4.

**FIGURE 4
PROJECTED WATER DEMANDS (MGD)
WOODINVILLE WATER DISTRICT**



Projected future ADD and MDD with the anticipated impact of the 1% Conservation Program are presented in Figure 5 *Projected Water Demands - With Conservation*. The 1% Conservation Program is discussed in Chapter 4.2 *Conservation Program*.

**FIGURE 5
PROJECTED WATER DEMANDS - WITH CONSERVATION (MGD)
WOODINVILLE WATER DISTRICT**



SOURCE OF SUPPLY ANALYSIS

The District's current water supply contract with SPU will expire on January 1, 2012. Although SPU will likely not renew the contract under the current terms, the SPU water supply contract will be renewed in some form prior to 2012 to assure continuity of water supply to District customers. At the time of this writing, a revised contract with SPU could be through the District's participation in the Cascade Water Alliance, or a new individual contract. In addition, the District has been exploring future supply alternatives. The various sources of supply alternatives were examined as part of this plan.

There are two organizations under formation to address the development, operation, and management of regional municipal water supplies:

- Cascade Water Alliance (CWA). The CWA is a regional group, which would serve as a single wholesale customer to SPU. The CWA is composed of several cities and a number of water districts, which currently purchase most of their water from SPU. With the CWA, these purveyors would continue to obtain their water from SPU.
- Snohomish River Regional Water Authority (SRRWA). The SRRWA is a joint administrative entity, which is presently comprised of three public water utilities: the City of Everett (Everett), Northshore Utility District (NUD), and the Woodinville Water District. In December 1996, the SRRWA acquired the Weyerhaeuser Timber Company surface water right from the Snohomish River. In December 1996, the SRRWA submitted a draft plan of use and an application to the Department of Energy (DOE) to change the type of the water right, from "manufacturing" to "municipal" and the place of use from Weyerhaeuser's north Everett mill site to the "area serviced by the Snohomish River Regional Water Authority."

Future Source of Supply Alternatives

The potential future water supply alternatives were examined in terms of:

- Capacity: Annual Withdrawal (Qa) and Instantaneous Withdrawal (Qi), if available.
- Status: What work has been completed thus far.
- Costs: capital and operating and maintenance costs, if available.
- Likelihood that the project will occur.
- Time frame for the project to be on-line.

A comparison table of the alternatives is included as Table 1.

TABLE 1
COMPARISON OF SOURCE OF SUPPLY ALTERNATIVES
WOODINVILLE WATER DISTRICT

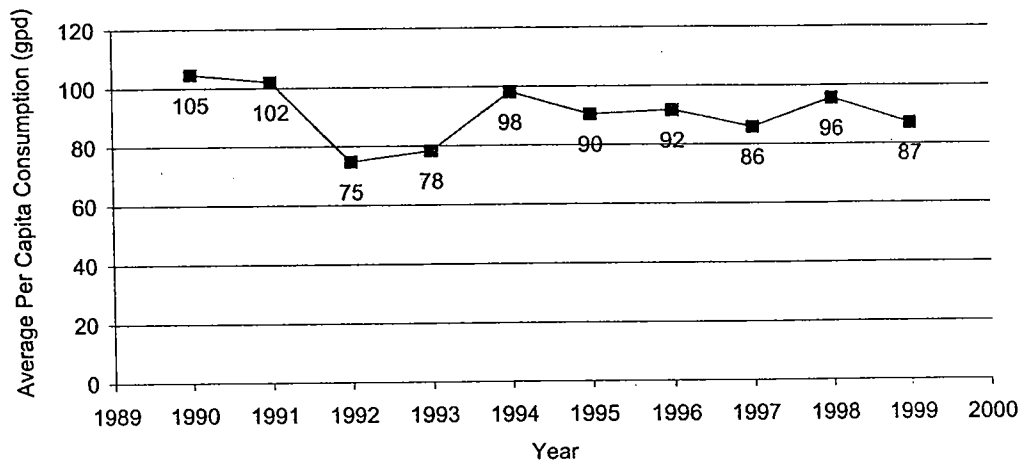
Source	Institution/ How Acquired	Budgetary Costs ⁽¹⁾	Capacity	Major Required Facilities	Likelihood to Occur and Time Frame for Source to Be On-Line	Water Rights	Right-of-Way Acquired	SEPA/ES Complete	Major Permitting Complete	Other Issues ⁽²⁾
Tol and Cedar Rivers	Direct Purchase from SPU	Water Rate (Jan. 2000): Winter: \$0.73/cf Summer: \$1.12/cf Growth Surcharge: \$0.46/cf	Current District use is not limited. Currently: ADD: -3.9-4.4 mgd MDD: -11.8 mgd	None SPU's Tolt Filtration Plant is under construction; Cedar Treatment Plant is in the planning stage	Current source and most likely future sources.	Water rights are in place.	NA	NA	NA	Adoption of Tacoma Water's HQP. Corp's advancement of HHD AWP. CWA formation Future filtration.
Green River	Direct Purchase from TW. Wheel through SPU or CWA (via TSI)	Capital: \$7 M/mgd Water Rate: 7/cf	Average Annual: 13 mgd ⁽³⁾ TSI Capacity: 40 mgd The District's share would be part of SPU/CWA agreement.	Howard Hanson Dam Additional Water Storage Project. SSP (Headworks, PLS, North Branch TSI)) Potential Future Filtration	Most likely of alternative future sources - most progressed. Time Frame: 2004 - 2005 (TSI) Time Frame: 2002 (upper reach PLS) Time frame dependent on the financial viability of the middle reach of PLS and North Branch (TSI).	In 1986, Tacoma was granted a water right for an additional 65 mgd, which is subject to in-stream flow requirements, The piece of use is "the City of Tacoma and its environs."	Yes - PL 5 No - TSI	Yes - PL 5 No - TSI (Programmatic and Project)	Yes - PL 5 No - TSI	
Sultan River (Lake Chaplain)	Direct Purchase from Everett Clearview Reservoir	Capital: \$2.2 M for new pipeline capacity; SPU/PUD Surcharge; Wheeling Cost 7/cf; Transmission Costs from Clearview Reservoir Water Rate: 7/cf ⁽⁴⁾	District's capacity of Clearview Project: 12 mgd	Clearview Project; Additional Transmission Piping from Clearview Reservoir to District	Less likely than SRRWA options.	Option would require that the place of use for Everett's existing water rights be expanded to include Woodville.	No	No	No	Crossing Stromish/King County Line. Challenging permit process.
Sultan River (Chaplain)	Develop Source as Purchase in SRRWA - Flow Swap	Capital: \$5.8 M/mgd ⁽⁵⁾ plus: SPU/PUD Surcharge; O&M: \$1.6 M/yr plus: SPU/PUD Surcharge 7/cf	Qa: 8.8 mgd Ql: 11 mgd	Industrial WTP - Clearview Project; WWD Transmission Piping	Undetermined - Subject to issues affecting SRRWA Plan of Use Implementation. Time frame: Undetermined ⁽⁷⁾	No application submitted and/or regulatory efforts have been initiated to facilitate swap.	No	No	No	Crossing Stromish/King County Line.
Stromish River	Develop Source as Partner in SRRWA - Direct Transfer	Capital: \$7.3 M/mgd ⁽⁷⁾ O&M: \$2.0 M/yr	Qa: 8.8 mgd Ql: 11 mgd	Potable WTP - WWD Transmission Piping	Reasonable likelihood. Time frame: - 2014 - 2016	SRRWA submitted an application in 1996 to change type and place of use for current SRRWA water right. ⁽⁸⁾ Decision on change application by May 1, 2000. WWD entitled to 11 mgd share of 36 mgd (Ql) total.	Partially (Clearview Project)	Partially (Clearview Project)	Partially (Clearview Project)	Crossing Stromish/King County Line. Challenging permit process.
Gross Valley Ground Water	Transfer CWA/Water Rights	Capital: \$4 to 5 M/mgd	Qa and Ql: 2 mgd	Ground Water Pumping; Treatment; Transmission Facilities	At one time a viable project to save east side of District. However because of GMA, growth will occur on west side.	Woodville may submit an application to expand the place of use of CWA/Water right to include Woodville.	No	No	No	Crossing Stromish/King County Line.
Snoqualmie Aquifer and River	CWA and EKCRWA	Capital: \$3 to \$4 M/mgd	Qa and Ql: 40 mgd total determined. (District share not determined)	Groundwater Pumping Facilities; Potable WTP; Transmission Piping	This is a potential long-term alternative. Time frame: - 2014 to 2020	EKCRWA and SPU have applied for two water right permits. (Snoqualmie aquifer and Snoqualmie River).	No	No (Programmatic and Project)	No	Possible in-stream benefits.
Lake Tapps	SPU or CWA	Capital: \$3.7 M/mgd ⁽⁹⁾	Qa and Ql: 65 mgd	WTP; Transmission Piping; Distribution Piping	High likelihood. Time frame: 2015	Puget Sound Energy applied for permit on June 29, 2000.	No	No	No	In-stream flow benefits.
Wastewater Reuse	King County	Capital: Not Determined	Qa and Ql: 20 mgd irrigation	Water Reuse WTP; Transmission Piping; Distribution Piping	Undetermined.	King County theoretically holds water rights for treated wastewater.	No	No	No	

(1) Budgetary costs reflect available costs to date; additional cost components are noted. Budgetary costs between alternatives can not be compared directly.
(2) The impacts of the ESA would need to be addressed under all options.
(3) With the TSI online, the average annual incremental increase in SPU system yield is estimated to be 13 mgd based on a 98 percent system reliability. SPU's portion of the annual withdrawal from the Green River will be 3,300 acre-feet plus an additional 6,700 acre-ft during the drier three out of every 10 years. The amount available will vary seasonally as a function of in-stream flow requirements and storage at HHD. The maximum available will be 40 mgd.
(4) Cost studies purchased from Everett would include wholesale rate from Everett (currently \$0.85/cf), water wheeling costs from CWA, and potential Stromish PUD surcharge.
(5) From SRRWA Technical Memorandum (June 1999), based on District's share of capital costs: \$5.17 m for 8.8 mgd.
(6) From SRRWA Technical Memorandum (June 1999), based on District's share of capital costs: \$5.46 m for 8.8 mgd.
(7) From SRRWA Technical Memorandum (June 1999), based on District's share of capital costs: \$5.46 m for 8.8 mgd.
(8) DOE has stated that water right transfers will be approved prior to new applications, unless the project is environmentally damaging.
(9) Based on a capital cost of \$240 million and a capacity of 65 mgd.
ADD = Average Day Demand
cfd = 100 cubic feet
CWA = Cascade Water Alliance
CWA = Cross Valley Water District
DOE = Department of Ecology
EKCRWA = East King County Regional Water Association
ESA = Endangered Species Act
GMA = Growth Management Act
HCP = Habitat Conservation Plan
HHD AWP = Howard Hanson Dam Additional Water Storage Project
MDD = Maximum Day Demand
M = Million
mgd = million gallons per day
N/A = Not Applicable
O&M = Operation and Maintenance
PLS = Pipeline No. 5
Qa = Annual Withdrawal
Ql = Instantaneous Withdrawal
SRRWA = Stromish River Regional Water Authority
SPU/PUD = Stromish PUD
SPU = Seattle Public Utilities
SSP = Second Supply Pipeline
TSI = Tacoma Seattle Inlet
TW = Tacoma Water
WTP = Water Treatment Plant
?/cf = undetermined cost

WATER CONSERVATION PROGRAM

In 1991, the District implemented an aggressive water conservation program. The goal was to reduce per capita consumption by eight percent by the year 2000. Per capita consumption from 1990 to 1999 is shown in Figure 6.

**FIGURE 6
PER CAPITA WATER CONSUMPTION**



Note: 1992 and 1993 were anomalous years. In 1992, there were mandatory water restrictions because of a drought; 1993 was unusually rainy.

Since implementation of the conservation program in 1991, the average demand has steadily decreased. Average per capita consumption decreased approximately seventeen percent from 1990 to 1999, far exceeding the eight percent goal. Average per capita consumption increased during 1998. Rainfall and solar radiation data collected at the District's Evapotranspiration Weather Station suggests that unusually low rainfall and high solar radiation in 1998 resulted in this increased usage.

The District has a full-time Public Information Coordinator who manages the conservation program for the District. The District participates in and promotes all of SPU conservation programs to its customers, including the one percent Conservation Initiative. In addition, the District implements its own programs locally and partners with other area water utilities.

The District is committed to the 1% Conservation Program. The goal of the conservation program will be to lower overall water demand by one percent per year through 2010. The District will focus on reducing residential irrigation water usage.

The emphasis of the District's continuing water conservation program is to lower peak demand, primarily by targeting landscape irrigation. Many residential customers in the District have large irrigated lots, resulting in high summertime peak water usage. The District's ratio of MDD to ADD is approximately 3.0, compared with 2.1 for the Seattle regional system. The higher ratio is due to the District's service area being largely rural, with much larger lots compared with Seattle's service area.

SYSTEM ANALYSIS

Water Quality

The District participates in a regional distribution system monitoring program with SPU and other purveyors supplied by the Tolt and Cedar River supplies. The 90th-percentile lead concentration in the regional system currently exceeds the lead action level established under the Lead and Copper Rule (LCR). The District source waters do not contain lead or copper. However, lead and copper can leach into residential water from building plumbing systems containing copper plumbing, lead-based solder, brass fixtures or some types of zinc coatings used on galvanized pipes and fittings. Each year, the District is required to send out public education materials concerning the lead concentrations. Under a bilateral compliance agreement with DOH, SPU will complete a Corrosion Control Optimization Study once the Tolt Filtration Plant is on-line. The District is in compliance with all other regulations. The District plans to meet all new regulations including the Stage 1 Disinfection By-products Rule (DBPR) with which large surface water systems (i.e., serving 10,000 or more) must comply by December 2001. In accordance with federal regulations requiring annual Consumer Confidence Reports, the District publishes an annual Water Quality Report for distribution to its entire customer base. A copy of the 1999 report is included in Appendix J.

Hydraulic Analysis

The distribution system was analyzed using the KYPIPE Version 3 hydraulic model. The system model was run for existing and 2020 ADD, MDD, and Peak Hour Demand (PHD) conditions. The hydraulic evaluation criteria are based on maintaining ranges of system pressures and velocities, as defined in the DOH WAC 246-290-230 and in *Water System Design Manual*, (DOH, June 1999). The distribution system was evaluated under the following conditions:

- Existing and 2020 PHD within each individual pressure zone under the condition where all equalizing storage is depleted. All Tolt taps are operating at the minimum hydraulic grade line guaranteed by SPU (effective in 2000). The evaluation criteria were based on maintaining a minimum pressure of 30 psi in any point in the distribution system during PHD conditions.
- Fire flows during existing and 2020 MDD, with all Tolt taps operating at the minimum hydraulic grade line guaranteed by SPU (effective in 2000) under the condition where the designed volume of fire suppression and equalizing storage is depleted. Fire flow locations were selected based on land use, major facilities (schools), pressure zones, and possible problem areas. The fire flow evaluation criteria were based on maintaining minimum pressures while delivering the required fire flow. The DOH WAC 246-290-230 requires that new distribution systems be designed to provide the MDD plus the required fire flow with a minimum pressure of 20 psi throughout the rest of the system.

Based on the hydraulic analysis, the existing distribution system is capable of meeting the PHD criteria through 2020. Isolated improvements are required to improve flows and pressures under fire flow conditions. Locations in which the maximum available fire flow was less than the design fire flow under the criteria of MDD, with equalizing storage and fire storage depleted, while maintaining 20 psi in the distribution system, are listed in Table 2. In addition, with equalizing storage and fire storage depleted, Zone 1 was unable to maintain 20 psi under MDD, even without providing a fire flow. Table 2 also shows model results for available fire flow in 2020, with the recommended CIP projects identified in Chapter 8.

**TABLE 2
AVAILABLE FIRE FLOW
EXISTING AND YEAR 2020**

Available Fire Flow⁽¹⁾

Service Zone	Node	Location	Existing System and Demands	2020 Demands with Improvements ⁽²⁾	Zoning
4	403	NE 195 th St. and 132 nd Ave. NE	1,500	2,300	School
5	420	Wdnlle Duvall Rd. and 144 th Ave. NE	3,300	3,300	R-24/Comm.
5	450	144 th and NE 203 rd St.	2,800	3,300	Industrial
5	508	148 th Ave. NE near 147 th Pl. NE	550	1,000	SF
7	700	151 Ave. NE, near Wdnlle Duvall Rd.	800	1,000	SF

(1) Under the conditions of MDD while maintaining 20 psi in the distribution system.

(2) With recommended improvements through 2020.

SF = Single-family residential

R-24 = Residential with base density of 24 dwelling units per acre.

Storage Analysis

Storage requirements for the system and individual service zones were calculated for existing, 2000, 2010, and 2020 demands. The service zones were grouped together by the storage facilities which serve the zones. In most cases, a storage facility serves more than one pressure zone through PRVs or a pump station. Several of the pressure zones are served by more than one storage facility. The required effective storage volume for each pressure zone is equal to the sum of the operational storage, equalizing storage and the larger of either emergency standby or fire storage. The storage components are defined as:

- **Operational Storage** - The volume of the distribution storage associated with source or booster pump normal cycling timer under normal operating conditions.
- **Equalizing Storage** - Utilized to meet the daily variations in demand.
- **Emergency Standby Storage** - Provides water supply during equipment failures, power failures, or during natural disasters such as earthquakes or floods.
- **Fire Storage** - Provides water for fire fighting.
- **Effective Storage** - Represents the total storage of a reservoir minus the dead storage. The dead storage is the volume of stored water that is not available to all consumers at the minimum design pressure.

Table 3 summarizes required additional storage volumes to meet the storage criteria for existing and projected 2010 and 2020 demands.

TABLE 3
REQUIRED ADDITIONAL STORAGE VOLUMES (MG)

Service Zones	Required Additional Storage (MG)		
	Existing	2010	2020
1 (510); 2 (420) and 21 (340)	0.7	1.1	1.6
11 (570) and 12 (420)	0.4	0.4	0.4
15 (670) and 22 (570)	-	-	0.1

Zone 1 (Kingsgate)

Zone 1 (Kingsgate), along with two lower Zones 2 and 21 which are fed through PRV stations, has an existing storage deficiency of 0.7 MG because of the considerable dead storage (about 60 feet) in the Kingsgate Standpipe. By 2020, Zone 1 requires an additional 1.6 MG of storage. The existing deficiency could be eliminated, and future required storage volumes reduced, if the District were to utilize the dead storage (of approximately 0.7 MG) in the existing Kingsgate Standpipe. A pre-design study to evaluate options for utilizing the dead storage from the Kingsgate standpipe and additional storage capacity is included in the CIP.

Zone 11 (Reintree)

Zone 11 (Reintree) along with Zone 12, which is fed through PRV 21, has an existing storage deficiency of approximately 0.4 MG. The required storage volume does not increase significantly by 2020 because the area is outside of the Urban Growth Boundary (UGB) and is already built to the allowable zoning density.

This required storage volume could be eliminated if the District were to successfully operate Zone 11 with Zone 9, as one zone, which the District initially intended for the two zones. If the zones were to operate one zone, existing storage in Zone 9 would be sufficient for Zones 11 and 12. Zone valves which connect the two zones, are generally closed because of difficulties in synchronizing PRV 41 with the storage facilities in Zone 9. A pre-design study to investigate operating options for Zone 9 is included in the CIP.

Zone 15 (Ringhill)

Zone 15 (Ringhill) shows a storage deficiency of 0.1 MG by 2020. It is recommended that the storage for this area be reevaluated with the next comprehensive water plan. No storage improvement is included in the CIP.

Summary of Deficiencies

System deficiencies are summarized in Table 4. The deficiencies incorporate the hydraulic model and storage analysis results, as well as consultation with District operation staff. The table includes the reference numbers for the CIP projects.

**TABLE 4
SYSTEM DEFICIENCIES**

Zone	Deficiency	CIP Ref.
Transmission and Distribution		
4 (420)	System has difficulty providing fire flow to school near 195 th and 132 nd Ave. NE while maintaining pressures in northwest portion of service zone during MDD due to restricting 10-inch DI pipe which feeds the zone from Zone 5, restricting 6-inch AC pipe which feeds the northwest portion of the service area, and higher elevations in the northwest corner of Zone 4.	D-1 D-2
5 (420)	During MDD, the system has difficulty drawing water from Zone 9 to provide fire flow to high density residential, commercial and industrial areas in Zone 5 because of restricting 6-inch AC pipe and 6-inch DI pipe which feed PRV 27.	D-3 D-4
5 (420)	System has difficulty meeting fire flow criteria in SF, residential area in Zone 5 on 148 th Ave. NE near 147 th Pl. NE because of restricting 6-inch AC pipe along 148 th Ave. NE.	D-9
7 (650)	System has difficulty meeting fire flow criteria in SF residential area in Zone 7, near 151 Ave. NE and Woodinville Duvall Rd because of restricting 6-inch, dead-end AC and CI pipe.	D-7 D-8
6 (570), 3 (260), 10 (420), 15 (670), 9 (570)	AC pipe replacement and need to strengthen distribution grid with enlarged pipe diameter.	D-11 D-13
Source		
8	Service zone needs source redundancy. Currently, zone is served solely by PRV 23 from Zone 9.	D-5
17	Service zone needs source redundancy; currently PRV 32 and PRV 38 serve the zone from Zone 10.	D-6
Storage		
6	If needed, Zone 6 may have difficulty utilizing the storage from Zone 9S (South Hollywood Reservoir) because of restricting 6-inch AC pipe and circuitous pipeline route.	D-10 D-12
11	As it is currently operated, Zone 11 is in need of storage. Storage options include: upgrading the Reintree Pump Station to utilize storage from the Brookside Reservoir operating Zone 11 and Zone 9 as one zone in order to utilize the Wellington Standpipe, or constructing a new storage facility in Zone 11.	S-1
1	Additional storage required in Zone 1.	S-2
Pumping		
1	A pump station is needed to utilize dead storage from existing Kingsgate Standpipe.	P-1
15	Need modifications to optimize operation of Ringhill Pump Station.	P-2
9	Project is underway to construct pump station to utilize dead storage from South Hollywood Reservoir.	P-2

DI = Ductile Iron

CI = Cast Iron

AC = Asbestos cement

CROSS-CONNECTION CONTROL PROGRAM

District Resolution No. 3320 (October 5, 1999) establishes the District's Cross Connection Program and outlines the program requirements. A copy of Resolution 3320 is included in the appendix. The District protects the public water supply with premise isolation cross connection control protection and by installation of approved air gaps or approved backflow prevention assemblies at the property line.

At present, premise isolation is required for commercial connections only. The District is in the process of updating its Cross-Connection Control Program and is coordinating the review with the DOH. Upon approval by the DOH, the District will adopt the updated Cross-Connection Control Program by resolution. The updated program will be incorporated into this Comprehensive Plan by this reference.

CAPITAL IMPROVEMENT PLAN (CIP)

The CIP was developed based on the findings of the system analysis. The CIP itemizes the requirements and costs for system improvements, and expansions including pump stations, storage reservoirs, transmission, and distribution.

The CIP schedule covers through 2020. A six-year annual schedule was developed for 2000 through 2005. For the remaining years, projects are scheduled in five-year increments. Projects were selected and prioritized on the schedule using the following criteria of importance:

1. Compliance with regulatory/health and safety requirements.
2. Transmission, distribution, storage improvements.
3. System reliability/repair.
4. Scheduling of project budgets for financing.

Major CIP improvements include:

- **Clearview Transmission Project**

A conveyance system to transfer water from the City of Everett's water supply system to the Clearview Reservoir.

- **Emergency Ground Water Supply**

Installation of a sodium hypochlorite feed system to bring the District's existing ground water well on-line as an emergency supply.

- **SRRWA Source Alternative**

A project to develop a source as a partner in the SRRWA. (Plan of Use proposal is listed in the CIP).

- **Lake Tapps Source Alternative**

A project to develop Lake Tapps as a source of supply.

- **Zone 1 (Kingsgate) Storage and Pump Station**

Construction of a booster pump station to utilize the existing dead storage. (An initial pre-design study is included to evaluate system configurations). Construction of an additional 1.0 MG standpipe located adjacent to the existing facility.

- **Zone 11 (Reintree) Storage**

Construction of the storage facility is included in the CIP as a placeholder. An initial study is included to evaluate storage options for the zone which include either constructing a new storage facility or operating Zone 11 and Zone 9 as one pressure zone.

- **Distribution Projects**

Replacement/installation of distribution piping to improve fire flow conditions, replace existing AC pipe, and strengthen distribution grid.

Table 5 summarizes the 20-year CIP projects by type (distribution and transmission, storage, and pumping).

Table 5 CIP Projects

FINANCIAL PLAN

The financial analysis summarizes the District's financial status and evaluates the ability of the District to financially support necessary capital improvements identified in the CIP. It also addresses rate and financing options, and potential long-term problems, including both capital and operating requirements. The various sources considered include outside low-interest loan/grant programs, rates, connection charges, and debt financing. Finally, it reviews the District's current rate structure with respect to financial policies and conservation objectives.

Funding Options

The funding options available to the District for capital projects consist primarily of debt mechanisms or cash funding through various user charges.

State Funding Programs

Several state programs were identified as potential funding sources for the utility improvements. The Public Works Trust Fund (PWTF) is the most attractive program for the District.

The emphasis of PWTF loans on replacement and rehabilitation fits well with the District's plan to replace portions of its transmission and distribution system at an estimated cost of \$8.3 million over the next 10 years. The District has received a PWTF loan of \$1.8 Million for the year 2000. The District should continue to apply for PWTF loans in the future and the District is eligible for \$10 million from the PWTF every two years. In addition, the District should participate at the 15 percent level to receive the .5 percent PWTF loan rate. The benefits of participating at the 15 percent level and receiving the .5 percent rate reduces the overall interest rate on borrowing by 40 basis points or .4 percent versus the District participating at the 5 percent level and receiving a 2 percent interest rate. This calculation assumes the District issues revenue bonds to cover their portion at a net effective interest rate of 6 percent. Translated into dollars, the District would save \$4,000 annually for every \$1 million of PWTF loans outstanding by participating at the 15 percent level versus the 5 percent level. The economics of this financing strategy hold true until the alternative interest rate, such as that on revenue bonds equals 9.5 percent.

Existing District Funds and Reserves

The District has several funds containing cash and investments. Most are restricted in their use, or have minimum requirements, which limit or preclude their use for funding capital programs.

- **Construction Fund** - The projected Construction Fund beginning balance for 2000 is estimated at \$9,800,000 and is assumed to be available to support project costs. This includes the proceeds of the 1999 bond issue.
- **Rate Stabilization Fund** - The projected fund balance is \$854,000 at the beginning of 2000. This fund is restricted in use to meeting unanticipated or emergency revenue shortfalls and would not normally be available to support capital project costs.
- **Bond Reserve Fund** - The District will have approximately \$1,100,000 in its bond reserve fund after the 1999 Bond Issue is distributed in compliance with its bond covenants. These funds must remain in place as required by those bond covenants.

General Facilities Charges/System Development Charges

General Facilities Charges (GFCs) or System Development Charges (SDCs) are sources of funding typically used by utilities to support capital needs. The District's current GFC is \$2,260 for a 5/8" and 3/4" meter. This current level appears both fair and appropriate, and it is not recommended that the District adjust this charge.

Historical District Financial Performance

A review of the consolidated audited income statement of revenues and expenses shows that the District is providing positive cash flow and well exceeds its bond covenant obligations. A review of the District's Balance Sheet shows that the District is financially healthy. Retained earnings are steadily growing while liabilities are remaining steady or declining.

Capital Financing Strategy

Table 6 shows the projected sources of revenue that the District will use to fund its proposed Capital Improvement Program. The District issued \$5,000,000 in Revenue Bonds in 1999 and has been selected to receive a Public Works Trust Fund Loan for \$1,800,000 in 2000. These two debt issues along with existing reserves should enable the District to finance its Capital Program without difficulty.

**TABLE 6
CAPITAL PROJECTS FINANCING**

	2000	2001	2002	2003	2004	2005	2006
<i>Capital Projects to be Financed</i>	\$3,099,000	\$5,637,956	\$1,522,211	\$551,033	\$86,064	\$682,920	\$706,822
Connection Charges	\$500,000	\$300,000	\$270,000	\$243,000	\$218,700	\$200,000	\$200,000
Rates	\$457,023	\$234,141	\$207,692	\$536,596	\$541,617	\$610,595	\$571,650
Use(Addition) of Reserves(*)	\$2,141,977	\$5,103,815	\$1,044,518	(\$228,563)	(\$674,253)	(\$127,675)	(\$64,828)
Debt Financing	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Ending Reserve Balance	\$10,038,023	\$6,868,285	\$6,167,181	\$6,704,104	\$7,713,562	\$8,226,915	\$8,703,089

* Includes 1999 Bond and 2000 PWTF Loan

Projected Revenue Requirements

The financial analysis shows that the SPU wholesale water costs will drive Woodinville rates for the foreseeable future. Figure 7 shows the correlation between projected Seattle wholesale costs and projected Woodinville user rates. Wholesale water costs will increase from 49 percent of Woodinville's operating expenses in 1999 to 58 percent by 2005.

**FIGURE 7
CUMULATIVE RATE INCREASES**

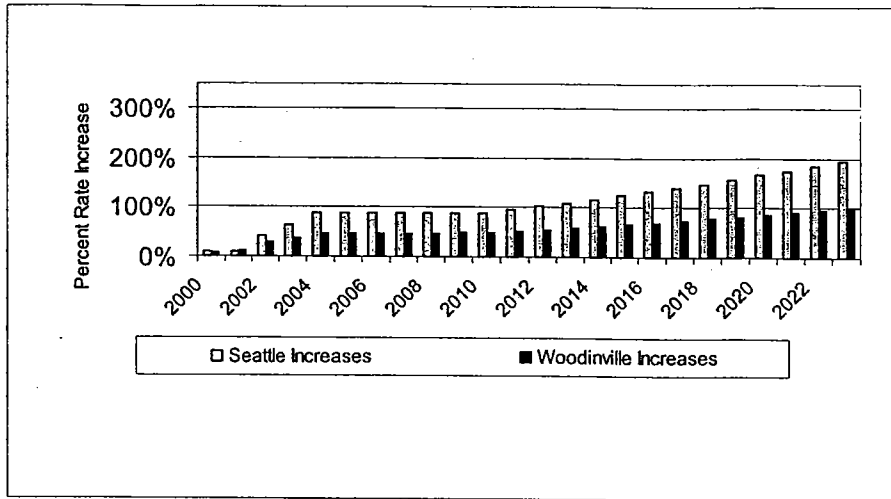
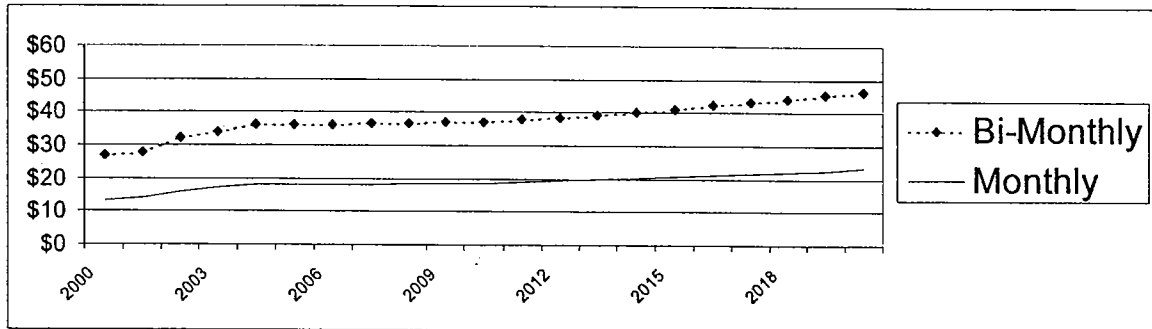


Figure 8 shows the impact on a typical single family residence bill from these projected rate increases.

**FIGURE 8
SINGLE FAMILY RESIDENCE MONTHLY AND BI-MONTHLY BILL**



Rate Structure

Woodinville Water District has essentially kept the same rate structure since 1992. The structure was put in place in 1992 in response to droughts and shortages that occurred that year. The Commissioners modified the structure in 1999 by increasing the volume charge and adding a fourth block to send a stronger conservation signal to their customers.

The current rate structure (shown in Table 6) has four blocks for its bi-monthly residential bills, with each block costing more per unit than the previous block. For example, a customer will currently pay, under the new rates, \$1.70 for their 10th CCF for the bi-monthly bill but will pay \$4.00 per CCF for the 52nd CCF they use in that period.

**TABLE 7
SINGLE FAMILY RESIDENCE BLOCK STRUCTURE CHANGE**

	0 – 12 CCF	13 – 25 CCF	28 – 50 CCF	Over 50 CCF
1999 Structure	\$1.60	\$2.25	\$2.90	\$2.90
2000 Structure	\$1.70	\$2.50	\$3.25	\$4.00

The District currently charges its non-residential customers a volume charge of \$2.05 per CCF for usage up to their winter average and \$2.40 per CCF for water usage over their winter average. For billing purposes, the winter average is determined by evaluating the customers' actual water usage as metered during the winter months.

Some examples of possible rate structure enhancements that the District commissioners could consider in the future:

- Smaller blocks to further encourage conservation. This would force more usage into the higher "more expensive" blocks. The District Board of Commissioners generally does not consider this to be a viable option.
- Adjusting the residential structure to one more based on each residence average winter usage, similar to the commercial basis. The District could charge customers a certain price for their winter average or some fraction there of, and then establish a series of usage blocks of fixed size which begin at the benchmark volume.
- Developing a pattern-based rate structure. This structure would have a conservative user discount and actively reward customers that use less water. Examples of this program could include sending a rebate check at the end of the year if the customer met certain conservation goals or having an automatic adjustment on their bills to reward them if their usage history conforms to some targeted pattern. Additional studies may be required to implement a pattern-based rate structure.

CHAPTER 1 - WATER SYSTEM DESCRIPTION

BACKGROUND

History

The Woodinville Water District (District), formerly King Water District No. 104, is a municipal corporation which was established by a special election held on August 4, 1959. The King County Board of Commissioners authorized the creation of the District by Resolution No. 20121 on August 17, 1959.

By 1961, the District had completed several source of supply connections to the City of Seattle's Tolt River Pipeline. In 1963, the initial distribution system was completed and the District began providing water to customers.

Early system expansions were constructed through Utility Local Improvements Districts (ULIDs). More recently, system expansions have been through developer extensions.

Historically, the District's boundaries have expanded through annexation proceedings. A list of the District annexations is provided as Table 1-1 *Annexations*. The locations of the annexations are shown in Figure 1-1 *Annexations*.

In addition to water service, the District also provides sanitary sewer service within the Corporate Boundaries of the City of Woodinville, and within the Designated Urban Growth Boundaries of Unincorporated King County.

**TABLE 1-1
ANNEXATIONS
WOODINVILLE WATER DISTRICT**

Annexation Number	Name	District Resolution	Year
0	Original District	--	1959
1	Kingsgate	86	1963
2	Bloomberg	162	1967
3	Hollywood-Sunrise	634	1976
4	Avondale	810	1979
5	Morrison	865	1978
6	Goldsmith-Bell	865	1978
7	Brookside	899	1979
8	Holiday Lake	1062	1980
9	Bear Creek Road	1590	1983
10	Ellsworth-Anderson	1634	1983
11	Bondo	1858	1985
12	Strelinger	2143	1986
13	Kinkenberg	2144	1986
14	Ross	2232	1987
15	Hjelte	2277	1987
16	Shadowbrook	2278	1987
17	Aspenwood	2264	1987
18	Himmelpach	2294	1987
19	Scheumann	2365	1988
20	Curry	2592	1989
21	East Aspenglen	2883	1991
22	Anstalt	3058	1994

Insert Figure 1-1

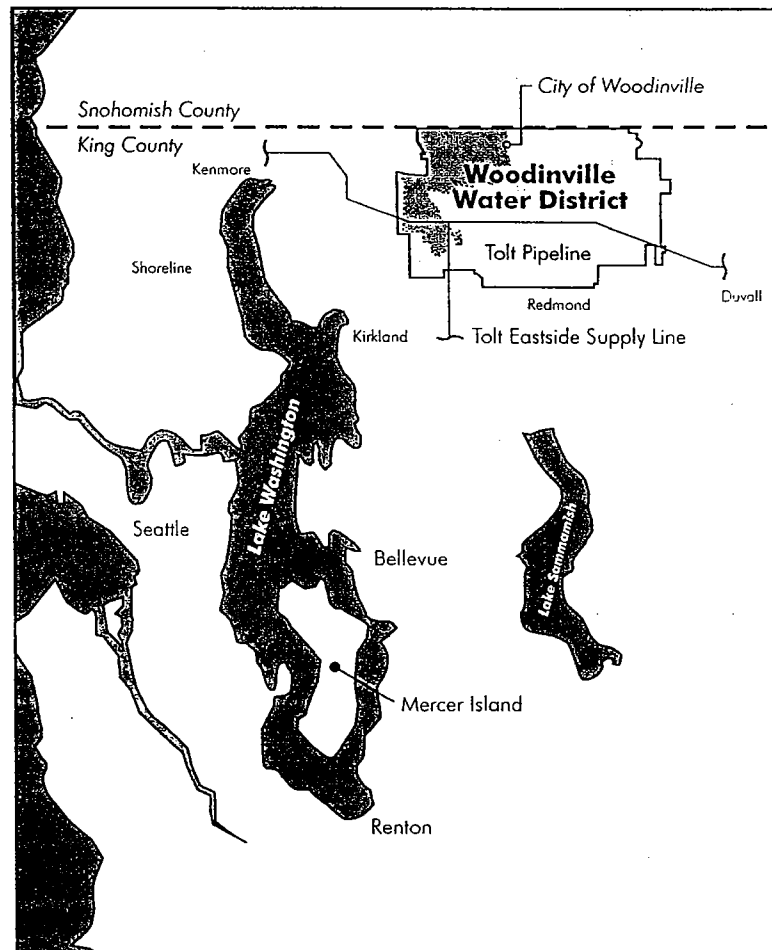
District Management

The District is governed by a five member Board of Commissioners elected by the residents of the District for overlapping six-year terms. The Board of Commissioners oversees the management of the District. The General Manager is responsible for overall management and operation of the District.

EXISTING SERVICE AREA CHARACTERISTICS

The District is located in northeast King County (see Figure 1-2 *Service Area Location Map*) and covers approximately 18,660 acres (29.2 square miles). The District serves the City of Woodinville and portions of unincorporated King County (See Figure 1-3 *Land Use Map*). In 1998, the District population was approximately 43,100 with approximately 12,400 connections. Average annual water use in 1998 was approximately 4.4 million gallons per day (mgd).

**FIGURE 1-2
SERVICE AREA LOCATION MAP
WOODINVILLE WATER DISTRICT**



Insert Figure 1-3 *Land Use*

Geography

Topography within the District ranges from flat terrain to undulating hills, with elevations varying from 25 feet to over 600 feet. Elevations at the western District boundary are over 400 feet. Moving east, elevations drop to 25 feet in the Sammamish Valley, then rise to 500 feet at the east ridge of the Sammamish Valley. The elevations drop to below 200 feet across the Cottage Lake Creek and Bear Creek drainage basins. Elevations then rise to over 600 feet at the east boundary of the District (the westerly ridge of the Snoqualmie Valley).

Adjacent Purveyors

Adjacent purveyors are shown on Figure 1-3 *Land Use Map*. In King County, the City of Bothell and the Northshore Utility District border the District on the west; the City of Kirkland borders on the southwest, and the City of Redmond borders on the south. Water District 119 is located to the east of the District. There is an unclaimed area between the District and the Duvall Water District. To the north in Snohomish County, the adjacent purveyors are the Alderwood Water District and the Cross Valley Water District.

Land Use

Land use policies identify where growth will occur. The District provides service consistent with the adopted land use policies of King County and the City of Woodinville. One of the biggest impacts of land use planning on the District is the Growth Management Act (GMA). The GMA defines where growth can occur through the delineation of the Urban Growth Boundary (UGB). Outside of the UGB, the land use is rural, and is restricted to rural densities. Approximately one third of the District is within the UGB, most of which is within the City of Woodinville. There is also an unincorporated urban area located south of NE 145th St., in the vicinity of English Hill. The majority of the District service area is located outside of the UGB.

Land use in the District is shown on Figure 1-3 *Land Use Map*. The majority of the District is rural residential land use. The adopted zoning is shown in Figure 1-4 *Zoning Map*. The zoning legend types are further defined in Table 1-2 *Zoning Designations and Zoning Map Symbols*. Approximately 70 percent of the District's current service area is zoned either RA-2.5 or RA-5, both of which have base densities of one dwelling unit in five acres.

Insert Figure 1-4

**TABLE 1-2
ZONING DESIGNATIONS AND ZONING MAP SYMBOLS**

Map Symbol	Zoning Designations
A	Agricultural (10 –or 35 acre minimum lot size)
RA	Rural Area (2.5-acre, 5-acre, 10-acre or 20-acre minimum lot size)
UR	Urban Reserve
R	Urban Residential (base density in dwellings per acre)
NB	Neighborhood Business
CB	Community Business
RB	Regional Business
O	Office
I	Industrial
- P	Property-specific development standards (suffix to zone's map symbol)
- SO	Special District Overlay (suffix to zone's map symbol)
P/I	Public Institutional

EXISTING FACILITIES INVENTORY

This section provides a basic description of District facilities including sources of supply, storage and transmission and distribution.

Sources of Supply

Seattle Water

The District purchases its water from Seattle Public Utilities (SPU), from the Tolt River source of supply through the Tolt Pipeline. The Tolt Pipeline enters the District from the southeast, and traverses the District along approximately NE 150th St. The Tolt Eastside Supply Line junction which diverts a portion of the Tolt River supply to the south, is located on the west side of the District. SPU also has the capability to supply water from the Cedar River system northward into the District through the Tolt Eastside Supply Line. The District has nine active connections or taps to the Tolt River supply, eight to the Tolt Pipeline and one tap to the Tolt Eastside Supply Line. Details on the taps are presented on Table 1-3, *District Source Meters on Tolt Supply*. Flow control valves on each tap are manually controlled remotely from District headquarters.

SPU guarantees a set minimum hydraulic gradient at each tap. With implementation of the Tolt Filtration Plant, the minimum hydraulic gradient that SPU will supply to some taps will be reduced. The District has planned for this reduction in the pressure gradient, and is prepared to continue to supply water without changing the pressure zones.

**TABLE 1-3
DISTRICT SOURCE METERS ON TOLT SUPPLY
WOODINVILLE WATER DISTRICT**

Tolt Tap Number	Name & Location	Meter Size And Type	Pressure Zones Served		Minimum HGL ⁽¹⁾		Water Available (gpm) ⁽³⁾
			Primary	Secondary	Current	Future ⁽²⁾	
53	Wellington Transmission Main 159 th Ave. NE & Tolt River Pipeline	10" Prop.	570	-	580	580	2,400
57	S. Hollywood 14400 174 th Ave. NE	8" Prop.	570	-	600	585	1,800
76	Flow Station No. 1 124 th Ave. NE & Tolt River Pipeline	6" Prop.	510	420/305/260	560	560	600
77	Flow Station No. 16 132 nd Ave. NE & NE 140 th St.	6" Prop.	510	420/305/260	560	560	1,350
78	Ringhill Pump Station 232 nd Ave. NE & Tolt River Pipeline	2-8" Dan Foss Mag ⁽⁵⁾	670	575/420/340 0770/480	635	605	2,100
79	Avondale Transmission Main 15100 Blk. Avondale Rd. @ Tolt River Pipeline	12" Prop.	570	420	615	590	3,375
80	Hollywood Pump Station 15700 168 th Ave. NE	2-8" Dan Foss Mag ⁽⁶⁾	650	570	595	580	1,800
123	Sammamish 15004 132 nd Ave. NE	8" Prop.	260	-	560	560	1,350
125	Brookside 15000 181 st Pl. NE	6" Dan Foss Mag	420	-	600	585	2,500

⁽¹⁾ Minimum Hydraulic Grade Line Guaranteed by SPU.

⁽²⁾ Modified minimum hydraulic gradient effective December 13, 2000.

⁽³⁾ Indicates AWWA Maximum Rated Flow

⁽⁴⁾ Tolt Tap T77 is off of the Tolt Eastside Supply Line, all other taps are from the Tolt River Pipeline

⁽⁵⁾ One meter on the gravity side and one on the pump discharge

⁽⁶⁾ One meter on station influent and one on pump discharge

Prop. = Propeller

Ground Water

The District currently owns and maintains an emergency standby well (and site) located in close proximity to the District's Woodinville office properties. The specific purpose of the well is to provide the District and its customers with an alternate source of water in the event a natural disaster (e.g., seismic event) or other unforeseen event disrupts the District's ability to receive a safe and reliable water supply from Seattle Public Utilities (or potentially the Cascade Water Alliance or Snohomish River Regional Water Authority). The well, which does not have a water right, possesses a reliable, sustained pumping capacity of 1,000 gpm. Analysis of the well's water quality indicates that the quality is good and acceptable for use as a public water supply without treatment.

As an emergency standby source, the District would utilize this well only when necessary to address public health and safety emergencies arising within District boundaries. Should such emergencies arise, including those caused by natural disasters, it is the District's understanding and belief that the use of emergency standby wells will be authorized by the Department of Ecology (DOE) by public notice and/or policy for the duration of such events. For this reason, and pursuant to consultations regarding the well with DOE Northwest Regional Office Water Resources staff, the District has no immediate intention to secure an emergency standby water right for this well. The District performs periodic water quality tests on the emergency standby well to assure that the water quality will meet acceptable standards in the case of an emergency.

Surface Water

As a member of the Snohomish River Regional Water Authority (SRRWA), the District has an 11 mgd legal interest in former Weyerhaeuser Company surface water right S1 – 10617C. An application to change the place and purpose of use of this right is pending with DOE, with a decision expected by May 1, 2001. The SRWWA is a joint administrative entity formed in 1996 comprised of the City of Everett, Northshore Utility District, and the Woodinville Water District. The District joined the SRRWA pursuant to receipt of a notice of intent from SPU that it would not renew the District's existing supply contract.

Interties

The District does not have any formal interties with surrounding jurisdictions. However, the District does have informal emergency interties with both the Northshore Utility District and the City of Bothell.

Northshore Utility District Intertie

This intertie is located at approximately NE 132nd St. and 125th Ave. NE in the Kingsgate area (Zone 1). The intertie consists of a meter, which feeds the District through Pressure Reducing Valve (PRV) 19. The PRV setting allows flow only under an extreme demand, such as would occur during a fire.

City of Bothell

This intertie is located at approximately 131st Ave. NE and NE 182nd Pl. in the Bloomberg area (Zone 4). The City of Bothell has three water mains in this general vicinity, which are tied into the District's system running along 131st Ave. NE. Two of Bothell's mains are 8-inches in diameter and the third is 12-inches in diameter. The 12-inch water main ties into a District 12-inch main, which immediately reduces to an 8-inch main, where the other two Bothell mains are connected. Valves at the intertie location are normally closed. On occasion, Bothell has provided water to the service zone on a temporary/emergency basis.

Future Interties

A potential future intertie may be constructed with the City of Redmond along the southern boundary of the District. The District currently provides water service to several properties just south of the District's

boundaries through an interlocal agreement with the City of Redmond. Once Redmond extends its water system northward, and can provide service, the District will transfer service of the customers back to Redmond. At that point, the District anticipates having interties with Redmond at those locations.

There is potential for both formal and informal interties with the Cross Valley Water District. Cross Valley will be taking over several District customers along the Woodinville-Snohomish Road, just north of the King/Snohomish County line, in the year 2000. The system will be separated by closing an 8-inch zone valve at the county line. This valve may serve as an emergency intertie after Cross Valley assumes service to this area.

Storage and Transmission Distribution

General Operation

The District's system includes approximately 253 miles of transmission and distribution piping, eight storage facilities, five pump stations (three of which are active and two standby), and 44 pressure reducing valve stations. Figure 1-5 *Water Distribution System* (located at the back of the document) is a map showing the location of storage facilities, Tolt taps, pump stations, and transmissions/distribution piping. A schematic of the system is presented on Figure 1-6 *System Schematic*.

With its varying topography, the District operates several service zones (see Figure 1-7 *Service Zone Map*). In some zones, water from the Tolt discharges directly into the system through a PRV. Since the minimum head from the Tolt Pipeline varies from 560 to 635 feet across the District, some of the higher elevation zones require booster pumping to reach service pressures. Storage facilities provide water to meet peak demands allowing the District to maintain a fairly constant flow from the Tolt Pipeline taps. The lower pressures zones are fed directly though PRVs.

Figure 1-6

Figure 1-7 Service Zones

Storage Facilities

The District has eight steel storage reservoirs. Storage facility data is summarized in Table 1-4 *Storage Facilities*. Each reservoir is associated with a particular service zone. The overflow elevations of six of the reservoirs are set to "float" on the pressure elevation of the highest zone that the reservoir serves. Two reservoirs do not float on the elevations of the service zones. The Sammamish Reservoir is located at a higher elevation (300 feet) than the zone that it serves (Zone 3 Sammamish at 260 feet). To reduce pressure, supply to these zones is provided through PRV 43. The Hollywood Reservoir has an associated pump station which pumps from the reservoir (with an overflow elevation of 570 feet) to Zone 7 Hollywood Hill (pressure elevation 650 feet).

Plans for future storage facility projects include a booster pump station for the S. Hollywood Reservoir serving Zone 9S South Hollywood. The reservoir currently has difficulty maintaining zone pressures when the head provided by the Tolt Pipeline is low.

**TABLE 1-4
STORAGE FACILITIES
WOODINVILLE WATER DISTRICT**

Storage Facility And Location	Year Constructed/ Recent Coating	Capacity (MG)	Maximum Water Depth (ft)	Overflow Elevation (ft)	Diameter (ft)	Primary Pressure Zone Served
Hollywood 15700 168 th Ave. NE	1978 Recoat 1991	2.5	27	570	125	650
Brookside 1500 180 th Pl. NE	1981 Recoat 1993	2.5	18	420	154	420
Sammamish 15106 132 nd Ave. NE	1992 No Recoat-	2.8	36	300	115	260
Ringhill/Saybrook 22636 NE 169 th St.	1996 No Recoat	1.8	20	575	125	575
Kingsgate 14422 130 th Ave. NE	1972 Recoat 1993	1.1	100	510	56	510
South Hollywood 14400 174 th Ave. NE	1986 Touchup 1993	1.7	88	579	58	570
Wellington 15600 NE 204 th St.	1979 Recoat 1993	1.4	78	570	56	570
Aspenwood 20433 223 rd Ave. NE	1998 No Recoat	1.1	116	670	40	670

Transmission/Distribution Piping

The District maintains over approximately 253 miles of transmission/distribution pipe ranging in size from 4- to 18-inches in diameter. The majority of the pipe (approximately 74 percent) is ductile iron. The District also has approximately 65 miles (26 percent) of asbestos cement pipe, which the District intends to eventually replace. A summary of piping material is presented in Table 1-5 *Inventory of Piping Material*.

There are two 16-inch transmission mains connecting to the Tolt Pipeline. The Wellington Transmission Main runs from Tolt Tap T53 to the Wellington Reservoir. The transmission main feeds PRVs 26, 33, and 35. The Avondale-Reintree Transmission Main runs from Tolt Tap T79 to Zone 11 Reintree. The transmission main feeds PRVs 40 and 41. There is no reservoir directly connected to the Avondale-Reintree Transmission Main.

TABLE 1-5
INVENTORY OF PIPING MATERIAL (lengths in feet)
WOODINVILLE WATER DISTRICT

Size (in)	Asbestos			Totals
	Cement	Ductile Iron	PVC	
4	10,526	59,476	869	70,871
6	173,233	24,952	0	198,185
8	134,560	723,733	486	858,779
10	17,894	54,683	0	72,577
12	6,945	89,258	0	96,203
16	0	36,629	0	36,629
18	0	2,166	0	2,166
Totals (ft)	343,158	990,897	1,355	1,335,410
Totals (miles)	65	188	0.3	253

Pressure Reducing Valves

The District has 44 PRV stations, which control flow from the Tolt supply and between pressure zones. The PRVs are summarized on Table 1-6 *Pressure Reducing Valve Stations*.

**TABLE 1-6
PRESSURE REDUCING VALVE STATIONS
WOODINVILLE WATER DISTRICT**

Location	Zone Number		Zone Pressure		Valve Size (inch)	Valve Elevation (ft)	Field Setting (psi)	Field Setting+
	From	To	From	To				Valve Elev. (ft)
1 124 th NE & NE 151 st	T76 ⁽¹⁾	1	560	510	6	318.3	89	524
					3	315.6	89	521
2 124 th NE & NE 165 th	1	2N	510	420	6	310.7	45	415
					3	308.0	51	426
3 124 th NE & NE 171 st	2N	3	420	260	6	183.9	28	249
					3	181.2	34	260
4 NE 171 st & 146 th PI. NE	5	3	420	260	6	185.0	28	250
					3	182.2	34	261
5 168 th NE & NE 143 rd	7	9S	650	570	6	451.0	43	550
					3	451.0	47	559
6 164 th NE & NE 175 th	7	9N	650	570	6	482.5	21	531
					3	479.5	26	539
7 155 th PI. NE & NE 175 th	7	19	650	585	6	465.0	50	580
					3	462.3	55	589
8 NE 173 rd & 151 st NE	6	5	570	420	6	320.9	39	411
					3	318.1	44	420
9 NE 150 th & 220 th NE	15	14	670	575	6	447.7	50	563
					3	441.9	55	569
10 NE 165 th & 212 th NE	14	10A	575	485	6	337.8	59	474
					3	335.0	65	485
12 171 st NE & NE 185 th	9N	10	570	420	6	313.7	35	394
					3	310.9	41	406
13 148 th NE & NE 190 th	9N	5	570	420	8	298.5	46	405
					4	298.8	51	416
14 NE 195 th & 142 nd NE	5	3	420	260	6	179.2	30	248
					4	179.4	35	260
15 NE 156 th & 183 rd NE	9S	10	570	420	8	296.0	47	405
					4	293.0	53	415
16 NE 140 th & 132 nd NE	T77	1	560	510	6	381.6	53	504
					3	378.8	59	515
17 148 th NE & NE 159 th	5	3	420	260	6	144.6	46	251
					3	141.7	51	259
18 130 th NE & NE 195 th	4	3	420	260	4	204.7	20	251
					2	204.6	24	260
19 NE 132 nd & 125 th NE ⁽²⁾	-	1	-	510	8	285.9	53	408

**TABLE 1-6 (Continued)
PRESSURE REDUCING VALVE STATIONS
WOODINVILLE WATER DISTRICT**

Location	Zone Number		Zone Pressure		Valve Size (inch)	Valve Elevation (ft)	Field Setting (psi)	Field Setting+				
	From	To	From	To				Valve Elev. (ft)				
20 135 th NE & Tolt ⁽³⁾	T*(4)	3	--	260	6	216.6	21	265				
					1.5	213.1	offline					
21 200 th NE & NE 197 th	11	12	570	420	6	345.0	50	460				
					3	345.0	55	472				
					1	342.3	60	481				
22 153 rd NE & Tolt	6	16	570	420	6	342.6	31	414				
					3	339.9	37	425				
23 NE 132 nd & 172 nd NE	9S	8	570	420	6	328.8	31	400				
					3	326.3	37	412				
24 NE 184 th Pl. & 147 th Ct.	9N	5	570	420	6	303.5	46	410				
					3	301.4	51	419				
25 140 th Way NE & 226 th NE	T78	14	T78	575	8	449.6	55	577				
					4	449.6	61	590				
26 NE 160 th & 160 th NE	T53	6	580	570	6	474.3	39	564				
					7	6	650	570	4	474.3	35	555
					T53	6	580	570	3	471.8	45	576
27 NE 200 th & 146 th NE	9N	5	570	420	6	342.3	29	409				
					3	339.7	35	420				
28 NE 200 th & 142 nd NE	5	3	420	260	6	168.8	35	250				
					3	168.5	40	261				
29 162 nd NE & NE 141 st	9S	16	570	420	6	324.9	37	410				
					3	325.0	41	420				
30 NE 142 nd & 209 th NE	14	10	575	420	6	325.3	35	406				
					3	325.5	39	415				
31 165 th NE & NE 135 th	9S	16	570	420	6	361.5	21	410				
					3	361.4	25	419				
32 NE 132 nd Pl. & 187 th Pl. NE	10	17	420	340	6	168.0	72	334				
					3	168.0	76	343				
33 156 th NE & NE 186 th	T53	9N	580	570	6	438.5	53	561				
					3	436.4	58	570				
34 NE 182 nd & 156 th NE ⁽⁵⁾	T53	7	595	650	6	503.2	68	660				
					3	503.2	72	669				
35 154 th NE & NE 173 rd	T53	6	580	570	6	379.7	78	560				
					19	6	585	570	4	379.7	74	550
					T53	6	580	570	3	377.7	83	569

**TABLE 1-6 (Continued)
PRESSURE REDUCING VALVE STATIONS
WOODINVILLE WATER DISTRICT**

Location	Zone Number		Zone Pressure		Valve Size (inch)	Valve Elevation (ft)	Field Setting (psi)	Field Setting+
	From	To	From	To				Valve Elev. (ft)
36 NE 147 th Pl. & 134 th NE	1	2E	510	420	6	267.9	62	411
					2	267.4	67	422
37 NE 150 th & 205 th NE	13	10	485	420	8	222.0	82	411
					4	222.4	86	421
38 NE 133 rd & 202 nd NE	10	17	420	340	6	135.6	85	332
					3	135.4	89	341
39 222 Way NE & NE 222 Ave.	15	18	670	575	6	448.6	50	564
					3	449.0	54	574
40 Woodinville-Duvall & 194 th NE	T79	10	615	420	6	277.6	56	407
					3	277.4	59	415
41 194 th NE & NE 188 th	T79	11	615	570	12	494.3	35	575
					3	494.8	38	582
42 NE 168 th & 226 th NE Henley Park	15	14	670	575	6	436.0	42	533
					3	436.0	45	540
43 133 rd NE & Tolt Pipeline	T123	3	560	260	10	256.0	9	291
					4	256.0	9	256
44 Rolling Mdws Plat	1	21	510	340	6	215.0	45	319
					3	210.9	60	349
45 212 th Ave. NE & NE 133 rd St.	14	23	575	420	6	338	50	453
					4	338	55	465

(1) T_=Tap # (e.g., T 76 is Tolt Tap No. 76)

(2) PRV 19 is at an intertie with the Northshore Utility District. The PRV is set to flow only for an extreme demand, such as for a fire. The PRV has only one valve.

(3) Small valve does not operate at Station 20. Station 20 is off-line.

(4) Abandoned tap.

(5) Valve only works when Tolt Hydraulic Grade Line is greater than 670 feet.

Pump Stations

The District has five pump stations. Table 1-7 *Pumping Stations* summarizes the pump station data.

The pump stations boost water to upper zones and maintain system pressures. The Ringhill Pump Station is equipped with a remote sensor at a high point in the system near 232nd Ave. NE and NE 168th St. When system pressures are low, pumps operate; otherwise flow bypasses the pump station. Variable frequency drives adjust the speed of the pumps to match the pressure and flow demand in the system. The pump station is also equipped with a local pressure transmitter located on the pump discharge header to enable backup or alternative automatic operation if there is a failure with the remote sensor. The District is planning to install control modifications to give more flexibility to the various operating modes.

Lake of the Woods East was constructed recently to serve Zone 20, a small residential area. Reintree and Cottage Lake pump stations are inactive.

**TABLE 1-7
PUMPING STATIONS
WOODINVILLE WATER DISTRICT**

Location	Function	Pump No.	Manufacturer/ Model	Design Flow (gpm)	Design Head (ft)	Shut- Off Head (ft)	Speed (rpm)	Horse- Power (HP)
Hollywood	Pumps from Tolt Tap T80 to Zone 7 Hollywood Hill (650 feet)	1 (Jockey)	Berkley B-2	400	84	94	3,500	15
		2	Aurora/361A	800	130	137	1,750	50
		3	Aurora/361A	800	130	137	1,750	50
Ringhill	Pumps from Tolt Tap T78 to Zone 15 Ringhill (670 feet)	1	Peerless/10 MA	695	178	263	1,760	40
		2	Peerless/10	695	178	263	1,760	40
		3	MAPeerless/10 MA	695	178	263	1,760	40
Reintree (Standby) ⁽¹⁾	Inactive	1 (Jockey)	PACO/2595-1	240	185	225	3,500	20
		2	Floway/8JKM	500	236	320	3,500	40
		3	Floway/8JKM	500	236	320	3,500	40
Cottage Lake(Standby) ⁽²⁾	Inactive	1	Peerless/10 M10 – 1825- 1801	500	133	--	1,760	25
Lake of the Woods East	Pumps from Zone 15 Ringhill (670 feet) to Zone 20 (770 feet)	1	Carver/L&H Horizontal	53	148	170	3,450	5
		2	Carver/L&H Horizontal	53	148	170	3,450	5
		3 (Fire)	Carver/L&H Horizontal	1,000	55	67	1,760	20

⁽¹⁾ Whether to remove or rebuild the Reintree Pump Station will be determined as part of the System Analysis.

⁽²⁾ The District plans to remove the Cottage Lake Pump Station.

Service Zones

The District service area is organized into 24 service zones. The service zone locations are shown on Figure 1-7 *Service Zones Map*. Supply and withdrawal for each service zone is summarized on Table 1-8 *Service Zone Connections*.

**TABLE 1 -8
SERVICE ZONE CONNECTIONS
WOODINVILLE WATER DISTRICT**

Pressure (feet)	Feed To	Withdrawal From	Comments
Service Zone 1 Kingsgate			
510	PRV 1 from Tolt River Tap T76 PRV 16 from Tolt Eastside Supply Tap T77 PRV 19 (Northshore Utility District) Kingsgate Standpipe	PRV 2 to Zone 2N PRV 36 to Zone 2E PRV 44 to Zone 21 Sammamish Emergency Bypass through Tolt Tap 123	PRV 16 is the District's only tap off of the Tolt Eastside Supply Line, and may be subject to peak demand charges. A flow control valve at PRV 16 controls the flow, and peaks are provided for by Tolt Tap T76 (PRV 1) and the Kingsgate Standpipe. PRV 19, which is an intertie with Northshore Utility District, is set to allow for flow only during an emergency.
Service Zone 2N Sammamish Slope			
420	PRV 2 from Zone 1	PRV 3 to Zone 3	Service zone slopes down from the north end of the Kingsgate area northward toward the Sammamish River. Elevations drops from 340 to 210 feet in less than one mile. The demand from Service Zone 3N draws water through the zone, creating operational challenges to hold water in Zone 2N since there is no reservoir in the zone to control flow. Careful control of PRV 2 and 3 is necessary to maintain pressure. PRV 3 is hydraulically closed to keep water in Zone 2N.
Service Zone 2E Chateau Woods			
420	PRV 36 from Zone 1	None	Service zone slopes easterly from Zone 1 (Kingsgate) to Zone 3S (Sammamish) and is limited in size and service due to steep slopes. There is no connection to Zone 3S, so no water flows through the zone.

**TABLE 1 -8 (Continued)
SERVICE ZONE CONNECTIONS
WOODINVILLE WATER DISTRICT**

Pressure (feet)	Feed To	Withdrawal From	Comments
Service Zone 3 Sammamish			
260	PRV 43 from Samm. Res. from Tolt Tap 123 (west) PRV 14 and PRV 28 from Zone 5 (east) PRV 18 from Zone 4 PRV 3 from Zone 2N (west) PRV 4 from Zone 5 PRV 17 from Zone 5	None	Zone is primarily fed by PRV 43 from the Sammamish Reservoir, which is fed by Tolt Tap 123. PRV 14 and PRV 28 provide secondary feed; all other PRVs are normally hydraulically closed.
Service Zone 4 Bloomberg			
420	Zone 5 Emergency Intertie with City of Bothell	PRV 18 to Zone 3	Availability of water to Zone 4 may be restricted when there is a high demand in Zone 3; line to Zone 4 also supplies water downstream to Zone 3 through PRV 18. Connected with Zone 5. Emergency intertie with City of Bothell is used in isolated incidences such as when the District supply is shut down for construction.
Service Zone 5 Reinwood			
420	PRV 13 from Zone 9N PRV 8 from Zone 6 PRV 24 from Zone 9N PRV 27 from Zone 9N	PRV 14 to Zone 3 PRV 28 to Zone 3 PRV 4 to Zone 3 PRV 17 TO Zone 3	The primary source for Zone 5 is from the Wellington Reservoir through PRV 13, 24, and 27. Backup is provided through PRV 8. Connected with Zone 4 by 10" main.
Service Zone 6 West Hollywood			
570	PRV 26 PRV 35	PRV 8 to Zone 5 PRV 22 to Zone 16	Zone 6 connects directly with Zone 9S, although 6-inch lines limit the exchange of flow between the two zones. The connection to the Wellington Transmission Main at PRV 35 is used primarily as a backup, with the major source being from the Hollywood Hill area at PRV 26.

**TABLE 1 -8 (Continued)
SERVICE ZONE CONNECTIONS
WOODINVILLE WATER DISTRICT**

Pressure (feet)	Feed To	Withdrawal From	Comments
Service Zone 7 Hollywood Hill			
650	Hollywood Pump Station and Reservoir Tolt Tap T80 PRV 34 from Tolt Tap T53 (not in service)	PRV 5 to Zone 9S PRV 6 to Zone 9N PRV 7 to Zone 19 PRV 26 to Zone 9	The Hollywood Hill area is served directly from a connection to the Tolt Supply Line (Tap T80), via a small bypass line in the Hollywood Pump Station. If that line is insufficient to supply the needs of the zone, the pumps draw from the Hollywood Hill Reservoir, pumping directly into the Hollywood Hill grid. A permanently mounted diesel generator supplies emergency power in case of a power outage in the system. The key to keeping the pressure up in the Hollywood Hill grid is proper settings and maintenance of the four PRVs which provide water to lower zones from this area. If the PRVs are set too low, the amount of water drawn from the Hollywood Hill grid requires non-stop operation of the large pumps in the Hollywood Pump Station, and makes maintaining the pressure in the zone difficult. If the PRVs are set too high, maintaining the pressure in the lower grids is difficult due to a limited supply. The District has worked extensively with these settings in the past, and has the operation of the various grids well defined. PRV 26 (which supplies water to a lower zone) has three pressure valves, rather than the normal two valves. By coordinating the settings of the 3-inch, 4-inch, and 6-inch valves, most demand situations are handled easily. The 3-inch and 6-inch valves are fed from Wellington Transmission Main. If the pressure is not sufficient in the main, the 4-inch valve will draw water from the Hollywood Hill grid.
Service Zone 8 South English Hill			
420	PRV 23 from Zone 9S	None	Only feed to zone is PRV 23.

**TABLE 1 -8 (Continued)
SERVICE ZONE CONNECTIONS
WOODINVILLE WATER DISTRICT**

Pressure (feet)	Feed To	Withdrawal From	Comments
Service Zone 9N Wellington			
570	PRV 6 from Zone 7 (Emergency/Fire only) PRV 33 from Tolt Tap T53 through Wellington Trans. Main Wellington Standpipe (from Tolt Tap T53; controlled by altitude valve)	PRV 12 to Zone 10 (hyd. shut) PRV 13 to Zone 5 (secondary source) PRV 24 to Zone 5 (tertiary source) PRV 27 to Zone 5 (primary source)	Connection with Zone 9S. High draw to lower zones requires careful operation of PRVs.
Service Zone 9S Hollywood South			
570	Tolt Tap T57 via South Hollywood Standpipe PRV 5 from Zone 7	PRV 15 to Zone 10 PRV 23 to Zone 8 PRV 29 to Zone 16 PRV 31 to Zone 16	The District intends to install a pump station to maintain pressure in grid and to utilize existing storage during demand season. Zone 9S connects directly with Zone 6, although 6-inch lines limit the exchange of flow between the two zones.
Service Zone 10 Brookside			
420	Tolt Tap T125 via Brookside Reservoir PRV 40 from Tolt Tap T79 via Avondale-Reintree Trans. Main (primary source) PRV 12 from Zone 9N (secondary source to zone) PRV 15 from Zone 9S PRV 30 from Zone 14 PRV 37 from Zone 13 (hyd. closed to keep water in Zone 13)	PRV 32 to Zone 17 PRV 38 to Zone 17	The primary source of water to Zone 10 is PRV 40 from north end of Avondale-Reintree Trans. Main. With accurate settings on PRV 40, the Brookside Reservoir floats on the zone. Because the Brookside reservoir is not equipped with a swing check, careful adjustment of the PRV stations which feed the zone are required. A setting which is too high could result in overflow of the reservoir.
Service Zone 11 Reintree			
570	PRV 41 from Tolt Tap T79 via Avondale-Reintree Trans. Main	PRV 21 to Zone 12	Connected to 9N. A reservoir to control flow in the zone is under consideration.
Service Zone 12 Paradise Lake			
420	PRV 21 from Zone 11	None	Due to the small size of this zone, PRV 21 has three valves: 6-inch, 3-inch, and 1-inch direct acting PRV for low flows.
Service Zone 13 Park Estates			
485	PRV 10 from Zone 14	PRV 37 to Zone 10	

**TABLE 1 -8 (Continued)
SERVICE ZONE CONNECTIONS
WOODINVILLE WATER DISTRICT**

Pressure (feet)	Feed To	Withdrawal From	Comments
Service Zone 14 Lake of the Woods			
575	PRV 9 PRV 25 from Tolt Tap T78	PRV 10 to Zone 13 PRV 30 to Zone 10 PRV 45 to Zone 23	Connected with Zone 18. In Zones 14 and 18, a high pressure is maintained in the grid, and the Ringhill Reservoir is full most of the time. The reservoir provides fire storage only and little equalization storage. To maintain water quality, PRV stations feeding Zones 14 and 18 have winter and summer settings. Periodically, the PRV stations are manually shut down to turn the water in the reservoir.
Service Zone 15 Ringhill			
670	Tolt Tap T78 Ringhill P.S. Aspenwood Reservoir fed by Ringhill P.S.	PRV 9 to Zone 14 PRV 39 to Zone 18 PRV 42 to Zone 22	If the energy grade line on Tolt is high enough, water will bypass the Ringhill P. S. PRV 25 is used as a back-up to zone.
Service Zone 16 Southwest Hollywood			
420	PRV 31 from Zone 9S PRV 22 from Zone 6 PRV 29 from Zone 9S	None	
Service Zone 17 Tuscany			
340	PRV 32 from Zone 10 PRV 38 from Zone 10	None	
Service Zone 18 Aspenwood/Lexington			
575	PRV 39 from Zone 15 Ringhill/Saybrook Reservoir	PRV 45 to Zone 23	Connected with Zone 14. See additional comments under Zone 14.
Service Zone 19 Woodway			
585	PRV 7 from Zone 7	PRV 35 to Zone 6 when Tolt pressure is low	PRV 35 has three valves. The 3-inch and 6-inch valves are supplied by the Wellington Transmission main. The 4-inch valve is supplied by Zone 7.
Service Zone 20 Lake of the Woods East			
770	Lake of the Woods E. Pump Station from Zone 15	None	
Service Zone 21 Rolling Meadows			
340	PRV 44 from Zone 1	None	

**TABLE 1 -8 (Continued)
SERVICE ZONE CONNECTIONS
WOODINVILLE WATER DISTRICT**

Pressure (feet)	Feed To	Withdrawal From	Comments
Service Zone 22 Henley Park			
570	PRV 42 from Zone 15	None	
Service Zone 23 Anstalt			
420	PRV 45 from Zone 14 and 18	None	

AGREEMENTS AND POLICIES

Service Area Agreements

The District has water service area agreements and/or policies with the City of Seattle (SPU), the City of Redmond, the Cross Valley Water District, the Northshore Utility District, and King County. The agreements are listed on Table 1-9 *Summary of District Service Area Policies and Agreements*. Copies of agreements are included in the Appendix.

The District purchases its water from the City of Seattle. Conditions for the supply of water are defined in the *Water Purveyor Contract - Version B* (November 1981, Amended February 3, 1982 and February 26, 1982) and the *First Amendment to the Water Purveyor Contract* (June 6, 1994). The contract expires on January 1, 2012. Copies of both contracts are included in the Appendix.

An interlocal agreement with the City of Redmond designates the service area boundary between the two purveyors to be the easterly extension of NE 124th St. An addendum to the agreement establishes service to the Shadowbrook Phase II development that straddles both service areas. Several additional addenda to the agreement establish service to several individual properties and smaller developments.

The District has a policy regarding the extension of water service into the Cross Valley Water District which borders the District to the north in Snohomish County. The District will only consider requests for water service into Snohomish County made by Cross Valley Water District pursuant to the terms and conditions of an approved interlocal agreement. A service area agreement with the Cross Valley Water District defines the manner in which service can be provided for circumstances where a customer lies within the service area of one purveyor, but water service can be more feasibly provided by the other purveyor. Service requires the written consent of the other purveyor, and SPU.

Service area boundaries are designated in the East King County Coordinated Water System Plan (*CWSP*). The *CWSP* was most recently updated November 14, 1996.

The District has no formal agreements for water service with the City of Bothell, which borders the District on the northwest, or with Kirkland, which borders the District on the southwest. Bothell supplies water west of 124th Ave. NE. On occasion, Bothell provides water for Zone 4 (Bloomberg), on an emergency/temporary basis. The District is in the process of entering into a formal agreement with the City of Bothell.

The District is one of three utilities (i.e., Woodinville Water District, Northshore Utility District, City of Everett) that executed the interlocal agreement which formed the SRRWA in 1996. The purpose of the SRRWA is to plan, develop, manage, and finance a regional water supply system in coordination with current and future members. Once the SRRWA was formed, the District executed an Agreement to Develop Water Supply Resources with the other SRRWA members. The latter agreement establishes the rights and obligations of SRRWA members relative to acquisition of the Weyerhaeuser Company surface water right, including costs for development of the SRRWA source, including permitting and construction. The Agreement assigns 11 mgd of the SRRWA total 36 mgd (Qi), to the District for municipal supply purposes. Copies of the SRRWA agreements are attached.

**TABLE 1-9
SUMMARY OF DISTRICT SERVICE AREA POLICIES AND AGREEMENTS**

Purveyor/Jurisdiction	Date	Description
Cross Valley Water District and Alderwood Water District	5/17/88	Policy statement regarding extension of water service into Snohomish County (Cross Valley Water District and Alderwood Water District) (Resolution 2388)
Cross Valley Water District	9/30/91	Letter from SPU to District - Response to the request to provide temporary water service to the Cross Valley Water District
Cross Valley Water District	3/4/85	Water service agreement between District and Cross Valley Water District (Resolution 1863)
City of Redmond	7/13/88	Interlocal Agreement designates the service area boundary between the District and Redmond to be an easterly extension of NE 124 th St. Resolution 2407 (dated 6/27/98) approves the Interlocal Agreement
City of Redmond	See Description	Addenda to the interlocal agreement between the District and Redmond establishing water service to the following areas: Shadowbrook (1/22/90); between 177 th Ave. NE and 184 th Ave. NE (10/1/92); 167 th Ave. NE and 172 nd Ave. NE (9/14/93); east of 184 th Ave. NE (12/29/93); east of 176 th Ave. NE extended (1/27/94); and 177 th Ave. NE and 184 th Ave. NE (9/19/94).
King County	10/6/92	Acknowledges the water service area boundaries and responsibilities for the water purveyor as outlined in the East King County Coordinated Water System Plan.
City of Seattle	11/81 (Initial)	Conditions for the supply of water. <i>Water Purveyor Contract – Version B</i> (11/81, Amended 2/3/82 and 2/26/82) and the <i>First Amendment to the Water Purveyor Contract</i> (2/6/94).

Service Area Policies

Cascade Water Alliance

The District has been a participant in the formation of the Cascade Water Alliance (CWA). The CWA is a regional group forming to address the future water supply of suburban water districts which currently purchase most of their water from the City of Seattle. The agreement and contract for the CWA are under development.

Design and Performance Standards

Minimum design and performance standards for new development are listed in the *Standard Water Specifications of the Woodinville Water District for Developer Extensions* (July 11, 1997). A copy of the standards is included in the Appendix. The District also meets the minimum design and performance standards of the *CWSP* for the East King County Critical Water Supply Service Area.

Emergency Service

Resolution No. 2333, adopted January 18, 1988, defines the conditions under which an emergency service connection can be provided for an applicant located within District boundaries. This connection is intended only for a single family residence served by an individual well in which the groundwater supply is contaminated and presents an adverse health condition. Emergency service will only be provided following demonstration of a health hazard from the contaminated groundwater supply. The emergency service connection is a temporary connection to the District's water system until permanent water facilities are extended to the property requesting service.

Annexations

The District's policy is to only serve properties within the District boundaries. Annexation is a condition for providing service to areas outside of the District's boundary, except upon a contractual basis such as exists under the interlocal agreement with the City of Redmond. Territory adjacent to the District that is within the District's future service area, and not already part of another water purveyor or service area within the *CWSP* service area boundary, may be annexed.

System Extensions

Anyone seeking to connect to the existing water system is required to install improvements to assure orderly development of the utility system. These improvements must comply with the requirements for water quantity and pressure established by the District and with fire protection requirements contained in the District standards and/or King County Ordinance No. 5828 (or latest edition). Water main extensions must extend through and to the extremes of the property being developed, unless specifically waived by the District due to physical constraints, or other site limitations. Each building lot must have frontage on a permanent water main.

An extension to the District water system is required under the following conditions:

- Where the subject property, under existing conditions, is unable to comply with fire protection requirements established by the District or other applicable fire protection requirements.
- When an existing water main is unable to adequately serve the property being developed and meet the District flow and pressure standards.
- When the property to be served will connect to a water main that is scheduled for upgrading as specified in the adopted Water Comprehensive Plan.
- When a water main extension is needed to complete the existing system of water mains or to further the orderly development, gridding, or looping of the water system.
- Mains are required to be extended as a condition of service.

Three methods are available for extending the District's water system, including developer extension, ULID, and fire hydrant extension. Developer extensions are the primary method used by property owners to extend water service.

Developer Extensions. Developer extensions are constructed and financed by a property owner or developer wishing to serve an area with water. Annexation is required for developer extensions in areas outside District boundaries (but within the District's designated future service area). The process for extending the system through the Developer Extension method consists of:

- Developer obtains water availability certificate from District.
- Developer and District enter into signed agreement per District standards.
- Developer pays administrative and other applicable fees.

- Project is designed and permits obtained (may be by District or developer at developer's option). All costs are to be paid by the developer.
- Project constructed (District inspection). All costs are to be paid by the developer.
- Developer to furnish recorded or recordable easements, title insurance and fees.
- Project accepted by District.

The written Developer Extension agreement with the District sets forth the terms and conditions under which the system will be extended. The developer extension agreement addresses fees, plan reviews, insurance and indemnity, warranties, ongoing bonds, conditions of acceptance, technical specifications, standards and other applicable issues.

Under certain circumstances, the District may participate financially in the construction of the project when it is determined that "oversizing" of the line or Extended Service Agreement removal is in the best interests of the District as a whole.

If a water main extension is planned in the vicinity of properties with extended or temporary service agreements, the District may require those properties to hook up to the new permanent water main upon completion of the extension in accordance with District Resolution. The District gives additional notice to the owners of property subject to an extended or temporary service agreement. This notice reminds those owners that their water service from the District is temporary and that their properties and they may be subject to certain obligations. The District will hold a Public Hearing prior to determining whether a temporary service will be terminated. A temporary water service connection will be terminated upon advance notice to the owner of the property that is temporarily connected, whenever:

- (a) A permanent water main has been installed and made operative, and
- (b) That permanent main satisfies the standards of the District for permanent service to the property that is temporarily connected.
- (c) The Board of Commissioners determines that it is in the District's interest to terminate such service.

Before the property subject to an extended or temporary service agreement may be connected to the permanent main, the owner(s) of that property must first:

- (a) Satisfy all prerequisites of the District for water service, and
- (b) Pay the District the actual cost of the new connection, other connection charges as allowed, and any applicable fees for reimbursing property owners who contributed to the construction of the permanent water main, as required by District resolutions.

ULID. The District Board of Commissioners is empowered to determine whether or not to form ULIDs. This determination is made on the basis of the facts and circumstances pertinent to each particular ULID proposed for formation. The two methods available for initiating a ULID are the petition method and by resolution of the Board of Commissioners. The petition method requires signatures of property owners representing at least 51 percent of the land area within the boundary of the proposed ULID. The Board of Commissioners initiates the resolution method by passing a resolution of formation.

Following the receipt of a petition for the formation of a ULID, a public meeting is held by the District. This meeting is held for the purpose of generally explaining the procedures that the District follows in forming a ULID. Notice of the meeting is sent to the occupants and/or owners of property included within the boundaries of the proposed ULID. The District also provides notice to these occupants and/or property owners of the meeting at which the Board of Commissioners plans to determine the sufficiency of a petition for the formation of a ULID. (The Board of Commissioners then determines the sufficiency of the petition or adopts a resolution of its intent to form the ULID.)

A property owner desiring to initiate a petition for the formation of a ULID has the option of preparing the form and contents of the petition himself or herself or of contracting with the District to prepare the form and contents of the petition. There is an administrative charge for this service. This charge is not refundable, and is not credited against the assessment or any other fees or charges imposed by the District.

Emergency Service Agreement. During the early years of the District, another mechanism for system extension was used and termed an Extended Service Agreement (also called an Emergency Service Agreement or a Temporary Service Agreement). This method is no longer available and it is the District's policy to eliminate those existing agreements where it is possible to do so in an orderly, consistent fashion. One of the conditions under which an Extended Service Agreement was granted for a particular property was an agreement not to oppose or protest formation of a future ULID when the use of this method became appropriate, and temporary service would be disconnected once permanent service was available.

It is the District's policy to cease service to properties currently served under Extended Service Agreement within 60 days of the date permanent service becomes available. The property owner is given an opportunity to connect to the new permanent service with the attendant connection, latecomer, or other charges and fees as established by District Resolution.

Fire Hydrant Service/Extension. A fire hydrant service/extension is the installation of a water main and/or fire hydrant for the purpose of providing additional fire protection to an area. This situation usually occurs in commercial or industrial areas where additional buildings are added to a site in which the Fire Marshall requires a fire hydrant or sprinkler system in order to meet the fire codes. This is a special extension which is in lieu of a complete developer extension at the discretion of the District. A need or desire for this special extension must be expressed to the District.

The criteria for considering a fire hydrant service/extension are as follows:

1. Length of water main between fire hydrants:
 - 300 feet maximum in commercial areas.
 - 600 feet maximum in residential areas.
2. Maximum distance from hydrant to structure is 150 feet in commercial and industrial areas.
3. Number of fire hydrants required – limited to one fire hydrant for every 300 feet.
4. The property has previously extended the water system in accordance with District standards and service polices.

If determined by the District that the extension does not meet one of these requirements, then another method of water system extension must be used.

The developer or property owner is responsible for all costs associated with Fire Hydrant Service/Extension in accordance with District Resolution.

Residential Sprinkler Systems. Residential sprinkler systems are permitted. Separate meters with approved backflow devices are required for these services.

Satellite System Management Program

In accordance with the *CWSP*, the District may be called upon to provide some level of response to adjacent areas beyond District boundaries that require a public water supply. The *CWSP* outlines a Satellite System Management Program (SSMP), under which an existing, viable water provider may provide operation and management services to areas outside of its boundaries on a contractual basis.

The District supports the concept of satellite management and may provide satellite management services after evaluating requests or applications on a case-by-case basis. The District reviews requests for satellite management of separate and self-contained water systems based on the following considerations:

1. The economic feasibility of connecting to the District's system. Economic feasibility is gauged by the distance between the project site and the District's system, engineering variables that might affect cost, the size of project to be served by the water system, possible participation by other interested parties, and other factors the District considers relevant. Whenever connection to the District's system is economically feasible, the District will not provide satellite management services. Instead, those properties would be required to extend the District's permanent water main system to obtain water service.
2. Existing systems. The condition of the existing system and its compatibility with the District's system. The ability of property served by the system to fund necessary upgrades, either privately or through municipal funding mechanisms. Supply adequate in quantity and quality must be available. Water rights must be transferred to the District.
3. New systems. The applicant must possess water rights adequate to supply the project and be willing to transfer those rights to the District. This would apply only to those systems with seven or more connections, since public water systems with fewer connections are not required to have water rights. The system must be constructed according to District standards and specifications.
4. Except when otherwise approved by the Board of Commissioners, the District will own all systems which it agrees to manage, and rates and charges will be established by the Board of Commissioners according to law. Satellite systems will be subject to all rules and regulations of the District. Satellite systems will be connected to the District's system when public service is available to the property served by the system.

Because satellite management will not benefit the District's customers, the District will consider various financing options to provide satellite management services. Satellite System Management will have no rate impacts to current customers. The August 12, 1993 Addendum to the *CWSP* suggests the following potential financing options for satellite management services:

- District to advance cost of satellite system improvements which would be paid back by remote system customers through rates, or acting as an intermediary to help the system secure state or federal grant money.
- Low interest loans from such programs as the State Public Works Trust Fund.
- Conventional loans.
- Community development Block Grant funds for qualified low income residents.
- The formation of ULIDs.

Related Planning Documents

District plans that are related to the Water Comprehensive Plan include:

- *Woodinville Water District Water Shortage Contingency Plan for Drought and Emergency Reduction*, 1994.
- *Woodinville Water District Emergency Response Plan* (under production).

The District plans and provides service consistent with the land use policies of King County and the City of Woodinville. Related land use plans include:

- *1998 King County Annual Growth Report. Land Development and Demographic Information for King County, Its Cities, and Unincorporated Areas* (King County Office of Budget and Strategic Planning, August 1998).
- *City of Woodinville Comprehensive Plan*, June 1996.
- *The 1994 King County Comprehensive Plan Complete with 1997 Updates*, (King County Office of Budget and Strategic Planning, November 1994 revised December 1994).

Future water demand projections will be based on both the land use policies of the King County and the City of Woodinville as well as demographic projections from the following:

- *Forecast of Demographics by Purveyor* (Seattle Public Utilities, 1998).
- *1995 Population and Employment Forecasts for the Central Puget Sound Region* (Puget Sound Regional Council of Governments (PSRC), 1995).
- *East King County Coordinated Water System Plan Update* (November 14, 1996).

A portion of the Trilogy at Redmond Ridge Urban Planned Development (UPD) (formerly Blakely Ridge) is located within the District's service area. At this time, Redmond will supply all water to the development. However, the District could provide service to the Trilogy UPD in the future directly (not through Redmond). Information on Trilogy UPD is provided in:

- *Blakely Ridge Water System Master Plan* (January 23, 1992).

The District is part of the Water Utility Coordinating Committee which published the East King County CWSP (November 14, 1996). Some issues addressed by the CWSP include water demand forecasts, boundaries between purveyors, regional water supply options, a conservation program, and minimum design and performance standards.

There are several related conservation planning documents. Some of these documents include:

- *Conservation Planning Requirements Guidelines and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting, Methodology, and Conservation Programs*, DOH, DOE, March 1994.
- *Municipal Water Conservation Analysis and Recommendations Draft*, DOH, August 12, 1998.
- *1996 Long Range Regional Conservation Plan* (Seattle Water and Its Wholesale Customers).
- *Water Conservation Potential Assessment Draft Project Report*, Seattle Public Utilities, March 2, 1998.
- *A Peek at the Peak Case Study: Reducing Seattle's Peak Water Demand*, Allan Dietemann Resource Conservation Section, Seattle Public Utilities, February 9, 1998.

Complaint Response

The District receives approximately 10 customer “complaints” or inquiries per week. The subject of customer complaints generally pertains to high water bills, water pressure, or water quality. The District often resolves the concern by telephone. If needed, the District’s customer service department prepares a work order and a staff member is sent to the site to investigate. The District retains records of all work orders in accordance with State archiving rules and regulations.

INTRODUCTION

The District's current water supply contract with the Seattle Public Utilities (SPU) will expire on January 1, 2012. To secure its future water supply, the District has been exploring future supply alternatives. This chapter summarizes the various supply alternatives under consideration.

INSTITUTIONS

There are two organizations under formation to address the development, operation, and management of regional municipal water supplies:

- Cascade Water Alliance (CWA).
- Snohomish River Regional Water Authority (SRRWA).

Cascade Water Alliance

The CWA is a regional group that would serve as a single wholesale customer to SPU. The CWA is composed of several cities and water districts that currently purchase most of their water from SPU. With the CWA, these purveyors would continue to obtain their water from SPU. Instead of the current individual contracts between SPU and each purveyor, the CWA would consolidate the individual water contracts of the wholesale purveyors into one contract. The CWA would allow the purveyors to work as a unified group to address issues such as water supply planning, conservation, transmission, and operations.

The CWA began as the Interim Water Group in 1995. Formal meetings began in March 1996 to establish an organizational structure and plan operations, to negotiate an agreement with SPU, and to recruit membership. Currently, the CWA constitutes 51 percent of SPU's purveyors (by water volume) and nearly 60 percent of total retail water sales within King County (outside of Seattle). As of early 2000, the CWA has not formed into the governance structure anticipated by its members.

Snohomish River Regional Water Authority (SRRWA)

Description

The Snohomish Regional Water Authority (SRRWA) is a joint administrative entity comprised of the Northshore Utility District, the City of Everett, and the Woodinville Water District. The SRRWA was formed by interlocal agreement in the fall of 1996. The agreement provides that the SRRWA will work to promote regional cooperation in the planning and development of new water sources.

Pursuant to the purpose of its formation and SPU's notice of intent not to renew the existing purveyor supply contract, in November, 1996, the SRRWA acquired the Weyerhaeuser Timber Company (WEYCO) Surface Water Right S1-10617C. This certificated water right authorizes an instantaneous withdrawal of 36 mgd/56 cfs from the Snohomish River for manufacturing purposes. The SRRWA interlocal agreement allocates to the District approximately 11 mgd of the total 36 mgd.

On December 23, 1996, the SRRWA submitted to the DOE, a Plan of Use and application to change the purpose and place of use of the Weyerhaeuser Company water right to "municipal purposes" and the "Area served by the SRRWA." The application for change and the supporting documentation are currently under evaluation by DOE. In February, 2000, DOE Director Fitzsimmons committed the DOE to render a final decision on the application by May 1, 2001, if not sooner.

DOE's response to this application is expected to have a significant impact on the long-term water supply strategy of the District. Under any circumstance, it is the District's intent to continue to be active in regional water resources planning and to coordinate development of SRRWA supply sources with SPU and other regional purveyors.

FUTURE SOURCE OF SUPPLY ALTERNATIVES

A description of potential future water supply alternatives is provided below. Each description includes:

- Capacity: Annual Withdrawal (Qa) and Instantaneous Withdrawal (Qi), if available.
- Status: What work has been completed thus far.
- Costs: capital and operating and maintenance costs, if available.
- Likelihood that the project will occur.
- Time frame for the project to be on-line.

A comparison table of the alternatives is included as Table 4.1- 1.

TOLT AND CEDAR RIVERS (EXISTING SUPPLY)

The District's current primary water source is the South Fork Tolt River Watershed, which is occasionally supplemented by the Cedar River Watershed. The water is purchased directly from SPU, and is supplied via the Tolt Pipeline.

Capacity

The District's current usage is not limited by SPU.

Status

This is the District's current source. The District's water supply contract with SPU expires on January 1, 2012. Although SPU will not renew the contract under the current terms and agreements, the SPU water supply contract will likely be renewed in some form prior to 2012 to assure continuity of water supply to existing District customers.

The District has had ongoing discussions with SPU regarding the potential form of a renewed supply agreement. At this time, a revised contract with SPU could be through the District's participation in the CWA or a new individual contract. The term of this six-year Water System Plan update is through 2006. The status of the continuing SPU contract discussions will be further refined and updated in the 2006/2007 Water System Plan as the District has a valid contract in excess of the time frame of this plan update.

Costs

The wholesale water rates (effective December 31, 1999) paid to SPU are as follows:

Old Water:	
Winter	\$0.73/ccf
Summer	\$1.12/ccf
New Water:	
Growth Surcharge	\$0.46/ccf

The District's current water usage comprises about 48 percent old water.

TABLE 4.1-1
COMPARISON OF SOURCE OF SUPPLY ALTERNATIVES - DRAFT
WOODINVILLE WATER DISTRICT

Source	Institution/How Acquired	Budgetary Costs ⁽¹⁾	Capacity	Major Required Facilities	Likelihood to Occur and Time Frame for Source to be On-line	Water Rights	Right-of-Way Acquired	SEPA/EIS Complete	Major Permitting Complete	Other Issues ⁽²⁾
Tolt and Cedar Rivers	Direct Purchase from SPU	Water Rate (Jan. 2000): Winter: \$0.73/ccf Summer: \$1.12/ccf Growth Surcharge: \$0.46/ccf	Current District use is not limited. Currently: ADD: ~ 3.9-4.4 mgd MDD: ~ 11.8 mgd	None (SPU's Tolt Filtration Plant is under construction; Cedar Treatment Plant is in the planning stage)	Current source and most likely future sources.	Water rights are in place.	NA	NA	NA	
Green River	Direct Purchase from TW, Wheel through SPU or CWA (via TSI)	Capital: \$7 M/mgd Water Rate: ?/ccf	Average Annual: 13 mgd ⁽³⁾ TSI Capacity: 40 mgd The District's share would be part of SPU/CWA agreement.	Howard Hanson Dam Additional Water Storage Project; SSP (Headworks, PL5, North Branch (TSI)) Potential Future Filtration	Most likely of alternative future sources -- most progressed. Time Frame: 2004 - 2005 (TSI) Time Frame: 2002 (upper reach PL5) Time frame dependent on the financial viability of the middle reach of PL5 and North Branch (TSI).	In 1986, Tacoma was granted a water right for an additional 65 mgd, which is subject to in-stream flow requirements. The place of use is "the City of Tacoma and its environs."	Yes - PL 5	Yes - PL 5	Adoption of Tacoma Water's HCP. Corp's advancement of HHD AWSP. CWA formation Future filtration.	
Sultan River (Lake Chaplain)	Direct Purchase from Everett	Capital: \$2.2 M for new pipeline capacity; SnoPUD Surcharge; Wheeling Cost ?/ccf; Transmission Costs from Clearview Reservoir Water Rate: ?/ccf %	District's capacity of Clearview Project: 12 mgd	Clearview Project; Additional Transmission Piping from Clearview Reservoir to District	Less likely than SRRWA options.	Option would require that the place of use for Everett's existing water rights be expanded to include Woodinville.	No	No	No	Crossing Snohomish/King County Line. Challenging permit process.
Sultan River (Lake Chaplain)	Develop Source as Partner in SRRWA - Flow Swap	Capital: \$5.9 M/mgd ⁽⁴⁾ plus: SnoPUD Surcharge ⁽⁵⁾ O&M: \$1.6 M/year plus: SnoPUD Surcharge ?/ccf	Qa: 8.8 mgd Qi: 11 mgd	Industrial WTP; Clearview Project; WWD Transmission Piping	Undetermined - Subject to issues affecting SRRWA Plan of Use implementation. Time frame: Undetermined(?)	No application submitted and/or regulatory efforts have been initiated to facilitate swap.	No	No	No	Crossing Snohomish/King County Line.
Snohomish River	Develop Source as Partner in SRRWA - Direct Transfer	Capital: \$7.3 M/mgd ⁽⁷⁾ O&M: \$2.0 M/year	Qa: 8.8 mgd Qi: 11 mgd	Potable WTP; WWD Transmission Piping	Reasonable likelihood. Time frame: ~ 2014 - 2016	SRRWA submitted an application in 1996 to change type and place of use for current SRRWA water right. ⁽⁶⁾ Decision on change application by May 1, 2000. WWD entitled to 11 mgd share of 36 mgd (Q) total.	Partially (Clearview Project)	Partially (Clearview Project)	Partially (Clearview Project)	Crossing Snohomish/King County Line. Challenging permit process.
Cross Valley Ground Water	Transfer CVID Water Rights	Capital: \$4 to 5 M/mgd	Qa and Qi: 2 mgd	Ground Water Pumping; Treatment; Transmission Facilities	At one time a viable project to serve east side of District. However because of GMA, growth will occur on west side.	Woodinville may submit an application to expand the place of use of CVID water right to include Woodinville.	No	No	No	Crossing Snohomish/King County Line.
Snoqualmie Aquifer and River	CWA and EKORWA	Capital: \$3 to \$4 M/mgd	Qa and Qi: 40 mgd total capacity. (District share not determined)	Groundwater Pumping Facilities; Potable WTP; Transmission Piping	This is a potential long-term alternative. Time frame: ~ 2014 to 2020	EKORWA and SPU have applied for two water right permits. (Snoqualmie aquifer and Snoqualmie River).	No	No	No	Possible in-stream benefits.
Lake Tapps	SPU or CWA	Capital: \$3.7 M/mgd ⁽⁸⁾	Qa and Qi: 65 mgd	WTP; Transmission Piping; Distribution Piping	High likelihood. Time frame: 2015	Puget Sound Energy applied for permit on June 20, 2000.	No	No	No	In-stream flow benefits.
Wastewater Reuse	King County	Capital: Not Determined	Qa and Qi: 20 mgd Irrigation	Water Reuse WTP; Transmission Piping; Distribution Piping	Undetermined.	King County theoretically holds water rights for treated wastewater.	No	No	No	

(1) Budgetary costs reflect available costs to date; additional cost components are noted. Budgetary costs between alternatives can not be compared directly.
(2) The impacts of the ESA would need to be addressed under all options.
(3) With the TSI on-line, the average annual incremental increase in SPU system yield is estimated to be 13 mgd based on a 98 percent system reliability. SPU's portion of the annual withdrawal from the Green River will be 3,300 acre-feet plus an additional 6,700 acre-ft during the drier three out of every 10 years. The amount available will vary seasonally as a function of in-stream flow requirements and storage at HHD. The maximum available will be 40 mgd.
(4) Cost for direct purchase from Everett would include wholesale rate from Everett (currently \$0.65/CCF), water wheeling costs from CVID, and potential Snohomish PUD surcharge.
(5) From SRRWA Technical Memorandum (June 1999), based on District's share of capital costs: \$51.7 m for 8.8 mgd.
(6) Potential Snohomish PUD surcharge for Jackson Hydroelectric Plant, since District is outside of Snohomish PUD service area.
(7) From SRRWA Technical Memorandum (June 1999), based on District's share of capital costs: \$84.6 m for 8.8 mgd.
(8) DOE has stated that water right transfers will be approved prior to new applications, unless the project is environmentally damaging.
(9) Based on a capital cost of \$240 million and a capacity of 65 mgd.
ADD = Average Day Demand
ccf = 100 cubic feet
ESA = Endangered Species Act
GMA = Growth Management Act
CWA = Cascade Water Alliance
CVID = Cross Valley Water District
DOE = Department of Ecology
EKORWA = East King County Regional Water Association
M = Million
MDD = Maximum Day Demand
Mg = Million
NG = Not Applicable
O&M = Operation and Maintenance
PL5 = Pipeline No. 5
QA = Annual Withdrawal
CI = Instantaneous Withdrawal
SRRWA = Snohomish River Regional Water Authority
SnoPUD = Snohomish PUD
SPU = Seattle Public Utilities
SSP = Second Supply Pipeline
TSI = Tacoma Seattle Interlie
TW = Tacoma Water
WTP = Water Treatment Plant

Likelihood

The current source is also the most likely future source, although it is expected to be supplanted and/or conjunctively used with the SRRWA source of supply once this source comes on line.

Time Frame

This source is on-line.

Green River

The proposed TSI would connect Tacoma Water's Green River supply to SPU's Cedar River supply system. Water from the TSI would be made available through SPU or the CWA.

The TSI, also referred to as the North Branch of the SSP, is a joint project between Tacoma Water, SPU, CWA, and purveyors. The TSI will connect Tacoma's Pipeline No. 5 (PL5) to SPU's Lake Youngs Reservoir. Construction of the TSI is contingent on completion of Howard Hanson Dam Additional Water Storage Project and other SSP components which include headworks improvements, and the upper 13-mile reach of PL5 from Tacoma control works to the TSI.

Capacity

The District's portion of the TSI capacity will depend on the SPU/CWA agreement. SPU will be eligible for an annual withdrawal from the Green River of 3,300 acre-feet (1,100 MG). An additional 6,700 acre-ft (2,200 MG) will be available three out of every 10 years, during years with less precipitation.

The amount available to SPU at a given time will vary seasonally, and will be a function of in-stream flow requirements and storage at Howard Hanson Dam. Tacoma's second diversion water right is for 100 cfs. Provided instream flow requirements are met, SPU will be eligible to withdrawal one-third of 100 cfs, or approximately 21 mgd. From approximately February to June, SPU will rely on the Cedar and Tolt Rivers supply, and will store the Green River water at Howard Hanson Dam. Beginning in June of each year, SPU will use the stored Green River supply, which will provide up to 40 mgd (the design capacity of the TSI).

SPU conducted a computer simulation model to estimate the average annual incremental increase in SPU's system yield that would result from the Green River supply. Model results indicated that the Green River supply would provide an average annual incremental increase of 13 to 14 mgd, based on a 98 percent system reliability over 50-years.

Status

Several milestones of PL5 have been completed. The EIS has been accepted, water rights have been secured, and major permitting is in place. PL5 is being constructed in three sections. The status of each section is:

- Upper reach from the control structure to Covington (including connection to the TSI): final design is scheduled to begin in early 2000.
- Middle reach from First Avenue at Federal Way to Covington: final design is on-hold until the section is deemed financially viable.
- Lower reach from approximately First Avenue at Federal Way through Tacoma to the Portland Avenue Reservoir: construction complete.

The North Branch (TSI) of the SSP is still in the early stages. Preliminary design, permitting and acquisition of right-of-way have not been completed.

An agreement has been reached between the SSP participants regarding the construction and operation of the project. Tacoma will own and operate the entire SSP (including the TSI). SPU (and its purveyors)

will have capacity rights in the project for the life of the project. The capacity rights will be equal to SPU's share of the project water and project costs (one third).

Costs

The entire cost of the SSP, including financing and reserve is estimated to be \$279 million (June 1996 dollars). SPU's share of this cost would be approximately \$93 million. Project costs to the District are undetermined. Based on SPU's share of project costs (of \$93 million), and the incremental increase in SPU's regional supply yield (of 13 mgd), the capital cost of the TSI is estimated to be approximately \$7 million per mgd. A wholesale water rate to the District would apply.

Likelihood

This is the most likely future alternative source for the District.

Time Frame

The time frame for completion of the TSI is dependent on the financial viability of the project. The earliest estimate for the TSI to be on-line is 2004 to 2005.

Sultan River Through Direct Purchase From Everett

Under this alternative, the District would purchase Everett WTP water from the City of Everett. The water would be conveyed through the Clearview Project (described below) to the Clearview Reservoir. A new transmission main would then need to convey the water from the Clearview Reservoir site to the District. This purchase would require that the water rights place of use be expanded to include the Woodinville Water District service area.

Capacity

The District's share of the Clearview Project capacity is 12 mgd.

Status

This project is speculative. Although the Clearview Project is under construction, no work specific to this option has been undertaken.

Costs

The District's cost for the Clearview Project is estimated to be \$2.2 million. Additional transmission would be required from the Clearview Reservoir to the District. The District would purchase the water from Everett, based on a wholesale rate established by Everett (current rate is about \$0.65/100 cubic feet). Other cost components would include water wheeling cost from the Cross Valley Water District and a surcharge from Snohomish PUD for the Jackson Hydroelectric Plant, which may be required since the District is outside of the Snohomish PUD service area.

Likelihood

The Sultan River source is less likely to occur through direct purchase from Everett than under the SRRWA because of anticipated permitting and regulation obstacles.

Time Frame

The time frame is unknown, because of permitting obstacles.

Sultan River or Snohomish River Through SRRWA

The District currently presumes the SRRWA water right will be conveyed consistent with the Plan of Use submitted to DOE in 1996. The Plan of Use approach is characterized as Direct Transfer. A second approach, characterized as Flow Swap, was also prepared for primarily comparative purposes. These

approaches were investigated as part of the *Snohomish River Regional Water Authority Water Rights Transfer Project Technical Memorandum (SRRWA Technical Memorandum)* (HDR Engineering, June 1999). A copy of the technical memorandum is included in the appendix.

Direct Transfer. The District has committed itself to this approach pursuant to the SRRWA Plan of Use and the SRRWA SEPA process. Under this approach, the SRRWA would treat water from the Snohomish River to potable water standards and directly transfer the water to the SRRWA. The transfer would include up to 36 mgd instantaneous flow and an annual average flow of 28.7 mgd. The Woodinville Water District would be eligible for 11 mgd peak instantaneous and 8.8 mgd average annual flow. Under current and future demand projections, the District has a demonstrated need for its entire SRRWA allocation and is committed to its use once permitted.

This approach would include:

- The construction of a new 36 mgd potable WTP.
- Retrofit of the existing Weyco Ebey Slough Intake Facility.
- Installation of a new transmission main and finished water pump station to convey the water from Everett to the District.

Capacity

The District would be eligible for 11 mgd peak instantaneous and 8.8 mgd average annual flow.

Status

In December 1996, the SRRWA submitted a draft plan of use and an application to the DOE to change the purpose of use of the Weyerhaeuser surface water right (S1-10617C), from “manufacturing” to “municipal purpose” and the place of use from Weyerhaeuser’s north Everett mill site to the “area serviced by the Snohomish River Regional Water Authority.” (City of Everett et al., January 1998). DOE Director Fitzsimmons has committed DOE to render a final decision on the pending change application no later than May 1, 2001. With the exception of the SEPA processes for the Clearview Project and SRRWA Plan of Use and Water Right Change being completed, preliminary design, major permitting and acquisition of right-of-way have yet to occur. The District, however, intends to address future use of this supply source in pending contract negotiations with SPU.

Likelihood

This option has a reasonable likelihood to occur.

Flow Swap. This approach involves a water swap with the City of Everett. The SRRWA would provide the City of Everett with up to 36 mgd instantaneous and 28.7 mgd average annual flow of treated industrial grade process water (non-potable water). The City of Everett would, in turn, provide the same volumes of potable water to the SRRWA. The District would be eligible for 11 mgd instantaneous and 8.8 mgd average annual flow. At this time, the flow swap approach is not the presumed development path for the SRRWA project. It is, however, an option that may be pursued if the Direct Transfer/Plan of Use approach, once permitted, encounters substantial cost and/or regulatory obstacles. Pursuing this approach would, at a minimum, require the City of Everett and Snohomish PUD agree to amend the place of use of Sultan Water, development of a new Plan of Use by the SRRWA, and approval by DOE of a change application by Everett and the PUD.

The approach would include:

- The construction of a new 36 mgd industrial water treatment plant (industrial WTP) adjacent to the Snohomish River in the City of Everett.
- Retrofit of the existing Weyerhaeuser Company (Weyco) Ebey Slough Intake Facility.

- Minor repairs to a portion of the existing Weyco pipe, which would convey raw water from the Ebey Slough Intake to a new pipe connecting to the industrial WTP. Approximately 1,700 feet of new raw water transmission pipe would connect the existing Weyco pipe to the headworks of the industrial WTP.
- Slip lining of a portion to the existing Weyco pipeline to convey treated water from the treatment plant to the redeveloped Weyco site.
- Installation of a new finished transmission main from the industrial WTP clearwell to the existing Weyco pipeline.
- The potable water from the City Everett would be transferred to the Clearview Reservoir through the Clearview Project (described below). A new transmission main would convey the water from the Clearview Reservoir site to the District.

The Clearview Project. The Clearview Project is a conveyance system to transfer water from the City of Everett's water supply system to the Clearview Reservoir located north of the District in Snohomish County. Original participants in the Clearview Project include: Alderwood Water District, Silver Lake Water District, and Cross Valley Water District. The Woodinville Water District purchased 12 mgd of Cross Valley's capacity in the Clearview Project through a September 30, 1999 agreement.

The Clearview Project facilities include pumping facilities, a transmission line and a reservoir. The transmission line will run from the City's of Everett's pipeline No. 5 to the Clearview Reservoir. Woodinville paid an incremental cost to oversize the transmission line from 36-inches to 42-inches and to expand pumping facilities. The Clearview Project facilities are under construction and are projected to be complete in 2000. The cost for the pipeline and pumping facilities is estimated to be \$2.2 million.

The Clearview Project would serve to transfer the Everett WTP supply either through the SRRWA or through direct purchase from Everett, as described below. Because the Clearview Project terminates at the Clearview Reservoir, a transmission main would be required from the Clearview Reservoir to the Woodinville Water District.

Costs

The District's share of the costs for the two SRRWA alternatives is estimated to be:

	<u>Capital Cost</u>		<u>Annual O&M Cost</u>	
	<u>Million</u>	<u>M/mgd</u>	<u>million</u>	<u>M/year</u>
Approach 1 – Direct Transfer	\$64.8	\$7.3	\$2.0	\$2.0
Approach 2 – Flow Swap	\$51.7	\$5.9	\$1.6	\$1.6

Time Frame

The projected time frames for the two *SRRWA* development approaches are:

Alternative 1 – Direct Transfer	2014 - 2016
Alternative 2 – Flow Swap	Undetermined

Cross Valley Water District Ground Water

Under this alternative, the Cross Valley Water District would transfer its ground water rights to the District. This option would require ground water pumping, treatment, and transmission facilities.

Capacity

A volume of 2 mgd is available to be transferred.

Status

The District may submit an application to the DOE to expand the place of use for the CVWD ground water rights permit to include the Woodinville Water District service area. No work associated with this alternative has been completed.

Costs

The estimated capital cost is \$4 to \$5 million per mgd delivered.

Likelihood

At one time this was a viable project to serve the east side of the District. However, District growth on the east side has leveled off because of GMA restrictions. Since the supply cannot be efficiently conveyed to the west side of the District, where demand is projected to increase, this project is not deemed to be viable.

Time Frame

The time frame is undetermined.

Snoqualmie Aquifer and Snoqualmie River

Under this alternative, water would be pumped from the Snoqualmie aquifer and discharged to the Snoqualmie River near North Bend. The river would serve as the conveyance system to a new potable WTP near Carnation. The treated water would be discharged into the Tolt Pipeline in the Redmond area.

Status

A Snoqualmie Aquifer water right has been applied for jointly by the East King County Regional Water Association (EKCRWA) and SPU. The preliminary design has been conducted on the project. Upcoming activities include:

- Scoping notice for EIS.
- An engineers estimate of project components.
- An update of ground water modeling.

Costs

The cost is estimated at \$3 to \$4 million per mgd (delivered water with treatment). Costs do not include water wheeling, which would require a separate contract.

Capacity

The total capacity of the project is 40 mgd.

Likelihood

This is a potential long-term alternative.

Time Frame

The time frame for this source to be on-line is 2014 to 2020.

Lake Tapps

Lake Tapps is under consideration as a regional water supply. The lake is supplied primarily through a Puget Sound Energy (PSE) diversion system on the White River. The project is being developed and pursued in connection with the efforts of the Lake Tapps Task Force to arrive at a collaborative settlement of issues surrounding the 1997 Federal Energy Regulatory Commission (FERC) operating license for

PSE's White River Hydroelectric Project. The water supply would be purchased by a combination of the CWA, SPU and/or Tacoma Water.

In addition to the infrastructure in place and required for the continuation of the Power Project, additional infrastructure is necessary to provide municipal water use:

- Pipeline to connect a water supply project to the existing Power Project
- Treatment Plant to treat Lake Tapps water
- Transmission to regional interconnection points. Options for interconnection points to the supply systems include:
 - McMillin Reservoir (Tacoma system)
 - North Branch of the Second Supply Project (Tacoma and Seattle system)
 - Lake Youngs (Seattle system)
 - Eastside Reservoir (Seattle system)

Status

PSE applied for a 100 cfs water right from the White River on June 20, 2000.

Costs

The total cost of the project is estimated to be \$240 million, the District's share of the cost would be about \$24 million.

Capacity

The total capacity of the project is 100 cfs (65 mgd).

Likelihood

This option has a high likelihood to occur.

Time Frame

The time frame for this source to be on-line is 2015.

Wastewater Reuse

The District is very receptive to the possibility of a King County Water Reuse plant located near the Sammamish River. During the summer, the effluent could be used for irrigation. During the winter, the plant would either be shut down or the effluent would discharge to the Sammamish River. This option would include the construction of a 20 mgd water reuse plant and the installation of a transmission and distribution system.

Capacity

The treatment plant would have a 20 mgd capacity.

Status

This project is in the conceptual stage.

Costs

No costs have been specified.

Likelihood

The likelihood has not been determined.

Timeframe

No time frame has been specified.

Ground Water

The District currently owns and maintains an emergency standby well (and site) located in close proximity to the District's Woodinville office properties. The District has no intention at this time of operating the well as a full-time source. Further description of the well is provided in Chapter 1.

INTRODUCTION

The Capital Improvement Plan (CIP) was developed based on the findings of the system analysis. The CIP itemizes the requirements and costs for system improvements and expansions including pump stations, storage reservoirs, transmission, and distribution.

SCHEDULE

The CIP schedule covers through the year 2020. A six-year annual schedule was developed for 2000 through 2005. For the remaining years, projects are scheduled in five-year increments. Projects were selected and prioritized on the schedule using the following criteria of importance:

1. Compliance with regulatory/health and safety requirements.

2. Transmission, distribution, storage improvements.

3. System reliability/repair.

4. Scheduling of project budgets for financing.

COST ESTIMATES

Budgetary costs for improvement projects were estimated in 1999 dollars (Seattle ENR CCI 6950), construction year dollars, and present worth. The costs were developed based on recent costing data from the District, bid tabulation costs, unit takeoffs from designs, and published data. Project costs include construction costs, construction contingency, engineering and administration, and sales tax. Costs for future projects were escalated to the year of construction at a rate of three percent per year. Present worth calculations are based on a discount rate of six percent.

RECOMMENDED IMPROVEMENTS

Supply

As discussed in Chapter 4.1, the District is exploring various source of supply options. Included in the CIP are:

- The Clearview Transmission Project
 - The Lake Tapps Project
 - Installation of a sodium hypochlorite feed system to bring the District's existing ground water well on-line as an emergency supply.
 - A project to develop a source as a partner in the SRWA. (Two alternatives are under consideration; the higher cost alternative is listed in the CIP).
- Within the distribution system, source recommendations are made to add redundancy to the individual service zones through additional PRVs.

Storage

Storage improvements are recommended for Zone 1 (Kingsgate) and Zone 11 (Reintree).

Zone 1 (Kingsgate)

Zone 1 has an existing storage deficiency of about 0.7 MG. Coincidentally, the Kingsgate Standpipe which serves the zone, has an existing dead storage volume of about 0.7 MG. The CIP includes an initial pre-design study to evaluate system configurations to utilize the existing dead storage to meet existing demand. Construction of a 700 gpm booster pump station for the storage facility by 2001 is included in the CIP.

To meet future storage requirements, an additional 1.0 MG standpipe located adjacent to the existing facility is recommended by 2010.

Zone 11 (Reintree)

As it is currently operated, Zone 11 has an existing storage deficiency of approximately 0.4 MG. Storage options for the zone include either constructing a new storage facility or operating Zone 11 and Zone 9N as one pressure zone (at 570 feet). Operating the two zones as one zone would allow the two zones to use existing storage in Zone 9N, which is sufficient through 2020. The CIP includes an initial study to evaluate storage options for the zone and the CIP includes construction of a 0.5 MG storage facility by 2001.

Transmission

No improvements to the Wellington and Avondale Transmission mains are recommended.

Distribution

The majority of the distribution improvements are to replace existing 6-inch pipe with 8-, 10-, or 12-inch pipe to improve flows and pressures under fire flow conditions. Since the majority of the 6-inch pipe is asbestos cement, these improvements allow the District to continue its aggressive asbestos cement replacement program.

In addition, the recommended improvements include:

- A parallel 10-inch pipeline from Zone 5 to Zone 4, which will allow the system to provide additional fire flow to a school zone, while maintaining pressures in Zone 4.
- Installation of PRV stations to add source redundancy for two service zones: Zone 8 to Zone 16 and Zone 23 to Zone 17.

Pumping

Construction of a 700 gpm pump station to utilize the dead storage from the Kingsgate Reservoir is included (additional discussion of this project is presented above under storage) in the CIP.

The District is performing modifications to the Ringhill Pump Station to optimize its operation.

CAPITAL IMPROVEMENT PROJECTS

Figure 8-1 shows the location of the CIP projects. Table 8-1 summarizes the 20-year CIP projects by type (distribution and transmission, storage, and pumping). A summary of the projects and costs by year is provided in Table 8-2.

Figure 8-1

The purpose of this financial analysis is to summarize Woodinville Water District (District) financial status and evaluate the ability of the District to financially support necessary capital improvements identified in the Capital Improvement Plan (CIP). It also addresses rate and financing options, and potential long-term problems, including both capital and operating requirements. The various sources considered include outside low-interest loan/grant programs, rates, connection charges, and debt financing. Finally, it reviews the District's current rate structure with respect to financial policies and conservation objectives.

FUNDING OPTIONS

The funding options available to the District for capital projects consist primarily of debt mechanisms or cash funding through various user charges. Historically, federal and state grant programs were available for financial assistance; however, these have been mostly eliminated or replaced by loan programs. Remaining miscellaneous grant programs are generally funded lightly and heavily subscribed. Nonetheless, the benefit of even low-interest loans makes the effort of applying worthwhile.

State Funding Programs

State programs identified as potential funding sources for the utility improvements set forth in this comprehensive plan are summarized below:

- **Public Works Trust Fund** - The Public Works Trust Fund (P WTF) is a commonly used, low cost revolving loan fund established in 1985 by the state legislature to provide financial assistance to local governments for public works projects. Eligible projects include repair, replacement, rehabilitation, reconstruction, or improvement of eligible public works systems to meet current standards for existing users. Growth related projects are not eligible. P WTF Loans are available at interest rates of .5 percent, 1 percent, and 2 percent, with the lower interest rates given to applicants who pay a larger share of the total project costs. The loan applicant must pay a minimum of 5 percent towards the project cost to qualify for a 2 percent loan, 10 percent for a 1 percent loan, and 15 percent for a .5 percent loan. The useful life of the project determines the loan term up to a maximum of 20 years.
- **Community Economic Revitalization Board** - Managed by the Department of Community Trade and Economic Development, this program provides grants and loans to fund public facilities that result in specific private sector development. Eligible projects include water, sewer, roads, and bridges. Funding varies.
- **Community Development Block Grant (CDBG) Program** - Also administered by the State Department of Community Trade and Economic Development, the CDBG program provides grants and loans for infrastructure improvements, including water projects, for business development that create or retain jobs for low and moderate-income residents.

■ **Department of Ecology** - The Department of Ecology Water Quality Financial Assistance

Program sponsors four grant and loan programs: the Centennial Clean Water Fund, Federal 319 Programs, State Revolving Fund Loans, and the Aquatic Weeds Grant Programs. While most of the funding goes to wastewater programs, projects such as development and implementation of groundwater and wellhead protection programs are included. Congress has authorized a limited amount of money for the Drinking Water State Revolving Fund (DWSRF) loan specifically for programs to improve water quality. Funding is generally limited to 50 percent and comes in the form of either a grant or low interest loan (0 percent for up to 5-years, increasing to 4.8 percent for 15- to 20-years).

Of these programs, the PWTf is the most attractive program for the District. The emphasis of PWTf loans on replacement and rehabilitation fits well with the District's plan to replace portions of its transmission and distribution system at an estimated cost of \$8.3 million over the next 10-years. The District has received a PWTf loan of \$1.8 Million for the year 2000 and \$3.2 Million for 2001. The District should continue to apply for PWTf loans in the future and the District is eligible for \$10 million from the PWTf every two years. In addition, the District should participate at the 15 percent level to receive the .5 percent PWTf loan rate. The benefits of participating at the 15 percent level and receiving the .5 percent rate reduces the overall interest rate on borrowing by 40 basis points or .4 percent versus the District participating at the 5 percent level and receiving a 2 percent interest rate. This calculation assumes the District issues revenue bonds to cover their portion at a net effective interest rate of 6 percent. Translated into dollars, the District would save \$4,000 annually for every \$1 million of PWTf loans outstanding by participating at the 15 percent level versus the 5 percent level. The economics of this financing strategy hold true until the alternative interest rate, such as that on revenue bonds equals 9.5 percent.

Existing District Funds and Reserves

The District has several funds containing cash and investments. As noted below, most are restricted in their use, or have minimum requirements, which limit or preclude their use for funding capital programs.

- **Construction Fund** - The Construction Fund beginning balance for 2001 is \$10,091,793 and is assumed to be available to support project costs. This includes the proceeds of the 1999 bond issue.
- **Rate Stabilization Fund** - The Rate Stabilization Fund balance is \$941,943 at the beginning of 2001. This fund is restricted in use to meeting unanticipated or emergency revenue shortfalls and would not normally be available to support capital project costs.
- **Bond Reserve Fund** - The District will have approximately \$1,000,000 in its bond reserve fund after the 1999 Bond Issue is distributed in compliance with its bond covenants. These funds must remain in place as required by those bond covenants.

General Facilities Charges/System Development Charges

General Facilities Charges (GFCs) or System Development Charges (SDCs) are sources of funding typically used by utilities to support capital needs. GFCs are a form of connection charges as authorized in the Washington Revised Code 57.08.010. GFCs are imposed on new customers connecting to the system as a condition of service, in addition to any other costs incurred to connect the customer such as meter installation charges. Typically, the basis for the GFC is the capital cost the utility will or has incurred to provide the water system. The underlying premise of the GFC is that growth (i.e. future customers) will pay for growth related costs that would not have been necessary absent the increase in customer base. A ten-year horizon is used to determine the capital facilities necessary to be constructed to serve the projected growth during the same period.

The projection of financial performance uses the District's existing financial condition as a baseline for projecting future costs and estimating the impacts of recommended improvements and program.

PROJECTION OF FINANCIAL PERFORMANCE

Net Existing Plant (as of 12/31/00) including 2001 CIP	\$28,557,889
Accumulated Interest on Existing Plant	\$14,278,944
Total Net Assets	\$42,836,833
Total Planned Capital Improvements (2002-2011)	\$13,708,860
Existing Meter Equivalents	17,199
Projected Future Meter Equivalents	21,538
Net Assets and Improvements	\$56,545,693
divided by Total Projected Meter Equivalent	21,538
Capital Facility Charge (5/8" SFR Meter)	\$2,625

Note: 5/8" Meter is a 1.5 Flow Factor

TABLE 9-1
CAPITAL FACILITY CHARGE - CALCULATION SUMMARY

The summary calculation of the GFC is displayed in Table 9-1. The current charge is \$2,260 for a 5/8" and 3/4" meter. The new charge for a 5/8" and 3/4" meter is \$2,625. The primary driver for the increase is due to a \$15.8 million increase in net assets from 1998 through 2001. Asset additions include AC main replacements, the Aspenwood Reservoir, and costs-to-date for the District's new administration building. Another factor contributing to a higher charge in 2001 over 1998 is that outstanding debt principal was not deducted from total assets in arriving at the charge. Ordinarily outstanding debt is deducted from the asset base if there is insufficient cash and investments available to pay the debt. In this case the cash and investments exceeded the debt principal outstanding and consequently the debt was not deducted from total assets in arriving at the final charge.

Excluding installation expenses, the cost of the system to be recovered by the general facilities charge can be defined in two parts:

- The cost of existing facilities of general benefit, such as storage tanks, transmission mains, etc. In addition, State law allows collection of up to 10-years of interest on the cost of these assets. This cost is net of donated facilities, whether from grants, developers or through ULIDS.
- The cost of future capital facilities. This includes all capital projects funded by the utility for the next ten years based on the current system growth projections. Projects funded by developers or special assessments are not included in this calculation.

The purpose of the GFC is two-fold: 1) to provide funding sources for capital financing, and 2) to recover an equitable level of investment in the system from new customers. In the absence of such a right-to-connect charge, growth-related costs would be borne, in large part, by existing customers. In addition, the current customers' net investment in the utility would be diluted by the addition of new customers absent a GFC. This dilution would, in effect, be a subsidy to new customers.

Historical District Financial Performance

The District provides Water and Sewer Service. Table 9-2 shows a consolidated audited income statement of revenues and expenses from 1994 - 1999. The District is providing positive cash flow and well exceeds its bond covenant obligations. Table 9-3 shows the District's Balance Sheet. Again, the District is very financially healthy. Retained Earnings is steadily growing while liabilities are remaining steady.

Basis for Revenue Requirements

The revenue requirements analysis determines that the operating revenues, operating expenses, debt service requirements, and any other identified revenues or expenses necessary to meet the revenue sufficiency tests. Three separate conditions must be met for user charge revenues to be sufficient: periodic cash needs must be met, net earnings must be positive, and the minimum revenue bond debt service coverage requirement must be realized.

The cash flow test identifies cash requirement for the utility in the year addressed. Those requirements can include cash operating and maintenance expenses, debt service, directly-funded capital outlays, and any projected additions to reserves. The total cash needs are then compared to projected utility revenues. Any shortfalls are identified and the level of rate increase necessary to make up the shortfall is estimated. District policy is for net earnings to be positive. This earning test is similar to the cash flow test with two differences. Any capitalized expenses (revenues) are netted out, but non-cash expenses (e.g. depreciation) are added in. This test is required for the District to fully fund depreciation.

The coverage test is based on the bond covenants for revenue bonds which requires that a specific test of revenue sufficiency be met. This requirement states that revenues must be sufficient to meet operating expenses plus a factor, set at 1.25, times annual debt service on all revenue bond debt issued. The coverage factor adds some protection for bondholders against the risk of poor financial performance. The District may wish to consider maintaining a higher target to enhance or maintain credit worthiness. Coverage targets of 1.50 to 2.0 are common for municipal utilities with this objective.

**TABLE 9-2
HISTORICAL INCOME STATEMENT 1994-1999
COMPARATIVE STATEMENT OF REVENUES AND EXPENDITURES**
(Fiscal Years Ended December 31)

	1999	1998	1997	1996	1995	1994
Operating Revenue						
Water Service	\$4,833,147	\$4,610,544	\$4,771,080	\$4,800,164	\$5,862,614	\$5,494,661
Sewer Service	1,219,895	1,459,588	1,609,067	1,864,796	1,901,365	1,946,245
Street Lights	127,200	128,724	138,600	144,661	114,959	115,078
Other Revenue	26,908	28,598	26,804	74,043	50,345	55,175
Total Operating Revenue	6,207,150	6,227,454	6,545,551	6,853,664	7,929,283	7,611,159
Operating Expenses						
Water Purchased	1,434,396	1,514,590	1,670,936	1,732,008	2,514,322	2,136,733
Metro Charges	759,554	878,136	1,104,867	1,223,192	1,368,824	1,356,591
Power for Street Lights	109,692	112,276	115,207	93,209	89,883	88,796
Personnel Expense	1,194,715	1,224,408	1,342,619	1,382,240	1,516,306	1,703,467
Plant Expense	708,528	603,329	626,772	781,972	742,449	903,106
Professional Services	140,858	105,085	130,223	148,877	133,948	132,007
Depreciation and Amortization	1,205,396	1,235,512	1,356,380	1,422,069	1,602,714	1,649,511
Total Operating Expenses	5,553,139	5,673,336	6,347,004	6,783,567	7,968,446	7,970,211
Net Income from Operations	654,011	554,118	198,547	70,097	-39,163	-359,052
Other Revenue						
Investment Interest	398,725	627,998	712,539	771,835	815,986	867,573
Misc. Revenue	74,501	35,361	39,315	170,600	-10,749	19,087
Total Other Revenue	473,226	663,359	751,854	942,435	805,237	886,660
Other Expense						
Other Interest Expense	214	18	18	13,254	45,434	13,718
Amortization of Debt Discount	13,715	12,813	12,813	12,812	12,813	13,718
Loss on Abandoned Assets			505,014			
Debt	528,141					
Total Other Expense	528,141	13,027	517,845	12,812	26,067	59,152
Net Income	\$585,381	\$1,204,450	\$432,556	\$999,720	\$740,007	\$468,456
Add: Depreciation	1,205,396	1,235,512	1,356,380	1,422,069	1,602,714	1,649,511
Add: Connection Fees	912,184	614,285	548,871	995,531	1,093,558	628,157
Add: Loss on Abandoned Assets and Early Debt Extinguishment	528,141		505,014			
Funds Available to Pay D/S on Party Bonds	\$3,231,102	\$3,054,247	\$2,842,821	\$3,417,320	\$3,436,279	\$2,746,124
Debt Service on Party Bonds	\$865,014	\$754,720	\$844,640	\$849,390	\$835,590	\$636,577
Debt Service Coverage	3.74	4.05	3.37	4.02	4.11	4.31

TABLE 9-3
COMPARATIVE BALANCE SHEET 1994-1999

	1994	1995	1996	1997	1998	1999
ASSETS						
Utility Plant - net	\$40,734,585	\$42,379,499	\$42,976,784	\$46,481,804	\$48,716,603	\$49,963,587
Restricted Assets						
Cash	7,326,760	7,939,226	9,665,294	11,290,152	12,111,299	17,931,293
Accounts Receivable	24,065	19,207	22,652	18,636	15,587	14,279
Interest Receivable	49,398	0	7	57,463	58,022	89,814
Assessments Receivable	304,224	229,849	131,552	82,365	52,330	26,447
Total Restricted Assets	\$7,704,447	\$8,188,282	\$9,819,505	\$11,448,616	\$12,237,238	\$18,061,833
Current Assets						
Cash & Investments	3,199,975	3,095,518	2,914,051	3,549,700	2,104,468	1,875,442
Accounts Receivable	816,815	936,507	897,746	52,674	1,012,742	1,049,965
Interest Receivable	17,744	42,857	4	13,812	11,288	9,898
Inventory & Prepaid Expenses	90,493	76,153	73,854	97,080	69,557	128,922
Due From Developers	42,834	21,231	27,107	5,164	1,616	8,923
Total Current Assets	\$4,167,861	\$4,172,266	\$3,912,762	\$3,718,430	\$3,199,671	\$3,073,150
Other Assets						
Investment in Deferred Compensation Plan	188,957	256,862	435,794	794,357	0	0
Unamortized Discount on Debt	128,125	115,313	102,500	89,688	76,875	169,996
Deferred Excise Tax Credits	124,410	7,360	2,861	1,980	2,389	0
Total Other Assets	\$441,492	\$372,175	\$545,654	\$886,906	\$78,855	\$172,385
Total Assets	\$53,048,385	\$55,112,222	\$57,254,705	\$62,535,756	\$64,232,367	\$71,270,955
LIABILITIES AND FUND EQUITY						
Equity						
Contributions in Aid of Construction	\$39,835,473	\$41,232,331	\$43,173,890	\$46,891,269	\$49,572,699	\$51,354,800
Appropriated Retained Earnings	571,773	596,464	649,931	666,330	727,808	654,294
Unappropriated Retained Earnings	6,754,382	7,864,169	8,118,464	9,003,105	9,701,634	10,243,604
Total Equity	\$47,161,628	\$49,692,964	\$51,942,285	\$56,580,704	\$60,002,141	\$62,252,698
Long Term Debt						
Public Works Trust Fund Loan	\$0	\$208,050	\$415,605	\$883,404	\$979,031	\$1,119,163
Revenue Bonds Outstanding	4,465,000	3,790,000	3,090,000	2,380,000	1,835,000	6,405,000
Total Long Term Debt Outstanding	\$4,465,000	\$3,998,050	\$3,505,605	\$3,263,404	\$2,814,031	\$7,524,163
Liabilities from Restricted Assets						
Accounts Payable	\$130,563	\$162,859	\$50,278	\$267,316	\$72,346	\$295,987
Retainage Payable	4,253	17,218	341	14,061	54,499	19,826
Accrued Interest	99,056	90,220	79,201	67,039	57,992	101,282
Public Works Trust Fund Loans	0	0	10,950	96,951	106,061	123,751
Revenue Bonds	660,000	675,000	700,000	710,000	545,000	430,000
Liabilities From Restricted Assets	\$893,872	\$945,297	\$840,770	\$1,155,367	\$835,898	\$970,846
Current Liabilities						
Accounts Payable	\$189,624	\$166,968	\$307,840	\$484,201	\$351,800	\$279,540
Accrued Vacation and Sick Leave	70,630	83,575	119,072	148,443	168,082	187,155
Developer Extension Agreements	78,674	77,413	103,339	93,095	60,415	43,096
Other Current Liabilities	0	0	0	16,186	0	13,457
Total Current Liabilities	\$338,928	\$327,956	\$530,251	\$741,925	\$580,297	\$523,248
Other Liabilities						
Deferred Compensation	188,957	256,862	435,794	794,537	0	0
Total Liabilities and Equity	\$53,048,385	\$55,221,129	\$57,254,705	\$62,535,937	\$64,232,367	\$71,270,955

Source: Woodville 1999 Revenue Bond Statement / 1999 Washington State Auditor's Report

Forecast Assumptions

The District provided its 1999 audited financial statements, 2000 draft financial statements, and current projections for 2001 revenues and expenses. A number of forecast assumptions are used in the analysis including:

- Revenue is calculated to increase with growth for future years. The growth assumptions are consistent with the growth assumptions published by the Puget Sound Regional Planning Council (PSRPC).

- Most future expenses are projected using an inflation rate of three percent. The major exception is the cost of Seattle wholesale water. Established SPU water rates are used to project the District's wholesale water costs through 2002. After 2002 through 2011 water costs are increased by inflation plus customer growth. The growth factor is increased by 25 percent to reflect that "new" customers connecting to the District's system will be served by "new water" at an additional cost under the current Seattle contract. From 2012 through 2014 water is purchased from Seattle Water for twice the prevailing rate. After 2014 wholesale water is purchased through the Snohomish River Regional Water Authority (SRRWA) (see the section called Long Term Supply Financing).

- A Capital Improvement Program that will invest \$13.7 million in the District's infrastructure over the next 10-years is included in the computation of the Capital Facility Charge (CFC). The District issued \$5 million in bonds in 1999 and will receive \$5 million Public Works Trust Fund Loans in 2000 and 2001 to help cover these expenses. The SRRWA and Lake Tapps capital projects have been included in the forecast after the GFC planning horizon with the assumption that funding will be provided by issuing debt.

- An average inflation rate of three percent and a fund earnings rate of five percent are also assumed in the analysis.

Capital Financing Strategy

Table 9-4 shows the projected sources of revenue that the District will use to fund its proposed Capital Improvement Program. The District issued \$5,000,000 in Revenue Bonds in 1999 and will receive a total of \$5 million in Public Works Trust Fund Loan proceeds over the next two years. These debt issues along with existing reserves should enable the District to finance its Capital Program without difficulty.

TABLE 9-4
CAPITAL PROJECTS FINANCING

	2000	2001	2002	2003	2004	2005	2006
Capital Projects to be Financed	\$3,731,000	\$9,265,000	\$1,268,000	\$720,000	\$0	\$407,000	\$0
Connection Charges	\$425,323	\$690,502	\$1,268,000	\$720,000	\$0	\$407,000	\$0
Rates	\$0	\$464,954	\$0	\$0	\$0	\$0	\$0
Use of Capital Reserves	\$0	\$1,103,531	\$0	\$0	\$0	\$0	\$0
Debt Financing (*)	\$3,305,677	\$7,006,013	\$0	\$0	\$0	\$0	\$0

* Includes 1999 Bond and 2000 and 2001 PWTF Loans

The SRRWA project is expected to provide Woodinville Water District with 11 million gallons of water per day at a cost of \$134 million in 2015 (\$86 million in 2001 dollars) plus \$2.8 million in O&M Costs (\$1.8 million in 2001 dollars).
District's needs.

Scenario 1 as outlined below. This also assumes Seattle's continued willingness to supply all of the Authority (SRRWA) in 2015 and wholesale water payments to Seattle Water will be consistent with assumption that Woodinville Water District will participate in the Snohomish River Regional Water Figure 9-1 shows cumulative rate increases through 2025 with wholesale water costs based on the

Long Term Supply Financing

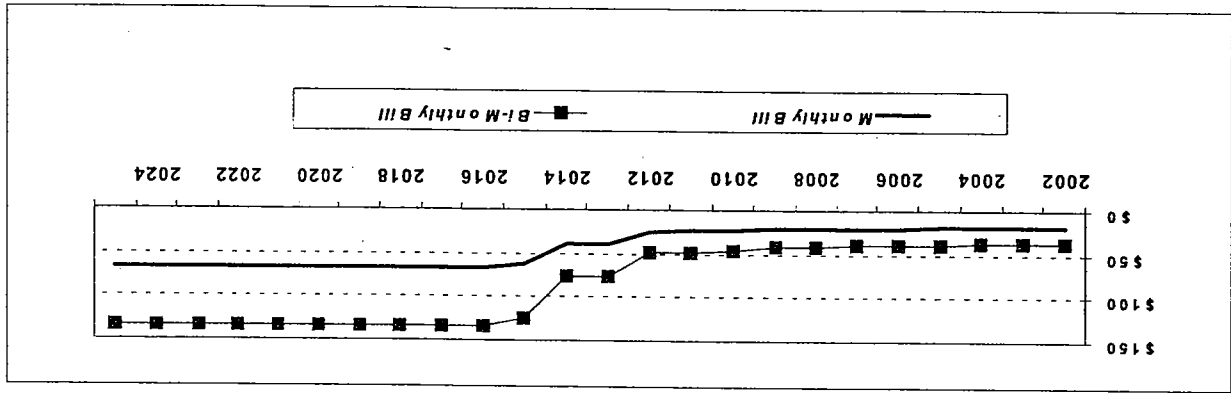


FIGURE 9-2
SINGLE FAMILY RESIDENCE MONTHLY AND BI-MONTHLY BILL

Figure 9-2 shows the impact on a typical single family residence bill from these projected rate increases.

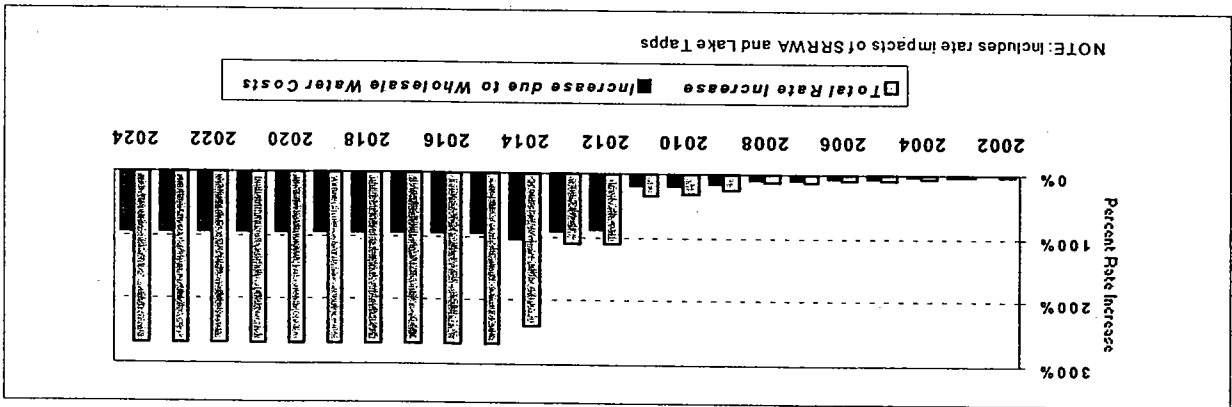


FIGURE 9-1
CUMULATIVE RATE INCREASES

This analysis shows that wholesale water costs will be the major driver for Woodinville Water District rate increases until 2014. After 2014 the major drivers are the debt service cost related to the SRRWA and Lake Tapps capital projects. Figure 9-1 shows the correlation between projected wholesale water costs and projected Woodinville user rates.

Long Range Projected Revenue Requirements

FIGURE 9-4

Figure 9-4 shows the same wholesale water supply costs as Scenario 1. However, Figure 9-4 also illustrates the financial implications if Seattle doubles the price of water in 2012 and then starting in 2015 allows Woodinville to purchase 10 percent less per year for 10-years as a way to slowly withdraw from the regional system. In 2027, the axes cross and the SRWA becomes more cost efficient for Woodinville. Again, Woodinville would have the debt paid off in 2035, and the system would just need to recover O&M costs to operate.

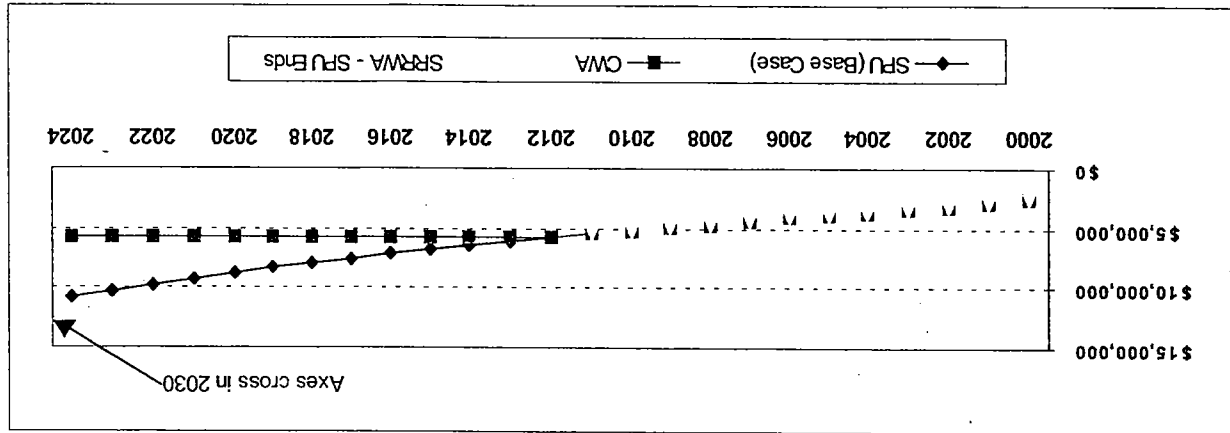


FIGURE 9-3
SUPPLY COSTS - SRWA SCENARIO 1

Figure 9-3 compares Scenario 1 to SRWA and CWA options. The figure illustrates the annual water cost to the District under a scenario whereby SPU doubles the cost of Woodinville from 2012 until 2015 when the SRWA would come on line. It is anticipated that SPU would charge a high premium to give Woodinville the option of walking away from its contract in 2015. In 2015, Woodinville would be buying just peak water from Seattle but would also have to pay the \$10 million a year in debt service plus approximately \$3 million a year in O&M costs for SRWA. However, in 2030 the SRWA would become less costly than Seattle water and in 2035, when the debt service ends, the cost of water to Woodinville customers would be much less than buying water from Seattle.

The two scenarios are used to illustrate potential adverse outcomes. It may be possible to avoid all or some of these impacts, depending on the outcome of negotiations with Seattle. The two scenarios are:

- Scenario 1 - SPU supplies the District with necessary capacity until SRWA is operational in 2015. This scenario assumed that in return for this commitment, the District pays a rate comparable to marginal water costs, or roughly double the prevailing rate. Beginning in 2015, the District would buy peak water from SPU at that same higher rate, but maximize the use of SRWA to meet its needs.
- Scenario 2 - Same as Scenario 1, except that Seattle requires "take or pay" provision which allow annual reductions in demand over a 10-year period (10 percent per year). This may be required to protect Seattle customers from the impact of the revenue loss.

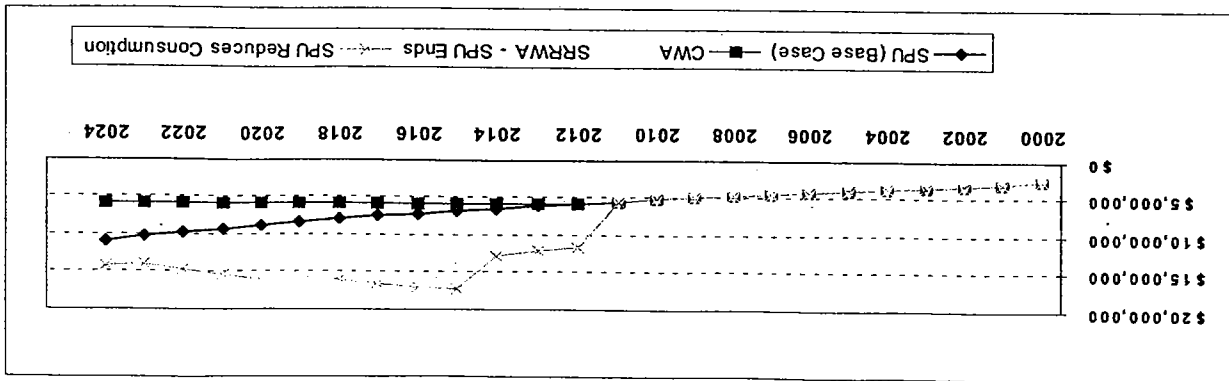
This delay puts Woodinville in a difficult situation in contract negotiations with SPU. Woodinville will totally rely on SPU supply until the SRWA is operational in about 2015 and will need SPU supply for its peak days even with SRWA fully operational. Seattle may not offer favorable terms to Woodinville upon the contract extension which provides both a supply commitment and an option to terminate or greatly reduce demands when SRWA is available. The following two scenarios illustrate the possible effect of negotiated outcomes with Seattle.

- A "bridge" supply from 2012 until SRWA is operational.
- Ability to reduce supply commitment and payment when SRWA is operational.
- Flexibility on SRWA availability date.
- Cost and rate structure.
- Hold harmless conditions, such as take or pay provisions.
- Continued capacity commitment for needs beyond SRWA capacity, such as peak periods.
- Wheeling or transfer ability of Seattle commitment.
- Access to other new "regional" resources.

The scenarios above are not meant to suggest which supply options the District commissioners are to pursue but to show the financial impacts of the source options as well as the timing impacts of those options. These illustrations are meant to show a worst case scenario of potential choices that the District commissioners will have to decide on in the future. The charts also do not project the financial implications past 2025. The debt for the SRWA will be paid off at some point, and at the time, it will be a much more cost effective resource than purchases from the Seattle system.

The financial impact of pursuing independent supply sources can be mitigated through various means, including the use of longer term debt, sale of surplus water (when available) to other agencies, and the use of grants or loans. Most importantly, the District must address supply from Seattle beyond contract termination in 2011. The above scenarios describe potentially adverse circumstances, while potentially beneficial circumstances may also exist. The critical issues when negotiating an extended water commitment from Seattle include:

Long Term Supply Summary



Rate Structure

Woodinville Water District has essentially kept the same rate structure since 1992. The structure was put in place in 1992 in response to droughts and shortages that occurred that year. The Commissioners modified the structure in 1999 by increasing the volume charge and adding a fourth block to send a stronger conservation signal to their customers.

The current rate structure has four blocks for its bimonthly residential bills (see Table 9-5), with each block costing more per unit than the previous block. For example, a customer will currently pay, under the new rates, \$1.85 for their 10th CCF for the bimonthly bill but will pay \$4.30 per CCF for the 52nd CCF they use in that period.

**TABLE 9-5
SINGLE FAMILY RESIDENCE BLOCK STRUCTURE CHANGE**

	0 - 12 CCF	13 - 25 CCF	28 - 50 CCF	Over 50 CCF
2001 Structure	\$1.75	\$2.55	\$3.35	\$4.15
2002 Structure	\$1.85	\$2.65	\$3.45	\$4.30

The 2002 projected charges for non-residential customers is a volume charge of \$2.25 per CCF for usage up to their winter average and \$2.60 per CCF for water usage over their winter average. For billing purposes, the winter average is determined by evaluating the customers' actual water usage as metered during the winter months.

Some examples of possible rate structure enhancements that the District commissioners could consider in the future:

- Smaller blocks to further encourage conservation. This would force more usage into the higher "more expensive" blocks. The District Board of Commissioners generally does not consider this to be a viable option.
- Adjusting the residential structure to one more based on each residence average winter usage, similar to the commercial basis. The District could charge customers a certain price for their winter average or some fraction thereof, and then establish a series of usage blocks of fixed size which begin at the benchmark volume.
- Developing a pattern-based rate structure. This structure would have a conservative user discount and actively reward customers that use less water. Examples of this program could include sending a rebate check at the end of the year if the customer met certain conservation goals or having an automatic adjustment on their bills to reward them if their usage history conforms to some targeted pattern. Additional studies may be required to implement a pattern-based rate structure.