

# **EXECUTIVE SUMMARY**

## **INTRODUCTION**

The Northshore Utility District (District) Water System Comprehensive Plan (Plan) has been developed in accordance with the latest revision to Chapter 246-290 of the Washington Administrative Code (WAC), as presented in the Washington State Department of Health (DOH) regulations for Group A Public Water Systems, effective July 3, 2004.

## **SERVICE AREA AND PLANNING CRITERIA**

The service area includes those properties within the current District retail service area boundary including those areas served by interlocal agreements. Since the availability of water service is dependent upon whether or not allowable service pressures can be maintained, the retail service area boundary and the District corporate boundary are not entirely coincidental. The District's corporate boundary comprises approximately 11,860 acres, while the retail water service area is approximately 10,912 acres.

The planning period for the Plan is through 2026, coinciding with a 20-year planning interval. Because the service life of many water system components is greater than 20 years, the planning of future facilities considers a buildout scenario as an estimate of the ultimate capacity required to serve all land under current zoning.

The current and future populations within the retail service area are estimated based on transportation analysis zone (TAZ) population projections. A summary of the projected annual population growth rate, population, employee growth rate, and number of employees within the District's water service area for the 20-year planning period and buildout is presented in Table E-1. The projected buildout population for the District's retail service area is 118,584.

**TABLE E-1**

**Projected Water Service Area Population and Employment**

<b>Year</b>	<b>Population Growth Rate</b>	<b>Population</b>	<b>Employee Growth Rate</b>	<b>Employees</b>
2006	0.37%	69,108	1.49%	16,980
2007	0.37%	69,366	1.49%	17,232
2008	0.37%	69,625	1.49%	17,488
2009	0.37%	69,885	1.49%	17,748
2010	0.37%	70,146	1.49%	18,013
2011	0.48%	70,483	1.70%	18,319
2012	0.48%	70,821	1.70%	18,630
2013	0.48%	71,161	1.70%	18,946
2014	0.48%	71,503	1.70%	19,268
2015	0.48%	71,846	1.70%	19,595
2016	0.48%	72,191	1.70%	19,928
2017	0.48%	72,537	1.70%	20,267
2018	0.48%	72,885	1.70%	20,611
2019	0.48%	73,235	1.70%	20,961
2020	0.48%	73,586	1.70%	21,318
2021	0.29%	73,799	1.28%	21,590
2022	0.29%	74,012	1.28%	21,865
2023	0.29%	74,226	1.28%	22,144
2024	0.29%	74,440	1.28%	22,426
2025	0.29%	74,655	1.28%	22,712
2026	0.29%	74,871	1.28%	23,002
Buildout	N/A	118,584	N/A	24,199 <sup>(1)</sup>

(1) Employees at buildout are assumed to equal the number of employees in 2030.

**EXISTING SYSTEM**

The District owns and operates a Group A water distribution and storage system. The system consists of 22 pressure zones, ranging from a hydraulic grade of 640 feet in the Lake Forest Park area to 292 feet along the shore of Lake Washington. The District’s distribution system includes 29 MG of storage, three booster stations, and over 258 miles of pipe, ranging from 1.5 inch to 24 inches in diameter. Table E-2 provides a summary of the District’s service area characteristics and water system facilities.

**TABLE E-2****2005 Water System Data**

<b>Description</b>	<b>Data</b>
Water Service Area Population	68,835
Water Service Area	8,248 acres
Total Connections	20,050
Total ERUs	27,445
Demand per ERU (2000-2005 Average)	202 gpd
Demand per Capita (2000-2005 Average)	83.6 gpd
Annual Supply	2,082,228,544 gallons
Average Day Demand	5.70 mgd
Unaccounted for Water (2000-2005 Average)	4.4%
Peak Day/Average Day Demand Factor	2.0
Peak Hour/Peak Day Demand Factor	2.0
Number of Pressure Zones	22
Number of Supply Stations and Total Capacity	8 (8.55 mgd)
Number of Pump Stations and Total Capacity	3 (15,600 gpm)
Number of Reservoirs and Total Capacity	8 (29.1 MG)
Number of Pressure Reducing Stations	51
Number of Fire Hydrants	2,653
Total Length of Water Main	258 miles

Historically, the District has purchased all of its water from Seattle Public Utilities (SPU). In 2005, the District and SPU executed a new block wholesale contract with an expiration date of 2062. The block contract replaces the District's prior 1982 SPU wholesale supply contract that was set to expire at the end of 2011.

The quantities secured under the new SPU block contract, coupled with ongoing and future conservation programs, are expected to meet the District's system demands over a 20-year planning period, if not longer. However, the contract does not preclude the District from developing additional sources of supply, including its Snohomish River Regional Water Authority water right, if such action is required and/or if such supplemental supplies can be developed on a more cost-effective basis than SPU wholesale supply.

## **WATER USE CHARACTERIZATION AND FORECASTING**

The District's customer base is composed of residential, commercial, and industrial connections. Approximately 66 percent of the District's total water is used by single-family residential customers. The total number of water service connections within the District at the end of 2005 was 20,050.

Table E-3 provides projections for the average day, maximum day, and peak hour demand. Maximum day demands are equal to 2.0 times the average day demands and peak hour demands are equal to 2.0 times the maximum day demand as discussed previously in this Chapter. Peak month demand is estimated to equal 1.52 times the average day demand, and peak season demand is estimated to equal 1.29 times the average day demand.

**TABLE E-3**

**Water Service Area Peak Demand Projections**

<b>Year</b>	<b>Average Day Demand, ADD<sup>(1)</sup> (mgd)</b>	<b>Maximum Day Demand, MDD<sup>(2)</sup> (mgd)</b>	<b>Peak Hour Demand, PHD<sup>(3)</sup> (gpm)</b>	<b>Peak Month Demand<sup>(4)</sup> (mgd)</b>	<b>Peak Season Demand, PHD<sup>(5)</sup> (gpm)</b>
2005	5.83	11.66	16,200	8.86	7.52
2006	5.86	11.72	16,300	8.91	7.56
2007	5.89	11.78	16,400	8.95	7.60
2008	5.93	11.86	16,500	9.01	7.65
2009	5.96	11.92	16,600	9.06	7.69
2010	5.99	11.98	16,600	9.10	7.73
2011	6.02	12.04	16,700	9.15	7.77
2012	6.06	12.12	16,800	9.21	7.82
2013	6.11	12.22	17,000	9.29	7.88
2014	6.14	12.28	17,100	9.33	7.92
2015	6.18	12.36	17,200	9.39	7.97
2016	6.22	12.44	17,300	9.45	8.02
2017	6.26	12.52	17,400	9.52	8.08
2018	6.29	12.58	17,500	9.56	8.11
2019	6.34	12.68	17,600	9.64	8.18
2020	6.38	12.76	17,700	9.70	8.23
2021	6.41	12.82	17,800	9.74	8.27
2022	6.44	12.88	17,900	9.79	8.31
2023	6.46	12.92	17,900	9.82	8.33
2024	6.49	12.98	18,000	9.86	8.37
2025	6.53	13.06	18,100	9.93	8.42
2026	6.55	13.10	18,200	9.96	8.45
Buildout	9.63	19.26	26,800	14.64	12.42

- (1) Average day demand from Table 5-15.
- (2) Maximum day demand equals 2.0 times the average day demand. See Table 5-6.
- (3) Peak hour demand equals 2.0 times the maximum day demand. See Table 5-7.
- (4) Peak month demand equals 1.52 times the average day demand. See Table 5-5.
- (5) Peak season demand equals 1.29 times the average day demand. See Table 5-5.

**WATER SYSTEM HYDRAULIC MODEL**

The District developed a hydraulic model of the water system. The output from this model is used to evaluate the capacity of the existing system and to recommend future

improvements. The District's water distribution system has sufficient capacity through the 20-year planning period to provide peak hour demands and fire flow demands while maintaining adequate service pressures. In general, the distribution system is well looped to minimize pipe velocities and provide redundancy.

## **OPERATION AND MAINTENANCE PROGRAM**

The Operations Department is responsible for the operation and maintenance of the water and wastewater systems. The Operations Department is also responsible for emergency response planning and drills. The District is continuing to improve its operation and maintenance programs to meet existing and future regulations and to provide the best service possible to District customers.

## **SYSTEM ANALYSIS**

The District has sufficient capacity in its existing storage and distribution system to meet growth for the 20-year planning period. The District has identified a number of projects that will improve redundancy and reliability and will replace aging facilities and pipelines. These improvements have been identified in the Capital Improvement Program (CIP).

## **CONSERVATION PROGRAM**

The District plans to continue its existing conservation program, which is consistent with the SPU 1 Percent Conservation Program and meets the requirements of the Municipal Water Law and the Water Use Efficiency Rule. The District's program includes a number of elements such as annual leak detection, water saving devices, and a conservation priced water rate structure. The District also is supportive of the development of a reuse system in coordination with King County Department of Natural Resources' plans to develop Class A reclaimed water at the Brightwater Wastewater Treatment Facility.

## **CAPITAL IMPROVEMENT PROGRAM**

Since the completion of the previous Plan, the District has completed over \$8,100,000 in capital improvement projects for the water utility. These projects included reservoir seismic upgrades, valve installation, fire flow improvements, and water main replacement. Table E-4 summarizes these projects and their cost.

**TABLE E-4**

**Water Capital Improvement Projects, 2000-2006**

<b>Project</b>	<b>Name</b>	<b>Project Cost</b>
2000 – Kirkland, Juanita Drive Project	Water Main Replacement	\$ 233,573
Contract 2001-01	Water Main Replacement	\$ 204,028
Contract 2001-02	Inglemoor Standpipe Seismic Upgrade	\$ 790,237
2001 – Kenmore, NE 155 <sup>th</sup> Street Sidewalk	Water Main Replacement	\$ 128,576
Contract 2002-02	187/63 Water Main Replacement	\$ 201,752
Contract 2002-04	Totem Lake Fire Flow Project – Phase 1	\$ 270,136
Contract 2002-08	Kingsgate Standpipe Seismic Upgrade	\$ 772,460
Contract 2002-09	Inglemoor Site Piping Alterations	\$ 945,905
Contract 2003-01	Totem Lake Fire Flow Project – Phase 2	\$ 824,936
Contract 2003-02	124 <sup>th</sup> Avenue NE Water Main Replacement	\$ 230,569
2003 – Kirkland, Juanita Creek Culvert	Water Main Replacement	\$ 111,239
Contract 2004-01	Westhill Standpipe Seismic Upgrade	\$ 682,747
Contract 2004-03	Totem Lake Water Improvements	\$ 565,456
Contract 2005-02	Norway Hill Reservoir Improvements	\$ 700,836
Contract 2005-04	Water Main Replacement	\$ 530,336
2005 – King County Denny Creek Culvert	Holmes Point Drive Relief Valve and Water Main	\$ 211,111
2005 – Sound Transit – I-405 Access	Water Main Relocation	\$ 192,251
2005 – Kenmore – Swamp Creek Project	Water Main Relocation	\$ 200,926
Contract 2006-01	Water Main Replacement	\$ 173,088
2006 Small Works Roster Project	155/Simonds Road Water Main Replacement	\$ 135,000
<b>Total</b>		<b>\$8,105,162</b>

Included in the CIP is the construction of new facilities, supporting facilities and upgrades, as well as other improvements that will increase system efficiency. Table E-5 is a summary of the costs of the recommended 10-year capital improvements for 2007 through the year 2016.

In the future, other projects may arise that are not identified as part of the District’s CIP. Such projects may be deemed necessary for accommodating improvements proposed by other agencies or addressing unforeseen problems with the District’s water system. Due to budgetary constraints, the completion of these projects may require that the proposed completion date for projects in the CIP be rescheduled. The District retains the flexibility to reschedule proposed projects and to expand or reduce the scope of proposed projects as best determined by the District’s Commissioners when new information becomes available for evaluation. Each capital improvement project should be reevaluated to consider the most recent planning efforts as the proposed completion date for the project approaches.

**TABLE E-5**  
**Ten-Year CIP Summary**

<b>Year</b>	<b>Total Water</b>	<b>Total Wastewater</b>	<b>Total Water and Wastewater</b>
2007	\$ 1,739,000	\$ 3,414,000	\$ 5,153,000
2008	\$ 1,865,000	\$ 4,059,000	\$ 5,924,000
2009	\$ 2,084,000	\$ 3,757,000	\$ 5,841,000
2010	\$ 2,476,000	\$ 2,348,000	\$ 4,824,000
2011	\$ 1,621,000	\$ 2,931,000	\$ 4,552,000
2012	\$ 3,246,000	\$ 3,233,000	\$ 6,479,000
2013	\$ 966,000	\$ 2,024,000	\$ 2,990,000
2014	\$ 1,266,000	\$ 2,067,000	\$ 3,333,000
2015	\$ 1,659,000	\$ 3,644,000	\$ 5,303,000
2016	\$ 2,233,000	\$ 1,490,000	\$ 3,723,000
<b>Total</b>	<b>\$19,155,000</b>	<b>\$28,967,000</b>	<b>\$48,122,000</b>

**FINANCE**

In order to implement the capital improvement plan, a basic financial program must be established. Through the financial program, the District Commissioners and District Manager are assured that the capital improvement schedule can be implemented. The financial program plays a key role in establishing sewer rates and general facilities charges that reflect the actual costs of providing service to the District.

The District maintains a combined water and sewer utility but tracks revenues and expenses separately. Total sewer sales in 2005 were \$12,737,093, of which \$8,762,528 (69 percent) was paid to King County Department of Natural Resources (KCDNR) for

treatment charges. Total water sales in 2005 were \$9,750,310, of which \$4,568,754 (47 percent) was paid to SPU for wholesale water. As a combined utility, the District has experienced a net positive operating income each year from 2003 to 2005.

Several funding source alternatives are available to the District for the financing of proposed capital improvement projects. Five such alternatives are revenue bonds, Public Works Trust Fund loans, developer financing, connection charges, and local improvement districts. In addition, King County may also fund cost-effective I/I removal projects.