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Section 8

Assessment of Existing Water Supply Systems

8.1 Water System Inventory

Tables 3-1 through 3-3 provide the current inventory of public water systems in Skagit County (County). The Skagit County Health Department (SCHD) and Skagit County Planning and Permit Center (SCPPC) continue to maintain and update the inventory as needed. Following Department of Health (DOH) approval of this Coordinated Water System Plan (CWSP), all water purveyors will be required to review their Water System Plans (WSP) for accordance with the CWSP and submit to an updated WSP or indicate to SCHD that the existing WSP remains current. This process will aid SCHD in updating the Water System Inventory.

Concurrent with the compilation and analysis of water system data, service area boundaries have been revised based on the intent to expand, reduce, or restructure the service area. Through these activities, public water systems have been identified with 100 permanent connections or more, or with intentions to expand their service area. Smaller, non-expanding systems are also inventoried.

For purposes of this study, it is assumed the non-expanding systems are adequately serving the current customers. An assessment of the utility/system capability to serve expanding needs may then be limited to the expanding systems. Recognizing the large percentage of population served by the City of Anacortes and the Skagit County PUD No. 1 (PUD), and that this proportion will increase in the future due to the State Growth Management Act (GMA), a more detailed evaluation of these two larger systems is appropriate.

8.2 Future Distribution of Growth

The GMA, as reflected in the County's Comprehensive Plan, sets forth a broad strategy for addressing problems of rapid growth. High growth rate counties (such as Skagit) are required to enact comprehensive land use plans and update those plans every five years. The Comprehensive Plan contains a land use element that designates urban growth areas (UGAs). Within these areas, growth is to be encouraged. In the remaining area, growth can occur only if it is not urban in nature.

The GMA and Skagit County Comprehensive Plan requires that urban growth first occur in areas already characterized by urban growth having existing public

facilities and service capacities to serve such development. The second priority is to areas already characterized by urban growth that will be served by a combination of both existing public facilities and services and any additional needed public facilities and services that are provided by either public or private sources. Further, it is appropriate that urban government services be provided by cities, and urban government services should not be provided in non-urban areas.

Utilizing the same methodology, the population forecast for the UGAs and the balance of County (non-UGA), is shown in Table 8-1 (unconstrained by land supply). A key assumption of this forecast is that 80 percent of future population growth, as established by County-wide Planning Policies, will be directed to the UGAs.

	Year					
	2000	2010	2020	2030	2040	2050
Total Population	106,454	136,644	176,067	220,083	275,104	343,880
Total Increase	13,354*	30,190	39,423	44,016	55,021	68,776
UGA Growth (80% of total increase)	10,683	24,152	31,538	35,213	44,017	55,021
Non-UGA Growth (20% of total increase)	2,671	6,038	7,885	9,803	11,004	13,755
UGA Population Distribution (Total Increase)						
Anacortes	15,203	20,275	26,899	34,293	43,536	55,090
Bayview Ridge	2,300	3,024	3,970	5,026	6,346	7,996
Big Lake	1,170	1,556	2,060	2,623	3,327	4,207
Burlington	8,170	10,826	14,295	18,168	23,009	29,061
Concrete	1,052	1,438	1,942	2,505	3,209	4,089
Hamilton	314	386	480	585	717	882
La Connor	845	1,086	1,401	1,753	2,193	2,743
Lyman	354	450	576	716	892	1,112
Mount Vernon	28,116	38,742	52,618	68,111	87,478	111,687
Sedro-Woolley	9,729	12,868	16,967	21,544	27,266	34,418
Swinomish	1,820	2,544	3,490	4,546	5,866	7,516
UGA Total	69,073	93,195	124,698	159,870	203,839	258,801
Non-UGA Total	37,380	43,448	51,367	60,212	71,264	85,078

* Increase over 1995 population (Table 7-1).

8.3 Urban Water Supply Systems

Referring to Section 3 (Water Utility Service Areas), it will be noted that public water service to the 11 UGAs will be provided by utilities as shown in Table 8-2.

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**Table 8-2
UGA Water Service Providers**

UGA	Service Area of		
	City of Anacortes	Skagit PUD	Other
Anacortes	X		
Bay View Ridge		X	
Big Lake		X	
Burlington		X	
Concrete			X (Concrete)
Hamilton			X (Hamilton)
La Conner	X		
Lyman			X (Lyman)
Mount Vernon		X	
Sedro Woolley		X	
Swinomish		X	
Whidbey Island	X		

Utilizing 1995 Office of Financial Management (OFM) data, the population and water demand forecasts developed in Section 7, and the distribution of population growth between urban and rural areas shown in Table 8-1; water demand forecasts for the City of Anacortes, the PUD, Hamilton, Lyman, and Concrete systems were determined. Derivation of these forecasts is shown in Tables 8-3 through 8-8.

Average day and peak day demands are broken out for ten-year periods between 2000–2050 for Anacortes, Skagit PUD, Hamilton, Lyman, and Concrete in Tables 8-7 through 8-10.

**Table 8-3
Anacortes Service Area High Population Forecast⁽³⁾**

	Year					
	2000	2010	2020	2030	2040	2050
UGAs ⁽¹⁾						
Anacortes	15,203	20,275	26,899	34,293	43,536	55,090
La Conner	845	1,086	1,401	1,753	2,193	2,743
Swinomish	1,820	2,544	3,490	4,546	5,866	7,516
Non-UGA ⁽²⁾	3,738	4,344	5,136	6,021	7,126	8,507
Total	21,606	28,249	36,926	46,613	58,721	73,856

Footnotes:

- ⁽¹⁾ Whidbey Island demand not included as population dependent for purposes of CWSP.
- ⁽²⁾ Assumes 80 percent of County growth occurs in UGAs.
- ⁽³⁾ Assumes 10 percent of total non-UGA service is provided by Anacortes, 50 percent by PUD, and 40 percent other.

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**Table 8-4
Anacortes Service Area Water Demand Forecast (excluding industrial)**

Year	Population		Water Demand (MGD) ⁽¹⁾				Whidbey Island		Total Avg.	Total Peak
			Average Day		Peak Day		Demand ⁽²⁾			
	UGA	Non-UGA	UGA	Non-UGA	UGA	Non-UGA	Avg. Day	Peak Day		
2000	17,868	3,738	2.4	0.3	4.8	0.8	3.4	6.7	6.1	12.3
2010	23,905	4,344	3.2	0.4	6.4	1.0	4.8	9.5	8.4	16.9
2020	31,790	5,136	4.3	0.5	8.6	1.3	4.8	9.5	9.6	20.2
2030	40,592	6,021	5.5	0.5	11.0	1.3	4.8	9.5	10.8	21.8
2040	51,595	7,126	7.0	0.6	14.0	1.6	4.8	9.5	12.4	25.1
2050	73,856	8,507	10.0	0.8	20.0	2.1	4.8	9.5	15.6	31.6

Footnotes:

- ⁽¹⁾ Assumes 135 gpc demand for urban use and 2.0 peak factor; 90 gpc rural use and 2.6 peak factor.
⁽²⁾ Table 7-8 and 7-9 total Island County demand, and 2.0 peak factor.

**Table 8-5
PUD Service Area High Population Forecast**

	Year					
	2000	2010	2020	2030	2040	2050
UGAs ⁽¹⁾						
Bayview Ridge	2,300	3,024	3,970	5,026	6,346	7,996
Big Lake	1,170	1,556	2,060	2,623	3,327	4,207
Burlington	8,170	10,826	14,295	18,168	23,009	29,061
Mount Vernon	28,116	38,742	52,618	68,111	87,478	111,687
Sedro-Woolley	9,729	12,868	16,967	21,544	27,266	34,418
Sub-Total	49,485	67,016	89,910	115,472	147,426	187,369
Non-UGA ⁽²⁾						
	18,690	21,724	25,683	30,106	35,632	42,539
Total	68,175	88,740	115,593	145,578	183,058	229,908

Footnotes:

- ⁽¹⁾ Assumes 80 percent of County growth occurs in UGAs.
⁽²⁾ Assumes 10 percent of total non-UGA service is provided by Anacortes 50 percent by PUD, and 40 percent other.

**Table 8-6
PUD Service Area Water Demand Forecast (excluding industrial)**

Year	Population		Water Demand (MGD) ⁽¹⁾				Water Demand (MGD)		Total Water Demand (MGD)	
			Average Day		Peak Day		Whatcom County and Stanwood ⁽²⁾		Total Avg.	Total Peak
	UGA	Non-UGA	UGA	Non-UGA	UGA	Non-UGA	Avg.	Peak		
2000	49,485	18,690	6.7	1.7	13.4	4.4	0.5	1.0	8.9	18.8
2010	67,016	21,724	9.0	1.9	18.0	4.9	1.4	3.2	12.3	26.1
2020	89,910	25,683	12.1	2.3	24.2	6.0	1.5	3.5	15.9	33.7
2030	15,472	30,106	15.6	2.7	31.2	7.0	1.5	3.5	19.8	41.7
2040	147,426	35,632	19.9	3.2	39.8	8.3	1.8	4.1	24.9	52.2
2050	187,369	42,539	25.3	3.8	50.6	9.9	2.1	4.7	31.2	65.2

Footnotes:

- ⁽¹⁾ Assumes 135 gpc demand for urban use and 2.0 peak factor; 90 gpc rural use and 2.6 peak factor.
- ⁽²⁾ Table 7-8 and 7-9, Whatcom County and Stanwood combined demand and 2.0 peak factor.

**Table 8-7
Concrete, Hamilton, and Lyman Service Area High Population Forecast**

	Year					
	2000	2010	2020	2030	2040	2050
Concrete ⁽¹⁾	1,052	1,438	1,942	2,505	3,209	4,089
Hamilton ⁽¹⁾	314	386	480	585	717	882
Lyman ⁽¹⁾	354	450	576	716	892	1,112
Total	1,720	2,274	2,998	3,806	4,818	6,083

Footnotes:

- ⁽¹⁾ For County-wide demand purposes all water usage is considered to be at an urban level of 135 gpc.

**Table 8-8
PUD Service Area Average and Peak Day Projected Water Demands (including industrial)**

Use	Year											
	2000		2010		2020		2030		2040		2050	
	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day
UGAs	6.7	13.4	9.0	18.0	12.1	24.2	15.6	31.2	19.9	39.8	25.3	50.6
Industrial Supply ⁽¹⁾	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
City of Stanwood and Whatcom County Intertie	0.5	1.0	1.4	3.2	1.5	3.5	1.5	3.5	1.8	4.1	2.1	4.7
Non-UGA	1.7	4.4	1.9	4.9	2.3	1.0	2.7	7.0	3.2	8.3	3.8	9.9
Total	12.9	22.8	16.3	30.1	20.9	38.7	24.8	46.7	29.9	57.2	36.2	70.2

Footnotes:

- ⁽¹⁾ Approximately 25 percent of County industrial demand served by PUD.

Table 8-9
Anacortes Service Area Average and Peak Day Projected Water Demands (including industrial)

Use	Year											
	2000		2010		2020		2030		2040		2050	
	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day
UGAs	2.4	4.8	3.2	6.4	4.3	8.6	5.5	11.0	7.0	14.0	10.0	20.0
Non-UGA	0.3	0.8	0.4	1.0	0.5	1.3	0.5	1.3	0.6	1.6	0.8	2.1
Whidbey Island	3.4	6.7	4.8	9.5	4.8	9.5	4.8	9.3	4.8	9.3	4.8	9.5
Industrial Supply ⁽¹⁾	9.0	9.0	12.0	12.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Total	15.1	21.3	20.4	28.9	25.6	35.4	26.8	37.8	28.4	41.1	31.6	47.6

Footnotes:

⁽¹⁾ Approximately 75 percent of County industrial demand served by Anacortes.

Table 8-10
Concrete, Lyman and Hamilton Service Areas Demand Forecast ⁽¹⁾

Year	Year											
	2000		2010		2020		2030		2040		2050	
	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day	Avg. Day	Peak Day
Hamilton	0.14	0.28	0.19	0.38	0.26	0.52	0.34	0.68	0.43	0.83	0.55	1.10
0.04	0.04	0.08	0.05	1.10	0.06	0.12	0.08	0.16	0.10	0.20	0.12	0.24
Concrete	0.05	0.10	0.06	0.12	0.07	0.14	0.09	0.18	0.12	0.24	0.15	0.15

Footnotes:

⁽¹⁾ For purposes of CWSP all flow considered at an urban level of 135 gpc and a peaking factor of 2.0.

8.4 Rural Water Supply Systems

Of the larger and/or expanding public water systems identified, the remaining 17 are located within areas of the County currently targeted for a rural area designation. Based upon data obtained from the utilities and other sources during preparation of the CWSP, the water supply requirements are projected to be as shown in Table 8-11. These requirements are derived from the number of potential services/connections proposed by the utility and in most cases represent a foreseeable "build-out" condition. Totals include an estimate of private wells not accounted for in other utility service. Data are not available to allow a forecast of time over which the build-out will take place.

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Table 8-11
Non-UGA Utilities
Water Supply Demand

Utility	Potential		Water Demand ⁽³⁾ (MGD)	
	Services	Population	Avg. Day	Peak Day
Blanchard Edison Water Association	384	899	0.081	0.210
Cape Horn Maintenance Co.	590	1,381	0.124	0.323
Cedargrove on the Skagit	292	683	0.061	0.160
Del Mar Community Service	346	725	0.065	0.170
Guemes Island Water Company	150	351	0.032	0.082
Lakeside Estates	27	405	0.006	0.016
Leif Erickson Recreation Assn.	180	421	0.038	0.099
Rockport Water System	60	140	0.013	0.330
Samish Farms Water Assn.	465	1,088	0.098	0.255
Shelter Bay Community	935	2,188	0.197	0.512
Skagit County Water District No. 1	90	211	0.019	0.049
Upper Skagit Indian Tribe	70	164	0.015	0.038
Wilderness Village	110	257	0.023	0.060
Other (private wells)	4,268	9,989	0.899	2.300
Total	9,231	18,902	1.7	4.400

Assumptions:

- (1) Based upon 1990 Census report of an average of 2.34 persons per housing unit in rural Skagit
- (2) Assumes and average per capita demand of 90 gallons per day and a peaking factor of 2.6.
- (3) Based on estimate of non-UGA population not accounted for by PUD, Anacortes or above non-UGA

8.5 Existing Facilities

Information related to 20 of the 23 systems under review is presented in Table 8-12. Sources of this data are water system comprehensive plans, DOH files, and personal contacts. Data reported includes utilities' supply sources, installed supply capacity, water treatment, fire flow, storage, and present and/or planned interties.

Data regarding the installed capacity for each source was developed in the following manner, relying on the information sources indicated above:

- The reported capacity of the pumping facilities installed at a well or other source was assumed to be the peak supply rate.
- This rate was usually provided in gallons per minute and was converted to million gallons per day (MGD).
- In instances where source development includes a water filtration plant and the capacity of the plant is the limitation on water delivery, the peak day production of the plant was assumed to be the peak installed capacity.

Although the overall data reported in Table 8-11 are a measurement of the ability of a utility to provide adequate and reliable water service, the key data element to the system assessment is the source installed capacity. This data element is used to evaluate the ability of utilities to serve expanded service areas from existing sources.

Table 8-12
Public Water System Inventory

Water System Name	Date of Comp Plan	Supply Sources	Source Installed Capacity (Peak MGD)	Water Treatment*	Fire Flow	Storage (MG)	Certified Operator	Interties	Future Expansion	Comments
Anacortes, City of	2/25/92	Skagit River	33.0	Dis., Sed., Filt., PAC, pH, FL	Yes (750-4,500 gpm)	7.00	Yes	Yes - Skagit PUD	Yes	Wholesales water to Oak Harbor, LaConner, and Skagit PUD. Water rights established on Lakes Campbell and Erie, but presently not used. Indicated source installed capacity of 33 MGD is present peak day production of pumping station on Skagit River.
			33.0							
Blanchard Edison Water Assn.	None	Well No. 1	0.144	None	No	0.20	Yes	Yes - Skagit PUD	No	Additional services would be a result of infilling only. Skagit PUD - emergency use only.
		Well No. 3	0.432							
		Well No. 4 White Wheel Creek	0.187							
Cape Horn Maintenance Co.	8/16/95	Well No. 2	0.216	None	No	0.119	Yes	None	Yes	Future increases due to infilling of existing lots and some new areas to the southwest.
		Well No. 3	0.216							
			0.432							
Skagit PUD - Cedar Grove	10/5/95	Well No. 1	0.432	Dis.	Yes	0.27	Yes	None	Yes	System owned and operated by Skagit PUD.
			0.432							
Colony Mountain Community Club	1998	Well #1	0.01	None	Pending	0.06	No	None	No	
Concrete Utilities	8/16/95	Spring	1.080	None	Yes (2.5" -70PSI)	0.10	Yes	None	Yes	Any future increase would be west of City limits. Considering adding new spring source estimated at 200 gpm.
			1.080							
Del Mar Community Service	1/1/95	Well	0.036	CL	Yes	0.20	Yes	Yes - Anacortes	No	Approved for 346 services, but utility does not propose to expand.
		Spring (Jones Canyon)	0.016	CL						
		Spring (Dodson Canyon)	0.027	CL						
			0.079							

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Table 8-12 (continued)
Public Water System Inventory

Water System Name	Date of Comp Plan	Supply Sources	Source Installed Capacity (Peak MGD)	Water Treatment*	Fire Flow	Storage (MG)	Certified Operator	Interties	Future Expansion	Comments
Guemes Island Water Company	1/1/94	Well No. 1	0.034	None	No	0.08	No	None	Yes	Will expand service if water rights are granted by DOE.
		Well No. 2	0.026							
		Well No. 3	0.034							
			0.094							
Hamilton Water Department	8/4/95	Well No. 1	0.100	None	No	0.065	No	None	Yes	Potential 130 new services in development north of town, additional 50 by infilling. New well and storage are being designed.
			0.100							
La Connor Water Department	4/14/86	Anacortes	5.040	Yes (by	Yes	1.50	Yes	Yes - Swinomish	Yes	Additional services will be infilling within existing service area boundary, with some extension to the northeast.
			5.040	Anacortes)						
Leif Erickson Rec. Assn.	None	Well No. 1	0.114	None	No	0.011	No	None	No	No plans or desire to expand service area. Additional 100,000 gallons storage proposed. About 20 connections are full time residents.
			0.114							
Lyman Water Department	None	Well No. 1	1.008	None	Yes (250 - 1,450 gpm)	0.15	Yes	None	Yes	Would be willing to expand service to the south and surrounding city limits but no development plans are known.
		Well No. 2	1.008							
			2.016							
Skagit PUD - Rockport	10/5/95	Well No. 1	0.144	Dis. (available)	Yes	0.060	Yes	None	Yes	System owned and operated by Skagit PUD.
			0.144							
Samish Farms Water Assn.	None	Skagit PUD	0.216		No	0.45	Yes	None	Yes	Would be willing to expand service, but no development plans are known.
			0.216							
Shelter Bay Community	1969	La Connor/Anacortes	0.778	Yes (by	Yes	0.147	Yes	Yes - Swinomish	Yes	Would be willing to expand service, but no development plans are known.
			0.778	Anacortes)						
Skagit PUD (Fidalgo Island)	10/5/95	Anacortes		Dis., Sed., Filt., Pac., pH, FL	Yes	0.3	Yes	Yes - Anacortes	Yes	4 interties with City of Anacortes. Transmission lines at Reservation Road, Shapiro Corners, Dewey and Deception Road.

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Assessment of Existing Water Supply Systems

Table 8-12 (continued)
Public Water System Inventory

Water System Name	Date of Comp Plan	Supply Sources	Source Installed Capacity (Peak MGD)	Water Treatment*	Fire Flow	Storage (MG)	Certified Operator	Interties	Future Expansion	Comments
Skagit PUD (Judy)	10/5/95	Gilligan Creek	14.24	Disinfection Filtration pH	Yes	24.12	Yes	Yes - Anacortes, Sanish Farms, Fir Island, Blanchard Edison	Yes	Installed capacities of the creek sources are diverted to Judy Reservoir. Water delivery to the transmission mains is limited by the water treatment plant which has a design capacity of 12 MGD and peak day flow capacity of 18 MGD.
		Mundt Creek	17.17							
		Turner Creek	11.05							
		Salmon Creek	3.75							
		Anacortes	36.145							
Skagit County W. D. No. 1	1/27/96	Well No. 1	0.108	None	Yes	0.08	No	None	Yes	Plans to expand by 20 services.
		Well No. 2	0.181							
			0.289							
Swinomish Utility and Env. Serv. Auth.	1986	Well No. 1	0.130	CL, FL	Yes (500 - 1,000 gpm)	0.218	Yes	Yes - Anacortes, La Connor, Shelter Bay	Yes	Projected future services estimated based on an expected increase of 235 residential equivalents. Assumed 3 residents per service. Growth along Western Coast North of Highway 20. Well No. 1 not used - high iron problem.
		Well No. 2	0.065							
		Well No. 3	0.065							
		Anacortes	0.0288							
			0.548							
Upper Skagit Indian Tribe	None	Well No. 1	0.065	CL, FL	Yes	0.088	No	None	Yes	
		Well No. 2	0.079							
			0.144							
Indian Village	1/29/98	Well No. 1	0.122	None	No	0	No	None	Yes	
			0.122							

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Water Treatment:
 CL = Chlorine
 FL = Fluoride
 DIS = Disinfection
 SED = Sedimentation
 FILT = Filtration
 PAC = Powdered Activated Carbon

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8.6 Water Rights

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8.6.1 Analysis for Existing and Expanding Systems

Having adequate water rights is a requisite for water supply development and planning. Being able to acquire new water rights is a necessary component of new source selection and development.

Current water right information is on file with the Department of Ecology (Ecology) for the larger Group A and expanding systems. A search of individual records was not conducted for the CWSP.

The water rights as they apply to the PUD and the City of Anacortes are being documented through a 50-year Memorandum of Agreement (MOA) (Appendix G). The MOA is signed by the PUD, City of Anacortes, the County, Upper Skagit, Swinomish, and Sauk-Suiattle Tribes, Ecology, and Department of Fish and Wildlife. It sets forth the process of determining Lower Skagit River and Cultus Mountain in-stream flows in exchange for water rights in accordance with the agreed upon in-stream flow levels.

Through this Agreement, the PUD and the City of Anacortes will confirm water rights to resources to meet projected future demand. The MOA is binding. No challenge to water right will be made for a 50-year period from the date of signing and agreement to in-stream flow levels. Beyond the 50-year period, existing water rights will be protected.

8.6.2 Future Requirements

WAC 246-290-130 requires that no new, previously unapproved sources, or modification of existing sources, be approved by DOH for use as a public water supply without a water right permit, if required, issued by Ecology (a water right permit is not required for withdrawals of groundwater of 5,000 gallons per day or less, for use for single or group domestic purposes). The purpose of this requirement is to ensure that public water systems are not created or expanded without having an adequate and reliable source of supply. In the past, DOH has given approval to water system projects conditional upon obtaining a water right permit from Ecology. However, in many cases projects that had received conditional approval proceeded to construction without obtaining the water right. This has resulted in a number of existing systems potentially being without an adequate and reliable source of supply should there be problems in ultimately obtaining the water right.

DOH now places greater emphasis on assuring that a utility has adequate and proper water rights before approving plans for new and expansion of existing public water systems. Pursuant to an agreement entered between DOH and Ecology in June 1991, it is required that, prior to submittal of

drinking water supply projects to DOH for approval, the applicant must determine from Ecology whether a water right permit or change to an existing water right is required. If required, the applicant must obtain the water right permit from Ecology prior to submittal of the proposal to DOH for approval. Since current processing time for water right permits is measured by years, utilities must include water right considerations in their short- and long-term improvement plans.

8.7 Demand Analysis

8.7.1 Special Considerations

The dominant future water demands within this evaluation are obviously on the City of Anacortes and the PUD systems. For this reason, the following circumstances of the existing systems are set forth.

- (1) City of Anacortes - The raw water intake/pumping station on the Skagit River is designed and constructed to provide for a maximum diversion of 55 MGD. Four low head pumps are currently installed (two constant and two variable volume) having a combined capacity of 33 MGD. Pumping bays exist for installation of two additional pumps to increase the capacity to 55 MGD.

Raw water is delivered to the filtration plant which is designed for a nominal capacity of 20 MGD and a peak capacity of 30 MGD. Critical hydraulic features of the treatment plant are designed to permit future expansion to 60 MGD.

Treated water is delivered to a 760,000 gallon clearwell where chlorination takes place. Eight, five-stage, vertical turbine pumps with a rated capacity of 3,000 gallons per minute (4.32 MGD) each, and two, twelve-stage vertical variable output turbine pumps rated at a maximum of 1,200 gallons per minute (1.728 MGD) each, pump water to the transmission lines. The two variable output pumps are "balancing" or "trim" pumps to provide flow for final filling of reservoirs. Total maximum pumping capacity of the pump header is about 38 MGD. However, based upon pipeline conditions, the peak pumping capacity is 33 MGD and the normal maximum is approximately 30 MGD.

- (2) PUD - The District obtains its primary water supply from the Cultus Mountain watershed. A portion of the waters of Gilligan, Salmon, Mundt, and Turner Creeks are diverted to Judy Reservoir. This reservoir is created by two dams and currently stores 1,010 million gallons at water surface elevation 451 feet. Design and construction is currently underway to expand the impounding dams to raise water

surface elevation to 461.2 feet. Storage at this elevation would be 1,460 million gallons.

Currently, water is pumped from Judy Reservoir to the water treatment plant, which has a nominal design capacity of 12 MGD and a hydraulic peak capacity of 18 MGD. The treatment plant is designed for future expansion to 30 MGD peak flow and oversizing of pumps and piping took place during construction. Treated water flows from the treatment plants to two, 1.2 million gallon storage tanks which supply the transmission system by gravity.

8.7.2 Summary

A comparison of (1) current installed system capacity, (2) forecasted system demand for the year 2050, and (3) recorded water rights is shown in Table 8-13. All data represents peak day conditions since regional planning for future water supplies must address this need. The peak day requirement for the urban systems is the year 2050 forecasted demand. For the rural systems, the data represents full development of the potential services/connections shown in Table 8-10, plus estimated private wells. The systems have been grouped in the categories of UGA and non-UGA based upon the UGAs established by Skagit County and the cities. The data represents a summary of the analysis described in this section of the CWSP.

Table 8-13
Future Regional Demand Summary

Purveyor	Peak Day Existing Installed Capacity ⁽¹⁾ (MGD)	Projecte d Peak Day Capacity	Year 2050 Peak Day Requirement ⁽³⁾ (MGD)	Existing Water Rights (MGD)	Water Rights per MOA ⁽²⁾	Short Falls	
						Capacity	Water Rights
UGA Systems							
City of Anacortes	30.0	55.0	47.6	75.8	75.8	-	-
PUD No. 1 (Judy)	18.0	30.0	70.2	27.5	35.8	40.2	34.4
Hamilton, Lyman, and Concrete	3.2	3.2	1.5	-	-	-	-
Subtotal	51.2	88.2	119.3	103.3	111.6	-	6.2
Non-UGA Systems							
	6.0	6.0	4.4	4.0	4.0	0	0.4
Total	57.2	94.2	122.7	107.3	115.2	30.2	6.0

Footnotes:

- ⁽¹⁾ Installed capacity is the peak day production of the filtration plant.
⁽²⁾ Of this total, 54.94 MGD (City) and 27.5 MGD (PUD) are not subject to in-stream flows.
⁽³⁾ Includes industrial demands.

Although numerous assumptions have been made as to the future distribution of County population and related water demand, the system

assessment results for a total County peak day demand is consistent with the County-wide forecast developed in Section 7 (i.e., 122.5 MGD by the system assessment compared to 122.7 MGD for year 2050 population based estimate).

8.8 Conclusions

Viewing the above analysis from a regional perspective, the following conclusions are reached:

- In the aggregate, the current installed capacity of the rural systems (6 MGD) is sufficient to meet the forecasted peak day requirement at full connection development (4.4 MGD). Documented water rights (4 MGD) fall short of the projected requirements. However, each rural utility's situation is unique and must be viewed separately. Due to the distance between utilities, there is little opportunity for sharing of supply sources through system interties.
- Additional system capacity must be installed by the City of Anacortes to meet projected year 2050 peak demand of 47.6 MGD. The City has planned for this need in the design and construction of its water intake structure on the Skagit River and at the water treatment plant. Both can accommodate an expansion to 55 to 60 MGD (peak day flow) and water rights currently exist for benefit of a 55 MGD diversion.
- The PUD must also provide for additional system capacity to meet the forecasted demand upon its regional system. Here again, advanced planning has taken place. Provision has been made, and work is in progress to raise Judy Reservoir dams, water right applications have been advertised and are pending for appropriation of additional water from Cultus Mountain streams, based on the 50-Year MOA. The water treatment plant is designed and constructed to accommodate an increase in capacity to 30 MGD.
- Including the projected installed capacity of 30 MGD scheduled for 2005, the PUD shortfall by the year 2050 will be approximately 40.2 MGD on a peak day basis.
- On a regional basis, assuming the MOA agreement is implemented, water rights will be insufficient to meet year 2050 forecasted peak day needs by 6.0 MGD.
- It is the position of at least the Swinomish Tribe that nothing in the CWSP should be construed as acknowledging or constituting quantification of Tribal reserved water rights or future Tribal water needs.
- Agricultural demands are not addressed here, but should be included in the basin-wide planning performed with the Skagit-Samish Rivers Watershed Plan.