7. System Reliability, Water Rights, and Source Water Protection

This chapter provides information about water system reliability, including water rights, water supply and protection of source water for Anacortes' water system.

7.1. System Reliability

This water system plan summarizes efforts Anacortes has made to ensure that a safe and reliable supply of water can be provided to its customers at all times. Below is a list of provisions and policies Anacortes has undertaken to achieve this goal.

- **Provide access to a sufficient quantity of water to meet customer demands** – These efforts are described in the Source of Supply Analysis and Water Rights Evaluation included in this chapter of the water system plan.

- **Maintain a reliable supply of water during adverse events such as drought or an emergency** – This chapter of the water system plan, as well as Chapter 9 (Operations and Maintenance), includes information on Anacortes' drought and emergency response planning efforts.

- **Implement adequate planning for and development of facilities** – Facility and system development is described in Chapter 2 (System Description) of this water system plan. Chapter 6 (System Analysis) details Anacortes' facility needs in order to meet criteria for fire flows and increasing customer demands during the planning period. In addition, as part of future planning and facilities development, Anacortes and the Skagit PUD have entered into a Joint Operating Agreement that, "provides for the cooperation of [the] City and [the Skagit] PUD in development of regional solutions for long range water supply needs" (JOA, 1992). The specifics of this agreement are discussed in Chapter 3 (Related Plans, Agreements, and Policies) and a copy of the agreement in contained in Appendix 3-2.

- **Sustain a water supply which meets water quality requirements** - Anacortes provides a safe drinking water supply by managing and protecting its sources, drinking water treatment processes, and meeting federal and state drinking water requirements. The efforts Anacortes has undergone to protect and manage drinking water sources are summarized in this chapter. Anacortes' compliance with drinking water requirements is described in Chapter 8 (Water Quality).

7.2. Source of Supply Analysis

A source of supply analysis is only required for water systems that will be pursuing water rights within 20 years to meet the demand forecast. Based on review of Anacortes' water rights and projected demands, Anacortes has adequate water supply to meet water demand for the next 20 years (see detailed discussion in section 7.3. Water Rights Evaluation below). Therefore, Anacortes is not required to complete this section of the water system plan. However,

Anacortes is pro-actively providing the following information with respect to source of supply and water system facilities:

- **Water Source** – The source of Anacortes' water supply is the Skagit River. Treatment and transmission of the water is described in Chapter 2 (System Description). Chapter 3 (Related Plans, Agreements, and Policies) describes important agreements, such as the 1996 Memorandum of Agreement and the Joint Operating Agreement, between Anacortes and other key parties that effect water use and water rights associated with the Skagit River. This chapter discusses water rights as they relate to water demand, emergency planning and protection of source water.

- **Water Conservation Program** – Anacortes' water conservation program is described in Chapter 5 (Conservation) of this water system plan. Chapter 5 contains: a review of Anacortes' compliance with State conservation planning requirements, a description of Anacortes' recent conservation program, and an overview of the conservation program that Anacortes will implement from 2008 through 2014.

- **Interties** – Anacortes' interties are listed and described in Chapter 2 (System Description) of this water system plan.

- **Water Reuse** – Water reuse involves intensive treatment of municipal wastewater and use of that water to meet non-potable needs such as agricultural irrigation, landscape irrigation, industrial uses, or aquifer recharge. Anacortes owns and operates a wastewater treatment system that could potentially provide water for reclamation and reuse. However, to implement this approach, significant investments would be needed to install advanced treatment technology and develop a separate delivery system to pipe water from the treatment plant to customers that can put it to use. At this time, there are no plans to implement a reuse strategy, as existing water sources appear adequate to meet future needs. Anacortes has discussed various scenarios for water reuse that could potentially be implemented in the future. Anacortes will periodically evaluate opportunities for reuse in the future, particularly with regard to landscape and turf irrigation.

- **Facility Analysis** – Chapter 6 (System Analysis) of this water system plan provides information regarding the ability of the water system facilities to perform under various operating conditions. Recommended improvements related to system deficiencies are covered in Chapter 10 (CIP).

7.3. Water Rights Evaluation

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

7.3.1. Description of Water Rights

The waters of Washington State collectively belong to the public and cannot be owned by any one individual or group. Instead, individuals or groups may be granted rights to use them. A water right is a legal authorization to use a predefined quantity of public water for a designated purpose. This purpose must qualify as a beneficial use. Beneficial use involves the application of a reasonable quantity of water to a non-wasteful use, such as irrigation, domestic water supply, or power generation, to name a few.

Anacortes currently holds three water right certificates whose total uninterruptable maximum instantaneous quantity of primary rights equals 57.53 mgd, as shown in Table 7-1. The two Skagit River water rights have an uninterruptable maximum instantaneous quantity of primary rights equals 54.94 mgd. The additional 2.59 mgd of uninterruptable maximum instantaneous quantity of primary rights comes from the Lake Campbell water right.

Table 7-1 Summary of Anacortes Water Rights

CERTIFICATE NUMBER	PRIORITY DATE	PRIMARY/ SUPPLEMENTAL	SOURCE	MAXIMUM INSTANTANEOUS QUANTITY (QI)	SUBJECT TO LOWER SKAGIT INSTREAM FLOWS
Skagit River Water Rights					
C-709	2/14/1963	Primary	Skagit River	45.24 mgd (70 cfs)	No
C–3959 [1]	7/2/1930	Primary	Skagit River	9.7 mgd (15 cfs)	No
	9/13/1954	Supplemental	Skagit River	11.18 mgd (17.3 cfs)	Yes
	-	Total	Skagit River	20.88 mgd (32.3 cfs)	-
Subtotal Maximum Instantaneous Quantity (QI) of primary water rights				54.94 mgd (85 cfs)	-
Lake Campbell Water Rights					
C-2187	3/2/1925	Primary	Lake Campbell	2.59 mgd (4 cfs)	Not applicable
Subtotal Maximum Instantaneous Quantity (QI) of primary water rights				2.59 mgd (4 cfs)	-
Total Maximum Instantaneous Quantity (QI) of primary water rights				57.53 mgd (89 cfs)	-

1. This includes the original C-3959 water right, plus water associated with another water right that was relinquished. The original C-3959 water right had a priority date of 9/13/1954, had a QI of 20.88 mgd (32.3 cfs), was a supplemental water right, and was subject to lower Skagit instream flows. The other water right, C-1161, had a priority date of 7/2/1930, had a QI of 9.7 mgd (15 cfs), was a primary water right, and was not subject to lower Skagit instream flows. C-1161 was relinquished on 12/7/2001 and its quantities were transferred to C-3959, with the condition that the 9.7 mgd (15 cfs) would not be subject to lower Skagit instream flows.

The Skagit River water rights were documented as part of the 1996 Memorandum of Agreement (MOA), which is discussed in Chapter 3 (Related Plans, Agreements and Policies). The signators of the MOA agreed not to challenge the water rights captured in the agreement for a fifty year period from the date of signing. The MOA also established the Skagit River in-stream flow

rule[1], which set the amount of water required to remain in the Skagit River for in-stream uses (i.e., fish habitat). The in-stream flow rule established by the MOA does not affect the primary rights held by Anacortes. The MOA contract in its entirety is provided in Appendix 3-1.

7.3.2. Comparison of Water Rights with Water Demand

As described previously, the total uninterruptable quantity of water available to Anacortes on both an instantaneous and annual basis is 57.53 mgd, which is equivalent to 89 cfs and 64,436 acre feet per year (afy). This includes both the Skagit River and Lake Campbell water rights.

As described in Chapter 4, the existing (2007) Average Day Demand (ADD) is 18.6 mgd, which equates to 20,835 afy, with a Maximum Day Demand (MDD) of 27.9 mgd, which equates to 43 cfs on a continuous basis. The 20-year (2029) forecast indicates an ADD of 26.26 mgd, which equates to 29,415 afy, and a MDD of 39.38 mgd, which equates to 61 cfs on a continuous basis.

By comparing Anacortes' water rights to the existing and projected demands for the six-year and 20-year planning periods, it can be seen that Anacortes has adequate water rights to meet these projected demands. Table 7-2 and Table 7-3 provide a summary of the comparison of water rights to existing and forecasted demands. Figure 7-1 shows the comparison graphically.

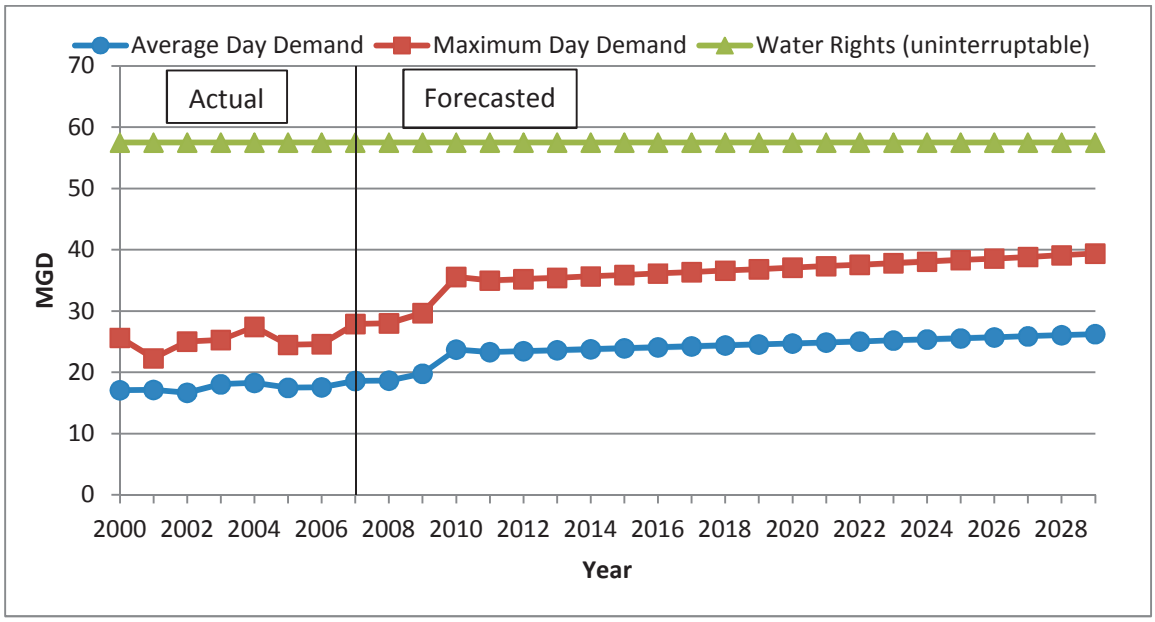

Figure 7-1 Comparison of Water Rights to Demands

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

Table 7-2 Comparison of Water Rights to Existing Demand

Water Rights							Existing (2007) Demand				Water Rights Status Excess/(Deficiency)			
Certificate/ Permit Number	Priority Date	Primary/ Supplemental	Maximum Instantaneous Quantity (Qi)		Maximum Annual Quantity (Qa)[2]		Maximum Instantaneous Quantity (Qi)		Maximum Annual Quantity (Qa)[2]		Maximum Instantaneous Quantity (Qi)		Maximum Annual Quantity (Qa)[2]	
C- 709	2/14/1963	Primary	70	cfs	50,680	afy	n/a		n/a		n/a		n/a	
			45.24	mgd	45.24	mgd								
C – 3959	7/2/1930	Primary	15	cfs	10,860	afy	n/a		n/a		n/a		n/a	
			9.70	mgd	9.70	mgd								
	9/13/1954	Supplemental	17.3	cfs	12,525	afy	n/a		n/a		n/a		n/a	
			11.18	mgd	11.18	mgd								
C – 2187	3/2/1925	Primary	4	cfs	2,896	afy	n/a		n/a		n/a		n/a	
			2.59	mgd	2.59	mgd								
Total[1]			89	cfs	64,436	afy	43	cfs	20,835	afy	46	cfs	43,607	afy
			57.53	mgd	57.53	mgd	27.9	mgd	18.6	mgd	29.63	mgd	38.93	Mgd

1. Only primary, uninterruptable water rights.
2. No annual quantity is specified in the certificate. The annual quantity is calculated based on continuous diversion at the authorized rate and 1 cfs equals 724 acre-feet/yr.

Table 7-3 Comparison of Water Rights to Future Demand

Water Rights							Forecasted (2029) Demand				Water Rights Status Excess/(Deficiency)			
Certificate/ Permit Number	Priority Date	Primary/ Supplemental	Maximum Instantaneous Quantity (Qi)		Maximum Annual Quantity (Qa)[2]		Maximum Instantaneous Quantity (Qi)		Maximum Annual Quantity (Qa)[2]		Maximum Instantaneous Quantity (Qi)		Maximum Annual Quantity (Qa)[2]	
C- 709	2/14/1963	Primary	70	cfs	50,680	afy	n/a		n/a		n/a		n/a	
			45.24	mgd	45.24	mgd								
C – 3959	7/2/1930	Primary	15	cfs	10,860	afy	n/a		n/a		n/a		n/a	
			9.70	mgd	9.70	mgd								
	9/13/1954	Supplemental	17.3	cfs	12,525	afy	n/a		n/a		n/a		n/a	
			11.18	mgd	11.18	mgd								
C – 2187	3/2/1925	Primary	4	cfs	2,896	afy	n/a		n/a		n/a		n/a	
			2.59	mgd	2.59	mgd								
Total[1]			89	cfs	64,436	afy	61	cfs	29,415	afy	28	cfs	35,027	afy
			57.53	mgd	57.53	mgd	39.38	mgd	26.26	mgd	18.15	mgd	31.27	mgd

1. Only primary, uninterruptable water rights.
2. No annual quantity is specified in the certificate. The annual quantity is calculated based on continuous diversion at the authorized rate and 1 cfs equals 724 acre-feet/yr.

7.4. Emergency and Water Shortage Planning

Anacortes has developed two important documents that address supplying a safe and adequate water supply during adverse events such as drought or an emergency. This section identifies these documents and details their content.

7.4.1. Emergency Response Plan

Emergency response planning is an essential element of managing a water supply system to ensure public health and safety. Anacortes has an Emergency Response Plan (ERP) which acts as a guide for operators and city officials in an emergency. The ERP lists the procedures these individuals should employ so that disruption of normal services to Anacortes' water customers is minimized and public health and safety is preserved during an emergency.

The ERP provides the steps to be taken during various water system emergency situations. Specific emergency scenarios include but are not limited to: power loss, flood, earthquake, source contamination, hazardous material spill, fire, civil disturbance and nuclear attack. For each scenario Anacortes has established immediate actions, notifications, and follow-up actions in the form of a checklist provided for the user. A copy of the ERP's Table of Contents is included for reference in Appendix 9-1. The contents of the ERP are also discussed in Chapter 9 (Operations and Maintenance).

7.4.2. Water Shortage Response Plan

Anacortes' water shortage response plan is documented in the Anacortes municipal code, Title 8 Health and Safety, Chapter 8.29 Water Shortage Response, which is included in Appendix 3-6.

The plan states that it is in the public interest to provide a plan of action by Anacortes and its water customers to respond to water supply shortage events, including, but not limited to, Skagit River levels that are below the minimum instream flow levels established by the Department of Ecology. In the case of low river levels, the goal is to reduce the possible impact Anacortes' diversions may have on the recommended instream flows for the lower Skagit River. To accomplish this declared purpose, the mayor and city council, when necessary for the protection of instream water uses, public health, safety, and welfare, shall have the authority to declare various stages of water emergencies and to implement the measures set forth in the plan.

The public works department will monitor the height and flow of the Skagit River utilizing U.S. Geological Survey Gaging Station No. 12200500 near Mt. Vernon as reference. If the flow in the Skagit River is projected to fall below the State Department of Ecology instream flow levels, the public works department shall appraise and recommend to the mayor implementation of certain actions.

The actions are based on the level and duration of the reduced flows in the Skagit River. Actions range from public awareness efforts, a call for voluntary reduction of 10 percent in peak day demands, limiting water withdrawals to quantities exempt (85cfs/54.94mgd) from Lower Skagit River instream flows, requesting upstream Skagit River dam operators to commence additional releases, and mandatory water use restrictions.

The plan includes variances, enforcement, and penalties associated with drought emergencies. Penalties begin with a warning, move to the installation of a temporary flow restriction device, and culminate with a water shut-off and associated turn-on charge.

7.5. Source Water Protection

As an owner and operator of drinking water sources of supply, Anacortes is responsible for meeting requirements for source water protection. Anacortes protects the Skagit River, its sole source of water, through its watershed control plan.

Under the Public Water System Coordination Act of 1977, purveyors of public drinking water systems that utilize surface water sources are required to develop and implement a watershed control plan. The purpose of a watershed control plan is to control sources of potential contamination to the supply source of a public drinking water system. Anacortes, in conjunction with Skagit PUD, developed a watershed control plan for the Skagit River watershed in 2004. The *2004 Skagit River Watershed Control Plan* reviews existing conditions such as water quality, land use, water systems operations and watershed characteristics. It also describes threats to water quality and provides strategies to limit the risks caused by these threats. Specific strategies described in the plan include: public education, emergency notification, Department of Ecology permit holder notification, interlocal agreements and cooperation among state and local agencies, municipalities in the program area, Anacortes and Skagit PUD.

In conjunction with this water system plan, an update of the 2004 watershed control plan was conducted, with emphasis placed on updating the inventory of potential contaminant sources. The 2010 watershed control plan update is documented in a technical memorandum, which is provided in Appendix 7-1, along with a copy of the original 2004 watershed control plan.