

Contents

Executive Summary

1 Introduction

1.1	Purpose of Report	1-1
1.2	Data Sources.....	1-3
1.3	Process for Developing Consolidated Report.....	1-3
1.4	Report Organization.....	1-4

2 Overview of Water Supply and Demand in King County

2.1	Types of Water Systems.....	2-1
2.1.1	Legal and Regulatory Organization of Water Systems.....	2-2
2.1.2	Geographical Organization of Water Systems	2-3
2.1.3	Characterization of Water Systems by Size	2-8
2.1.4	Characterization of Water Systems by Ownership.....	2-9
2.2	Sources of Supply	2-10
2.2.1	Major Regional Sources of Water Owned by SPU (Cedar, Tolt, and Highline Wells)	2-11
2.2.2	Major Regional Sources Owned by Tacoma Water	2-13
2.2.3	Other Large Sources of Water in King County	2-13
2.2.4	Smaller Sources of Water Owned by Public Water Systems..	2-13
2.2.5	Individual Household Wells	2-14
2.2.6	Water Sources Associated with Self-Supplied Users	2-15
2.2.7	Water-Resource Inventory Areas (WRIAs) in King County ...	2-16
2.3	Regional Organizations.....	2-16
2.3.1	Seattle Public Utilities	2-16
2.3.2	Cascade Water Alliance.....	2-17
2.3.3	Water Supply Association	2-18
2.3.4	East King County Regional Water Association.....	2-18
2.3.5	South King County Regional Water Association.....	2-19
2.3.6	Snohomish River Regional Water Authority.....	2-19
2.4	Current Demand and Population Served.....	2-19
2.5	Projected Demand and Population Served.....	2-24

3 Endangered Species Act Issues Related to Water Supply

3.1	Background on ESA Considerations	3-1
3.2	Potential Effects on Water Supply	3-2
3.3	Flow Conditions in King County Surface Waters.....	3-3
3.4	Seattle's Habitat Conservation Plan	3-4
3.5	Tacoma's Habitat Conservation Plan.....	3-5

4 Water Supply Solutions with Countywide Applications

4.1	Water Conservation	4-1
4.1.1	Background on Water Conservation.....	4-2
4.1.2	Conservation Potential in King County.....	4-3
4.1.3	Key Issues Related to Conservation	4-6
4.1.4	Application of Conservation to Identified Needs in King County.....	4-6
4.2	Water Reuse	4-7
4.3	Conjunctive Use.....	4-11
4.4	Conventional Supply Options	4-12
4.4.1	Regional Options.....	4-13
4.4.2	Second Supply Project	4-15
4.5	Stormwater Management and Utilization	4-17
4.5.1	Background on Stormwater Management and Utilization....	4-17
4.5.2	Stormwater Management Options.....	4-17
4.5.3	Current and Future Stormwater Regulations.....	4-19

5 Projected Shortfalls and Potential Solutions for Localized Areas

5.1	Countywide Water Supply and Demand Analysis.....	5-1
5.1.1	Analysis of Aggregate Water Supply and Demand for King County	5-2
5.1.2	Source Yield and Reliability.....	5-3
5.2	Individual Utilities with Projected Shortfalls Before 2020	5-7
5.2.1	Summary of Water Supply Shortfalls.....	5-7
5.2.2	Group A Community Water Systems Analysis	5-9
5.2.3	Group A Non-Community Systems Analysis	5-12
5.2.4	Group B Systems Analysis	5-13
5.2.5	Individual Household Well Analysis	5-13
5.3	Individual Utilities with Planned Supply Improvements that Address Projected Shortfalls Before 2020.....	5-13
5.3.1	Ames Lake Water Association, Inc.	5-14
5.3.2	Black Diamond Water Department	5-15
5.3.3	Covington Water District	5-16
5.3.4	City of Issaquah.....	5-16
5.3.5	Kent Water Department	5-17
5.3.6	King County Water District No. 111	5-17
5.3.7	City of North Bend.....	5-18
5.3.8	City of Pacific.....	5-18
5.3.9	Sallal Water Association, Inc.	5-19
5.3.10	Sammamish Plateau Water and Sewer District	5-19

6 Framework for Addressing Needs of Small Systems

6.1	Identification of Water Quality Issues that May Lead to Water Supply Shortfalls.....	6-1
6.1.1	Summary of DOH Water Quality Data	6-2
6.1.2	Summary of DOH Operating Permit Status	6-8
6.1.3	Summary of King County Water Quality Data.....	6-8
6.1.4	New or Pending Regulatory Issues Concerning Water Quality	6-9
6.2	Identification of Administrative and Financial Issues Related to Source Viability	6-14
6.3	Estimate of Water Quality, Administrative, and Financial Impacts on Potential Water Supply Shortfalls	6-15
6.4	Small Systems Solution Strategy	6-15
6.4.1	Solution 1: System Solves Problem Itself.....	6-17
6.4.2	Solution 2: System Requests Remote Services from and/or Connects to, Larger Nearby Utility.....	6-17
6.4.3	Solution 3: System Connects to Regional Transmission System and Purchases Wheeled Water	6-20
6.4.4	Solution 4: System Connects to Major Supplier's Transmission Line.....	6-22
6.4.5	Solution 5: System Forms New Water System by Consolidating with Nearby Small Systems.....	6-25
6.4.6	Solution 6: System becomes Satellite System Managed by Approved Satellite System Management Agency	6-26
6.4.7	Solution 7: County Assumes Responsibility for System as Provider of Last Resort.....	6-28
6.5	Solution Identification for Hypothetical Small Systems	6-28
6.5.1	Hypothetical System X Solution	6-29
6.5.2	Hypothetical System Y Solution	6-29
6.5.3	Hypothetical System Z Solution	6-29

7 Policy Implications

7.1	Regional Issues.....	7-1
7.1.1	Partnerships for Evaluating and Implementing Options.....	7-1
7.1.2	Water Right Considerations.....	7-2
7.1.3	Policies for Wheeling Water Supplies.....	7-3
7.1.4	Pricing of Water in Regional Context.....	7-4
7.1.5	Other Regional Considerations.....	7-4
7.2	Issues Related to Individual Utility Solutions.....	7-5
7.3	Issues Related to General Approach for Small Systems	7-5
7.3.1	Responsibilities Related to Small Systems	7-5
7.3.2	Policy Issues Related to General Approach for Small Systems.....	7-8

Appendices

- A Sources of Data Reviewed
- B Public Water System Definitions and Terminology
- C Inventory of Group A Systems in King County
- D Individual WRIA Overviews and Data
- E Descriptions of Potential Regional Conventional Supply Options
- F Individual Utility Comparison of Projected Demand and Existing Supply
- G Individual Utility Comparison of Projected Demand and Future Supply
- H Profiles of Selected Utilities Without Projected Water Supply Shortfalls Prior to 2020

Tables

ES-1	Areas in King County Where Projected Demand Exceeds Existing Supplies	ES-4
2-1	Small Systems in King County – Comparison of Geographic Relationships and Data Sources	2-8
2-2	Public Water Systems Distributing Water to at Least 10,000 People.....	2-9
2-3	Number of Public Water Systems by Type of Ownership in King County	2-10
2-4	Firm Yield of Seattle Public Utilities’ Supply Sources.....	2-11
2-5	Additional Large Sources of Municipal, Potable Supply in King County	2-13
2-6	Estimate of Individual Household Wells in King County	2-14
2-7	Regional Water Organizations Located within King County	2-18
2-8	Population Served by Utilities in King County	2-21
4-1	Regional Water Reuse Projects	4-8
4-2	Drivers and Constraints for Reclaimed Water	4-10
4-3	Conventional Regional Supply Options	4-14
4-4	Stormwater Management Options	4-18
4-5	Stormwater Regulations	4-20
5-1	Areas in King County where Projected Demand Exceeds Existing Supplies	5-9
5-2	Summary of Outlook Supply/Demand Comparison for Individual Utilities	5-10
5-3	Group A Community Systems with Potential Shortfall as Identified by Analysis Using DWAIN.....	5-12
6-1	Summary of Department of Health Water Quality Data for King County ...	6-4
6-2	Small Systems in Close Proximity to a Major Supplier’s Transmission Line	6-23
6-3	Solution Identification for Hypothetical Small Systems.....	6-28
7-1	King County Policies and Ordinances Related to Provision of Water Service	7-7

Exhibits

2-1	Group “A” Public Water Systems, Grouped by Type and Number of Connections	2-3
2-2	Group “A” Wells in King County	2-5
2-3	Group “B” Wells in King County	2-6
2-4	Geographic Breakdown of Small Systems in King County	2-7
2-5	King County Population Served, Grouped by Size of Water System	2-10
2-6	Major Sources of Supply and Major Transmission Mains	2-12
2-7	Population Growth in King County – 1970-2020.....	2-20
2-8	Population Served, Grouped by Source of Supply	2-22
2-9	Utilities Grouped by Sources of Supply	2-23
2-10	Variation in Population Growth Rate, by Source of Supply – 2000 – 2020.....	2-24
2-11	Current and Projected Average Day Demand (ADD), Grouped by Source of Supply.....	2-25
2-12	Firm Yield Estimates and Forecasts of Water Demand for SPU Regional System	2-27
4-1	Projected ADD Served by King County Utilities under Four Conservation Scenarios.....	4-5
5-1	King County Supply/Demand Comparison.....	5-3
5-2	Group “A” Community Water Systems whose Projected 2020 Demands Exceed 2000 Supply.....	5-8
6-1	Arsenic Monitoring Results	6-12
6-2	General Approach for Small Systems that May Need Alternative Source of Supply Prior to 2020	6-16
6-3	Wheeling of Water Involving Multiple Water Systems.....	6-21
6-4	Small Systems in Close Proximity to Major Water Transmission Mains ...	6-24