MEMORANDUM

TO: Island County Water Resources Advisory Committee
FROM: Nathan Howard, Long Range Planner, Island County
DATE: June 7, 2018
SUBJECT: 2018 CWSP Review – Joint-Use Facilities

Background
Joint-use (sometimes referred to as shared or conjunctive) facilities for water systems are infrastructures shared by two or more water systems, such as sharing sources, storage or interties. Interties are physical connection between water systems that allow for the transfer of water (either between each source or from one direction). This can be a primary source of water, secondary source for peak usage, or simply an emergency connection.

The Public Water System Coordination Act of 1970 requires that water purveyors develop water system plans, and one of those requirements is to, "Identify feasible emergency inter-ties between adjacent purveyors." RCW 70.116.050(4)(e).

Benchmark Studies
Of the 12 Coordinated Water System Plans (CWSP) reviewed during this benchmarking study, the following Jurisdictions had information on joint-use:

- **Island County**
  o Maps out the existing interties/joint-use facilities prior to 1990. Recommends water system purveyors include potential interties into their water system plans. Provides a draft intertie agreement for water systems to use.

- **Jefferson County**
  o Inventories existing interties. Design standards require that emergency interties are considered. Suggests the PUD identify interties between small water systems.

- **King County**
  o Inventories existing interties. Requires interties to be adequately sized. Suggests neighboring systems have uniform standards to allow for interties and shared facilities. Suggests future interties should be identified.
- **Kitsap County**
  - Inventories existing interties. Encourages water utilities to establish interties between each other. Proposes a regional supply strategy, which includes exploring a series of interties.

- **Pierce County**
  - Inventories existing interties. Encourages consistent standards so systems can efficiently intertie. Encourages the county to sponsor programs to help smaller water systems share resources. Establishes policies for water purveyors to consider developing interties with adjacent water systems and size them adequately.

- **Skagit County**
  - Inventories existing interties. Recommends utilities plan for interties that are appropriate and adequately sized. Discusses in more detail interties between the City of Anacortes and the PUD.

- **Snohomish County**
  - Encourages joint-use facilities and interties between water systems, where appropriate. Suggests uniform and consistent standards to allow for interties and shared facilities.

- **Vashon Island**
  - Requires water purveyors to consider interties for emergency purposes. Identifies potential locations for interties. Encourages water systems to identify interties for non-emergency needs.

- **Whatcom County**
  - Inventories existing interties. Suggests uniform and consistent standards to allow for interties and shared facilities. Encourages water systems to identify interties with adjacent water systems, both for permanent use and emergency purposes.

**Questions to Consider**
While reviewing the CWSP sections on receivership, the following questions might be useful to think about for discussion at the next meeting:

- Should the County undertake a new inventory of interties?
- Should the County identify possible intertie opportunities or should this be the responsibility of individual water systems?
- Should the identification of emergency interties (especially for smaller water systems) be encouraged, incentivized, or required?

**Options**
During the discussions, the WRAC has the following options for moving forward:

- **No change.** No recommended change at this time. This issue should not be included as a recommended update in the final recommendation document; OR
- **More research/outreach.** Additional research/outreach is necessary before making final recommendation; OR
- **Move forward with recommendation.** Sufficient information has been provided to make a recommendation to the Board.

**Attachments:**
- Whatcom CWSP – Intertie Map
2018 Island County Coordinated Water System Plan (CWSP) Review

Informational Packet

Joint-Use Facilities
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which obviate the risk of additional well construction. Also, older water rights may not allow for use outside specific service areas. Updating of water rights to allow for use in intertied areas may be necessary.

(2) Recommendations

(a) Purveyors planning expansion of service areas must submit a comprehensive water system plan to DOH and Island County within 1 year of final adoption of the CWSP, in accordance with WAC 248-54-065 and WAC 248-54-710. Plans submitted after the above deadline will be handled in order of submittal to DOH and Island County.

(b) Purveyors who prepare a comprehensive water plan should include in their capital improvement plans a review of the regional supply plan outlined in this Regional Supplement, and an identification of possible intertie locations with adjacent systems. Joint development and use of groundwater supplies should especially be considered. Sizing of facilities should be decided with future regional systems considered. Interties and other joint use facilities should be installed to benefit both utilities and to accomplish regional objectives of reliability and efficient resource management.

(c) Purveyors participating in interties, regional supply, or shared facilities should identify either Whidbey or Camano Island as the point of use for any water rights applications. Furthermore, when utilities are proposing regional or shared facilities, Ecology should be requested to revise existing rights to include the expanded place-of-use appropriate for such facilities.

(d) Purveyors should include in capital facilities planning the capability to provide fire flow, as required by the Minimum Design Standards.

(e) RWAs should explore regional facilities planning strategies, including satellite system support, resource protection, and conservation measures.

(f) New and expanding systems must develop and implement the following conservation measures:

- Installation of individual and source meters.
The financial plan selected for developing or improving water systems must be specific to the particular system. It should also reflect the policy that customers pay their fair share for the facilities necessary to provide service and/or conserve the available resource. Frequently, several different methods are combined in financing water system improvements.

o Major supply, pumping, transmission, and storage facilities are frequently paid for by the issuance of revenue bonds or special assessment revenue bonds. Ideally, the cost of the facilities should be spread over the area that can be served by the system. This should include not only the immediate customers of the system but parcels of land that can be served in the future. Assessments based on area or number of land parcels are appropriate. Sometimes a system development charge is calculated and assessed when customers are connected to the system.

o The distribution pipelines that are constructed to serve the individual properties are a more specific benefit to adjacent properties. It is customary to charge the costs of these improvements on a front-footage basis to the benefitted properties, although in some cases an area component is also included in these assessments.

o In addition to the major water system facilities and the distribution pipelines, there is a cost for the service connection and meter to the individual customer. This cost is generally assessed directly to the customer. Frequently, a utility maintains an established rate schedule for the various size service connections.

The above represents general concepts for financing water systems. It is often necessary to tailor improvement districts to the systems being constructed. It is not always possible to gain support from the owners of undeveloped land so these individuals may need to be excluded from the assessed district. All lots should support facility construction or improvements if hookups are available. Undeveloped lots pay lower fees.

8. PRIORITIES

The recommended priorities of the CWSP are as follows:

A. Public Education - Education can improve public awareness on a wide array of areas including individual and community conservation options and benefits, comprehensive land use planning, hazardous waste and other non-point pollution threats to groundwater and watershed management, and can encourage non-participating purveyors to join in coordination and conservation efforts.
B. Conservation - Water conservation activities improve the efficiency of use and reduce losses and waste of water, ultimately decreasing demand. Short-term conservation measures differ from long-term measures in terms of implementation time, degree of public cooperation, long-term effectiveness and influence on water supply planning. Long-term measures can serve as potential substitutes for new water supplies.

C. Technical and Financial Assistance Programs - Ineffective operation and management of small systems, including inadequate financing mechanisms was one of the key findings of the "Preliminary Assessment." County and State technical and financial support is needed to facilitate cost-effective improvements, model utility rates and financing based on revenue requirements, provide professional management, and promote water and energy conservation.

D. Shared Facilities Development - Although the lack of coordination between adjacent water utilities is an acknowledged problem, there has been inadequate involvement of the water purveyors to-date. Very few systems have actually participated by designating service areas or expanding service areas. The objectives of the CWSP can not be attained without an outreach program to inform and involve purveyors of all Classes in the CWSP process.

E. Groundwater - The coordination of a comprehensive groundwater management plan/program with the objectives of the CWSP is essential to not only protect the available groundwater resources of Island County, but to assure proper development of the resource. This may require the adoption of growth management policies consistent with the objectives of the Island County Comprehensive Land Use Plan.

F. Funding - New methods of funding education, conservation, assistance, and management programs should be sought. Without direct County involvement in facility ownership, funding sources available to purveyors are limited.

G. Future Planning - The CWSP must be seen as an initial planning effort and not a final document. An evaluation of the implementation program contained herein, and the possible increase in the County's role in water system operations and planning, must be included in the CWSP update required in 1995.

9. IMPLEMENTATION PLAN

A. Board of County Commissioners - Island County officially established a Public Works Department in 1973 pursuant to ICC 13.01 for the purposes of "establishing, operating, and maintaining systems of solid waste,
F. Desalination

The treatment of brackish or salt water in Island County is a possible alternative to importing a water supply. Technically, this solution is possible although it is expensive, and desalted water is not as palatable as natural supplies. The Town of Coupeville installed an electro-dialysis type of water treatment plant in the 1970s to reduce the total dissolved solids from its well sources. The facility is in use, but has high operation and maintenance costs and because the "brine" that is formed by concentrating the solids must be wasted, this results in wasting of approximately 30 percent of the scarce source of supply.

Desalination is expensive, ranging from $2 to $5 per 1,000 gallons of treated water. It may have some local application within the County but is not considered feasible as a regional source of supply within the near future.

In summary, the Anacortes/Oak Harbor water supply and the Stanwood water system appear to be possible future water supply sources for portions of Whidbey and Camano Islands, respectively. These sources are further considered in the Whidbey Island/Camano Island Water Implementation Plan (see Appendix M).

G. Alternative Methods

Alternative methods for developing water resources should be considered whenever possible. Methods such as reuse of grey water, or the use of stormwater and wastewater for irrigation, may provide significant reductions in withdrawal of water resource volume. However, technical aspects of alternative methods must be reviewed and approved by the appropriate review authority prior to consideration.

4. SHARED FACILITIES PLAN

In addition to the possible regional water supply systems to serve Central Whidbey Island and the northeast sector of Camano Island, which have already been discussed, there are other opportunities for shared facilities in Island County. As already identified, most of the areas in Island County are expected to continue to rely on local groundwater as a source of supply during the planning horizon covered by the CWSP. The geographic distribution of the groundwater resources and the clustering of existing and future development within the County forms service areas which, in many cases, are served by several different systems. This offers the opportunity for joint development or sharing of source, and storage, or intertie facilities.
A. Source

Exhibits VII-4 and VII-5 identify possible shared facilities for the years 2000 and 2015, respectively. The existing water system facilities within each of the identified future water service areas were reviewed to estimate the water supply potential. Where additional source of supply appears necessary, the amount of the deficiency for each of the years is shown on the respective exhibits. The criteria used is the anticipated maximum daily demand (based on 250 gallons per capita per day).

It is suggested that in future service areas where additional source of supply is required, that the systems within the existing service areas consider opportunities for sharing or jointly developing these future facilities. It could result in the need to develop fewer wells or in some instances where the local groundwater supply will be inadequate, it will help to justify a connection to the Oak Harbor or one of the proposed regional water supply systems. Other benefits of joint facilities can be an improved level of water service and decreased water costs.

It is beyond the scope of this CWSP to prepare detailed cost estimates for potential joint source development. This will require careful evaluation by the water systems involved to come up with a proposed plan.

B. Storage

The anticipated amount of additional storage that will be required within the water service areas by the years 2000 and 2015 is also shown on Exhibits VII-4 and VII-5. This analysis is based on providing 800 gallons per customer per day which is the requirement of DOH for water systems. In estimating the amount of additional storage that will be required, we reviewed the existing system storage within each of the service areas. In some instances, reservoirs that are of questionable condition were not considered in evaluating the existing storage capacity. The storage requirements shown in Exhibits VII-4 and VII-5 are total additional requirements for 2000 and 2015, respectively.

A detailed evaluation of the cost of storage reservoirs is beyond the scope of this CWSP. However, in order to provide some perspective on the storage cost, the following is a tabulation of cost for reservoirs of typical sizes that might be constructed in Island County.
<table>
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(1) Includes 40 percent indirect costs.

The costs will depend on the reservoir shape, type of construction, and a number of other factors. The above costs do not include an allowance for any significant length of pipeline that may be required to connect the reservoir to a water system.

C. Interconnections

It appears there are a number of opportunities for interties between systems in Island County as the population and customer base increase. Potential interties are as shown on Exhibit VII-5 and are described in Table VII-5. In some instances, these interties are within water service areas and in other instances, they connect between different water service areas. The letter designation for each of the interties cross-references the exhibit and table.

Table VII-5 provides some outline information on these potential interties. In many cases, they will become a significant or primary supply to all or portions of the water service areas due to the limited groundwater resources. In some instances, they will be the standby or backup intertie between two water service areas that are expected to be relatively self-sufficient. In other instances, the intertie, in addition to providing supply for standby capability will provide a primary transmission/distribution loop and/or facilitate future extension of the water system. In all cases, the interties should increase reliability of the water systems.

The approximate lengths, diameters, and cost estimates should be viewed as general information to provide some perspective on the cost of the facilities. It should be kept in mind that it is not necessary, in many cases, to construct the full length of the intertie at one time, but that the construction could be phased. The minimum diameter shown is a judgment based on the purpose of the intertie and the configuration of water systems. In the case of a standby interconnection, a 6-inch diameter pipeline may be sufficient to provide emergency support. Where the intertie will serve as a primary source of supply, it is suggested that a minimum of 8-inch diameter pipeline be used. Where the intertie
also will provide a "backbone" pipeline through the water system to deliver municipal supply and to provide fire protection a larger pipeline may be justified in some instances.

D. Implementation

The implementation of shared water system facilities will require organization and a lead agency. The recommendations in the coordinated water system plan includes shared facilities through Regional Water Associations. These committees can help the water systems to initiate their plans. The County may be able to assist the systems in attaining funding and support and could provide administrative expertise to the water systems.

The development of shared facilities could be implemented in a variety of ways and may depend on the size and cost of the proposed facilities. In the case of an intertite that provides a regular or standby supply from one system to another, it could be as simple as the second system paying the water rates charged by the supplying system. Cities and water/sewer districts have the ability to extend water lines to provide service and could agree to do this for some of the interties proposed. In the case of shared storage or a pipeline that interties and gives benefit to several systems an interlocal agreement might be appropriate or a separate district could be set up to finance the proposed water system improvements. The district approach may be necessary if the water systems are informal associations in order to provide a governmental entity that can issue bonds and incur debt. Also, an applicant for public grant or loan assistance usually must be a public agency in order to qualify for aid.

The ICPW may be able to assist the systems in obtaining funding and support, and could provide technical and administrative expertise to the water systems.
APPENDIX I

WATER INTERTIE AGREEMENT

This Agreement made and entered into this _____ day of ______________, 19____ by and between the ____________________________ (hereinafter referred to as ________________), and ____________________________ (hereinafter referred to as ________________), witnesseth that:

The definitions of certain terms, as used later in this Agreement, are as follows:

INTERTIE: A connection, either made or potential, between water mains of the two parties to this Agreement, at specifically identified points, where water may be transferred from the supplies of one system to the transmission or distribution facilities of the other.

SURPLUS PRODUCTION CAPACITY: Volumetric rate of available water supply from the sources of the supplying water system, which can be transferred through an intertie after all service requirements to the customers of the supplying system are met.

ISOLATION VALVE: A positive shut-off fitting which shall be installed at the point in either water system which is used to accept or deliver water through the intertie. The isolation valve shall also be designed so as to maintain cross connection control. Each isolation valve is defined as part of the system connected to the intertie and not part of the intertie. Each system has sole responsibility for providing and operating its respective isolation valve.

MINIMUM REQUESTED CAPACITY: A minimum intertie flow capacity requested by either party. Intertie facilities shall be designed so as to afford not less than the minimum flow capacity requested by either party to this Agreement. The availability of sufficient flow to the intertie shall be certified by the supplying utility. The minimum requested capacities shall be the principal basis of negotiating cost sharing of construction of intertie facilities. Flows in excess of minimum requested capacity may be available.

NOW, WHEREAS, ________________ and ________________ are responsible for operating and maintaining a public water system in accordance with the rules and regulations of the State of Washington and Island County, and

WHEREAS, the parties recognize the responsibility of public water utilities to provide for the highest reliability of service to their customers at reasonable cost, and
WHEREAS, the parties further recognize that water resources are finite and vulnerable, and the prudent use and management of these resources requires cooperation among water utilities, and

WHEREAS, both __________________ and __________________ have water system facilities which can be interconnected so as to be mutually beneficial to both utilities,

NOW, THEREFORE, it is agreed that ____________ and ____________ will provide for an intertie of water mains at the specific locations and with the terms and specifications as provided in the following appendices to this Agreement:

A. ______________________________________
B. ______________________________________
C. ______________________________________
D. ______________________________________

It is further agreed that the following terms and conditions shall apply to the construction and operation of each intertie:

1. Water shall be made available only from surplus production capacity, after all needs of the customers of the supplying utility are satisfied at the time of intertie operation. Neither party shall be liable for failure to deliver water to the other party at any time; and

2. Each utility shall be responsible for installing and operating an isolation valve, which is identified as the point of delivery and does not include the building or vault and appurtenances; and

3. Costs of providing joint use facilities such as pumps, buildings, and other appurtenances shall be shared on the basis of mutual benefit which may be determined in each case by establishing a minimum requested capacity for each utility; and

4. Unit cost of supplied water shall be based on a rate determined by evaluation of production and transmission cost components applying to water delivered. A water rate shall be established by each party at the time of this Agreement and shall remain in effect until March 1 of the succeeding year. The rates may be renewed annually thereafter; and

5. The company requesting water shall submit a written request to the supplying company, and the supplying company must give written permission prior to opening the valve between the two systems. Should, however, a situation arise
necessitating the supply of water immediately, a verbal request shall initially be sufficient, followed by the above written request. Each party shall designate, in writing, an authorized person(s) to evaluate such a verbal request and determine whether such a request should be granted.

6. The use of any intertie will be governed by the terms of this Agreement and the provisions of the applicable attachment. Termination of use of any intertie by either party shall be preceded by not less than 12 months' written notice.
SAMPLE INTERTIE SPECIFICATION OUTLINE

NAME OF INTERTIE: ____________________________

DATE: ______________________________________

1. Description
2. Design Criteria
3. Plans and Specifications
4. Financial Agreement
5. Terms of Operation
and DOT/APWA Section 7-11.3(12), unless other equivalent standards are specified by the designated utility.

4.5.7 Cross Connection Control

Where the possibility of contamination of the supply exists, water services shall be equipped with appropriate cross connection control devices in accordance with Chapters 246-290 WAC and 246-291 WAC. The designated utility shall determine the need, size, kind, and location of the device.

4.5.8 Pipe Sizing

Water mains shall be sized using the current edition (or as amended) of "Sizing Guidelines for Public Water Supplies," prepared by DOH, or other accepted hydraulic analysis submitted by a licensed engineer. Water main size shall be adequate to provide maximum instantaneous demand flow plus required fire flow, and to maintain the pressure requirement defined above.

4.5.9 Storage

Storage requirements are based upon three components:

- Equalizing Storage, required to supplement production from water sources during high demand periods;
- Standby Storage, required as backup supply in case one or more sources is out of service; and,
- Fire Storage, required to supplement producing sources in order to deliver required fire flow for the required duration (see "Fire Flow Requirements").

Sizing of storage facilities shall be adequate to provide for equalizing storage plus the standby and fire storage requirements. Equalizing and standby storage volumes shall be determined using "Sizing Guidelines for Public Water Supplies," DOH. Fire storage volumes shall be determined using the appropriate fire flow and duration as provided below under "Fire Flow Requirements."

4.6 Coordinated Water System Plan Specific Standards

4.6.1 Design Standards

Utility Interties

Emergency interties or dual transmission capability should be provided whenever practicable. Specific locations, size, and alignment of major water lines should consider emergency interties with adjacent water utilities.
What are the likely populations and densities for these areas?
Which purveyors will commit to meeting the water demands in which areas?

The Pathway to Answers (A Workplan)

To develop some certainty in the future of water supply for this portion of the County, the following steps need to be followed (preferably in the following order of priority) in a manner consistent with the County-Wide Planning Policies developed as part of the GMA:

The WUCC reviews completed and adopted City and County Comprehensive plans, and amends CWSP as necessary for consistency,

WUCC meets to discuss service areas and request submittal of any changes and any proposed source of supply updates/planning changes.

Proposed service area changes and CWSP amendments reviewed by the County for consistency with City and County Comprehensive Plans.

CWSP amended with new or amended Service Areas and other necessary changes.

10.10.3 The Remainder of Jefferson County

PUD Satellites and Small Systems

Because the only available source of supply is groundwater, supply strategies for the PUD Satellites and other small systems are not complex. For all of these systems, the problem is one of assuring protection of their existing sources, and managing for the level of in-filling which is anticipated within their boundaries. To meet their needs, these water purveyors will:

Need to confirm their existing water rights, if there are any questions. (See Tables 10-4 and 10-5)

Need to be diligent in protection of their water supplies as growth and other human activity occurs around them.

Need to provide incentive or regulation for conservation and reuse, where appropriate, to optimize the resource they currently have available.

Groundwater to meet current domestic needs appears adequate. However, the County has limited groundwater resources. Estimates are that by 2042, groundwater demand will increase from the current consumption of 4.38 MGD to 11.94 MGD. Nearly 8 MGD will need to be found. Of this, nearly 3
MGD of the 8 MGD will need to be provided by PUD Satellites and small systems.

Following the results of the Groundwater Characterization Study, these utilities should now do the following.

- Carefully examine their individual needs and consider joint or individual exploration and development of those aquifers which seem adequate for regional supply.
- At the same time, consideration should be given to a County-wide Ground Water Management Plan, with a mission to protect and optimize available resources. The only supply option available to the PUD Satellites and small systems is the development of groundwater. Protection of groundwater will also require consideration of sewer collection and treatment.
- The PUD should continue to manage small systems so opportunities for interties, conjunctive use, conservation, and reuse are all optimized.
- Water rights for all small systems should be verified and confirmed.
- The PUD should take the lead in continuing to search for and develop new groundwater sources and in examination of current treatment technologies for improving the quality of existing supplies.

**Rural Areas with Special Supply Problems (Marrowstone Island)**

Jefferson County, like many rural Western Washington counties, faces increasing rural population and associated demand for rural utility services. In some cases, the growth itself, and its impact on environmental resources, is increasing the acute nature of these problems. Rural areas experiencing water supply problems because of lack of water, salt water intrusion, and groundwater contamination (from natural and manmade sources) need an affordable water supply to meet public health needs.

Currently, there are areas of the County, such as Marrowstone Island, where supply is short, groundwater contamination has been partially documented, and alternative supplies are being sought by individuals. To meet the need for a "safe and adequate" water supply in rural areas, where limited supply or economics limit the typical system design, an alternative approach is required.

Options have included traditional pipeline supply, conservation measures, stormwater catchment, and "greywater" reuse. The pipeline alternative has been seen until now as the only way to supply an adequate supply as defined
disputes may be filed either by a water service applicant, a developer, a utility, or another affected entity over matters pertaining to the timely and reasonable provision of service.

(7) King County should adopt, by ordinance, the Minimum Standards and Specifications for water utilities, developed by the East King County WUCC, outlined in Section IV. A water utility may adopt more stringent standards in its own service area, as long as standards in rural areas are consistent with the adopted King County Comprehensive Plan.

(8) EKRWA should complete development of the Center and enter into appropriate agreements with the SKRWA, SKCHD, and other agencies for data management and technical service assistance.

B. Water Utility Planning and Operations

(1) It is recommended that, unless a documented health problem exists, approval of proposed system expansions be denied for systems that have not submitted their Water System Plan or Service Area Agreement within 1 year from the date of submittal of the CWSP by the WUCC to the County Council.

(2) Each water utility should verify that Ecology has properly recorded water rights for the sources and service area of its water system. A water right application should be filed immediately if adequate rights are not recorded. Utilities wishing to retain rights on sources no longer in use should work with Ecology to evaluate the likelihood of developing another facility from the same source, thereby enabling application for a change in the point of diversion/withdrawal. Any unused or non-transferrable water rights should be relinquished.

(3) Water utilities already having or which are interested in participating in interties, regional supplies, or other shared facilities, should identify the appropriate encompassing boundary as the place of use for all new water right applications. Further, Ecology should be requested to revise existing water rights for these utilities to reflect a place of use that encompasses the expanded boundary.

(4) Water utilities throughout East King County should adopt the water conservation program presented in Section VII and actively pursue measures of implementing the program as a means to reduce future water demands and to postpone future source
development. In addition, the utilities should work closely with Ecology, DSHS, and local agencies to facilitate State and local legislation that supports prudent conservation measures by all users of ground and surface waters of the State. It is further recommended that the EKRWA support utility efforts by implementing those elements of the conservation program assigned to EKRWA.

(5) Utilities should include in capital facilities planning the capability to provide fire flow, as required by the Minimum Standards and Specifications.

(6) Utilities participating in regional supply network development should develop joint financing and source development programs based on mutual benefits.

(7) All interties with adjacent utilities should be sized to accomplish the appropriate regional objective of reliability, regional transmission, and/or emergency interties.

(8) The WUCC should work closely with Ecology and DSHS to reach agreement on the appropriate variables for econometric modelling of water demand forecasts. Once agreement is reached, the WUCC should notify utilities of the type of data and frequency of collection required to refine the modelling forecast during the update of the CWSP. The WUCC should monitor the progress of key utilities in collection of this data and to submit the data for inclusion in the EKRWA/SKRWA Center.

C. Water Resource Strategy

(1) The EKRWA should adopt a Supply Plan which will, in cooperation with the SWD, result in the following actions:

- Prior to 1997 - Develop well field located near Issaquah as a regional source of water.
- Prior to 1997 - Construct a filtration plant for the South Fork of the Tolt to develop additional supply from existing reservoir.
- Prior to 2010 - Develop North Fork Tolt system with water filtration.
SECTION IV

WATER UTILITY DESIGN STANDARDS

1. INTRODUCTION

A primary objective of the Coordinated Water System Plan (CWSP) is to develop minimum design and performance criteria for the water utilities in East King County. The Rural and Urban Service Area Subcommittees of the East King County Water Utilities Coordinating Committee (WUCC) prepared a draft Minimum Design Standards document. These draft standards were reviewed by the Steering Committee, which in turn formed a special task force with representations of the South King County WUCC to promote consistency. Several meetings were held with representatives of other Regional Water Association (RWA)/WUCC committees as well as County staff to facilitate the development of a uniform set of standards which accommodated differing concerns in local areas. This Section presents the engineering and construction design criteria which resulted from these discussions and which were uniformly adopted by the South King and East King WUCCs to achieve the overall objectives of the CWSP.

2. MINIMUM DESIGN STANDARDS

Standardized design and performance criteria are essential for establishing a common set of standards which apply to and set a base level of utility planning, design, and construction for all public water utilities. Uniformity and consistency in standards will, in the long-term, reduce costs to customers as system interties and/or consolidation of utilities takes place. In addition, these standards, in conjunction with the Utility Service Review Procedure (USRP), will clarify the facility requirements and financial impacts of projects proposed by developers and water service applicants.

The Public Water System Coordination Act requires development of minimum standards applicable to water system improvements within a Critical Water Supply Service Area (CWSSA). The East King County Coordinated Water System Minimum Design Standards were developed to fulfill this requirement. These are minimum performance, design, and construction standards used to maintain uniformity of design between adjacent water utilities. Each purveyor, as a part of its water system plan, is required by WAC 248-54-105, to identify its design standards and specifications. By reference to these Minimum Design Standards, the intent of this requirement will be met.
EXHIBIT IV-1
EAST KING COUNTY
COORDINATED WATER SYSTEM PLAN

MINIMUM DESIGN STANDARDS

1. INTRODUCTION

This Section of the Coordinated Water System Plan (CWSP) provides a set of minimum design standards and incorporates performance specifications, where applicable, for new and existing water utilities which are planning to install new capital facilities in King County. Subsection 3 describes the manner in which the specifications are to be applied to water utility planning and construction. Since other legally constituted standards which are more stringent are not superseded, the primary, currently existing, and applicable standards are listed and incorporated by reference in Subsection 4. The design standards are described in Subsection 5.

2. PURPOSE

The purpose of these standards is to set a base level of utility planning, design, and construction for public water utilities. Uniformity and consistency in standards will, in the long-term, reduce costs to consumers as system interties and/or consolidation of utilities takes place. Reliability of water supply will also be improved.

Subject to certain exceptions, each utility, including municipalities, is to adopt design standards as a part of its water system plan. It is intended that a utility may adopt the minimum design standards described herein or may adopt higher standards, provided such standards are not inconsistent with applicable land use plans.

3. APPLICATION OF STANDARDS

A. Existing Water Systems

Existing water systems are not required to apply these minimum standards for repair or replacement of existing facilities unless the replacement is associated with providing expanded service due to new developments. Adherence to these standards for repair of facilities is encouraged to provide better public water service throughout the County. When system replacement occurs, the design should be based on the utility's long-term water system planning design criteria.
in accordance with DOT/APWA Section 7-11.3(11) or AWWA C-600 specifications unless otherwise specified by the designated utility.

(5) Disinfection and Bacteriological Testing

All pipe, reservoirs, and appurtenances shall be flushed and disinfected in accordance with the standards of the DSHS, AWWA C601 and D105, or DOT/APWA Section 7-11.3(12) unless otherwise specified by the designated utility.

(6) Auxiliary Power

All source and booster pumping facilities required for primary supply in an emergency shall be equipped with auxiliary power unless a redundant power supply source is provided. Where pumping is to a storage facility which is sized to permit down time for mobilization of a portable standby power unit, pigtail outlets and a manual transfer switching device are adequate. If the pigtail outlet approach is taken, the purveyor must provide a portable power unit. Where adequate gravity standby storage has been provided, no auxiliary power is required for pumping facilities. An adequately sized engine driven pumping device is an acceptable method to meet this requirement. Adequacy of facilities will be determined by the utility through its water comprehensive plan.

(7) Utility Interties

Planning for specific locations, size, and alignment of major water lines shall consider emergency interties with adjacent water utilities.

(8) Flow Measurement

All service lines shall be installed so that each residential, commercial, and industrial structure will have a separate metered service for domestic water received from the utility. This requirement may be waived by the utility, but, at a minimum, any new service will have a box for meter drop installation. If approved by the utility, domestic water consumption may be measured by a master meter for service to a complex, under single ownership, and where water utility line subdivision is impractical. Service lines providing fire flow may be required by the utility to be equipped with a fire detection check.
(6) Storage

Storage requirements are based upon three components:

- Equalizing Storage, required to supplement production from water sources during high demand periods,
- Standby Storage, required as backup supply in case the largest source is out of service, and
- Fire Storage, required in order to deliver the level of fire flow service identified in the utility's approved plan (see "Fire Flow Requirements" below) for the required duration.

As a minimum, sizing of storage facilities shall be adequate to provide for equalizing storage, plus the larger of standby or fire storage requirements. Equalizing and standby storage volumes shall be determined using "Sizing Guidelines for Public Water Supplies", DSHS. Minimum fire storage volumes shall be determined using the fire flow and duration requirements of the County Fire Marshall, the respective municipal ordinance, or the minimum design standards prescribed herein. Siting of storage facilities should consider locations which provide gravity flow. In some cases, the system hydraulics may require additional storage.

(7) General Facility Placement

All piping, pumping, source, storage, and other facilities, shall be located on public rights-of-way or dedicated utility easements. Utility easements must be a minimum of 15 feet in width, and piping shall be installed no closer than 5 feet from the easement's edge. Exceptions to this minimum easement may be approved by the operating water utility. Unrestricted access shall be provided to all public water system lines and their appurtenances and public fire hydrants that are maintained by public agencies or utilities.

**New Class 2, 3, and 4 utilities in undesignated service areas should consider future interties with Class 1 systems when determining the location of their distribution network.**

The location of utilities shall be in accordance with the standards and guidelines established by King County or the appropriate City criteria. Where existing utilities or storm drains are in place, new utilities shall conform to these standards as nearly as practicable.
facilities shall be located on public rights-of-way or dedicated utility easements. Utility easements must be a minimum of 15 feet in width, and pipes shall be installed no closer than 5 feet from the easement's edge. Exceptions to this minimum easement may be approved by the operating water utility. Unrestricted access shall be provided to all public water system lines and their appurtenances and public fire hydrants that are maintained by public agencies or utilities.

Group B water systems in undesignated service areas should consider future interties with Group A systems when determining the location of their distribution network.

The location of utilities shall be in accordance with the standards and guidelines established by King County or the appropriate City criteria. Where existing utilities or storm drains are in place, new utilities shall conform to these standards as nearly as practicable and yet be compatible with the existing installations. Where practical, there shall be at least 3 feet horizontal separation from other utilities.

(8) Pipe Cover

The depth of trenching, installation of pipes, and backfill shall be such as to give a minimum cover of 36 inches over the top of the pipe from finished grade unless unusual site constraints exist which justify less cover. This standard shall apply to all transmission and distribution piping and to service piping within the right-of-way unless specifically designed for an above ground installation.

(9) Water Line and Sewer Separation Distances

Transmission and distribution water piping shall be separated at least 10 feet horizontally from existing wastewater gravity or force mains. The bottom of the water main shall be 18 inches above the top of the sewer. Where local conditions prevent such horizontal and/or vertical separation, closer spacing is permissible where design and construction meet the special requirements of Section 2.4 of Ecology’s Criteria for Sewage Works Design as revised October, 1985.

Separation distances between water piping and any portion of an on-site sewage system shall meet the requirements of the SKCBH Rules and Regulations.
1.2 Recommendations

The WUCC recommends and provides for the following:

1.2.1 Management Area

The CWSP specifically plans for the provision of public water supply throughout Kitsap County (Exhibit 2-3 shows current land use designations). The CWSP and the Public Water System Coordination Act assign responsibility for planning, designing, financing, constructing, and operating all public water systems (see WAC 246.290.02) in the designated areas.

1.2.2 Supply Area

The source of supply for the CWSP area is a combination of ground waters, and the City of Bremerton’s Union River surface supply. As the primary source, ground water provides approximately 80% of the potable water for the county. The City of Bremerton’s Union River Supply is the only significant surface water supply. An evaluation is included of potential regional supplies including sources from outside the Water Resource Inventory Area (WIRA), wastewater reuse, aquifer storage and recovery, recharge enhancement, and desalination.

1.2.3 Interties

Interties between existing water utilities will allow conjunctive use of surface and ground water, emergency supply, and wholesale delivery of supply in accordance with the CWSP.

1.2.4 Water Supply and Land Use

The CWSP has incorporated the land use and projected development program of the county and the cities to the degree that they have been documented. The plan has been updated based on county and city comprehensive plans and other ordinances developed in conjunction with the GMA.

1.2.5 Designated Service Area/Utility Review Procedure

The designated retail water service areas represent the geographical area where the identified utility has accepted responsibility to provide a "safe and adequate" water supply in a "timely and reasonable manner." The appeals process of this CWSP is the
1.2.10 Individual Wells and Ground Water Management

Water service in urban growth areas should be provided by utilities with retail service areas designated through the CWSP process. Individual wells, however, may be constructed on parcels meeting the KCHD siting criteria. As part of the well application process for parcels in retail service areas, KCHD will require the applicant to obtain a feasibility of water service statement from the applicable water purveyor. The applicant retains the permissive judgment to either drill a private well or connect to the utility. The Initial Basin Assessments for Kitsap County and WRIA 15 (Basin Assessments) found that ground water availability varies throughout the County. The Basin Assessments and the Kitsap County Ground Water Management Plan (GWMP) project that water is available for near term growth requirements. The Basin Assessments and the GWMP also recognize the need for additional data collection and analysis.

The participating WUCC utilities should continue to collect, record, analyze and utilize specified ground water, production, and customer usage data for the data management program (See Section 10 and Appendix K).

1.2.11 Regional Supply Strategy

The CWSP has developed a regional strategy for water resource management and development. Based on available data generated through the CWSP, the Kitsap GWMP, and the Basin Assessments, ground water supplies appear to provide the best near-term supply alternative. Continued development of local ground water supplies is recommended as KPUUD and other purveyors continue drilling throughout the county to evaluate long-term regional supplies. The uncertainty of water right application processing, surface/ground water cost issues, and ESA issues cast concern on the feasibility of ground water development plans, even if significant resources are identified at a regional or sub-area level.

The proposed reliance on ground water, coupled with current uncertainties regarding water rights laws and policies, poses a dilemma for the future availability of supply. Based on the results of the GWMP, the Basin Assessments, and the conjunctive use supply strategy outlined herein, reservation of public waters, as prescribed by WAC 173-590, should be submitted to ensure the issuance of future ground water rights.

Ecology in 1992 noted that no action would be taken on water rights reservation applications until an additional regional water resource planning process was conducted. This regional planning process will need to have active involvement of all interested parties and fully consider regional alternatives. It should be noted that Kitsap County requested such an evaluation as a pilot area under the regional planning process empowered by Chapter 90.54 RCW, but was not selected. The 1998 legislature enacted guidelines for basin planning that most likely will result in coordinated planning for all of WIRA 15 (the Kitsap Peninsula). Supporting data for the Water Rights Reservation process is included in the CWSP.
In order to maintain the utmost flexibility in accepting regional ground water, surface water, or conjunctive use supply strategies, a regional transmission network composed of piping, pump stations, and reservoirs may be necessary. A series of intensities should also be explored. Section 9 will address these possibilities. The County Comprehensive Plan, in response to the Growth Management Act, will concentrate growth around Dyes Inlet and Sinclair Inlet. Consequently, it will be necessary to develop water sources in the surrounding parts of the county and establish transmission mains to move the water to where growth is occurring.

A regional supply system to meet the growth management needs of Kitsap County for public water supply will require continuing evaluation to establish the most cost-effective program consistent with public policy.

1.2.12 Data Management

Each major local government and/or division is currently pursuing a coordinated approach to data management. This approach is designed to preclude duplications of effort, repetition of similar data collection efforts, and confusion or disagreement over facts and interpretations of scientific data.

At the state level, the Departments of Ecology, Health, Natural Resources, Wildlife, Fisheries, and Community Development are developing a uniform approach. At the county level, Kitsap County, KCHD, along with several cities, KPUD, and some water/sewer districts, have begun to develop a coordinated Geographic Information System (GIS) and data management system. It is in the best interests of the county, the cities, KCHD, and utilities to complete a joint needs assessment and then undertake a separate but coordinated local government data collection and management program. A generalized outline of the water monitoring program is contained in Appendix K.

1.2.13 Administrative Framework

Implementation of the CWSP requires participation by all members of the WUCC. The CWSP is the County’s regional public water plan. All related decisions by local or state government are guided by the plan.

The Utility Service Review Procedure (USRP), shown in Exhibit 5-1, represents how the county anticipates administering its responsibilities. The water utilities will be responsible for updating the Water System Plans for their designated areas in accordance with DOH regulations. KCHD is responsible for Service Area Coordination including Satellite Management Agencies (SMAs).

1.2.14 Plan Implementation

The following identifies the primary requirements for implementing the revisions identified in this 2004 Update to the CWSP Regional Supplement. The program is designed to be both responsive to existing needs and to place responsibility on designated
4.5.6 Disinfection and Bacteriological Testing

All pipe, reservoirs, and appurtenances shall be flushed and disinfected in accordance with the standards of DOH, AWWA C651-86 and C652-86, or DOT/APWA Section 7-11.3(12), unless specified otherwise by the designated utility.

4.5.7 Utility Interties

Interties should be established where desired, observing the requirements of RCW 90.03.383. “No intertie shall be used and/or constructed as a public water supply without department approval” per WAC 246-290-132. Planning for major water line extensions should consider specific locations, size, and alignment of potential future emergency interties with adjacent water utilities.

4.5.8 Flow Measurement

Unless otherwise directed by the designated utility, all service lines shall be installed so that each residential, commercial, institutional, and industrial structure will have a separate metered service for domestic water received from the utility. If approved by the designated utility, domestic water consumption may be measured by a master meter for service to a complex, under single ownership, and where water utility line subdivision is impractical. Service lines providing fire flow may be required by the utility to be equipped with a fire flow meter, leak detection check valve and/or appropriate cross-connection control devices as required by WAC 246-290-490.

All new ground water sources shall be provided with an access port for devices that measure depth to water and be outfitted with a flow-measuring device for total production. Installation of a production meter is also recommended for existing ground water sources and may be required by Ecology. DOH expects all Group A water systems to install a flow measurement device on all their sources and routinely record water production. All new sources for which water treatment is included shall be provided with a flow measurement device.

4.5.9 Cross-Connection Control

Where the potential of contamination of the supply exists, water services shall be equipped with appropriate cross-connection control devices in accordance with Chapters 246-290 WAC and 246-291 WAC. The designated utility and/or the county cross-connection control program shall determine the need, size, kind, and location of the device.
6.1 Introduction

Satellite Management and Receivership are two different management options that may be utilized separately or together in the case of a failing system.

Whenever it is not feasible to directly connect a new water service application that is in a utility's assigned retail service area, a "remote" system may be created. This level of service constitutes a satellite management condition, which is governed by the conditions within this section. In addition, some utilities own and operate a series of water systems that are not connected and provide operation and/or ownership through satellite management.

In the event that a utility's retail service area and role as a purveyor are relinquished due to receivership action taken by the State, then a new purveyor must be selected or assigned system management responsibilities. The role may be assumed by an established utility, a Satellite Management Agency (SMA), or a newly created public water system as described below.

6.2 DOH Satellite Management Agency (SMA) Requirements

The concept of satellite management has evolved from general guidance contained in Chapter 246-295 WAC and the State Department of Health (DOH) Satellite Management Planning Handbook (October, 1995). In general terms, the satellite management program is intended to address situations where small public water systems (e.g., Group B systems) exist or are proposed in areas remote from the supply facilities of larger systems and extension of existing facilities may not be practical in a timely and reasonable manner.

Prior to 1991, the term SMA (Satellite Management Agency) was applied loosely to those water utilities that provided service to remote systems.

In 1991, the legislature modified the Public Water System Coordination Act rules to establish criteria for designating entities as approved SMAs. The current definition of a SMA is:

A person or entity that is approved by DOH to own or operate more than one public water system on an area wide-basis, without the necessity for a physical connection between such water systems.

Currently, the laws and policies relating to the provision of satellite management services are embodied in legislation passed in 1995. In that year, the legislature passed Engrossed Second
9.4 Regional Water Supply Strategy

Given the population growth projected for the county, it is reasonable to assume that, over time, an integrated regional water supply system will be necessary. The recommended regional water supply strategy outlined here is based upon a tiered approach, with a range of activities planned for implementation, beginning with options involving lower costs and/or greater ease of implementation, followed by more expensive and complex activities that may be required to address long-term needs. A brief discussion of each tier is provided below.

Tier 1: Local Development of new Ground Water Sources by Individual Water Systems.

New ground water supplies are dependent on obtaining new water rights, which can involve extensive delays or the significant expense of resorting to Ecology’s Cost Reimbursement WaterRight Evaluation process. In either case, the results are not certain. As Exhibits 9-2 and 9-3 show, however, new ground water wells are very cost effective compared to other water sources. In some cases, additional water can be made available by redeveloping existing wells or by drilling replacement wells. In many situations, replacement wells can be sited or modified to gain significant environmental benefit (e.g., deeper or farther distance from a stream or as a replacement for springs).

Tier 2: Conservation

Continued application of effective water conservation and water system efficiency measures will be a basic component of meeting future water needs. The efforts of WATERPAK, an organization of the larger water purveyors, to decrease per capita water demand, has and in the future, will extend the time that existing water supplies are sufficient to meet demands. As noted in Section 7, this continuing water conservation effort will be modified based on requirements developed by DOH in response to conservation mandates set by the 2003 legislature in The Municipal Water Law. It should be noted that while basic conservation measures are very cost effective, eventually it will be necessary to resort to programs that have costs similar to Tier 5 and above sources (see Exhibit 9-3).

Tier 3: Interties Between Adjacent Utilities Requiring Limited Adjustments

In some situations, it may be possible for neighboring water systems to share and optimize their water sources. In pursuing this activity, it is logical to begin with considering new interties amongst adjacent utilities where limited hydraulic adjustments
would be necessary. Such situations would be characterized as systems with reservoirs having similar overflow elevations and distribution systems having similar operating pressures.

**Tier 4: Interties Between Adjacent Utilities Requiring More Substantial Adjustments**

Once resource sharing is optimized in cases where implementation is not complex, opportunities should be investigated for interties where additional hydraulic modifications may be necessary. This may include the installation of pressure reducing valves and additional pumping facilities in situations where operating pressures between neighboring systems are incompatible.

**Tier 5: Regional Source, Storage, and Transmission Network**

A long-term regional strategy that has been under consideration for many years is the development of new regional ground water supplies, with a storage and transmission network to convey water throughout the County. A number of previous studies have examined the feasibility of utilizing surface waters from rivers on the Olympic Peninsula for public water supply. Water right applications were filed with the State by the City of Bremerton in 1957 for development of the Hamma Hamma River. Kitsap PUD filed for water rights on the Duckabush River in 1964. These applications were both denied by the Department of Ecology (Ecology) in 1999, and no appeals were made.

The approach to regional water supply has changed since the 1992 CWSP, when surface water sources outside of the County were seen as the best supply alternative. Now, based upon the complications surrounding the use of surface water and the recent water right application experiences of Bremerton and KPUD, new ground water supplies are viewed as more feasible than new surface water supplies. Such ground water sources would likely be developed in the Seabeck aquifer or other aquifers in the western and southwestern portions of the County.

Water from such supplies would be pumped into a regional transmission and storage network. The transmission network developed and modeled in the 1992 CWSP is still a valid approach in the context of this strategy. The analysis conducted for the 1992 CWSP indicated that water from a regional source can be delivered throughout the County using existing pipeline facilities in combination with new interties and regional reservoirs (*Appendix F provides excerpts from the 1992 CWSP as a reference to this current document*). Although some portions of the existing transmission grid in the County may be adequate to support a regional system, other areas may require modifications such as increasing pipe sizes, installing pumping stations, and adding new reservoirs and additional valving. Due to the diverse topography of the County, boosting of regional supplies by some individual water systems will likely be required to maintain desired system operating pressures.

The general flow of water within the envisioned regional transmission system would be north and south through the lower elevations found in the Bremerton area, with new