

The League of Women Voters of Seattle

## **RECLAIMED WATER REVIEW**

February 2011

### Study Committee

Denise Smith, chair  
Maria Brusher  
Jan O'Connor  
Kerry Peterson  
Gail Shurgot  
Joan Thomas

### Reading Committee

Judy Bevington  
Kelly Powers

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## Introduction

Water issues in Washington State and King County in particular are a long standing interest of the League of Women Voters of Seattle (LWVS). The challenges to water quality and quantity predicted with global climate change, the threat to aquatic species from pollution of Puget Sound and fresh water resources, and the increased demand for water with our burgeoning population are topics currently being addressed by local and regional policy makers in King County.

One solution that addresses all of these issues is the reuse of treated wastewater for non-drinking water purposes. Since October 2008, King County has been in the process of developing their Reclaimed Water Comprehensive Plan, intended to provide “guidance for King County’s reclaimed water program for the next 30 years.” Over the last six months, the LWVS Reclaimed Water Committee has conducted interviews with representatives from King County, the city of Seattle and People for Puget Sound and reviewed this program. This report is an overview of the evolution of wastewater treatment in King County from the creation of the Municipality of Metropolitan Seattle (Metro) to the King County Regional Treatment System and Reclaimed Water Program.

Typically, population growth results in increased demand for water. In fact, the King County region has seen a paradoxical decrease in demand for several reasons, including conservation and update of plumbing codes. Nevertheless, some communities in Washington have already reached the limits of easily available water. The use of groundwater from wells exempt from water right permits under Washington state statute RCW 90.44.050 for irrigation and other non-drinking water purposes has lowered water tables. Long time water advocate, water and sewer commissioner and county councilwoman Louise Miller remarked to our committee that: “We should not be using good drinking water to put out fires, wash trucks or water golf courses.”

Critical to our response to water demand is the understanding that along with increased demand for water comes an increased production of wastewater. Viewing wastewater as a resource through water reclamation and reuse, rather than as sewage to be discharged, offers the opportunity to simultaneously provide a new source of water and make productive use of wastewater. Many communities have implemented nonpotable (water not suitable for drinking) reclaimed water programs to provide water for landscape, agricultural and industrial uses. Reusing wastewater also provides communities with an opportunity to divert effluent, the liquid product of wastewater treatment plants, away from sensitive surface waters.

The regional population growth in the late 1980s and early 1990s put significant pressure on local water supplies in the central Puget Sound area. Several water shortages at that time highlighted the potential limitations of existing supplies. Pressure from growth and over-appropriated water basins in some local areas caused some suburban King County water districts to impose temporary moratoriums on new water connections between 1989 and 1998. This unsatisfied demand intensified the search for new sources to supplement traditional water supplies. Reclaimed water — that is, effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated — was seen as one new resource to supply nonpotable water.

At about this same time, several salmon species in the Puget Sound watershed were listed or being considered for listing as threatened under the Endangered Species Act. King County Metro was

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involved in this issue for its role in affecting Puget Sound water quality through discharge of effluent. Once again reclaiming water offered a potential solution. Increasing the level of wastewater treatment would improve the quality of discharged water while decreasing its quantity by diverting treated water for reuse. King County initiated a water reclamation program and has been using reclaimed water since 1997 for on-site industrial processes and landscape irrigation at its regional treatment plants in Seattle and Renton.

The Regional Wastewater Services Plan adopted by the King County Council in 1999 included the decision to build a third wastewater treatment plant to meet the increased demand in King and south Snohomish Counties. The new plant, Brightwater, includes reclaimed water processing as an integral part of its treatment system. Brightwater, as an advanced secondary treatment facility, will under normal flows treat all wastewater through membranes that can with some further disinfectant produce Class A reclaimed water. During high flow situations it becomes a blended system, with most flow going through the membranes and excess through secondary treatment.

Most recently, in 2005, the Puget Sound Partnership, a high level advisory commission of regional leaders, was established. This commission studied the scientific, geographical, political and funding issues influencing the sound's environmental problems. In their report to the governor, the partnership identified use of reclaimed water as one of the possible solutions to the long term health of Puget Sound.

### **The History of Wastewater Treatment in the Region**

To understand the King County reclaimed water program, it is helpful to understand some history of wastewater treatment in the region. King County's wastewater treatment website and League members' institutional memories provide the following background.

Wastewater treatment in King County and parts of Snohomish and Pierce Counties entered a new era when the Municipality of Metropolitan Seattle (Metro) was created by King County voters in 1958 to address the problems arising from rapid urban growth and inadequate wastewater treatment in the area. At that time, less than half the sewage in King County received any treatment, and many small and individual wastewater treatment systems were failing or close to failure. The city of Seattle's main sewage outflow pipe discharged into Puget Sound just a short distance offshore, at a depth of only 25 feet. Throughout the area, raw sewage and storm water from multiple sources were contaminating Lake Washington, Puget Sound, other smaller lakes and rivers.

Prior to 1958, regional leaders including Jim Ellis and concerned citizens including Madeline Lemere, a member of the League of Women Voters, had joined together to address the contamination of Lake Washington. The group conducted a study of the water pollution problems facing the region and used their findings to gather public support. They also petitioned the state legislature to allow local governments in Washington to form metropolitan municipal corporations. A legislative measure passed in 1957 allowed regions to establish governmental bodies such as Metro to solve problems that crossed jurisdictional boundaries of special districts, cities and counties.

The approach taken by the newly formed Metro was thought to be very progressive at the time. The plan developed a regional system based upon watershed boundaries rather than individual systems

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within jurisdictions. Metro's first comprehensive sewage plan was adopted at the first meeting of the newly formed Metro council, establishing the framework for a regional system. The system included five wastewater treatment plants, including Seattle's Alki Beach sewer plant, and large interceptor sewer lines around Lake Washington, the Duwamish Waterway and the Elliot Bay commercial waterfront.

Over the next 10 years Metro completed the Carkeek Park Treatment Plant, the Richmond Beach Treatment Plant, the Renton Treatment Plant and the West Point Treatment Plant. Metro also built wastewater pump stations and more than 100 miles of large trunk lines and interceptor sewers to connect the system. Most significant to the public, Metro closed the Lake City Treatment Plant in 1967, ending the flow of sewer effluent into Lake Washington.

The Metro Council began with elected officials from Seattle, King County, and small cities in the area, including south Snohomish County. The council was expanded by state legislative action in 1970s and 1980s to include representatives from Bellevue and sewer districts in the metropolitan service area and unincorporated areas.

Citizens concerned about the representation structure of Metro Council, as a body of elected officials from many jurisdictions with no direct constituents, brought a lawsuit against Metro. Judge William Dwyer ruled in 1991 that the Metro Council was unconstitutional. The King County Council and regional cities convened a summit to discuss reorganization. In 1992 voters approved an initiative to merge the Municipality of Metropolitan Seattle (Metro) with King County. The merger was completed in January 1994, and Metro wastewater treatment became King County Department of Natural Resources Wastewater Treatment Division.

Projected population growth determined by the Puget Sound Regional Council in the mid 1990s and wastewater flow estimates based on use patterns at that time predicted that King County's regional wastewater treatment system would run out of capacity by 2010. In order to meet the planning requirements of the Growth Management Act and ensure effective wastewater treatment services in the future, the county carried out an intensive planning effort with elected officials and other stakeholders across the service area. The group developed a regional wastewater service plan, including a few policy options to be decided by then County Executive Ron Sims and approved by the King County Council.

The County Executive's preferred Regional Wastewater Services Plan (RWSP) cited the region's commitment to preserving water quality and recycling resources in a cost-effective manner while meeting or exceeding state and federal standards for water quality. The Regional Wastewater Services Plan was delivered to the King County Council in April 1998 and adopted after considerable study and review on November 29, 1999.

The adopted plan included building a new North treatment plant, Brightwater, with a new outfall into Puget Sound, and expanding the East treatment plant (in Renton). The plan also provided for reusing highly-treated water from the plants, conducting pilot and demonstration projects in order to study ways to economically provide reclaimed water, investigating stream-flow augmentation and groundwater recharge opportunities, and exploring the idea of building satellite plants to provide reclaimed water to local communities.

Construction on the new Brightwater Treatment Plant began in 2006. Geological and technical issues and problems with drilling the conveyance tunnel have delayed the planned 2011 beginning of operations. Most problems have been resolved and construction continues at this time. Production of reclaimed water remains a key component of the new Brightwater Wastewater Treatment Plant. As mentioned, the RWSP supports treating wastewater for irrigation purposes, and contemplates public and regulatory acceptance of reclaimed water as an adjunct to existing water supplies.

Stormwater runoff—rainwater that is contaminated by pollutants from roads, agricultural, industrial and other land sites—is recognized as the major cause of pollution in Puget Sound; it is a diffuse, difficult to control, non-point pollution. Such pollution, however, is outside the scope of King County wastewater management and of this study.

### **A Brief History of Reclaimed Water**

Using reclaimed water is not a new idea. The United Nations Economic and Social Council established a policy in 1958 that states “No higher quality water, unless there is a surplus of it, should be used for a purpose that can tolerate a lower grade.” The United States Environmental Protection Agency (EPA) first developed guidelines for water reuse in 1980. EPA policy was that for human consumption, “priority should be given to selection of the purest source. In cases where there is limited availability of water of the purest source lower quality water can be substituted to serve nonpotable purposes such as urban residential, commercial, and industrial uses.” (EPA 1976) Treated wastewater can provide a suitable source for irrigation, air conditioning and industrial cooling towers, industrial processing, toilet flushing, dust control and construction, cleaning and maintenance, including vehicle washing, manmade scenic water features and fountains, and environmental and recreational purposes.

Water reuse is an established practice in the United States, where in 2003 it was estimated that “1.7 billion gallons per day of wastewater is reused, and reclaimed water use on a volume basis is growing at an estimated 15% per year.” (EPA 2003) Since 2004, twenty-five states including Washington have had regulations in place regarding water reuse.

In Washington State, the city of Walla Walla has operated a water reclamation plant since 1927. Reclaimed water from this plant has irrigated agricultural land, particularly in areas where surface and groundwater is restricted. A 2005 Department of Ecology case study of reclaimed water facilities reported that in 2004 there were 17 facilities operating in Washington State providing water for purposes including crop and landscape irrigation, toilet flushing, dust control, construction water, industrial cooling, created wetlands, ground water recharge and stream flow. There are now 24 reclaimed water permits in Washington, ranging in size from 5000 gallons per day to 9.6 million gallons per day (mgd) at the Walla Walla irrigation project. A reclaimed water project at Snoqualmie Ridge was developed through a partnership between the city of Snoqualmie and the Weyerhaeuser Development Corporation. Snoqualmie’s Class A water reclamation facility has supplied reclaimed water to the Snoqualmie Ridge development for direct use or storage in Eagle Lake since 1998, allowing the Snoqualmie Ridge PGA Golf Course to meet its 1.0 mgd landscape maintenance requirement with reclaimed water.

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## Reclaimed Water in King County

The evolution of reclaimed water in the King County region has been driven as much by the desire to improve the quality and quantity of effluent leaving the treatment plant and entering Puget Sound as by the opportunity to augment water supply. Reclaimed water also provides a consistent and reliable source for nonpotable water uses, offering an alternative to the proliferation and continued use of exempt wells for nonpotable purposes that are stressing watersheds throughout the county. Regional Wastewater Services Plan outreach to residents in the King County wastewater service area identified a strong community desire to protect water quality and public health and a willingness to pay more to prevent water quality problems if costs were distributed equally. Keeping water bodies such as Puget Sound, Lake Washington, and regional rivers and streams clean was a high priority for those interviewed.

Reclaimed water was introduced into the King County wastewater system treatment system for on-site industrial processes and landscape irrigation at the Renton and Seattle treatment plants in 1997. King County's current reclaimed water program produces 284 million gallons of Class A reclaimed water per year at these two regional wastewater plants. The Renton Plant has the potential to produce 1.3 mgd Class A reclaimed water from an average capacity of 115 million gallons per day. The West Point Plant has the potential to produce up to 0.70 mgd Class A reclaimed water from an average capacity of 133 million gallons per day, and the Brightwater Plant is expected to produce 5.0 mgd Class A reclaimed water from an average of 36 million gallons per day when it becomes operational.

There is a reclaimed water hydrant at the Renton Plant that provides nonpotable water for county and other jurisdiction staff to use for street sweeping, cleaning drains and catch basins, and controlling dust. Reclaimed water is also used by county staff to irrigate a demonstration garden and greenhouse and newly planted vegetation used for stream restoration and flood control projects.

Reclaimed water from Brightwater will be used for irrigation at the treatment plant, tank wash down, and other processing requiring nonpotable water. King County plans to make the reclaimed water available to customers along the outflow line and via a "purple" distribution pipeline to the Sammamish Valley area and has the ability to expand Brightwater reclaimed water production capacity as customer demand grows. See Figure 1. The cost of reclaimed water to be provided by King County has not yet been determined; however, it is expected to be sufficiently less than Seattle Public Utility's wholesale drinking water rate to encourage use for nonpotable purposes.

## What is Reclaimed Water?

All water on earth is essentially reused water, since water is constantly moving as a solid, liquid or gas through the atmosphere, lithosphere or biosphere. Whether it is taken from a snow-melt surface water source such as Seattle's Cedar River or Tolt River systems or a groundwater source such as the Highline well field or the Issaquah Aquifer, the water we drink and use has been used before. The natural hydrologic system of evaporation, condensation, precipitation and infiltration and the natural treatment of groundwater percolating through sand and gravel have supplied our past water needs. The engineered process of reclaiming water, sometimes called water recycling or water reuse, involves a multi-step treatment process that speeds up nature's restoration of water quality.

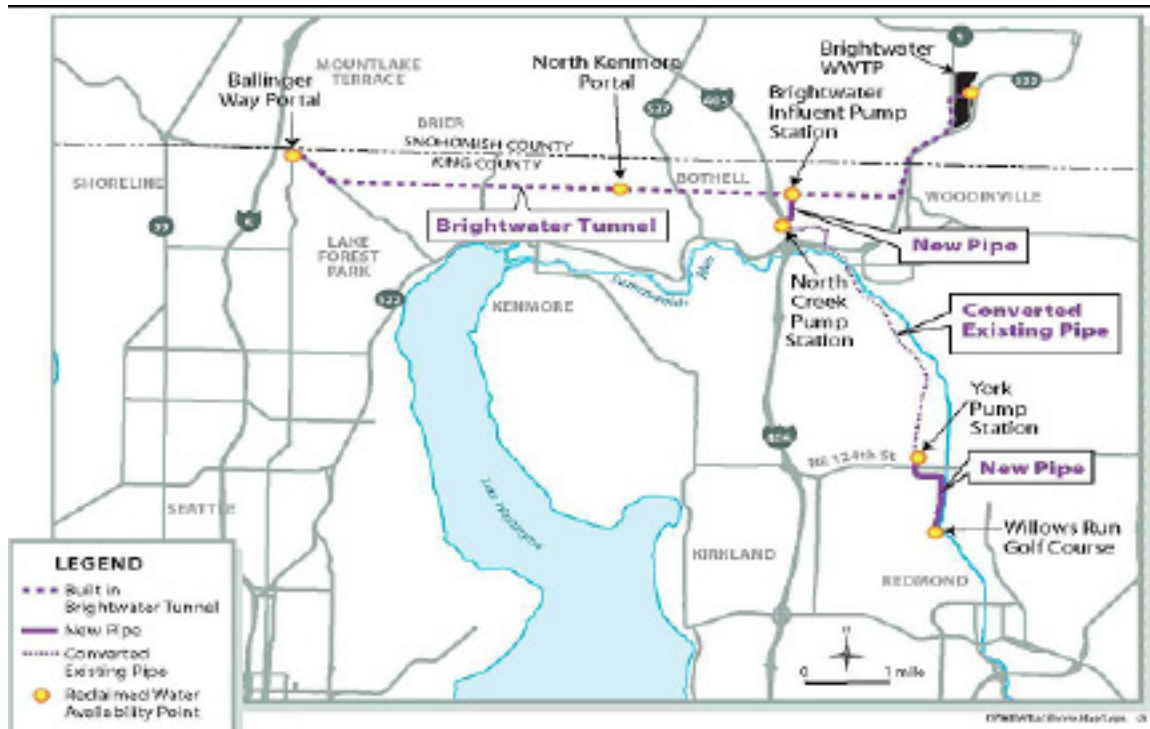


Figure 1. Map of the Brightwater Reclaimed Water Backbone Project.

King County’s regional treatment plants use an activated sludge process, a biological treatment using aeration, bacteria, screening and more technical measures, to treat all of the wastewater to meet state and federal secondary treatment standards before discharge into Puget Sound. The wastewater must receive a series of treatment steps that among other things removes suspended solids, organic material and pathogens. The reclaimed water process involves additional treatment beyond the secondary treatment, including additional filtration and disinfection, in order to meet the standards of reclaimed water. All reclaimed water is highly treated and must meet a specific set of treatment and reliability standards to assure that it is appropriate for the intended use. The process provides a high level of purity and reliability to assure that only water meeting stringent requirements leaves the treatment facility.

Reclaimed water has several definitions. The definition used in the Departments of Ecology and Health 1997 Water Reclamation Standards is:

“Reclaimed water means effluent derived in any part from sewage from a municipal or domestic wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for a beneficial use or a controlled use that would not otherwise occur, and is no longer considered wastewater.”

Another less formal definition used in King County’s outreach is this:

“Reclaimed water is wastewater that’s treated to such a high level it can be used safely and effectively for nondrinking purposes such as landscape and agricultural irrigation, heating and cooling, and industrial processing...Reclaimed water is available year-round, even during dry summer months or when a drought strains other water resources. Reclaimed water is distributed through a separate set of purple pipes, which makes sure reclaimed water and drinking water supplies are never

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mixed. Purple is the nationally designated color marking reclaimed water pipes, hoses, pumps, and other equipment.”

### **Reclaimed Water Standards**

Washington State specifies four classes of reclaimed water, labeled Class A, B, C and D. Classification is determined in part by the level of disinfection, based on bacteriological analysis of total coliform organisms. Class D, the lowest class of reclaimed water, requires a minimum of secondary treatment plus additional disinfection. Class D reclaimed water may be used only in restricted areas on non-food crops. Increasingly stringent levels of disinfection differentiate Class D from the higher levels of Class C and B reclaimed water. Class A reclaimed water receives advanced treatment steps beyond secondary treatment. Chemicals such as aluminum sulfate (alum) are added to form larger particles from the smaller remaining particles in the water. Filters remove the larger particles, and the water is then disinfected with processes including ultraviolet light, chlorine, or ozone to destroy surviving bacteria, viruses, or other pathogens.

When it becomes operational, Brightwater will produce about 5 million gallons of Class A reclaimed water each day, and eventually up to 36 mgd as demand requires. The Brightwater Plant will use an advanced treatment technology called a membrane bioreactor (MBR) system instead of the conventional large round settling tanks. Microfiltration membranes are becoming increasingly popular to achieve Class A treatment. These membranes are immersed in the wastewater. The MBR system draws wastewater through hollow fibers with microscopic pores small enough to filter out particulate matter and even individual bacteria. A membrane bioreactor converts screened sewage to “clean” effluent in a single process, but additional disinfection is still required to meet Class A standards.

Washington state standards do not include the use of microfiltration membranes for Class A reclaimed water production. Until the new reclaimed water rule (chapter 173-219 WAC) is complete, Ecology and Health will use the California standards for membrane treatment to show equivalency to the filtration steps for Class A reclaimed water.

The current Washington state reclaimed water classifications are all considered nonpotable water. Higher levels of treatment, better than Class A, that would meet potable or drinking water standards are not within the realm of the King County reclaimed water program at this time but may be in the future. Such higher levels could allow use of reclaimed water for artificial recharge of aquifers, wetland supply, and surface water augmentation of open water bodies and stream and river flow.

The Washington State Department of Ecology has produced a guide for the level of reclaimed water needed for each reclaimed water use. (See Table 1)

**Table 1: Uses of Reclaimed Water**

Uses of Reclaimed Water	Class of Reclaimed Water Required			
	A	B	C	D
<b>Irrigation of nonfood Crops</b>				
Trees and fodder, fiber, and seed crops	Yes	Yes	Yes	Yes
Sod, ornamental plants for commercial use, and pasture to which milking cows or goats have access	Yes	Yes	Yes	No
<b>Irrigation of Food Crops</b>				
Spray irrigation – all food crops	Yes	No	No	No
Spray irrigation – food crops which undergo physical or chemical processing sufficient to destroy all pathogenic agents	Yes	Yes	Yes	Yes
Surface irrigation – food crops where there is no reclaimed water contact with edible portion of crop	Yes	Yes	No	No
Surface irrigation – root crops	Yes	No	No	No
Surface irrigation – orchards and vineyards	Yes	Yes	Yes	Yes
Surface irrigation – food crops which undergo physical or chemical processing sufficient to destroy all pathogenic agents	Yes	Yes	Yes	Yes
<b>Landscape Irrigation</b>				
Restricted access areas (e.g., cemeteries & freeway landscapes)	Yes	Yes	Yes	No
Open access areas (e.g., golf courses, parks, playgrounds, schoolyards, and residential landscapes)	Yes	No	No	No
<b>Impoundments</b>				
Landscape impoundments	Yes	Yes	Yes	No
Restricted recreational impoundments	Yes	Yes	No	No
Nonrestricted recreational impoundments	Yes	No	No	No
Fish hatchery basins	Yes	Yes	No	No
Decorative fountains	Yes	No	No	No
<b>Commercial</b>				
Flushing of sanitary sewers	Yes	Yes	Yes	Yes
Street sweeping, brush dampening	Yes	Yes	Yes	No
Street washing, spray	Yes	No	No	No
Washing of corporation yards, lots, and sidewalks	Yes	Yes	No	No
Dust control (dampening unpaved roads and other surfaces)	Yes	Yes	Yes	No
Dampening of soil for compaction (at construction sites, landfills, etc.)	Yes	Yes	Yes	No
Water jetting for consolidation of backfill around pipelines	Yes	Yes	Yes	No
Fire fighting and protection – dumping from aircraft	Yes	Yes	Yes	No

Fire hydrants or sprinkler systems in buildings	Yes	No	No	No
Toilet and urinal flushing	Yes	No	No	No
Ship ballast	Yes	Yes	Yes	No
Washing aggregate and making concrete	Yes	Yes	Yes	No
<b>Industrial</b>				
Boiler Feed	Yes	Yes	Yes	No
Cooling – no creation of aerosols or other mist	Yes	Yes	Yes	No
Cooling aerosols or other mist created (e.g., use in cooling towers, forced air evaporation, or spraying)	Yes	No	No	No
Process water – without exposure of workers	Yes	Yes	Yes	No
Process water – with exposure of workers	Yes	No	No	No
Source: Frequently Asked Questions about Reclaimed Water Use, Water Quality Program/Department of Ecology, Publication 05-10-012 (February 2005)				

### **The Rules for Wastewater Treatment**

The state of Washington began a formal pollution control program in 1945 with the creation of the Pollution Control Commission and enactment of RCW 90.48, the Water Pollution Control Act. Three years later the federal government enacted the Water Pollution Control Act, which provided funds for design of municipal wastewater treatment plants and for study of water pollution problems. The 1956 Federal Water Pollution Control Act and amendments in 1961 established grants for construction of municipal wastewater treatment plants.

The federal Water Pollution Control Act required the Surgeon General to cooperate with states to develop water pollution control programs for interstate waters, confirming the role of state and local health jurisdictions in wastewater treatment and pollution control. The Water Quality Act of 1965 directed the states to adopt water pollution programs for interstate waters. The Federal Water Pollution Control Administration was created by the 1965 Water Quality Act to administer federal water quality improvement and pollution control programs, but was abolished five years later, to be succeeded in a federal reorganization by the Environmental Protection Agency.

The state of Washington established a wastewater discharge permit system in 1955, encoded in RCW 90.48. In 1971, the Pollution Disclosure Act established a new approach to pollution control. Under this act, all dischargers are required to provide a high level of wastewater treatment regardless of the quality of the receiving body. The act also requires a technology-based standard for effluent releases that is applicable to all dischargers.

The federal government enacted the Federal Water Pollution Control Act Amendments of 1972, which also requires technology-based pollution control. Although passed as amendments, this was effectively a new law and in 1977, along with its revisions, became known as the Clean Water Act. The Clean Water Act objectives are “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” Together with our state Water Pollution Control Act (RCW 90.48) and Pollution Disclosure Act (RCW 90.52), it forms the framework of the Washington State water quality regulatory program.

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Directed by these federal and state requirements, the Washington State Department of Ecology (DOE) regulates discharges to state waters. These requirements include the National Pollutant Discharge and Elimination System (NPDES) administered by the Water Permits Division (WPD) within the EPA's Office of Wastewater Management, and both general and site-specific state regulations. Specific permits for wastewater discharge in Washington are regulated under RCW 90.48, the Water Pollution Control Act. According to DOE guidance, wastewater discharges must be treated to protect existing beneficial uses of ground or surface water, but the wastewater is not planned for a specific beneficial use.

### **Legislative Directives for Reclaimed Water**

The Washington State Legislature passed the Reclaimed Water Act (RCW 90.46) in 1992. At that time Washington was experiencing significant water shortages throughout the state. Headlines pronounced Water Crisis and Severe Drought and water users on both sides of the state were searching for new sources of water.

#### **Introduction to Reclaimed Water Code**

“It is hereby declared that the people of the state of Washington have primary interest in the development of facilities to provide reclaimed water to replace potable water in nonpotable applications, to supplement existing surface and ground water supplies, and to assist in meeting the future water requirements of the state.”

RCW 90.46, the Washington Reclaimed Water Act, clearly articulates both concerns and potential uses of reclaimed water:

“To the extent reclaimed water is appropriate for beneficial uses, it should be so used to preserve potable water for drinking purposes, contribute to the restoration and protection of instream flows that are crucial to preservation of the state's salmonid fishery resources, contribute to the restoration of Puget Sound by reducing wastewater discharge, provide a drought resistant source of water supply for nonpotable needs, or be a source of supply integrated into state, regional, and local strategies to respond to population growth and global warming.”

The Reclaimed Water Act directed the Washington State Departments of Ecology and Health to develop standards for reclaimed water use and to jointly administer a reclaimed water program. The goals of this joint program are to encourage use of reclaimed water, provide new water supplies to meet future needs, protect public health and safety, protect and enhance the environment, gain public confidence and support for reclaimed water, and find cost-effective solutions. The Department of Health (DOH) specifically is directed to focus on the reliability of the treatment process, assess the distribution, storage and use of reclaimed water and coordinate with local public health supply managers. The Department of Ecology (DOE) approves applications for reclaimed

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water use through the Water Reclamation and Reuse program of the Water Quality division. The Department of Health, through the division of Environmental Health's Office of Shellfish and Water Protection, administers the Water Reclamation and Reuse program.

Under The Reclaimed Water Act, anyone who generates reclaimed water must obtain a state reclaimed water permit before putting the water to use. The law requires reclaimed water permits to be issued only to public entities or to entities permitted under the state Water Pollution Control Act (RCW 90.48). A reclaimed water permit establishes the required water quality and authorizes the distribution, storage, and use of the reclaimed water. The permit specifies monitoring, recording, and reporting to verify that the treatment process is functioning correctly, that ground or surface water criteria are not violated, and that reclaimed water limitations are being achieved. The permit includes approved locations, uses, and related conditions needed to assure human health and environmental protection.

Legislation in 1997 added a clause to RCW 90.46 stating that "the owner of a wastewater treatment facility that is reclaiming water with a permit issued under this chapter has the exclusive right to any reclaimed water generated by the wastewater treatment facility." This exclusive right clause encouraged the municipalities to invest in reclaimed water projects. However, a concern remains that the use of reclaimed water may reduce the amount of water left in the natural system of rivers, streams and lakes and thereby potentially impair other users.

Another concern about the exclusive right clause is the potential encouragement of privatization of reclaimed water production facilities. This is an issue of concern nationally and internationally. The League has addressed the privatization of wastewater treatment and reclaimed water in the LWVS 2009 Privatization Study. In Washington State, one of the 24 permitted reclaimed water facilities, the Cardinal Glass facility, is a private reclaimed water project which has provided water for industrial use since 2006.

In 2006 the Legislature passed ESHB 2884 amending the Reclaimed Water Act and directed the Departments of Ecology and Health to adopt rules by December, 2010 addressing all aspects of reclaimed water, thereby establishing a clear permitting process. This legislation enabled the rulemaking process for reclaimed water. The intent of the rulemaking process is to remove some barriers to reclaimed water use by promoting consistent, credible and predictable regulatory processes.

The water reclamation rule is intended to provide sufficient flexibility to accommodate the diversity of proposed projects while assuring that reclaimed water is considered within the context of other state and federal requirements. Having this rule will move reclaimed water forward from a pilot phase to a mainstream program. The DOE considers public interest in accordance with state policy established in RCW 90.54. The rule was scheduled for adoption in December 2010. In response to a severe budget shortfall, Governor Gregoire recently froze implementation of non-essential rules, including this rule, which will impact the finalization of the reclaimed water rule.

Engrossed Second Substitute Senate Bill 6117 (E2SSB 6117) passed the legislature in 2007; it reaffirmed the state's commitment to reclaimed water and recognized the importance of the

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following reclaimed water use:

- Consistent, reliable water supply as Washington faces climate change challenges.
- Reduced discharge of treated wastewater into Puget Sound and other sensitive areas.
- More water in our rivers, lakes and streams for salmon recovery and other benefits.
- Comprehensive water planning integrating water and wastewater management.

Governor Gregoire, however, vetoed a section of this bill. She reasoned that there were issues of concern in areas of both water rights and water quality.

Water right permits regulated under RCW. 90.03 Water Code and RCW. 90.44 Ground Water Code govern the quantity, location and purpose of water use in relation to other water users. Reclaimed water permits are regulated under a different law, RCW 90.46, the Reclaimed Water Act. Reclaimed water is considered a new water supply planned for beneficial use but does not require a water right per se. The law requires issuance of a single comprehensive permit governing the water quality, the rate, location, and purpose of use. The owner of the permitted facility receives an exclusive right to the water treated but may not impair the water rights of another user.

Impairment is an important concept in Washington water law. It is based on prior appropriation, the rule of “first in time, first in right.” New water uses such as reclaimed water shall not impact existing water right users. For example, water processed for reclaimed water use could be redirected away from a traditional receiving body where someone else had made use of it. This potential for impairment must be addressed. There may also be net environmental benefits from reclaimed water programs, such as treating wastewater to a higher reclaimed standard before discharge to large water bodies such as Puget Sound, or using reclaimed water to augment stream flow in summer.

In August 2007, the Department of Ecology convened an advisory committee to consider water right issues related to impairment from water reuse projects. In 2009 SSB 5504 directed DOE and DOH to submit recommendations regarding impairment requirements and standards to the Legislature. The Governor further recommended DOE to propose amendments to the impairment standard to ensure the state is protecting water resources and complying with state agreements. The state process remains at this point as we enter the 2011 legislative session.

### **Water Quality Concerns**

Reclaimed water permits are intended to meet all statutory requirements for authorizing the beneficial use of reclaimed water, including those limitations and conditions believed necessary to control toxics, and to protect human health and the beneficial uses of waters of the state of Washington. The DOE issues permits that are typically valid for five years.

The Departments of Ecology and Health use a multi-barrier approach to assure these requirements are met at all times. A multi-barrier approach is a required sequence of prevention, control, and treatment steps to prevent water from leaving a reclamation facility until it meets the required quality. This assures that only water meeting the standards is distributed.

The first step in the multi-barrier approach, source control, is intended to prevent contaminants from entering the wastewater through best management practices and pre-treatment. Next, the wastewater

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is treated through a series of processes to meet the federal secondary treatment standards. Class A reclaimed water receives additional treatment as detailed in the Reclaimed Water Standards section above. All reclaimed water receives a very high level of disinfection. In addition to the treatment steps, reclaimed water facilities use continuous monitoring, alarms, extra standby treatment units, and emergency areas to re-treat or divert improperly treated water to assure a high quality product.

As analytical methods improve for constituents considered as emerging pollutants, the ability to detect these constituents at trace levels has also improved. Many of these contaminants of concern are found in all water sources and are ubiquitous in the environment. As the scientific community becomes more adept at discovering and quantifying their presence or absence in the parts-per-billion or -trillion range, it should not be a surprise that the presence or absence of most emerging pollutants is largely a function of how hard one looks and to what degree detection methods have advanced.

The presence or absence of an unregulated substance does not necessarily present concern or a need for alarm. To put this in perspective, nearly ninety percent of adult Americans consume caffeine daily. A person would need to drink approximately one million cups of reclaimed water at concentrations seen in some studies to ingest a dose of caffeine equivalent to that provided by one cup of coffee.

The presence of constituents of concern, such as nutrients, pharmaceuticals, hormones and steroids, organic and synthesized chemicals, and microbiologicals, is not necessarily a reason to dismiss the use of reclaimed water. There are specific standards and treatments for microbiologicals in the reclaimed-water processes. Reclaimed water facility operators ensure that disinfection of the final reclaimed water significantly reduces the microorganism levels, but this process often elevates levels of disinfection byproducts such as trihalomethane and haloacetic acids. Class A reclaimed water does not have to meet the drinking water standards for these byproducts.

Additional concerns regarding reclaimed water quality include emerging pollutants which are defined as “those synthetic or naturally occurring chemicals or microorganisms that are not commonly monitored in the environment but have the potential to enter the environment and cause known or suspected adverse ecological and(or) human health effects.” King County closely monitors the scientific work of national and international researchers on these emerging pollutants, including endocrine disrupting chemicals in the environment. “A Survey of Endocrine Disruptors in King County Surface Water” was published in 2007.

King County continues to monitor the presence of these emerging chemicals, and works with organizations such as People for Puget Sound to limit the amount of chemicals discharged in wastewater through education about proper disposal of chemicals.

In 2008, the Washington State Department of Ecology (DOE) and the U.S. Environmental Protection Agency (EPA) conducted a study to characterize pharmaceuticals and personal care products (PPCP) at five municipal wastewater treatment plants that discharge to Washington State waters. The study routinely found pharmaceuticals and personal care products in all samples. Secondary treatment reduced 21 percent of the 172 organic compounds to below detection levels. Advanced nutrient removal and filtration technologies reduced the number of compounds detected

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by 53 percent. None of the wastewater treatment technologies were able to remove three of the PPCP chemicals. These were the pharmaceuticals carbamazepine (anticonvulsant), fluoxetine (antidepressant), and thiabendazole (a fungicide). Overall, the DOE/EPA study suggests that a higher level of wastewater treatment, designed to remove nutrients, reduces concentrations of certain PPCP chemicals.

These findings, however, emphasize the importance of the first step in the multi-barrier approach, source control. As a start, the DOE in partnership with Group Health and Bartell Drugs has mounted a drug collection program to safely dispose of surplus home medications in order to remove them from the wastewater stream.

### **Centralized vs. Decentralized Debate**

The King County wastewater treatment system, with two active regional treatment facilities and a third major treatment facility in development, is a successful centralized system. Centralized systems require major public investment to build and operate and are often energy intensive to operate. The King County wastewater treatment system has made attempts to address energy costs with the energy recovery project at the South Treatment Plant, but the distribution infrastructure (pipes, pumps, maintenance) is expensive to install, particularly in a developed urban environment.

Some argue it would be a better investment for the health of Puget Sound to invest in other, more cost-effective alternatives such as installing natural drainage systems in North Seattle or improving options for small local treatment facilities. Seattle Public Utilities (SPU) conducted an economic analysis of the full life-cycle costs of building and operating a distribution system to deliver reclaimed water from the Ballinger portal (the end of the Brightwater reclaimed water main line) to potential customers in North Seattle and Shoreline. SPU called this contemplated distribution system the North Seattle Project. In this analysis, SPU determined that the estimated \$109 million for building and operating a distribution system was not cost-effective when weighed against the availability of lower cost alternatives such as installing natural drainage systems in North Seattle, switching self-supplied irrigators from their own sources to Seattle municipal water, and intensifying existing water conservation programs. They concluded that the North Seattle Project was not an effective means of attaining the modest water supply increase and the environmental benefits predicted, and that the cost to provide reclaimed water to North Seattle from the Brightwater portal at Ballinger would be four times the cost of alternative projects that provide the same benefits. Costs and benefits are still being debated, and will likely be refined prior to proceeding with planning a specific distribution system.

A major hurdle to maximizing opportunities to use reclaimed water is finding the means for 'delivering' reclaimed or recycled water from water treatment facilities to various users for irrigation, landscape and domestic purposes, even for possible in-home use. One alternative offered is to design decentralized water treatment facilities that keep water from leaving the subbasin. The argument is that the design and operation of decentralized plants will offer an efficient and economic strategy for delivering reclaimed water to users.

A decentralized reclaimed water system could provide on-site or localized distribution of treated wastewater to an on-site irrigation facility or industrial customer(s) or a reclaimed water district on

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a neighborhood-sized scale. A decentralized system would employ smaller-scale treatments on site, thus reducing the number of distribution pipes and pumps and other necessary infrastructure.

Indeed, the Regional Wastewater Services Plan identifies “explore the idea of building satellite plants to provide reclaimed water to local communities” as one of the elements of the plan. The King County Reclaimed Water Comprehensive Plan describes a reclaimed water “skimming or polishing strategy” which focuses on “providing reclaimed water for nonpotable consumptive uses, irrigation and industrial/commercial uses using small preassembled reclaimed water treatment facilities from various points along influent or effluent pipelines of the County’s regional wastewater conveyance system.”

Options that incorporate more biology-based systems that mimic the natural environment and promote more diversity in environment are gaining support as the sustainability movement gains popularity. Investments in low impact development (LID) and support of research into more sustainable alternatives to wastewater treatment are important roles for our state, local and national government as well as private industry.

The debate between centralized and decentralized wastewater treatment or a combination of the two is ongoing.

### **Climate Change**

Climate change modeling of the western Cascade region by the Climate Impact Group predict that snow pack — that is, the snow stored in the mountains — will continue to decrease in years to come. Winter precipitation will fall as rain rather than snow under warmer winter temperatures. Without physical and operational changes to drinking water systems, such as water releases and improvement of distribution, less snow available to melt in spring will mean less water will be available during critical summer months for both stream-flow needs and human water demands. This is particularly significant since we as a region rely heavily on rain and snowmelt to replenish our aquifers and supply our lakes, streams and rivers with water. Reclaimed water could provide a source of nonpotable water independent of climate variations, thus reducing the demand on scarce supplies of potable water. In the future, reclaimed water treated to higher standards and called “Class A+” may also supplement water in streams and aquifers.

### **Conclusion**

Investments in water and wastewater infrastructure have been central components of successful communities throughout history. Seattle is a prime example of this, with the public investment in securing the Cedar River Water supply in the 1890s and in the establishment of Metro for wastewater treatment in 1958. King County’s new Brightwater regional Wastewater Treatment Plant and the reclaimed water program are further examples of major investments for our future.

Seattle’s economy and quality of life are intimately tied to our water. Ensuring availability of water and sewer capacity during the building boom of the 1990s was a primary driver for the construction of a new regional wastewater plant. Puget Sound water quality issues in the region have also gained importance. Research by the EPA, DOE and People for Puget Sound identified pollutants including pharmaceuticals and personal care products in Puget Sound. Recent reports of algae blooms, lower

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dissolved oxygen levels and fish kills, all related to increased nutrient plumes in the South Sound, have added a level of urgency to the process.

One of the primary benefits cited for the use of reclaimed water is its positive impact on water quality. The quality of wastewater discharged from King County's two regional treatment plants has a significant effect on the water quality of Puget Sound. As an end-of-pipe or point source, King County's two regional plants discharge more than 40% of the wastewater that flows into Puget Sound. Treatment of wastewater to reclaimed standards alone would be beneficial to the health of Puget Sound even without actually reusing that water. By also diverting that reclaimed water to secondary use, the water reclamation process further reduces the flow of pollutants to Puget Sound.

Planning for reclaimed water should take the long-range perspective. It should address issues such as drinking water supply, quality of effluent discharged to bodies of water such as Puget Sound, and impacts of organic and inorganic constituents including emergent pollutants. Problems of seasonal shortages and low stream flows that will be exacerbated by climate change should be addressed. Effective and adequately funded regulatory systems, including oversight and enforcement, are needed to protect the public interest.

Successfully implementing a new program, particularly one that will need significant investment in infrastructure and change in public perception, is difficult. When evaluating King County's reclaimed water plan, League members should keep in mind the problems the program is meant to solve. There is significant contention between policy makers and jurisdictions about how much of the original King County Reclaimed Water proposal should be implemented. Treatment of wastewater to reclaimed water standards before discharge to Puget Sound is generally well received. Where, how and how much Class A reclaimed water should be distributed throughout the county is another matter.

Concerns about the cost of building a new purple pipe distribution infrastructure when weighed against the environmental benefits expected or when compared with alternative, less costly projects have been voiced by Seattle Public Utilities. Additionally, reports from Puget Sound Partnership have focused on the significant impacts to Puget Sound from stormwater runoff.

League members, too, should consider cost-effectiveness and long-term benefits to the region when evaluating King County's complete reclaimed water plans. We should not lose sight of the long term goals of making the best use of our valuable water resource. The League's continued participation in the reclaimed water comprehensive planning will bring us closer to wise use of this valuable resource.

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## Glossary

Definitions excerpted from:

Washington Department of Ecology Reclamation and Reuse Standards September 1997  
<http://www.ecy.wa.gov/pubs/97023.pdf>

*“Beneficial Use”* means the use of reclaimed water, which has been transported from the point of production to the point of use without an intervening discharge to waters of the State, for a beneficial purpose.

*“Class A Reclaimed Water”* means reclaimed water that, at a minimum, is at all times an oxidized, coagulated, filtered, disinfected wastewater. The wastewater shall be considered adequately disinfected if the median number of total coliform organisms in the wastewater after disinfection does not exceed 2.2 per 100 milliliters, as determined from the bacteriological results of the last 7 days for which analyses have been completed, and the number of total coliform organisms does not exceed 23 per 100 milliliters in any sample.

*“Class B Reclaimed Water”* means reclaimed water that, at a minimum, is at all times an oxidized, disinfected wastewater. The wastewater shall be considered adequately disinfected if the median number of total coliform organisms in the wastewater after disinfection does not exceed 2.2 per 100 milliliters, as determined from the bacteriological results of the last 7 days for which analyses have been completed, and the number of total coliform organisms does not exceed 23 per 100 milliliters in any sample.

*“Class C Reclaimed Water”* means reclaimed water that, at a minimum, is at all times an oxidized, disinfected wastewater. The wastewater shall be considered adequately disinfected if the median number of total coliform organisms in the wastewater after disinfection does not exceed 23 per 100 milliliters, as determined from the bacteriological results of the last 7 days for which analyses have been completed, and the number of total coliform organisms does not exceed 240 per 100 milliliters in any sample.

*“Class D Reclaimed Water”* means reclaimed water that, at a minimum, is at all times an oxidized, disinfected wastewater. The wastewater shall be considered adequately disinfected if the median number of total coliform organisms in the wastewater after disinfection does not exceed 240 per 100 milliliters, as determined from the bacteriological results of the last 7 days for which analyses have been completed.

*“Effluent”* means the liquid product (esp. of wastewater treatment plants) derived in any part from sewage from a wastewater treatment system.

*Exempt Wells* are groundwater withdrawals exempt from water right permits under Washington State statute RCW 90.44.050.

*“Food Crops”* mean any crops intended for human consumption.

“*Ground Water*” means water in a saturated zone or stratum beneath the surface of land or below a surface water body.

“*Impoundment*”

“Landscape Impoundment” means a body of reclaimed water which is used for aesthetic enjoyment or which otherwise serves a function not intended to include public contact. Examples may include but are not limited to: golf course water ponds/hazards, landscape ponds and vegetative landscape ponds, e.g. “lily ponds.”

“Nonrestricted Recreational Impoundment” means a body of reclaimed water in which no limitations are imposed on body-contact water sport activities. Examples may include but are not limited to: recreational lakes, public water features (ponds) and fish ponds.

“Restricted Recreational Impoundment” means a body of reclaimed water in which recreation is limited to fishing, boating, and other non-body-contact water recreation activities.

“*Instream flow*” means a specific stream flow at a specific location for a defined time and typically following seasonal variations—the flow needed to protect and preserve instream resources and values, such as fish wildlife and recreation.

“*Nonpotable water*” means water that is not used or intended to be used as, or is unsuitable for, a source of water supply for domestic purposes and has not been classified as a source of drinking water by the department.

“*Pathogens*” are microorganisms that can cause disease in other organisms or humans, animals, and plants. Pathogens include bacteria, viruses, fungi, or parasites found in sewage, in runoff from farms or city streets, and in water used for swimming. Pathogens can be present in municipal, industrial, and nonpoint source discharges.

“*Potable water*” means water that is used or intended to be used as, or is suitable for, a source of water supply for domestic purposes and has been classified as a source of drinking water by the department.

“*Reclaimed Water*” means effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for a beneficial use or a controlled use that would not otherwise occur and is no longer considered wastewater.

“*Reuse*” means the use of reclaimed water, in compliance with Washington Departments of Health and Ecology regulations and these standards, for a direct beneficial use.

“*Sewage*” means water-carried human wastes from residences, buildings, industrial and commercial establishments, or other places, together with such ground water infiltration, surface waters, or industrial wastewater as may be present.

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“*Streamflow Augmentation*” means the discharge of reclaimed water to rivers and streams of the state or other surface water bodies, but not wetlands.

“*Total coliform organisms*” Total coliform, fecal coliform, and E. coli are all indicators of drinking water quality. The total coliform group is a large collection of different kinds of bacteria.

“*Wastewater Treatment Facility*” means a facility that receives water and waste discharges from homes, businesses and industry through a sewer system. A wastewater treatment facility is not considered a reclamation plant.

“*Wetland or Wetlands, (RCW 90.46 definition)*” means areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation and typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands regulated under RCW 90.46 shall be delineated in accordance with the manual adopted by the Department of Ecology pursuant to RCW 90.58.380. (Ed. note: reclaimed water discharges to certain natural and constructed wetlands are currently permitted, subject to conditions, limitations and restrictions.)

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**Web Resources for Reclaimed Water Review  
Fall 2010**

History of Metro King County

<http://www.kingcounty.gov/environment/wtd/About/History.aspx>  
Waste Water Treatment History

<http://www.kingcounty.gov/environment/wtd/About/History/BuildingRegionalFacilities.aspx>  
Waste Water Treatment Building Regional Facilities

King County Wastewater Treatment

<http://www.kingcounty.gov/environment/wtd.aspx>  
KC Wastewater Treatment Division

<http://www.kingcounty.gov/environment/wtd/Construction/planning/rwsp.aspx>  
KC Wastewater Treatment Division Regional Wastewater Services Plan

<http://www.kingcounty.gov/environment/wtd/Construction/North/Brightwater.aspx>  
KC Wastewater Treatment Brightwater Project

<http://www.kingcounty.gov/environment/wtd/About/System/TreatmentProcess.aspx>  
KC Wastewater Treatment: Treatment Process

<http://www.kingcounty.gov/environment/wtd/About/SewerAgencies.aspx>  
KC Wastewater Local Sewer Agencies

Reclaimed Water In Washington State

<http://www.kingcounty.gov/environment/wastewater/ReclaimedWater.aspx>  
KC Reclaimed Water

<http://www.ecy.wa.gov/programs/wq/reclaim/ResourcesGuidance.html>

<http://www.ecy.wa.gov/programs/wq/reclaim/advisorycommittee/standards.pdf>  
Water Reclamation and Reuse Guidelines September 1997

<http://www.doh.wa.gov/ehp/ts/WW/wrr/default.htm>  
Division of Environmental Health Water Reclamation and reuse program

<http://www.ecy.wa.gov/programs/wq/reclaim/index.html>  
WA Department of Ecology: Water Quality, Reclaimed Water

<http://www.ecy.wa.gov/pubs/97023.pdf>  
WA Department of Ecology/ WA Department of Health  
Water Reclamation and Reuse Standards September 1997

<http://apps.leg.wa.gov/RCW/default.aspx?cite=90.46>  
Title 90 Chapter 90.46 RCW Reclaimed Water Use

<http://water.washington.edu/Research/Projects/reclaimed%20water/reclaimed%20water%20news.html>  
UW Reclaimed Water Seminar, April 23, 2009. The seminar was cosponsored by the League of Women Voters, the UW Student Chapter of American Water Resources Association (AWRA), and the King County Wastewater Treatment Division.

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Reclaimed Water Washington State Legislative History

<http://www.ecy.wa.gov/programs/wq/reclaim/legislation.html>

WA Department of Ecology: Reclaimed Water Legislation

Reclaimed Water and Impairment

<http://www.ecy.wa.gov/programs/wr/rules/rwwrac.html>

<http://www.ecy.wa.gov/biblio/0911027.html>

WA Department of Ecology Water Rights Impairment Standards for Reclaimed Water  
2009 Report to the Legislature

[http://www.ecy.wa.gov/programs/wq/permits/permit\\_pdfs/king\\_co\\_s\\_water%20reclam/  
SouthWaterReclamationPlant\\_Factsheet.pdf](http://www.ecy.wa.gov/programs/wq/permits/permit_pdfs/king_co_s_water%20reclam/SouthWaterReclamationPlant_Factsheet.pdf)

FACT SHEET FOR RECLAIMED WATER PERMIT ST-7445 King County South  
Wastewater Treatment Plant - Water Reclamation Facility September 30, 2009

<http://ag.arizona.edu/AZWATER/>

University of Arizona Water Resources Research Center

Reclaimed Water Use

<http://www.ecy.wa.gov/biblio/0510013.html>

Case Studies in Reclaimed Water Use DOE 2005

[http://www.seattle.gov/util/About\\_SPU/Water\\_System/Reports/ReclaimedWaterEvaluation/index.htm](http://www.seattle.gov/util/About_SPU/Water_System/Reports/ReclaimedWaterEvaluation/index.htm)  
Seattle Public Utilities

Reclaimed Water Economic Analysis, Seattle Public Utilities, August 2010

<http://ag.arizona.edu/azwater/awr/24613ae3-7f00-0101-014c-28db49ed9286.html>

University of Arizona Water Resource Research Center

<http://watereuse.org/foundation>

“A Reconnaissance-Level Quantitative Comparison of Reclaimed Water, Surface Water, and  
Groundwater”, WateReuse Foundation Product 02-008-01 (April 2009)

Reclaimed Water Toxics

<http://toxics.usgs.gov/regional/emc/index.html>

USGS Toxics Toxic Substances Hydrology Program  
Emerging Contaminants In the Environment

<http://www.ecy.wa.gov/pubs/0710087.pdf>

WA Department of Ecology  
Focus on Toxic Chemicals in Puget Sound Control of Toxic Chemicals in Puget Sound

<http://www.ecy.wa.gov/pubs/1003003.pdf>

WA Department of Ecology Focus on Pharmaceuticals  
and Personal Care Products

<http://www.kingcounty.gov/environment/wtd/Education/EmergingIssues/EDC.aspx>

King County report: Endocrine disrupting chemicals in the environment

<http://green.kingcounty.gov/wlr/waterres/streamsdata/reports/Endocrine-disrupting-compounds.aspx>

Survey of Endocrine Disruptors in King County Surface Waters

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<http://pugetsound.org/pressroom/issues/urban-bay-restoration/stormwater-policy/people-for-puget-sound-stormwater-policy>  
People for Puget Sound Stormwater Policy

Reclaimed Water and Climate Change

<http://cses.washington.edu/cig/res/hwr/hwrkeyfindings.shtml>  
Climate Impact Group Hydrology and Water Resources

<http://cses.washington.edu/cig/pnwc/pnwwater.shtml>  
Climate Impacts Group Climate Impact on Northwest Water Resources

KC Wastewater Maps <http://www.kingcounty.gov/operations/GIS/Maps/VMC/Utilities.aspx#6EF1322CC1EA43FA8F1725533D242A75>

Water Privatization

<http://dissentvoice.org/2010/03/the-business-of-water-privatizing-an-essential-resource/>  
The Business of Water: Privatizing an Essential Resource

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## **League of Women Voters of Seattle Water Positions**

### DRAINAGE AND WASTEWATER MANAGEMENT

- Support the development of governmental policies, legislation, and processes for storm water management that protects and maintain habitats as part of a sustainable ecosystem.
- Support emerging scientifically based practices that encourage best management practices, low impact development and natural drainage systems.

## **Joint Positions of the King County Leagues**

### REGIONAL WATER SUPPLY

- Support water conservation efforts by all users including education programs, voluntary and mandatory conservation requirements that take into account previous conservation efforts and alternative types of water reuse. 1996, 1999
- Support a regional approach to water resources, watersheds, basins, aquifers and to the accountability of any decision-making bodies to citizens. 1999
- Support a legal framework to create a regional water entity to manage regional water development. 1996

### WASHINGTON STATE WATER RIGHTS AND GROUNDWATER PROTECTION

- Support the principle of maximum net benefits including human health and safety, riparian habitat, concurrency of supply with permitted demand, Indian treaty rights, protection of in-stream flow, and hydraulic continuity. 1996, 1999
- “Allocation of waters among potential uses and users shall be based on the securing of the maximum net benefits for the people of the state. Maximum net benefits shall constitute total benefits less costs including opportunities lost.” (Water Resources Act, 1971)
- Support federal and state standards and guidelines on a watershed basis. Other governments should meet or exceed federal and state regulations. County government should be the most restrictive. 1996
- All wells (Class A, B, and single family residential wells) should be measures and the data regarding water withdrawal, use and claims be reported to King County and the Department of Ecology.