NOTE: This impact assessment is based on the Service Strategies as presented in the Draft RWSP. See Part I of this FEIS for revised strategy descriptions and analysis.

Chapter 9
RECLAIMED WATER APPLICATIONS, IMPACTS AND MITIGATION MEASURES

Introduction

Wastewater reclamation and reuse is the practice of treating and managing wastewater to produce water of suitable quality for beneficial uses. All nonpotable uses of water can be supplied with properly treated reclaimed wastewater of less than drinking water quality.

In many parts of the world, properly treated wastewater has become an attractive option for conserving and extending available water resources. Reclaimed water may also present an opportunity for pollution abatement (a beneficial impact) when it replaces effluent discharge to sensitive surface waters or is of better quality than receiving waters.

The RWSP and this DEIS discuss the production of reclaimed water at the treatment plants as part of each service strategy, and as three service strategy options (DEIS Chapter 12). Environmental impacts associated with the application of reclaimed water for uses in close proximity to treatment plants and effluent transfer pipes is discussed in this chapter. There are no unique environmental impacts associated with the production and delivery of reclaimed water that are not covered by the discussion of treatment plant operations in Chapters 5-8.

The potential role of reclaimed water in meeting the region's future water supply demand is a major issue addressed in the RWSP. Three options to the service strategies have been developed to represent this large scale use of reclaimed water: Discharge at the Ballard Locks; discharge to Lake Washington/Sammamish; and North Plant Discharge to Lake Washington. Environmental issues that would need to be addressed prior to the implementation of the service strategy options are discussed in Chapter 12 of this DEIS.

This chapter of the DEIS (Chapter 9) provides a programmatic analysis of the potential environmental impacts of utilizing reclaimed water for two of the uses defined and allowed by the State of Washington's Interim Standards (Departments of Health and Ecology (DOH and DOE). Specifically, impacts and mitigation measures associated with irrigation and the use of reclaimed water for "process water" within the treatment plants (essentially an industrial use) will be the primary focus.

It is also a focus because these uses are representative of other allowable uses of reclaimed water. Irrigation with reclaimed water is representative of uses that involve exposure of the reclaimed water to the air (e.g. street cleaning, firefighting, decorative

fountains, etc.) and where there is a high probability of public exposure. Using reclaimed water to undertake industrial processes in the treatment plants is representative of most other types of industrial uses (except those using mists for cooling). Reclaimed water is also suitable for use in recreational or landscape impoundments and may, in the future, be allowed to be discharged into constructed wetlands. Where these uses present different or unique environmental consequences, there will be a discussion also at a programmatic level.

For the purposes of this environmental analysis, it is assumed that reclaimed water will be treated to a "Class A" level as defined by the Washington Water Reclamation and Reuse Interim Standards (see Appendix D). Class A reclaimed water has the highest level of treatment and quality designated by the State of Washington. Treatment includes oxidation (secondary treatment), coagulation, filtration, and disinfection to a level resulting in a median number of total coliform organisms not to exceed 2.2 per 100 ml in seven consecutive daily samples, with no sample exceeding 23 per 100 ml.

In the future, there may be reasons to treat reclaimed water to higher than Class A quality (e.g., treated to a level meeting drinking water quality standards, Washington surface water standards, irrigation water quality guidelines or other relevant standards and/or guidelines). This may apply to uses involving replenishing groundwater supplies or discharging reclaimed water to surface water bodies. In any case, reclaimed water treated to a water quality standard above Class A would have virtually negligible adverse environmental impacts.

In the following discussion, environmental impacts are identified and mitigation measures for irrigation and industrial process use are suggested that are not site specific, but could potentially result from the use of reclaimed water within the service area. Individual site specific assessments or environmental analyses may be appropriate in the future to determine whether unique characteristics are present at locations where reclaimed water is proposed to be applied. Part of this programmatic impact analysis is based on conclusions reached through the following risk assessments conducted by King County: *Metro Effluent Baseline Risk Assessment* (April, 1993)and *Addendum to Metro Effluent Baseline Risk Assessment* (December, 1994). This study, evaluated the use of secondary effluent to irrigate a public golf course and a recreational park and to cool an industrial complex via a closed-loop, non-contact system. Although this use of less than Class A quality is not proposed for irrigation, this study represented a "worst case" scenario against which more highly treated effluent could be measured. In it, the constituents in King County's secondary effluent, the possible risks to humans and wildlife from reuse of King County's secondary effluent and the reduction of risks associated with several advanced treatment methods were studied. One other risk assessment was on a specific "representative site": *A Summary and Explanation of Risk Assessments Related to Potential Landscape Irrigation with Reclaimed Wastewater at the Boeing Longacres Park Office Complex*, (December 1994). The results of these risk assessments can be used to identify impacts and mitigation measures appropriate for other situations and similar sites.

There are three other classes of reclaimed water as designated by the state of Washington that are lower quality than Class A. Reclaimed water Classes B, C and D require oxidation and disinfection with a median number of coliform organisms not exceeding 2.2, 23 and 240, respectively, per 100 ml. Appropriate uses of these reclaimed water products depend on the potential for exposure to humans or biota (see Appendix D).

In general, Class B reclaimed water uses are similar to Class A uses with a few exceptions. Class B reclaimed water must meet the same numerical standard for coliform as Class A (see Appendix D). The difference is that Class B reclaimed water is not required to undergo coagulation or filtering. The presumption is that these processes, in addition to oxidation and disinfection, remove a greater number of viruses and other organisms. Therefore, Class B uses are nearly identical to Class A uses except where there may be exposure to the public from sprays or mists (which could transmit viruses more readily than other exposure pathways).

Classes C and D have much lower coliform standards (does not exceed 23 per 100 milliliter (ml) for Class C and 240 per 100 ml for Class D). Both these classes of reclaimed water can be used for some irrigation purposes. Class C can be used for more industrial uses than Class D.

Potential Reclaimed Water Applications

With feasible treatment technology and under appropriate conditions, reclaimed water may be used for virtually all nonpotable purposes for which potable water currently is used. The overriding consideration is that the quality of the reclaimed water be appropriate for its intended use. This includes an assessment of the potential for public exposure relative to the degree of disinfection and treatment that reclaimed water receives.

"Direct" use of reclaimed water requires pipelines or other conveyance facilities for delivering reclaimed water to the point of use. "Indirect" reuse, such as discharge of reclaimed water to a receiving water for assimilation and withdrawals downstream, is also recognized to be an important potential application. This "indirect" use of reclaimed water discharged to the Lake Washington drainage basin is not allowed at this time. General reclaimed water use categories currently possible in Washington State include:

- Landscape irrigation
- Agricultural irrigation
- Industrial use
- Groundwater recharge
- Nonpotable urban use
- Miscellaneous

Examples of water reuse applications included in each of these use categories are presented in Appendix D. Although the majority of uses are not part of the RWSP proposal, these activities and uses may be considered in the future.

Reclaimed Water Facilities

Reclamation facilities required to process treatment plant effluent and distribute Class A reclaimed water include chemical coagulation, filtration and disinfection processes (e.g. using chlorine, Ultraviolet light or ozonation), storage and distribution piping and pumping. The reclamation production facilities are above ground except possibly for summer storage in the chlorine contact channel.

Distribution to usage areas is through either gravity flow or pumped conveyance. Pipelines for a facility as described (1 mgd) would typically be between 10 and 24-inch diameter. Pipeline lengths and alignments would depend on project-specific application sites.

Both the East and West treatment plants have recently added reclamation facilities to produce Class A reclaimed water per the Washington State reuse standards.

Reclaimed Water Use in King County

MetroTherm

Non-consumptive use of effluent (where the entire quantity diverted for use is returned to its source) by King County can be traced to the mid-1980's when the East Treatment Plant began using secondary effluent in its heat pumps. The effluent, with a temperature up to 70 degrees Fahrenheit, is an ideal heat transfer medium between King County's effluent pipelines and the mechanical systems that heat and cool businesses or industrial facilities. Metro and the Washington State Energy Office began investigating use of the effluent from the proposed effluent transfer system for a district heating and cooling system. Seven taps along the Effluent Transfer System (ETS) were included in the initial construction. They remain available for customers along the Duwamish corridor to use for withdrawal of secondary effluent for heating and cooling purposes with subsequent discharge back into the ETS.

Reclaimed water is also available for use in the immediate vicinity of the East Treatment Plant in Renton. Chlorinated secondary effluent from the plant can be used without additional treatment as an energy source since it is delivered and returned with a once-through, closed-loop system. It is not "consumed" by the customers' process or product. A closed loop effluent line has been installed between the East Treatment Plant and a nearby industrial development. Such a system has not been developed at the West

Treatment Plant because it is located at the point of effluent discharge, does not have an effluent transfer line available and there are no nearby customers at present.

Production and Consumptive Uses
In the summer of 1992, Metro and the City of Seattle designed a temporary reclamation facility in response to the emergency drought situation. This pilot project produced highly treated effluent which was available to be hauled by tanker truck from the site and used as appropriate. This pilot facility is no longer in use although some of the equipment has been incorporated into the West Treatment Plant reclaimed water facility.

King County's current reclaimed water program consists of producing "Class A" reclaimed water for use at, or in the vicinity of, the two regional treatment plants. The East Treatment Plant is capable of producing approximately 1.3 million gallons per day (mgd) of reclaimed water and the West Treatment Plant can produce 0.7 mgd. The current uses include landscape irrigation and use as process water within the treatment plants (a supply of water where less than potable quality is acceptable). In the near term, these applications are the most likely to be implemented although any of the uses described in the "Interim Standards" would be appropriate.

Although it has not yet occurred, there is interest in drawing secondary effluent off the effluent transfer system which runs from Renton through the Duwamish Industrial area to Duwamish Head. The effluent would receive additional on-site treatment to produce any class of reclaimed water, depending on the proposed application. Industrial uses of reclaimed water currently appear to be the most likely due to the land use character of the Duwamish area. The use of industrial process water of a Class A character is discussed in this chapter. If an industrial use of reclaimed water of less than Class A is proposed, it would have to comply with the Washington State Interim Standards. With the use of Class B reclaimed water, the risk of exposure to bacteria would be the same as for Class A although the risk of exposure to viruses and other organisms could be greater. The risk of exposure to bacteria would increase with the use of Class C and be the greatest with Class D reclaimed water. Environmental impacts associated with such a proposal would need to be evaluated on a case by case basis each time through SEPA environmental review.

Reclaimed Water and the Regional Wastewater Services Plan

Service Strategies

Both the East and West treatment plants have recently added reclamation facilities to product Class A reclaimed water per the Washington state reuse standards. It is proposed that if an additional treatment plant is added to the regional system (north end plant described in Service Strategy 2 and Service Strategy 3) it would be designed to include reuse production facilities. It is also reasonable to assume that if a north end plant were located inland and some distance from the outfall, the pipeline transporting treated effluent could be tapped along its route to reuse part of the effluent.

Service Strategy Options

Three of the service strategy options considered in the RWSP involve the large scale use of reclaimed water. Potential environmental impacts associated with these service strategy options are discussed in Chapter 12 of this DEIS. Because they are service strategy options rather than specific proposals at this time, the level of analysis provided there is introductory and general.

Impacts and Mitigation Measures Associated with Applications and Uses of Reclaimed Water

Construction of reclaimed water facilities includes installation of tanks, process equipment, and small underground pipelines. Environmental impacts resulting from the construction of reclaimed water production facilities are typical of those experienced during the construction of other wastewater facilities and are addressed in Chapter 11. Environmental impacts associated with operating reclaimed water facilities are very similar to those previously described for secondary treatment facilities only on a much smaller scale. These operational impacts have been discussed in Chapters 5-8. The following discussion pertains to impacts and mitigation measures associated with the application and use of Class A reclaimed water.

Earth Resources

Applications and Impacts

Reclaimed water has the potential to impact earth resources adversely when substances present in the reclaimed water are introduced into the soil. This could occur either directly, as in irrigation with reclaimed water, or indirectly, when runoff from activities using reclaimed water reaches the soil. The most likely activity to result in impacts to earth resources is irrigation where reclaimed water is sprayed on the landscape periodically during the summer months.

Constituents of potential concern include salts, metals, synthetic organic chemicals and certain long-lived pathogens that may be highly resistant to disinfection.

It is unlikely, however, that constituents in reclaimed water would accumulate rapidly in irrigated soils. Preliminary evaluations presented in the risk assessments conducted by King County found that, at the representative site studied, it would take at least 300 years of irrigation with Class A reclaimed water to cause an incremental accumulation of metals to levels above current Washington soil cleanup levels under the Model Toxics Control Act (MTCA).

For a discussion of impacts resulting from human contact with pathogens that could be present in reclaimed water, see Environmental Health section later in this chapter.

Mitigation Measures

Application of Class A reclaimed water at agronomic rates (matching crop uptake with water demand to minimize the potential for leaching) should not result in adverse impacts to earth resources. Reclaimed water undergoes several treatment processes prior to being distributed for irrigation purposes. Many of the constituents and levels of constituents that could adversely impact earth resources have been removed by the treatment processes prior to distribution and reuse.

In addition, application rates for irrigation can be controlled by calibrating the quantity of irrigation water used to the moisture content of soils so that over irrigation does not occur.

Pre- and post application monitoring of soils for the constituents described above could be conducted for each site using reclaimed water so that levels could be tracked and evaluated.

Air Resources

Applications and Impacts

The types of applications that could result in impacts to air resources generally fall into two main categories: those that have the potential to generate aerosols (i.e., tiny droplets of water formed by mechanical processes such as spraying or splashing) and those that have the potential to release volatile compounds (e.g., vapors of organic compounds such as chloroform). Odor impacts associated with air resources are generally related to the release of volatile compounds (gases and vapors).

Spray irrigation using reclaimed water is the application most likely to generate aerosols. Certain industrial processes involving spraying operations and operations that generate steam also generate aerosols. The most likely impacts to air resources would include the release of reclaimed water constituents to the air in either the environment or the workplace. Both aerosols and volatile compounds are easily inhaled by humans and animals. If sufficient quantities of chemicals and/or pathogens enter the body the result can be adverse health effects.

The results of the risk assessments conducted for a representative site in King County indicated that, for likely reuse applications, the risks from airborne chemicals and microorganisms from reclaimed water were negligible (i.e., within or below the range of risks considered to be “acceptable” by the U.S. Environmental Protection Agency).

For a more complete discussion of potential impacts to human health, see the section on Environmental Health later in this chapter.

Mitigation Measures

The primary means of mitigating potential adverse impacts resulting from applications of reclaimed water that produce aerosols (irrigation or spray, mist industrial operations) or vapors is avoidance of direct contact.

Irrigation with reclaimed water can be scheduled to occur only at night or during other times when human exposure would be unlikely or could be restricted.

Where reclaimed water is part of an industrial process, mitigation for adverse air impacts in the workplace, such as impacts resulting from a spill, include ventilation of enclosed spaces with adequate air exchange with outside air. Industrial exposure to airborne contaminants can also be avoided by conducting industrial processes using reclaimed water in enclosed tanks or other sealed vessels. Protective clothing and respiratory protection can be provided where exposure would be otherwise unavoidable.

Additional mitigation measures for the workplace include signage, training and appropriate operations and maintenance procedures for equipment, all of which can be integrated into the employer's existing health and safety program.

Water Resources

Applications and Impacts

Based on conclusions reached in the risk assessments, irrigation with reclaimed water would be unlikely to degrade water quality. The site specific risk assessment predicted that there would be no adverse effects on groundwater quality from irrigation with reclaimed water for hundreds of years, if not more than 1,000 years.

Surface water resources could, however, experience adverse impacts if irrigation occurred at rates that allowed for overland runoff into surface water or because of overspray or spray drift onto nearby surface waters

Potential adverse impacts to water resources (surface and groundwater) could include contamination of these waters with constituents that may be found in reclaimed water (i.e., chemicals and pathogens). Possible results could include toxicity to humans, wildlife or plant species from chemical constituents, risk of infection to humans from pathogens, and eutrophication of surface water from nutrients (primarily phosphorus and nitrogen) in the reclaimed water. Nitrogen can also accumulate in groundwater if present in sufficient quantities in water used for irrigation.

Applications with potential adverse impacts to groundwater include (a) irrigation at rates that allow for dry weather percolation through soil to groundwater; and (b) irrigation at

rates that allows accumulation of reclaimed water constituents in soil until such time as wet-weather precipitation drives the constituents downward into groundwater.

Potential beneficial impacts to water resources could occur when the quality of the treated effluent is higher than the receiving water. If the treated effluent was introduced in sufficient quantity, it would dilute the receiving water and provide an overall improvement to water quality.

Wetlands can also be affected by intentional or unintentional discharge of reclaimed water to wetlands or drainages leading to wetlands. The Departments of Ecology and Health are developing draft regulations for beneficial discharge of reclaimed water to wetlands for flow enhancement, water quality improvement and/or other beneficial impacts.

Potential adverse impacts to wetlands may include eutrophication due to excess nutrient loading, presence of constituents that are harmful to aquatic life (e.g., chemicals, potential pathogens, BOD) and other qualities and physical properties of the water that may be deleterious to plants and animals (e.g., temperature and rate of flow).

In the near future it may be permitted to intentionally discharge reclaimed water to groundwater through surface spreading or direct injection through subsurface wells. These practices would replenish dwindling groundwater supplies, prevent ground subsidence, and indirectly could increase streamflows for streams dependent on groundwater as a water source.

Constituents present in the reclaimed water could be introduced into groundwater as well. Reclaimed water can also extract or leach materials from the soil which then could be mobilized into groundwater. If these constituents are present in sufficient quantities, they could adversely affect the quality of groundwater.

Proposed regulations are considering the conditions under which groundwater recharge could be permitted using reclaimed water.

Mitigation Measures

King County has an Industrial Waste/Source Control Pretreatment Program that assists industrial and commercial enterprises in controlling their waste products and preventing wastes from entering the sewer system. Through this program, permits are issued limiting the amount and type of discharges that industries can release into the sewer. These permits require industries to monitor the quality of their discharges and to remove potentially hazardous materials before discharging into the collection system. The success of this program has resulted in significantly lower levels of many constituents, primarily metals, in wastewater. The improved quality of the influent entering the treatment plants also improves the quality of the secondary effluent that is discharged or treated to a higher reclaimed water standard.

The risk assessments cited previously found negligible potential for adverse impacts to surface water and groundwater for the likely reuse scenarios that were studied. This is because the quality of Class A treated effluent is high and the majority of potentially harmful chemicals and pathogens are substantially removed during the treatment process.

The Washington interim standards require monitoring of reclaimed water for quality for parameters that indicate the continued operational effectiveness of the reclaimed water treatment process. Compliance with these standards would be expected to prevent any significant risk to public health from pathogens. Where appropriate, additional monitoring could be conducted to ensure that reclaimed water constituents are not present at levels that could have adverse impacts to water resources.

In addition to the Class A quality requirements, the Washington reuse standards include requirements for treatment reliability to prevent the distribution of reclaimed water that may not be adequately treated because of a process upset, power outage, or equipment failure. Reliability requirements include provisions for alarms, standby power supplies, multiple or standby unit treatment processes, emergency storage or disposal provisions and standby replacement equipment.

The Washington standards also include operations, sampling and analysis, engineering reporting, and land use area requirements, as well as general design requirements. Dual distribution systems (i.e., reclaimed water distribution systems that parallel a potable water system) must also incorporate safeguards to prevent cross connections with reclaimed water. For example, piping, valves, and hydrants must be marked or color-coded (purple) to differentiate reclaimed water from potable water, and backflow prevention devices must be installed.

Wetlands standards have recently been proposed to amend the Washington interim standards. They are designed to protect wetlands from adverse impacts from the flow rate, water depth, and/or constituents that may be present in reclaimed water. When these standards are applied the potential for adverse environmental impacts to wetlands would be minimal.

According to the proposed regulations, mitigation to ensure groundwater quality is maintained may include treating the effluent to meet drinking water quality standards.

Biological Resources

Applications and Impacts

Potential adverse impacts to biological resources from the use of reclaimed water could include potential exposure to and bioaccumulation of toxic chemicals and the potential for ingestion or inhalation of pathogens. Exposure to, or bioaccumulation of these constituents could affect animals directly exposed, and/or their offspring, or transfer them to a higher trophic level in the food chain. However, very few of these substances

are detected in King County's secondary effluent and even fewer would remain after treatment to a Class A level.

The risk assessments previously cited included an "ecological health" element where potential impacts to biological resources were assessed. The ecological portion of the risk assessments concluded that risks to aquatic life were likely to be limited, even with a lower than Class A level of treatment. It was also predicted that the use of reclaimed water was unlikely to adversely affect terrestrial wildlife (such as moles and robins) that typically inhabit golf courses and parks, likely candidate sites to be irrigated with reclaimed water.

Plants are more likely to be affected by the use of reclaimed water than animals. Some inorganic compounds (e.g., sodium, chloride, boron) could accumulate and adversely affect the germination, establishment, growth, survival, and/or appearance of plants if present in high concentrations in the reclaimed water or if applied to soils in such a way as to allow for accumulation to high concentrations in the soil.

Mitigation Measures

Mitigation measures to ensure ecological health is maintained include monitoring the quality of the reclaimed water to ensure that it consistently meets the Class A standard (as required in the Interim Guidelines). Monitoring certain parameters at the application site as irrigation occurs could provide an additional safeguard.

If high levels of mineral salts and inorganic compounds are known to be present in the reclaimed water, plant materials can be selected that are proven to be tolerant of these conditions.

Some wetland plants are known for their ability to take nutrients and other constituents from the water into the plant tissue. If wetland discharge is considered in the future, incorporating these plants into the design of constructed wetlands could provide additional mitigation.

Energy

Applications, Impacts and Mitigation Measures

The closed-loop non-consumptive system provides effluent to be used be as an energy source for heating or an energy sink for cooling processes used by businesses and industrial facilities (MetroTherm). By using the heat from the effluent (usually at 70 degrees) as a source of energy, the demand on other consumptive energy sources (oil, natural gas, etc.) can be avoided resulting in beneficial impacts. Using the heat contained in treated effluent as an energy source can be considered to mitigate adverse impacts associated with developing and using many other sources of energy.

Environmental Health

Applications and Impacts

Applications of reclaimed water with the potential for human exposure to the water include (1) irrigation of areas accessible to the public (e.g., golf courses, recreational parks and public playfields); (2) charging of recreational impoundments and augmentation of streamflow in water bodies used for fishing, boating and water contact sports; (3) industrial reuse, especially in situations where workers could come into direct contact with reclaimed water or be exposed to aerosols and/or vapors in confined spaces or other poorly ventilated areas.

Potential pathways and routes of exposure include: direct skin contact with reclaimed water; accidental ingestion of reclaimed water; inhalation of spray (e.g., from irrigation and/or inhalation of dust) from resuspended soils irrigated with reclaimed water); and direct skin contact with or ingestion of irrigated soils.

Potential health effects are directly related to the level of contaminant removal and microbiological inactivation provided to the wastewater before reuse and the level of human contact associated with the water reuse system. As the level of treatment increases and the level of human contact decreases, the possibility of adverse public health effects related to water reuse is decreased.

The factors which influence the level of health risk of infectious disease from waterborne transmission include the identity of the specific infectious agent, the reservoir of the agent, the mode of transmission and the susceptibility of the host. In determining potential health risks, infectious agents are evaluated based on their potential to produce disease (virulence), the stability in the environment and their size. Not all infectious agents have equal potential for causing human illness.

There is ample evidence that most bacterial, parasitic, and viral agents can be removed from wastewater effluent by the current filtration and disinfection methods. The absence or significant reductions of total coliform and turbidity are considered to be reliable indicators of a well-operated plant and highly treated reclaimed wastewater. These indicators are monitored to ensure the virtual absence of detectable wastewater related pathogens in reclaimed water.

The absence of potential health risks associated with the reuse of reclaimed water have been well documented nationwide as water reuse projects are implemented and carefully monitored by health authorities and water quality control agencies. This has resulted in findings that the risk of infection and disease are negligible.

King County has recently studied the potential risks associated with using reclaimed water. The *Metro Effluent Reuse Baseline Risk Assessment* (April 1993) characterized the chemical and biological constituents in the secondary effluent produced at the East and West treatment plants, the possible risks to humans and wildlife from reuse of this

secondary effluent, and the reduction of risks associated with several advanced treatment methods.
The risk assessment evaluated the use of secondary effluent to irrigate a public golf-course and a recreational park and to cool an industrial complex via a closed-loop, non-contact system. By considering worst-case scenarios, a baseline was established to identify potential problems with reuse and ways to manage associated risks. Similar evaluations were conducted for each of the advanced treatment methods to identify the degree of further risk reduction.

The public health portion of the risk assessment concluded that even reuse of secondary effluent has limited potential to adversely affect human health. The use of Class A reclaimed water for irrigation would pose negligible risk to public health and the environment.

Mitigation Measures

The State of Washington Water Reclamation and Reuse Interim Standards protect public health by requiring a specific level of water quality and treatment corresponding to each beneficial use of reclaimed water. King County's facilities produce the highest quality effluent designated by the State of Washington, i.e., Class A. There are numerous safeguards to ensure that the system is operating safely and reliably. These standards are among the most stringent in the world.

Treating wastewater to a Class A standard provides the greatest safeguard towards protection of public health; however, any potential risk to the public could be lowered even further by implementing some or all of the following measures:

- Irrigation could occur at night when public exposure is likely to be low,
- public education (e.g., posting of signs)
- environmental monitoring (e.g., soil and water sampling)
- appropriate irrigation system design and operation (e.g., providing for emergency shut-off of the irrigation system in the event of a pipe rupture) and;
- implementation of appropriate irrigation system maintenance procedures.

If necessary and appropriate, reclaimed water could be treated to a level higher than the current Class A water quality standards (e.g., treated to a level meeting drinking water quality standards, Washington surface water quality standards, irrigation water quality guidelines or other relevant standards and/or guidelines).

Recreation

Reclaimed water is approved for use in irrigating recreational sites including parks, playfields and golf courses. The potential for adverse impacts resulting from this use of reclaimed water is negligible. Sections on Biological Resources, Water Quality and Environmental Health include more specific information.

Utilities and Public Services

Applications and Impacts

Irrigation or other use of reclaimed water relieves some demand on potable water supplies, extending those supplies, particularly in drought conditions.

Also, there is the potential for a reclaimed water delivery line to leak or rupture under certain circumstances. The uncontrolled release of reclaimed water could contaminate a potable water supply system if it was located in the immediate vicinity.

Mitigation Measures

There are requirements governing the siting and construction of reclaimed water lines, particularly as they relate to proximity to potable water lines. Reclaimed water distribution systems that parallel a potable water system must also incorporate safeguards to prevent cross connections of reclaimed water and potable water lines and misuse of reclaimed water. In general, reclaimed water pipes must be located at a prescribed minimum vertical distance and depth. Purple is the color used to designate reclaimed water pipes and sprinklers.