RONALD WASTEWATER DISTRICT

COMPREHENSIVE SEWER PLAN

CHS ENGINEERS, LLC

January 2010

Ronald Wastewater District

COMPREHENSIVE SEWER PLAN

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King County, Washington

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This report was prepared under the direction of a registered professional engineer.

Prepared by: N. Diane Pottinger

Checked by: _____

Approved by: _____

Date: 2/2/2010

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Ronald Wastewater District
17505 Linden Avenue North
Post Office Box 33490
Shoreline, Washington 98133
(206) 546-2494

COMMISSIONERS

Arnold H. Lind
Arthur L. Wadekamper
Brian T. Carroll

GENERAL MANAGER

Michael U. Derrick

DISTRICT ENGINEERS

CHS Engineers, LLC
12507 Bel-Red Road, Suite 101
Bellevue, Washington 98005
(425) 637-3693
www.chsengineers.com

DISTRICT ATTORNEYS

Hendricks-Bennett, PLLC
402 5th Ave S
Edmonds, WA 98020
(425) 775-2751

RONALD WASTEWATER DISTRICT

COMPREHENSIVE SEWER PLAN

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DEFINITIONS

Corporate Boundary	Legal boundary.
District Service Area	Area in which the District owns and maintains the sewer collection system.
Wastewater	Throughout this plan the terms “waste water” and “sewer” are used interchangeably.

ABBREVIATIONS

AADF	Annual Average Daily Flow
AC	Acre
CCTV	Closed-Circuit Television
CFS	Cubic Feet per Second
City	City of Shoreline
CMOM	Capacity, Management, Operations, & Maintenance
CSI	Conveyance System Improvement
CSO	Combined Sewer Overflows
DE	Developer Extension
District	Ronald Wastewater District
DOE	Department of Ecology
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FPS	Feet per Second
F.O.G.	Fats, Oils, & Grease
FTE	Full-time Equivalent Student
GAL	Gallons
GFC	General Facilities Charge
GIS	Geographic Information Systems
GMA	Growth Management Act
GPAD	Gallons per Acre per Day
GPCD	Gallons per Capita per Day
GPM	Gallons per Minute
HDPE	High Density Polyethylene (pipe)
HPA	Hydraulic Project Approval
HUD	US Department of Housing and Urban Development
I/I	Infiltration and Inflow
JARPA	Joint Aquatic Resources Permit Application
KC#3	King County Sewer District No. 3
KCDNR	King County Department of Natural Resources
LCSD	Lake City Sewer District
LF	Linear Feet
MGD	Million Gallons per Day
NPDES	National Pollution Discharge Elimination System
NWP	Nationwide Permits
OFM	Washington State Office of Financial Management
OVWSD	Olympic View Water and Sewer District
PAA	Potential Annexation Area
PSRC	Puget Sound Regional Council
PVC	Polyvinylchloride (pipe)
PWTF	Public Works Trust Fund
RCE	Residential Customer Equivalents
RCP	Reinforced Concrete Pipe

RWD	Ronald Wastewater District
RWSP	Regional Wastewater Services Plan
SAZ	Shoreline Analysis Zones
SPU	Seattle Public Utilities
SSA	Special Study Areas
SSO	Sanitary Sewer Overflows
SWD	Shoreline Water District
Town	Town of Woodway
ULID	Utility Local Improvement District
WAC	Washington Administrative Code
WRIA	Water Resource Inventory Area
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY AND RECOMMENDATIONS

BACKGROUND

The subject of this report is the public sewer collection system owned, operated and maintained by Ronald Wastewater District. The District is a municipal corporation in the form of a special purpose district, under RCW 57. The District provides public sewer service to the majority of the City of Shoreline in King County and an unincorporated portion of Snohomish County. This area is known as the District's corporate or service boundary (see Figure 1.1).

The District is bordered on the west by Puget Sound and on the north by the Town of Woodway. The eastern boundary line is the Town of Woodway and the City of Lake Forest Park. The southern boundary is the Highlands Sewer District and the City of Seattle. The District presently includes approximately 6,870 acres. The sewer service area and District corporate boundary are shown on Figure 1.2.

The District was formed as Ronald Sewer District in 1951. The first sewers were installed in 1960. The District office is located at 177505 Linden Avenue North, Shoreline, Washington 98133, telephone (206) 546-2494.

The following paragraphs present a condensed summary of the Comprehensive Sewer Plan, covering the principal features of this report. Specific recommendations are presented in this summary based on findings and conclusions reached during the study of the sewer system.

PHYSICAL CONSIDERATIONS

Elevations range from 250 feet to just over 500 feet throughout the District and down to the marine shoreline of Puget Sound. There are some wetlands, unclassified streams, and geologic hazard areas prone to landslide, seismic and erosion hazards primarily located on the bluffs along Puget Sound or along creek beds. The water supply is provided by Shoreline Water District, Seattle Public Utilities and Olympic View Water and Sewer District. There are 953 wells that are active in the District with the majority of them resource protection wells.

POPULATION

The annual population growth rate has been of within the City of Shoreline has been 0.2% since 2000 or 1.9% total for the current nine year period according to the Washington State Office of Financial Management. Areas of future growth have been identified by the City of Shoreline and within the Point Wells area of Snohomish County. These areas are expected to have an increase in population of 19,425 people and 5,687 future jobs over the next 20 years. This equates to 11,555 future residential customer equivalents (RCEs) by 2030.

DESIGN CRITERIA

The design criteria used in this comprehensive plan is based on “Criteria for Sewage Works Design” established by the State of Washington Department of Ecology, District historical design criteria, actual usage records and other accepted standards for wastewater system design and construction.

SEWER SYSTEM

The Ronald Wastewater District collection system is composed of approximately 190 miles of gravity sewer mains and 16 lift stations. The District has completed at least one or more improvement projects since 2000. Infiltration and inflow (I/I) has been studied within the District and a side sewer replacement project was completed, which significantly reduced I/I. The District’s maintenance staff complete regularly scheduled lift station inspections, manage a Fats, Oils and Grease (F.O.G.) inspection program with local commercial and multi-family customers, monitor infiltration and inflow, clean and inspect sewer mains. Maintenance related problems are identified through the District’s maintenance management system. If a sewer main has structural problems, requires root removal on a regularly scheduled basis and/or has degenerated pipe, it may likely be scheduled for repair, rehabilitation or replacement. Sewer mains expected to be overcapacity at build out conditions are identified by a District wide hydraulic model.

WASTEWATER TREATMENT

The District does not own or operate a wastewater treatment facility. Sewage from the District’s collection and transmission system is eventually treated at either King County Wastewater Treatment Facilities or the City of Edmonds wastewater treatment plant. Removing I/I reduces the amount of water that has to be treated at these treatment plants. King County and Seattle Public Utilities have been looking at reclaimed water options throughout King County and the District’s service area.

AGREEMENTS

The District has agreements with adjacent purveyors and land use agencies for a variety of reasons. One of the agreements with Seattle Public Utilities (SPU) includes a provision for the District to share in the cost of upgrading sewer mains, should the areas within the District and Seattle grow as identified. The overcapacity lines in the SPU areas are identified and shown in Figure 7-1.

CAPITAL IMPROVEMENT PLAN

The Capital Improvement Plan identifies projects that will be necessary to extend sewer service throughout the District corporate area, including the District’s new side sewer replacement policy. Several of the projects are recommended for completion over the next ten years, as summarized in Tables 8-1 and 8-2.

FINANCES

The monthly service charge includes two components: a District charge and a treatment charge. The treatment charge is a pass through charge. The District charge pays for operation, maintenance, debt service and capital projects for the District. The proposed projects identified in the Capital Improvement Plan will be funded by the month charge, general facility charges from new customers, bonds, grants and low interest loans.

RECOMMENDATIONS

On the basis of the information presented in this report, it is recommended that Ronald Wastewater District:

1. Conduct a public hearing to receive input on the plan; specifically, the Capital Improvement Plan. Review and update the Capital Improvement Plan annually in conjunction with the annual budget and general facility charge review process, including public hearings.

2. Adopt the Comprehensive Sewer Plan for improvements as set forth herein.

3. Submit copies of this report to appropriate regulatory agencies for approval.

4. Complete the recommended wastewater treatment collection system improvements.

5. Continue evaluation of the sewer collection system for excessive inflow and infiltration and implement measures to eliminate such flows.

6. Periodically review the Plan and update it to conform to actual growth patterns and population levels and to remain consistent with land use designation.

CHAPTER 1

INTRODUCTION

This document sets forth the Comprehensive Sewer Plan for Ronald Wastewater District (RWD or District), Shoreline, Washington. This Plan has been prepared in general conformance with the requirements of the Washington Administrative Code (WAC) for sewer plans 173-240-050. This plan updates and integrates previous sewer facilities plans, studies and proposals including:

- *Comprehensive Sewer Plan,* Ronald Wastewater District, CHS Engineers, Inc., April 2001.
- *Lake City Sewer District System Service Area Comprehensive Sewer Plan,* Ronald Wastewater District, CHS Engineers, Inc., June 2003.
- *Comprehensive Sewer Plan Amendment No. 1,* Ronald Wastewater District, CHS Engineers, LLC, August 2007.
- City of Shoreline *Comprehensive Plan,* Ordinance 547, May, 2009.
- King County *Buildable Lands Report 2007*, September 2007.

1.1 AUTHORIZATION

Recognizing the need for the continuing development of the District's sewer facilities, the Ronald Wastewater District Board of Commissioners authorized CHS Engineers, LLC to proceed with the studies required to prepare a Comprehensive Sewer Plan. The plan has been written to conform to the requirements of the Washington Administrative Code (WAC) 173-240-050, was approved by the Board of Commissioners of Ronald Wastewater District by resolution and was submitted to the Department of Ecology, King County, Snohomish County, and the cities of Edmonds and Shoreline for review and approval. The District, as lead agency, reviewed a SEPA checklist and issued a threshold determination on October 7, 2009 (see Appendix B).

1.2 PURPOSE AND SCOPE

The purpose of this report is to establish a comprehensive sewer plan which will guide the Ronald Wastewater District in the planning process for providing and maintaining sewer service within the District's corporate boundary in the City of Shoreline and unincorporated Snohomish County. This plan has been updated from the 2001 and 2003 Comprehensive Sewer Plans in addition to the 2007 Amendment to address increased housing and business density which are likely to occur as a result of the City of Shoreline changes in land use and zoning.

Snohomish County has designated an area within the District corporate boundary where new development is likely to occur but currently no final land use changes have been made. This report has been prepared to bring all the Comprehensive Sewer Plans under one document and to address the increased development with the District's corporate boundary. The plan covers capital improvement needs and estimated project costs for the short term (6 years) and long term (20 years) planning periods. The studies leading to the preparation of this report included:

A. A review of existing planning data and material pertaining to the District's corporate area.

B. Using City of Shoreline's planning data from the King County Buildable Lands Report 2007 a projection of anticipated population growth in the District's sewer service area was made to forecast wastewater generation for the next 20 years.

C. Using Puget Sound Regional Council and Snohomish County data, a projection of anticipated population growth in the District's Snohomish County wastewater service area was made to forecast wastewater generation for the next 20 years. The planning data from the 2009 FEIS for Point Wells area in Snohomish County was reviewed but as the land use has not officially changed, projects will have to be updated to reflect the final adopted land use.

D. A review of existing sewer facilities to determine their current and future adequacy, current conditions, and a review of sewer system design criteria.

Using the information obtained from these steps and previous reports, a general plan and map showing future facilities or improvements for the sewer system was developed. These facilities were analyzed to identify appropriate system sizing and provide preliminary cost estimates for the proposed facilities in the area for the next 20 years.

1.3 MISSION

Ronald Wastewater District was conceived with the intent of providing improved sewerage service to its residents and maintaining rates to protect the integrity of the facilities. The District continues to strive to meet that objective. In an effort to provide quality service, the District initiated a number of actions and goals over the years, including the following:

1. Established a preventative maintenance program to protect the public's capital investment in the District's facilities.

2. Automated the financial, administrative and maintenance functions of the District by upgrading to computerized systems.

3. Funded repair and replacement projects by establishing a special fund financed by a portion of monies collected as sewer service fees.

In May 1994, Shoreline Wastewater Management District (later renamed Ronald Wastewater District) obtained a franchise agreement with Snohomish County to upgrade Lift Station No. 13 which provides sewer service for a portion of unincorporated Snohomish County known as the Point Wells area. This area had become part of the RWD with the King County Sewer District No. 3 which was transferred in 1984. This franchise agreement is in effect through May 2019.

In October 2002, the District entered into an Interlocal Agreement and Non-Exclusive Franchise Agreement with the City of Shoreline to encompass the entire City, except for the area within the Highlands Community. These 15-year agreements are in affect through October 2017 with the potential for a five year extension, pending agreement by both parties.

1.4 BOUNDARY AND SERVICE AREA

The District is located within the City of Shoreline and unincorporated Snohomish County. The City of Shoreline is located in the northwest corner of King County. Figure 1.1 is a vicinity map for the District. The District is located within the Local Service Area of King County as established in the King County Wastewater Treatment Service Center Area and the City of Edmonds Wastewater Treatment service area. Figure 1.2 indicates the corporate boundaries for the District as well as the city limits of Shoreline. The District boundaries are generally described as follows:

North -	King County-Snohomish County line except for a portion in Snohomish County which is bounded by the North line of the Southwest quarter of Section 35, Township 27 North, Range 3 East.
West -	Puget Sound
Southwest -	Highlands Sewer District
South -	City of Seattle
East -	City of Lake Forest Park except for the portion in Snohomish County which is bounded by the East line of SW quarter of Section 35, Township 27 North, Range 3 East and the western limits of the Town of Woodway.

The corporate boundaries of the District are coincident to the western boundary of the City of Lake Forest Park. Due to the topography of the area, the District provides sewer service by gravity to 80 homes within the City of Lake Forest

Park. The City of Lake Forest Park also provides sewer service to 82 residents of the City of Shoreline via gravity. Agreements outline in Chapter 7 of this plan explain the arrangements made between neighboring districts and agencies for sewer service.

The District presently serves an area of approximately 6,870 acres and serves over 99% of the City of Shoreline's 54,320 residents (25,649 residential customer equivalents). Due to the size and natural drainage characteristics of the District, the domestic wastewater collected from within the District is treated at two separate wastewater treatment facilities: the City of Edmonds' treatment plant and King County's West Point treatment plant.

According to the 2005 City of Shoreline Comprehensive Plan, "The City is now substantially developed, with only a little over one percent of its total area remaining vacant or available for use. Shoreline is primarily residential in character and over 50 percent of the households are single family homes". Commercial development occurs along traffic corridors with some limited industrial development. Less than 5 percent of the land within the District is classified public/park, open spaces or are water bodies. Trends in developed portions of King County, including the District areas, point towards small "in-fill" projects and the development of new multiple-family housing projects.

There is limited potential for significant increases in sewage flows into the District's system due to present land use patterns, current zoning restrictions and topographic conditions. Municipalities bordering the District have also limited the potential for boundary expansion. For the purpose of this plan, the District corporate area boundary and service area boundary are the same. The future service area is the same except it includes two annexation areas; Holyrood Cemetery and Seattle Golf Course (see Figure 1.2). It is anticipated that future expansion will be derived from developer extensions and possible changes in the residential land patterns from single family to multiple family dwellings. Future demographic changes and expansion possibilities within the District are discussed more thoroughly in Chapters 3 and 7, respectively.

1.5 HISTORY AND BACKGROUND

The Ronald Wastewater District was formed in July 1951 under the name of Ronald Sewer District, in accordance with the laws of the State of Washington to construct, operate and maintain a sewage collection system. The formation of the District, by petition and election, was in response to requests by residents of the area for improved sewage disposal facilities. In 1992, Ronald Sewer District changed its name to Shoreline Wastewater Management District to better describe its expanded general service area then known as "the Shoreline Community". On January 1, 2001, the District changed its name to the Ronald Wastewater District.

The first sewers were constructed in 1960 and were sized from 8" to 15" in diameter. They were of concrete pipe construction with O-ring type flexible joints. Manholes were of precast concrete construction with cast-in-place concrete bases. Since the inception of the District in 1951, its standards have changed to keep up with the latest technology in sewer design, materials and construction. District Resolution 07-18, as amended, describes the rules and regulations regarding sewer installations and general policies and requirements of the District. These regulations are upgraded periodically to meet current needs.

In 1960, the District constructed a sewage collection system in a portion of the northern area of Shoreline surrounding Echo Lake that was within the boundaries of Utility Local Improvement District (ULID) 2. Treatment and disposal were provided for by contract with the City of Mountlake Terrace. Sewage was transported via the Mountlake Terrace system to the City of Edmonds' treatment plant.

In 1962, the District constructed ULID's 3 and 4 which included the area from N.W. 195th Street to the Seattle City Limits and the balance of the original boundaries forming ULID 2. ULID's have continued through 1983 when ULID 18, known as Appletree Lane, was formed and constructed with the help of an EPA grant.

In 1970, the District constructed ULID 14 which included the area known as Innis Arden (approximately 550 single family residences). ULID 14 was the last major unsewered area in the portion of northwest King County between Lake Washington and Puget Sound.

Design provisions in Lift Station #5 (one of four lift stations in ULID 14) were made to accommodate sewer flows from the area known as "The Highlands" which is located directly south of Innis Arden. In June, 1971, the District entered into a joint use agreement with the Highlands Sewer District to allow for sharing costs of operation and future capital improvements of Lift Station #5 (Resolution 1050).

In 1984, King County began a process to divest themselves from providing direct residential sanitary sewage collection and thus, King County Sewer District No. 3 (KC#3) was transferred to the District on January 1, 1986. The KC#3 area includes the northwest portion of unincorporated King County and the Point Wells Chevron facilities area of unincorporated Snohomish County. King County prepared a Sewer Comprehensive Plan for KC#3 in 1984. Portions of the KC#3 system were built in 1939 and 1940. A sub-district to the KC#3 Sewer District was added in 1965.

In 1985 an area known as Holyrood, adjacent to the ULID 2 area, was annexed to the District and several years later, a 485-unit apartment complex called Ballinger Commons was constructed on this site.

In 1988, the District and other component agencies entered into an agreement with the City of Edmonds to share in financing the design, construction and ongoing maintenance of a new wastewater treatment plant at Edmonds. The District sold $2 million dollars in bonds to pay for their share of the Edmonds plant based on 9.488% of ultimate plant capacity (0.861 MGD). The ULID 2 customer rates were adjusted as of January 1, 1989 to provide revenue for the new debt. The City of Edmonds assumes responsibility for all services related to the transport, treatment, and disposal of sewage for the ULID 2 area once it leaves the District's boundary.

In 1988, the METRO Council adopted a plan to eliminate the METRO Treatment Plant at Richmond Beach instead of upgrading it to secondary treatment. The plan provided for a new pump station at the Richmond Beach Site. All sewage flowing to the abandoned Richmond Beach treatment plant is now pumped to the City of Edmonds' treatment facility. The plan also includes the potential for additional sewer flows in the District to be routed to METRO's upgraded West Point regional treatment facility. The regional wastewater service plan is discussed in more detail later in Chapter 6.

In 1991, the District entered into an agreement with the Town of Woodway addressing the transport of South Woodway's sewage through District lines to King County facilities for pumping to the City of Edmonds treatment facility.

In 1995, the City of Shoreline was incorporated and assumed responsibility for land use planning from King County for most of the District's service area.

In 1997, the District and the City of Shoreline entered into an interlocal agreement under which the District would conduct assessments, analysis and prepare a plan to assume operation of the Seattle Public Utilities service area north of 145th Street within the boundaries of the City of Shoreline. This area is known as the old Lake City Sewer District (LCSD). Most of the system was built in the 1950's and 1960's and was funded by Utility Local Improvement Districts. The one exception to this was the collection system associated with the then Naval Hospital (later known as Fircrest) on N.E. 150th St. and 15th Ave. NE. This private collection system was installed prior to the mid-1950s and is now owned by the Department of Social and Health Services.

In 2000, the District signed a "Letter of Understanding" with the City of Lake Forest Park that the District had the City of Lake Forest Park's authority to negotiate with City of Seattle to purchase the entire system north of Seattle city limits.

In 2001, the District sold revenue bonds to purchase the system from SPU. Later that same year, the District began servicing and maintaining the LCSD service area north of 145th Street.

In 2002, the District sold the portion of their sewer system located within the City of Lake Forest Park. This included portions of the LCSD and other portions of the District located in the northern part of Lake Forest Park.

The most recent agreements/ordinances that have been adopted are as follows:

- 1994 – Snohomish County No. 94-030, Granting a utility franchise agreement to Shoreline Wastewater Management District (now Ronald Wastewater District). The franchise agreement is to use the rights-of-way of certain county roads for the purposes of constructing, installing, and maintaining a sanitary sewer system.
- 1996 – City of Shoreline No. 83, Establishing minimum requirements, procedures, and application information for franchise and right-of-way use agreements within the City.
- 2002 – City of Shoreline Ordinance No. 306 – Granting Ronald Wastewater District a non-exclusive franchise to construct, maintain, operate, replacement and repair a sanitary sewer system within public rights-of-way of the City of Shoreline, Washington.

1.6 RELATED MUNICIPALITIES AND AGENCIES

Several organizations, agencies and governmental bodies are involved with the aspects of planning, financing, regulating and operating wastewater treatment works and collection systems for the District corporate area. Various rules, procedures and requirements are applicable to the process of providing sewage service and all must be considered. Presented below is a list and short description of the primary agencies associated with providing wastewater services for the corporate area (the list is not intended to be all-inclusive).

- Board of Commissioners, Ronald Wastewater District – owns and operates the wastewater collection and pumping system in the District; provides operation and maintenance services to sewer customers in the corporate area.

- Environmental Protection Agency (EPA) - the lead federal agency responsible for setting regulatory requirements, financing the planning and construction of wastewater treatment systems; evaluates environmental impacts of projects with federal funding.

- U.S. Army Corps of Engineers - responsible for navigable waters; issues permits for construction in tidelands and wetlands, provides construction

inspection when requested by the U.S. EPA for projects with federal funding.

- U.S. Department of Housing and Urban Development (HUD) - responsible for funding community development projects in special need areas; administers the National Flood Insurance Program and delineates flood hazard zones for insurance purposes

- Washington State Department of Ecology (Ecology) - the lead State agency responsible for environmental matters; determines water quality criteria and effluent limitations; administers the National Pollutant Discharge Elimination System (NPDES); administers permits for "substantial development" along shoreline within the authority of the Shorelines Management Act; assists in funding of publicly owned wastewater treatment systems; reviews and regulates engineering designs; reports and plans for construction of new wastewater treatment plants or expansions of existing plants; reviews plans for federally funded projects and acts as final review board for environmental impacts under the State Environmental Policy Act.

- Washington State Department of Fish and Wildlife - responsible for wildlife throughout the State; responsible for issuance of hydraulic project permits.

- Puget Sound Air Pollution Control Agency – responsible for air quality in the Puget Sound region, regulates emissions or discharges from industrial uses.

- King County Department of Natural Resources Wastewater Treatment Division (KCDNR, formerly METRO) - the agency was initially created in 1960 to provide regional wastewater treatment in the Lake Washington and Lake Sammamish drainage basins. In 1972, the boundary of METRO was expanded to match King County's boundaries (thereby including Ronald Wastewater District). METRO was dissolved in the mid-1990's with all of their original charter being passed on to King County. Areas outside of King County are also accepted for treatment into the County's system, by contract. The charter not only includes the provision of sewage treatment and disposal but also that of trunk and intercepting sewers. The charter also provides for plan review of all wastewater projects which discharge into the KCDNR Wastewater Treatment Division's system for transport and treatment to assure compliance with King County standards.

- Snohomish County – one of three local land use planning agencies in the District's corporate boundary which is responsible for planning and zoning. Ronald Wastewater District provides sewer service within unincorporated Snohomish County in the Point Wells area.

- City of Shoreline – one of three local land use planning agencies in the District's corporate boundary, which is responsible for planning and zoning; issues local permits regulating road construction, building, etc. Sewer service within the City limits is provided by the District and Highlands Sewer District.

- City of Edmonds – a local municipality in southwest Snohomish County, operates a sewage treatment plant and contracts treatment capacity to adjacent municipalities.

- City of Lake Forest Park – a local municipality east of Ronald Wastewater District. Some of the District's sewer system flows through the City of Lake Forest Park sewer mains then into the regional KCDNR sewer system.

- Town of Woodway – one of two local land use planning agencies in the District's corporate boundary in southwest Snohomish County which conveys a portion of its wastewater to the District due to local topographic constraints.

- Olympic View Water and Sewer District – special purpose district in southwest Snohomish County which conveys wastewater to and receives wastewater from Ronald Wastewater District in small areas along the King/Snohomish County line due to local topographic constraints.

1.7 FACILITIES AND SERVICES

Facilities and services available in Ronald Wastewater District are listed in Table 1.1. The table indicates the appropriate entity providing or administering the service or facility. Since the area is mostly urbanized, services are provided nearly uniformly throughout the District. Services within the District are described as follows:

TABLE 1.1

FACILITIES AND SERVICES

Facility/Service	Provider
Schools	Shoreline School District No. 412; some private schools, Shoreline Community College.
Fire Protection	Shoreline Fire Department (Fire District No. 4).
Police Protection	City of Shoreline Police Department (contract with King County Sherriff's office), Snohomish County Sheriff's Office.
Recreation	City of Shoreline Parks and Recreation; 25 parks with various combinations of playgrounds, playfields and sports courts, hiking, swimming, picnic and fishing opportunities. There are no recreational areas within the District's service area of unincorporated Snohomish County.
Solid Waste	CleanScapes and King County Transfer Station No. 7.
Stormwater Management	City of Shoreline Surface Water and Snohomish County.
Public Transportation	METRO Transit local and express services, Sound Transit and Community Transit.
Health	No hospitals are in the area served by the District. Health services are provided at Stevens Hospital in Edmonds and Northwest Hospital in Seattle as well at several clinics and doctors offices through the City of Shoreline.
Water Supply	Shoreline Water District, Seattle Public Utilities, Olympic View Water and Sewer District; some private wells.
Sewage Disposal	Ronald Wastewater District & private septic systems.
Electricity	Seattle City Light & Snohomish County PUD.
Gas	Puget Sound Energy.
Telephone	Qwest Communications and Verizon.
Cable	Comcast and Verizon

Schools

The Shoreline Public School District 412 serves the Cities of Shoreline and Lake Forest Park. School District 412 encompasses a sixteen square mile area. The Shoreline Public School District operates nine elementary schools (grades K-6), two middle schools (grades 7 and 8), two high schools (grades 9-12) and one home education resource facility. All Shoreline Public School District schools, except Lake Forest Elementary School, serve residents of the City of Shoreline. Peak enrollment occurred in the late 1990s of approximately 10,500 students. According to School District 412, the planned capacities for the school facilities average 550 students for each elementary school, 1,000 students for each middle school and 1,800 students for each high school. The District currently serves 12 of the 14 schools within their service boundaries. The Aldercrest Learning Center is currently leased and both the Cedarbrook and Sunset Elementary schools are considered surplus properties. There are no school facilities in unincorporated Snohomish County. Table 1.2 lists the educational institutions that serve the community within the District.

Shoreline Public School District passed a bond in 1984 to bring the schools up to current code and capacity. The bond was renewed in 1996. All of the construction projects identified in the bond issues have been completed. The 2006 school bonds identified upgrades to all the facilities and the design phase of the upgraded high schools. The Shoreline Public School District is considering a 2010 park bond for the tear down & rebuild phase of the two existing high schools.

There are five large, private schools in the City of Shoreline. None of the five currently have plans to increase in size in the next 20 years. Several schools are in the process of planning or actually replacing existing classrooms and/or buildings with newer facilities. Near the Crista School, Crista Ministries is planning on adding residential dwelling units to their campus but no additional classroom space.

Shoreline Community College was founded in 1963 and has grown over the years into an institution educating approximately 5,000 full time equivalent students with 350 full time equivalent staff. The college is located on 84 acres and contains over 30 structures. The Shoreline Community College is currently adding an additional 26,000 sq to the Automotive Training facilities. The College is also undergoing development a master plan which onside and offsite dormitory facilities are being considered.

TABLE 1.2

AREA SCHOOLS CAPACITY

Schools	Staff[2]	Student
Public Higher Education		
Shoreline Community College	350 FTE[1]	5000 FTE[1]
Public Elementary		
Briarcrest	575	
Echo Lake	575	
Highland Terrace	575	
Meridian Park	575	
North City	575	
Parkwood	575	
Ridgecrest	575	
Syre	575	
Public Middle		
Einstein	1000	
Kellogg[3]	1000	
Public High		
Shorewood	1,800	
Shorecrest[3]	1,800	
Private		
St. Mark School (K-8)	18	235
St. Luke School (K-8)	26	426
Crista School	70	1,200
Evergreen School[4]	60	330
Shoreline Christian School[4]	45	300

[1]FTE=Full-time equivalent student or staff
[2]Staff during full capacity of schools
[3]Includes showers
[4]2002-2003 school year numbers

Fire Protection

Fire protection is provided by Shoreline Fire Department (Fire District No. 4) which serves the entire District sewer service area within King County. The Point Wells area is under contract with Shoreline Fire Department. The Shoreline Fire Department has five stations. Headquarters & Station No. 61 are located at 1061 N. 175th Street, Station No. 62 located at N.W. 195th and 20th N.W. (used for

apparatus storage only). Station No. 63 is located at N.E. 180th and 15th N.E., Station No. 64 is located at North 185th and Fremont and Station No. 65 is located at N.E. 155th and I-5. There are currently no capital facilities improvements planned for the Fire Department.

Police Protection

Snohomish County currently provides police service to the unincorporated Snohomish County area of the District but do not have any facilities within the District's service area. Police services are provided within the City of Shoreline by the Shoreline Police Department. Shoreline Police Department also provides first response police service to the unincorporated Snohomish County area of the District. The Administrative headquarters is located at 1206 N. 185th Street. There are two neighborhood police centers, located at Eastside Neighborhood Center (521 NE 165th Street) and Westside Neighborhood Center (624 Richmond Beach Drive NW). The City of Shoreline contracts with King County to provide jail facilities. An agreement was signed with King County to continue to provide jail facilities through 2015. There are currently no capital facilities improvements planned for either agency.

Recreation

The City of Shoreline provides recreational opportunities within the District. There are no recreational areas within the District Snohomish County service area. In 1997, the City of Shoreline assumed responsibility for providing recreational programs from King County. Local recreation areas currently with restroom facilities include: Echo Lake Park, Hamlin Park, Hillwood Park, Paramount School Park, Richmond Beach Community Park, Richmond Beach Saltwater Park, Richmond Highlands Recreation Center and Park, Shoreline Park, Shoreview Park, and Twin Ponds Park.

Solid Waste

Solid waste disposal in the area is handled through contracts with CleanScapes, a private company. King County maintains a transfer/recycling station for use by both residents and commercial companies, located at 1st Avenue NE and NE 165th Street.

Stormwater

Stormwater management services within the District are managed by the City of Shoreline and Snohomish County. The drainage basins in Shoreline are Middle Puget Sound and Boeing, Lyons, McAleer, Thornton creeks and West Lake Washington. Boeing Creek and Middle Puget Sound basins drain into Puget Sound; the others drain into Lake Washington. The drainage basin in Snohomish County is known as Possession Sound Watershed. Prior to the City

of Shoreline incorporating, King County provided surface water management services to the District service area. Such services include the analysis, planning, and construction of surface water capital improvements; maintenance of the existing surface water systems, and responding to drainage complaints. The District will continue to coordinate any future policies or activities that may impact stormwater within the appropriate jurisdiction.

Public Transportation

The District service area is served by METRO (King County) with local bus transportation within King County. Both Sound Transit (Regional Transit Authority) and Community Transit (Snohomish County) provide bus service into the District's service area.

Health

No hospitals are located within the District boundaries. Hospitals serving the area are Stevens Hospital in Edmonds and Northwest Hospital in the Northgate area. There are numerous medical and dental clinics and nursing facilities within the District boundaries.

Water Supply

Seattle Public Utilities, Shoreline Water District, and Olympic View Water and Sewer District provide water for the area served by the District. These providers supply approximately 3.9 million gallons of water per day to the area. In addition, there are multiple water wells within the community including wells in the Richmond Beach area, along with wells in Holyrood Cemetery, Acacia Cemetery and the Seattle Golf Club. SPU supplies the Shoreline Water District's water and a portion of Olympic View Water and Sewer District's (OVWSD) water from the Tolt Treatment facility. OVWSD also produces some of the water from Deer Creek watershed. OVWSD is in the process of moving their new well water treatment facility and new Administrative and Operations building to a new location on 228th Street SW in Edmonds.

Sewage Disposal

The wastewater collected within the District is treated at two facilities under contract arrangements: King County's West Point Treatment Plant and the City of Edmonds' Treatment Plant.

Electricity

Seattle City Light is a City of Seattle-owned electrical utility. It is both a retailer and a wholesaler of electrical power, providing power service in all parts of the District's service area.

Natural Gas

Natural gas is supplied by Puget Sound Energy within the District.

Telephone

Both Qwest and Verizon supply telephone service within the District.

Cable

Both Comcast and Verizon supply cable service within the District.

CHAPTER 2

PHYSICAL AND ECONOMIC CONSIDERATIONS

2.1 INTRODUCTION

Physical features such as topography, location, climate and economic factors play an important role in the planning of community utility systems. Collectively, these factors have a considerable impact on the processes involved in determining the location, size and extent of facilities to be planned and the ability of the community to accept the financial burden of the improvements. These factors are briefly described in this chapter. The City of Shoreline's Comprehensive Plan includes more detailed information about the physical environment within the Ronald Wastewater District's boundaries.

2.2 LOCATION, TOPOGRAPHY AND SOILS

As indicated in Chapter 1, Ronald Wastewater District's sewer service area includes the City of Shoreline and portions of Snohomish County including the Point Wells Chevron facilities and flows from the Town of Woodway and Olympic View Water and Sewer District. The wastewater collected from within the District is treated at two facilities under contract arrangements: KCDNR's West Point Wastewater Treatment Plant and the City of Edmonds' Wastewater Treatment Plant.

The majority of the corporate area is sewered by existing public sewers. A few individual residences within the District still maintain private septic systems.

The Ronald Wastewater District service area covers approximately 6,870 acres (see Figure 1.2). The area is primarily residential, with clustered commercial development along the major transportation corridors; Aurora Avenue, Ballinger Way, 15th Avenue NE and NW Richmond Beach Road.

Continental glaciers extended into central Puget Sound in the past depositing layers of silt-clay, gravel and till in a rolling plateau known as the Seattle drift plain. Figure 2.1 shows the topography of the District area. This plateau drops irregularly to Puget Sound and Lake Washington through a series of basins formed by small streams that flow through the District's service area. A number of steep bluffs are located along the shores of Puget Sound within the Innis Arden and Richmond Beach neighborhoods. These bluffs diminish in the Richmond Beach neighborhood. Aurora Avenue generally follows the natural drainage-dividing boundary of the District, separating the land area sloping to Puget Sound and Lake Washington. The Echo Lake area is an exception, however, containing a drainage basin of approximately 600 acres which drain to Echo Lake. Most of the rest of the District's service area is located on a rolling plateau with a

north/south topographical orientation. Elevation ranges from 250 feet to just over 500 feet throughout most of the area and down to the marine shoreline of Puget Sound. The highest point in the District is located south of Highland Terrace Elementary School between North 160th Street and N.W. 155th Street. The highest point in the Snohomish County area of the District is over 220 feet and located immediately west of the Town of Woodway.

The District's service area is predominately covered with the Alderwood series of soils. Alderwood soils are gravely, sandy loam on rolling (6-15 percent slope) and hilly (15-25 percent slope) topography. Alderwood soils have sufficient surface drainage but internal water movement is slow because of a subsurface cemented stratum. During winter and spring rains the cemented stratum can cause a high water table at the surface. However, during summer dryness these soils retain water well. Erosion can be severe if forest litter, which protects the soils from rain, is removed. The Everett soils series appears mostly on the slopes leading down to Puget Sound in the neighborhoods of Richmond Beach and Innis Arden. Everett soils are gravely, sandy loams with rolling (2-15% slope) and hilly (15-25% slope) topography. While the deposits of clay and gravel yield excellent foundation stability throughout most of the corporate area, the areas of steep slopes, bluffs, hillsides and ravines create localized problems of instability.

Upland soils tend to be of shallow depth ranging from two to six feet. High groundwater pressures have built up in local areas along the banks of Puget Sound due to the low permeability of underlying subsoils. The high pressure has resulted in bank erosion and slides particularly south of the Richmond Beach Regional Park and within the Innis Arden neighborhood.

A review of the King County Sensitive Areas Map Folio (King County, 1990) shows the District service area contains some wetlands and unclassified streams, geologic hazard areas prone to landslide, seismic, and erosion hazards. Most of these hazard areas are located on the bluffs along Puget Sound or along creek beds. Significant portions of the District's service area are susceptible to landslides and erosion with lesser impacts from seismic activities. Most soils on 15 to 40 percent slopes are potential erosion and landslide hazards. The City of Shoreline's Comprehensive Plan identifies Potential Geography Hazards throughout the City but does not distinguish between landslide, seismic, erosion and frequently flooded areas. The Snohomish County records indicate that there are geologic hazards on each Lowland parcel.

2.3 HYDROLOGY

The area served by Ronald Wastewater District contains several streams that flow into either the Lake Washington or Puget Sound drainage basins (see Figure 2.2). Some of the streams contain water only during the winter months. The three major streams which flow all year are Boeing Creek, located between the Innis Arden neighborhood and the Highlands area, which flows to Puget Sound, and McAleer and Lyons Creeks which originate in Snohomish County and flow into

Lake Washington. The City completed a City's Habitat Inventory and Assessment Project, which included funding from the District and King County. The results of the study have been beneficial for future capital improvement projects throughout the District. From that study, the headwaters of Thornton Creek as well as many other waterways were identified. Thornton Creek headwaters begin in several locations: near Ronald Bog and Meridian Park which join together near Twin Ponds, Little's Creek and Hamlin Creek. Beyond the City of Shoreline limits, Thornton Creek flows through the northeast portion of the City of Seattle and discharges into Lake Washington. Whisper, Cedarbrook and Sarah's Creek are part of the head waters of McAleer Creek which flows through Lake Forest Park into Lake Washington. Neither of the two streams that begin within the Town of Woodway have been identified to contain fisheries resources at this time.

Echo Lake is the only major body of water within the District. It is located in the north central portion of the District's service area. Several small ponds, most of which are man-made, are located throughout the District. Hidden Lake is another small lake located along Boeing Creek. A study of Boeing Creek is planned by the City of Shoreline in 2013.

2.4 CLIMATE

The climate within the corporate area is a mild marine type, strongly influenced by the surrounding terrain and its proximity to the Pacific Ocean and Puget Sound. The wet season begins in October, reaching a peak in the winter, reducing in the spring with the least rain occurring during the June-September summer season. The average rainfall in the area is approximately 37 inches per year.

Rainfall amounts and intensity can be localized during any given storm event but tend toward regional values when compared on a monthly or yearly basis. The National Weather Service has two precipitation recording stations operating in northern Seattle. Weather stations are located a several schools within the District boundary and can be accessed by the internet. King County has had a weather gauge near Brugger's Bog since September 1991. District staff periodically compares one or more of these independent sources of data against the rainfall recorded at the District's station and validate the quality of data collected by the District.

The District acquired and installed a "tipping station" rain gauge and data recorder in the spring of 1994. The rain gauge was initially installed on the roof of the District Office. Effective rainfall data collection began on April 28, 1994. In February 1996, the District purchased a Novalynx WS-14 Weather Station that included a rain gauge. This weather station was installed at the District Office and the original "tipping Station" rain gauge was relocated to the roof of a Chevron gas station located on Richmond Beach Road and 8th Avenue N.W. This weather station was later relocated to the Fire Station at N.E. 180th and 15th Avenue in 1998 then was later removed. In December, 2000, the WS-14 Weather Station was upgraded to a WS-16 Station. The rain gauge began operating intermittently

and was replaced in April 2009. The new station is a Davis Vantage Pro2 digital weather station and appears to be reading similarly to other weather stations near the District office.

2.5 INDUSTRY

Industrial land uses or development is limited within the District's service area. The City of Shoreline has several commercial areas that include a variety of shops and services that are pedestrian oriented, such as shopping malls. Mixed uses, commercial, and light industrial establishments are permitted in selected areas. The City has identified areas that have been developed as business centers along major arterials (Special study areas, Regional and Community Business Areas). Existing zoning allows mixed uses, commercial, and light industrial establishments in these areas. Within the Snohomish County portion of the District's service area, an asphalt plant receives sewage service from the District. No water from the existing asphalt plant requiring an industrial discharge permit is received from the facility. Any proposed developments within the District boundaries that exceed the existing land use or require an industrial permit, a hydraulic evaluation will be required prior to connecting to the District's system.

2.6 TRANSPORTATION

The City of Shoreline's transportation network consists of grid street network. The transportation access to the Ronald Wastewater District corporate area in Snohomish County is via the City of Shoreline's Richmond Beach Drive NW.

Interstate 5, 15th Avenue N.E. and Aurora Avenue North provide regional connections to the northeast and south. The City of Shoreline, King and Snohomish Counties are looking to improve the level of service of the transportation system throughout the District's service area, especially along Aurora Avenue. Several phased projects area scheduled by the City of Shoreline, to improve transportation along the Aurora Corridor. The District will work with the City to coordinate project improvements so as to minimize disruptions to local residents.

2.7 WATER SUPPLY AND WELLS

The District service area is served by three water purveyors: Seattle Public Utilities (SPU), Shoreline Water District (SWD) and Olympic View Water and Sewer District (OVWSD). All three purveyors receive water from the Tolt supply line. SPU is a direct provider of water to its customers. They provide water to residents and businesses west of Interstate 5 in the Shoreline city limits and to the City of Lake Forest Park. SWD currently contracts with SPU for water supply. SWD provides service to residents and businesses east of Interstate 5 within the City of Shoreline. SPU also supplies water to the Highlands southwest of the District. The SPU storage capacity within the City of Shoreline includes Richmond Highlands reservoirs (1.0 and 2.0 million gallons) and Foy Standpipe (1.0 million

gallons). The distribution system includes the Foy and North Pump Stations and over 115 miles of water mains within Ronald's corporate area. All three utilities receive water from the Tolt supply line.

The SWD storage capacity is composed of a 3.7 million gallon reservoir and a 400,000-gallon reservoir. SWD receives water from the Tolt supply line at two SPU Tolt Supply Stations. The distribution system consists of a booster pump station and the majority of the 91 miles of water main are within the District's corporate area.

Olympic View Water and Sewer District purchases water from SPU and has a second water source from Deer Creek, northeast of the Point Wells area. The storage reservoirs are located within Snohomish County but not within the District's corporate area.

Groundwater supplies in the corporate area are generally contained in unconsolidated sedimentary deposits. Aquifers having the most favorable water-bearing properties are contained in alluvium, gravel, sand deposits, or recessional outwash.

The Washington Department of Ecology (DOE) was contacted to determine the location of existing wells within the District's corporate area. The 1,437 recorded wells within the District's service area are separated into the following types:

484 abandoned wells
918 resource protection wells
35 water wells
1,437 wells

2.8 REGULATIONS

DOE-Regulatory Authority

In 1972, the US Environmental Protection Agency passed the Federal Water Pollution Control Act Amendments. This law because known as the Clean Water Act and gave EPA the authority to implement pollution control programs in an effort to control discharges into the waters of the US. The Act has set water quality standards for many contaminants into surface waters. Permits to monitor the discharges, construction of sewage treatment plants and nonpoint source pollution have all been addressed by the CWA and subsequent amendments.

The Clean Water Act has authorized several programs that impact sewer collection and treatment such as the National Pollution Discharge Elimination System, and the National Pretreatment Program.

NPDES

The National Pollution Discharge Elimination System permit program is administered in Washington State by the Department of Ecology under the authority of EPA. This program regulates all point source discharges into public waters and is the primary regulatory permit for the operations of wastewater treatment plants.

The National Pretreatment Program requires industrial and commercial discharges to treat or control pollutants in their wastewater prior to discharge into the publicly owned treatment system. A non-regulated discharge into the treatment system could potentially cause the treatment plants to exceed their discharge limits. Currently, the District does not have any industrial waste customers. The District will coordinate with the pretreatment program of either King County or the City of Edmonds before connecting future customers that may adversely impact the wastewater treatment facilities.

CMOM

The EPA found that most Sanitary Sewer Overflows (SSO) could be credited to the lack of proper proactive management of the collection system. SSOs can be a direct health risk to the community and in the event of an emergency, the closure of key environmental areas such as drinking water sources or swimming areas are examples of highly visible incidents, which bring unwanted negative attention to a utility. SSos that discharge to surface waters can be considered as an "unpermitted discharge" under RCW 90.48, which also carries the risk of penalties or other enforcement actions from Ecology.

Capacity, Management, Operations and Maintenance regulations (CMOM) was developed by EPA as a means to reduce the number of and SSO and Combined Sewer Overflows (CSO)s. The CMOM regulations have been draft since 2001 and no date has been identified as to when the regulations will be finalized. Nevertheless, the draft regulations can best be described as a series of Best Management Practices relative to wastewater operations and maintenance. The District's Operations and Maintenance Program meets many of the requirements of the draft CMOM regulations. The District has not had any sewer overflows that would discharge to the stormwater systems.

Environmental

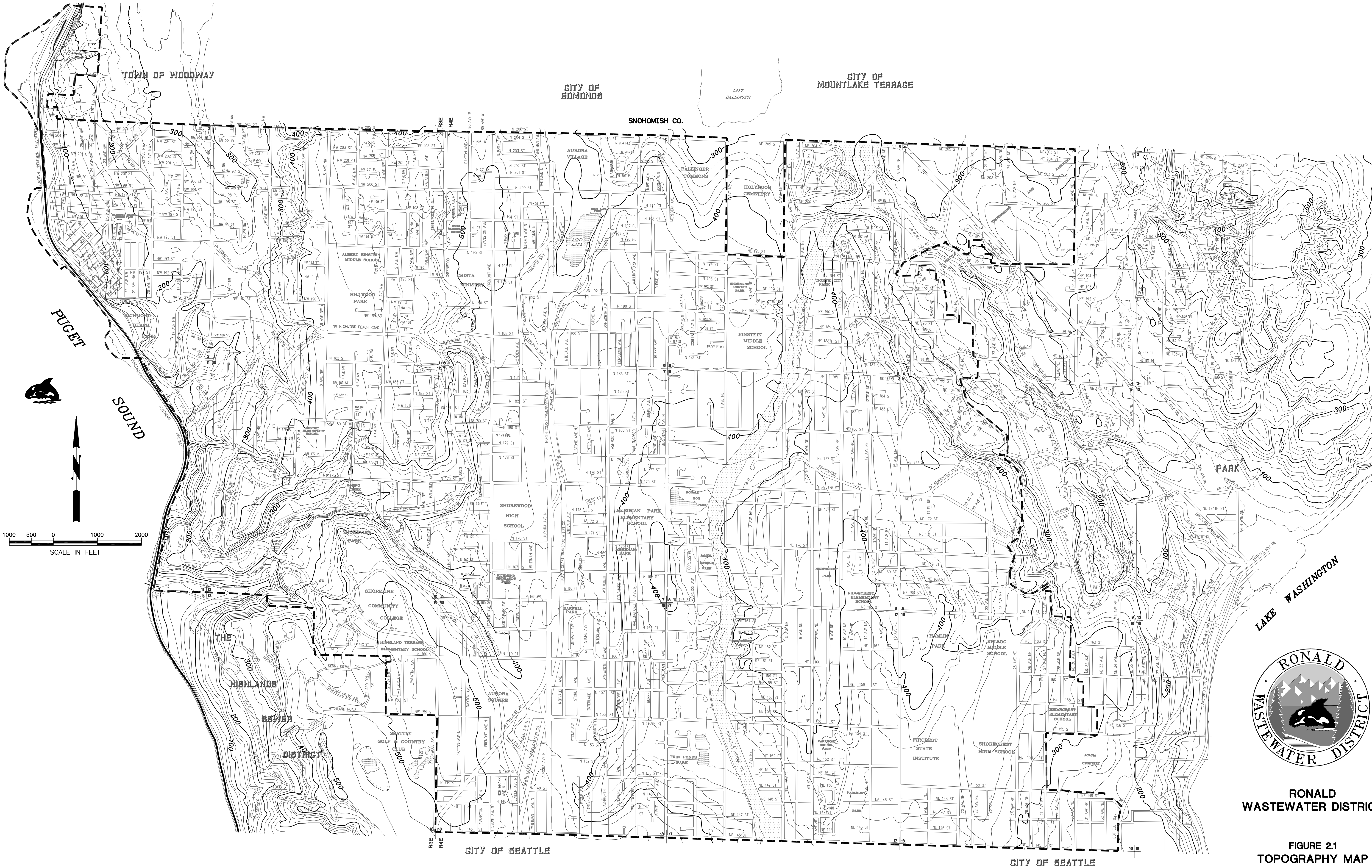
The Army Corps of Engineers has regulatory authority over construction and development activities within navigable waters in the United States such as rivers, streams and tributaries, and wetlands associated with these waters. A Joint Aquatic Resources Permit Application (JARPA) will be required for projects regulated by the Army Corps of Engineers. The Army Corps of Engineers maintain a list of Nation-wide Permits (NWP) for routine construction projects.

Puget Sound Chinook Salmon and the Coastal Bull Trout are currently listed as a "threatened" species under the Endangered Species Act. Salmon runs throughout the Puget Sound and the Pacific Northwest are critically depressed. The District is

divided into two watersheds – Central Puget Sound and the Cedar River-Lake Washington Watershed. The entire service area is located in the Water Resource Inventory Area (WRIA) 8. The WRIA 8 Chinook Salmon Conservation Plan was approved in for activities identified through 2015. The plan's actions were grouped into three categories of actions: site-specific habitat protection and restoration activities, land use and planning actions focus, and public outreach and education actions.

The Washington State Department of Fish and Wildlife enforces the State's Hydraulic Code. Any construction activity that will use, divert, obstruct or change the bed or flow of state waters must obtain a Hydraulic Project Approval (HPA) permit. The state waters can mean both the marine and freshwater areas. It is the intent of the HPA permit to minimize the impacts on fish.

The Department of Ecology enforces the State of Washington's Shoreline Management Act, which went into law in 1971. Shorelines of the states are all marine water, streams with more than 20 cfs mean annual flow, lakes 20 acres or larger, and upland areas extending 200 feet landward from the edge of these waters. District improvement projects near McAleer, Lyons, and Boeing Creek as well as along the marine shoreline will fall under the Shoreline Management Act and will require a Shoreline Permit. The City of Shoreline or Snohomish County would issue any shoreline permits the District would require.


TOWN OF WOODWAY
CITY OF EDMONDS
CITY OF MOUNTLAKE TERRACE
LAKE BALLINGER
SNOHOMISH CO.
PUGET
SOUND
LAKE WASHINGTON
CITY OF SEATTLE
THE HIGHLANDS SEWER DISTRICT
RICHMOND BEACH PARK
HILLWOOD PARK
ALBERT EINSTEIN MIDDLE SCHOOL
CRISTA MINISTRIES
AURORA VILLAGE
BALLINGER COMMONS
HOLYROOD CEMETERY
ECHO LAKE
EINSTEIN MIDDLE SCHOOL
SHOREWOOD HIGH SCHOOL
MERIDIAN PARK ELEMENTARY SCHOOL
SHORELINE COMMUNITY COLLEGE
HIGHLAND TERRACE ELEMENTARY SCHOOL
AURORA SQUARE
SEATTLE GOLF & COUNTRY CLUB
TWIN PONDS PARK
RIDGECREST ELEMENTARY SCHOOL
HAMLIN PARK
KELLOGG MIDDLE SCHOOL
FIRCREST STATE INSTITUTE
SHORECREST HIGH SCHOOL
BRIARCREST ELEMENTARY SCHOOL
ACACIA CEMETERY
PARK
SCALE IN FEET
1000 500 0 1000 2000
RONALD WASTEWATER DISTRICT

RONALD
WASTEWATER DISTRICT

FIGURE 2.1
TOPOGRAPHY MAP

CONTOUR INTERVAL: 20'

CHS
CHS ENGINEERS LLC

TOWN OF WOODWAY

CITY OF EDMONDS

SNOHOMISH CO.

CITY OF MOUNTLAKE TERRACE

PUGET SOUND

ECHO LAKE

RONALD BOG

TWIN PONDS

HIDDEN LAKE

BOEING CREEK

McALEER CREEK

LYON CREEK

LAKE WASHINGTON

THE HIGHLANDS SEWER DISTRICT

AURORA VILLAGE

BALLINGER COMMONS

HOLYROOD CEMETERY

ALBERT EINSTEIN MIDDLE SCHOOL

HILLWOOD PARK

CRISTA MINISTRY

EINSTEIN MIDDLE SCHOOL

SHOREWOOD HIGH SCHOOL

MERRIAN PARK ELEMENTARY SCHOOL

SHORELINE COMMUNITY COLLEGE

HIGHLAND TERRACE ELEMENTARY SCHOOL

SEATTLE GOLF & COUNTRY CLUB

AURORA SQUARE

RIDGECREST ELEMENTARY SCHOOL

KELLOG MIDDLE SCHOOL

BRIARCREST ELEMENTARY SCHOOL

FIRCREST STATE INSTITUTE

SHORECREST HIGH SCHOOL

CITY OF SEATTLE

CITY OF SEATTLE

1000 500 0 1000 2000

SCALE IN FEET

CONTOUR INTERVAL: 20'

RONALD WASTEWATER DISTRICT

FIGURE 2.2

LAKES, STREAMS AND WETLANDS

CHS ENGINEERS LLC

CHAPTER 3

POPULATION AND LAND USE

3.1 INTRODUCTION

In order to project wastewater facility needs over a given period of time, it is necessary to establish a reasonable estimate of the probable demand on these facilities. This can be accomplished in most service areas by a study of the population trends and land use which impact the capacity and placement of sewer system facilities.

This chapter presents historical population data with population forecasts and population estimates based on land use designations. The historical data and forecasts are presented for general information only. The purpose of this Sewer Comprehensive Plan is to provide the planning for the provision of sewer service for the potential population at ultimate development of the Ronald Wastewater District's service area under the City of Shoreline's current land use designations as well as those areas in the City of Seattle and unincorporated Snohomish County that are served by the District.

3.2 BRIEF HISTORY OF GROWTH

In the 1880's, railroad fever gripped the Northwest, and speculators planned towns in anticipation of the arrival of the trans-continental railroad route. Among these was Richmond Beach, platted in 1890. The arrival of the railroad in Richmond Beach in 1891 spurred the growth of the small town and increased the pace of development in the wooded uplands.

Between 1905 and 1925 construction of the Seattle-Everett Interurban line and the brick-surfaced North Trunk Road (also connecting Seattle and Everett) made travel to and from Richmond Beach easier, which facilitated suburban development. People could live on a large lot in a semi-rural area, raise much of their own food and still be able to work or go to school in Seattle.

During the Great Depression and World War II (1930-1945) the pace of housing development in outside of the City of Seattle slowed. By the late 1930s, commercial development north of Seattle concentrated along Aurora Avenue, also known as U.S. Highway 99, the region's primary north-south travel route.

With the end of World War II came a tremendous demand for family housing. The late 1940's saw large housing developments spring up seemingly overnight. In 1949, the name "Shoreline" was used for the first time. Coined by a Lake City student for a contest, "Shoreline" described a community running from the Puget Sound shore to the Lake Washington shore and from the Seattle City limits to the Snohomish County line.

Today, Shoreline has a preponderance of residential uses, supporting commercial and retail uses as well as various institutional uses. Only about one percent of the total land within the City limits remains vacant. Single lots scattered throughout the city primarily characterize the vacant land.

3.3 LAND USE, ZONING AND SERVICE AREA

Land use decisions within the District corporate boundaries are made by the land use authorities, City of Shoreline, Town of Woodway and Snohomish County.

City of Shoreline: The City of Shoreline adopted the first Comprehensive Plan in 1998. The city created a special study area, the North City Business District, in 2001 to "guide and encourage redevelopment of the area". The revised City of Shoreline Comprehensive Zoning Map was adopted by Ordinance 292 on January 7, 2002. Included in that map were the Briarcrest and Paramount Special Study Areas. Several other special study areas (SSAs) and areas with mixed use development have been identified since that time. Included in each of these SSAs are increased residential and commercial development which impacts the collection system both within the SSA and the surrounding areas. Updates (including land use revisions) were completed annually until the entire plan was revised in 2005. Amendments have been made to the City of Shoreline Land Use Designations and Zoning maps since 2005. The current land use maps dated January 2009 is shown in Figure 3.1. The Point Wells area has been identified as a Potential Annexation Area (PAA) for the City of Shoreline. Shoreline has identified Mixed Use for the Point Wells PAA.

In 2007, Shoreline's Buildable Lands Study quantified the development potential of the SSAs. City of Shoreline staff identified vacant and redevelopable sites and used recent development trends to estimate a 20-year capacity in terms of household and jobs. This was completed as part of King County's second, five year Buildable Lands Study, which is required by RCW 36.70A.215. Individually, one redevelopment project may not have an impact on the sewer collection system. However, multiple projects can collectively impact the sewer system as flows continue to accumulate as they progress downstream.

The zoning map was recently updated (June 2009) to correct minor differences between the zoning and land use maps throughout the City of Shoreline. A specific plan was developed for many of the SSAs including the Crista Campus, Fircrest, & Point Wells. The remaining SSAs will have specific master development plans in the future, which will include review of the area land use. The resulting projected population increase has been factored into the gross projected population growth for the entire District over the next 20 years.

Town of Woodway: There are four parcels within the Town of Woodway currently served by the District. Per the 2004 Town Comprehensive Plan, the land use is Suburban Residential and the zoning is Residential 14.5. These

designations are not expected to change for the four Woodway parcels. The Town of Woodway has included the Point Wells area in their PAA in their Comprehensive Plan. The lowland area would remain Industrial whereas the upland area would be Open Space/Critical Area and some Low Density Residential.

Snohomish County: There are two separate land uses within the Snohomish County area of the District: Urban Low Density Development and Heavy Industrial. The Urban Low Density Development area can develop to a current zoning of R-9,600. The Heavy Industrial does not have a limit as to how large an area can be developed and at what level. No residential dwellings are currently located on these parcels. The Snohomish County GMA Comprehensive Plan identifies the potential for the parcels currently with a land use of Heavy Industrial to be changed to Mixed Use/Urban Center land use. Snohomish County's Comprehensive Plan identifies residential dwellings in Urban Centers to be not less than 12 dwellings per acre with maximum densities being established as part of more detailed planning.

A Final Environmental Impact Statement (FEIS) has been submitted to Snohomish County in June 2009 and approved in August 2009. The FEIS proposed a site-specific non-project amendment to the Future Land Use Map designation and associated rezone of the lower portion of the Point Wells area from Heavy Industrial designation to Urban Center/Mixed Use with Planned Community Business zoning.

Figure 3.1 indicates the present land use within the District boundaries combining land use designations from the City of Shoreline, Town of Woodway and unincorporated Snohomish County. Prior to 1995, most of the District's service area was in unincorporated King County. Land use designations were developed in the County's Shoreline Community Plan. In 2001 the District adopted its first Comprehensive Plan utilizing Shoreline's current (at the time) Land Use Map. A comparison has been made between the previous Shoreline Land Use Map (4/2000) and the current updated version (1/2009). The following are the major land use changes between the two maps:

- Areas of the northern portion of the Aurora Corridor have been changed from Med/High Density Residential to Mixed Use

- A small area along 175th Ave near Aurora has been changed from Low-Density Residential to Mixed Use

- The Point Wells Area is identified as Mixed Use

- The Ballinger Special Study Area has been identified and various land use changes are shown in this area

Commercial zoning is restricted to Aurora Avenue, the Ballinger Way area and the area adjacent to I-5. There is no major industrial development within the District boundary at this time. The projected population, based on proposed land use classifications, is the best way to estimate the future number of dwelling units throughout the City. Using the residential land use classifications within the District's service area, the population density over the next twenty years was assumed to be 2.4 residents per unit, unless specifically identified as part of a special study area. Commercial densities are discussed later in this section. The potential population density (persons per acre) has been determined for each land use designation, as indicated in Table 3.1.

TABLE 3.1

LAND USE RESIDENTIAL POPULATION DENSITY

Land Use Designation	Units, Acre	Density, persons/acre
City of Shoreline		
Low Density Residential	6 or fewer	14.4
Medium Density Residential	8-12	28.8
High Density Residential	18-48	115
Mixed Use	48	115
Neighborhood Business	N/A	0
Community Business	N/A	0
Regional Business	110	Up to 198
Public Facilities	N/A	[1]
Institution	N/A	[1]
Town of Woodway		
Suburban Residential	4	9.6
Unincorporated Snohomish County		
Urban Low-Density Residential	6	14.4
Mixed Use/Urban Center	48	115
Urban Industrial	N/A	25[2]

[1]Current building or area population estimates were made by individuals within each organization.
[2]Assumed to be similar to a commercial use with no residential dwellings.

Note: Units/Acre is based on the predominate underlying zoning within each land use designation.

Commercial building equivalent population has been estimated in the following manner. Building square footage was used as the basis for calculating future development trends in commercial areas. An occupancy rate was assumed to be 95% for business development. A "building factor" was estimated to represent the amount of building floor area over the building lot area and this factor increases significantly for multi-story structures. The ultimate number of employees per acre is then multiplied by 20/85 to obtain an equivalent residential population density for use in sewer system analysis and planning. This factor (20/85) is the ratio of commercial to residential per-capita flows (see Chapter 4). The ultimate number of employees per acre was determined by multiplying the building factor by the number of employees per square foot of building by the occupancy rate by 43,560 square feet per acre (Table 3.2).

TABLE 3.2

EQUIVALENT COMMERCIAL/BUSINESS POPULATION DENSITIES

Land Use	Building Factor	Employees per Sq. Ft.	Occupancy Rate	Ultimate Employees per Acre	Equivalent Population per Acre
Business	0.85	1/325	0.95	Up to 108	25

3.4 POPULATION

Population projections have been reviewed from source materials prepared by the Washington State Office of Financial Management (OFM), the Puget Sound Regional Council (PSRC), Snohomish County's Comprehensive Plan, and the City of Shoreline's Comprehensive Plan. Population projections have been made based on land use. The District does not have the authority over land use decisions within the District boundaries. Currently, the agencies who make the land use decisions are the City of Shoreline and Snohomish County.

While the Puget Sound Regional Council developed the population projections for King, Pierce, Snohomish and Kitsap Counties, the City of Shoreline completed a more detailed analysis to determine the population served within the District boundary. The Shoreline Comprehensive Plan further analyzed the areas as part of its transportation study.

The City of Shoreline staff determined the number of single family units and the number of multi-family units (2 or more units per parcel) within the entire city limits using 2002 King County Assessor's data from the City of Shoreline as well

as data from the US Census Bureau and the PSRC as part of a Shoreline's Transportation Master Plan that was completed in 2005. The Cities of Shoreline and Lake Forest Park were divided into 117 zones (Shoreline Analysis Zones or SAZs). The number of both single family and multi-family residential living units were then predicted for each SAZ for the year 2022. The purpose of the SAZ study was to get a more defined look at the population and employment forecasts and increases in the number of vehicles on the roadways throughout the City.

The information of primary importance from this chapter is the projected growth within the various SAZ's and the proposed population density based on land use classifications, as indicated in Table 3.1. This information will be used in later chapters of this plan to evaluate the impact of growth and land use, as currently designated, on the capacity of the existing sewer collection system and to help identify where new or upsized facilities are necessary to accommodate the projected growth.

The population served by the District was determined using the above sources by taking the number of housing units in the District (as estimated from the SAZ study) and multiplying that number by 2.4 people per residence. This number was previously defined in Shoreline's Comprehensive Plan, dated June 13, 2005, as the future average household size during the 2001-2022 period. The OFM estimated the 2009 population for the City of Shoreline to be 54,320. If the number of Residential Customer Equivalents (RCE's) as recorded by the District at the end of 2008 is used 23,373 RCE's of residential and commercial accounts, rather than housing units, the estimated population would be 56,095 people, again assuming the average household population is 2.4 people. These population estimates are within three percent of each other.

Based on the population estimates from the OFM, the City of Shoreline grew approximately 16% over the 1996-2000 period, from approximately 45,927 residents in 1996 to 53,296 in 2000. A large portion of this growth was due to changes in city-managed boundaries. Shoreline's average annual growth during that period was approximately 1.6%, slightly higher than King County's 1.3% average annual growth. However, from 2000 to 2009 the population is estimated to have increased from 53,296 to 54,320, only 1.9 percent or 0.2% per year, according to the OFM. Assuming continued growth from 2010 to 2030 at the same rate as the previous 9 years, the number of residential units throughout Shoreline is expected to increase to 56,588.

According to Shoreline's Comprehensive Plan, approximately 1% of the total land area within the City of Shoreline remains undeveloped. The primary development potential within the District is expected to occur as redevelopment of existing uses into denser uses. Shoreline conducted an analysis of the available buildable lands within the City in 2007 to identify growth potential within the City limits. According to this study 23% of the redevelopment potential is anticipated to

occur in existing single-family residential units with the remaining 77% to occur in Medium and High Density Residential and Mixed-Use areas.

Four areas are identified on Shoreline's 2009 Comprehensive Land Use map as special study areas. They are:

- North City Business District
- Ballinger Special Study Area
- Briarcrest Special Study Area
- Paramount Special Study Area

Six areas are classified on the same map as "mixed use" which contains both residential and commercial developments. These areas are:

- 175th/Serpentine Mixed Use Study Area
- Ridgecrest Mixed Use Study Area
- Richmond Beach
- Greenwood
- Aurora
- South Aurora Triangle

An eleventh area, Fircrest School, is presently under study regarding its excess property. The Fircrest School, Food Lifeline, Firland Sheltered Workshop and Department of Health facilities will remain while 33 acres are considered for redevelopment options.

A twelfth area within the District's corporate boundary is Point Wells. This area is currently under Snohomish County land use regulations. The Town of Woodway and City of Shoreline have each included this area as a Potential Annexation Area (PAA). The different proposed land uses of either land use agencies will have different impact on the District's sewers.

Plans for future expansion on the Crista Campus as well as Shoreline Community College will also create concentrated population growth similar to the other SSAs. Table 3.3 identifies the potential growth in population for each Special Study Area.

Assuming each SSA will have 2.4 people/household, except the North City Business District which will have 1.8 people/household (density confirmed with Shoreline City Staff) and Point Wells (density obtained in FEIS), the expected increased residential population is estimated to be 19,425 people. With the increased population from new jobs (5,687), the total increased population is 25,112 people.

In order to calculate the total number of Residential Customer Equivalents (RCE) for sizing the sewer system, a two step process must occur. First, Table 3.3 shows the increased population expected in each of the special study areas. Then the population density was used to generate the third column.

TABLE 3.3

SPECIAL STUDY AREAS
POTENTIAL POPULATION

Special Study Area	Additional Residential Dwelling Units	Density, people/unit	Increased Residential Population
North City Business District[1]	1,107	1.8	1,993
Ballinger	150	2.4	360
Briarcrest	127	2.4	305
Paramount	165	2.4	396
175th / Serpentine	32	2.4	77
Ridgecrest	234	2.4	562
Richmond Beach	217	2.4	521
Greenwood	0	2.4	0
Aurora Corridor	440	2.4	1,056
South Aurora Triangle	1,210	2.4	2,904
Fircrest	862	2.4	2,069
Shoreline Community College	513	2.4	1,231
Crista Campus	629	2.4	1,509
Point Wells[2]	3,500	1.8	6,442
TOTAL	**9,186**		**19,425**

[1]Based on 1.8 people/household
[2]Based on numbers from Paramount Development's FEIS for Point Wells

Table 3.4 indicates historical and projected populations within the existing District service area compared to other areas within the District.

TABLE 3.4

POPULATION ESTIMATES

Year	King County Population[1]	City of Seattle Population[1]	City of Shoreline Population[1,4]	Unincorp. SW Snohomish County Population[1]	Special Study Areas Population
1970	1,159,464	530,844			
1980	1,269,749	493,846			
1990	1,507,319	516,290	45,927[2]		
2000	1,737,047	547,425	53,296	138,089	
2010	1,949,816	596,292	54,372	174,813	
2020	2,151,281	648,706	55,469	220,264	
2030	2,368,159	705,727	56,588	277,533	19,425[3]

[1]King County, Snohomish County, and Cities of Shoreline & Seattle populations are from the Population and Employment Forecast Report by the Puget Sound Regional Council (PSRC) October 2006 which uses actual census data. The forecasted population is increased by the Forecast Analysis Zone information as published by PSRC and the Shoreline Analysis Zone information published in the 2005 Shoreline Comprehensive Plan.
[2]Projected 1996 population from Washington State OFM data.
[3]Projected residential population at maximum build-out of all SSAs.
[4]Projected population based on historical growth rate from 2000-2009 and does not include special study area populations.

Figure 3.2 is a graphical representation of the forecast percent increase of housing units over the period from 2010 to 2030 for all SAZs. The different shading on Figure 3.2 reflects where in the District boundaries the greatest percentage of change in residential housing units is expected to occur. Because the area sewered by the District is mostly developed and the sewer system extends throughout most of the area, the information on Figure 3.2 indicates where the highest pressure on existing system capacity is expected.

In order to calculate the total number of Residential Customer Equivalents (RCE) from commercial customers, 2.4 is assumed as the factor for jobs/RCE. This is the same factor as the population density. Table 3.5 identifies the increased

population for jobs in each of the Special Studies Areas. The 5,687 jobs represent approximately 2,339 RCEs.

TABLE 3.5

SPECIAL STUDY AREAS
POTENTIAL COMMERCIAL POPULATION AND RCES

Special Study Area	Increased Jobs	RCEs
North City Business District	97	40
Ballinger	286	119
Briarcrest	33	14
Paramount	13	5
175th / Serpentine	0	0
Ridgecrest	132	55
Richmond Beach	244	102
Greenwood	72	30
Aurora Corridor	3,500	1,458
South Aurora Triangle	275	115
Fircrest	139	58
Shoreline Community College	0	0
Crista Campus	0	0
Point Wells	896	373
TOTAL	**5,687**	**2,369**

Table 3.6 shows the total expected increase in RCEs expected in the Special Study Areas. These future RCEs and expected distribution within the City of Shoreline, is used for sizing future sewer service. With 2,369 RCEs for commercial and 9,186 RCEs for residential, there is a total proposed increase in RCEs is 9,186 + 2,369 or 11,555 RCEs.

TABLE 3.6

SPECIAL STUDY AREAS
POTENTIAL RESIDENTIAL CUSTOMER EQUIVALENTS

Special Study Area	RCEs from increased residential population	RCEs from increased commercial population	Total RCEs
North City Business District	1,107	40	1,147
Ballinger	150	119	269
Briarcrest	127	14	141
Paramount	165	5	170
175th / Serpentine	32	0	32
Ridgecrest	234	55	289
Richmond Beach	217	102	319
Greenwood	0	30	30
Aurora Corridor	440	1,458	1,898
South Aurora Triangle	1,210	115	1,325
Fircrest	862	58	920
Shoreline Community College	513	0	513
Crista Campus	629	0	629
Point Wells	3,500	373	3,873
TOTAL	**9,186**	**2,369**	**11,555**

SNOHOMISH COUNTY LEGEND

- URBAN LOW DENSITY RESIDENTIAL
- URBAN INDUSTRIAL

TOWN OF WOODWAY

CITY OF EDMONDS

CITY OF MOUNTLAKE TERRACE

SNOHOMISH CO.

CITY OF LAKE FOREST PARK

CITY OF SEATTLE

CITY OF SEATTLE

PUGET SOUND

LAKE WASHINGTON

1000 500 0 1000 2000

SCALE IN FEET

CITY OF SHORELINE LEGEND

- LOW DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- MIXED USE
- COMMUNITY BUSINESS
- REGIONAL BUSINESS
- PUBLIC FACILITIES
- SINGLE FAMILY INSTITUTION
- PUBLIC OPEN SPACE
- PRIVATE OPEN SPACE
- SPECIAL STUDY AREA
- CITY OF SHORELINE BOUNDARY
- RONALD WASTEWATER DISTRICT BOUNDARY

RONALD WASTEWATER DISTRICT

FIGURE 3.1

LAND USE MAP

CHS ENGINEERS, LLC

NOTE:
THE SAZ NUMBERS AND BOUNDARIES ARE TAKEN FROM INFORMATION PROVIDED BY THE CITY OF SHORELINE.

TOWN OF WOODWAY

CITY OF EDMONDS

LAKE BALLINGER

CITY OF MOUNTLAKE TERRACE

SNOHOMISH CO.

PUGET SOUND

LAKE WASHINGTON

CITY OF SEATTLE

CITY OF SEATTLE

CITY OF LAKE FOREST PARK

1000 500 0 1000 2000

SCALE IN FEET

LEGEND

- NO CHANGE
- 1% TO <10% INCREASE
- <11% TO <20% INCREASE
- <21% TO <30% INCREASE
- GREATER THAN 30% INCREASE
- CITY OF LAKE FOREST PARK BOUNDARY
- CITY OF SHORELINE BOUNDARY
- RONALD WASTEWATER DISTRICT BOUNDARY

RONALD WASTEWATER DISTRICT

FIGURE 3.2
FORECAST CHANGE IN HOUSING UNITS

CHS ENGINEERS, LLC

CHAPTER 4

DESIGN CRITERIA

4.1 INTRODUCTION

In this chapter, design criteria, as applicable to system wide evaluation, are established to determine the adequacy of the existing system and the requirements of future facilities. Specific criteria applicable to mainline extension are discussed in Section 4.8 and Appendix E.

4.2 DEVELOPER STANDARDS AND DESIGN CRITERIA

The District has developed a Developer Extension Manual. The DE Manual established the design guidelines, criteria, forms, and material specifications that are accepted by the District. The manual meets or exceeds the minimum standards set by DOE in the "Criteria for Sewage Works Design". The design criteria portion of the DE Manual is included in Appendix E.

The District currently has no plans for any large-scale service expansion or Utility Local Improvement Districts. The majority of new pipelines are expected to come in the form of Developer Extensions.

4.3 REFERENCE DATUM

Since hydraulic capabilities of sewerage facilities are based on pipeline slopes, size and material, it is important that a common datum be used for design purposes. Ronald Wastewater District is currently referencing its facilities to the NAVD "88". Existing facilities should always be checked for elevation prior to design of new facilities.

4.4 PERIOD OF DESIGN

In planning sewerage facilities it is necessary to evaluate both present and future service needs, and to design a system compatible with variable demands over a given length of time. This time span is known as the Period of Design. A 20-year period will be used in developing a system capable of handling future sewage demands.

Economy in design and construction cost is achieved by the construction of trunk and interceptor sewers with sufficient capacity to meet the present and future (ultimate) capacities of the drainage area. This is especially true in congested areas where duplication and paralleling of sewerage facilities at some future date would be extremely difficult and costly. Pump stations are best suited for staged construction. Basic pumping structures are often designed to meet ultimate needs, but use equipment compatible with nearer term demands. Some basic

transmission components follow a similar construction and equipment schedule, but in many cases basic structures are expanded or duplicated as the need arises. The design of pipeline facilities that will not operate at full capacity for many years needs to address the impact of relatively small flows in a high capacity line. For example, gravity sewers must have adequate velocity at initial and long-term flow rates in order to avoid sedimentation and sulfide gas production within the pipeline. The diameter and profile of a force main must be carefully chosen to avoid sedimentation and septicity problems.

4.5 DESIGN LOADING FOR SEWER FACILITIES

The flow in a sanitary sewer system is composed of commercial and industrial wastewater, infiltration and inflows in addition to residential wastes. “Infiltration” occurs when groundwater enters a sewer system through broken pipes, defective pipe joints, or illegal connections of foundation drains. “Inflow” is surface runoff that enters a sewer system through manhole covers, exposed broken pipe and defective pipe joints, cross connections between storm sewers and sanitary sewers, and illegal connection of roof leaders, cellar drains, yard drains, or catch basins (Ecology 97-03).

Projecting sewer flows requires knowledge or estimates of the following variables: area (acres), development density (e.g. 6 units per acre), inflow and infiltration rate (I/I, in gallons per acre per day), residential density (persons per household), flow per capita (gallons per person per day) and peaking factor or diurnal wastewater flow pattern.

Measured sewage flow represents the total of all components, thus giving little indication of the volume attributable just to sanitary waste. The District has previously used an estimate of 85 gallons per capita per day (gpcd) for residential sewage rates. Analysis of sewer system flow data as part of the District’s Inflow/Infiltration program indicates that the average flow per person varies but the average for the areas studied to date is about 83 gpcd. Thus, the quantity of 85 gpcd is appropriate for the areas within the Ronald Wastewater District.

A sanitary sewerage system must be capable of carrying the peak sewage flows that occur daily. The magnitude of the peaking factor will vary with the size and density of the area served. A peaking factor is the relationship of Peak Hour flow to Average Day flow. The historical peaking factor values the District has used range from a maximum of 4.0 for small residential areas under 100 acres to 1.9 for a large tributary area of 10,000 acres.

To estimate the impact of new development on the existing sewer system, sewage flow from commercial accounts is estimated by assuming an approximate number of residents per acre then multiplying by 85 gallons per resident per day. Using the population equivalents as determined in Chapter 3,

average daily flows can be determined for the entire service area, for both residential and commercial developments.

4.6 INDUSTRIAL WASTES

In the collection system there are currently five industrial users, as defined by the King County Industrial Waste Program. These include:

- King County Roads Department– Bruggers Bog Decant Station,
- King County Surface Water Department – Shoreline Transfer Station,
- King County Natural Resources Department, Wastewater Treatment Division – Brightwater Conveyance System II,
- Point Wells Portal and
- Paramount Petroleum Corporation.

The agreement between the District and King County allows discharge of industrial waste to the District's collection system provided the discharge meets certain criteria. There are currently no industrial users, as defined by the King County Industrial Waste Program, in the collection system at this time.

4.7 INFILTRATION/INFLOW SOURCES

The quantity of water which may enter a system through infiltration and inflow (I/I) is rather indeterminate and will generally increase with the age of the sewer. However, the design of the sewer system, careful construction and inspection techniques can reduce the amount of I/I that can enter a sewer system.

For infiltration, the porosity of the pipe material and the type of pipe joint influence the amount of groundwater that enters a sewer. The use of longer length, impervious PVC pipes reduces the number of joints in a collection system and, consequently, helps reduce infiltration. Current construction and inspection techniques take into account the need for having as watertight of system as possible. Poorly installed manholes and improperly aligned manhole covers are additional possible sources of extra flow into the sewer system. Infiltration values of 600 gallons per acre per day (gpad) are used for new sewer systems. See Chapter 5 for further discussion of the existing system and infiltration.

For inflow, illegal connections from roof, footing and area drains, as well as broken side sewers or open connections left unplugged during construction increases the amount of surface water that enters a sewer. These types of sources are of concern in the design of a sanitary sewer system since the amount of flow from these sources may exceed the design capacity of the sewer, thereby causing the sewer to become surcharged or overloaded. Even though this type of connection is strictly prohibited, it occurs and can reoccur even after correction. Inflow values of 500 gpad are used for new systems. See Chapter 5 for further discussion of the existing system and inflow.

4.8 DESIGN OF SEWER SYSTEM FACILITIES

The recommendations which follow are for preliminary design of interceptors, trunk sewers, force mains, inverted siphons and pumping stations.

Collection and Pumping Facilities

The ideal method of collecting sewage from a community is by gravity sewers. This is the most economical method when physical conditions permit. Sewage collection by this method is dependent upon the topography of the surrounding land. Many times the topography is not suited for sewage collection solely by gravity in which case pumping facilities must be constructed. Pumping facilities increase both initial and operating costs over those of gravity type sewers. There is a point, however, at which the construction costs and physical parameters associated with gravity sewers become overwhelming and then pumping facilities must be installed regardless of the topography.

Many communities in the Northwest use a combination of gravity and pumped sewage facilities; the Ronald Wastewater District is among them.

The natural drainage basins within the District are tributary to many creeks, Puget Sound, Lake Washington and a few small lakes. King County Department of Natural Resources has their interceptor sewers located within many of these natural basins. Sewage flows within these individual basins can be collected by gravity sewers, but at the point where these drainage basins reach a low point some distance from the King County facilities, the sewage must be pumped from there to an adjacent basin or to a King County facility.

One of the problems encountered with the construction of gravity sewers in the Puget Sound area has been poor soil condition. Construction of gravity sewers in excess of 15 feet deep has been difficult due to sloughing of the trench walls and poor foundation soil which increase construction costs. Besides the difficulties and safety concerns of construction, these problems can result in deflection or misalignment of the sewer pipe. As construction costs increase on deep gravity sewers, the use of pump stations and shallower gravity lines become more economical in some cases. Prior to final design, the economics of a deep gravity system versus a pump station and shallow gravity line should be reviewed in order to determine the appropriate design approach.

Trunk and Interceptor Sewers

The interceptor sewers should be designed with sufficient capacity to carry the peak flows from the ultimate development of the tributary area. This flow represents the sum of several loadings calculated separately for each section of sewer or tributary area. The loadings consist of the peak flow of sanitary sewage, groundwater infiltration, surface water inflow and any special quantities

that must be considered. The larger the area served by a particular trunk or interceptor, the lower the peak factor or ratio of peak instantaneous flow to average flow due to the "averaging" of flows over the larger area.

The ability of a sewer to transport suspended solids contained in sewage is related to the velocity of flow in the sewer. A velocity of 2 feet per second is generally considered to be the minimum which will keep pipe surfaces relatively free of deposited material. Grease is an exception to this rule and will leave deposits on pipe walls at much higher velocities. Table 4.1 presents the minimum allowable slope of various sizes of sewers to obtain a cleaning velocity under full-pipe conditions. Minimum slopes are not acceptable for all sewers. Sewers with low flow rates should have increased slopes or they may become maintenance problems due to deposition of solids.

TABLE 4.1

MINIMUM PIPE SLOPES

Pipe Size in Inches	Slope* (Feet/Foot)
8	0.004
8-dead end	0.005
10	0.0028
12	0.0022
15	0.0015
18-21	.0012-.001
24-30	.0008-.0006

*Minimum slope for various sized sewer pipe necessary to maintain a cleansing velocity of 2 fps, at full pipe conditions.

A value of 0.013 is used for Manning's "n" value when calculating flow in a gravity sewer system.

Force Mains and Inverted Siphons

The design of force mains and inverted siphons is predicated on the fact that they flow full and under pressure. As in the case of gravity sewers, the mains must be capable of carrying the peak flow from a given area. Proper cleaning velocities are obtained in a force main by selection of a pipe size that will insure this with a specified pumping capacity.

Inverted siphons may consist of two or three parallel lines of different sizes to obtain the desired velocities. Inlet and outlet structures provide for use of one line until the flow increases to the point where the capacity of the second line is needed.

Since the design flow uses the full pipe and is either pumped or divided between parallel lines, force mains and siphons are commonly of smaller size than adjacent gravity sewers. The empirical Hazen-Williams equation is commonly utilized for analyzing friction loss under pressure flow conditions. A discharge coefficient "C" is used in the equation to account for the roughness and condition of the material. The typical value of "C" of small diameter pressure mains (PVC or ductile iron) is 130. The appropriate pipe diameter is determined from the Hazen-Williams equation with consideration for the desired velocity of approximately three to five feet per second.

Pumping Stations

Wastewater pumping stations are generally constructed underground, either as factory assembled package units or custom designed stations. An on-site standby power generator is included as conditions warrant. Gravity overflow from the station's wet well to a downstream gravity sewer may be possible at some pump stations. In this scenario, the solids are retained in the wet well during a power outage but the liquid flows downstream without overflowing the system. Once normal operation resumes liquids and solids are pumped out of the wet well. Capacities of permanent pumping stations are based on the peak flow of all sewers tributary to the individual station. Stations can be designed to allow for staged increases in pumping capacities, with pumping units installed as required by growth and consequent flow increases.

Pumps are usually driven by electric motors, are of a non-clog design, and are of a number of units sufficient to pump the design peak flow with any one unit out of service. Providing a duplication of pumping capabilities in each pump station minimizes wear and tear thereby reducing the chances of mechanical failure. Providing on-site standby power generators with electrical power failure alarm systems reduces problems resulting from power outages. Pump stations are monitored with an auto dialer system that calls the District Office or staff member that is on call outside normal business hours. Each of the District pump stations has either on-site standby power or pre-mounted connections and disconnect/transfer switches.

Sewer Materials

The primary material acceptable for sewer pipe construction is polyvinyl chloride (PVC). Ductile iron pipe is also employed where its use is justified due to depth, scouring velocities, or other unique conditions. The pipes are joined by flexible, rubber-gasket type joints.

The construction of manholes with precast, reinforced concrete bases, rings and cone sections with rubber gaskets between sections is the standard. Cast in place manhole construction is also another option. One of the most recent

developments for infiltration elimination is the use of mastic sealing devices around the outside of manholes at the joints. Cement mortar applied to the inside of manhole joints appears to be an effective way of reducing infiltration in wet soils. These favorable modifications have resulted in a significant decrease in infiltration in the manholes.

Sewer Locations

In general, the trunk and interceptor sewers will be located in existing street rights-of-way or in proposed street areas. Certain sewers will have to be located on easements following natural drainage courses, although these locations will become much more difficult to use because of the current Endangered Species Act (ESA) listing of Puget Sound salmon and Bull Trout.

The location of the sewer lines in relation to other utilities must also be considered. There may be some conflict in final sewer locations due to interference with water mains, drains and electrical conduits. In most cases, however, sewer lines would pass beneath the other utilities. This is especially true in the case of water mains, where it is desirable to have the sanitary sewer a minimum of eighteen inches below the water main, with ten feet of horizontal separation.

During the predesign phase of a sewer facility, consideration should be given to the proximity of shorelines, wetlands, open space buffer zones; stream or lake habitat and buffer zones as identified under the Endangered Species Act legislation and other special corporate areas identified by agencies with jurisdiction.

Table 4.2 indicates the sewer planning criteria used for this plan.

TABLE 4.2

DESIGN CRITERIA FOR SEWAGE FLOWS

Parameter	Criteria
Quantity of Sanitary Sewage (Average) – Residential	85 gpcd
Population Density City of Shoreline Low Density Residential Areas Medium Density Residential Areas High Density Residential Areas Neighborhood Business Areas Community Business Areas Regional Business Areas Unincorporated Snohomish County Urban Low Density Residential Urban Industrial Mixed Use/Urban Center	 14.4 persons per ac 29 persons per ac 115 persons per ac 25 persons per ac 25 persons per ac Up to 198 persons per ac 14.4 persons per ac 25 persons per ac[1] 28.8 persons per ac minimum[2]
Quantity of Sanitary Sewage (Average) – Schools Without showers but with cafeteria	8.5 gal/8 hrs/student
New Systems in Areas of Average Ground Water & Good Storm Drainage -Infiltration -Inflow	 600 gpad 500 gpad 1,100 gpad

Peaking Factors for Sanitary and Commercial Waste:

	100 Ac.	1,000 Ac.	5,000 Ac.	10,000 Ac.
Peak Factor	4.0	3.0	2.2	1.9

[1]Assumed to be similar to a commercial use with no residential dwelling.
[2]Maximum densities to be established as part of more detailed planning.

CHAPTER 5

EXISTING SEWER SYSTEM

5.1 INTRODUCTION

In the development of a sewer capital facilities plan for the District, it is necessary to consider the condition and capacity of the existing collection system in order to determine its ability to meet present and future needs.

5.2 EXISTING SEWER SYSTEM INVENTORY

Ronald Wastewater District presently owns, operates and maintains a domestic wastewater collector and interceptor system consisting of 16 lift stations, 21 individual grinder pumps, and approximately 190 miles of 6" to 30" diameter sanitary sewer mains, not including private sewers (see Table 5.1). Sewer service is generally provided to customers by gravity flow through the District system or by gravity flow to District owned and operated lift stations. The existing collection system is shown on Figure 5.1 included at the back of this chapter. All sewer lines are 8 inches in diameter unless otherwise shown.

TABLE 5.1

EXISTING SEWER SYSTEM PIPE QUANTITIES

Pipe Diameter, Inches	Length, Feet
6	28,424
8	858,771
10	31,929
12	28,494
14	2,534
15	26,622
16	1,221
18	13,413
21	1,835
24	6,998
30	2,966
Total	**1,003,207**

Total length of sewer mains: 1,003,207 feet or 190 miles

Due in parts to the timing of development and of site topography, some areas on the periphery of the District are served across District boundaries. Sewer service to these areas is by agreement between the District and adjacent agencies (see Chapter 7).

As indicated in Chapter 1, Ronald Wastewater District provides wastewater collection only. Treatment is provided by contract with the City of Edmonds and King County. Figure 5.2 shows the dividing lines for the 25 drainage basins of the District. The City of Edmonds' plant treats approximately 10 percent of the District's wastewater flows. King County's West Point plant treats the remaining 90 percent of the sewage flows from the District.

As of December 31, 2008, the District had 23,373 sewer residential customer equivalents (RCE's) from 16,636 accounts including multifamily and commercial accounts connected to the sewer. The District accepts flow from 2,243 RCE's that flow to Edmonds treatment plant and 21,130 RCE's that flow into Metro's system. The agreement for these transfers is part of the flow transfer agreement (see Chapter 9).

PUMP STATIONS & INDIVIDUAL RESIDENTIAL PUMPS

A summary of the existing District owned pumping facilities is presented in Table 5-2. Lift stations #1 through #9 were designed and constructed as part of the Ronald Wastewater District. Lift Stations #11, #12 and #13 were originally part of King County Sewer District #3 (KC#3) which was transferred to the District in 1986. Lift stations #14 and #15 were part of the old Lake City Sewer District (LCSD) which became part of the District in 2002. Lift stations #16 and #17 were part of Richmond Beach Park which was part of KC#3. However, the ownership of these lift stations was not clarified until 2008.

The District's Lift Stations are well maintained and to the District's knowledge have not had any overflow events in the past few years. Each station has an auto-dialer that notifies the on call maintenance technician of problems occurring at the lift station. The dialer (Dialog Elite) notifies the District of the following alarm conditions: High Water, Low Water, Intrusion, Fire, Generator Run and Generator Low Fuel. The District has a spreadsheet that estimates the time until overflow for all stations. As indicated in Table 5-2 several of the Lift Stations have onsite generators. Besides these generators, the District has two wheel mounted generators that can provide emergency power via pre-mounted connections and disconnect/transfer switches. The auto dialers alert RWD staff of high water conditions which elicits a response and inspection of the station as soon as possible. The tanks draw down when the primary wet well pumps come back on. The Residual sewage is pumped out with the vactor truck and the overflow tanks are washed down.

The District collection system includes one pressure sewer system including 21 grinder pumps discharging through 1 ½" to 2 ½" force mains. This system is owned and operated by the District. If a homeowner requests a grinder pump in this system, the homeowner comes to the District, requests a grinder pump. The District would install it to the District standards and the homeowner would pay it.

OTHER FACILITIES

The combined administration and maintenance building is owned by the District and has been at its present location since 1963. The building has been remodeled and expanded to its present configuration and is generally adequate to serve the current needs of the District. The District completed a Building Needs Study and identified the future needs of the District Maintenance and Administrative District staff. Two new vehicle storage buildings are currently under construction on the District owned parcels immediately north of the District office. It is the intent of the District to remodel the existing Administrative Building after the vehicle storage buildings are completed.

5.3 HISTORY OF IMPROVEMENTS

The District obtained a low interest Public Works Trust Fund loan in 2005 for construction of sewers in three areas of the District that were previous unsewered. New collection mains were installed and side sewer stubs installed to 44 residences or vacant lots. One of the areas had to be annexed to the District before service could be provided. The low interest loan was passed onto those customers that chose to connect to the new system.

The District received a second Public Works Trust Fund loan in 2008 for upgrading Lift Stations #14 and #15. Construction began in spring of 2009 and is expected to be completed in February of 2010. Lift Station 15 is receiving new controls and an onsite emergency generator. Lift Station 14 is being downsized and is receiving new pumps, controls, force main and emergency generator connection.

The following projects have been or are nearly complete since 2000:

Basin 12 and 15 Repairs
15th Avenue NE Rehabilitation
23rd Avenue NE @ Ballinger Annexation
Shorewood Hills Annexation
Pipe Bridges Retrofit
Appletree Lane Pump Upgrades
Unsewered Areas Sewer Extensions
Lift Station #14 & #15 Improvements
Withdrawal of Territories in Lake Forest Park
2007 CIP Rehabilitation
Lake City Sewer District Annexation

2008 CIP Rehabilitation
2009 CIP Rehabilitation

5.4 INFILTRATION AND INFLOW STUDIES/PROJECTS

In all sewer systems, there will always be some amount of infiltration and inflow (I/I) occurring, regardless of the pipe material or construction techniques. The older the pipe, the more likely the I/I will be greater than in newly-installed sewer lines. The key to making a decision on whether to spend money on reducing I/I in a sewer system is whether the expenditure is cost effective. In general, determination of the cost-effectiveness of I/I reduction efforts compares the estimated cost to reduce I/I to a particular level versus the estimated cost of increasing the capacity of sewer mains, interceptors, pump stations and/or treatment plants. These I/I reduction costs are considered capital costs compared to the cost of operation and maintenance (including treatment) that would be considered as a part of a cost-effective analysis.

In the case of the District, two cost-effectiveness evaluations can be made. The first would consider the effect of I/I in the District's system and the second would consider the effect of I/I in Edmonds' and King County's sewer conveyance system and treatment plants.

I/I in the District's system may result in flow rates that exceed the capacity of the District's sewer mains and/or pump stations. The estimated cost to increase the capacity of the mains or pump station to handle the flow rate including I/I would be compared to the estimated cost of reducing I/I to a level where such upgrades would not be necessary. If the cost to reduce I/I were less than the cost of additional capacity, the repairs would be recommended. In some instances, it may be cost-effective to remove some I/I to the point where some, but not all, capacity upgrades could be avoided. This process would consider how much I/I could feasibly be removed. (See discussion of existing system capacity beginning in Section 5.7 for an example.)

The second cost-effectiveness consideration for the District is the cost of conveyance and/or treatment by Edmonds and King County. Presently the District pays Edmonds on the basis of actual volume of wastewater discharged to Edmonds, but the District pays King County for treatment based on the number of residential customer equivalents in the District which are tributary to King County's system, without regard to actual flow rates or levels of I/I. Every gallon of I/I removed from that portion of the District served by the Edmonds' treatment plant saves money for the District's ratepayers. Removing I/I in the District at a cost less than the cost per gallon for treatment by Edmonds is cost-effective I/I removal. Because King County does not charge on the basis of actual flows, the analysis is simple from a District cost standpoint. The District can accept the I/I in that part of its system tributary to King County, as long as there are no capacity constraints in the District's mains or pump stations, because the cost of

any amount of I/I reduction effort would be greater than the cost to treat the additional flow due to I/I. However, the District may still choose to complete repairs in that portion of the system tributary to King County for reasons other than cost-effective I/I removal from the District's view. These reasons include extending the life of the system, improving operational characteristics or being a "partner" with King County in its efforts to reduce the cost of future capital improvement projects for conveyance and treatment, which costs are eventually passed on to District customers.

There have been several studies of inflow and infiltration in the Districts system dating back to 1967, 1988, and 1993. King County completed a Regional I/I Control Program in June 2002. Sub-basins of approximately the same length of sewer main were identified by King County throughout their tributary area. Flow monitoring by King County occurred throughout the District during the winters of 2000/2001 and 2001/2002. Thirty-minute peak I/I values calculated during the King County study range from approximately 1,202 to 26,917 gallons per acre per day (gpad).

In 2002, the District proposed a project to replace side sewers within an area of the District known to have high I/I. This project was selected for partial funding by King County Department of Natural Resources as one of ten pilot projects in their Inflow/Infiltration control program, an element of the County's Regional Wastewater Services Plan (RWSP). Flow monitoring indicated that this basin had approximately 11,000 gallons per acre per day. However, previous District sanitary sewer evaluation work in this basin (sewer main inspection and smoke testing) revealed relatively few faults. Based on existing information, the supposition was made that the source of I/I must be in the side sewers and stubs. Of the 261 properties who signed up for the project, side sewers and/or stubs were replaced at approximately 217 properties and 18 repairs were made within the right-of-way. The I/I was reduced by 74% with this project.

The District has continued to conduct its own comparative flow monitoring using "Flo-totes" since 1994. The District has measured rainfall in the District with their own rain gauges, concurrently with the flow monitoring. By comparing wet and dry weather flows at the same monitoring points in the collection system, the domestic flow has been estimated to be from 37 to 172 gpcd with average about 83 gpcd. The measured diurnal peak factor is rarely over 2, even for the smallest sub-basins. The District has measured I/I amounts range from less than 100 to over 8,600 gpad, with an average of about 3,600 gpad. The highest amounts have been in Basins 8, 12 and 15.

The District had a recent major storm event that impacted the sewer system. During the first of two major storm events in late November thru early December 2007, flows through Meters B and C to Edmonds facilities increased by 767% and 962% respectively. King County's Richmond Beach Lift Station increased by 515%. Ongoing flow monitoring upstream of Meter B revealed two manholes

over capacity during this same event. A new sewer main is currently under design which will accommodate sewer flows from the ultimate build out according to the current land use. The District is in its second wet weather period collecting information in Basin 15 (Echo Lake) to validate there are no unaccounted for sources of I/I within the basin.

Information in the District's Maintenance Management Program was used to identify and select capital replacement projects. Beginning in 2007, the District began an annual program of replacing aging sewer mains. Sewer mains with low rating scores due to broken pipe, pulled and misaligned joints, root intrusions, visible inflow or other maintenance problems are scheduled for replacement. Replacing these lines will not only reduce maintenance costs but will also reduce I/I in the system.

The District recognizes the I/I allowance of a new system is 1,100 gpad. Much of the existing system has I/I values greater then 1,100 gpad. The District has prioritized future maintenance projects that have basins with high I/I

5.5 OPERATION AND MAINTENANCE

The District has an on-going preventive maintenance program for the District's facilities. The District maintenance technicians are encouraged to be certified as Wastewater Collection System operators even though this is not mandated by the State.

The preventive maintenance program includes the inspection and flushing of 33% of the system's sewer main lines and manholes annually to remove debris and locate possible blockage and root problems. This has resulted in a reduction in the number of emergency call-outs and use of outside contractors to perform repairs. When necessary, a television inspection of the line is done to determine the condition of the sewer line and whether repairs are needed. The District has an ongoing closed-circuit television (CCTV) inspection program, with the goal to video inspect at least three days per week. The CCTV program is coordinated with the inflow and infiltration evaluation program to allow correlation of faults with extraneous or unusual flows. Approximately 85% of the District sewer mains have been CCTV inspected since January 2004. As part of the CCTV program, each manhole is inspected, its condition is noted, and any necessary repairs are made. All 16 of the District's lift stations are inspected once per week. In addition, the District inspects the grinder pump stations twice a year.

All maintenance and operation functions have been carefully documented in the past through daily reports. A computer automated maintenance program known as "Maintenance Management Information System" (MMIS) is in use by the District. All maintenance activities are logged into this program. The program provides an inventory and maintains a history of all activities and costs related to

the main lines, manholes and service lines. The system also schedules preventive maintenance activities and automatically generates work orders at the beginning of each month. A similar software program called “Plant Maintenance Manager” is used to schedule maintenance activities and inventory equipment used in the operation of the District’s lift stations.

All but two of the lift stations are connected by a telephone autodialer system to the District office. Lift stations #1 and #2 share a phone line. When Lift Stations #16 and #17 are upgraded in 2010, they will also share a phone line. The District contracts a 24-hour, seven day a week, answering service. All of the maintenance technicians rotate standby duty.

The District acquired KC#3 and purchased the old LCSD sewer system from SPU. Each of these sewer systems had their own manhole and sewer main numbering system. The District desired to have one database, with one set of manhole numbers and sewer main numbers within the District boundary. Also, the District desired to upgrade the mapping system so that it had Geographic Information Systems (GIS) capabilities. The maps were converted to GIS; District staff is trained and regularly uses the GIS system. As specific projects are identified by either District staff or as a result of the hydraulic modeling, information in the GIS database is verified.

The District has enacted a fats, oil and grease (F.O.G.) management program as part of Resolution No. 05-06. This plan requires all commercial establishments within the District generating grease and fat to have a management plan which is to be approved by the District. This plan requires the installation or modification of grease interceptors, traps, or biological process which will meet King County and/or Ronald Wastewater District standards. This policy has substantially reduced the number of emergency call-outs by District staff to clear blockages caused by extensive grease and fat build-up from commercial accounts. Additionally, the District has been able to reduce substantially the number of “specially scheduled” inspections and flushing of the District’s main lines located in the vicinity of the restaurant areas within the District. The District inspects the grease intercepts and traps on a regular basis to enforce Resolution 05-06. In order to more accurately track the compliance with the F.O.G. program, the District has created a database of F.O.G.-producing businesses. This will help the F.O.G. inspectors to tract the progress of each commercial account as it reduces F.O.G. entering the collection system from its business. This information can be queried and the results displayed graphically with the District’s database Arc View 3.1 GIS software.

In 1990, the District adopted a policy outlined in Resolution No. 90-11 regarding the installation of lift stations. All new developments requiring pumps must go through a review process and certain conditions must be met before the District will approve sewer service. The pump and its installation must conform to District standards, and a standby generator and overflow storage are required.

In addition to the grinder pumps located along Appletree Lane, there is one small pump in an Innis Arden neighborhood that pumps sewage from the homes in a cul-de-sac to the gravity system.

The District updated their "Emergency Response/Management Plan" in July of 2000 to guide the operation and maintenance of their sewer system in emergency situations.

The District's General Manager is responsible for management of operation and maintenance of the interceptor and collection system and the pump stations. The Maintenance Manager and Technicians carry out this responsibility. The District presently employs six maintenance technicians who are responsible for operation and maintenance of the District owned facilities. They carry out specified, scheduled tasks as well as responding in times of an emergency.

The general responsibilities of each employee are outlined in Table 5.3. Specific tasks for equipment operation and maintenance are detailed in the District's operation and maintenance manuals.

TABLE 5.3

PRESENTLY SCHEDULED MAINTENANCE OF COLLECTION AND TREATMENT FACILITIES

I.	**PERSONNEL** General Manager, Maintenance Manager, Lead Technician and Five Maintenance Technicians
II.	**COLLECTION SYSTEM:**
A.	Check all pump stations, wet wells and standby generators once a week
B.	Once per week check and perform maintenance on lift station vaults, grounds, pumps and alarms;
C.	Run all standby generators monthly under load:
D.	Pump electrical checks (weekly);
E.	Clean wet wells every four months or as needed to control grease, sludge, etc. (3 times per year);
F.	Flush all sewer mains on a schedule varying from once a year to every 3 years based on historical data and experience factors.

5.6 PERMITS

The District has been issuing permits for connections to its sewer system for nearly 50 years. The number of sewer system connections that have occurred since 2000 are listed in Table 5.4. This includes buildings that are remodeled and those connections that are new because of growth. (For example, a single-family house is torn down and rezoned to allow for 3 units on the lot. Three new permits would be required.) The District categorizes single family units as those with four or less residences per building and multi-family units as those that contain five or more units per building.

TABLE 5.4

NUMBER OF NEW PERMITS ISSUED 2001-SEPTEMBER 2009

Year	Single Family	Commercial
2001	81	11
2002	71	17
2003	45	12
2004	43	9
2005	41	9
2006	77	8
2007	47	6
2008	43	15
2009	16	9

5.7 EVALUATION AND DEFICIENCIES

The majority of the existing sewer system is nearing 50 years old. The District has begun detailed evaluation of the system as described above and has, for many years, documented, and addressed where appropriate system deficiencies are located.

Over the years, several deficiencies have been identified in the District's system, as follows:

- Lift Stations: Two lift stations are scheduled for rehabilitation in 2010 (LS #16 and #17). Lift stations #8, #9 and #12 will require upgrading within the next six years.
- System Faults: Repairs to the District's sewer mains, manholes and side sewer stubs, repairs on private sewer connections and disconnection of illegal connections may be necessary to extend the life of the collection system and reduce the amount of inflow and infiltration. This work is specifically identified as part of the District's I/I Program.
- System Capacity: Some sections of the collection system may not have adequate capacity for future levels of development, in accordance with

current land use plans, or may not have adequate capacity for extraneous flows (see further discussion below and in Appendix C).

Hydraulic Capacity Analysis of Existing Sewer System

The District began using HYDRA software in 1993 for the Infiltration/Inflow (I/I) Phase I study. During the development of the 2001 and 2003 Comprehensive Sewer Plans, the majority of the District transmission mains greater than 8 inches in diameter were modeled. However, the model is now outdated, the service area has changed significantly, and the capacity of all sewer mains within the District needs to be evaluated. Bentley's SewerGEMS software was selected for use in developing the next generation of the hydraulic model of the District's collection system. The entire District sewer main system is now included in the updated model.

The hydraulic model was run under several I/I flow rates (see Appendix C for further discussion regarding the hydraulic modeling):

- 0 gpad
- 1,100 gpad
- 4,300 gpad
- 6,100 gpad
- King County "composite" I/I rate

King County completed the Wet Weather Flow Monitoring Study 2001/2002. During the study, mini-basins were created throughout the County with approximately the same length of pipe (approximately 22,000 to 32,000 feet per basin). Peak I/I values for each of the King County mini-basins within the District were estimated by King County as part of the 2001/2002 study. A "weighted average or composite" I/I rate for each of the District's 25 drainage basins was calculated based on the area of the King County mini-basin within the District basin boundary. This "composite" I/I rate is assumed to represent a 20 year storm event and was used in the hydraulic model.

I/I rates as high as 8,600 gpad for less than a 20-year storm event have been estimated (e.g. Sub-basin 1-3) in prior District I/I studies. In conjunction with these studies, King County has evaluated flow tributary to their Hidden Lake Pump Station with a calibrated hydraulic model. An I/I rate of approximately 6,100 gpad is required to match the results of the King County model with projected flows for future build-out conditions and adjust for a 20-year storm. This 6,100 gpad was the design peak I/I rate used in the 2001 and 2003 Comprehensive Sewer Plan modeling. This same rate was used to compare results from prior modeling efforts to the results from the new sewer model. The I/I rate of 4,300 gpad was assumed to demonstrate the benefit of achieving an I/I reduction of approximately 30 percent from 6,100 gpad.

Table 5.5 indentifies those sewer segments that are projected to be over 100% of full-pipe capacity as modeled under the District design criteria for full-development conditions and both 4,300 gpad and the King County I/I rates. If the King County I/I rate was calculated to be less than 4,300 gpad, only those pipes shown to be over capacity at 4,300 gpad were reviewed. Assuming the District was to replace all the pipes over capacity at 4,300 gpad I/I rate, the District would replace 15,735 feet of pipes compared to replacing 32,086 feet of pipes at the King County I/I rate. All of the overcapacity lines were included in capacity related projects identified in Chapter 8.

As discussed in Chapter 4 and above, the hydraulic system analysis is based on projected and estimated population and flow. Population is based on ultimate or saturation development of the service area of the various basins in accordance with current land use designations and the daily wastewater generated per capita. The peaking factor conservatively increases the peak flow. The peak factor curve is conservative for the District's sewer basins, based on a limited review of diurnal flow patterns during dry weather. These factors must be considered prior to replacement of sewer lines that are projected to be over 100 percent capacity under the modeled conditions. Flow monitoring and more detailed study should be performed prior to constructing replacement or parallel lines to verify that the recommended improvements are necessary to remedy real and not possible conditions. The District should also periodically review the subject segments as the results of the hydraulic modeling indicate that these segments are over capacity, even under design criteria conditions (1,100 gpad I/I) at ultimate buildout.

Determining the "weighted average" I/I rate from the King County study can also provide some direction for prioritization of District flow monitoring efforts. For instance, Basin 16 has the second highest calculated King County I/I rate (14,851 gpad) behind Basin 1 (18,352 gpad). However, the high I/I rate in Basin 16 results in more sewer mains being overcapacity (35 mains) as opposed to Basin 1 (8 mains). Therefore, the District should focus its next flow monitoring in Basin 16 rather than Basin1.

TABLE 5.5

OVERCAPACITY MAINS AND PROPOSED REPLACEMENT MAINS

Basin	Upstream MH	Downstream MH	Length (ft)	Slope (ft/ft)	**Existing Diameter (in)**	**Proposed Diameter (in)**
1	A6001	A6021	1300	0.068	**8**	**10**
1	A6021	A6027	223	0.015	**8**	**15**
1	A6027	A6028	149	0.086	**8**	**10**
1	A6028	A6031	98	0.043	**8**	**12**

1	A6031	A6033	172	0.043	**8**	**12**
1	A6033	A6037	152	0.054	**8**	**10**
1	A6037	A6041	346	0.013	**8**	**15**
1	A6041	KC WW	31	0.019	**8**	**15**

TABLE 5.5

OVERCAPACITY MAINS AND PROPOSED REPLACEMENT MAINS (CONT.)

Basin	Upstream MH	Downstream MH	Length (ft)	Slope (ft/ft)	**Existing Diameter (in)**	**Proposed Diameter (in)**
12	E6038	E6039	94	0.008	**8**	**10**
12	E6040	E6038	23	0.004	**8**	**10**
12	E6041	E6040	258	0.005	**8**	**10**
14	D3006	D3004	104	0.005	**24**	**27**
14	D3020	D3019	179	0.005	**18**	**21**
14	D3021	D3020	353	0.004	**21**	**24**
14	D3022	D3021	292	0.004	**21**	**24**
14	E1066	E1067	84	0.006	**10**	**12**
14	E2037	E2038	283	0.004	**18**	**21**
14	E2038	E2039	102	0.004	**18**	**21**
14	E2039	E2042	163	0.003	**18**	**21**
14	E2043	E2044	290	0.004	**18**	**21**
14	E2051	E3007	412	0.016	**15**	**18**
14	E2065	E2064	265	0.003	**18**	**21**
14	E2066	E2065	295	0.003	**18**	**21**
14	E2075	E2067	302	0.001	**15**	**18**
14	F2002	F2003	259	0.004	**12**	**15**
14	F3030	F3039	397	0.004	**10**	**12**
14	F3039	F3059	402	0.004	**10**	**12**
15	F5001	F6027	155	0.003	**14**	**18**
15	F5002	F5001	335	0.003	**14**	**15**
15	F6027	F6028	204	0.002	**14**	**18**
15	F6028	F6029	85	0.003	**14**	**15**
15	F6029	F6030	135	0.003	**14**	**18**
15	F6030	F6031	158	0.003	**14**	**18**
15	F6031	F6032	102	0.002	**14**	**18**
15	F6032	F6115	65	0.003	**14**	**18**
15	F6033	F6034	256	0.002	**14**	**18**
15	F6034	F6035	65	0.003	**14**	**18**
15	F6035	F6036	152	0.003	**14**	**18**

15	F6063	F6064	112	0.006	**15**	**18**
15	F6064	F6065	197	0.005	**15**	**18**
15	F6065	F6087	152	0.006	**15**	**18**
15	G6002	G6001	41	0.009	**16**	**18**
16	H4001	H4111	295	0.005	**8**	**12**

TABLE 5.5

OVERCAPACITY MAINS AND PROPOSED REPLACEMENT MAINS (CONT.)

Basin	Upstream MH	Downstream MH	Length (ft)	Slope (ft/ft)	**Existing Diameter (in)**	**Proposed Diameter (in)**
16	H4029	H4103	835	0.010	**8**	**12**
16	H4030	H4028	215	0.004	**12**	**15**
16	H4102	H4104	256	0.060	**8**	**10**
16	H4103	H4102	300	0.034	**8**	**10**
16	H4111	H4030	336	0.006	**8**	**12**
16	H5030	H4001	53	0.005	**8**	**10**
16	H6059	H6060	261	0.007	**8**	**10**
16	H6061	H6064	389	0.007	**8**	**10**
16	I4001	I4002	43	0.012	**8**	**15**
16	I5002	I5003	86	0.010	**8**	**12**
16	I5003	I5006	350	0.010	**10**	**12**
16	I5007	I5010	289	0.014	**10**	**12**
16	I5010	I5014	125	0.007	**12**	**15**
16	I5014	I5015	135	0.007	**12**	**15**
16	I5015	I5016	49	0.007	**12**	**15**
16	I5016	I5019	130	0.002	**12**	**18**
16	I5020	I5024	395	0.006	**12**	**15**
16	I5024	I5025	271	0.004	**12**	**18**
16	I5025	I5027	334	0.011	**12**	**15**
17	G4074	G4075	347	0.005	**10**	**12**
17	G4075	G4076	351	0.005	**10**	**12**
17	H4060	H4061	334	0.004	**8**	**10**
17	H4061	H4066	322	0.004	**8**	**10**
18	325	49	364	0.008	**18**	**21**
18	040	325	303	0.004	**18**	**24**
18	H2041	H2042	286	0.005	**15**	**18**
18	H3028	H3029	318	0.004	**15**	**18**
18	H3029	H3032	352	0.004	**15**	**18**
18	H3040	H3041	330	0.005	**8**	**10**
18	H3043	H3044	322	0.007	**8**	**10**

18	H3044	H3045	300	0.005	**8**	**10**
18	H3046	H3047	91	0.004	**8**	**10**
18	H3047	H3074	410	0.006	**8**	**10**
18	H3051	H3063	314	0.007	**10**	**12**
18	H3064	H3065	128	0.010	**10**	**12**

TABLE 5.5

OVERCAPACITY MAINS AND PROPOSED REPLACEMENT MAINS (CONT.)

Basin	Upstream MH	Downstream MH	Length (ft)	Slope (ft/ft)	**Existing Diameter (in)**	**Proposed Diameter (in)**
18	H3065	H3066	478	0.006	**10**	**12**
18	H3068	H3073	115	0.004	**12**	**15**
18	H3073	H3028	312	0.007	**12**	**15**
19	I6038	I6076	206	0.009	**8**	**10**
19	I6076	I6077	86	0.002	**8**	**12**
19	I6077	J6017	328	0.010	**8**	**10**
19	J6020	J6021	150	0.007	**10**	**12**
19	J6021	J6022	162	0.006	**10**	**12**
20	79	85	332	0.007	**8**	**12**
20	81	83	294	0.002	**12**	**18**
20	168	169	162	0.017	**12**	**15**
20	171	231	327	0.007	**12**	**15**
20	230	229	329	0.002	**15**	**21**
21	109	164	100	0.007	**15**	**18**
23	48	49	334	0.005	**12**	**15**
23	49	50	240	0.006	**12**	**15**
23	50	51	395	0.005	**12**	**15**
23	51	139	333	0.008	**12**	**15**
23	59	60	337	0.007	**16**	**18**
23	60	66	350	0.007	**16**	**18**
23	66	123	331	0.008	**15**	**18**
23	117	118	75	0.001	**18**	**27**
23	139	140	53	0.002	**12**	**18**
23	140	141	281	0.009	**12**	**15**
23	141	145	176	0.007	**12**	**15**
23	145	146	175	0.006	**12**	**15**
23	146	150	295	0.008	**12**	**15**
23	150	205	312	0.013	**12**	**15**
23	205	204	317	0.015	**12**	**15**
23	240	241	144	0.001	**16**	**30**

23	298	387	302	0.007	**16**	**18**
23	390	392	206	0.006	**16**	**18**
23	392	397	310	0.008	**16**	**18**
23	397	59	390	0.006	**16**	**18**

CHAPTER 6

WASTEWATER TREATMENT

6.1 INTRODUCTION

The Federal Water Pollution Control Act Amendment of 1972 (Public Law 92-500) required that existing sanitary sewage treatment facilities achieve secondary treatment capability by July 1, 1977. The Ronald Wastewater District does not own or operate any sewage treatment facilities. The District currently discharges its collected wastewater into two separate treatment facilities: King County Department of Natural Resource's (KCDNR, formerly METRO) West Point plant and the City of Edmonds' plant. Although compliance with the Ecology's requirements for wastewater treatment is the responsibility of KCDNR and the City of Edmonds, the District is concerned with the analysis of alternative proposals for compliance with the requirements since the cost of alternatives would be passed on to the Ronald Wastewater District customers.

6.2 KING COUNTY

METRO was created in 1958 to solve environmental problems with wastewater discharge into Lake Washington and Puget Sound. METRO constructed two wastewater treatment plants to handle the wastewater generated in the region – West Point in Seattle and South Plant in Renton. A portion of wastewater from the District flows to the West Point treatment plant (adjacent to Discovery Park in Seattle). West Point treatment plant was upgraded to secondary treatment in 1995. Since February 1990, King County levies a sewage treatment capacity charge on all new sewer connections within the County's sewage treatment area. The monthly capacity charge is collected directly from new customers by King County. For 2010, the amount is $49.07 per month per residential customer equivalent (RCE) for fifteen years. Customers can elect to pay off their loan up front or during the fifteen year period. Customers would need to check with King County to get the exact amount of their payoff.

As of December 31, 2008, sewage from 21,130 RCE's were sent via interceptor to King County for sewer treatment. The King County Council determines and fixes the total monetary requirements for disposal of sewage each year. For the year 2010, the monthly treatment charge is set at $31.90 per RCE/month. This is collected by the District as a pass-through charge to District ratepayers. This amount is in addition to the District treatment charge of $11.15/RCE/month. Multi-family and commercial accounts are based on water use converted to RCEs (750 cubic feet water = 1 RCE).

6.3 EDMONDS

The City of Edmonds originally constructed their wastewater treatment plant (WWTP) in 1957 to intercept discharge of untreated waste into Puget Sound. It

was originally designed to handle the flows from the City of Edmonds. The plant was later expanded to serve Mountlake Terrace and portions of Ronald Sewer District (ULID 2) beginning in 1959. A second upgrade to the Edmonds' WWTP was completed in 1967 to provide wastewater treatment service for Olympic View Water and Sewer District. A third upgrade, which increased capacity and also expanded treatment level from primary to secondary treatment was completed in 1991. The component agencies to the City of Edmonds agreed to pay for their capacity share by selling their own bonds. The Edmonds Wastewater Treatment Facility Capacity and Proportionate Share are indicated in Table 6.1, according to the 1988 Agreement with the City of Edmonds:

TABLE 6.1

ALLOCATED CAPACITY OF DOMESTIC SEWAGE FOR THE EDMONDS WASTEWATER TREATMENT FACILITY

	Annual Average Daily Flow, mgd	Proportionate Percentage
City of Edmonds	4.609	50.787%
City of Mountlake Terrace	2.103	23.174%
Olympic View Water And Sewer District	1.502	16.551%
Ronald Wastewater District	0.861	9.488%
Total	**9.075**	**100.000%**

Ronald Wastewater District's capacity share is 9.488% of the ultimate plant capacity and the District sold $2 million in bonds to finance the capacity purchased. In 2008, the Edmonds WWTP treated 120 million gallons of sewage generated from 2,243 RCEs in the District. The District charges $20.00 per RCE per month for capital projects and for the District's share of Edmonds' annual wastewater treatment plant operation and maintenance costs.

6.4 WASTEWATER FLOW PROJECTIONS

The District has a purchased treatment capacity of 0.861 mgd of annual average daily flow (AADF) to the Edmonds' wastewater treatment plant. Of the 0.861 mgd capacity purchased by the District in 1988, the District's flow in 2008 was 0.33 mgd or 38% of the purchased capacity. If the Point Wells facility is constructed as proposed, the District may be required to purchase additional capacity. The District does not have a capacity limit in King County wastewater treatment facilities.

6.5 FLOW TRANSFER

The majority of the wastewater in the District's service area flows to King County interceptors. The north central section of the District (the boundaries are based

on topography) flows to Edmonds' wastewater treatment plant. Flows from the Point Wells area are directed to Lift Station 13 then into King County's Richmond Beach pump station. The wastewater from this area is then treated by the City of Edmonds' wastewater treatment plant. King County discharges flows into Edmonds wastewater treatment plant through an agreement between Edmonds and the County which was updated in the year 2000. This same agreement allows for flows in the Edmonds area to be diverted to King County's West Point Treatment plant to offset the flows sent to Edmonds from the Richmond Beach area.

The Flow Transfer plan was arrived at after considering several alternatives to meet the requirement of upgrading treatment plants to secondary treatment capability. While evaluating the alternatives, public input and the related costs for each alternative were considered. The final configuration included the elimination of the King County Richmond Beach Treatment Plant located in the District service area. In order to eliminate this plant, an alternative was developed called "Flow Transfer". The overall concept is that King County would pump the sewage that was collected from the area west of Aurora to Edmonds and the sewage flow east of Aurora would connect through a new interceptor to the line flowing to King County's West Point plant for treatment (see Figure 6.1). Sewage from the Richmond Beach area flows year-round to Edmonds. Flows from Basin 15 flow into King County's Ballinger Pump Station then onto Edmonds' collection system. Sewage from Basin 12 flows by gravity into the District's collection system, then into a pump station and via force main which connects to Edmonds' collection system. More specifically, flows from the Ballinger Pump Station flow to Edmonds' from November through April. During the months from May through October, a volume of sewage at Ballinger Pump station equal to the volume of sewage collected in the Richmond Beach area is sent down King County's McAleer trunk into King County's system. This agreement is in effect January 1st, 2012, at which time the transfer of flow (equal to the volume received from Richmond Beach) from Edmonds to King County will occur year-round instead of seasonally.

6.6 NEIGHBORING TREATMENT FACILITIES

The City of Lynnwood, Alderwood Water and Wastewater District, Mukilteo Water and Wastewater District, City of Edmonds and the City of Everett have wastewater treatment facilities and serve surrounding areas to the north of the District. Olympic View Water and Sewer District, purveyor to the north of the District, has an agreement with Edmonds and King County for sewer treatment. King County West Point Treatment Plant, South Treatment Plant and several-combined sewer overflow facilities in Seattle as well as Southwest Suburban Sewer District's Salmon Creek Treatment plant serve sewer facilities south of the District.

6.7 WATER RECLAMATION AND REUSE

The use of secondary effluent, treated to meet the requirements for reclaimed water, has been implemented or is planned to be implemented in King County:

- South Treatment Plant (for use at the plant and by the City of Tukwila)
- West Point Treatment Plant (for use at the plant)
- Carnation Treatment Plant (for use as wetlands enhancement)
- Brightwater Treatment Plant (for use in Sammamish Valley)

King County and Seattle Public Utilities (SPU) are both completing reports on Reclaimed Water and how it might be handled within both service areas. While the details have not been finalized, initial plans include King County as the wholesale provider of Reclaimed Water. A proposed distribution system would be built off the Brightwater Portal, potentially near the Ballinger Way Portal. It would be up to the individual purveyors, such as the District, to build a portion of a reclaimed water distribution system. SPU's study has been looking into the costs of the distribution system and determining the most practical route available to feed the large water users. Table 6.2 lists the large water users within the Shoreline/Lake Forest Park area which have either SPU or Shoreline Water District (SWD) or individual wells as their water supplier.

TABLE 6.2

LARGE WATER USERS IN SHORELINE[1]

		Irrigation/Non-potable Consumption				
		Annual		MGD		Water
		CCF	MG	Summer	Winter	Supplier
1	Seattle Golf and Country Club	41,789	31.3	0.171	0	Wells
2	Holyrood Cemetery	23,700	17.7	0.097	0	Wells
3	Acacia Memorial Park	16,119	12.1	0.066	0	Wells
4	King County Wastewater	7,474	5.6	0.015	0.015	SPU
5	Kings Schools Ministry of Crista	6,662	5.0	0.027	0	SPU
6	Paramount School Park	4,745	3.5	0.019	0	SWD
7	Shorewood High School	3,996	3.0	0.016	0	SPU
8	Sky Nursery	2,986	2.2	0.009	0.003	SPU
9	Shoreline Community College	2,751	2.1	0.011	0	SPU
10	Kellogg Middle School	2,750	2.1	0.011	0	SWD
11	Shorecrest High School	2,717	2.0	0.011	0	SWD
12	Hamlin Park	2,605	1.9	0.011	0	SWD
13	Herzl Memorial Park/ Herzl Ner-Tamid	2,594	1.9	0.011	0	SPU/Wells

[1]Information provided by SPU

6.8 INFILTRATION AND INFLOW

King County identified in the 1999 Regional Wastewater Services Plan (RWSP) the need for a regional Infiltration and Inflow (I/I) program. The first project, the Pilot Project Report, was completed in 2004. Ronald Wastewater District was selected as one of the 10 pilot projects I/I. I/I was reduced in a portion of Basin 14 by 74% by replacing side sewers and laterals. This project was part of King County's Conveyance System Improvement (CSI) program. The 2007 update to the CSI program identified four projects for I/I reduction evaluation. Some of the findings from this second study include:

- Laterals and side sewers represent the major source of I/I in a system.
- New flow monitoring confirmed that the largest part of I/I in the project areas originates from private property.
- Drainage problems should be fixed with any associated rehabilitation to the existing sewers.
- Basins with I/I of less than 3 gpm per property were not good candidates for cost-effective removal of I/I.

CHAPTER 7

AGREEMENTS

Due to the number of former and current municipal agencies within the service area, and due to the natural drainage characteristics of the sewer service area, a number of agreements exist between Ronald Wastewater District (District) and other municipalities with jurisdiction for land use and/or sewage service, located either in King County or Snohomish County. These agreements, in general, provide for methods and costs of transport and disposal of the sewage generated by either Ronald Wastewater District or the other municipalities.

In the October 1, 2001 agreement with the City of Seattle, the District agreed to share in the repair, rehabilitation, or replacement of Seattle and Ronald Common Facilities. The common facilities or Commonly Used Pipes are identified on Exhibit A of the agreement (see Figure 7-1). The Ronald Common facilities include sewer mains in the District boundaries that accept sewer flows from an area identified as Basin 17N (south of Ronald's Basin 17). The Seattle Common facilities include sewer mains in Seattle identified as Basins 18S, 20S, 21S and 23S, immediately south of Ronald Basins 18, 20, 21 and 23. The following paragraphs are excerpts from that agreement:

> "2.(b) Repair, Rehabilitation or Replacement. Seattle shall be responsible for all repair, rehabilitation or replacement of Seattle Common Facilities and pay the Total Project Costs for such work. Ronald shall reimburse Seattle in the amount of forty percent (40%) of such Total Project Costs."
>
> "3.(b) Repair, Rehabilitation or Replacement. Ronald shall be responsible for all repair, rehabilitation or replacement of Ronald Common Facilities and pay the Total Project Costs for such work. Seattle shall reimburse Ronald in the amount of forty percent (40%) of such Total Project Costs."
>
> "4. Capacity Analysis
> Commencing in the year 2010 and thereafter decennially, Seattle and Ronald each will recalculate the capacity and use of its Commonly Used Facilities. If, as a result of the capacity analysis, projects necessary to enhance capacity must be undertaken, they shall be paid for in the same proportion as provided in paragraphs 2(b) and 3(b) of this agreement."

The areas within Seattle were also modeled with the District's hydraulic model for this report. The land use information was taken from the City of Seattle's current land use. Sewer mains and manholes were simulated as shown in the 2001 agreement. Basin specific composite I/I rates were calculated for each Seattle basin using the same King County study (see Appendix C).

Under ultimate buildout for both Seattle and Ronald sewer basins, 7,611 feet of sewer mains in the SPU area are shown to be over capacity at King County's I/I rates. A single project for each basin was identified and included in Chapter 8. The timing of these projects will be dependent upon future communications between the District and the City of Seattle.

TABLE 7-1

SUMMARY OF OVER-CAPACITY PIPE LENGTHS BY BASIN IN THE SEATTLE DRAINAGE BASINS

Basin	Length of Overcapacity Sewer Pipe, ft
18S	667
20S	1,444
21S	100
23S	5,400
Total	**7,611**

The remaining agreements are ongoing and have been summarized in the following descriptions. The following is a brief description of the existing agreements. Copies of the agreements described are available at the District office upon request.

DESCRIPTION OF AGREEMENTS

- November 16, 1959 - Mountlake Terrace - To provide for gravity disposal of sanitary sewage to Mountlake Terrace and RWD ULID 2, and eventual treatment by Edmonds.

- June 13, 1960 - Mountlake Terrace - Supplement to November 16, 1959 agreement.

- June 15, 1967 - Five Way Agreement – Agreement for sewer related facilities in an area outside of the city limits of Lake Forest Park but with the potential of someday being annexed by Lake Forest Park. METRO/Northeast Lake Washington Sewer District/City of Lake Forest Park/Lake City Sewer District/Ronald Wastewater District are all party to this agreement.

- April 15, 1968 - Mountlake Terrace - To provide for gravity disposal of sanitary sewage for area annexed to Mountlake Terrace, discharge to RWD System.

- September 16, 1968 - Olympic View Water District - To convey to Olympic View certain sewer lines along 90th Avenue West and 89th Place West, and permit Olympic View Water District to connect sewer stubs to and to discharge sewage into sewer trunk line owned and operated by RWD on Northwest 205th Street between Greenwood Avenue Northwest and Highway 99.

- November 6, 1969 - Metro - Delivery and acceptance of sewage, construction of facilities, connection to local sewerage facilities and payment for sewage disposal.

- September 21, 1970 - Olympic View Water District - To provide for gravity disposal of sanitary sewage to Olympic View Water District from RWD in area within RWD, south of 244th Street Southwest (Northwest 205th Street) between Greenwood Avenue Northwest and westerly of 5th Avenue Northwest to the City of Edmonds for treatment.

- January 7, 1971 - Hidden Lake Overflow Agreement, Metro - Provides for joint use emergency overflow.

- June 21, 1971 - Highlands Sewer District - Joint use agreement for pumping facilities known as Ronald Wastewater District's Lift Station No. 5 providing pumpage for Highlands wastewater.

- October 4, 1971 - Mountlake Terrace - To establish ownership and operating responsibility for certain sewer lines, provide for treatment of sewage for portion of RWD's lines south of the King County/Snohomish boundary.

- February 18, 1975 - City of Seattle - (Supercedes Lake City Sewer District Agreement dated December 16, 1959) - To clarify responsibility for continued maintenance and operation of sewers abutting the jurisdictional boundaries of each municipality.

- May 16, 1977 - Northeast Lake Washington Sewer District - To provide Horizon Hills with sanitary sewer service by gravity flow into the systems of both Northeast Lake Washington Sewer District and Ronald Wastewater District.

- August 5, 1985 - King County Sewer District No. 3 - To transfer the Richmond Beach Sewer System owned and operated by King County to RWD for ownership and operation.

- May 16, 1988 - City of Edmonds - To provide conditions and terms for component agencies serving to Edmonds, including RWD, to participate in the cost of the upgrade of the Edmonds plant to secondary treatment, based on allocated capacity; and to continue to pay for operation and maintenance costs for ULID 2 and transfer responsibility for Metering Station B to the City of Edmonds from Mountlake Terrace.

- September 15, 1989 - METRO - To provide conditions and terms for METRO to use an existing casing and highway crossing under the freeway previously constructed by RWD through a franchise with the State Department of Transportation in return for METRO replacing a deteriorated District sewer line at METRO's cost, located on N.E. 195 Street between Manhole Nos. 20 and 157.

- November 25, 1991 – Town of Woodway - To provide conditions and terms to allow the Town of Woodway to discharge sanitary sewage into the District's facilities.

- August 14, 1995 – City of Shoreline Ordinance, No. 45 – Franchise agreement between Waste Management, Rabanco Companies, Seattle City Light, Shoreline Water District #42, Ronald Wastewater District, Chambers Cable and Washington Natural Gas Company to provide operation of public service businesses in the City of Shoreline.

- May 13, 1996 – City of Shoreline Ordinance, No. 82 – Establishing minimum requirements and procedures for the underground installation of electric and communication facilities within Shoreline. This ordinance names RWD as being exempt from the joint trench requirement as specified in this ordinance.

- May 28, 1996 – City of Shoreline Ordinance, No. 83 – Establishing minimum requirements, procedures, and application information for franchise and right-of-way use agreements within Shoreline.

- August 13, 1997 – City of Shoreline - Interlocal agreement between the City and RWD relating to sanitary sewer service within Shoreline City Limits.

- February 6, 2001 – City of Shoreline – Stream and Wetland Inventory and Assessment Project Utilities Cooperative Agreement between the City and Ronald Wastewater District to have joint and cooperative efforts in a City-wide study of stream, wetland and fisheries assessment.

- October 1, 2001 – City of Seattle – Wastewater Facilities Use Agreement – Transferring the wastewater facilities and installations north of NE 145th St. located within LFP and Shoreline to RWD. Wastewater is conveyed from this area to Seattle mainlines south of NE 145th St. to King County.

- November 8, 2001 – City of Lake Forest Park Resolution No. 657 – Resolution authorizing support for the annexation of property inside the City of Lake Forest Park sewer service boundary to RWD.

- October 22, 2002 – City of Shoreline – Interlocal Operating agreement between the City of Shoreline and Ronald Wastewater District relating to sanitary sewer services within Shoreline City Limits.

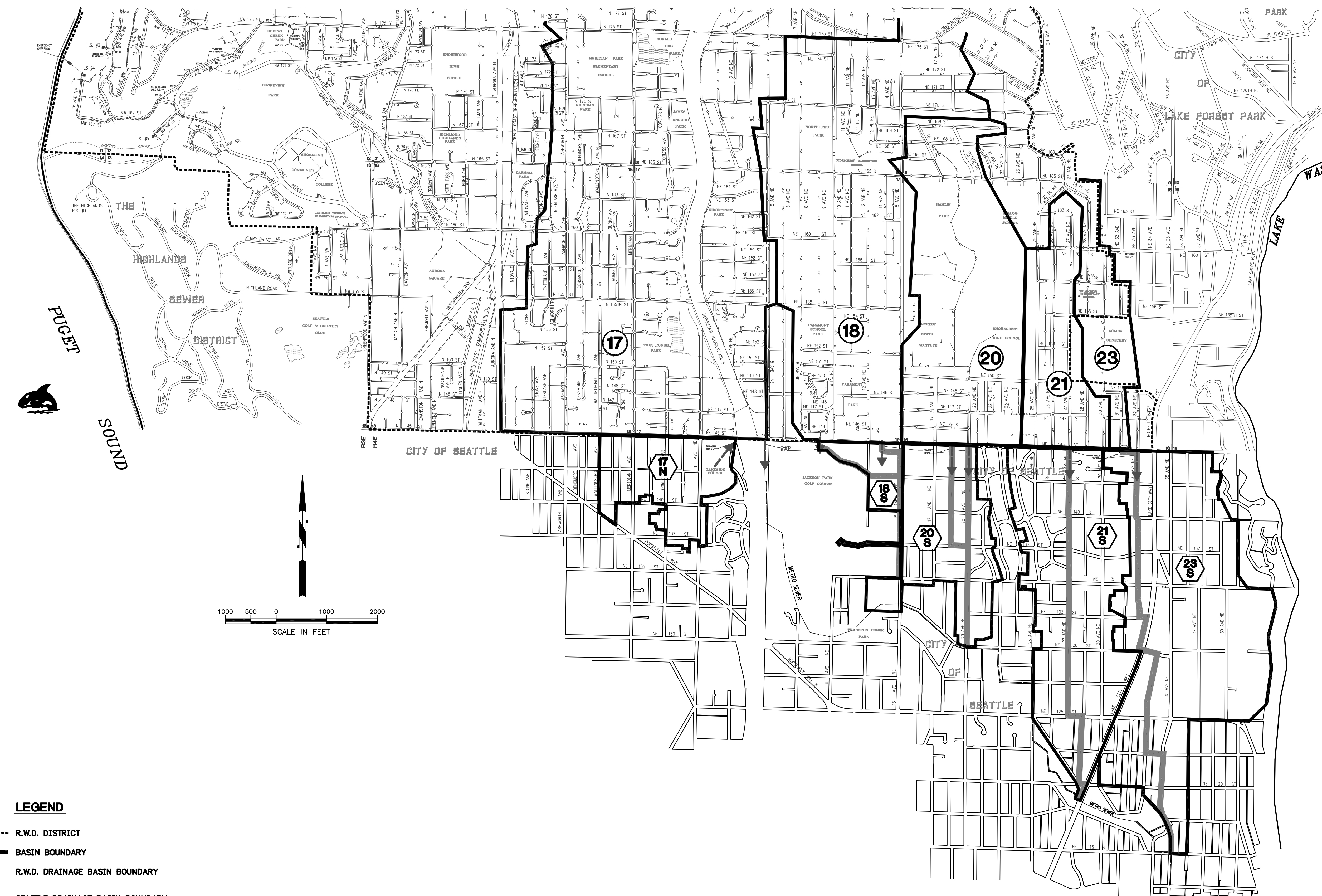
- October 22, 2002 – City of Shoreline Ordinance, No. 306 – Granting Ronald Wastewater District a non-exclusive franchise to construct, maintain, operate, replacement and repair a sanitary sewer system within public rights-of-way of the City of Shoreline, Washington.

- December 30, 2002 – City of Lake Forest Park Resolution 754 – Agreement to transfer wastewater assets and services located within the city limits from Ronald

Wastewater District to the City of Lake Forest Park. These properties include those that had previously been owned by the City of Seattle and other parcels which have not been owned by the City of Seattle.

- March 13, 2003 - City of Lake Forest Park – Operation and Maintenance agreement to transfer units along the border between Shoreline and Lake Forest Park. Eighty two units within Ronald Wastewater District corporate limits can be served by gravity by the City of Lake Forest Park where as 80 units within the City of Lake Forest Park can be served by gravity by Ronald Wastewater District.

- December 14th, 2005 – Olympic View Water and Sewer District (OVWSD)- Updating the 1992 agreement with the town of Woodway as OVWSD was now the town's sewer service provider.



LEGEND

- R.W.D. DISTRICT
- BASIN BOUNDARY
- 17 R.W.D. DRAINAGE BASIN BOUNDARY
- 17 N SEATTLE DRAINAGE BASIN BOUNDARY
- SEATTLE DRAINAGE BASIN BOUNDARY
- COMMON SEWER FACILITIES

RONALD WASTEWATER DISTRICT

FIGURE 7.1

SEATTLE PUBLIC UTILITIES BASINS WITH COMMON SEWER FACILITIES

CHS

CHS ENGINEERS, LLC

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

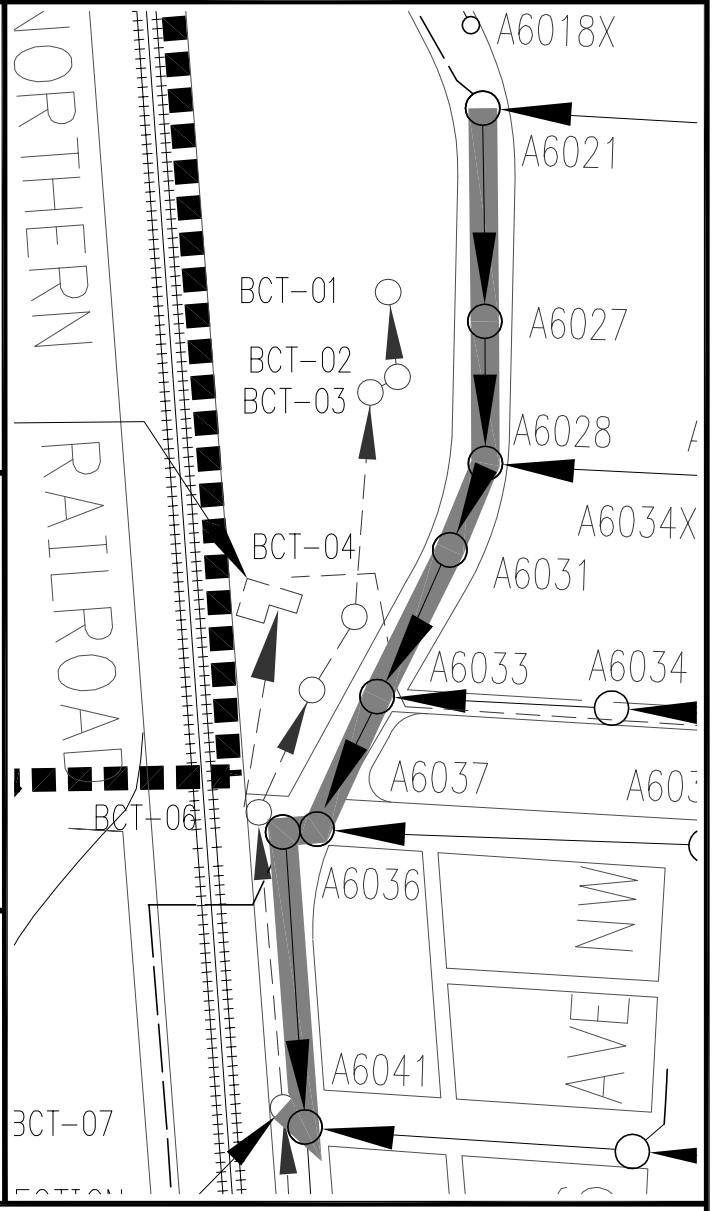
A. RICHMOND BEACH DRIVE SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 757,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 1171 LF OF 8" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 15" SEWER MAIN BY OPEN CUT AND PIPEBURSTING FROM MH A6021 TO A6041 TO CONNECTION AT KING COUNTY WASTEWATER.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH DEVELOPMENT OF THE POINT WELLS AREA OF THE DISTRICT.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST									757,000
FUNDING SOURCE									GFC

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

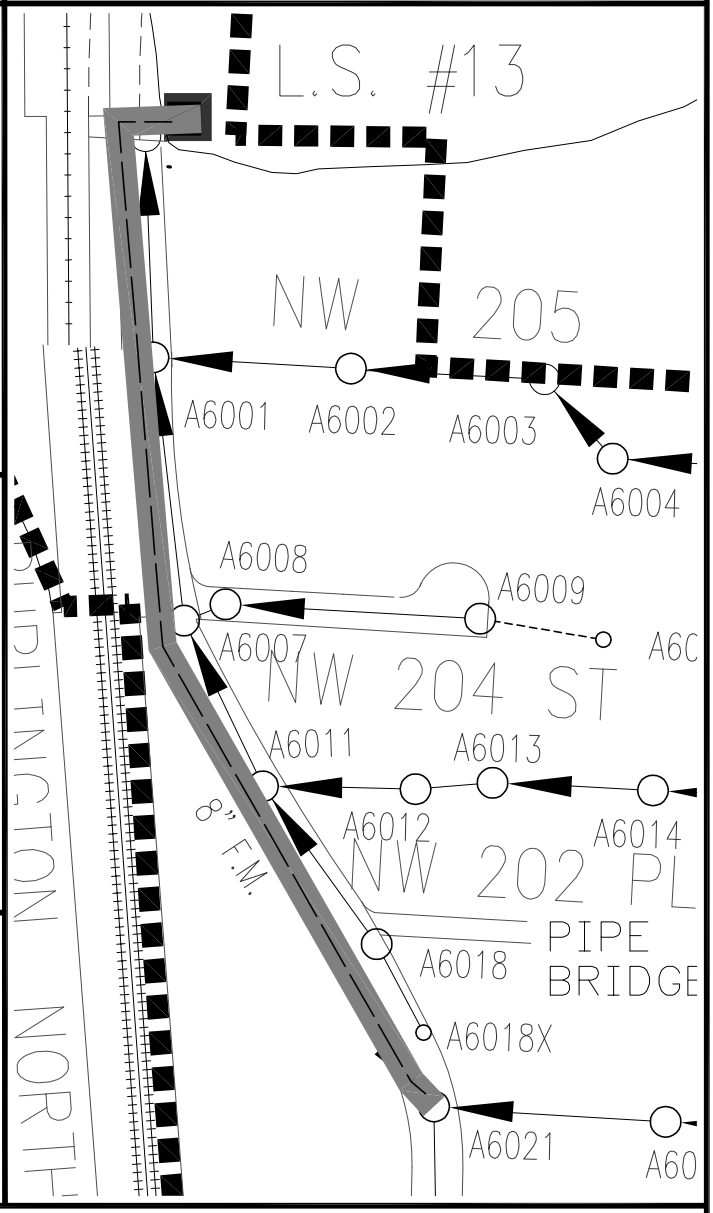
B. LIFT STATION
NO. 13 IMPROVEMENTS

ESTIMATED PROJECT COST

$ 2,020,000

PROJECT DESCRIPTION

INCREASE CAPACITY OF LIFT STATION NO. 13 TO 1,800 GPM. REPLACE 1300 LF OF EXISTING 8" DI FORCE MAIN WITH 12" FORCE MAIN.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH DEVELOPMENT OF THE POINT WELLS AREA OF THE DISTRICT.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST									2,020,000
FUNDING SOURCE									GFC

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

ALT. AB POINT WELLS SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 4,200,000

PROJECT DESCRIPTION

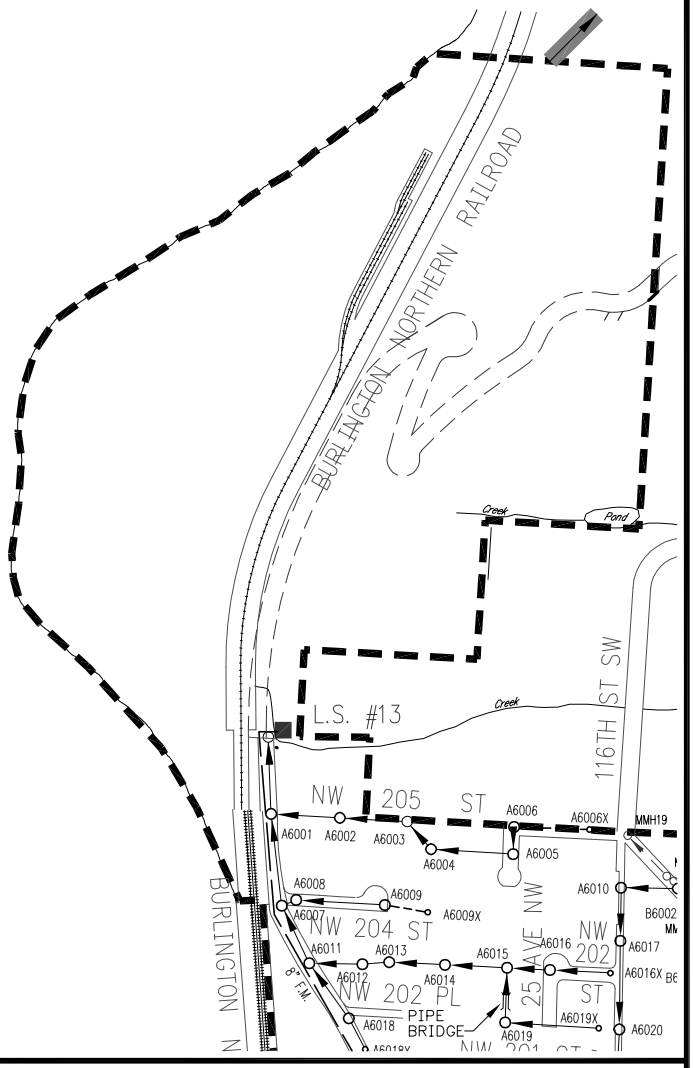
INSTALL APPROXIMATELY 10,500 LF OF 10"SEWER FORCE MAIN BY OPEN CUT TO TRANSPORT SEWAGE FROM POINT WELLS TO THE 24"SEWER MAIN LOCATED IN EDMONDS WAY (SR 104) IN EDMONDS. LIFT STATION NO. 13 WOULD BE MODIFIED TO ACCOMIDATE INCREASED FLOW AND TO ALLOW SEWAGE TO TRAVEL NORTH TO THE EDMONDS WASTEWATER TREATMENT PLANT.

PROJECT BENEFIT/RATIONALE:

THE PROJECT IS AN ALTERNATIVE TO PROPOSED PROJECTS A & B. THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH DEVELOPMENT OF THE POINT WELLS AREA OF THE DISTRICT.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW



PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST									4,200,000
FUNDING SOURCE									BONDS, GFC, R/R

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

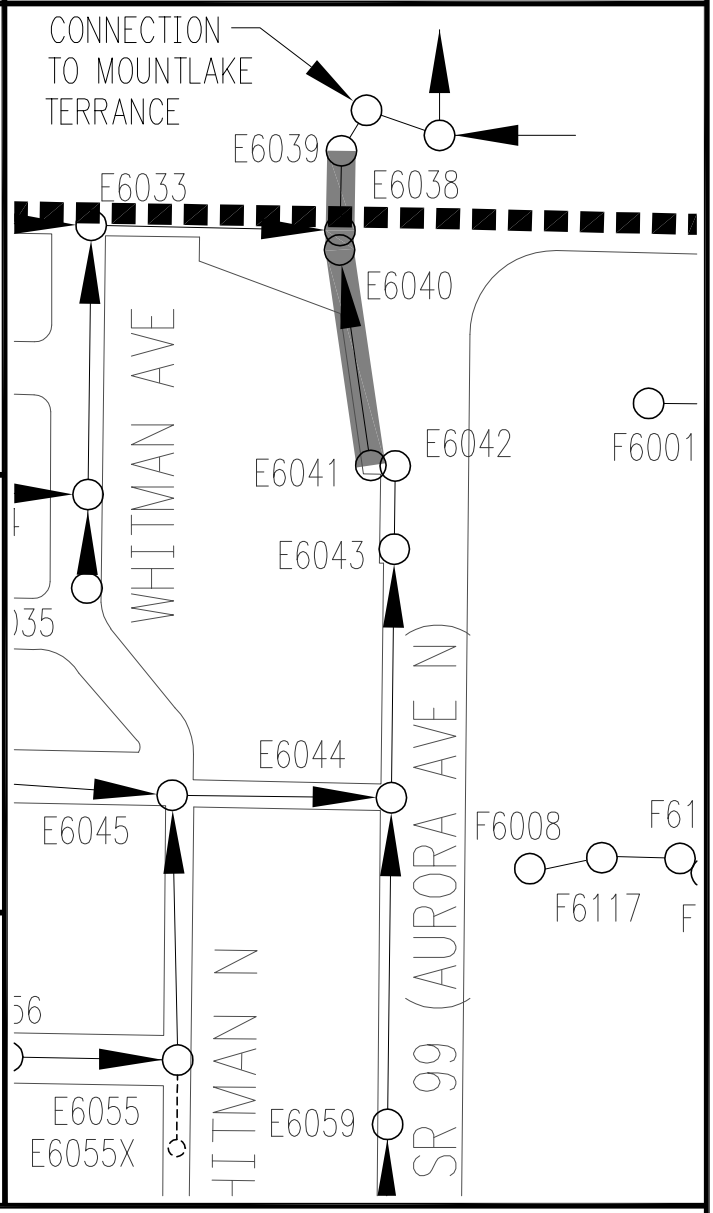
C. SR 99 SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 203,000

PROJECT DESCRIPTION

REPLACE 375 LF OF 8" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 10" SEWER MAIN BY PIPEBURSTING FROM MH E6041 TO E6039.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE SR 99 (AURORA AVE) PHASE III.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST		203,000							
FUNDING SOURCE		BONDS, GFC, R/R							

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

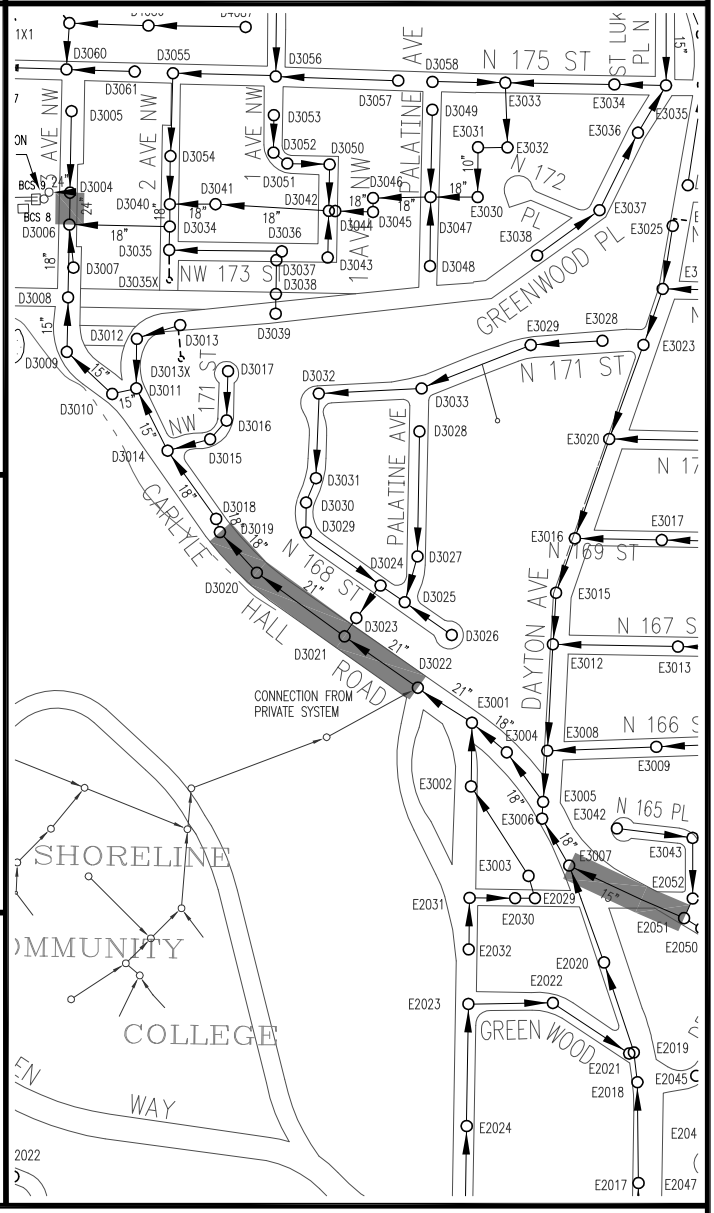
D. CARLYLE HALL ROAD SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 1,097,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 1340 LF OF 18"–24" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 21"–27" SEWER MAIN BY OPEN CUT FROM MH E2051 TO E3007, D3022 TO D3019, AND D3004 TO D3006.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE SR 99 (AURORA AVE) AND SHORELINE COMMUNITY COLLEGE

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST					1,097,000				
FUNDING SOURCE					BONDS, GFC, R/R				

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

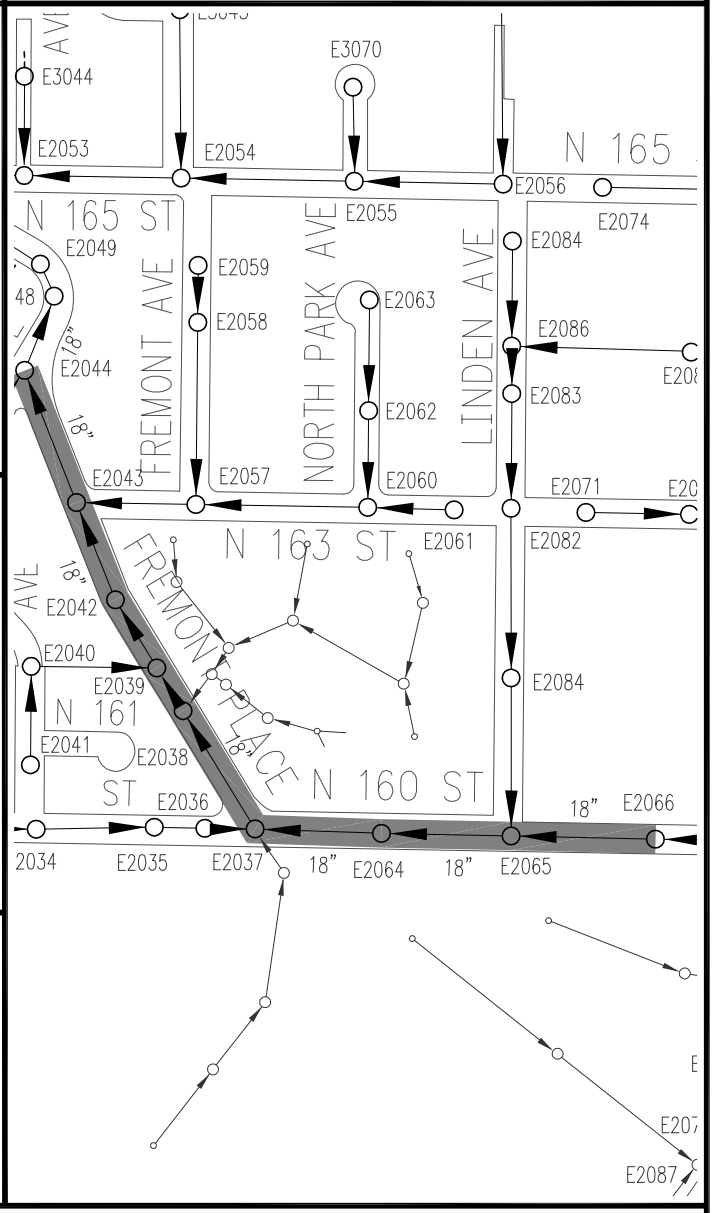
E. N 160TH ST AND FREMONT PL SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 1,517,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 1870 LF OF 18" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 21" SEWER MAIN BY OPEN CUT FROM MH E2066 AND E2044.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE SR 99 (AURORA AVE) AND SHORELINE COMMUNITY COLLEGE

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST					1,517,000				
FUNDING SOURCE					BONDS, GFC, R/R				

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

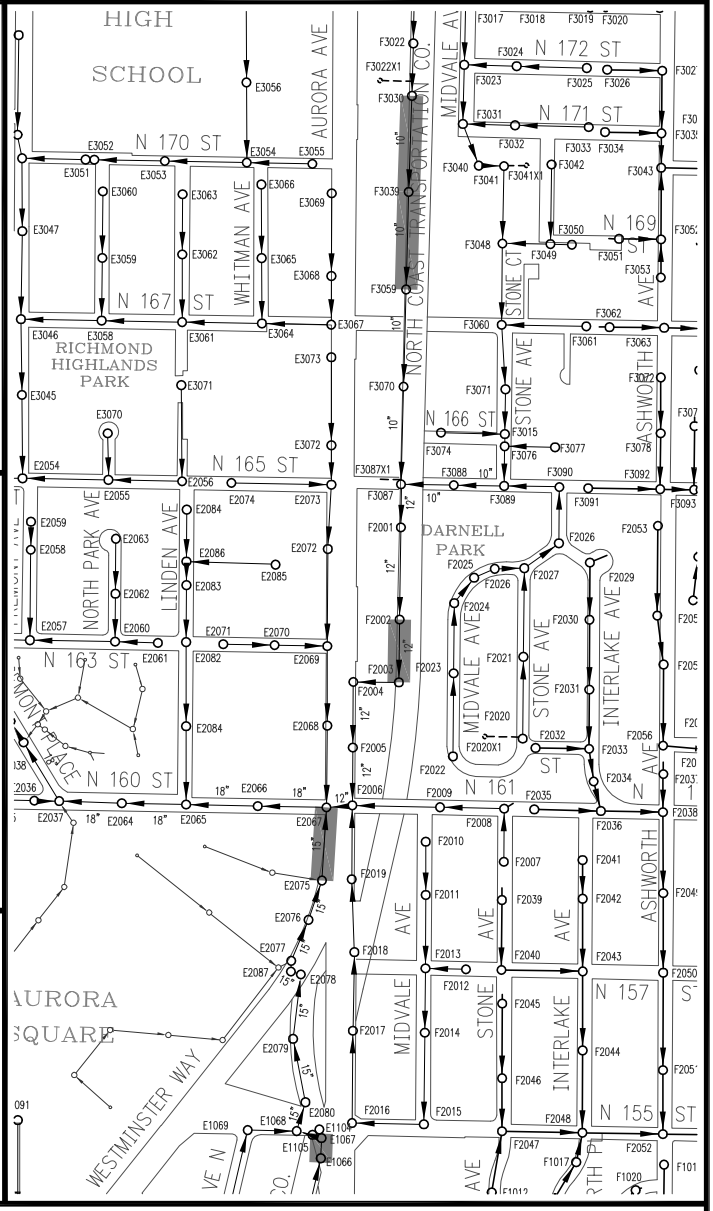
F. AURORA AVE N SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 831,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 1444 LF OF 10"–15" GRAVITY SEWER MAIN AND SIDE SEWERS BY PIPEBURSTING FROM MH F3030 TO F3059, F2002 TO F2003, E2075 TO E2067, AND E1066 TO E1067.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE SR 99 (AURORA AVE) SOUTH OF N. 183RD ST.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2012	2013	2014	2015	2016	2017	2018	2019	2020
PROJECT COST								831,000	
FUNDING SOURCE								BONDS, GFC, R/R	

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

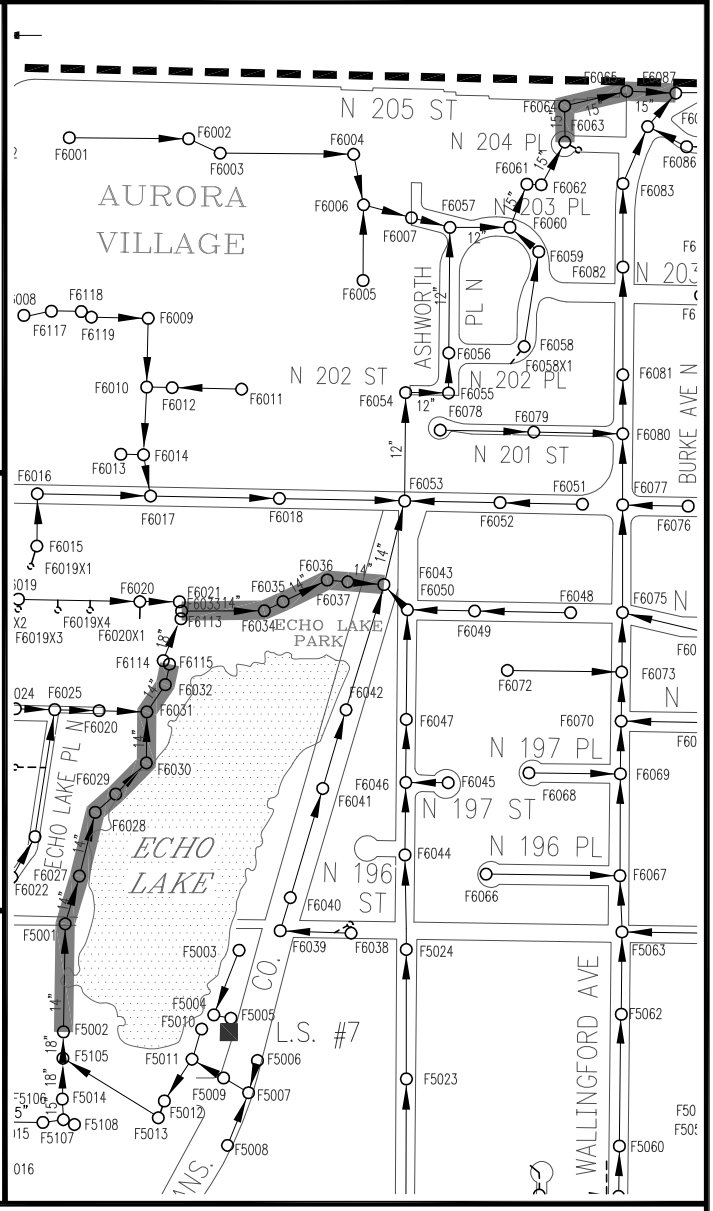
G. ECHO LAKE TRUNK REPLACEMENT

ESTIMATED PROJECT COST

$ 1,546,300

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 2372 LF OF 14" AND 15" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 20" (OD) HDPE SEWER MAIN BY PIPEBURSTING FROM MH F5002 TO F6032, F6033 TO F6043, F6063 TO F6087, AND CONNECTING MH G6045 TO KING COUNTY WASTEWATER BY OPEN TRENCH.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE ECHO LAKE AREA.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST	1,546,300								
FUNDING SOURCE	BONDS, GFC, R/R								

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

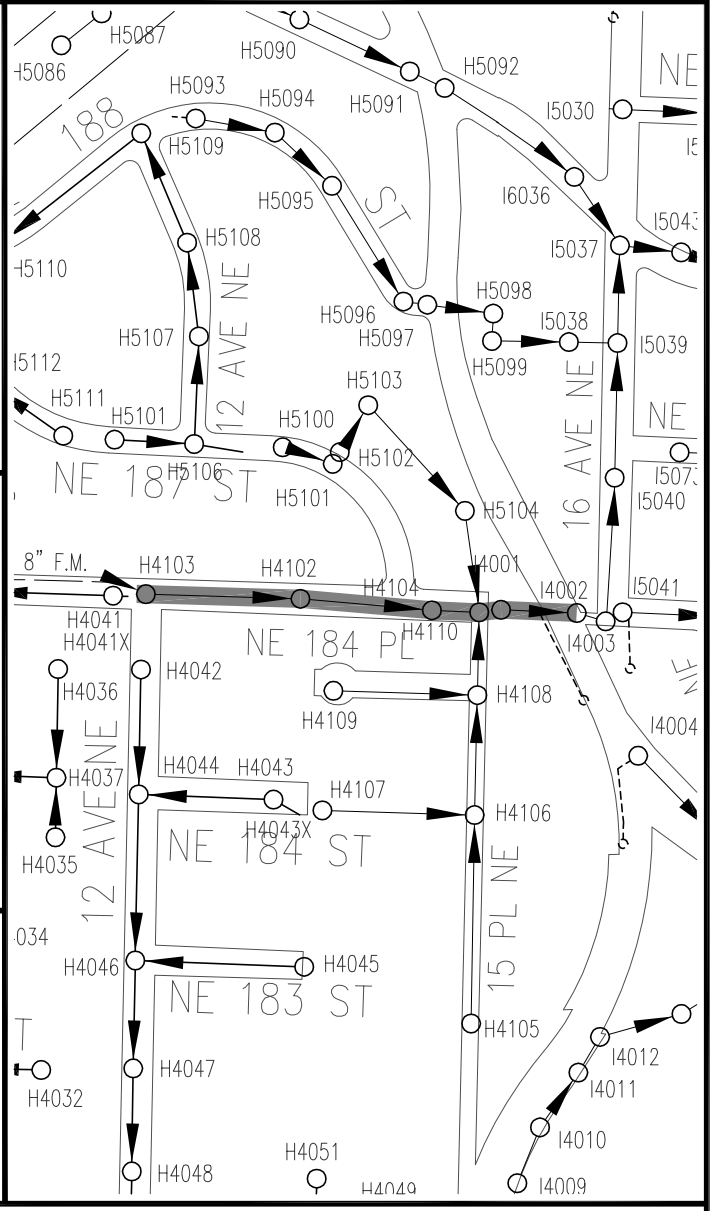
H. NE 185TH ST SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 417,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 749 LF OF 8" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 10"–15" SEWER MAIN BY PIPEBURSTING AND OPEN CUT FROM MH H5030 TO H4030, H4103 TO H4104, AND I4001 TO I4002.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE AREA NORTH OF NORTH CITY.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST		417,000							
FUNDING SOURCE		BONDS, GFC, R/R							

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

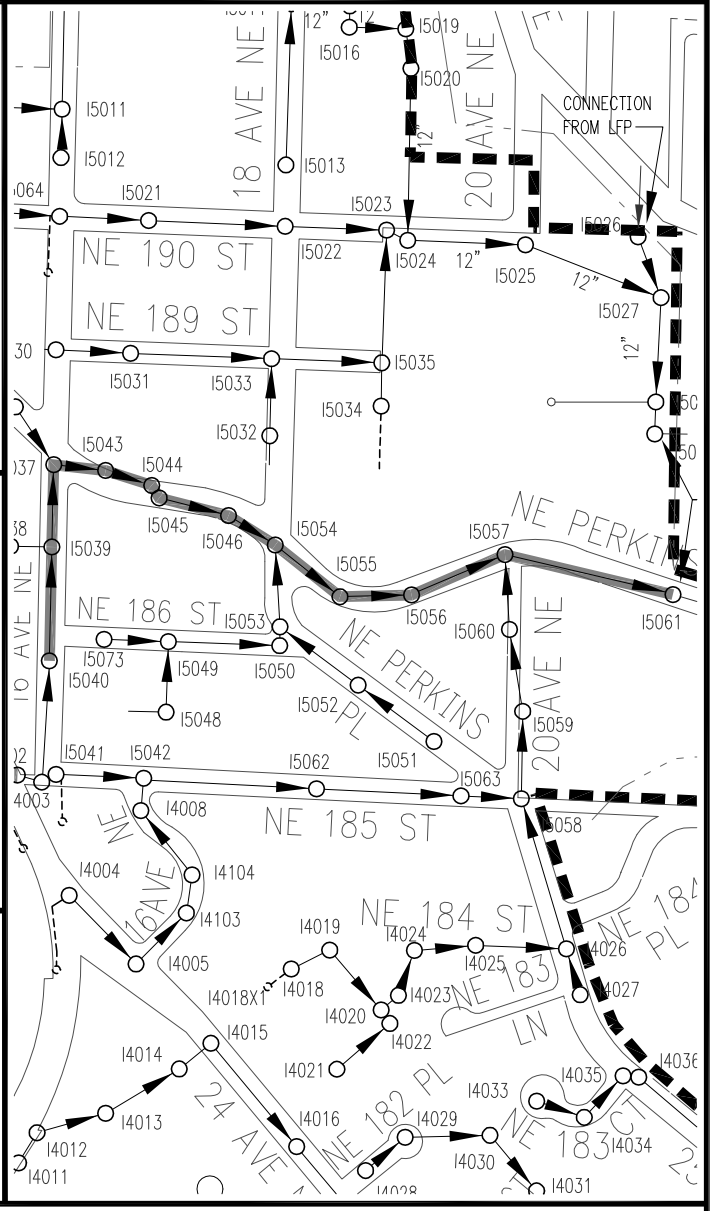
I. 16TH AVE NE/PERKINS WAY SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 1,108,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 2324 LF OF 8" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 10" AND 12" SEWER MAIN BY PIPEBURSTING FROM MH I5040 TO I5061.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE AREA NORTH OF NORTH CITY.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST						1,108,000			
FUNDING SOURCE						BONDS, GFC, R/R			

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

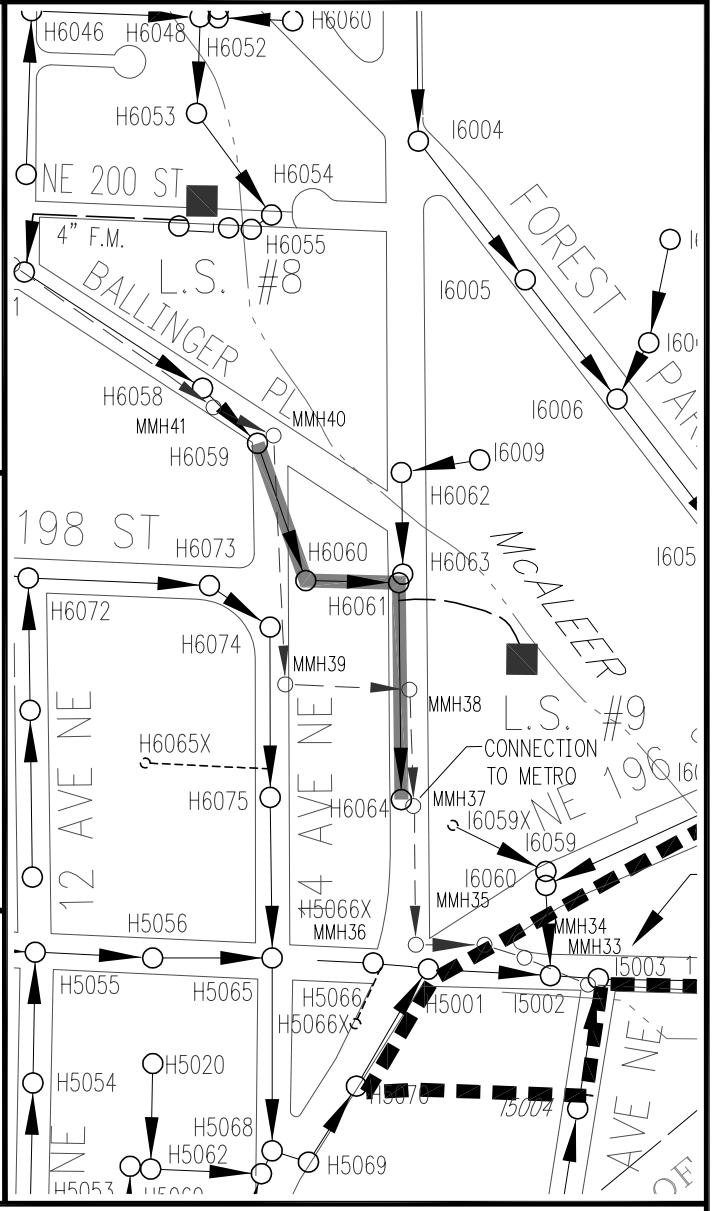
J. BALLINGER PL/15TH AVE NE SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 444,000

PROJECT DESCRIPTION

REPLACE 817 LF OF 8" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 10" SEWER MAIN BY PIPEBURSTING FROM MH H6059 TO H6064.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE BALLINGER AREA.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST								444,000	
FUNDING SOURCE								BONDS, GFC, R/R	

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

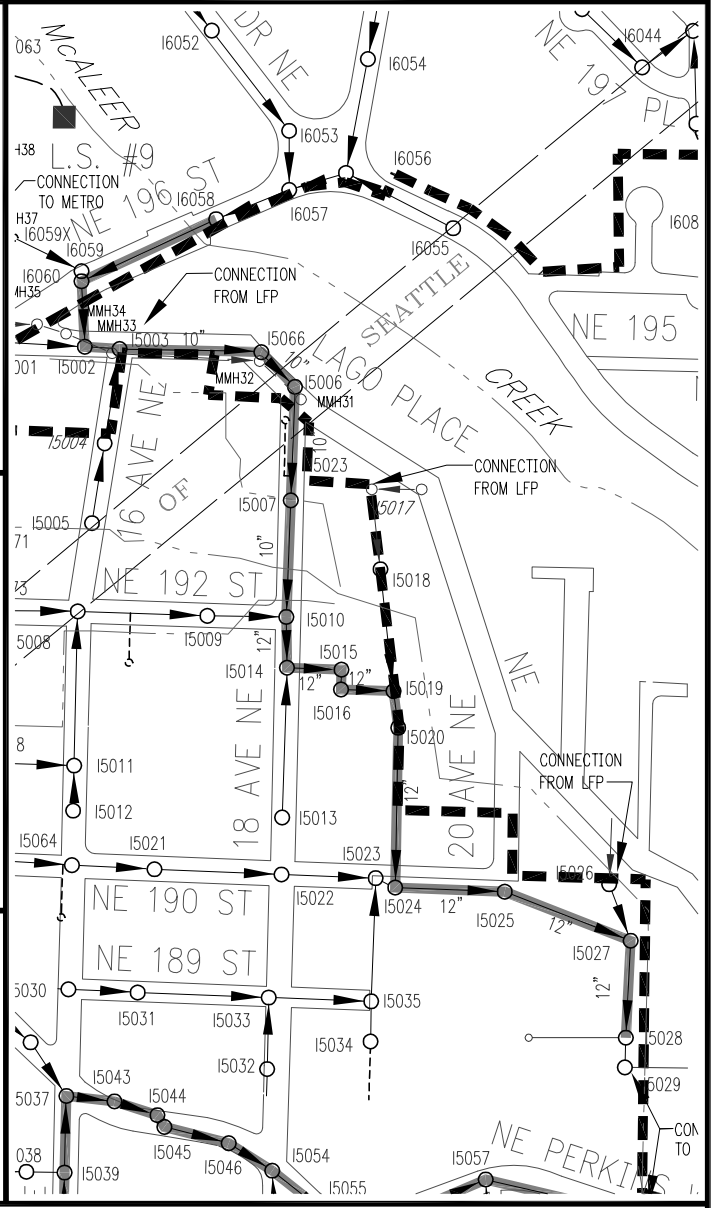
K. LAGO PLACE SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 1,966,000

PROJECT DESCRIPTION

REPLACE 3424 LF OF 8"–12" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 10"–18" SEWER MAIN BY PIPEBURSTING FROM MH I6058 TO I5028.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE BALLINGER AREA.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST			1,966,000						
FUNDING SOURCE			BONDS, GFC, R/R						

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

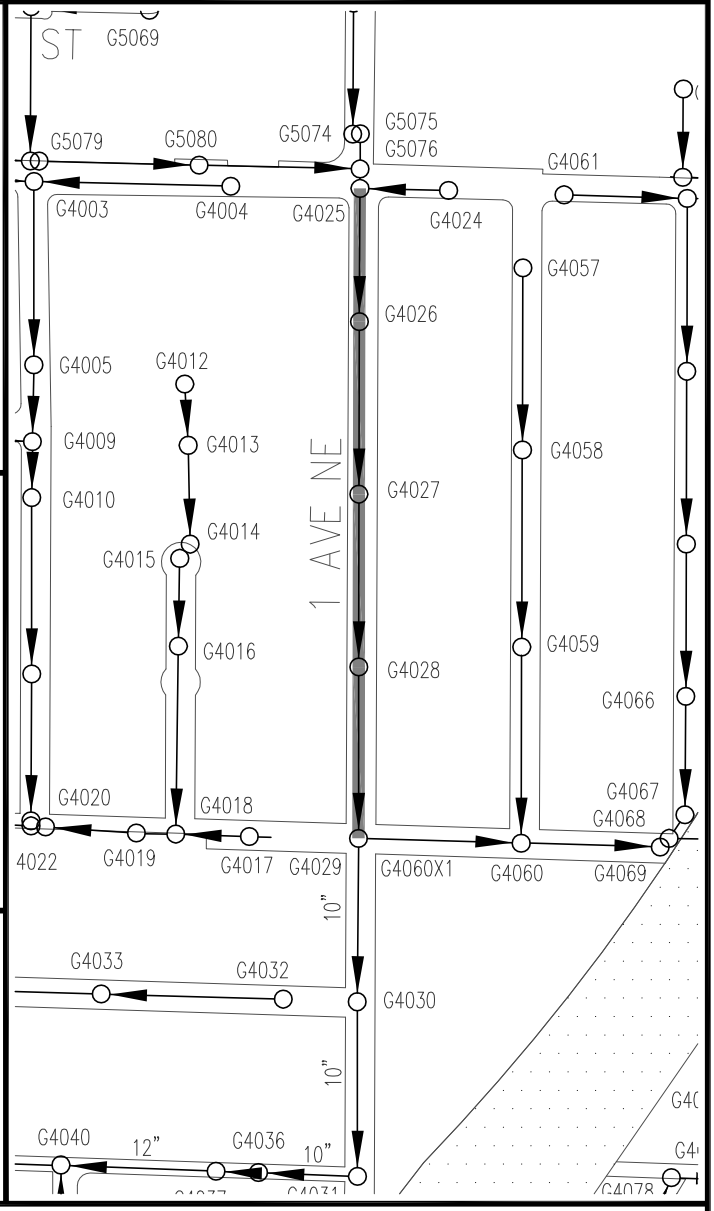
L. 1ST AVE NE SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 719,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 1321 LF OF 8" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 10" SEWER MAIN BY PIPEBURSTING FROM MH G4025 TO G4029.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE NORTH CENTRAL PORTION OF THE DISTRICT.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST								719,000	
FUNDING SOURCE								BONDS, GFC, R/R	

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

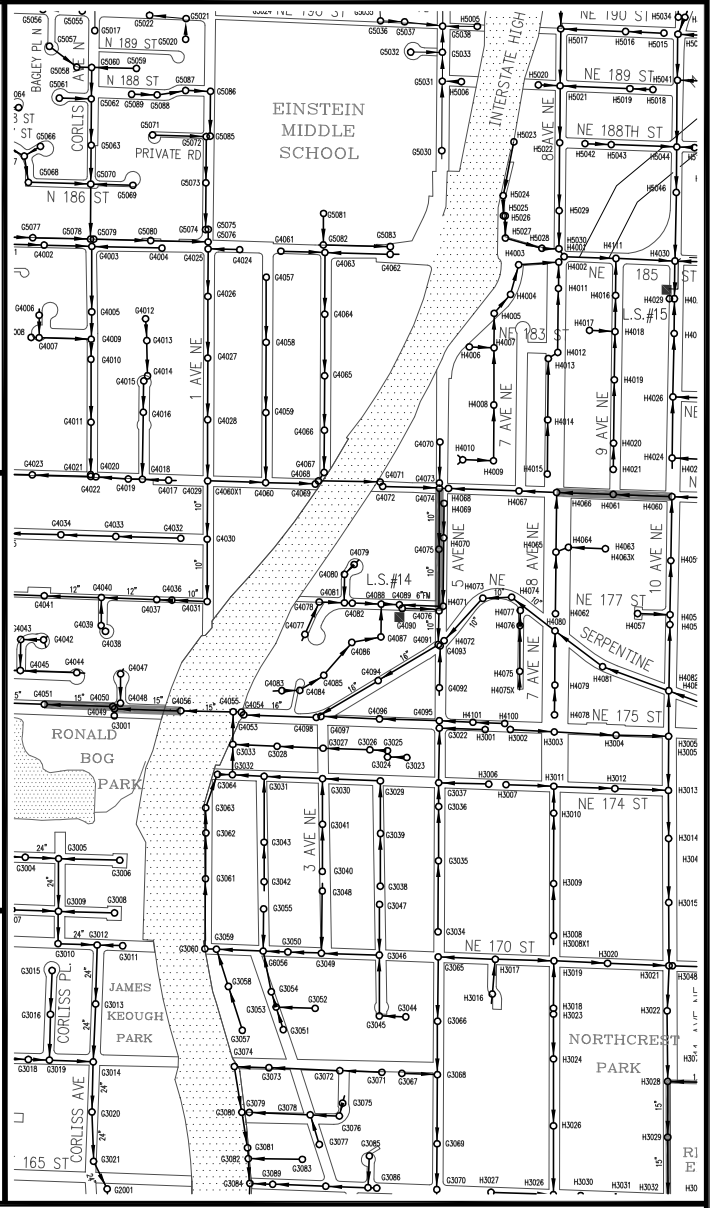
M. BASIN 17 SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 1,305,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 2136 LF OF 8", 10", AND 15" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 10", 12", 18", AND 21" SEWER MAIN BY PIPEBURSTING AND OPEN CUT FROM H4060 TO H4066, G4074 TO G4076, AND G4056 TO G4051.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE NORTH CENTRAL PORTION OF THE DISTRICT.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2012	2013	2014	2015	2016	2017	2018	2019	2020
PROJECT COST								1,305,000	
FUNDING SOURCE								BONDS, GFC, R/R	

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

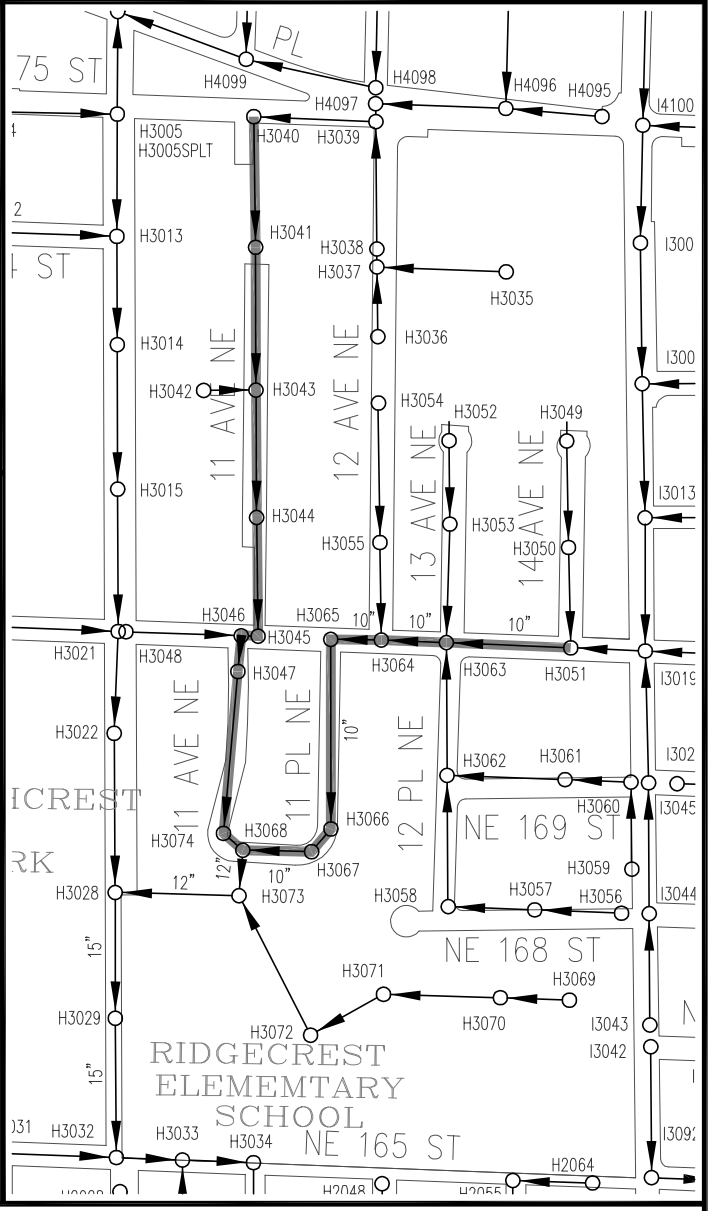
N. 11TH AVE NE SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 1,792,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 3252 LF OF 8" AND 10" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 10" AND 12" SEWER MAIN BY PIPEBURSTING FROM MH H3040 TO H3068 AND H3051 TO H3068.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE NORTH CITY AREA.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST							1,792,000		
FUNDING SOURCE							BONDS, GFC, R/R		

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

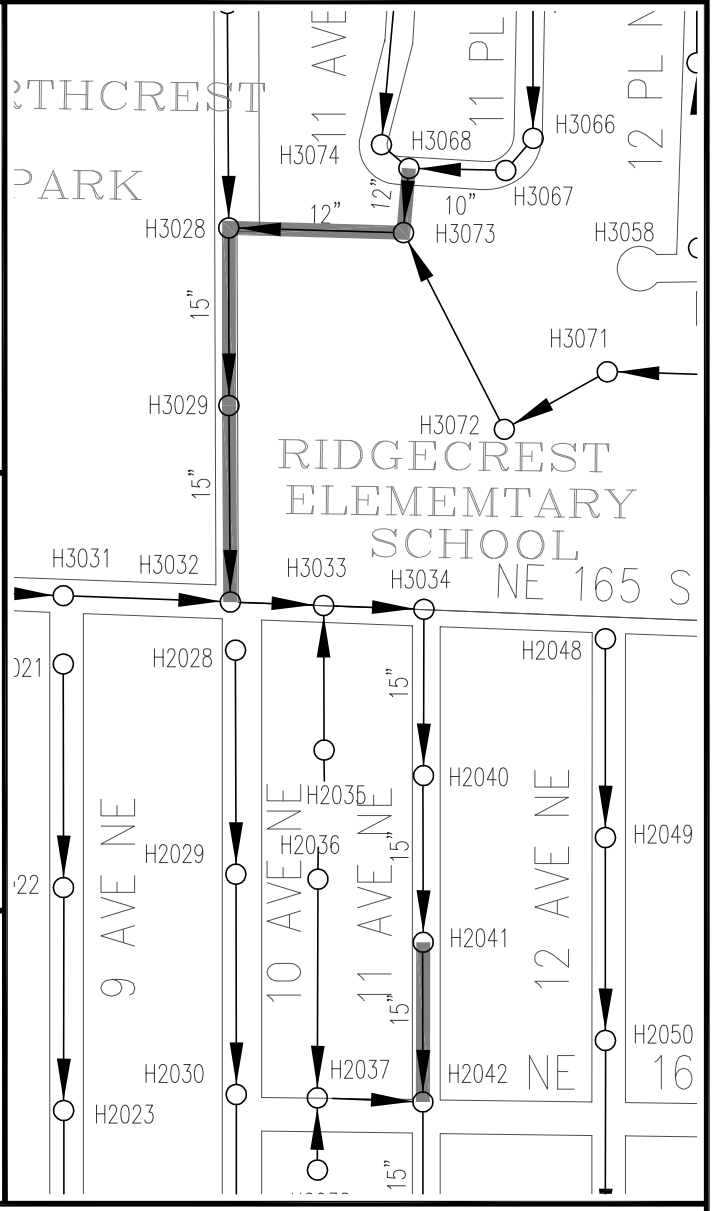
O. NE 170TH ST SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 831,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 1383 LF OF 12" AND 15" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 15" AND 18" SEWER MAIN BY PIPEBURSTING FROM MH H3068 TO H3032 AND H2041 TO H2042.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE NORTH CITY AREA.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST				831,000					
FUNDING SOURCE				BONDS, GFC, R/R					

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

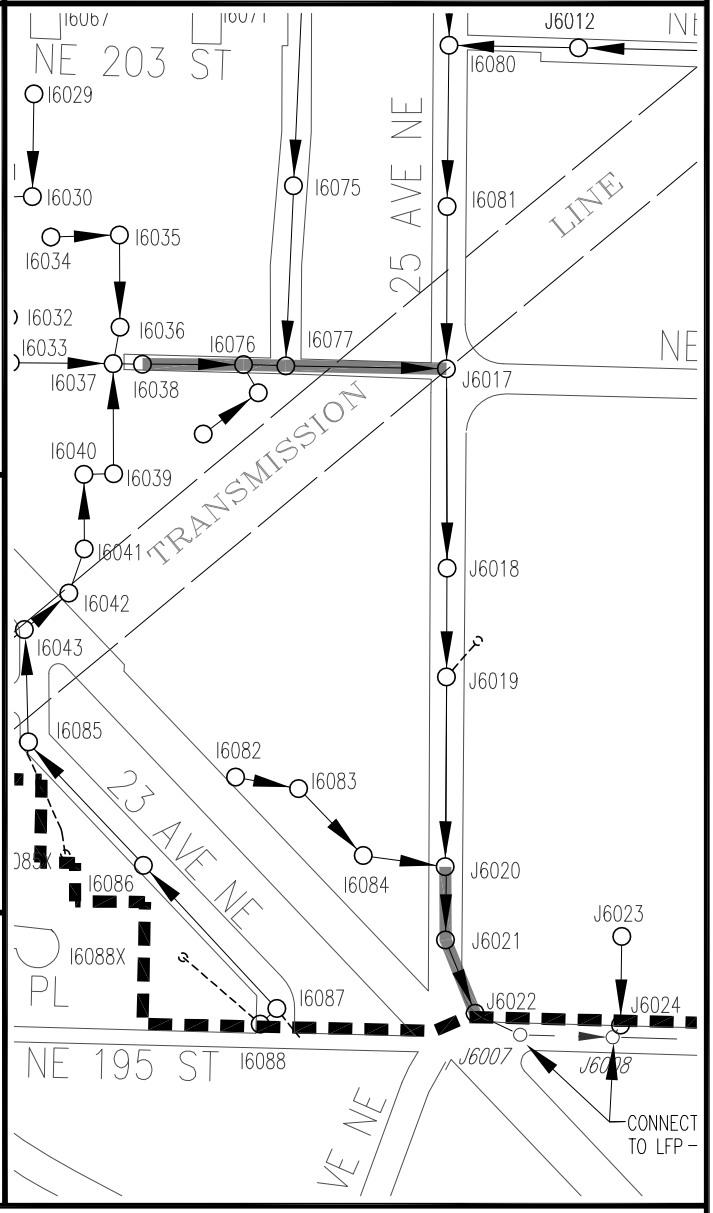
P. 25TH AVE NE SANITARY SEWER IMPROVEMENTS

ESTIMATED PROJECT COST

$ 520,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 932 LF OF 8" GRAVITY SEWER MAIN AND SIDE SEWERS WITH 10" AND 12" SEWER BY PIPEBURSTING FROM MH I6038 TO J6017 AND J6020 TO J6022.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE BALLINGER AREA.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2012	2013	2014	2015	2016	2017	2018	2019	2020
PROJECT COST		520,000							
FUNDING SOURCE		BONDS, GFC, R/R							

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

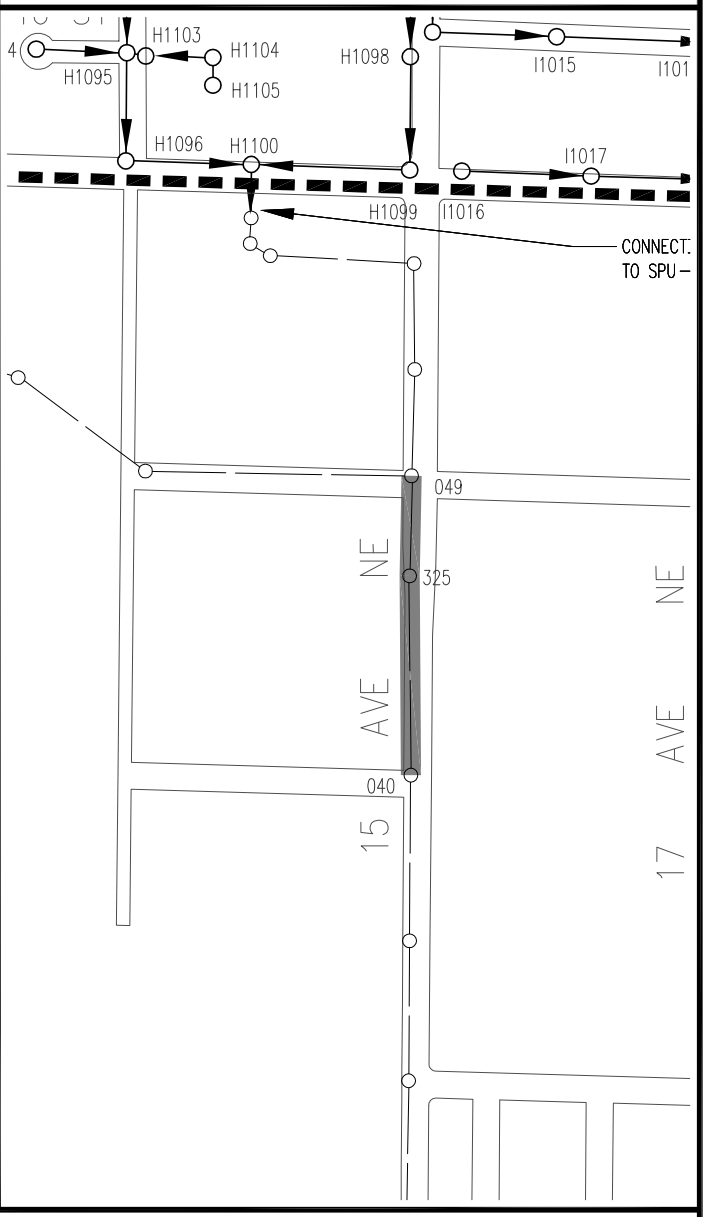
Q. SPU BASIN 18

ESTIMATED PROJECT COST

$ 209,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 667 LF OF 18" GRAVITY SEWER MAIN WITH 24" SEWER MAIN BY OPEN CUT FROM MH 040 TO 049. TOTAL PROJECT COST TO BE SPLIT WITH SPU PER 2001 AGREEMENT.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE EAST SIDE OF THE DISTRICT.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2011	2012	2013	2014	2015	2016	2017	2018	2019
PROJECT COST									84,000
FUNDING SOURCE									BONDS, GFC, R/R

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

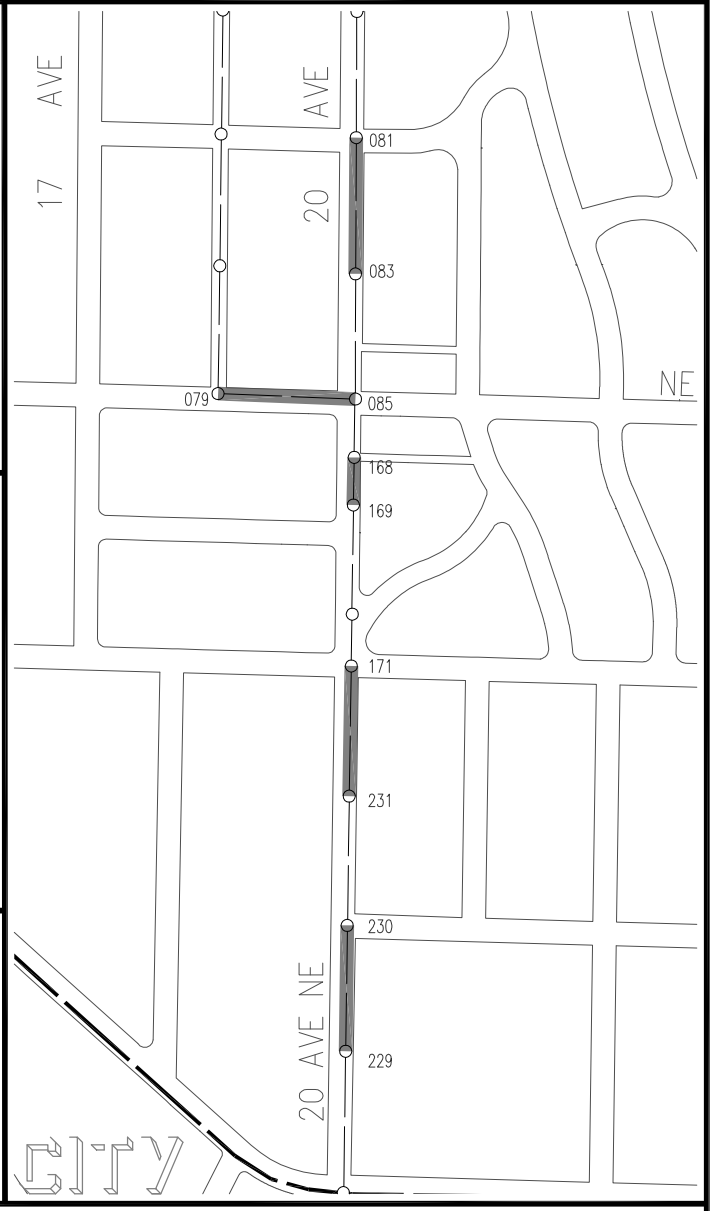
R. SPU BASIN 20

ESTIMATED PROJECT COST

$ 406,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 1444 LF OF 8"–15" GRAVITY SEWER MAIN WITH 12"–21" SEWER MAIN BY OPEN CUT FROM MH 079 TO 085, 081 TO 083, 168 TO 169, 171 TO 231, AND 230 TO 229. TOTAL PROJECT COST TO BE SPLIT WITH SPU PER 2001 AGREEMENT.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE EAST SIDE OF THE DISTRICT.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2011	2012	2013	2014	2015	2016	2017	2018	2019
PROJECT COST							162,000		
FUNDING SOURCE							BONDS, GFC, R/R		

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

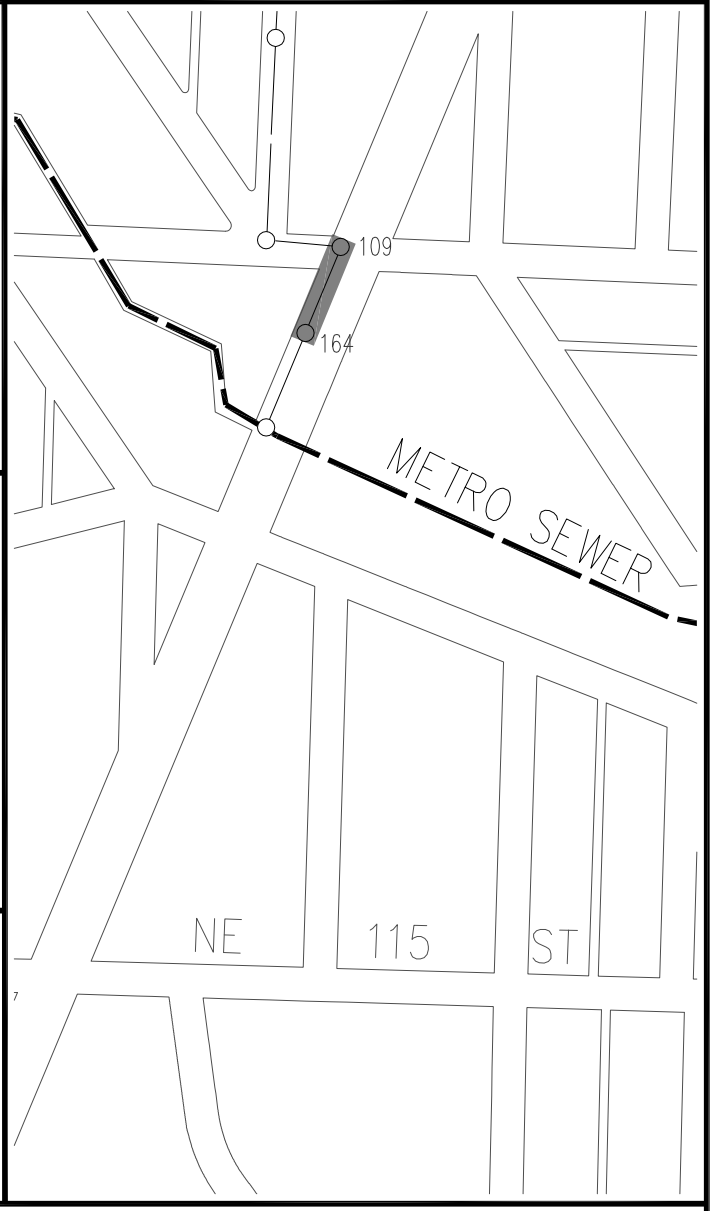
S. SPU BASIN 21

ESTIMATED PROJECT COST

$ 29,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 100 LF OF 15" GRAVITY SEWER WITH 18" SEWER MAIN BY PIPEBURSTING FROM MH 109 TO 164. TOTAL PROJECT COST TO BE SPLIT WITH SPU PER 2001 AGREEMENT.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE EAST SIDE OF THE DISTRICT.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2011	2012	2013	2014	2015	2016	2017	2018	2019
PROJECT COST									12,000
FUNDING SOURCE									BONDS, GFC, R/R

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

T. SPU BASIN 23

ESTIMATED PROJECT COST

$ 1,217,000

PROJECT DESCRIPTION

REPLACE APPROXIMATELY 5400 LF OF 10"–18" GRAVITY SEWER WITH 15"–30" SEWER MAIN BY PIPEBURSTING AND OPEN CUT FROM MH J1043 TO 204, 298 TO 387, 390 TO 123, 240 TO 241, AND 117 TO 118. TOTAL PROJECT COST TO BE SPLIT WITH SPU PER 2001 AGREEMENT.

PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO PROVIDE SUFFICIENT SEWER CAPACITY TO ALLOW PLANNED DEVELOPMENT IN THE DISTRICT. THE SCHEDULE FOR THIS PROJECT WILL BE COORDINATED WITH REDEVELOPMENT OF THE EAST SIDE OF THE DISTRICT.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2011	2012	2013	2014	2015	2016	2017	2018	2019
PROJECT COST						487,000			
FUNDING SOURCE						BONDS, GFC, R/R			

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

U. ANNUAL SEWER REPLACEMENT PROJECTS

ESTIMATED PROJECT COST

$ SEE CHART BELOW

PROJECT DESCRIPTION

REPLACEMENT IN KIND AND REHABILITATION OF EXISITNG SEWER MAINS AND SIDE SEWERS.

PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO SOLVE MAINTENANCE PROBLEMS OR MINOR DEFICIENCIES. PROJECTS WILL REPLACE EXISING MAINS IN-KIND. SOME PROJECTS WILL BE INCONJUNCTION WITH PROJECTS BY OTHERS. THE SCHEDULE FOR THESE PROJECTS WILL VARY AS THE PROJECTS CAN'T BE ANTICIPATED.

ENVIRONMENTAL IMPACTS

THE PROJECTS SHOULD NOT REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST	1,125,000	1,100,000	1,000,000	995,000	1,100,000	1,300,000	1,400,000	1,400,000	1,400,000
FUNDING SOURCE	R/R	R/R	R/R	R/R	R/R	R/R	R/R	R/R	R/R

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

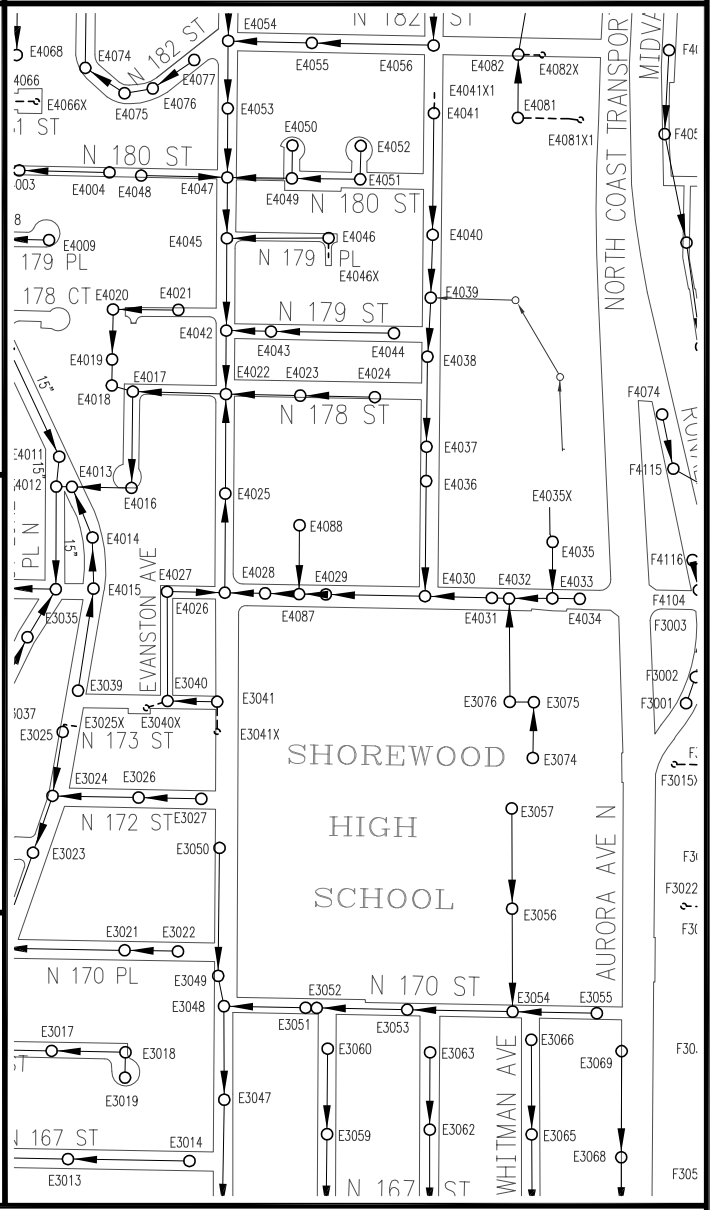
V. ADMIN BUILDING DESIGN

ESTIMATED PROJECT COST

$ 150,000

PROJECT DESCRIPTION

DESIGN DISTRICT OFFICE BUILDING REMODEL.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO REDESIGN EXISTING STRUCTURE FOR ADMINISTRATIVE STAFF ONLY.

ENVIRONMENTAL IMPACTS

SEPA IS NOT REQUIRED FOR THE DESIGN PHASE OF THE PROJECT

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST	150,000								
FUNDING SOURCE	R/R								

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

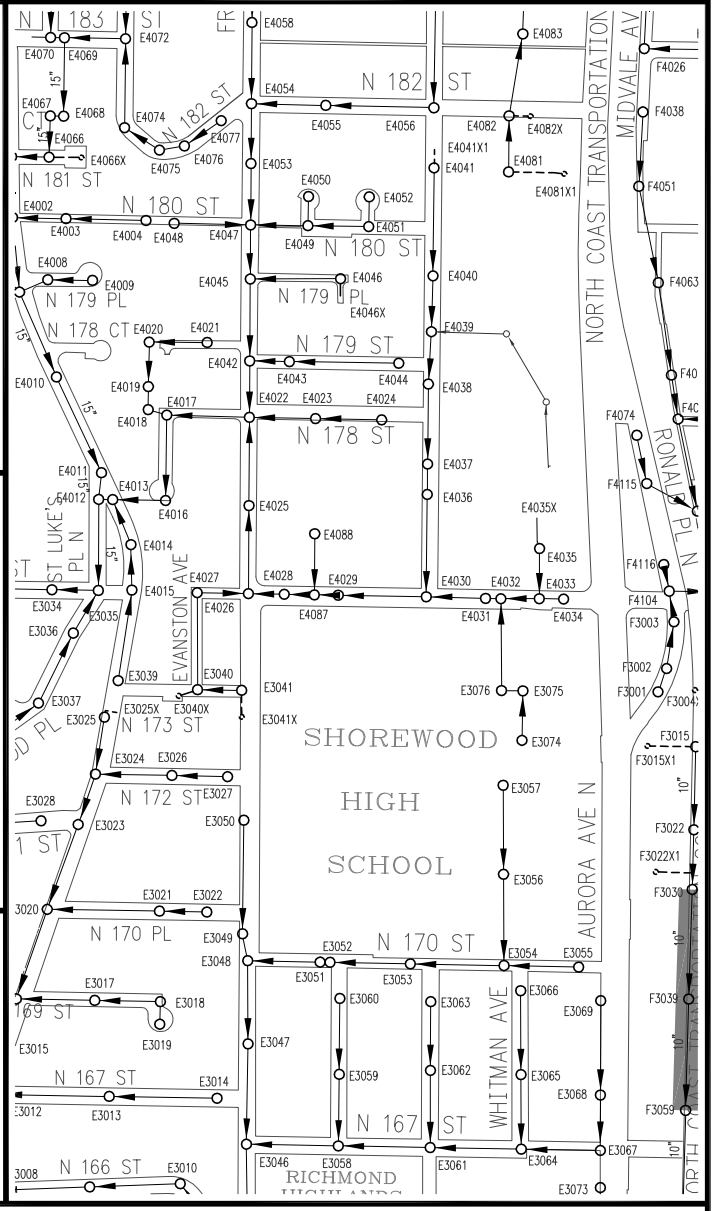
W. ADMIN BUILDING REMODEL

ESTIMATED PROJECT COST

$ 1,000,000

PROJECT DESCRIPTION

REMODEL OF DISTRICT OFFICE BUILDING.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO COMPLETE THE REMODEL OF THE ADMINISTRATION BUILDING.

ENVIRONMENTAL IMPACTS

SEPA IS REQUIRED FOR THE CONSTRUCTION PHASE OF THE PROJECT

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST		1,000,000							
FUNDING SOURCE		R/R							

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

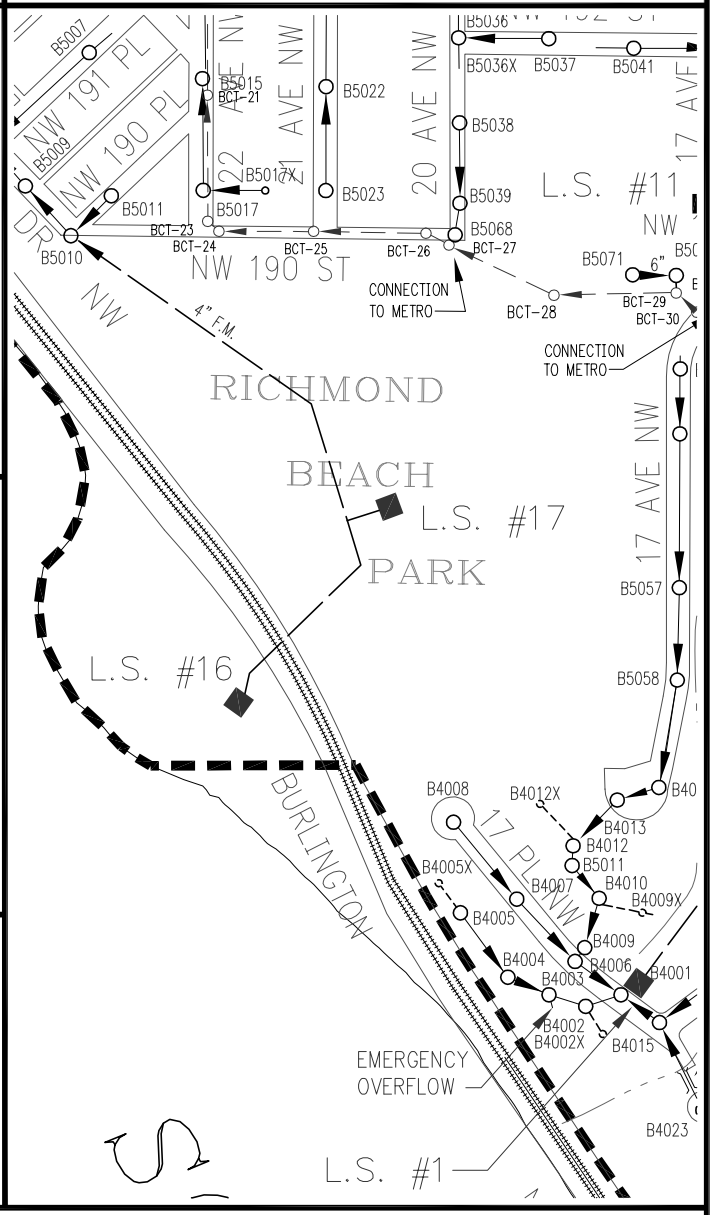
X. LIFT STATION NO. 16 IMPROVEMENTS

ESTIMATED PROJECT COST

$ 260,000

PROJECT DESCRIPTION

REPLACE EXISTING PUMPS AND ELECTRICAL AND MECHANICAL EQUIPMENT FOR LIFT STATION AT RICHMOND BEACH PARK.



PROJECT BENEFIT/RATIONALE:

UPGRADE LIFT STATION NO. 16 AND ASSOCIATED FORCE MAIN.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL NOT REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST	260,000								
FUNDING SOURCE	R/R & PWTF								

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

Y. LIFT STATION NO. 8
PREDESIGN

ESTIMATED PROJECT COST

$ 30,000

PROJECT DESCRIPTION

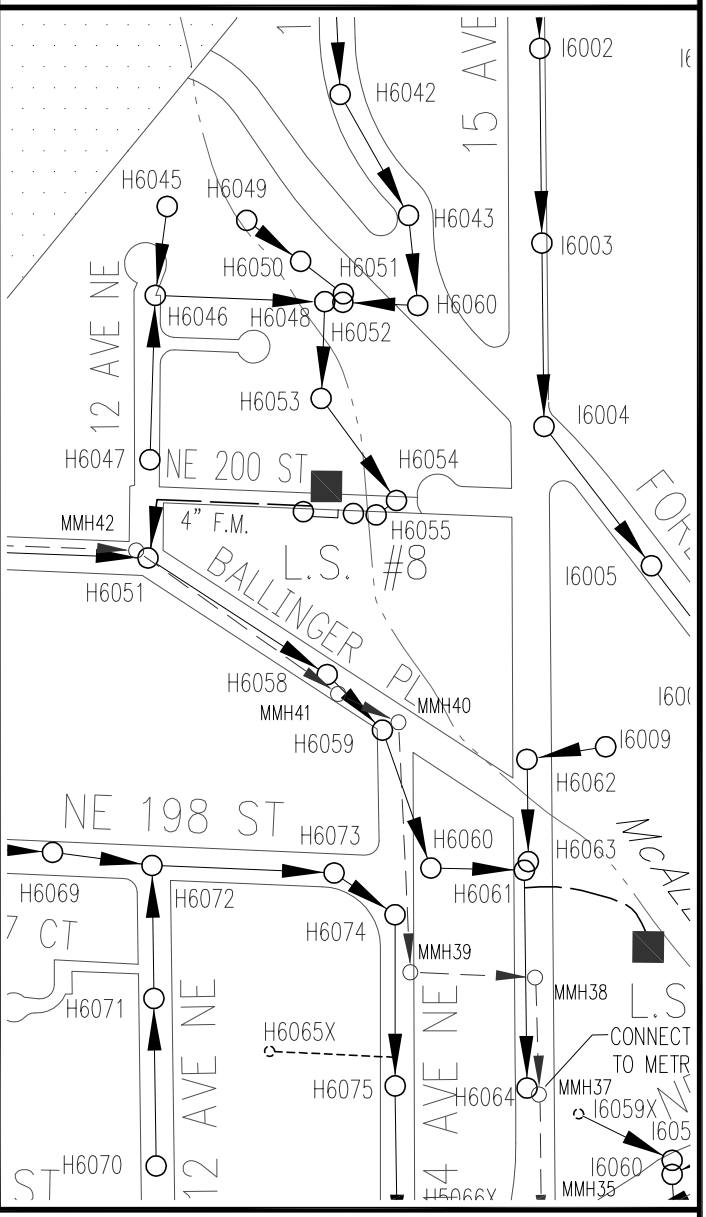
PREDESIGN REPORT FOR IMPROVEMENTS TO EXISTING LIFT STATION.

PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO IDENTIFY UPGRADE ALTERNATIVES. THE STATIONS WILL BE 25 YEARS OLD MANY COMPONENTS MAY REQUIRE REPLACEMENT OR UPGRADE.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL NOT REQUIRE SEPA REVIEW.



PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST			30,000						
FUNDING SOURCE			R/R						

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

Z. LIFT STATION NO. 8
DESIGN/CONSTRUCTION

ESTIMATED PROJECT COST

$ 700,000

PROJECT DESCRIPTION

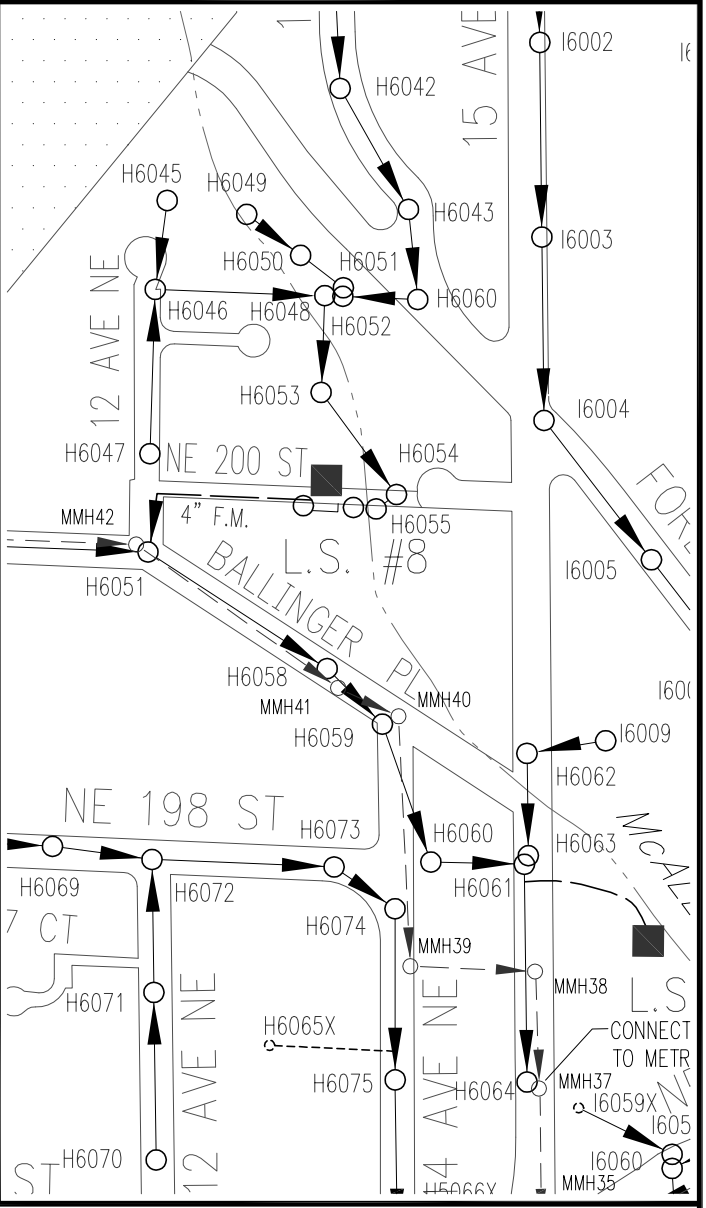
DESIGN AND CONSTRUCTION OF LIFT STATION NO. 8 IMPROVEMENTS

PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO COMPLETE THE DESIGN AND CONSTRUCTION PHASE OF THE LIFT STATION UPGRADES. THE SCHEDULE FOR THIS PROJECT SHOULD BE SHORTLY AFTER THE PREDESIGN IS COMPLETED.

ENVIRONMENTAL IMPACTS

THE PROJECT MAY NOT REQUIRE SEPA REVIEW, DEPENDING ON THE PROJECT ALTERNATIVE SELECTED DURING THE PREDESIGN.



PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST				700,000					
FUNDING SOURCE				R/R & PWTF					

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

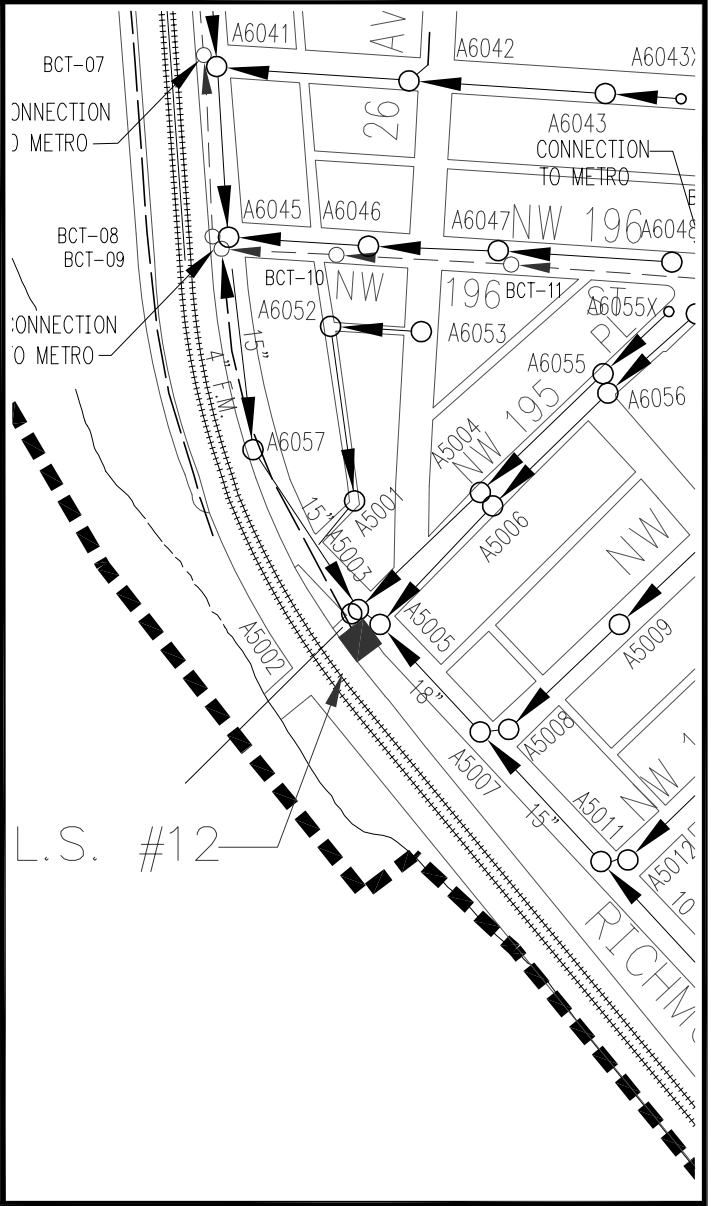
AA. LIFT STATION NO. 12
PREDESIGN

ESTIMATED PROJECT COST

$ 30,000

PROJECT DESCRIPTION

PREDESIGN REPORT FOR IMPROVEMENTS TO EXISTING LIFT STATION.



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO IDENTIFY UPGRADE ALTERNATIVES. THE STATIONS WILL BE 25 YEARS OLD MANY COMPONENTS MAY REQUIRE REPLACEMENT OR UPGRADE.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL NOT REQUIRE SEPA REVIEW.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST							30,000		
FUNDING SOURCE							R/R		

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

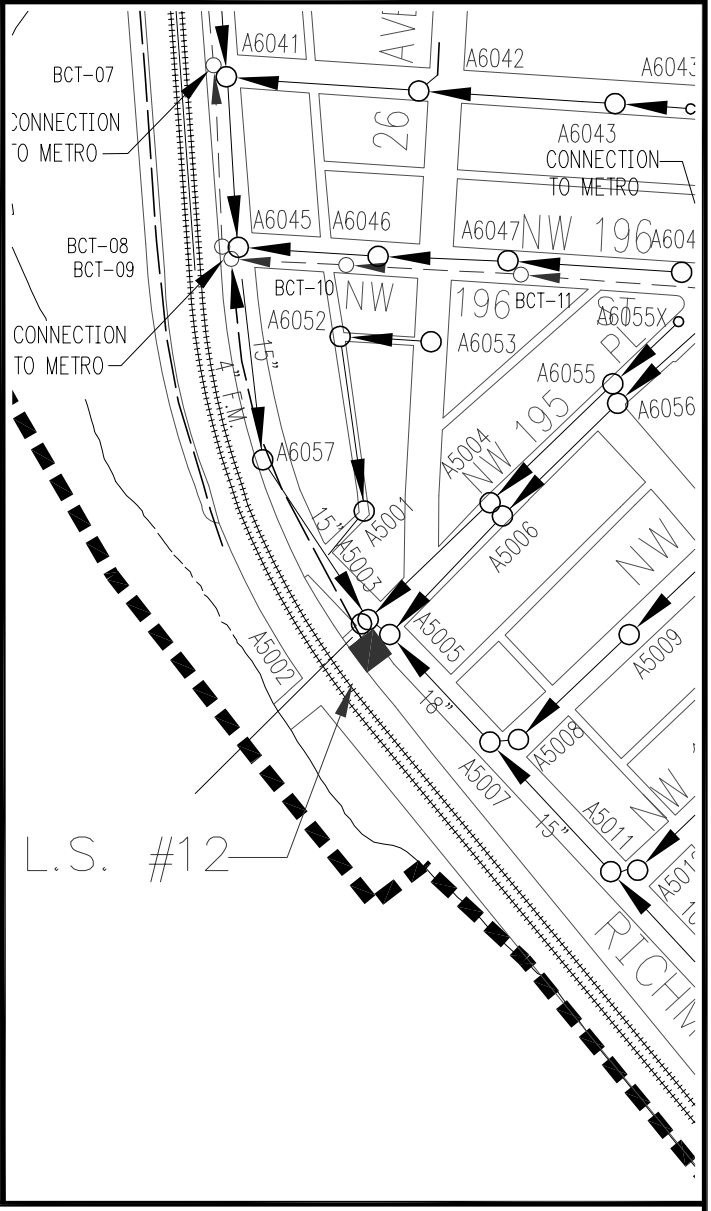
AB. LIFT STATION NO. 12
DESIGN/CONSTRUCTION

ESTIMATED PROJECT COST

$ 650,000

PROJECT DESCRIPTION

DESIGN AND CONSTRUCTION OF LIFT STATION NO. 12 IMPROVEMENTS



PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO COMPLETE THE DESIGN AND CONSTRUCTION PHASE OF THE LIFT STATION UPGRADES. THE SCHEDULE FOR THIS PROJECT SHOULD BE SHORTLY AFTER THE PREDESIGN IS COMPLETED.

ENVIRONMENTAL IMPACTS

THE PROJECT MAY NOT REQUIRE SEPA REVIEW, DEPENDING ON THE PROJECT ALTERNATIVE SELECTED DURING THE PREDESIGN.

PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST								650,000	
FUNDING SOURCE								R/R & PWTF	

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

AC. LIFT STATION NO. 9
PREDESIGN

ESTIMATED PROJECT COST

$ 30,000

PROJECT DESCRIPTION

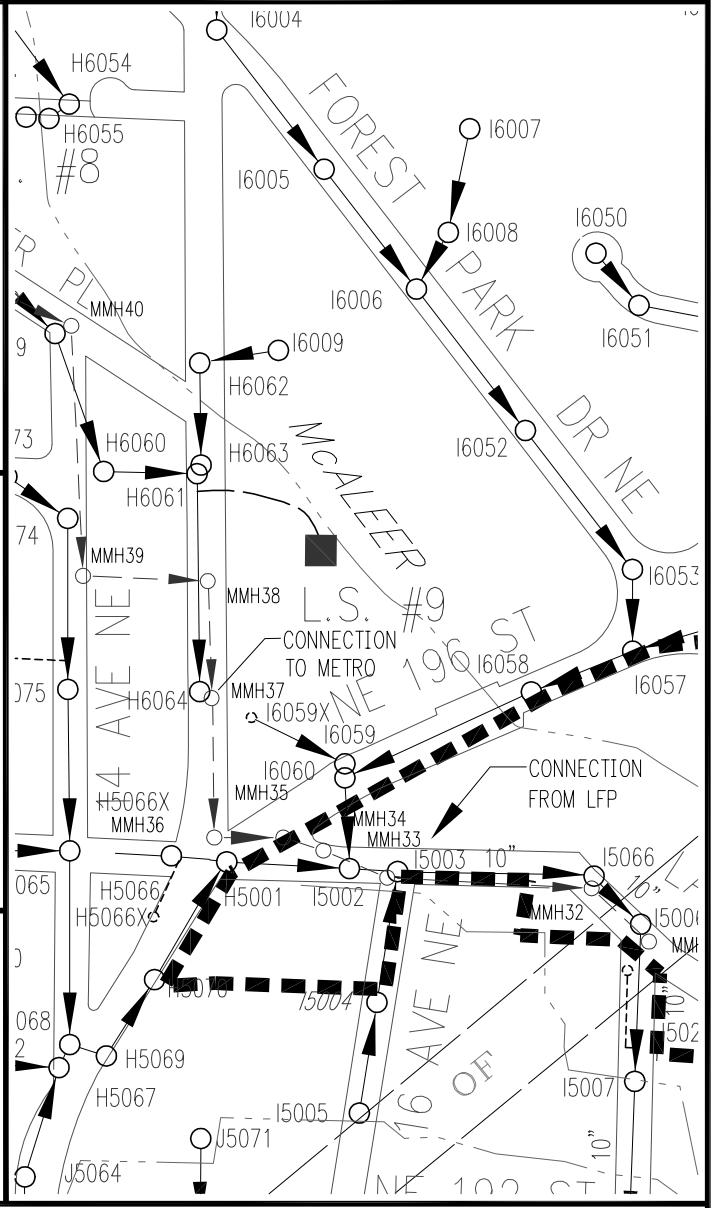
PREDESIGN REPORT FOR IMPROVEMENTS TO EXISTING LIFT STATION.

PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO IDENTIFY UPGRADE ALTERNATIVES. THE STATIONS WILL BE 25 YEARS OLD MANY COMPONENTS MAY REQUIRE REPLACEMENT OR UPGRADE.

ENVIRONMENTAL IMPACTS

THE PROJECT WILL NOT REQUIRE SEPA REVIEW.



PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST					30,000				
FUNDING SOURCE					R/R				

RONALD WASTEWATER DISTRICT

CAPITAL IMPROVEMENT PROJECT DESCRIPTION

PROJECT SUMMARY

PROJECT LETTER & NAME

AD. LIFT STATION NO. 9
DESIGN/CONSTRUCTION

ESTIMATED PROJECT COST

$ 500,000

PROJECT DESCRIPTION

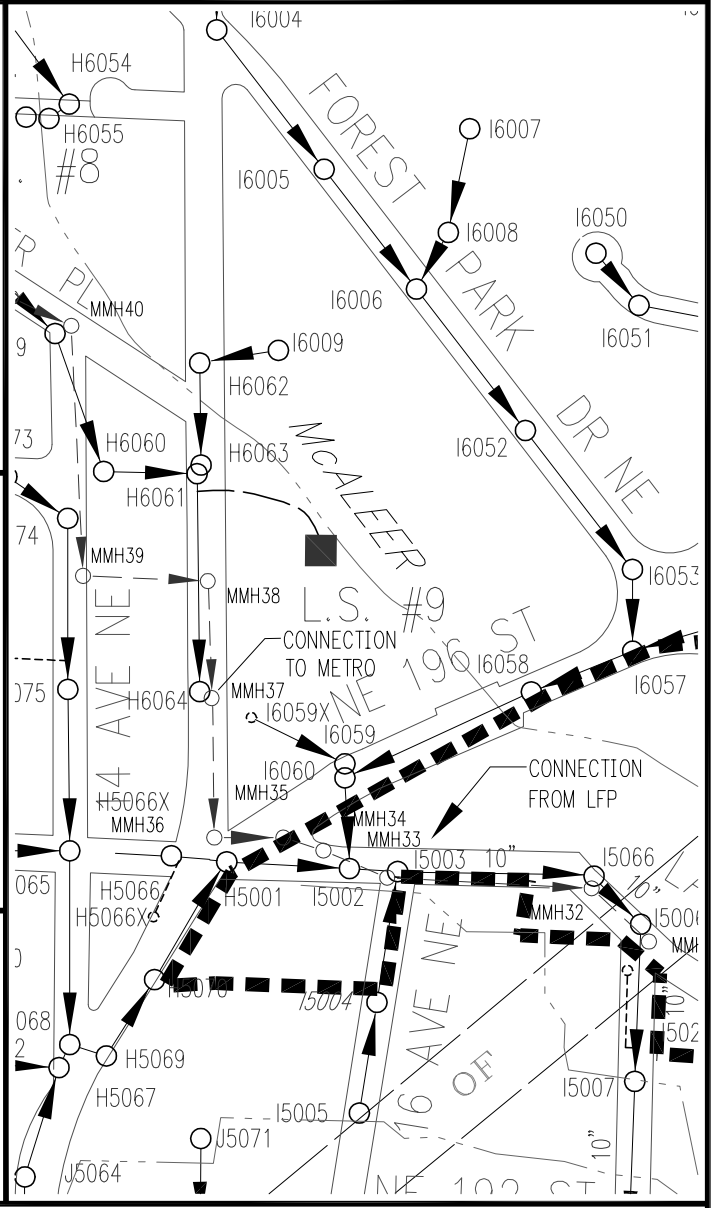
DESIGN AND CONSTRUCTION OF LIFT STATION NO. 9 IMPROVEMENTS

PROJECT BENEFIT/RATIONALE:

THE PROJECT IS NECESSARY TO COMPLETE THE DESIGN AND CONSTRUCTION PHASE OF THE LIFT STATION UPGRADES. THE SCHEDULE FOR THIS PROJECT SHOULD BE SHORTLY AFTER THE PREDESIGN IS COMPLETED.

ENVIRONMENTAL IMPACTS

THE PROJECT MAY NOT REQUIRE SEPA REVIEW, DEPENDING ON THE PROJECT ALTERNATIVE SELECTED DURING THE PREDESIGN.



PROGRAM FUNDING

	2010	2011	2012	2013	2014	2015	2016	2017	2018
PROJECT COST						500,000			
FUNDING SOURCE						R/R & PWTF			

CHAPTER 8

CAPITAL FACILITIES PLAN

8.1 INTRODUCTION

The development of a capital facilities plan for the maintenance and operation of the Ronald Wastewater District sewer system is set forth in this chapter. The population projections, land use, and design criteria presented in previous chapters were used to formulate the plan.

The existing system was reviewed to determine the necessity of replacing or repairing any components of the system. Once deficiencies were noted each project was evaluated and a recommended sequence for construction was established. The timing of construction or upgrading such facilities is contingent upon that point in time for which system demand is expected to exceed the rate that the existing facilities can operate properly.

Following is a discussion of the service area of Ronald Wastewater District and a capital improvement plan which includes cost estimates and a recommended schedule.

8.2 SERVICE AREA

The District presently has no plans or schedules for construction of sewer line extensions within its boundaries. It is expected that future construction within the District will occur by means of developer extension contracts in accordance with established District standards and policies as outlined in the District's Developer Extension Project Manual (see Appendix D).

Currently, Ronald Wastewater District provides sanitary sewer service to nearly all the existing residences within the District boundaries. The District expects to connect the few remaining residences via side sewer permits. Unsewered lots or lots that are redeveloped for increased densities will be served following the developer extension process.

There are two areas outside the District’s corporate area but within the City of Shoreline and receiving service by the District: Holyrood Cemetery and Seattle Golf and Country Club. Both areas could be annexed to the District following RCW 57.24. Both options will require going through annexation process of the King County Boundary Review Board.

8.3 DISTRICT STAFF

The District staff has remained stable since the District took over the LCSD sewer system. The District will continue to look at staffing needs to determine what change, if any, is needed to help meet the needs of the District.

8.4 SIDE SEWER REPLACMENT POLICY

The majority of sewers within the District are nearing 50 years in age. Future operating costs can be reduced by preventing storm water and ground water from the sanitary sewer system. The District has been conducting I/I studies for many years now and will continue to do so prior to the design of new capacity related projects. As the District discovered during the RON002 I/I Removal Pilot Project, significant quantities of I/I can be attributed to private side sewers. The District worked with Representative Kagi who sought and obtained an opinion from the Attorney General's office regarding the spending of public funds to replace private side sewers. Based on this opinion, the District has established a Side Sewer Replacement Policy (District Resolution 09-20 in Appendix E). All proposed projects included in this Capital Improvement Plan include the replacement of all sewers including side sewers on private property.

8.5 COST ESTIMATES

Project cost estimates involve an engineering judgment based on experience. Actual costs cannot be known until bids are received, and even these may be subject to adjustment. The District, in its decision-making, must always keep in mind that the costs presented in this plan are estimates.

Construction costs are estimated from prices obtained from various sources, including manufacturers, suppliers of materials and equipment, and bid prices for projects in other communities in the area. In considering these estimates, it is important to realize that changes during final design quite possibly will alter the total cost to some degree, and future changes in the cost of material, labor, and equipment will also have a direct impact. Prior to the initiation of the projects shown in this Capital Improvement Plan, the project costs should be reviewed and updated to reflect current conditions.

The cost estimates presented are based on 2009 prices and represent estimated total project costs. Project costs include construction cost plus a contingency of 20 percent as well as allied costs. Allied costs include consultant services, interest, taxes, District administration costs, etc. These allied costs have been estimated at 35.5 percent of the construction cost based on the following breakdown:

State sales tax	9.5%±
Permitting, environmental, engineering design, surveying, inspection, administrative, etc.	24.0%
Legal	1.0%
Administration, interest during construction, financial fees, etc.	1.0%
TOTAL	**35.5%**

Operation and maintenance costs are not reflected in the project cost estimates. However, these costs are important and require thorough consideration during the design phase of a proposed project. As facilities are replaced and upgraded, the sewer service rates should be reviewed and increased appropriately to provide continued funding for the system. In addition, the District also has administration needs that it must continue to upgrade. Rates must keep pace with these funding requirements.

Lift Station and Force Main Improvements

Lift stations #16 and #17 need to be upgraded in the near future. Lift stations #8 and #9 are nearing the end of their useful life. Lift station #12 was last upgraded in 1990. Otherwise, no renovation or upgrade of the lift stations should be scheduled in the next six years. Predesign reports will be forward to the Department of Ecology for future lift station projects.

Interceptor/Collection System Improvements

As discussed in Section 8.2, the District is primarily built out. New sewer mains will either be a result of problem areas (identified by maintenance activities) or expected increased sewer capacity to allow for planned development. Sufficient capacity will reduce the likelihood and occurrence of sewer overflows from additional residential and commercial users. While the timing of redevelopment of areas within Snohomish County and City of Shoreline is not known at this time, adequately sized public sewers will be required for any and all development. Individually, one redevelopment project may not have an impact on the sewer collection system. However, multiple projects can collectively impact the sewer system as flows continue to accumulate as they progress downstream.

8.6 CONSTRUCTION PLAN

This plan is intended to be a guide for upsizing, repairing and replacing the existing facilities located within the District. Each capital improvement project identified in Table 8.1 is discussed in detail in the following project descriptions. The project location, proposed sewer project and the project cost(s) are included in the detail. More specific project costs will be determined during predesign phases of the projects. A proposed schedule for constructing the project is

included in Table 8.2. Projects may be reprioritized during the next two years based on future development.

TABLE 8.1

CAPITAL IMPROVEMENT PROJECTS 2010-2030, in 2009 dollars

Project No.	Drainage Basin	Project Title	Total Estimated Project Cost
A	1	Richmond Beach Drive Sanitary Sewer Improvements	$ 757,000
B	1	Lift Station No. 13 Improvements	$ 2,020,000
Alt. AB	1	Point Wells Sanitary Sewer Improvements	$ 4,200,000
C	12	SR 99 Sanitary Sewer Improvements	$ 203,000
D	14	Carlyle Hall Road Sanitary Sewer Improvements	$ 1,097,000
E	14	N 160th St and Fremont Place Sanitary Sewer Improvements	$ 1,517,000
F	14	Aurora Ave N Sanitary Sewer Improvements	$ 831,000
G	15	Echo Lake Trunk Replacement	$ 1,546,300
H	16	NE 185th St Sanitary Sewer Improvements	$ 417,000
I	16	16th Ave NE/Perkins Way Sanitary Sewer Improvements	$ 1,108,000
J	16	Ballinger PL/15th Ave NE Sanitary Sewer Improvements	$ 444,000
K	16	Lago Place Sanitary Sewer Improvements	$ 1,966,000
L	17	1st Ave NE Sanitary Sewer Improvements	$ 719,000
M	17	Basin 17 Sanitary Sewer Improvements	$ 1,305,000
N	18	11th Ave NE Sanitary Sewer Improvements	$ 1,792,000
O	18	NE 170th St Sanitary Sewer Improvements	$ 831,000
P	19	Ballinger Sanitary Sewer Improvements	$ 520,000
Q	SPU18	SPU Basin 18 – total project cost $209,000	$ 84,000
R	SPU20	SPU Basin 20 – total project cost $ 406,000	$ 162,000
S	SPU21	SPU Basin 21 – total project cost $ 29,000	$ 12,000
T	SPU23	SPU Basin 23 – total project cost $1,217,000	$ 487,000
U	Various	Annual Sewer Repair & Replacement Projects	$ 27,620,000
V	14	Redesign of Administration Building	$ 150,000
W	14	Remodel of Administration Building	$ 1,000,000
X	25	Lift Stations No. 16 Improvements	$ 245,000
Y	16	Lift Stations No. 8 Predesign	$ 30,000
Z	16	Lift Stations No. 8 Design/Construction	$ 700,000
AA	1	Lift Station No. 12 Predesign	$ 30,000
AB	1	Lift Station No. 12 Design/Construction	$ 650,000
AC	16	Lift Stations No. 9 Predesign	$ 30,000
AD	16	Lift Stations No. 9 Predesign	$ 500,000
AE		Garage close out	$ 10,000
AF		Maintenance Equipment	$ 5,000
AG		Quarter Section Update	$ 31,000
AH		Two flow meters	$ 22,000
AI		Annex Seattle Golf Club	$ 5,000
AJ		Annex Holyrood Cemetery	$ 5,000
AK		Computers & Software Upgrades	$ 20,000
AL		1995 Ford Response Van replacement	$ 45,000

TABLE 8.1 continued

CAPITAL IMPROVEMENT PROJECTS 2010-2030, in 2009 dollars

Project No.	Drainage Basin	Project Title	Total Estimated Project Cost
AM		1997 Ford Dump Truck replacement	$ 40,000
AN		Air Compressor replacement	$ 27,000
AO		1999 Ford F-250 replacement	$ 25,000
AP		2000 Ford Explorer	$ 44,000
AQ		Office Equipment replacement	$ 10,000
AR		2001 Ford F-150 replacement	$ 26,000
AS		Office Building Roof replacement	$ 40,000
AT		2002 Peterbuilt Vactor replacement	$ 390,000
AU		2003 Ford Ranger replacement	$ 24,000
AV		2003 Ford Escape replacement	$ 27,000
AW		2005 CCTV replacement	$ 129,000
AX		Office Equipment	$ 10,000
AY		Hardware/Software replacement	$ 12,000
AZ		Scanner-Hardware & licensing	$ 17,340
		Misc projects previously authorized	$ 697,700
O-3A	15	Aurora Phase 3A – relocation of sewer main	$ 800,000
O-3B	12	Aurora Phase 3B – relocation of sewer main	$ 2,000,000
Fircrest	20	Purchase & Upgrade Fircrest System	$ 1,000,000
		Total 21 year Capital Improvement Plan[3]	**$ 54,235,340**

Notes:

1. Per agreement with SPU, District share of cost for increasing capacity for common sewer facilities south of the District's corporate boundary (N/NE 145th Street) is 40% of total project cost.
2. Assumed side sewers located every 50 feet along sewer main for replacement purposes.
3. Does not include Alternative AB cost

TABLE 8.2
RONALD WASTEWATER DISTRICT PROJECT SCHEDULE

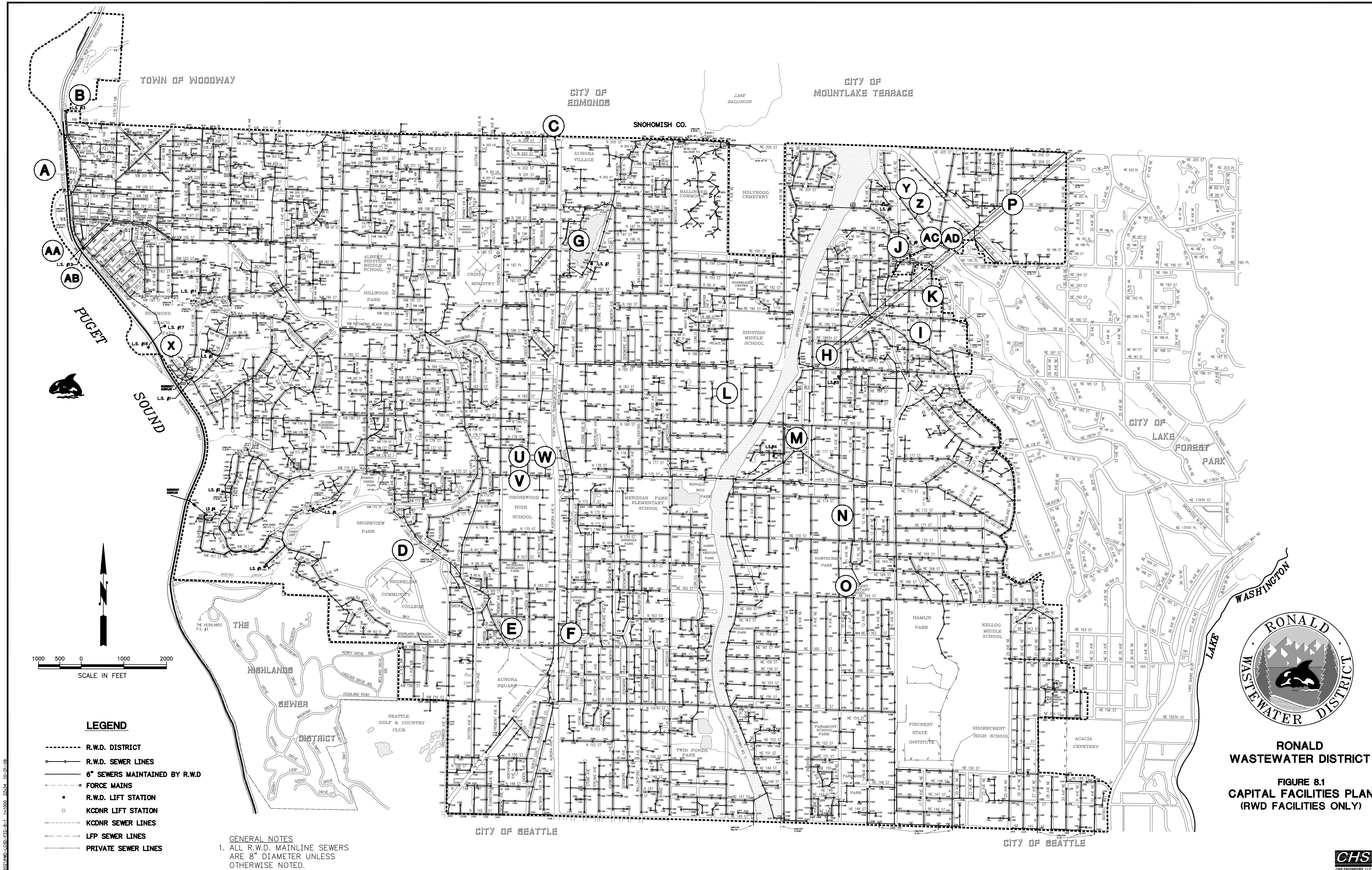
YEARS 2010 - 2015

Project	Project Name	Funding Source		2010	2011	2012	2013	2014	2015
	Prior Year Authorized Projects	R/R		$ 697,700					
G	Echo Lake Trunk Replacement	Bonds, GFC, R/R	2010	$ 1,546,300					
U	Annual Sewer Replacement Projects	R/R	Annual	$ 1,125,000	$ 1,100,000	$ 1,000,000	$ 995,000	$ 1,100,000	$ 1,300,000
V	Redesign of Administration Building	R/R	2010	$ 150,000					
X	Lift Station No. 16 Improvements	R/R & PWTF	2010	$ 245,000					
AE-AH	Misc. Admin Projects	R/R	2010	$ 68,000					
AZ	Scanner-Hardware & Licensing	R/R	2010	$ 17,340					
C	SR 99 Sanitary Sewer Improvements	Bonds, GFC, R/R	2011		$ 203,000				
H	NE 185th St Sanitary Sewer Improvements	Bonds, GFC, R/R	2011		$ 417,000				
W	Admin Building Remodel	R/R	2011		$ 1,000,000				
AI-AL	Misc. Admin Projects	R/R	2011		$ 75,000				
O-3A	Aurora Phase 3A - relocation of sewer main	Bonds, GFC, R/R	2011		$ 800,000				
K	Lago Place Sanitary Sewer Improvements	Bonds, GFC, R/R	2012			$ 1,966,000			
Y	Lift Station No. 8 Predesign	R/R	2012			$ 30,000			
AM	Misc. Admin Projects	R/R	2012			$ 40,000			
O-3B	Aurora Phase 3B - relocation of sewer main	Bonds, GFC, R/R	2012			$ 2,000,000			
O	NE 170th St Sanitary Sewer Improvements	Bonds, GFC, R/R	2013				$ 831,000		
P	25th Avne NE Sanitary Sewer Improvements	Bonds, GFC, R/R	2013				$ 520,000		
Z	Lift Station No. 8 Design/Construction	R/R & PWTF	2013				$ 700,000		
AN	Misc. Admin Projects	R/R	2013				$ 27,000		
Fircrest	Purchase & Upgrade Fircrest System	R/R	2013				$ 1,000,000		
D	Carlyle Hall Road Sanitary Sewer Improvements	Bonds, GFC, R/R	2014					$ 1,097,000	
E	N 160th St & Fremont Place Sanitary Sewer Improvements	Bonds, GFC, R/R	2014					$ 1,517,000	
AC	Lift Station No. 9 Predesign	R/R	2014					$ 30,000	
AO	Misc. Admin Projects	R/R	2014					$ 25,000	
I	16th Ave NE/Perkins Way Sanitary Sewer Improvements	Bonds, GFC, R/R	2015						$ 1,108,000
AD	Lift Station No. 9 Design/Construction	R/R & PWTF	2015						$ 500,000
AP-AQ	Misc. Admin Projects	R/R	2015						$ 54,000
	Total			**$ 3,849,340**	**$ 3,595,000**	**$ 5,036,000**	**$ 4,073,000**	**$ 3,769,000**	**$ 2,962,000**

TABLE 8.2
RONALD WASTEWATER DISTRICT PROJECT SCHEDULE

YEARS 2016 - 2030

Project	Project Name	Funding Source		2016	2017	2018	2019	2020	2021 -2030
N	11th Ave NE Sanitary Sewer Improvements	Bonds, GFC, R/R	2016	$ 1,792,000					
T	SPU Basin 23	Bonds, GFC, R/R	2016	$ 487,000					
U	Annual Sewer Replacement Projects	R/R & Bonds	Annual	$ 1,400,000	$ 1,400,000	$ 1,400,000	$ 1,400,000	$ 1,400,000	$14,000,000
AA	Lift Station No. 12 Predesign	R/R	2016	$ 30,000					
AR-AS	Misc. Admin Projects	R/R	2016	$ 66,000					
J	Ballinger Way/15th Ave NE Sanitary Sewer Improvements	Bonds, GFC, R/R	2017		$ 444,000				
L	1st Ave NE Sanitary Sewer Improvements	Bonds, GFC, R/R	2017		$ 719,000				
R	SPU Basin 20	Bonds, GFC, R/R	2017		$ 162,000				
AB	Lift Station No. 12 Design/Construction	R/R & PWTF	2016		$ 650,000				
AT	Misc. Admin Projects	R/R	2017		$ 390,000				
A	Richmond Beach Drive Sanitary Sewer Improvements	GFC	2018			$ 757,000			
B	Lift Station No. 13 Improvements	GFC	2018			$ 2,020,000			
AU-AV	Misc. Admin Projects	R/R	2018			$ 51,000			
F	Aurora Ave N Sanitary Sewer Improvements	Bonds, GFC, R/R	2019				$ 831,000		
M	Basin 17 Sanitary Sewer Improvements	Bonds, GFC, R/R	2019				$ 1,305,000		
Q	SPU Basin 18	Bonds, GFC, R/R	2021				$ 84,000		
S	SPU Basin 21	Bonds, GFC, R/R	2019				$ 12,000		
AW-AY	Misc. Admin Projects	R/R	2019				$ 151,000		
	Total			**$ 3,775,000**	**$ 3,765,000**	**$ 4,228,000**	**$ 3,783,000**	**$ 1,400,000**	**$14,000,000**


RONALD
WASTEWATER DISTRICT
FIGURE 8.1
CAPITAL FACILITIES PLAN
(RWD FACILITIES ONLY)
LEGEND
R.W.D. DISTRICT
R.W.D. SEWER LINES
6" SEWERS MAINTAINED BY R.W.D
FORCE MAINS
R.W.D. LIFT STATION
KCDNR LIFT STATION
KCDNR SEWER LINES
LFP SEWER LINES
PRIVATE SEWER LINES
GENERAL NOTES
1. ALL R.W.D. MAINLINE SEWERS ARE 8" DIAMETER UNLESS OTHERWISE NOTED.
SCALE IN FEET
1000 500 0 1000 2000
TOWN OF WOODWAY
CITY OF EDMONDS
CITY OF MOUNTLAKE TERRACE
SNOHOMISH CO.
PUGET SOUND
CITY OF LAKE FOREST PARK
LAKE WASHINGTON
CITY OF SEATTLE
THE HIGHLANDS SEWER DISTRICT
RONALD WASTEWATER DISTRICT
CHS
CHS ENGINEERS, LLC
A
B
C
D
E
F
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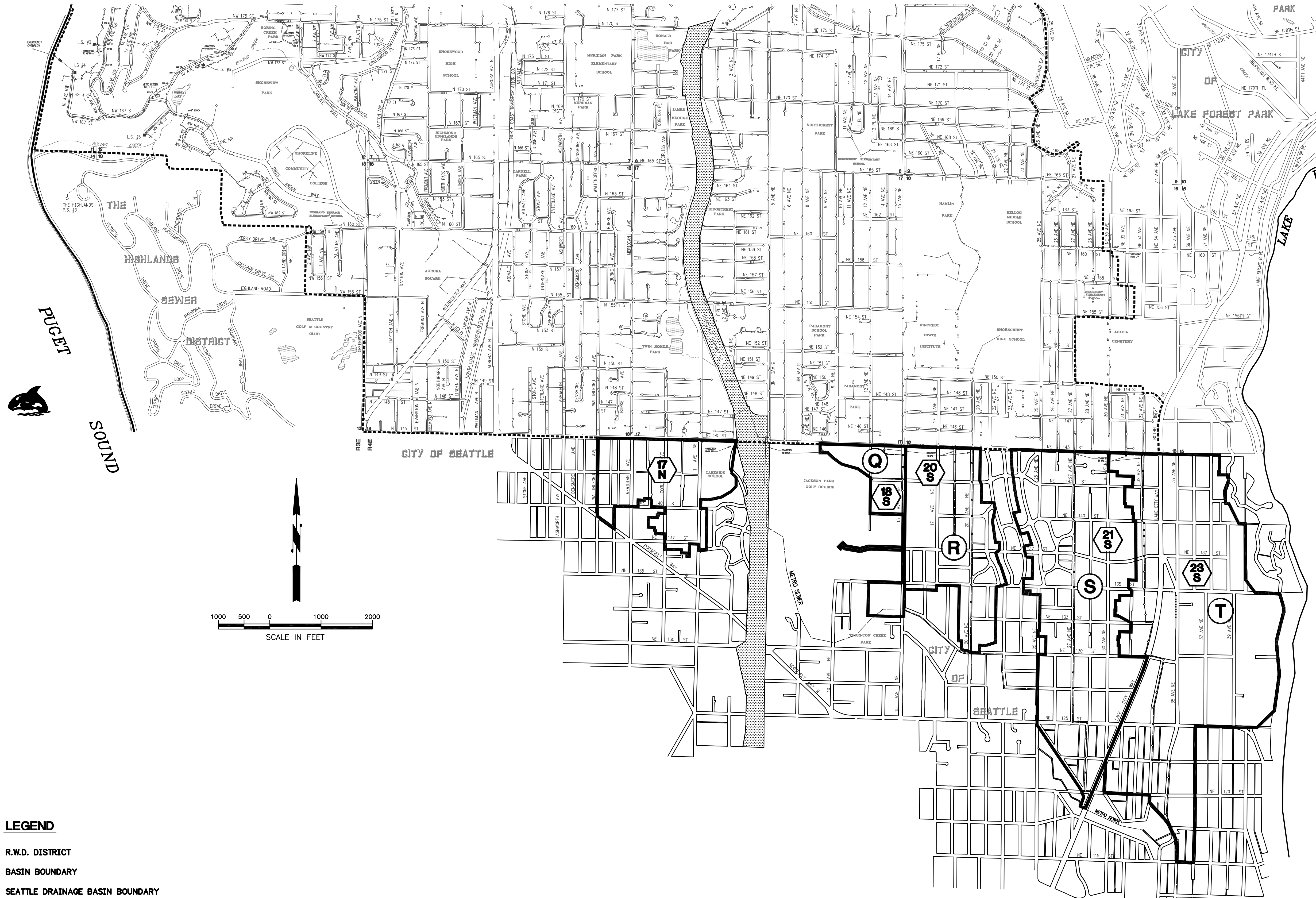


LEGEND

- R.W.D. DISTRICT
- BASIN BOUNDARY
- 17 N SEATTLE DRAINAGE BASIN BOUNDARY
- R.W.D. SEWER LINES
- R.W.D. – S.P.U. COMMON SEWER LINES
- METRO SEWER LINES

RONALD WASTEWATER DISTRICT

FIGURE 8.2
CAPITAL FACILITIES PLAN
(COMMON RWD/SPU FACILITIES)

CHS ENGINEERS, LLC

CHAPTER 9

FINANCES

9.1 INTRODUCTION

The purpose of this section is to assess the financing options for the capital facilities plan identified in Chapter 8 and the overall operations of the District. A ten and 20 year budget is proposed that assumes the rate requirements of the District and the expected rate revenue. A separate general facilities charge study is nearly complete by CHS Engineers and FCS Group.

9.2 RATES

The District is a public utility as defined under RCW 57. Because the District is a special purpose district, it does not share revenue collected for the sewer utility with other competing departments. One hundred percent of the revenue collected for the sewer utility pays for the capital projects, operation, maintenance and debt service of the District.

The revenue to operate the District is obtained through monthly service charges, which include a District charge and a treatment charge. The District charge funds the District operation. The treatment charge (a pass through charge) covers the cost of treatment by King County and the City of Edmonds. A portion of the District's monthly sewer rates goes toward infrastructure repair and replacement. The District looks at low cost loans, grants, and bonds when funding capital projects.

The 2009 Basic Sewer Charge is a flat $11.15 per month, per RCE. The District has also established a procedure for classifying different types of customers served by a sewer system with special needs within a particular area without burdening the rest of the District's ratepayers. The following is the schedule of charges currently in place. For comparison purposes, 1960, 1990 and 2009 rates are also listed.

Customers Served by King County

	District Charge	Treatment Charge	Total Monthly Charge
1960	$ 3.50	$ 2.00	$ 5.50
1990	$ 4.90	$11.60	$16.50
2000	$ 6.90	$19.50	$26.40
2009	$11.15	$31.90	$43.05

Customers Served by Edmonds

	District Charge	Treatment Charge	Total Monthly Charge
1960	$3.50	$ 1.00	$ 4.50
1990	$4.90	$10.30	$15.20
2000	$6.90	$15.80	$22.70
2009	$11.15	$20.00	$31.15

As discussed above, the District classifies different types of customers to deal with special needs within a particular area without burdening the rest of the ratepayers. An example is the Appletree Lane grinder pump installation that serves 34 homes. A surcharge of $25.54 per month is added to their base billing to cover the repair, replacement, monitoring and maintenance of this system. Customers are also billed for the electrical service to these stations.

Resolution 07-35 increased the rates in November 2007. The bimonthly water consumption used by each commercial customer is obtained from Shoreline Water District and Seattle Public Utilities, who provide water to the customers in the District service area. The King County rate of 750 cubic feet/month (or 187 gallons/day/connection) regardless of who the water purveyor is, was used to convert RCEs to daily volumes of wastewater generated.

The District recently added a surcharge to pay for the relocation of a sewer main in conjunction with the City of Shoreline's Aurora Corridor Widening Project. The City of Shoreline informed the District that its sewer line had to be moved for a future storm water collection system that had not been scheduled in the District's capital improvement projects. There are two phases to the project estimated to cost a total of $300,000. A relocation surcharge of $1.00/ month is included with each residential customer's bill. Multi-family commercial customer's charge is per RCE. A business that has 10 RCEs will pay $10/month. The surcharge will remain in effect until the total revenue for the projects is collected.

Low income/Senior citizen residential customers are given a 50% discount on the total charges to that customer. For a typical customer in King County drainage area, a bimonthly bill would be $88.10 ($43.05 + $43.05 + $2.00). A low income customer would pay 50% of the $88.10 and the $2.00 surcharge. Customers must provide proof of the income levels each spring to quality for the program.

Of the $11.15 single-family monthly service charge, $5.65 goes towards operations and maintenance costs, $2.26 for debt service and $3.24 for capital improvements. The District is in the process of updating a budget through 2015. The cost per service is shown in Table 9.1 for the entire planning period.

TABLE 9.1

COST PER SERVICE PER MONTH, 2010-2015[1]

Components of Monthly Charge	2009 Actual	2010 Budget	2011 Budget	2012 Budget	2013 Budget	2014 Budget	2015 Budget
O&M	$ 8.12	$ 7.15	$ 7.60	$ 7.76	$ 7.81	$ 7.87	$ 7.94
Debt Service	$ 2.03	$ 3.00	$ 2.55	$ 2.39	$ 2.34	$ 2.28	$ 2.21
Capital Improvements	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00
Total Charge	**$11.15**	**$11.15**	**$11.15**	**$11.15**	**$11.15**	**$11.15**	**$11.15**

[1]Costs for 2010 through 2015 for an increase of three percent from the 2010 expected O&M costs.

The District has a General Facilities Connection Charge that is defined by the District as "a charge representing the connecting property owner's equitable share of the cost of the District's sewer system which charge has been established in accordance with the requirements of RCW 57.08.005(10). The District's General Facility Charge for the District is $1,210 for a single-family dwelling (Resolution 08-03) These charges went into effect January 1, 2009.

Included in the District's sewer rates is a charge for an infrastructure repair and replacement fund. Many of the projects identified in Chapter 7 are funded by low interest loans. These various charges are segregated in the annual budget. The District's most current adopted budget was completed in November, 2008 for 2009.

9.3 PROJECT FUNDING SOURCES

There are five principal financing methods with which the proposed system improvements can be financed. Each of these methods of financing is discussed in the following subsections. The District will continue to evaluate financial options annually. Rates and charges must be maintained to an adequate level to insure sufficient funds to:

- make payment to bondholders,
- provide for debt service coverage as specified in bond covenants,
- properly maintain and operate the system, and
- provide funds for construction of the sewer system capital improvement plan.

A. Basic Sewer Charge (Rates)

Reoccurring sewer revenues from all the District customers, regardless of the customer type. The basis of the charge can include capital improvement projects.

B. General Facilities Charges (GFC)

Charge for the cost of facilities of general benefit to the District including but not limited to existing and future pump stations, trunk lines, interceptors, force mains, transmission mains, structures, equipment , and other capitalized costs.

C. Special Study Area Charges (SSA Charge)

Charge for the cost of facilities constructed for the District, specific to an area or group of customers including pumping stations, collection mains, interceptors, and other capitalized costs. These may be financed by a developer or the District. The District is currently considering adopting a Special Study Area Charge to help finance the Capital Improvement Plan identified in Chapter 7.

D. Bond Financing (Bonds)

Bond financing can be achieved by the sale of either revenue or general obligation bonds. Revenue bonds issued by the District do not require voter approval and may be financed by revenue from the basic sewer charges (rates), fees. General obligation bonds require voter approval and are collected by the County with the semi-annual property taxes. Bond financing can be utilized by the District for system-wide improvements. The District's current bond rating is Moody's A1.

E. Public Works Trust Fund (PWTF) Grants and Loans

The Public Works Board has historically offered loans for capital facilities planning, pre-construction, construction activities. The PWTF planning loan provides loans to finance capital facility plans. A maximum of $100,000 per jurisdiction per biennium is offered at a 0% interest rate and no local match is required. Applications for planning loans are accepted monthly and fund is typically awarded the following month.

The PWTF pre-construction loan program previously offered for design, engineering, preparing bid documents, environmental studies and acquiring rights-of-way for eligible facilities. For pre-construction loan financing, a maximum of $1,000,000 per jurisdiction per biennium was offered at an interest rate of 0.5% to 1.5% depending on the loan term and the local match. Applications had been previously accepted monthly. The PWTF construction loan program was available for repair, replacement and improvement of public infrastructure systems. The maximum loan amount, as of the March 2009 PWB workshops is $20,000,000 per jurisdiction and the interest rate ranges from 0.5% to 2% depending on the local match. The Legislature used the money anticipated to fund Public Works Trust Fund projects to balance the budget. Two new temporary competitive grant programs were created in the 2009-2011 budget. One grant program is specific for rural counties, the other for high density urban communities. Each grant program received appropriations of $9,531,000 for the 2009-2011 biennium. It is not known at this time if the PWTF will return to its prior program, or if so, what changes might be made.

F. State Revolving Funds and other Ecology-administered Funding

The State of Washington Department of Ecology has historically offered State Revolving Loans, for projects that can demonstrate a water quality benefit (such as projects that eliminate or prevent overflows to surface water). Lift station projects would be the most ideal candidates for these loans. Historically, the District has gone after PWT loans instead of SRF funding. The District should consider all alternatives when the next lift station is scheduled to be updated.

RONALD WASTEWATER DISTRICT
A Special Purpose District Formed Pursuant to RCW Title 57

Resolution 10-04

A Resolution of the Board of Commissioners of Ronald Wastewater District Adopting a Comprehensive Plan for a System of Sewers.

WHEREAS, RCW 57.08.005 authorizes Ronald Wastewater District to provide sanitary sewer services to property within and outside the District's corporate boundaries and provides the District full authority to regulate and control the those services and set the price thereof; and

WHEREAS, The Board of Commissioners determined that its Comprehensive Plan needed to be updated; and

WHEREAS, A capital improvement plan is included in the District's comprehensive plan and is intended as a guide for the District's improving and upgrading its existing facilities; and

WHEREAS, The Board of Commissioners directed the District's General Manager and the District's consulting engineers to develop a new comprehensive plan for the Board's approval; and

WHEREAS, A SEPA Hearing was held on October 22, 2009 to accept public comment on the District's Comprehensive Plan, and written comments were received by Seattle Public Utilities and Washington Department of Fish and Wildlife. Now, therefore,

BE IT RESOLVED by the Board of Commissioners of Ronald Wastewater District that the District's Comprehensive Sewer Plan is adopted.

ADOPTED by the Board of Commissioners of Ronald Wastewater District on January 19, 2010.

ATTEST:

Brian T Carroll
President/Commissioner

Secretary/Commissioner

Vice President/Commissioner

I, the undersigned Secretary of the Board of Commissioners of Ronald Wastewater District, a municipal corporation of King County, Washington, CERTIFY that the preceding document is a true and correct copy of Resolution 10-04 of the Board, duly adopted on January 19, 2010 at its regular meeting.

Secretary/Commissioner

DETERMINATION OF NON-SIGNIFICANCE
WAC 197-11-970

Description of Proposal:	Adoption of Comprehensive Sewer Plan for Ronald Wastewater District. Population projections were made over a twenty-year period. Existing sewer facilities were reviewed to determine their adequacy of current and future projections. Sewer system recommended improvements are identified and scheduled.
Proponent:	Ronald Wastewater District
Location of Proposal, including Street Address, if any:	The Ronald Wastewater District corporate area from the King/Snohomish County Line, including Point Wells areas of unincorporated Snohomish County, south to the Seattle City Limits and Highlands Sewer District. From Puget Sound, east to the City of Lake Forest Park
Lead Agency:	Ronald Wastewater District

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

[ ] There is no comment period for this DNS.

[X] This DNS is issued under 197-11-340(2); the lead agency will not act on this proposal for 15 days from the date below. Comments must be submitted by October 21, 2009.

Responsible Official: Michael U. Derrick

Position/Title: General Manager Phone: (206) 546-2494

Address: Ronald Wastewater District
Post Office Box 33490
17505 Linden Avenue North
Shoreline, Washington 98133-0490

Date: 10/7/09 Signature: Michael U Derrick

(NOTICE FOR PUBLICATION ON OCTOBER 14 AND OCTOBER 21, 2009)

NOTICE OF DETERMINATION OF NONSIGNIFICANCE

Ronald Wastewater District issued a determination of nonsignificance (DNS) under the State Environmental Policy Act Rules (Chapter 197-11 WAC) for the following project:

> Adoption of Comprehensive Sewer Plan for Ronald Wastewater District. The District's service area is comprised of the majority of the City of Shoreline with unincorporated Snohomish County area of Point wells and a several parcels within the Town of Woodway. Population projections were made covering a twenty-year period. Existing sewer facilities were reviewed to determine their adequacy for current and future population projections. Sewer system proposed improvements are identified and scheduled.

After review of a completed environmental checklist and other information on file with the agency, Ronald Wastewater District has determined this proposal will not have a probable significant adverse impact on the environment.

Copies of the DNS are available at no charge from the District office, 17505 Linden Avenue North, Shoreline, Washington 98133-0490, (206) 546-2494. The public is invited to comment on this DNS by submitting written comments no later than October 21, 2009, to:

Michael U. Derrick, General Manager
Ronald Wastewater District
17505 Linden Avenue North
Shoreline, WA 98133

A public hearing will be held on Thursday, October 22, 2009, commencing at 7:00 a.m., or thereafter, at the District Office. All interested persons may appear at such time and place and express their approval or disapproval of the proposed adoption of the sewer system plan amendment.

ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project (if applicable):

Ronald Wastewater District
Comprehensive Sewer Plan

2. Name of Applicant:

Ronald Wastewater District.

3. Address and phone number of applicant and contact person:

Ronald Wastewater District
17505 Linden Avenue N.
P.O. Box 33490
Shoreline, Washington 98133

Mr. Michael U. Derrick
(206) 546-2494

4. Date checklist prepared:

October 2009

5. Agency requesting checklist:

Ronald Wastewater District

6. Proposed timing or schedule (including phasing, if applicable):

Adoption of Comprehensive Sewer Plan – fall, 2009.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

The Ronald Wastewater District will implement the comprehensive plan according to the construction schedule in Chapter 8 of the plan.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

None.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

None at this time.

10. List any government approvals or permits that will be needed for your proposal, if known.

1. Washington State Department of Ecology Approval
2. King County Approval
3. Snohomish County Approval
4. City of Seattle Approval
5. City of Shoreline Approval
6. City of Edmonds Approval
7. Town of Woodway Approval

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (lead agencies may modify this form to include additional specific information on project description).

The Comprehensive Sewer Plan discusses the existing wastewater service area characteristics, population, and land use, and projects the growth within the District sewer service area. The plan discusses design criteria, sewer demand, the existing system, and proposed system expansion and improvements.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or details plans submitted with any permit applications related to this checklist.

Ronald Wastewater District's service area is located entirely within the City of Shoreline city limits with the exeption of two small service areas. One of these is located in the Town of Woodway and the other is a small portion in the SW corner of Snohomish County The District boundaries are generally described as follows:

North	-	King County-Snohomish County Line except for Point Wells area in unincorporated Snohomish county
West	-	Puget Sound
South	-	City of Seattle
East	-	City of Lake Forest Park/ Town of Woodway
Southwest	-	Highlands Sewer District

A map of the sewer service area is included in Figure 1-2 of the plan.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): *Flat*, rolling, *hilly*, *steep slopes,* mountainous, other _____.

Thre are a number of steep bluffs are located along the shores of Puget Sound within the Innis Arden, Richmond Beach and Point Wells areas of the District. These bluffs diminish in the Richmond Beach neighborhood. Aurora Avenue generally follows the natural drainage-dividing boundary of the District, separating the land area sloping to Puget Sound and Lake Washington. The Echo Lake area is an exception, however, containing a drainage basin of approximately 600 acres which drain to Echo Lake. Most of the rest of the District's service area is located on a rolling plateau with a north/south topographical orientation.

b. What is the steepest slope on the site (approximate percent slope)?

The topography in the District ranges from rolling hills (0 to 1% slope) to hilly (15-25% slope) topography.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck): If you know the classification of agricultural soils, specify them and note any prime farmland.

The District is located predominantly on Alderwood series of soils. Alderwood soils are gravely, sandy loam on rolling (6-15 percent slope), hilly (15-25 percent slope) and hilly/steep (25-70 percent slope) topography. Everett soils series appears mostly on the slopes leading down to Puget Sound in the neighborhoods of Richmond Beach and Innis Arden. Everett soils are gravelly, sandy loams with rolling (6-15 percent slope) and hilly (15-25 percent slope) topography. There are also some Carbondale mulch (0-1 percent slope) in a few isolated pockets throughout the district. Kitsap, Norma and Rifle soils are located along the eastern portion of the District service area. Kitsap soils are silty loam on hilly (15-25 percent slope) and Norma soils are fine sandy loam on flat (0-1 percent slope) topography. Rifle soils are peat on flat, shallow (0-1 percent slope) topography.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Some steep slopes are present adjacent to Puget Sound. Prior to construction, the proposed project in Chapter 8 will be reviewed for compliance with the current Critical Areas Ordinance for the relative jurisdiction, either the City of Shoreline or Snohomish County.

e. Describe the purpose, type and approximate quantities of any filling or grading proposed. Indicate source of fill.

Sewer line trenches will be excavated and backfilled with native material as much as possible. The City of Shoreline and Snohomish County may require imported backfill depending on condition and type of native soil. Bedding and backfill will come from local suppliers.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion during construction is possible but should be minimal. Construction erosion requirements will be imposed. Construction will typically take place in the public right-of-way, minimizing or eliminating the need for additional clearing.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

There are no plans to cover sewer lines with impervious surfaces other than those existing in the right-of-way. These include asphalt and concrete road surfaces. Minimal addition of impervious surfaces may be necessary with lift station improvements.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The construction documents will require the Contractor to utilize temporary erosion and sedimentation control measures to prevent erosion by covering erodable embankments, hydroseeding, filter fabric, straw bale filters, and other measures as necessary to meet local and state requirements. The Contractor will be required to schedule operations such that the excavation, embankment, and restoration work proceeds commensurate with his ability to complete restoration, mulching, seeding, and other erosion control measures immediately following disturbances of the earth. Implementing best management practices will minimize erosion during construction.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Normal dust and machinery emissions during construction; no emissions after construction. The Contractor will be required to limit emissions as required by the appropriate regulatory agencies and to control dust emissions so as not to damage property or vegetation or create a nuisance for the public. There will be diesel exhaust from the standby generator during its use for standby power and testing of equipment.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

The Contractor will be required to control dust during construction via sweeping, watering, and washing.

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands). If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

The area served by Ronald Wastewater District is located adjacent to and along Puget Sound. Within the District boundaries are several streams that flow into either Lake Washington or Puget Sound drainage basins. Some of the streams contain water only during the wet season. The three major streams which flow year-round are Boeing Creek, located between the Innis Arden neighborhood and the Highlands area and flows to Puget Sound, and McAleer and Lyons Creeks which originate in Snohomish County and flow into Lake Washington. There are no streams in the Snohomish County wastewater service area Three small bodies of water also exist within the

District's service area. They are Echo Lake, Ronald Bog, and Twin Ponds.

2) Will the project require any work over, in or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Individual projects will be designed and constructed in compliance with all applicable local, State, and Federal requirements. Some projects will require construction within 200 feet of Puget Sound or specific streams and water bodies identified above.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None. Individual projects will comply with applicable local, State, and Federal requirements. Some projects may require construction within 200 feet of said waters and will be subject to the appropriate permits.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

Dewatering of soil around lift stations for rehabilitation may be required. The construction documents will require proper sediment control before water can be discharged into the existing storm drainage system.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals...; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

None under this proposed plan.

c. Water Runoff (including storm water):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known) Where will this water flow? Will this water flow into other waters? If so, describe.

The finished project will not result in an appreciable amount of impervious area, with the exception of additional crushed rock surfacing on right of way shoulders as may be required. Depending on the type of development and number of residential units in this area, expansion or upgrading of pump stations may result in increased runoff to adjacent areas, but only minimally. Current drainage patterns will not be altered by the finished project.

Storm water runoff impacting the construction zone will be intercepted for sedimentation control prior to release to its normal outfall.

The construction documents will require the Contractor to utilize sedimentation control facilities per the specifications and local/state requirements to ensure that sediment-laden water does not enter the natural drainage system.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Possibly. Extended power outages combined with standby power system failure could result in wastewater overflow.

d. Proposed measures to reduce or control surface, ground and runoff water impacts, if any:

Erosion/sedimentation control facilities will be required as discussed in response to 3.b.1 and 3.c.1 above. If a pump station upgrade is required, runoff controls for the project would be in accordance with local development regulations.

4. Plants

a. Check or circle types of vegetation found on the site:

X	Deciduous tree: ***alder***, ***maple***, ***aspen***, other:
X	Evergreen tree: ***douglas-fir***, ***red cedar***, ***pine***, other:
X	Shrubs
X	Grass
	Pasture
	Crop or grain
X	Wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other
X	Water plants: water lily, eelgrass, milfoil, other
	Other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Low-growing vegetation such as grasses, forbs, and small shrubs and trees along the railroad roadway shoulders may be directly affected by excavation for the sewer mains. Cut trees will be replaced with native plant nursery stock and the railroad shoulder/ditch area will be reseeded with native grasses and forbs.

c. List threatened or endangered species known to be on or near the site.

None known.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Avoidance: The following measures may be incorporated into the construction plans to avoid impacts to existing plant communities and other wildlife habitat features.

- Large trees and native plants of significance will be flagged and avoided where feasible.

Reduction of Unavoidable Impacts: The following measures will be incorporated into the construction plans to reduce unavoidable impacts to existing plant communities and other wildlife habitat features.

- Vegetation will be cleared, where needed, or laid-over rather than graded.
- Topsoil from the trench will be stockpiled separately for short periods of time and replaced above the subsoil fill. This approach will allow for the survival of plant regenerative parts (roots, stems, rhizomes and seeds) present in the existing topsoil.
- Silt fences and hay bales will be placed in areas of steep slope to avoid erosion and sedimentation of wetland plant communities.

Compensatory Mitigation Measures: The following measures will be incorporated into the construction plans to compensate for unavoidable impacts to existing plant communities and other wildlife habitat features.

- Disturbed areas will be hydroseeded with a seed mixture containing native grasses and forbs.
- Native plant tree and shrub nursery stock will be planted to compensate for unavoidable loss of larger trees and portions of native plant communities.

5. Animals

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: ***hawk***, ***heron,*** ***eagle***, ***songbirds***, other: crow
mammals: deer, bear, elk, beaver, other: ***coyote***
fish: bass, ***salmon, trout,*** herring, ***shellfish,*** other: ***rockfish***

b. List any threatened or endangered species known to be on or near the site.

Ongoing fishery inventory studies indicate the presence of chinook, coho, sockeye, cutthroat, and rainbow trout.

c. Is the site part of a migration route? If so, explain.

The area is not part of a migration route for large mammals. Salmon use the near shore environment to during their migration. Songbirds may also use this area for migration and other birds as part of their north/south migration route along the Pacific Coast Line.

d. Proposed measures to preserve or enhance wildlife, if any:

None.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

None.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal. List other proposed measures to reduce or control energy impacts, if any:

None.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

The main risk would occur during construction from machinery and construction practices. This could include spills of small amounts of oil and diesel fuel.

1) Describe special emergency services that might be required.

Spill clean-up services and isolation during construction by the contractor.

2) Proposed measures to reduce or control environmental health hazards, if any:

Contractors are required to ensure all personnel are properly trained and construction equipment is properly maintained as required by W.I.S.H.A.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

None.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

During construction, noise levels will increase from construction equipment engines during normal working hours. Following construction, noise levels will return to their previous levels prior to construction.

3) Proposed measures to reduce or control noise impacts, if any:

Normal construction activity will be limited to daytime. Federal, State and local noise standards will regulate construction noise.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

Most of the District's service area has been developed as both single and multi-family residential. Commercial areas exist in small pockets and along major traffic corridors. These areas are classified as Community/Regional Business and Commercial by Shoreline's current Comprehensive Land Use Map. Approximately 58 percent of the service area located in Snohomish County is currently Urban Industrial with the remaining area Urban Low-Density Residential. The residential area has not yet been developed. The Snohomish County GMA Comprehensive Plan identifies the potential for the Urban Industrial area to become Mixed Use/Urban Center.

b. Has the site been used for agriculture? If so, describe.

No.

c. Describe any structures on the site.

Typically, the “site” is within public right-of-way, free of structures. The actual “site” will vary depending on the project.

d. Will any structures be demolished? If so, what?

None at this time.

e. What is the current zoning classification of the site?

There are many various zoning classifications throughout the Ronald Wastewater District ranging from low-density single-family residential to high intensity commercial and industrial zones. Current zoning throughout the District’s service area within the City of Shoreline is shown on Shoreline’s Zoning Map. The District’s Snohomish County service is shown on Figure 3.1 in the plan, per the Town of Woodway and Snohomish County.

f. What is the current comprehensive plan designation of the site.

The current comprehensive plan designations are shown on Figure 3.1 in the plan.

g. If applicable, what is the current shoreline master program designation of the site?

The western border of the District is bounded by Puget Sound shoreline and is designated Aquatic environment.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

Year	2009	2030
Population	53,296	56,588* 72,721 with special study areas

*Does not include potential growth in special study areas identified in Ch. 3 of the plan.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

None.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Review and approval by Snohomish County, Town of Woodway, City of Shoreline, King County and Washington State Department of Ecology.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any:

None.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

To be determined on a project-specific basis. Lift station projects and District Maintenance and Administration facilities would typically be the only projects involving a structure of any significant height.

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Proposed measures to reduce or control aesthetic impacts, if any:

None.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None.

d. Proposed measures to reduce or control light and glare impacts, if any:

None.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

The City of Shoreline provides recreational opportunities within the District within the City of Shoreline. There are no recreational areas within the District Snohomish County service area. The City of Shoreline provides for the operation of the parks system with the city limits, including the Shoreline Pool and Spartan Recreation Center.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None.

13. Historic and Cultural Preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

No.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

None.

c. Proposed measures to reduce or control impacts, if any:

None.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

City roads, State highways and Interstate Freeways provide public access to and through the District.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

Yes. METRO Transit local and express service, Sound Transit and Communicty Transiet provide service through the majority of the District's service area.

c. How many parking spaces would the completed project have? How many would the project eliminate?

No change.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

No change from existing operation.

g. Proposed measures to reduce or control transportation impacts, if any:

During construction signage and flaggers will be required to control traffic as needed.

15. Public Services

a. Would the project result in an increased need of public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No. The proposed capital facilities projects will provide be provided as a result of development of the area. These projects will provide improved reliability and higher capacity to the existing sewer collection system.

b. Proposed measures to reduce or control direct impacts on public services, if any.

None.

16. Utilities

a. **Circle utilities currently available at the site: *electricity*, *natural gas*, *water*, *refuse service*, *telephone*, *sanitary sewer*,** septic system, other.

b. **Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity, which might be needed.**

Future construction activities will consist of trenching for sewer line installation and District building contruction. The Ronald Wastewater District will operate and maintain the completed system.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: M. Diane Pottijer

Title: Project Engineer

Date Submitted: 10/7/09

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Temporary increase in noise and air emissions due to construction of proposed sewer facilities. As the community develops and grows, sewage flow will be generated requiring an increase in conveyance capacity.

Proposed measures to avoid or reduce such increases are:

Require compliance with local and state regulations.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

The implementation of the Comprehensive Sewer Plan would reduce the possibility of soil and water pollution by constructing and improving existing central collection and pumping facilities.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

Utilizing a comprehensive plan reduces the overall amount of construction activity and minimizes the effects of development.

3. How would the proposal be likely to deplete energy or natural resources?

Installation of materials, use of electricity, diesel, oil, and fuel are required in relatively small amounts. The comprehensive plan is not expected to have a significant impact on natural resources.

Proposed measures to protect or conserve energy and natural resources are:

Energy conservation may be realized through appropriate materials and processes that would be required for each element of construction and ongoing operation.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, flood-plains, or prime farmlands?

The implementation of the plan will not have a significant impact on environmentally sensitive areas. Most of the proposed facilities will be installed along existing transportation and utility corridors. The Comprehensive Sewer Plan would reduce the possibility of soil and water pollution by constructing central collection and pumping facilities. The projects will be permitted and constructed in accordance with the appropriate regulations.

Proposed measures to protect such resources or to avoid or reduce impacts are:

Comply with local and state requirements. Implementing a sewer comprehensive plan amendment reduces the overall amount of construction activity and minimizes the effects of development.

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

The plan will not significantly affect land and shoreline use. The proposal would provide new facilities, keeping in compliance with existing land and shoreline use plans.

Proposed measures to avoid or reduce shoreline and land use impacts are:

None. No significant impacts are anticipated.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

This proposal will not significantly increase demands on transportation or public services and utilities.

Proposed measures to reduce or respond to such demand(s) are:

None. No significant impact is anticipated.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

No conflicts.

RONALD WASTEWATER DISTRICT
COMPRHENSIVE SEWER PLAN

DETERMINATION OF NON-SIGNIFICANCE
AND SEPA CHECKLIST DISTRIBUTION LIST

U.S. Army Corps of Engineers
Chief, Regulatory Branch
PO Box 3755
Seattle, Washington 98124-3755

Ms. Barbara Ritchie,
Washington State Department of Ecology
Environmental Review Section
P.O. Box 47703
Olympia, Washington 98504-7703

Mr. Shawn McKone
Department of Ecology, NWRO
3190 160th Avenue SE
Bellevue, Washington 98009-5452

SEPA Center
Washington State Department of Natural Resources
P.O. Box 47015
Olympia, Washington 98504-7015

Ms. Teresa Eturaspe
Washington State Department of Fish and Wildlife
PO Box 43200
Olympia, Washington 98504-3155

Ms. Jan Haywood
Department of Health
P.O. Box 47820
Olympia, Washington 98504-7820

Mr. Steve Hirschey
Regional Water Policy Analyst
King County DNR
201 S Jackson St Rm 700
Seattle, WA 98104-3855

Ms. Sheila McCallister
Snohomish County Council
3000 Rockefeller Ave, MS 604
Everett, Washington 98201

Mr. Steve Thomsen
Snohomish County Engineer
3000 Rockefeller Ave, MS 604
Everett, WA 98201

Mr. Kevin Plemel
Snohomish Health District
3020 Rucker Avenue No. 104
Everett, WA 98201

Mr. Eric Faison
Town of Woodway
23920 113th PL W
Woodway, Washington 98020

Mr. Tim Stewart
City of Shoreline, Planning Dept.
17544 Midvale Avenue North
Shoreline, Washington 98133-4921

Mr. Roger Eberhart
District Manager
Olympic View Water and Sewer District
23725 Edmonds Way
Edmonds, WA 98026-8981

SEPA Coordinator
King County Department of Development and Environmental Services
900 Oaksdale Avenue SW
Renton, Washington 98055-1219

Mr. Steve Koho
City of Edmonds
200 – 2nd Ave S
Edmonds, WA 98020

Mr. Eric Davison
King County Wastewater
201 S. Jackson Street
Mail-Stop KSC-NR-0508
Seattle, Washington 98104-3855

Mr. Peter Mills
Tulalip Tribal Council
6700 Totem Beach Road
Marysville, Washington 98270

Ms. Karen Walter
Muckleshoot Indian Tribe
39015 172nd Avenue SE
Auburn, Washington 98092

Ms. Martha Burke
Seattle Public Utilities
P.O. Box 34018
Seattle, Washington 98124-4018

SEPA Coordinator
Seattle Department of Planning & Development
700 5th Avenue, Suite 2000
P.O. Box 34019
Seattle, Washington 98124-4019

Northshore Utility District
6830 NE 185th Street
Kenmore, Washington98028

Mr. Frank Zenk
City of Lake Forest Park
Public Works Department
17425 Ballinger Way, NE
Lake Forest Park, WA 98155

Mr. Stu Turner, General Manager
Shoreline Water District
P.O. Box 55367
Shoreline, Washington 98155

Mr. John Harris
Highlands Sewer District
The Highlands
181 NW 155th Street
Shoreline, WA 98177

DETERMINATION OF NON-SIGNIFICANCE
WAC 197-11-970

Description of Proposal:	Adoption of Comprehensive Sewer Plan for Ronald Wastewater District. Population projections were made over a twenty-year period. Existing sewer facilities were reviewed to determine their adequacy of current and future projections. Sewer system recommended improvements are identified and scheduled.
Proponent:	Ronald Wastewater District
Location of Proposal, including Street Address, if any:	The Ronald Wastewater District corporate area from the King/Snohomish County Line, including Point Wells areas of unincorporated Snohomish County, south to the Seattle City Limits and Highlands Sewer District. From Puget Sound, east to the City of Lake Forest Park
Lead Agency:	Ronald Wastewater District

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

[ ] There is no comment period for this DNS.

[X] This DNS is issued under 197-11-340(2); the lead agency will not act on this proposal for 15 days from the date below. Comments must be submitted by October 21, 2009.

Responsible Official: Michael U. Derrick

Position/Title: General Manager Phone: (206) 546-2494

Address: Ronald Wastewater District
Post Office Box 33490
17505 Linden Avenue North
Shoreline, Washington 98133-0490

Date: 10/7/09 Signature: Michael U Derrick

(NOTICE FOR PUBLICATION ON OCTOBER 14 AND OCTOBER 21, 2009)

NOTICE OF DETERMINATION OF NONSIGNIFICANCE

Ronald Wastewater District issued a determination of nonsignificance (DNS) under the State Environmental Policy Act Rules (Chapter 197-11 WAC) for the following project:

> Adoption of Comprehensive Sewer Plan for Ronald Wastewater District. The District's service area is comprised of the majority of the City of Shoreline with unincorporated Snohomish County area of Point wells and a several parcels within the Town of Woodway. Population projections were made covering a twenty-year period. Existing sewer facilities were reviewed to determine their adequacy for current and future population projections. Sewer system proposed improvements are identified and scheduled.

After review of a completed environmental checklist and other information on file with the agency, Ronald Wastewater District has determined this proposal will not have a probable significant adverse impact on the environment.

Copies of the DNS are available at no charge from the District office, 17505 Linden Avenue North, Shoreline, Washington 98133-0490, (206) 546-2494. The public is invited to comment on this DNS by submitting written comments no later than October 21, 2009, to:

Michael U. Derrick, General Manager
Ronald Wastewater District
17505 Linden Avenue North
Shoreline, WA 98133

A public hearing will be held on Thursday, October 22, 2009, commencing at 7:00 a.m., or thereafter, at the District Office. All interested persons may appear at such time and place and express their approval or disapproval of the proposed adoption of the sewer system plan amendment.

ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project (if applicable):

Ronald Wastewater District
Comprehensive Sewer Plan

2. Name of Applicant:

Ronald Wastewater District.

3. Address and phone number of applicant and contact person:

Ronald Wastewater District
17505 Linden Avenue N.
P.O. Box 33490
Shoreline, Washington 98133

Mr. Michael U. Derrick
(206) 546-2494

4. Date checklist prepared:

October 2009

5. Agency requesting checklist:

Ronald Wastewater District

6. Proposed timing or schedule (including phasing, if applicable):

Adoption of Comprehensive Sewer Plan – fall, 2009.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

The Ronald Wastewater District will implement the comprehensive plan according to the construction schedule in Chapter 8 of the plan.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

None.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

None at this time.

10. List any government approvals or permits that will be needed for your proposal, if known.

1. Washington State Department of Ecology Approval
2. King County Approval
3. Snohomish County Approval
4. City of Seattle Approval
5. City of Shoreline Approval
6. City of Edmonds Approval
7. Town of Woodway Approval

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (lead agencies may modify this form to include additional specific information on project description).

The Comprehensive Sewer Plan discusses the existing wastewater service area characteristics, population, and land use, and projects the growth within the District sewer service area. The plan discusses design criteria, sewer demand, the existing system, and proposed system expansion and improvements.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or details plans submitted with any permit applications related to this checklist.

Ronald Wastewater District's service area is located entirely within the City of Shoreline city limits with the exeption of two small service areas. One of these is located in the Town of Woodway and the other is a small portion in the SW corner of Snohomish County The District boundaries are generally described as follows:

North	-	King County-Snohomish County Line except for Point Wells area in unincorporated Snohomish county
West	-	Puget Sound
South	-	City of Seattle
East	-	City of Lake Forest Park/ Town of Woodway
Southwest	-	Highlands Sewer District

A map of the sewer service area is included in Figure 1-2 of the plan.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): *Flat*, rolling, *hilly*, *steep slopes,* mountainous, other _____.

Thre are a number of steep bluffs are located along the shores of Puget Sound within the Innis Arden, Richmond Beach and Point Wells areas of the District. These bluffs diminish in the Richmond Beach neighborhood. Aurora Avenue generally follows the natural drainage-dividing boundary of the District, separating the land area sloping to Puget Sound and Lake Washington. The Echo Lake area is an exception, however, containing a drainage basin of approximately 600 acres which drain to Echo Lake. Most of the rest of the District's service area is located on a rolling plateau with a north/south topographical orientation.

b. What is the steepest slope on the site (approximate percent slope)?

The topography in the District ranges from rolling hills (0 to 1% slope) to hilly (15-25% slope) topography.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck): If you know the classification of agricultural soils, specify them and note any prime farmland.

The District is located predominantly on Alderwood series of soils. Alderwood soils are gravely, sandy loam on rolling (6-15 percent slope), hilly (15-25 percent slope) and hilly/steep (25-70 percent slope) topography. Everett soils series appears mostly on the slopes leading down to Puget Sound in the neighborhoods of Richmond Beach and Innis Arden. Everett soils are gravelly, sandy loams with rolling (6-15 percent slope) and hilly (15-25 percent slope) topography. There are also some Carbondale mulch (0-1 percent slope) in a few isolated pockets throughout the district. Kitsap, Norma and Rifle soils are located along the eastern portion of the District service area. Kitsap soils are silty loam on hilly (15-25 percent slope) and Norma soils are fine sandy loam on flat (0-1 percent slope) topography. Rifle soils are peat on flat, shallow (0-1 percent slope) topography.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Some steep slopes are present adjacent to Puget Sound. Prior to construction, the proposed project in Chapter 8 will be reviewed for compliance with the current Critical Areas Ordinance for the relative jurisdiction, either the City of Shoreline or Snohomish County.

e. Describe the purpose, type and approximate quantities of any filling or grading proposed. Indicate source of fill.

Sewer line trenches will be excavated and backfilled with native material as much as possible. The City of Shoreline and Snohomish County may require imported backfill depending on condition and type of native soil. Bedding and backfill will come from local suppliers.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion during construction is possible but should be minimal. Construction erosion requirements will be imposed. Construction will typically take place in the public right-of-way, minimizing or eliminating the need for additional clearing.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

There are no plans to cover sewer lines with impervious surfaces other than those existing in the right-of-way. These include asphalt and concrete road surfaces. Minimal addition of impervious surfaces may be necessary with lift station improvements.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The construction documents will require the Contractor to utilize temporary erosion and sedimentation control measures to prevent erosion by covering erodable embankments, hydroseeding, filter fabric, straw bale filters, and other measures as necessary to meet local and state requirements. The Contractor will be required to schedule operations such that the excavation, embankment, and restoration work proceeds commensurate with his ability to complete restoration, mulching, seeding, and other erosion control measures immediately following disturbances of the earth. Implementing best management practices will minimize erosion during construction.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Normal dust and machinery emissions during construction; no emissions after construction. The Contractor will be required to limit emissions as required by the appropriate regulatory agencies and to control dust emissions so as not to damage property or vegetation or create a nuisance for the public. There will be diesel exhaust from the standby generator during its use for standby power and testing of equipment.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

The Contractor will be required to control dust during construction via sweeping, watering, and washing.

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands). If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

The area served by Ronald Wastewater District is located adjacent to and along Puget Sound. Within the District boundaries are several streams that flow into either Lake Washington or Puget Sound drainage basins. Some of the streams contain water only during the wet season. The three major streams which flow year-round are Boeing Creek, located between the Innis Arden neighborhood and the Highlands area and flows to Puget Sound, and McAleer and Lyons Creeks which originate in Snohomish County and flow into Lake Washington. There are no streams in the Snohomish County wastewater service area Three small bodies of water also exist within the

District's service area. They are Echo Lake, Ronald Bog, and Twin Ponds.

2) Will the project require any work over, in or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Individual projects will be designed and constructed in compliance with all applicable local, State, and Federal requirements. Some projects will require construction within 200 feet of Puget Sound or specific streams and water bodies identified above.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None. Individual projects will comply with applicable local, State, and Federal requirements. Some projects may require construction within 200 feet of said waters and will be subject to the appropriate permits.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

Dewatering of soil around lift stations for rehabilitation may be required. The construction documents will require proper sediment control before water can be discharged into the existing storm drainage system.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals...; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

None under this proposed plan.

c. Water Runoff (including storm water):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known) Where will this water flow? Will this water flow into other waters? If so, describe.

The finished project will not result in an appreciable amount of impervious area, with the exception of additional crushed rock surfacing on right of way shoulders as may be required. Depending on the type of development and number of residential units in this area, expansion or upgrading of pump stations may result in increased runoff to adjacent areas, but only minimally. Current drainage patterns will not be altered by the finished project.

Storm water runoff impacting the construction zone will be intercepted for sedimentation control prior to release to its normal outfall.

The construction documents will require the Contractor to utilize sedimentation control facilities per the specifications and local/state requirements to ensure that sediment-laden water does not enter the natural drainage system.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Possibly. Extended power outages combined with standby power system failure could result in wastewater overflow.

d. Proposed measures to reduce or control surface, ground and runoff water impacts, if any:

Erosion/sedimentation control facilities will be required as discussed in response to 3.b.1 and 3.c.1 above. If a pump station upgrade is required, runoff controls for the project would be in accordance with local development regulations.

4. Plants

a. Check or circle types of vegetation found on the site:

X	Deciduous tree: ***alder***, ***maple***, ***aspen***, other:
X	Evergreen tree: ***douglas-fir***, ***red cedar***, ***pine***, other:
X	Shrubs
X	Grass
	Pasture
	Crop or grain
X	Wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other
X	Water plants: water lily, eelgrass, milfoil, other
	Other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Low-growing vegetation such as grasses, forbs, and small shrubs and trees along the railroad roadway shoulders may be directly affected by excavation for the sewer mains. Cut trees will be replaced with native plant nursery stock and the railroad shoulder/ditch area will be reseeded with native grasses and forbs.

c. List threatened or endangered species known to be on or near the site.

None known.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Avoidance: The following measures may be incorporated into the construction plans to avoid impacts to existing plant communities and other wildlife habitat features.

- Large trees and native plants of significance will be flagged and avoided where feasible.

Reduction of Unavoidable Impacts: The following measures will be incorporated into the construction plans to reduce unavoidable impacts to existing plant communities and other wildlife habitat features.

- Vegetation will be cleared, where needed, or laid-over rather than graded.
- Topsoil from the trench will be stockpiled separately for short periods of time and replaced above the subsoil fill. This approach will allow for the survival of plant regenerative parts (roots, stems, rhizomes and seeds) present in the existing topsoil.
- Silt fences and hay bales will be placed in areas of steep slope to avoid erosion and sedimentation of wetland plant communities.

Compensatory Mitigation Measures: The following measures will be incorporated into the construction plans to compensate for unavoidable impacts to existing plant communities and other wildlife habitat features.

- Disturbed areas will be hydroseeded with a seed mixture containing native grasses and forbs.
- Native plant tree and shrub nursery stock will be planted to compensate for unavoidable loss of larger trees and portions of native plant communities.

5. Animals

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: ***hawk***, ***heron,*** ***eagle***, ***songbirds***, other: crow
mammals: deer, bear, elk, beaver, other: ***coyote***
fish: bass, ***salmon, trout,*** herring, ***shellfish,*** other: ***rockfish***

b. List any threatened or endangered species known to be on or near the site.

Ongoing fishery inventory studies indicate the presence of chinook, coho, sockeye, cutthroat, and rainbow trout.

c. Is the site part of a migration route? If so, explain.

The area is not part of a migration route for large mammals. Salmon use the near shore environment to during their migration. Songbirds may also use this area for migration and other birds as part of their north/south migration route along the Pacific Coast Line.

d. Proposed measures to preserve or enhance wildlife, if any:

None.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

None.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal. List other proposed measures to reduce or control energy impacts, if any:

None.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

The main risk would occur during construction from machinery and construction practices. This could include spills of small amounts of oil and diesel fuel.

1) Describe special emergency services that might be required.

Spill clean-up services and isolation during construction by the contractor.

2) Proposed measures to reduce or control environmental health hazards, if any:

Contractors are required to ensure all personnel are properly trained and construction equipment is properly maintained as required by W.I.S.H.A.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

None.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

During construction, noise levels will increase from construction equipment engines during normal working hours. Following construction, noise levels will return to their previous levels prior to construction.

3) Proposed measures to reduce or control noise impacts, if any:

Normal construction activity will be limited to daytime. Federal, State and local noise standards will regulate construction noise.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

Most of the District's service area has been developed as both single and multi-family residential. Commercial areas exist in small pockets and along major traffic corridors. These areas are classified as Community/Regional Business and Commercial by Shoreline's current Comprehensive Land Use Map. Approximately 58 percent of the service area located in Snohomish County is currently Urban Industrial with the remaining area Urban Low-Density Residential. The residential area has not yet been developed. The Snohomish County GMA Comprehensive Plan identifies the potential for the Urban Industrial area to become Mixed Use/Urban Center.

b. Has the site been used for agriculture? If so, describe.

No.

c. Describe any structures on the site.

Typically, the “site” is within public right-of-way, free of structures. The actual “site” will vary depending on the project.

d. Will any structures be demolished? If so, what?

None at this time.

e. What is the current zoning classification of the site?

There are many various zoning classifications throughout the Ronald Wastewater District ranging from low-density single-family residential to high intensity commercial and industrial zones. Current zoning throughout the District’s service area within the City of Shoreline is shown on Shoreline’s Zoning Map. The District’s Snohomish County service is shown on Figure 3.1 in the plan, per the Town of Woodway and Snohomish County.

f. What is the current comprehensive plan designation of the site.

The current comprehensive plan designations are shown on Figure 3.1 in the plan.

g. If applicable, what is the current shoreline master program designation of the site?

The western border of the District is bounded by Puget Sound shoreline and is designated Aquatic environment.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

Year	2009	2030
Population	53,296	56,588* 72,721 with special study areas

*Does not include potential growth in special study areas identified in Ch. 3 of the plan.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

None.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Review and approval by Snohomish County, Town of Woodway, City of Shoreline, King County and Washington State Department of Ecology.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any:

None.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

To be determined on a project-specific basis. Lift station projects and District Maintenance and Administration facilities would typically be the only projects involving a structure of any significant height.

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Proposed measures to reduce or control aesthetic impacts, if any:

None.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None.

d. Proposed measures to reduce or control light and glare impacts, if any:

None.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

The City of Shoreline provides recreational opportunities within the District within the City of Shoreline. There are no recreational areas within the District Snohomish County service area. The City of Shoreline provides for the operation of the parks system with the city limits, including the Shoreline Pool and Spartan Recreation Center.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None.

13. Historic and Cultural Preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

No.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

None.

c. Proposed measures to reduce or control impacts, if any:

None.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

City roads, State highways and Interstate Freeways provide public access to and through the District.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

Yes. METRO Transit local and express service, Sound Transit and Communicty Transiet provide service through the majority of the District's service area.

c. How many parking spaces would the completed project have? How many would the project eliminate?

No change.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

No change from existing operation.

g. Proposed measures to reduce or control transportation impacts, if any:

During construction signage and flaggers will be required to control traffic as needed.

15. Public Services

a. Would the project result in an increased need of public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No. The proposed capital facilities projects will provide be provided as a result of development of the area. These projects will provide improved reliability and higher capacity to the existing sewer collection system.

b. Proposed measures to reduce or control direct impacts on public services, if any.

None.

16. Utilities

a. **Circle utilities currently available at the site: *electricity*, *natural gas*, *water*, *refuse service*, *telephone*, *sanitary sewer*,** septic system, other.

b. **Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity, which might be needed.**

Future construction activities will consist of trenching for sewer line installation and District building contruction. The Ronald Wastewater District will operate and maintain the completed system.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: M. Diane Pottijer

Title: Project Engineer

Date Submitted: 10/7/09

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Temporary increase in noise and air emissions due to construction of proposed sewer facilities. As the community develops and grows, sewage flow will be generated requiring an increase in conveyance capacity.

Proposed measures to avoid or reduce such increases are:

Require compliance with local and state regulations.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

The implementation of the Comprehensive Sewer Plan would reduce the possibility of soil and water pollution by constructing and improving existing central collection and pumping facilities.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

Utilizing a comprehensive plan reduces the overall amount of construction activity and minimizes the effects of development.

3. How would the proposal be likely to deplete energy or natural resources?

Installation of materials, use of electricity, diesel, oil, and fuel are required in relatively small amounts. The comprehensive plan is not expected to have a significant impact on natural resources.

Proposed measures to protect or conserve energy and natural resources are:

Energy conservation may be realized through appropriate materials and processes that would be required for each element of construction and ongoing operation.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, flood-plains, or prime farmlands?

The implementation of the plan will not have a significant impact on environmentally sensitive areas. Most of the proposed facilities will be installed along existing transportation and utility corridors. The Comprehensive Sewer Plan would reduce the possibility of soil and water pollution by constructing central collection and pumping facilities. The projects will be permitted and constructed in accordance with the appropriate regulations.

Proposed measures to protect such resources or to avoid or reduce impacts are:

Comply with local and state requirements. Implementing a sewer comprehensive plan amendment reduces the overall amount of construction activity and minimizes the effects of development.

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

The plan will not significantly affect land and shoreline use. The proposal would provide new facilities, keeping in compliance with existing land and shoreline use plans.

Proposed measures to avoid or reduce shoreline and land use impacts are:

None. No significant impacts are anticipated.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

This proposal will not significantly increase demands on transportation or public services and utilities.

Proposed measures to reduce or respond to such demand(s) are:

None. No significant impact is anticipated.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

No conflicts.

RONALD WASTEWATER DISTRICT
COMPRHENSIVE SEWER PLAN

DETERMINATION OF NON-SIGNIFICANCE
AND SEPA CHECKLIST DISTRIBUTION LIST

U.S. Army Corps of Engineers
Chief, Regulatory Branch
PO Box 3755
Seattle, Washington 98124-3755

Ms. Barbara Ritchie,
Washington State Department of Ecology
Environmental Review Section
P.O. Box 47703
Olympia, Washington 98504-7703

Mr. Shawn McKone
Department of Ecology, NWRO
3190 160th Avenue SE
Bellevue, Washington 98009-5452

SEPA Center
Washington State Department of Natural Resources
P.O. Box 47015
Olympia, Washington 98504-7015

Ms. Teresa Eturaspe
Washington State Department of Fish and Wildlife
PO Box 43200
Olympia, Washington 98504-3155

Ms. Jan Haywood
Department of Health
P.O. Box 47820
Olympia, Washington 98504-7820

Mr. Steve Hirschey
Regional Water Policy Analyst
King County DNR
201 S Jackson St Rm 700
Seattle, WA 98104-3855

Ms. Sheila McCallister
Snohomish County Council
3000 Rockefeller Ave, MS 604
Everett, Washington 98201

Mr. Steve Thomsen
Snohomish County Engineer
3000 Rockefeller Ave, MS 604
Everett, WA 98201

Mr. Kevin Plemel
Snohomish Health District
3020 Rucker Avenue No. 104
Everett, WA 98201

Mr. Eric Faison
Town of Woodway
23920 113th PL W
Woodway, Washington 98020

Mr. Tim Stewart
City of Shoreline, Planning Dept.
17544 Midvale Avenue North
Shoreline, Washington 98133-4921

Mr. Roger Eberhart
District Manager
Olympic View Water and Sewer District
23725 Edmonds Way
Edmonds, WA 98026-8981

SEPA Coordinator
King County Department of Development and Environmental Services
900 Oaksdale Avenue SW
Renton, Washington 98055-1219

Mr. Steve Koho
City of Edmonds
200 – 2nd Ave S
Edmonds, WA 98020

Mr. Eric Davison
King County Wastewater
201 S. Jackson Street
Mail-Stop KSC-NR-0508
Seattle, Washington 98104-3855

Mr. Peter Mills
Tulalip Tribal Council
6700 Totem Beach Road
Marysville, Washington 98270

Ms. Karen Walter
Muckleshoot Indian Tribe
39015 172nd Avenue SE
Auburn, Washington 98092

Ms. Martha Burke
Seattle Public Utilities
P.O. Box 34018
Seattle, Washington 98124-4018

SEPA Coordinator
Seattle Department of Planning & Development
700 5th Avenue, Suite 2000
P.O. Box 34019
Seattle, Washington 98124-4019

Northshore Utility District
6830 NE 185th Street
Kenmore, Washington98028

Mr. Frank Zenk
City of Lake Forest Park
Public Works Department
17425 Ballinger Way, NE
Lake Forest Park, WA 98155

Mr. Stu Turner, General Manager
Shoreline Water District
P.O. Box 55367
Shoreline, Washington 98155

Mr. John Harris
Highlands Sewer District
The Highlands
181 NW 155th Street
Shoreline, WA 98177

APPENDIX C

HYDRAULIC MODELING

C-1 BACKGROUND

The District previously had utilized HYDRA software for hydraulic modeling since it began using the software in 1993. The HYDRA software was initially used for the 1993 Infiltration/Inflow (I/I) Phase I study. Basins 8, 14, 15, 16 and 19 were initially modeled for that study. The initial model was limited to sewer interceptors greater than 10 inches in diameter that discharged to the King County Wastewater system. The first model included approximately 10 miles of sewer interceptor (or 243 pipe segments) and covered approximately 70 percent of the area within the "original" District boundary (i.e. prior to the annexation of the old Lake City Sewer District north of NE 145th St). This model was expanded in 2001 for the 2001 Comprehensive Sewer Plan. The expanded model included nearly 15 miles of sewer interceptor (or 362 pipe segments) in 17 basins.

In 1999, prior to the 2001 hydraulic model update, the District began using HYDRA to analyze sewer interceptors in five basins in the old Lake City Sewer District north of NE 145th St. This model included approximately 9 miles of sewer interceptor (or 185 pipe segments). This model was updated in 2003 after the District had purchased the Old Lake City Sewer District system, to include 10.5 miles of sewer interceptor (or 208 pipe segments) in 6 basins.

The entire sewer system had never been modeled completely prior to this study. During the development of the 2001 and 2003 Comprehensive Sewer Plans, the majority of the remaining District transmission mains greater than 8 inches in diameter were modeled. No additional hydraulic modeling was completed for the 2007 Comprehensive Sewer Plan Amendment No. 1.

HYDRA was created by Pizer Inc. Pizer is a local company based out of Seattle, Washington. HYDRA was specifically developed for analysis of sanitary and storm sewer systems. This software was selected because the flow criteria can be developed in several ways and each pipe can be analyzed for gravity flow or surcharged flow conditions.

Since 1993 when the initial model was developed, the District's boundary has changed significantly following several annexations and withdrawal of areas. The original hydraulic model has been expanded to incorporate much of the revised service area but was still generally limited to transmission mains. The version of HYDRA that previous District models have used was no longer supported by the provider Pizer, Inc. Also, the original model was DOS-based and can now only run on older computers.

With the lack of support for the older, outdated version of HYDRA, the District recognized the need for a new hydraulic model of the collection system. The new

model would need to be capable of evaluating the cumulative impacts of all land use revisions on the entire collection system.

C-2 HYDRAULIC MODELING SOFTWARE

Sewer Geospatial Engineering Modeling System developed by Bentley Systems Inc., or "SewerGEMS" as it is more commonly known, was selected for use in developing the next generation of the hydraulic model of the District's collection system. One of the key features of this software is its capability of utilizing a GIS geodatabase to create a model of a collection system.

Other key features that were also noted when the Bentley SewerGEMS software was selected for the District's hydraulic model include:

- Use of actual wastewater flow measurements to evaluate the capacity of the collection system.
- Use of actual precipitation events to evaluate the capacity of the collection system.
- Evaluating multiple scenarios without requiring a different model for each scenario.

C-3 MODELED BASINS

Land use densities for all areas with development greater than high density residential development (>R-12), mixed use and any commercial development were used to manually generate domestic wastewater flows for the hydraulic model for each basin. The population densities for parcels within the District are shown in Table 3.1.

The District is divided into 25 drainage basins (see Figure 5-2). The software license agreement restricts SewerGEMS models to a maximum number of 1,000 segments of sewer main. To meet this requirement, the model of the entire District collection system was separated into individual drainage basins with less than 1,000 sewer mains in each basin. The models for each drainage basin were established so that each model would discharge to an adjacent sewer collection system owned and operated by another municipality (e.g. King County Wastewater, Seattle Public Utilities, City of Lake Forest Park or City of Edmonds sewer systems). No District drainage basin now discharges into another District drainage basin. The boundaries between the modeled Basins 16 and 22 were modified so all flow from Basin 22 was discharged into a collection system owned by King County Wastewater. Prior to this, a portion of the flow from Basin 22 discharged into Basin 16.

Fourteen of the District's 25 drainage basins were impacted by a special study area. Hydraulic models were created for 16 District drainage basins (1, 2, 3, 8, 9, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 23). The remaining basins were not modeled for several reasons.

- Basins 4, 6, 7, 10 and 13 were previously modeled using Hydra. Previous modeling results did not indicate that any sewer mains were over capacity when using an I/I rate of 6,100 gpad. The estimated KC I/I rate is less than 6100 gpad in each of these basins. Additionally, there were no land use revisions in these basins, which suggest there will be no sewer mains in these basins will be over capacity.
- Basins 5 and 11 are each less than 15 acres in area and were considered too small to model. There were no land use revisions in these basins.
- Basin 24 covers Point Wells. This area was transferred to the District in 1985. Domestic wastewater flows based on maximum build out (according to the June 2009 final environmental impact statement) were injected directly into Lift Station No. 13 in Basin 1.
- Basin 25 covers Richmond Beach Park with only 2 small lift stations and limited wastewater flows. This basin does not have a sufficient amount of pipe to warrant modeling. Additionally, there were no land use revisions in this basin.

The basins that were not modeled could be easily modeled in the future should the District desire to do so.

C-4 DEVELOPMENT OF THE COLLECTION SYSTEM MODEL

The District's GIS geodatabase, which includes all District sewer mains, was used as the basis for creating the collection system for the new hydraulic model. Information from the District's GIS geodatabase used to develop the collection system included the pipe diameter, pipe length, location of the sewer main and the upstream and downstream invert elevations for each manhole. As a result, all sewer mains impacted by special study areas are now modeled (approximately 4,400 pipes).

Once all the sewer mains were initially input into the hydraulic model, a cursory check was completed to confirm the model would operate properly once flows were loaded into the model. Each segment of sewer main was reviewed to verify that wastewater was flowing via gravity and in the proper direction. Sanitary sewer mains from other sewer collection systems (i.e. Seattle Public Utilities [SPU], King County Department of Natural Resources, Wastewater Treatment Division [King County], Olympic View Water and Sewer District and the City of Edmonds) were deleted from the District's hydraulic model. For modeling purposes, the sewer lines of the adjacent sewer provider were assumed to be adequately sized and would not provide backups into the District's system.

The District has a 2001 agreement with the City of Seattle to share costs of replacing sewer mains south of NE 145th St that may require upsizing as a result of growth in the City of Shoreline. The model includes the limits of the SPU collection system, known as the Common Facilities as defined in the agreement and shown within drainage basins identified in Figure 7-1, the District has agreed to share costs of so the capital facilities plan can include sewer mains in this area that may require upsizing. For modeling of

sewers outside the District boundaries but within the basins containing the Common Facilities, the population densities in Table C-1 were used.

TABLE C-1

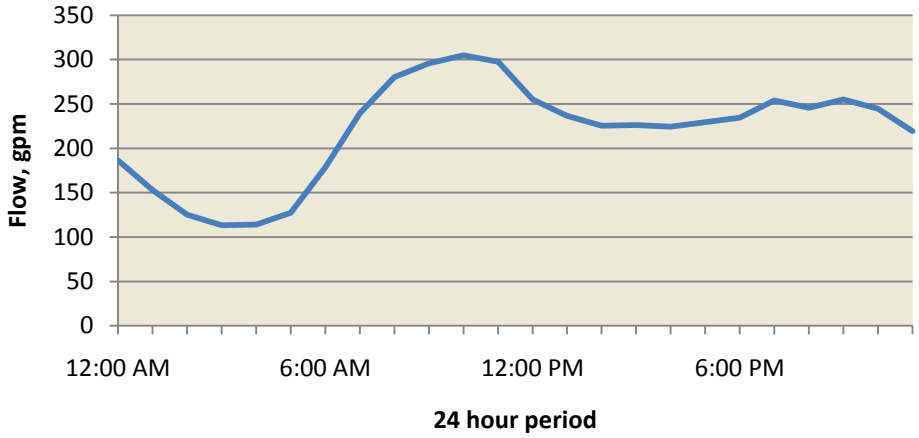
LAND USE POPULATION DENSITY IN SEATTLE

Land Use Designation	Units, Acre	Density, persons/acre
City of Seattle		
Residential,SF 9600	5	12
Residential,SF 7200	6	14.4
Residential,SF 5000	9	21.6
Multi-family Lowrise L1	27	65
Multi-family Lowrise L2	36	86
Multi-family Lowrise L3	55	132
Multi-family Midrise MR	48	115
Multi-family Lowrise L3RC	55	132
Commercial C1-40	48	115
Commercial C1-65	110	264
Commercial NC2-30	48	115
Commercial NC2P-40	48	115
Commercial NC2P-65	110	264
Commercial NC2P-85	110	264
Commercial NC3-65	110	264

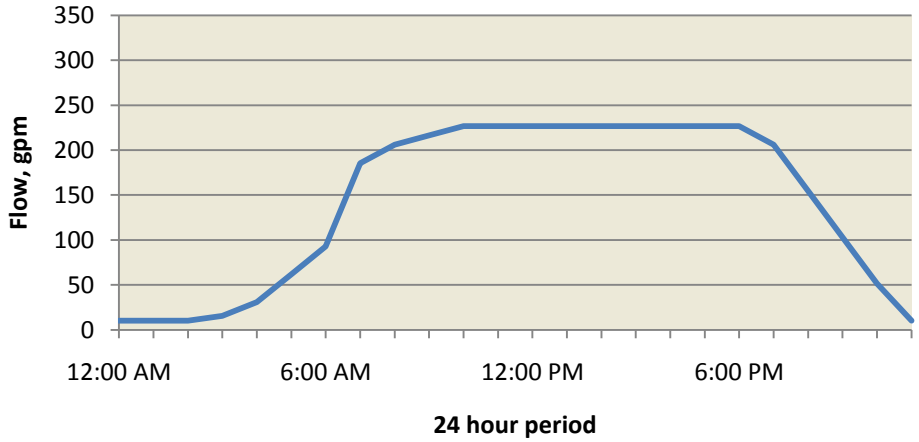
C-5 DIURNAL CURVES

Previous software used for modeling the District's collection system used a "peaking factor" to generate peak sanitary flows from average sanitary flows. The peak factor was based on the size of the upstream basin. Peak factors ranged from a value of 4 for drainage basins of 100 acres or less to a value of 2 for drainage basins of 5000 acres or more. SewerGEMS does not use the peaking factor method, but instead uses diurnal curves to generate peak flows. Diurnal curves are based on the principle that sewer flows vary throughout the day. The diurnal curves for this model were developed for both residential and commercial flows based on actual flow data measured during dry and wet weather flow monitoring. A mixed use diurnal curve was created by combining the residential and commercial diurnal curves together. The following figures show the three diurnal curves used along with current land use information to generate domestic wastewater flows for the hydraulic model.

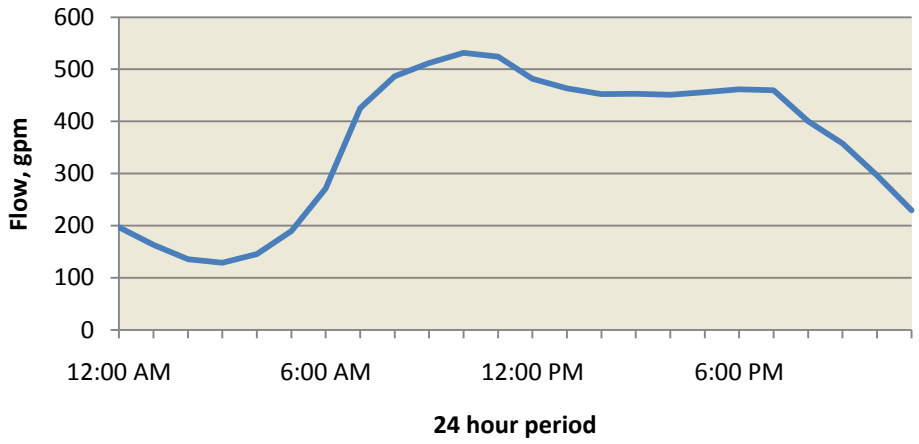
Residential Diurnal Curve



Commercial Diurnal Curve



Mixed Use Diurnal Curve



C-6 LIFT STATIONS

SewerGEMS does have the capability of modeling lift stations. However, in order to simplify the model, invert elevations of the portions of the collection system upstream of each lift station were “super-elevated” (i.e. a common value was added to each invert elevation to simulate a gravity flow discharge into the manhole where the lift station force main discharges). The entire collection system is currently modeled using simulated gravity flow conditions. It is possible to revise the model in the future to simulate pressurized flow from the lift stations if a more-detailed analysis of the collection system downstream of the force main discharge is necessary.

C-7 LAND USE

Several attempts were made to automatically generate domestic wastewater flows using information from the City of Shoreline GIS geodatabase. However, once it was discovered the format of the land use information in the City of Shoreline’s GIS geodatabase was presently incompatible with SewerGEMS, an alternate approach was used. The total area of each land use category in from the Cities of Seattle and Shoreline in each basin was determined using AutoCAD. Next, the number of manholes within each land use category was counted. The area of each land use category in each basin was divided by the number of manholes in each land use category in each basin to determine the average area of each land use category per manhole. Specific domestic flow loadings were calculated and contributing domestic wastewater flows loaded at each manhole.

C-8 DOMESTIC FLOWS

For all previous hydraulic models, the District has assumed each person uses 85 gallons per capita per day (gpcd) when estimating domestic wastewater flow entering the collection system. This value was initially used and subsequently validated during the 1993 Phase I I/I Study. To confirm this value, in 1993 rainfall was measured within the District service area using the District’s rain gage. Concurrently, the District monitored flows in the collection system. Wet weather flows were compared to dry weather flows at the same monitoring locations in the collection system. The difference between the wet weather flow and dry weather flow produced a base flow. The domestic wastewater flow per capita was calculated by dividing the base flow by the estimated population. The estimated domestic wastewater flows ranged from 37 gpcd in Sub-basin 2-1 to 172 gpcd in Sub-basin 15-1. The average of the flows was approximately 83 gpcd. This average correlates very well when compared to the estimated design criteria flow rate of 85 gpcd.

The domestic wastewater flow inserted at each manhole was then calculated by multiplying the maximum expected population for each land use by the estimated flow/person/day (85 gpcd). In most instances, the maximum expected population for each land use in each basin was determined by multiplying the estimated population density (2.4 people/dwelling unit) by the number of acres of each land use category (per

manhole) and then multiplying by the maximum number of dwelling units/acre. Two special study areas used an estimated population density of 1.8 people/dwelling unit rather than the typical 2.4 people/dwelling unit. The two special study areas that used this estimated population density were Point Wells and the North City Business District. The population density of 1.8 was selected based on the final Supplemental Environmental Impact Statement for Point Wells (June 2009). The population density of 1.8 for the North City was confirmed with City of Shoreline staff.

In all other cases where population was not readily available (such as for single family institutions or public facilities land use categories), the daily volume of wastewater generated was determined for each facility by multiplying the District's RCE count at each location by 187 gallons per day per RCE. RCE count data was based on the winter 2007 monthly average water use data. This was the most current data available at the time the model was constructed. The King County rate of 750 cubic feet/month (or 187 gallons/day/connection) was used to convert RCEs to daily volumes of wastewater generated. If redevelopment of an area was proposed, the estimated RCEs were included in the model.

The Shoreline School District indicated the peak public school population was 575 staff and students for elementary schools, 1,000 staff and students for middle schools and 1,800 staff and students for high schools. As in past hydraulic models, it was assumed that each staff member and student used 8.5 gallons per capita per day (10% of what a typical person would use at home). Sewer flows based on actual water use were compared to estimated sewer flows based on peak student and staff populations. In all cases, projected sewer flows based on peak student and staff populations exceeded estimated sewer flows based on water use. Sewer flows based on estimated peak student and staff population were used for hydraulic modeling purposes.

C-9 INFILTRATION/INFLOW

Each District drainage basin model was analyzed at five different infiltration and inflow (I/I) rates.

Each basin was first analyzed at 0 gallons per acre per day (gpad), 1,100 gpad, 4,300 gpad and 6,100 gpad. These I/I rates were selected for the following reasons:

- No I/I was used to determine the wastewater flow through the sewer collection system with no extraneous flows. This output shows the peak domestic flow only without infiltration or inflow.
- An allowance of 600 gpad for infiltration and 500 gpad for inflow is assumed for the design of new sewer systems. The I/I for a new collection system is assumed to be 1,100 gpad.
- I/I rates as high as 8,600 gpad for less than a 20-year storm event have been estimated (e.g. Sub-basin 1-3) in prior District I/I studies. In conjunction with these studies, King County has evaluated flow tributary to their Hidden Lake Pump Station with a calibrated hydraulic model. An I/I rate of approximately

6,100 gpad is required to match the results of the King County model with projected flows for future build-out conditions and adjust for a 20-year storm. This was the design peak I/I rate used in the 2001 and 2003 Comprehensive Sewer Plan modeling. This same rate was used to compare results from prior modeling efforts to the results from the new sewer model.

- An I/I rate of 4,300 gpad was assumed to demonstrate the benefit of achieving an I/I reduction of approximately 30 percent from 6,100 gpad. The District hopes to achieve a larger reduction with the repair and replacement projects but project scope and cost will have an impact on the final amount of I/I reduced.

Once the model had been analyzed based on the four I/I rates identified above, the model was then analyzed based on a fifth I/I rate, specific to each District drainage basin. This final I/I rate was generated based on a weighted average of I/I rates obtained from a comprehensive King County I/I study.

King County began a comprehensive evaluation of I/I throughout their service area in the year 2000. A total of 774 mini-basins were evaluated as part of the 2001/2002 Wet Weather Flow Monitoring Study. Each mini-basin was created with approximately the same length of pipe (approximately 22,000 linear feet and a maximum size of 32,000 linear feet). This allowed a comparison of I/I results between mini-basins. Twenty-year peak I/I values for each of the King County mini-basins within the District were estimated as part of the 2001/2002 study. The following table identifies each special study area, the District drainage basin, the associated King County mini-basin, and the accompanying King County estimated peak I/I rate for each mini basin.

Table C-2 provides the detailed calculations used to estimate the King County "composite" I/I rate for each drainage basin. These "composite" rates were determined by proportionally assigning I/I to the RWD basins to determine what portion of the King County I/I basins were within the RWD basins. These are assumed to be the twenty-year peak I/I values for each of the RWD basins. A summary of the "composite" I/I rate for each of the District's drainage basins modeled is shown in Table C-3.

TABLE C-2: KING COUNTY MINI-BASIN AND ESTIMATED PEAK I/I RATES FOR EACH RWD AND SPU DRAINAGE BASIN

		KC Basins	Special	RON 001	RON002	RON003	RON004	RON005	RON006	RON007	RON008	RON009	RON010	RON011	RON012	RON013	RON014	RON015	RON018	RON019	RON020	RON022	RON023	RON024	RON025	RON026	RON027	RON028	RON029	RON030	RON031
		Area (acres)	Study	244	90	155	138	189	165	69	168	102	104	100	107	35	134	139	114	154	177	179	186	140	75	91	170	120	90	155	61
RWD Basins	Area (acres)	I/I Rate (GPAD)	Area Codes	2688	8868	4486	5515	3029	3051	5884	5504	5514	4867	3203	2312	4030	5003	5492	2919	2638	1867	3988	4603	2180	4105	1535	1420	3364	4299	5183	1937
1	183	18352	G								40%																				
2	171	6730	G									50%		40%																	
3	144	6583									50%																				
4	74	5884								100%																					
5	17	3051							100%																						
6	50	3051							100%																						
7	59	3051							100%																						
8	344	4709	G										40%										60%								
9	53	5504	G								100%																				
10	33	4947							60%																						
11	11	0																													
12	129	5003	I, L														100%														
13	76	3051							100%																						
14	1429	4641	G, H, I, J, L	20%	5%	15%	10%	15%																10%	5%						
15	535	3953	I, L, M													10%		30%				40%				20%					
16	440	14851	B																		40%						30%				
17	1367	5536	A, E, F, I																									10%	10%	10%	5%
17N	96	8151																													
18	507	6904	A, D, E, F																												
18S	43	7418																													
19	177	2863	B																80%	20%											
20	344	2760	C, D, K																												
20S	125	9169																													
21	129	4318	C																												
21S	264	6751																													
22	392	1757	B												50%																
23	150	7567	C																												
23S	379	5248																													
24	84	0	N																												

Notes: 1) KC basin I/I rates determined from calculated 30-min peak total I/I per acre for the period 11-4-01
2) KC basin areas taken from King County Regional I/I Control Program spreadsheet.

Special Study Area Codes

Code	Special Study Area
A	North City Business District
B	Ballinger
C	Briarcrest
D	Paramount
E	175th and Serpentine
F	Ridgecrest
G	Richmond Beach Commercial
H	Greenwood
I	Aurora
J	South Aurora Triangle
K	Fircrest
L	Crista
M	Ballinger Commons
N	Point Wells

TABLE C-2: KING COUNTY MINI-BASIN AND ESTIMATED PEAK I/I RATES FOR EACH RWD AND SPU DRAINAGE BASIN

		KC Basins	Special	RON032	RON033	RON034	RON035	RON036	RON037	RON038	RON039	RON042	RON043	RON044	RON045	RON046	RON047	BOECR002	BOECR043	SHORELINE CC	UNKNOWN	SEA027	SEA036	SEA041	SEA042	SEA043	SEA044	SEA046	MCALE025
		Area (acres)	Study	103	153	101	189	84	188	83	183	70	121	183	93	99	127	115	168	130		100	137	102	118	133	186	87	194
RWD Basins	Area (acres)	I/I Rate (GPAD)	Area Codes	7303	10489	2026	4205	9160	3217	4318	7567	7662	1202	6111	5676	2888	11218	26917	7790	7790	0	8151	9169	10392	3110	8671	3150	7418	45594
1	183	18352	G															60%											
2	171	6730	G															10%											
3	144	6583										50%																	
4	74	5884																											
5	17	3051																											
6	50	3051																											
7	59	3051																											
8	344	4709	G																										
9	53	5504	G																										
10	33	4947																	40%										
11	11	0																			100%								
12	129	5003	I, L																										
13	76	3051																											
14	1429	4641	G, H, I, J, L																10%	10%									
15	535	3953	I, L, M																										
16	440	14851	B																										30%
17	1367	5536	A, E, F, I	5%	20%	10%								15%	5%	10%													
17N	96	8151																				100%							
18	507	6904	A, D, E, F				40%	15%	15%								30%												
18S	43	7418																										100%	
19	177	2863	B																										
20	344	2760	C, D, K						60%												30%		5%					5%	
20S	125	9169																					100%						
21	129	4318	C							100%																			
21S	264	6751																						50%	50%				
22	392	1757	B										50%																
23	150	7567	C								100%																		
23S	379	5248									10%															30%	60%		
24	84	0	N																		100%								

Notes: 1) KC basin I/I rates determined from calculated 30-min peak total I/I per acre for the period 11-4-01
2) KC basin areas taken from King County Regional I/I Control Program spreadsheet.

Special Study Area Codes

Code	Special Study Area
A	North City Business District
B	Ballinger
C	Briarcrest
D	Paramount
E	175th and Serpentine
F	Ridgecrest
G	Richmond Beach Commercial
H	Greenwood
I	Aurora
J	South Aurora Triangle
K	Fircrest
L	Crista
M	Ballinger Commons
N	Point Wells

TABLE C- 3

COMPOSITE KING COUNTY AVERAGE I/I RATES FOR DISTRICT DRAINAGE BASINS MODELED

District Drainage Basin	Composite Average I/I, gpad
1	18,352
2	6,730
3	6,853
8	4,709
9	5,504
12	5,003
14	4,641
15	3,953
16	14,851
17	5,536
18	6,904
19	2,863
20	2,760
21	4,318
22	1,757
23	7,567
17N	8,151
18S	7,418
20S	2,760
21S	4,318
23S	7,567

C.10 MODEL RESULTS

The hydraulic modeling was developed to comply with paragraphs (3) (ii) and (3) (iii) of WAC 173-240-050 - General Sewer Plan. District standards require sewer mains to have a minimum slope of 0.4% and be no less than 8 inches in diameter. The capacity of an 8-inch diameter sewer main at this slope is approximately 342 gallons per minute (gpm). District sewer mains have been installed to have a minimum capacity of 342 gpm. A baseline I/I rate had to be established in order to develop a capital facilities plan. For the purposes of this plan, pipes shown to be overcapacity at the King County average I/I rate established for each basin were considered overcapacity. In instances where the King County average I/I rate was less than 4,300 gpad (e.g. Basins 15, 19, 20, 22, and 23), a minimum rate of 4,300 gpad was used since these I/I rates will likely increase as the collection system ages. Based on the selection criteria described above, 132 segments of sewer main (or approximately 32,776 linear feet of sewer main)

are considered to be overcapacity at the King County I/I rate shown in Table C-4 on the following pages or 4,300 gpad, whichever is greater.

Table C-5 and C-6 below summarize the length of sewer main, by diameter, estimated to be overcapacity.

TABLE C-5

SUMMARY OF OVER-CAPACITY PIPE LENGTHS BY DIAMETER IN THE DISTRICT BOUNDARES

Existing Pipe Diameter, inches	Length of overcapacity pipe, Ft	Number of Pipe Segments
8	11,867	46
10	3,733	13
12	2,580	12
14	1,712	11
15	2,896	10
16	41	1
18	1,577	7
21	645	2
24	104	1
Total	**25,155**	**103**

TABLE C-6

SUMMARY OF OVER-CAPACITY PIPE LENGTHS BY DIAMETER IN THE SEATTLE DRAINAGE BASINS

Existing Pipe Diameter, inches	Length of overcapacity pipe, ft	Number of Pipe Segments
8	332	1
10	44	1
12	3,694	14
15	760	3
16	2,039	7
18	742	3
Total	**7,611**	**29**

TABLE C-4: COMPARISON OF OVER-CAPACITY LINES UNDER DIFFERENT I/I ASSUMPTIONS

Basin	Upsteam MH	IE	Downstream MH	IE	Length (ft)	Slope (ft/ft)	**Existing Diameter (in)**	Existing Full Capacity (gal/min)	Max Flow @ KC I/I rate (gpm) (rate varies)	% Overcapacity	KC I/I Rate (gpad)	Max Flow @ 4300 gpad (gpm)	% Overcapacity	I/I Rate (gpad)	Required Capacity (gal/min)	% Overcapacity	Proposed Capacity (gal/min)	Surplus Capacity (gpm)	**Proposed Diameter (in)**
1	A6001	128.6	A6021	62.6	1300	0.06831	**8**	1,417	1,765	125%	18352				1765	125%	2570	805	**10**
1	A6021	62.6	A6027	59.5	223	0.01451	**8**	653	2,087	320%	18352	937	143%	4300	2087	320%	3492	1405	**15**
1	A6027	59.5	A6028	48.6	149	0.08595	**8**	1,590	2,107	133%	18352				2107	133%	2883	776	**10**
1	A6028	48.6	A6031	44.4	98	0.04347	**8**	1,131	2,187	193%	18352				2187	193%	3334	1147	**12**
1	A6031	44.4	A6033	35.5	172	0.04303	**8**	1,125	2,207	196%	18352				2207	196%	3317	1110	**12**
1	A6033	35.5	A6037	28.9	152	0.05359	**8**	1,255	2,268	181%	18352				2268	181%	2276	8	**10**
1	A6037	28.9	A6041	24.6	346	0.01322	**8**	624	2,328	373%	18352	1,003	161%	4300	2328	373%	3334	1006	**15**
1	A6041	24.6	KC WW	0.0	31	0.01941	**8**	756	2,408	319%	18352	1,026	136%	4300	2408	319%	4039	1631	**15**
12	E6038	407.1	E6039	406.4	94	0.00784	**8**	480	704	147%	5003	640	133%	4300	704	147%	871	167	**10**
12	E6040	407.2	E6038	407.1	23	0.00392	**8**	339	399	118%	5003	369	109%	4300	399	118%	616	217	**10**
12	E6041	408.4	E6040	407.2	258	0.00481	**8**	376	378	101%	5003				378	101%	682	304	**10**
14	D3006	298.2	D3004	297.6	104	0.00505	**24**	7,212	7,294	101%	4641				7294	101%	9878	2584	**27**
14	D3020	363.5	D3019	362.7	179	0.00464	**18**	3,212	4,648	145%	4641	4,484	140%	4300	4648	145%	4844	196	**21**
14	D3021	365.0	D3020	363.5	353	0.00422	**21**	4,620	4,641	100%	4641				4641	100%	6596	1955	**24**
14	D3022	366.6	D3021	365.0	292	0.00390	**21**	4,441	4,538	102%	4641				4538	102%	6341	1803	**24**
14	E1066	409.3	E1067	408.8	84	0.00640	**10**	786	840	107%	4641	816	104%	4300	840	107%	1279	439	**12**
14	E2037	394.1	E2038	392.9	283	0.00437	**18**	3,118	3,140	101%	4641				3140	101%	4701	1561	**21**
14	E2038	392.9	E2039	392.4	102	0.00414	**18**	3,032	3,162	104%	4641	3,071	101%	4300	3162	104%	4576	1414	**21**
14	E2039	392.4	E2042	391.9	163	0.00319	**18**	2,661	3,199	120%	4641	3,106	117%	4300	3199	120%	4017	818	**21**
14	E2043	389.9	E2044	388.6	290	0.00428	**18**	3,083	3,301	107%	4641	3,204	104%	4300	3301	107%	4653	1352	**21**
14	E2051	379.8	E3007	373.2	412	0.01614	**15**	3,683	3,792	103%	4641				3792	103%	5990	2198	**18**
14	E2065	396.7	E2064	395.8	265	0.00343	**18**	2,763	3,024	109%	4641	2,935	106%	4300	3024	109%	4165	1141	**21**
14	E2066	397.7	E2065	396.7	295	0.00339	**18**	2,744	2,928	107%	4641	2,842	104%	4300	2928	107%	4141	1213	**21**
14	E2075	399.7	E2067	399.4	302	0.00086	**15**	851	1,345	158%	4641	1,303	153%	4300	1345	158%	1383	38	**18**
14	F2002	414.0	F2003	412.9	259	0.00440	**12**	1,061	1,072	101%	4641				1072	101%	1923	851	**15**
14	F3030	442.5	F3039	440.8	397	0.00429	**10**	644	645	100%	4641				645	100%	1047	402	**12**
14	F3039	440.8	F3059	439.1	402	0.00422	**10**	639	670	105%	4641	657	103%	4300	670	105%	1039	369	**12**
15	F5001	393.9	F6027	393.4	155	0.00255	**14**	1,218	1,429	117%	3953	1,465	120%	4300	1465	120%	2381	916	**18**
15	F5002	394.8	F5001	393.9	335	0.00261	**14**	1,233	1,414	115%	3953	1,450	118%	4300	1450	118%	1481	31	**15**
15	F6027	393.4	F6028	392.8	204	0.00238	**14**	1,175	1,444	123%	3953	1,480	126%	4300	1480	126%	2300	820	**18**
15	F6028	392.8	F6029	392.5	85	0.00283	**14**	1,284	1,459	114%	3953	1,495	116%	4300	1495	116%	1542	47	**15**
15	F6029	392.5	F6030	392.1	135	0.00250	**14**	1,206	1,474	122%	3953	1,511	125%	4300	1511	125%	2357	846	**18**
15	F6030	392.1	F6031	391.6	158	0.00255	**14**	1,218	1,489	122%	3953	1,526	125%	4300	1526	125%	2381	855	**18**
15	F6031	391.6	F6032	391.2	102	0.00219	**14**	1,128	1,586	141%	3953	1,626	144%	4300	1626	144%	2206	580	**18**
15	F6032	391.2	F6115	391.1	65	0.00250	**14**	1,206	1,601	133%	3953	1,641	136%	4300	1641	136%	2357	716	**18**
15	F6033	390.5	F6034	390.1	256	0.00212	**14**	1,112	1,700	153%	3953	1,744	157%	4300	1744	157%	2171	427	**18**
15	F6034	390.1	F6035	390.0	65	0.00250	**14**	1,206	1,725	143%	3953	1,769	147%	4300	1769	147%	2357	588	**18**
15	F6035	390.0	F6036	389.1	152	0.00250	**14**	1,206	1,750	145%	3953	1,795	149%	4300	1795	149%	2357	562	**18**
15	F6063	333.1	F6064	332.5	112	0.00562	**15**	2,174	2,485	114%	3953	2,552	117%	4300	2552	117%	3534	982	**18**
15	F6064	332.5	F6065	331.4	197	0.00532	**15**	2,115	2,492	118%	3953	2,559	121%	4300	2559	121%	3439	880	**18**
15	F6065	331.4	F6087	330.5	152	0.00611	**15**	2,266	2,498	110%	3953	2,566	113%	4300	2566	113%	3685	1119	**18**
15	G6002	286.0	G6001	285.5	41	0.00862	**16**	3,197	3,320	104%	3953	3,444	108%	4300	3444	108%	4377	933	**18**
16	H4001	471.8	H4111	470.3	295	0.00508	**8**	387	705	182%	12520				705	182%	1140	435	**12**
16	H4029	467.5	H4103	464.7	835	0.01028	**8**	550	1,566	285%	12520	621	113%	4300	1566	285%	1621	55	**12**

TABLE C-4: COMPARISON OF OVER-CAPACITY LINES UNDER DIFFERENT I/I ASSUMPTIONS

Basin	Upsteam MH	IE	Downstream MH	IE	Length (ft)	Slope (ft/ft)	**Existing Diameter (in)**	Existing Full Capacity (gal/min)	Max Flow @ KC I/I rate (gpm) (rate varies)	% Overcapacity	KC I/I Rate (gpad)	Max Flow @ 4300 gpad (gpm)	% Overcapacity	I/I Rate (gpad)	Required Capacity (gal/min)	% Overcapacity	Proposed Capacity (gal/min)	Surplus Capacity (gpm)	**Proposed Diameter (in)**
16	H4030	468.2	H4028	467.8	215	0.00372	**12**	975	1,442	148%	12520				1442	148%	1768	326	**15**
16	H4102	454.7	H4104	439.3	256	0.06006	**8**	1,329	1,597	120%	12520				1597	120%	2410	813	**10**
16	H4103	464.7	H4102	454.7	300	0.03352	**8**	993	1,581	159%	12520				1581	159%	1800	219	**10**
16	H4111	470.3	H4030	468.2	336	0.00620	**8**	427	814	191%	12520				814	191%	1259	445	**12**
16	H5030	472.1	H4001	471.8	53	0.00540	**8**	398	472	119%	12520				472	119%	723	251	**10**
16	H6059	263.1	H6060	261.3	261	0.00717	**8**	459	469	102%	12520				469	102%	833	364	**10**
16	H6061	253.9	H6064	251.3	389	0.00656	**8**	439	553	126%	12520				553	126%	796	243	**10**
16	I4001	411.9	I4002	410.1	43	0.01241	**8**	604	1,799	298%	12520	713	118%	4300	1799	298%	3230	1431	**15**
16	I5002	238.9	I5003	238.0	86	0.01046	**8**	555	1,204	217%	12520	627	113%	4300	1204	217%	1635	431	**12**
16	I5003	238.0	I5006	234.3	350	0.01016	**10**	991	1,252	126%	12520				1252	126%	1612	360	**12**
16	I5007	227.9	I5010	223.9	289	0.01400	**10**	1,164	1,302	112%	12520				1302	112%	1892	590	**12**
16	I5010	223.9	I5014	223.0	125	0.00718	**12**	1,355	1,582	117%	12520				1582	117%	2457	875	**15**
16	I5014	223.0	I5015	222.1	135	0.00704	**12**	1,342	1,613	120%	12520				1613	120%	2433	820	**15**
16	I5015	222.1	I5016	221.7	49	0.00714	**12**	1,351	1,629	121%	12520				1629	121%	2450	821	**15**
16	I5016	221.7	I5019	221.5	130	0.00154	**12**	627	1,644	262%	12520	803	128%	4300	1644	262%	1850	206	**18**
16	I5020	220.3	I5024	218.1	395	0.00557	**12**	1,193	1,696	142%	12520				1696	142%	2164	468	**15**
16	I5024	218.1	I5025	217.0	271	0.00402	**12**	1,013	1,914	189%	12520				1914	189%	2989	1075	**18**
16	I5025	217.0	I5027	213.4	334	0.01093	**12**	1,672	1,930	115%	12520				1930	115%	3031	1101	**15**
16	I5027	213.4	I5028	209.9	240	0.01442	**12**	1,920	1,963	102%	12520				1963	102%	3482	1519	**15**
16	I5037	323.5	I5043	313.5	120	0.08364	**8**	1,568	2,189	140%	12520				2189	140%	2844	655	**10**
16	I5039	342.5	I5037	323.5	196	0.10043	**8**	1,719	1,986	116%	12520				1986	116%	3116	1130	**10**
16	I5040	352.5	I5039	342.5	261	0.03827	**8**	1,061	1,846	174%	12520				1846	174%	1924	78	**10**
16	I5043	313.5	I5044	305.5	112	0.07172	**8**	1,452	2,205	152%	12520				2205	152%	2634	429	**10**
16	I5045	298.8	I5046	292.0	164	0.04117	**8**	1,100	2,236	203%	12520				2236	203%	3245	1009	**12**
16	I5046	292.0	I5054	285.8	127	0.04967	**8**	1,209	2,251	186%	12520				2251	186%	3564	1313	**12**
16	I5054	285.8	I5055	279.5	190	0.03299	**8**	985	2,376	241%	12520				2376	241%	2904	528	**12**
16	I5055	279.5	I5056	271.0	164	0.05156	**8**	1,232	2,391	194%	12520				2391	194%	3631	1240	**12**
16	I5056	271.0	I5057	263.2	234	0.03327	**8**	989	2,407	243%	12520				2407	243%	2917	510	**12**
16	I5057	263.2	I5061	228.5	396	0.08762	**8**	1,605	2,767	172%	12520				2767	172%	2911	144	**10**
16	I5061	228.5	I5042	200.0	327	0.08723	**8**	1,602	2,784	174%	12520				2784	174%	2904	120	**10**
16	I5066	230.1	I5007	227.9	281	0.00781	**10**	869	1,285	148%	12520				1285	148%	1413	128	**12**
16	I6058	242.3	I6060	240.5	366	0.00492	**8**	380	539	142%	12520				539	142%	690	151	**10**
16	I6060	240.5	I5002	238.9	162	0.00985	**8**	538	565	105%	12520				565	105%	976	411	**10**
17	G4025	414.0	G4026	412.8	271	0.00443	**8**	361	497	138%	5536	411	114%	4300	497	138%	655	158	**10**
17	G4028	402.5	G4029	400.4	348	0.00571	**8**	410	520	127%	5536	430	105%	4300	520	127%	743	223	**10**
17	G4050	363.7	G4051	362.7	389	0.00101	**15**	921	1,551	168%	5536	1,297	141%	4300	1551	168%	2260	709	**21**
17	G4056	365.5	G4049	364.7	376	0.00237	**15**	1,410	1,513	107%	5536				1513	107%	2295	782	**18**
17	G4074	381.7	G4075	380.3	347	0.00547	**10**	727	823	113%	5536				823	113%	1183	360	**12**
17	G4075	380.3	G4076	378.5	351	0.00468	**10**	672	829	123%	5536	704	105%	4300	829	123%	1094	265	**12**
17	H4060	399.3	H4061	397.9	334	0.00389	**8**	338	563	167%	5536	518	153%	4300	563	167%	613	50	**10**
17	H4061	397.9	H4066	396.0	322	0.00401	**8**	343	571	166%	5536	524	153%	4300	571	166%	623	52	**10**
18	325	271.7	49	268.7	364	0.00824	**18**	4,280	4,450	104%	6904				4450	104%	6456	2006	**21**
18	040	272.8	325	271.7	303	0.00363	**18**	2,841	4,418	156%	6904	3,349	118%	4300	4418	156%	6118	1700	**24**
18	H2041	364.6	H2042	363.2	286	0.00490	**15**	2,030	2,041	101%	6904				2041	101%	3300	1259	**18**
18	H3028	383.4	H3029	382.2	318	0.00378	**15**	1,782	1,943	109%	6904				1943	109%	2899	956	**18**

TABLE C-4: COMPARISON OF OVER-CAPACITY LINES UNDER DIFFERENT I/I ASSUMPTIONS

Basin	Upsteam MH	IE	Downstream MH	IE	Length (ft)	Slope (ft/ft)	**Existing Diameter (in)**	Existing Full Capacity (gal/min)	Max Flow @ KC I/I rate (gpm) (rate varies)	% Overcapacity	KC I/I Rate (gpad)	Max Flow @ 4300 gpad (gpm)	% Overcapacity	I/I Rate (gpad)	Required Capacity (gal/min)	% Overcapacity	Proposed Capacity (gal/min)	Surplus Capacity (gpm)	**Proposed Diameter (in)**
18	H3029	382.2	H3032	380.7	352	0.00427	**15**	1,894	1,953	103%	6904				1953	103%	3081	1128	**18**
18	H3040	405.1	H3041	403.3	330	0.00546	**8**	401	490	122%	6904	441	110%	4300	490	122%	727	237	**10**
18	H3043	393.1	H3044	392.3	322	0.00684	**8**	448	523	117%	6904	463	103%	4300	523	117%	813	290	**10**
18	H3044	392.3	H3045	390.7	300	0.00475	**8**	374	534	143%	6904	470	126%	4300	534	143%	678	144	**10**
18	H3046	390.0	H3047	389.6	91	0.00441	**8**	360	568	158%	6904	493	137%	4300	568	158%	653	85	**10**
18	H3047	389.6	H3074	387.1	410	0.00609	**8**	423	579	137%	6904	500	118%	4300	579	137%	767	188	**10**
18	H3051	409.2	H3063	406.9	314	0.00733	**10**	842	853	101%	6904				853	101%	1369	516	**12**
18	H3064	399.7	H3065	398.4	128	0.01020	**10**	993	1,017	102%	6904				1017	102%	1615	598	**12**
18	H3065	398.4	H3066	395.5	478	0.00606	**10**	766	1,028	134%	6904	832	109%	4300	1028	134%	1245	217	**12**
18	H3068	386.2	H3073	385.7	115	0.00434	**12**	1,053	1,651	157%	6904	1,362	129%	4300	1651	157%	1910	259	**15**
18	H3073	385.7	H3028	383.4	312	0.00736	**12**	1,372	1,719	125%	6904	1,413	103%	4300	1719	125%	2487	768	**15**
19	I6038	238	I6076	236.2	206	0.00872	**8**	506				552	109%	4300	552	109%	918	366	**10**
19	I6076	236.2	I6077	236	86	0.00229	**8**	259	481	186%	2863	568	219%	4300	568	219%	765	197	**12**
19	I6077	236	J6017	234	328	0.01000	**8**	542	595	110%	2863	717	132%	4300	717	132%	983	266	**10**
19	J6020	202.5	J6021	201.5	150	0.00670	**10**	805				919	114%	4300	919	114%	1309	390	**12**
19	J6021	201.5	J6022	200.5	162	0.00619	**10**	774				935	121%	4300	935	121%	1258	323	**12**
20	79	245.5	85	243.2	332	0.00693	**8**	451	753	167%	2760	688	153%	4300	753	167%	1331	578	**12**
20	81	267.2	83	266.7	294	0.00170	**12**	659	1,153	175%	2760	1,330	202%	4300	1330	202%	1944	614	**18**
20	168	239.7	169	236.9	162	0.01728	**12**	2,102				2,106	100%	4300	2106	100%	3811	1705	**15**
20	171	230.8	231	228.5	327	0.00703	**12**	1,341	2,200	164%	2760	2,172	162%	4300	2200	164%	2431	231	**15**
20	230	220.1	229	219.4	329	0.00213	**15**	1,337	2,284	171%	2760	2,216	166%	4300	2284	171%	3282	998	**21**
21	109	164.3	164	163.6	100	0.00700	**15**	2,426	2,497	103%	4318				2497	103%	3945	1448	**18**
23	48	217.6	49	215.9	334	0.00509	**12**	1,141	1,316	115%	7567				1316	115%	2069	753	**15**
23	49	215.9	50	214.4	240	0.00625	**12**	1,264	1,406	111%	7567				1406	111%	2292	886	**15**
23	50	214.4	51	212.5	395	0.00481	**12**	1,109	1,492	135%	7567				1492	135%	2011	519	**15**
23	51	212.5	139	209.7	333	0.00841	**12**	1,466	1,569	107%	7567				1569	107%	2659	1090	**15**
23	59	158.4	60	156.1	337	0.00682	**16**	2,845	3,468	122%	7567	2,895	102%	4300	3468	122%	3894	426	**18**
23	60	156.1	66	153.7	350	0.00686	**16**	2,852	3,745	131%	7567	3,167	111%	4300	3745	131%	3905	160	**18**
23	66	153.7	123	151.1	331	0.00785	**15**	2,570	3,974	155%	7567	3,385	132%	4300	3974	155%	4177	203	**18**
23	117	80.2	118	80.1	75	0.00133	**18**	1,721	4,363	254%	7567	3,730	217%	4300	4363	254%	5069	706	**27**
23	139	209.8	140	209.7	53	0.00189	**12**	695	1,654	238%	7567	1,213	175%	4300	1654	238%	2050	396	**18**
23	140	209.8	141	207.2	281	0.00925	**12**	1,538	1,764	115%	7567				1764	115%	2789	1025	**15**
23	141	207.2	145	206.0	176	0.00682	**12**	1,320	1,816	138%	7567	1,364	103%	4300	1816	138%	2394	578	**15**
23	145	206.0	146	205.0	175	0.00571	**12**	1,209	2,016	167%	7567	1,559	129%	4300	2016	167%	2191	175	**15**
23	146	205.0	150	202.6	295	0.00814	**12**	1,442	2,049	142%	7567	1,586	110%	4300	2049	142%	2616	567	**15**
23	150	202.6	205	198.5	312	0.01314	**12**	1,833	2,094	114%	7567				2094	114%	3324	1230	**15**
23	205	198.5	204	193.7	317	0.01514	**12**	1,968	2,214	113%	7567				2214	113%	3568	1354	**15**
23	240	105.8	241	105.7	144	0.00069	**16**	908	4,186	461%	7567	3,582	394%	4300	4186	461%	4836	650	**30**
23	298	178.7	387	176.6	302	0.00695	**16**	2,872	2,950	103%	7567				2950	103%	3930	980	**18**
23	390	164.6	392	163.3	206	0.00631	**16**	2,736	3,295	120%	7567	2,741	100%	4300	3295	120%	3745	450	**18**
23	392	163.3	397	160.9	310	0.00774	**16**	3,030	3,329	110%	7567				3329	110%	4148	819	**18**
23	397	160.9	59	158.4	390	0.00641	**16**	2,757	3,405	124%	7567	2,839	103%	4300	3405	124%	3775	370	**18**
23	J1043	217.7	48	217.6	44	0.00227	**10**	469	1,249	266%	7567	835	178%	4300	1249	266%	2246	997	**18**

APPENDIX D

DEVELOPER EXTENSION STANDARDS

Ronald Wastewater District has had in the past and will continue to have developer extensions on private property for residential and commercial development.

The Board of Commissioners of Ronald Wastewater District has established certain standards for extension of mainline sewers within their service area. The standard forms and requirements can be found in the *Ronald Wastewater District Developer Extension Project Manual*. The developer extension manual is updated periodically, with the last revision in April 2007.

The *Developer Extension Project Manual* is available for reference at RWD's office.

The Design Criteria for sewer extensions is reprinted from the *Developer Extension Project Manual* below:

DESIGN CRITERIA

Where special conditions exist some of the following requirements may be modified at the District's discretion.

General

1. Plans shall be on Plan-Profile mylar 24 x 36 or 22 x 34 inch sheets (Plan and Profile on same sheet). Profile grid shall have 10 horizontal lines per inch and 1 vertical line per inch equally spaced. See Sample Plan at the end of this Section.

2. Horizontal scale shall be 1 inch equals 50 feet. Vertical scale shall be 1 inch equals 5 feet or 1 inch equals 10 feet.

3. Note Datum on plan (Datum shall be North American Vertical Datum or NAVD 88. Subtract 3.58 feet to get NGVD 1929).

4. Note Bench Marks on plans.

5. Include General Notes on plan as shown at end of this Section.

6. Plans shall be stamped by a licensed Professional Engineer.

7. Vicinity map shall show project's location relative to the nearest intersection.

8. Plans shall have a North arrow.

9. Names of streets shall be indicated on the plans.

10. Designs shall be in conformance with District rules, regulations and resolutions.

11. Plans shall meet the Department of Ecology design requirements except where more stringent District requirements are noted.

12. In conjunction with prudent comprehensive planning and to insure the availability of sewer service to adjacent parcels, it is the District policy to have the Developer extend the system to certain points on a project site that will facilitate future extension of the system. This will in most cases cause the system to be extended to the opposite side(s) of the project site from the point of available service.

13. Right-of-Way and Monuments: All rights-of-way in which the sewer extension is to be made shall be improved prior to preparation of construction plans and installation of the sewers. Permanent private easements shall be not less than ten feet (10') in width. Public rights-of-way shall be cleared, grubbed and graded in accordance with the requirements of appropriate road agency. Monuments disturbed or destroyed shall be replaced at the Developer's expense.

14. The pipe sizes, routing and alignment (including build-through) shall be selected as is indicated by good practice and shall conform to the Comprehensive Sewer System Plan, as approved by the District.

Manholes

15. Manhole numbers are obtained from the District Engineer.

16. All lines 8-inches and larger shall terminate in a manhole. All pipes entering/leaving a manhole shall be aligned with the center of the manhole unless otherwise authorized by District.

17. Manholes shall be precast, shall be 48" I.D. in accordance with the specifications and Detail Nos. 1 and 2 and shall conform to ASTM C478. Manhole frames and covers shall be locking type in accordance with the specifications and Detail No. 3 and shall be supplied with stainless steel allen head cap screws. Ideally, manholes should be 7 feet plus in depth. Avoid manhole depths between 4 and 6 feet.

18. Manholes shall have a minimum one-tenth of a foot drop across the manhole (wall to wall). See Detail No. 7.

19. Manholes located in traffic areas shall have either a concrete or asphalt collar to hold neck assembly in place.

20. Where drop manhole is required, use outside drop unless otherwise authorized by the District.

21. Manhole channels shall be shaped to allow placement and use of the Districts television inspection equipment. Approximate dimensions are 32" long x 6" diameter.

22. Manholes shall be placed at each grade and direction change. Distances between manholes shall not exceed 400 feet.

23. Terminal manholes where future connection/extension may occur shall not be channeled. A grouted bottom sloping to the outlet shall be constructed.

Side Sewer

24. Each building or lot to be served shall have its own side sewer extending from the sewer main. Indicate the lowest finished floor elevation of each building on drawing

25. Approximate stub locations shall be shown on the plans.

26. Cleanouts shall be used.

27. Where commercial or multiple dwellings are to be constructed, stubs should be taken from the manhole. Multiple dwelling complexes shall have the number of units indicated. Commercial and industrial complexes shall have anticipated peak flows noted.

28. The grade for 6" side sewer stubs shall be a minimum of 2 percent (2%). The ends of the side sewers shall be marked with a vertical 1-1/4" white PVC pipe, ASTM 2241 SDR 21 200 PSI and shall rise 2 feet above finished grade level. Both ends of the PVC pipe shall have caps glued on and the pipe interior kept clean for the purpose of future depth measurement.

29. When an existing side sewer is to be reused after being disconnected or abandoned, the side sewer, the stub in the right of way, and the connection to the main shall be telespected (TV inspected) to determine the integrity and condition of the lines. If the District determines the side sewer, stub, or tee connection is/are deteriorated, structurally unsound, cracked, leaking, or shows other indications that the useful life of the side sewer, stub, or tee connection is/are short, the side sewer, stub, and/or tee shall be replaced at the property owner's expense.

Mainline

30. Ductile iron pipe and pipe anchors shall be specified for all slopes 20 percent and over.

31. Pipes shall have a 4-foot minimum cover.

32. All pipes 8-inch and over shall terminate at a manhole.

33. Where smaller diameter upstream pipe meets a larger diameter downstream pipe, the inverts at the manhole shall be determined by matching pipe crowns.

34. Where the new system is to be connected to the existing system there shall be the following notations on the plans, "Verify Invert Prior to Construction".

35. Design system so building first (lowest) floor elevation is at least one foot higher than rim of first manhole upstream from point of side sewer connection.

36. Unless otherwise called for by the District's Engineer in the specifications and plans, gravity sewers shall be PVC pipe. Ductile iron or concrete, may be required in certain applications.

Plastic-PVC	ASTM D3034-SDR 35 or F789
Ductile Iron (Polyethylene Encased)	AWWA C151
Concrete	ASTM C-14 Class 2

37. Pressure mains shall be ductile iron or PVC.

38. All joints for manholes, sewers or pressure mains shall be of the rubber gasket type.

39. Minimum grade for 8-inch mains shall be 0.5% and the minimum grade for end sewer mains that will not be extended shall be 0.75%, unless otherwise approved by the District's Engineer. Minimum grade and design criteria, unless District criteria is more stringent, shall be in accordance with "Criteria for Sewage Works Design, State of Washington, DOE"; however, minimum grades shall not be used without prior approval from the District's Engineer.

Pump Stations

40. Developments that may require a pump station to provide sewer service shall conform to the District Pump Policy; Resolution 05-06.

Oil/Grease Removal

41. Developments that include businesses, functions or activities that may discharge oily waste (sewer waste containing mineral or petroleum oil) to the District's Sewer System will be required to install, use and maintain an oil/water separator. Oil/water separators connected to the sewer must be approved by the District prior to installation.

    The separators should be sized to either have a minimum 45-minute detention time within the separator or have an effective separation/treatment capacity of at least 600 gallons. In addition, a grit-interception baffle should be incorporated in the design. However, the capacity and configuration of the separator must be approved by the District prior to installation. Refer to District Resolution No. 05-06 for a complete listing of the District requirements concerning oil/water separators. Resolution No. 05-06 is available at the District Office.

42. Developments that include business, functions or activities that may discharge wastewater containing animal/vegetable fats, oils or greases to the District Sewer System will be required to install, use and maintain a grease separator. Grease separators connected to the sewer are to be installed outside of the business structure and shall only accept flows containing fats, oils and greases. Sanitary sewer flows from lavatories, etc. should exit the facility through a different line and connect with the grease interceptor effluent flow line. Each grease interceptor should serve one establishment and should be sized per the manufacturers specifications or in accordance with the Uniform Plumbing Code. However, the capacity and configuration of the separator must be approved by the District prior to installation. Refer to District Resolution No. 05-06 for a complete listing of the District requirements concerning grease separators. Resolution No. 05-06 is available at the District Office.

Submittal

43. The Developer shall submit 3 sets of plans for review by the District. When the plans have been determined to meet the District standards, then a final set of reproducible plans shall be submitted to the District. These reproducible plans shall receive the District "Plan Review" approval stamp. The District shall submit the plans to the regulatory agencies for approval. After approvals have been received, a set of plans stamped "Issued for Construction" shall be made available to the Developer.

Drafting Standards

44. Enclosed is a sample plan showing a typical sewer design (see page 26). Drafting of plans for the District shall conform to this example. As-built drawings shall be supplied to the District on mylar and electronic CAD file.

District Records

45. The District and its consultants do not insure the correctness of the information supplied to the Developer from the District records. The Developer shall verify by survey any information provided by the District prior to using the information in design or construction.

EASEMENTS

Legal descriptions for easements for all portions of the sewer which lie outside of public street right-of-ways shall be signed and stamped by a Professional Land Surveyor, currently registered in the State of Washington, and transmitted to the District. The easement shall be a minimum of 10 feet in width, with the sewer in the center. There shall be a separate easement provided for each lot that a sewer crosses. These easements are required by the District regardless of easements recorded with property deeds or plats.

Easements must be approved by the District prior to side sewer connection.

CONSTRUCTION RECORD MODIFICATION OF PLANS

"AS BUILTS"

When the Contractor completes the mainline sewer work and the manholes have been adjusted to the finish grade, the mylars and CAD files of the sewer plans shall be revised to conform with construction records, and then sent to the District. Prior to submitting revised plans, manhole inverts and horizontal alignment shall be verified by a Professional Land Surveyor, currently licensed in the State of Washington.

RONALD WASTEWATER DISTRICT
A Special Purpose District Formed Pursuant to RCW Title 57

Resolution 09-26

A Resolution of the Board of Commissioners of Ronald Wastewater District Adopting a Comprehensive Code of Rules and Regulations Governing the Operation, Control, and Usage of the District's Sewage Collection Facilities.

WHEREAS, the Board of Commissioners reviews these Rules and Regulations periodically; and

WHEREAS, staff periodically recommends to the Board amendments, updates, and changes to these Rules and Regulations. Now, Therefore,

BE IT RESOLVED that the following policies are established as the Rules and Regulations Governing the Operation of the District's Sewerage Facilities and that all other previous resolutions pertaining to the rules and regulations governing the operation of the District's sewerage system are rescinded.

ADOPTED by the Board of Commissioners of Ronald Wastewater District on December 8, 2009.

ATTEST:

President/Commissioner

Secretary/Commissioner

Vice President/Commissioner

I, the undersigned Secretary of the Board of Commissioners of Ronald Wastewater District, a municipal corporation of King County, Washington, CERTIFY that the preceding document is a true and correct copy of Resolution 09-26 of the Board, duly adopted on December 8, 2009 at its regular meeting.

Secretary/Commissioner

Section 9. District Rehabilitation Projects That May Also Involve the Replacement or Repair of Private Side Sewers.

9 Intent:

9.1 The District may replace or repair private side sewers as part of a District initiated project to reduce the inflow and infiltration of extraneous water into the sanitary sewer system thereby conserving capacity and reducing liability claims.

9.2 Eligibility:

9.2.1 All private side sewers within and limited to the project area are potentially eligible for replacement or repair and will be shown on District approved contract project drawings. The private side sewers must be connected to a District mainline at the time of project design. The District will, at its sole discretion, determine which private side sewers to replace or repair.

9.2.2 Property owners who accept the District's offer to have their private side sewer replaced or repaired must sign a Right of Entry form and accept ownership and maintenance responsibility of the private side sewer. There will be no additional cost to the property owner to replace or repair the private side sewer.

9.3 Unauthorized Connections:

9.3.1 Connections to the District's sanitary sewer system not in the District's billing system shall be subject to the Rate Resolution and all charges due for new connections.

9.3.2 All unauthorized connections to the District's sanitary sewer system will be disconnected or corrected pursuant to Section 5 of this resolution.

Section 10. Work Order And Small Works Roster

10 Work Order and Small Works Roster:

10.1 General Provisions: The District's Work Order and Small Works Roster has been established in accordance with RCW 57.08.050, RCW 39.04.155, and RCW 39.80, and pursuant to District's Resolution 08-13. The District is a member of the Municipal Research Service Center (MSRC) small works roster. To be eligible for a Small Works Project or other District ordered work, contractors must register with the MSRC.

Opinion

Rob McKenna

Attorney General of Washington

SEWER DISTRICTS — PUBLIC FUNDS — GIFT OF PUBLIC FUNDS — GIFTS — LOANS — Use of public funds to repair or replace side sewers.

Municipal sewer districts have statutory authority to use public funds to repair or replace side sewers located on private property if doing so will increase sewer capacity by reducing infiltration and inflow. Use of public funds to do so does not constitute an unconstitutional gift or loan of public funds if the district acts without donative intent and can demonstrate that the action will result in significant benefit to the public.

****

August 27, 2009

Representative Ruth Kagi
State Representative, 32nd District
P. O. Box 40600
Olympia, WA 98504-0600

Cite As:
AGO 2009 No. 5

Dear Representative Kagi:

By letter previously acknowledged, you have requested our opinion with respect to the following question:

> **May a municipal sewer district repair or replace private side sewers as part of a district-wide infiltration and inflow reduction program where (a) aging and inadequate side sewers are the most significant contributor to infiltration and inflow in the district's entire system; (b) the purpose of the program is to benefit the district and the public through lower long-term capital and maintenance costs, not private property owners; (c) repair or replacement would be subject to a right of entry from the private property owner; and (d) the program costs will be paid back through the district's bi-monthly sewer rates?**

BRIEF ANSWER

Municipal sewer districts have statutory authority to maintain or operate the sewer system by repairing or replacing side sewers if doing so results in increased sewer capacity by reducing infiltration and inflow into the sewer system. The exercise of this statutory authority does not constitute a gift of public funds if the municipal sewer district does not have a donative intent and it is able to demonstrate that the expense will result in sufficient benefit to the public.

BACKGROUND

Your question concerns a municipal sewer district that owns and operates sewer mains and lift stations that transport wastewater and sewage to treatment plants.[1] Side sewer lines

[1] Treatment plants may or may not be owned and operated by the municipal sewer system. They may be operated by other governmental entities.

collect waste and stormwater from individual homes and buildings and connect to the sewer district's system of pipes and pumps. The side sewer lines are owned by individual property owners, not the sewer district.

The sewer district is experiencing infiltration and inflow from the side sewer lines. Infiltration takes place when groundwater enters the side sewers through deteriorated or damaged side sewer pipes. U.S. Envtl. Prot. Agency, *Sewer System Infrastructure Analysis and Rehabilitation* 91 (1991). Inflow occurs when stormwater is discharged into side sewers or the sewer system through direct connections, such as downspouts, foundation drains, and driveway drains. *Id.* Infiltration and inflow "is the major deterrent to the successful performance of a wastewater conveyance or treatment system." *Sewer System Infrastructure* at 19 (citing *Technology and Design Deficiencies at Publicly Owned Treatment Works*, Water Env't & Tech., (Dec. 1989)). It can cause excessive wear on pumping station equipment, high power costs, and the need for construction of new or additional sewer facilities earlier than the date projected. *Id.* Infiltration and inflow can also cause overloaded sewer systems and treatment plants to flood streets and basements and release untreated wastewater into waterways. *Id.*

ANALYSIS

A municipal sewer district may repair or replace private sewers if it has statutory authority to do so, and if paying for such repairs or replacements would not violate the state constitutional prohibition against the gifting or lending of public funds. We conclude that municipal sewer districts have the necessary authority and that its exercise would not transgress the state constitution.

We begin by briefly considering the statutory authority of municipal sewer districts. RCW 57.08.005(5) provides authority to municipal wastewater districts "to construct, condemn and purchase, add to, maintain, and operate" sewer systems for a variety of purposes, including provision of "an adequate system of sewers" and "control of pollution from wastewater." In addition to possessing the authority granted by RCW 57.08, municipal sewer districts are authorized to exercise any of the powers granted to cities and counties with respect to the maintenance and operation of waterworks and systems of sewage and drainage. RCW 57.08.005(21). Cities and towns have authority to "construct, condemn and purchase, acquire, add to, maintain, conduct, and operate" sewer systems "together with additions, extensions, and betterments thereto, within and without its limits." RCW 35.67.020(1). Counties have similar authority to "establish . . . operate, and maintain" a sewer system. RCW 36.94.020.

The statutory authority of a municipal corporation is limited to the power conferred by statute and the constitution, necessarily implied or incident to the powers expressly granted, or essential to the declared objects and purposes of the corporation. *Okeson v. City of Seattle,* 159 Wn.2d 436, 445, 150 P.3d 556 (2007). The Washington Supreme Court has explained that "if municipal utility actions come within the purpose and object of the enabling statute and no express limitations apply, [the] court leaves the choice of means used in operating the utility to the discretion of municipal authorities." *City of Tacoma v. Taxpayers of Tacoma,* 108 Wn.2d 679, 695, 743 P.2d 793 (1987).

The Washington Supreme Court considered the scope of similar municipal utility authority in *Taxpayers of Tacoma*. That case involved RCW 35.92.050, which provides cities authority to "maintain and operate" electrical facilities, and purchase and sell power to its residents. Tacoma's electric utility invested in energy conservation audits and paid for the installation of conservation measures on the private property of its ratepayers. *Taxpayers of Tacoma*, 108 Wn.2d at 683. The evidence in the record demonstrated that that "investment in conservation is considered the equivalent of purchasing electricity or of purchasing an electric generating facility." *Id.* at 693. In determining whether the expenditures were permitted, the Court considered whether the conservation program bore a "sufficiently close nexus to the purpose and object" of the city's statutory authority to operate the electrical utility. *Id.* at 696. The Court found that "the policy underlying legislative authorization of municipal utilities was the belief that municipalities could provide lower cost and more efficient electrical service." *Id.* Noting the "heavy environmental and financial costs" of generating additional power, the Court stated conservation "offers the cheapest and cleanest alternative for meeting future electrical supply needs." *Id.* at 696-97. The Court concluded that Tacoma had not exceeded its authority "to own and manage an electric utility and to purchase and sell power". *Id.* at 700.

As with the conservation measures considered in the Tacoma case, expending funds to repair side sewers that are causing infiltration or inflow is within the statutory authority to construct, maintain, and operate a sewer system. RCW 57.08.005(5); RCW 35.67.020(1); RCW 36.94.020. In addition, repair and replacement falls within the sewer district's statutory authority to control "pollution from wastewater" if it prevents an overloaded system from polluting streets, waterways, and private property with untreated wastewater. RCW 57.08.005(5).

In exercising its statutory authority, a municipality may not act contrary to constitutional limitations. *Okeson,* 159 Wn.2d at 447. The Washington Constitution prohibits state and local governments from giving or loaning public funds to private individuals, companies, or associations. Article VIII, section 5 states: "The credit of the state shall not, in any manner be given or loaned to, or in aid of, any individual, association, company or corporation." Article VIII, section 7 states:

> No county, city, town or other municipal corporation shall hereafter give any money, or property, or loan its money, or credit to or in aid of any individual, association, company or corporation, except for the necessary support of the poor and infirm, or become directly or indirectly the owner of any stock in or bonds of any association, company or corporation.

Although sections 5 and 7 are worded differently, the Washington Supreme Court has held that they have the same meaning and are to be analyzed in the same manner. *CLEAN v. State,* 130 Wn.2d 782, 797, 928 P.2d 1054 (1996). The purpose of the provisions is " 'to prevent state funds from being used to benefit private interests where the public interest is not primarily served.' " *Id. (quoting Japan Line, Ltd. v. McCaffree,* 88 Wn.2d 93, 98, 558 P.2d 211 (1977)). The question of whether a gift of public funds has occurred is resolved by (1) determining whether the governmental body had a donative intent and (2) examining the consideration received by the public. *CLEAN,* 130 Wn.2d at 798.

The Washington Supreme Court's analysis of these factors in the *Taxpayers of Tacoma* case is closely analogous to the question you have presented. In *Taxpayers of Tacoma,* the Court found that despite the fact that the conservation measures benefitted individuals by decreasing their utility bills, the city did not act with donative intent. "Aid to individuals is not absolutely prohibited under our law but is only improper where public money is used solely for private purposes." *Taxpayers of Tacoma,* 108 Wn.2d at 705 (quoting *State v. Ralph Williams' N. W. Chrysler Plymouth, Inc.,* 82 Wn.2d 265, 277, 510 P.2d 233 (1973)). The Court found that any benefit received by individuals was incidental to the public benefit of meeting future power needs by using the energy saved through the conservation measures. As in the *Taxpayers of Tacoma* case, private property owners may benefit from the repair or replacement of side sewers. However, if the private benefit is merely incidental to the public benefit of increasing sewer capacity, there would not be a donative intent.

In determining whether the consideration received by the public as a result of the energy savings was acceptable, the Court applied a legal sufficiency test. *Taxpayers of Tacoma*, 108 Wn.2d at 703; *see also King Cy.*, 133 Wn.2d at 597. The Court stated that if the consideration received is not "grossly inadequate," the courts will not analyze whether the public received consideration that was equal to the expenditure. *Taxpayers of Tacoma*, 108 Wn.2d at 703. In *Taxpayers of Tacoma*, the Court found that the consideration was not grossly inadequate, because the city demonstrated the number of kilowatts of electricity that were likely to be saved in the first year after installation of the conservation measures. *Id.* at 703-4. As in the *Taxpayers of Tacoma* case, a municipal sewer district could demonstrate the adequacy of consideration by analyzing the amount of increased sewer capacity it predicts will be obtained through the repair or replacement of side sewers. If the sewer district does not have a donative intent, and it is able to provide an analysis of the predicted increased sewer capacity, we do not believe the repairs or replacement would constitute a gift of public funds.

Our analysis of whether the repairs would constitute a gift of public funds is not affected by article VIII, section 10 of the state constitution. Section 10 contains an exception to the state constitution's prohibition on gifts of public funds. It states:

> Notwithstanding the provisions of section 7 of this Article, any county, city, town, quasi municipal corporation, municipal corporation, or political subdivision of the state which is engaged in the sale or distribution of water, energy, or stormwater or sewer services may, as authorized by the legislature, use public moneys or credit derived from operating revenues from the sale of water, energy, or stormwater or sewer services to assist the owners of structures or equipment in financing the acquisition and installation of materials and equipment for the conservation or more efficient use of water, energy, or stormwater or sewer services in such structures or equipment. Except as provided in section 7 of this Article, an appropriate charge back shall be made for such extension of public moneys or credit and the same shall be a lien against the structure benefited or a security interest in the equipment benefited. Any financing for energy conservation authorized by this article shall only be used for conservation purposes in existing structures and shall not be used for any purpose which results in a conversion from one energy source to another.

In *Taxpayers of Tacoma*, the Washington Supreme Court examined a prior version of section 10. Const. art. VIII, § 10 (as originally adopted as Amendment 70 (1979)). Like the current version of section 10, it permitted loans of public money to help property owners acquire equipment for energy conservation, but it did not include sewer systems or sewer equipment. The Court found that section 10 was proposed by the Legislature, and ratified by the people, for "the limited purpose of carving out an exception to the lending of credit prohibition" in the state constitution. *Taxpayers of Tacoma,* 108 Wn.2d at 688. The Court held that the question of whether Tacoma could *purchase* conservation measures from private parties was a question "totally separate from, and uninfluenced by" the exception in article VIII, section 10 for the provision of *loans* to private parties for conservation measures.

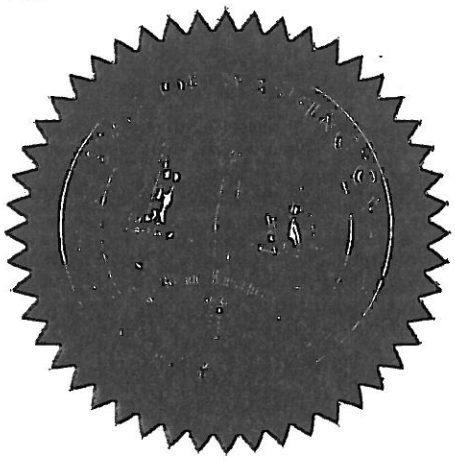
In 1997, section 10 was amended to add municipal sewer services and sewer equipment. Const. amend. 91 (H.J.R. 4209 (1997)). The legislative history of amendment 91 indicates that the Legislature's intent was to permit lending of public credit to finance sewer improvements, not to address the use of public funds for the purchase of improvements. H.B. Rep. on H.J.R. 4209, 55th Leg. (1997). The voters pamphlet reflects the same intent. The ballot title submitted to the voters asked: "Shall the Constitution be amended to permit local governments to make loans for the conservation or the more efficient use of stormwater or sewer services?" Voters Pamphlet for State General Election 18 (1997). As with the original enactment of section 10, there is no indication that amendment 91 was intended to create a negative implication that the purchase of conservation equipment would be prohibited. Accordingly, the amendment does not affect a municipal sewer district's authority to use public funds to repair or replace side sewers.

We trust that the foregoing will be useful to you.

ROB MCKENNA
Attorney General

ANNE EGELER
Deputy Solicitor General
(360) 753-7085

:pmd



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

May 20, 2010

Mr. Michael Derrick, General Manager
Ronald Wastewater District
PO Box 33490
Shoreline, WA 98133

Dear: Mr. Derrick

Re: 2010 Ronald Wastewater District Comprehensive Sewer Plan

Pursuant to RCW 90.48.110 and WAC 173-240-030, the above-referenced comprehensive sewer plan has been reviewed and is hereby approved. One copy of the approved document is being returned for your records.

State Regulations (WAC 173-240) requires construction of sewage facilities within the planning boundary to be based on this approved comprehensive sewer plan or amendments. The regulations also require the District to submit all engineering reports and design documents (plans and specifications) to Ecology for review and approval prior to starting construction. However, the District is not required to submit engineering reports and plans and specifications for sewer line extensions, including pump stations, if appropriate design standards are included in the comprehensive sewer plan. This comprehensive sewer plan includes appropriate collection system design standards and, therefore, the District may proceed with collection system improvement projects without further approval from Ecology. Prior to initiating collection system extension projects, you are required to submit to Ecology a written description of the project and written assurance that the extension is in agreement with the comprehensive sewer plan.

If you have any questions concerning this approval, please telephone Shawn McKone at (425) 649-7037.

Sincerely,

Kevin C. Fitzpatrick
Water Quality Section Manager

KF:sm
Enclosure

cc: Diane Pottinger, CHS Engineers
Steve Hirschey, King County DNRP (electronic copy)
Shawn McKone, Ecology NWRO

SNOHOMISH COUNTY COUNCIL
Snohomish County, Washington

MOTION NO. 10-185

CONCERNING APPROVAL OF THE RONALD WASTEWATER DISTRICT
2010 COMPREHENSIVE SEWER PLAN

WHEREAS, the Ronald Wastewater District (RWWD) has prepared and submitted a comprehensive sewer plan, dated January 2010, prepared by BHC Consultants, to the Snohomish County Council on February 09, 2010; and

WHEREAS, RCW 57.16.010 requires that any sewer system comprehensive plan be submitted to and approved by the county legislative authority before becoming effective; and

WHEREAS, the legislative authority, in reviewing the comprehensive plan pursuant to RCW 57.16.010, must consider three criteria: 1) whether the proposed action is in compliance with the development program outlined in the county comprehensive plan; 2) whether the action is in compliance with the basin wide sewage plan as approved by the state; and 3) whether the plan is in compliance with policies in the county comprehensive plan for sewage facilities; and

WHEREAS, statutory criteria 2 is inapplicable because the state has no applicable basin wide sewage plan for this entire area; and

WHEREAS, the Snohomish Health District officer has given approval to the plan via letter dated February 19, 2010 as required by Title 57 RCW; and

WHEREAS, the county engineer has given conditional approval of the plan via letter, dated February 25, 2010, to Ronald Wastewater District pursuant to Title 57.16.010; and

WHEREAS, the district's plan has been reviewed by the Department of Planning and Development Services and found to be generally consistent with the county's adopted GMA Comprehensive Plan, with issues related to the franchise agreement with Snohomish County and the Snohomish County Council's Docket XIII action in the Point Wells area on August 12, 2009;

NOW, THEREFORE, ON MOTION:

A. The county council finds that the proposed Ronald Wastewater District's Comprehensive Sewer Plan, dated January 2010, is in general compliance with the applicable criteria for approval prescribed in RCW 57.16.010.
B. The Snohomish County Council approves the Ronald Wastewater District's Sanitary Sewer Comprehensive Plan, dated February 2010, based on the foregoing plus review of the entire record and pursuant to RCW 57.16.010(6), subject to the following conditions:

1. No portion of any existing or proposed sewer facilities that the Ronald Wastewater District constructs, places, maintains, operates, or otherwise uses within Snohomish County right-of-way pursuant to the authority granted to the Ronald Wastewater District by that certain Franchise Agreement authorized by Snohomish County Ordinance No. 94-030 may be sold, assigned, or otherwise transferred to King County or to any other third party without first obtaining the written consent of the Snohomish County Council, as required by the terms of the Franchise Agreement.

2. The land use map (Figure 3.1) in the plan should be revised when the Urban Centers designation approved by the Snohomish County Council has taken effect.

PASSED this 14th day of April, 2010.

SNOHOMISH COUNTY COUNCIL
Snohomish County, Washington

Council Chair

ATTEST:

Asst. Clerk of the Council

D-14

King County

1200 King County Courthouse
516 Third Avenue
Seattle, WA 98104

KING COUNTY

Signature Report

January 6, 2011

Ordinance 17014

Proposed No. 2010-0562.1 **Sponsors** Phillips

AN ORDINANCE approving the Ronald Wastewater District Comprehensive Sewer Plan, January 2010.

STATEMENT OF FACTS:

1. K.C.C. chapter 13.24 requires approval of comprehensive plans for sewer utilities as a prerequisite to granting right-of-way franchises and approval for right-of-way construction permits. Such plans or their updates must be submitted to the county at least once every six years, and more frequently if circumstances call for an earlier submittal. Approval of the plan is also required under K.C.C. chapter 28.84 if the utility is a component agency of the regional system.

2. K.C.C. 13.24.060 requires that such plans be consistent with the requirements of any comprehensive plans or development regulations adopted under chapter 36.70A RCW or any other applicable comprehensive plan, land use plan, or development regulation adopted by a city, town, or county for the service area. The King County Comprehensive Plan, which includes wastewater policies in its provisions for facilities and services (policies F-245 through F-254), also calls for consistency with other adopted plans, pursuit of reclaimed water and water conservation, and protection of water resources.

3. Washington state law, RCW 57.16.010(7), requires that any general comprehensive plan of any sewer district be approved, conditionally approved, or rejected by the legislative authority of every county within whose boundaries all or a portion of the district lies. The county legislative authority must make its determination based on: a. whether the actions outlined in the plan comply with the development program outlined in the county's comprehensive plan; b. whether the actions outlined in the plan comply with any approved basin-wide water or sewerage plan; and c. whether the actions outlined in the plan comply with the policies expressed in any county plan for water or sewage facilities, or both. The actions proposed in the plan are consistent with RCW 57.16.010(7).

4. Both Washington state Department of Ecology ("DOE") and King County regulations require sewer plans to be approved prior to the construction of new facilities.

5. The Ronald Wastewater District ("the district") provides sewer service to a population of over fifty-six thousand in a service area of ten square miles in the northwest corner of King County. Its service area includes the city of Shoreline and a portion of Snohomish county and is a mixture of residential and commercial properties. The majority of the district's wastewater is treated at King County's West Point facility with a small amount being sent to the city of Edmond's treatment system.

6. The district's service area is largely developed. Its anticipated growth through 2030 will largely involve redevelopment to higher density land use. By 2030, it expects to be serving a residential population of approximately seventy-five thousand.

7. The principal operational issues facing the district include extending service to the few remaining pockets of existing development without sewer service, and inflow and infiltration into the district's facilities during rain events. The district has a reasonable plan to address inflow and infiltration when cost effective. Capacity issues related to growth will be addressed when development proposals are approved through rates and developer extension agreements.

8. The county's most recent approval of the district's sewer plan occurred in November 1991, although a district name change was approved in 2000, and the plan was updated in 2003.

9. The King County utilities technical review committee ("UTRC") reviewed the district's plan in June 2010 and recommends approval. K.C.C. chapter 13.24 requires review of wastewater plans by the UTRC, and a recommendation to the King County executive and council on the plan, its meeting the requirements under K.C.C. chapter 13.24, and its consistency with the King County Comprehensive Plan. The planning data and proposed operations were reviewed by the UTRC, and the UTRC found:

a. The infrastructure system for the existing service area and for the area anticipated to be served in the future is based on the appropriate adopted land use maps. The population and employment forecasts developed for the service area are appropriately used;

b. The plan has information sufficient to demonstrate the ability to provide service consistent with the requirements of all applicable statutes, codes, rules and regulations;

c. The DOE has determined the plan is consistent with WAC 173-240-050 and approved the plan;

d. There are no areas of concern with respect to corrosion and odor control;

f. The district evaluated opportunities for reclaimed water;

g. The district works with the cities and other special purpose districts to ensure the elimination or prevention of duplicate facilities;

h. The district provides service at a reasonable cost and maximizes the use of the existing public facilities;

i. The plan is consistent with the King County Comprehensive Plan and other pertinent county adopted plans and policies; and

j. The district meets applicable state water quality and waste management standards.

10. The UTRC recommends that the King County council approve the plan.

11. The district completed a state Environmental Policy Act checklist and issued a determination of nonsignificance for the issuance of the plan on October 7, 2009, and there were no appeals.

BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

SECTION 1. The Ronald Wastewater District Comprehensive Sewer Plan,

January 2010, Attachment A to this ordinance, is hereby approved as a general sewer and facilities plan.

Ordinance 17014 was introduced on 11/1/2010 and passed by the Metropolitan King County Council on 1/3/2011, by the following vote:

Yes: 9 - Mr. Phillips, Mr. von Reichbauer, Mr. Gossett, Ms. Hague, Ms. Patterson, Ms. Lambert, Mr. Ferguson, Mr. Dunn and Mr. McDermott
No: 0
Excused: 0

KING COUNTY COUNCIL
KING COUNTY, WASHINGTON

Larry Gossett, Chair

ATTEST:

Anne Noris, Clerk of the Council

RECEIVED
2011 JAN 12 PM 4:06
KING COUNTY
CLERK
COUNTY COUNCIL

APPROVED this 12 day of January 2011, 2010.

Dow Constantine, County Executive

Attachments: A. Ronald Wastewater District Comprehensive Sewer Plan--January 2010--Updated 82610

CHS ENGINEERS, LLC

August 10, 2010

Mr. Shawn McKone
Department of Ecology
Northwest Regional Office
3190 – 160th Avenue S.E.
Bellevue, WA 98008-5452

Mr. Noel Miller
City of Edmonds
200 ~ 2nd Ave S
Edmonds, WA 98020

Ms. Martha Burke
Seattle Public Utilities
PO Box 34018
Seattle, WA 98124-4018

Ms. Katherine Bratcher, County Clerk
Snohomish County Council
3000 Rockefeller Ave, MS 604
Everett, WA 98201

Mr. Steve Hirschey
Regional Water Policy Analyst
King County DNR
201 S Jackson St. Room 700
Seattle, WA 98104-3855

Subject: Comprehensive Sewer Plan
Ronald Wastewater District

In response to comments received from you and other agencies, we are providing the following information, responses and proposed revisions to the Ronald Wastewater District's Comprehensive Sewer Plan. Included attached the agency comments and the District responses. The District also noticed three areas in the text that required updating, which are also listed.

Copies of the revised pages are included with this transmittal, highlighting the changes.

Sincerely,

CHS Engineers, LLC

Diane Pottinger, P.E.
Project Engineer

Enclosures

Cc: Michael U. Derrick, Ronald Wastewater District

Date	Page number	Report Section	Paragraph number	Agency/comment	Response
11-Feb-10				City of Edmonds via email/suggested changes:	
	6-2	6.3	1st	Add sentence following 4th sentence. "A third upgrade, which increased capacity and also expanded treatment level from primary to secondary treatment was completed in 1991.	Sentence will be added.
	6-2	6.3	2nd	Same section, second paragraph. Reword sentence to be: In 2008, the Edmonds WWTP treated 120 million gallons of sewage generated from 2,243 RCEs in the District.	Sentence will be changed.
	6-2	6.4	1st	Correct values to 2,023 mg and 5.5 mgd.	Sentence will be changed
	6-2	6.4	1st	Third sentence. Delete.	Sentence will be deleted.
	6-3	6.5	5th & 6th	Recommended rewording to the following "King County discharges flows into Edmonds wastewater treatment plant through an agreement between Edmonds and the County which was updated in the year 2000. This same agreement allows for flows in the Edmonds area to be diverted to King County's West Point Treatment plant to offset the flows sent to Edmonds from the Richmond Beach area.	Sentences will be amended.
	6-3	6.5	5th & 6th	Recommend changing sentence 5 and eliminating sentence 6 to the following "In order to eliminate this plant, an alternative was developed called "Flow Transfer" which required negotiations with the City of Edmonds and King County.	Sentences will be amended and deleted

Date	Page number	Report Section	Paragraph number	Agency/comment	Response
	6-3	6.5	6th	Recommend adding the language "This agreement is in effect until January 1st, 2012, at which time the transfer of flow (equal to the volume received from Richmond Beach) from Edmonds to King County will occur year-round instead of seasonally.	Language will be added.
14-Apr-10				Snohomish County Approval	Plan approved , see attached.
7-May-10				City of Seattle	
				We agree that "flow monitoring and more detailed study should be performed prior to construction replacement or parallel lines to verify that the recommended improvements are necessary to remedy real and not possible conditions."	Please contact us when you have the results of your flow monitoring and we can discuss the need for projects at that time.
				We agree that while improvements should be constructed taking into account maximum build-out under future conditions, the actual replacement or increases in capacity should not be performed until the need warrants.	We concur. We will discuss with you the replacement of the sewer lines sometime after 2011.
				Construction in Seattle can be relatively expensive, given City design standards and code requirement associated with construction in the right-of-way.	We look forward to working with SPU to get the most out of projects that will be shared in expenses with the District.
20-May-10				Department of Ecology	The comprehensive sewer plan has been reviewed and is hereby approved.

Date	Page number	Report Section	Paragraph number	Agency/comment	Response
8-Jun-10				King County Department of Natural Resources and Parks	
	4-3	4.6	1	Our records show there are five permitted industrial waste discharges within your system, two of the facilities ultimately discharge to the Edmonds Treatment Plan and the other three to the regional treatment system.	We will modify the wording to the following "There are currently five industrial users, as defined by the King County Industrial Waste Program, in the collection system at this time. These include three King County Departments: Roads – Bruggers Bog Decant Station, Surface Water – Shoreline Transfer Station, Wastewater Treatment Division – Brightwater Conveyance System II, Point Wells Portal and Paramount Petroleum Corporation.
	5-7	5.4	11th	Section 6.4.."we are still interested in the projected flow, by basin, for any basin discharging into King County's sewage conveyance and treatment system". It should go either in chapter 5 or 6	A table is included with this letter depicting the base sewage flow, I/I modeled rate and resulting peak flow estimates in the downstream most component of each basin.

Date	Page number	Report Section	Paragraph number	Agency/comment	Response
		8,9		What is not apparent is a summary projection or estimate of public money to be used in the next six years to finance the proposed capital facility projects. Please provide a summary of those projects that will depend on public funding during the next 6 years.	We are to assume by Public monies you mean Public Works Trust Fund (PWTF) loans. Four projects were identified for PWTF loans totaling **$1,445,000 over the next 6 years** (Project X in 2010 for $245,000 Project Z in 2013 for $700,000 and Project AD in 2015 for $500k), and **$2,095,000 over the next 18 years** (previously identified projects plus Project AB in 2016 for $650,000). All other projects will be funded by the rates, general facility charge revenue from developers and proposed bonding. The District will be reviewing financing each fall to ensure the capital improvement projects are in line with the development occurring within their service area. Some scheduling changes may occur as economic conditions improve.
		5		Corrosion and Odor Control	The District does not have any problems in these areas.
	6-3	6.7		Reclaimed water	The District has no immediate plans regarding reclaimed water at this time.

Date	Page number	Report Section	Paragraph number	Agency/comment	Response
	6-3	6.7		Water Conservation	The most signigicant water conservation occurred in the Shoreline Water District service area in the 1990s (water use data is not readily available for the portion within Shoreline that is served by SPU). Conservation efforts have a relatively small impact on the sewer system. Within the sewer system, the I/I component can be a more significant component of the sewer flow.
				City of Shoreline	The plan was submitted to the City for review but none was received.
6/6/2010				District Comments/ clarifications	
	1-4	1.4	5th	District comments	Change the third sentence to read "For the purpose of this plan, the District corporate boundary and service area boundary are the same. The future service area boundary is the same except it includes two potential annexation areas, Holyrood Cemetery and Seattle Golf Course (see Figure 1.2).

Date	Page number	Report Section	Paragraph number	Agency/comment	Response
	5-7	5.4	11th	District comments - Asset Management Program,	The following sentence was added to paragraph 11 "Information in the District's Maintenance Management Program was used to identify and select capital replacement projects. " A paragraph was added after the 11th paragraph "The District recognizes the I/I allowance of a new system is 1,100 gpad. Much of the existing system has I/I values greater then 1,100 gpad. The District has prioritized future maintenance projects that have basins with high I/I."
	6-2	6.4	1st	District comments – Additional capacity may be required.	If the Point Wells facility is constructed as proposed, the District may be requied to purchase additional treatment capacity.

ESTIMATED BASE AND PEAK FLOWS BY BASIN INTO OTHERS TRANSMISSION MAINS

Quarter Section	RWD Basin	Estimated Peak I/I Rate (gpad)	RWD MH	To/From	Municipality	Flow at 0 gpad, gpm	Flow @ peak I/I rate, gpm	Comments
A6	1	18352	A6041	To	KC WW	602	2408	
A6	1	18352	LS #12	To	KC WW	125	125	
A6	2	6730	A6049	To	KC WW	191	991	
B6	2	6730	B6008	To	KC WW	21	127	
B5	3	6853	B5053	To	KC WW	3	12	Not in model; see calcs.
C4	4	Not modeled	C4048	To	KC WW			No over capacity mains @ 6100 gpad in prior study
B3, B4	5	Not modeled						Less than 15 acres
C4	6	Not modeled	C4095	To	KC WW			No over capacity mains @ 6100 gpad in prior study
C4	6	Not modeled	C4093	To	KC WW			No over capacity mains @ 6100 gpad in prior study
C3	7	Not modeled	C3062	From	Highlands Sewer District			
C3	7	Not modeled	C3063	To	KC WW			No over capacity mains @ 6100 gpad in prior study
C3	7	Not modeled	C3059	To	KC WW			No over capacity mains @ 6100 gpad in prior study
C5	8	4709	C5111	To	KC WW	490	1550	Add flows out of MHs C5021 and C5022.
C5	9	5504	C5076	To	KC WW	250	250	All flow from LS #2.
C5	9	5504	C5099	To	KC WW	8	37	
C3	10	Not modeled	C3088	To	KC WW			No over capacity mains @ 6100 gpad in prior study
D6	11	Not modeled						Less than 15 acres
E6	12	5003	E6039	To	Mountlake Terrace Meter C	249	704	
C2, C3, D2, D3	13	Not modeled						No over capacity mains @ 6100 gpad in prior study
D3	14	4641	D3067	To	KC WW	344	997	Ad flows out of MHs D3001 and D3059.
E1	14	4641	E1027	From	SPU			
E1	14	4641	E1028	From	SPU			
G6	15	4300	G6001	To	Mountlake Terrace/Edmonds Meter A	1795	3433	
H6	16	14851	H6064	To	KC WW	134	579	
I4	16	14851	I4044	To	Lake Forest Park	23	265	
I4	16	14851	I4076	To	Lake Forest Park	264	1374	
I5	16	14851	I5026	From	Lake Forest Park			
I5	16	14851	I5029	To	Lake Forest Park	396	1996	
I5	16	14851	I5042	To	Lake Forest Park	222	2800	
G1	17	5536	G1078	To	KC WW	2122	8055	Use flow generated out of MH G1077.
G1	17	5536	G1076	From	SPU			
H1	18	6904	H1086	To	SPU	1371	3800	
J6	19	4300	J6005	To	Lake Forest Park	4	9	Not in model; see calcs.
J6	19	4300	J6014	To	Lake Forest Park	6	17	Not in model; see calcs.
J6	19	4300	J6016	To	Lake Forest Park	6	41	Not in model; see calcs.
J6	19	4300	J6026	To	Lake Forest Park	4	8	Not in model; see calcs.
J6	19	4300	J6024	To	Lake Forest Park	5	14	Not in model; see calcs.
J6	19	4300	J6022	To	Lake Forest Park	455	951	
H1	20	6904	H1100	To	SPU	133	350	Included in Basin 18 model.
I1	20	4300	I1029	To	SPU	94	253	
I1	20	4300	I1039	To	SPU	507	1239	
J1	21	4318	J1027	To	SPU	165	562	
H6	22	4300	H6028	To	KC WW	96	555	
J1	23	7567	J1052	To	SPU	28	112	Not in model; see calcs.
J1	23	7567	J1043	To	SPU	282	1249	
J2	23	7567	J2039	From	Lake Forest Park			
A7	24	Not modeled						Point Wells, all flows injected at ps 13
B5	25	Not modeled						Entire basin a community park

King County
Department of Natural Resources and Parks
201 S Jackson St, Suite 700
Seattle, WA 98104-3855
206.296.6500

June 8, 2010

Michael U. Derrick
Ronald Wastewater District
17505 Linden Avenue North
PO Box 33490
Shoreline, WA 98133

Dear Mr. Derrick:

Thank you for the opportunity to review the Ronald Wastewater District (District) Comprehensive Sewer Plan (Plan), January 2010. Within King County, the Utilities Technical Review Committee (UTRC) reviews and evaluates the Plan pursuant to criteria in chapter 57.02 Revised Code of Washington (RCW) and the King County Code (KCC) (see chapters 13.24 and 28.84) for consistency with the King County Comprehensive Plan and KCC prior to making a recommendation to the King County Council for Plan approval. The UTRC review of the Plan includes the following:

- KCC 13.24.010(C) – Only plans consistent with the King County Comprehensive Plan adopted in KCC Title 20 and corresponding development regulations shall be approved. The infrastructure system for the existing service area and for the area anticipated to be served in the future shall be based on the adopted land use map of the Comprehensive Plan.
- KCC 13.24.010(F) – Water and sewer comprehensive plans shall include information sufficient to demonstrate the ability to provide service consistent with the requirements of all applicable statutes, codes, rules, and regulations.
- KCC 13.24.010(H) – Provides that sewer comprehensive plans shall be consistent with Washington State Administrative Code (WAC) 173-240-050 and the plan shall discuss the following:
    - Existing and planned flows, both average and peak;
    - Existing and planned flows for any basin discharging into King County's sewage conveyance and treatment system;
    - Amounts of inflow and infiltration (I/I) to the system, a comparison of those amounts with King County's 1,100 gallons-per-acre-per-day standard, and steps being taken to reduce the I/I;

- Areas of concern with respect to corrosion and odor control and steps being taken to reduce their occurrence; and
- Opportunities for reclaimed water as required under RCW 90.48.112 and effects of water conservation under RCW 90.48.495.

The UTRC offers the following observations or statements related to our statutory responsibilities for plan review. Overall, we find the District's Plan to be well-prepared and thorough and believe it provides a foundation for the District to be able to operate successfully in the upcoming years.

Section 4.6, Industrial Waste

Subsection 4.6, Industrial Waste, states that there are currently no industrial users, as defined by the King County Industrial Waste Program, in the collection system at this time. We believe that statement may be in error. Our records show there are five permitted industrial waste discharges within your system, two of the facilities ultimately discharge to the Edmonds Treatment Plant and the other three to the regional treatment system. Attached is a print out of our records. Please review the attached list and inform the County if we are in error as to the existing industrial waste discharge permits or, alternatively, perhaps the language in the Plan needs to be amended to add the list of industrial waste discharge permits to section 4.6.

Section 4.7, Section 6.8, Section 8.4

Sections 4.7, 5.4, 6.8, 8.4, and Appendix C talk about I/I and/or use I/I estimates. The Plan accurately characterizes the participation of the District in the Regional I/I Program done by the Wastewater Treatment Division and we thank you for your past and continuing participation in the Regional I/I program. The I/I reduction project undertaken in the District, basin 14, was very successful in addressing I/I from private property. The results of the initial Regional I/I projects are being used to design additional projects to control I/I and are scheduled for construction in 2011 and 2012. This work will provide King County and component agencies additional information on I/I removal efficiency for future actions.

As you know, several of the District's sewer sub-basins (i.e. basin 1 and 16) have very high I/I rates, far above King County standards. In light of the discussion on page 5-6, it appears the District has continued to collect its own comparative flow data. We support you in that endeavor. There should be some discussion or a table of how each sub-basin's peak I/I flows compare to the King County 1,100 gallons-per-acre-per-day standard. We understand the future action the District will take to alleviate I/I is to replace all side sewers when a mainline pipe is replaced.

Section 6.4

Section 6.4 addresses wastewater flow projections and sates that the District does not have a capacity limit in the King County wastewater treatment facilities. While that may be true, we are still interested in the projected flow, by basin, for any basin discharging into King County's sewage conveyance and treatment system. A simple table similar to C-3 that includes the base sewage flow, I/I rate and resulting peak flow estimates for the Ronald basins would provide a good overview of flows generated in the system. The resulting table could go in either chapter 5 or 6.

Chapter 8 and Chapter 9

Chapter 8 presents the capital facilities plan and chapter 9 the financial program. Section 9.3 presents the various potential funding sources. We also acknowledge the District will depend on developer financing to extend the system. We also noted the statement on page 9-2 that the District is in the process of updating a budget through 2015. What is not apparent is a summary projection or estimate of public money to be used in the next six years to finance the proposed capital facility projects. Please provide a summary of those projects that will depend on public funding during the next six years.

General Comments

With respect to corrosion and odor control, and steps being taken to reduce their occurrence, we note the Plan does not identify any problems.

The Plan contains a brief discussion of regional work being done to evaluate opportunities for the use of reclaimed water in Section 6.7 (on page 6-3). For your next Plan update, we encourage the District to evaluate opportunities for the use of reclaimed water more consistent with the guidance from the State entitled, Consideration of Reclaimed Water Within General Sewer Plans - March 2000.

The Plan does not appear to contain any discussion of water conservation measures (see RCW 90.48.495) being considered by the local water utilities that would reduce flows to the system, nor does it include any analysis of their anticipated impact on public sewer service and treatment capacity. We encourage you to consider the impact of water conservation efforts on the flow of wastewater. It appears the estimated domestic wastewater flows talked about on page C-6, and used within the hydraulic model, are based on water consumption data from 1993.

Finally, the District submitted the Plan to the Washington State Department of Ecology (Ecology) for its review and approval. Ecology approved the plan on May 20, 2010. If any of the cities you overlay are adopting the Plan, we would appreciate being informed of their action.

We hope you find these comments helpful as you finalize the District's Plan. We look forward to seeing the final Plan and working with you to secure King County Council approval. The Council's final action on the plan will constitute King County's approval of the Plan under RCW 58.17.010.

For the UTRC to recommend Council approval, please ensure that the final Plan:

- Contains a list of the permitted industrial waste discharge permits that authorize discharge into the District's system;
- Contains a discussion or a table of how each sub-basin's peak I/I flows compare to the King County 1,100 gallons-per-acre-per-day standard;
- Contains the projected flow by sub-basin for those basins that discharge into the King County regional system;
- Identifies any public money to be used in the next six year time period; and
- Evaluates the impact of future water conservation efforts on wastewater flows.

If you have any questions or concerns on information or findings in the letter, please do not hesitate to call me at 206-205-0817 or my colleague Mark Lampard in our Wastewater Treatment Division at 206-263-3162.

Sincerely,

Stephen Hirschey
Chair, Utilities Technical Review Committee

Enclosure

cc: Diane Pottinger, CHS Engineers
Shawn McKone, Washington State Department of Ecology

City of Seattle
Seattle Public Utilities
Ray Hoffman, Acting Director

May 7, 2010

Diane Pottinger, P.E.
CHS Engineers, LLC
12507 Bel-Red Road
Suite 101 Bellevue, WA
98005-2500

RE: Comprehensive Sewer Plan Ronald Wastewater District

Dear Ms. Pottinger:

On behalf of the City of Seattle, thank you for providing us this opportunity to review the Ronald Wastewater District Comprehensive Sewer Plan. In general, we found your plan to be well engineered and a good guide for sewer service in northern Seattle and in Ronald Sewer District.

We recognize that we have a shared interest in assuring there is sufficient capacity in the lines that serve both Seattle and Shoreline, as described in the 2001 agreement. We agree that "flow monitoring and more detailed study should be performed prior to constructing replacement or parallel lines to verify that the recommended improvements are necessary to remedy real and not possible conditions." This is consistent with the City's approach, and we anticipate that we will have monitoring data that we can share with Ronald District, for lines that we are jointly responsible for, within the next year. At that time we should be able to estimate what capacity is remaining to service our customers and determine the optimal timing for constructing any needed improvements.

We agree that while improvements should be constructed taking into account maximum build-out under future conditions, the actual replacement or increases in capacity should not be performed until the need warrants. If some of your assumptions regarding population growth and/or I &I are not realized, it may not be necessary to complete these projects as early as 2016/17. The timing will also need to take into account available funding, as identified in our CIP. Our revenues have been affected by the recent recession, and the need to complete construction of CSO projects to meet regulatory commitments places additional limits on our capital budget. So we need to make sure both cities are coordinating on timing. This is a question we should revisit next year when we have completed our monitoring.

One other thing I should note. Construction in Seattle can be relatively expensive, given City design standards and code requirements associated with construction in the right-of-way. These would include, but not be limited to, incorporation of improvements as required by the drainage code, drainage flow attenuation and treatment, requirements for street restoration, City permits, etc. These are all costs that will need to be considered when we do negotiate this coordination work.

We appreciate the work that went into this Plan and we look forward to working with Ronald in the future to meet future system improvements.

Sincerely,

Trish Rhay
Director, Drainage and Wastewater Systems
Seattle Public Utilities