CHAPTER 1

DESCRIPTION OF SEWER SYSTEM

1.1 INTRODUCTION

This 2013 Wastewater Comprehensive Plan for the Sammamish Plateau Water and Sewer District (District) addresses the District’s comprehensive planning needs for wastewater collection and transmission for the next 20 years. This plan was prepared in accordance with the provisions of the WAC Section 173-240-050, General Sewer Plan. The purpose of the Plan is to provide a comprehensive plan with preliminary engineering to ensure the technical feasibility of the proposed system of sewers and financial feasibility for implementation. Development of the Plan has been done in compliance with the Cities of Sammamish and Issaquah General Comprehensive Plans, King County Comprehensive Plan, and the District’s Water System Plan.

The District is located in east King County, between Lake Sammamish (to the west) and the Snoqualmie River Valley (to the east). The District is located 15 miles east of the City of Seattle, immediately north of the City of Issaquah as shown in Figure 1-1. As of the end of 2011, the District served approximately 16,890 water customers and 10,433 sewer customers with a population exceeding 50,000 people residing within District boundaries. This includes portions of the cities of Sammamish and Issaquah, and areas of unincorporated King County. The District has been providing water service to its customers for more than 60 years, and sewer for more than 40 years. The District operates a sanitary sewer collection and transmission system, and conveys all of its sewage to the KCDNR system. The flow is currently all directed to the South Treatment Plant in Renton.

1.2 OWNERSHIP AND MANAGEMENT

The District is a special purpose district with the authority to operate under Title 57 of the Revised Code of Washington (RCW). The District is administered by a five-member Board of Commissioners with overlapping 6-year terms. The Commissioners are elected by voters that reside within the District’s corporate boundaries. The Commissioners set the general policies for the operation of the District. The District holds three, regularly scheduled Commissioner’s meetings on the first three Mondays of each month.

There are four ancillary departments within the District: Administration, Finance and Customer Service, Engineering, and Operations. These departments are led
by managers who report to the General Manager, who in turn reports to the Board of Commissioners. The General Manager is selected by the Board of Commissioners and administers the daily operation of the District.

The Administration Department is headed by the General Manager and provides support for the Board of Commissioners. In addition to supporting coordination between the other departments, the Administration Department includes Human Resources, Information Technology/Geographic Information Services and Planning. The Engineering Department is responsible for developing and implementing the capital improvement programs and for bringing water and sewer services to areas of new development. It develops and reviews design plans, monitors contracts, and inspects construction. The Finance Department is responsible for utility billing and the financial affairs and functions of the District. The Operations Department is responsible for the operation and maintenance of the water and sewer systems including all related support services. Ownership and management is discussed further in the Operation and Maintenance Manual.

1.3 DISTRICT HISTORY

The Sammamish Plateau Water and Sewer District was originally formed as King County Water District No. 82 in 1948 by 35 local residents to supply water near Pine Lake. Through numerous annexations and mergers with King County Water District No. 121 and Cascade View Water District (Water District 122), the District has expanded greatly and now provides water service to approximately 29 square miles (District Corporate Boundary), and provides sanitary sewer service to approximately 20 square miles within the current District Sewer Service Boundary. The District’s first sewer plan was completed in 1970 and the District’s most recent plan in 2003. In 1987, the District changed its name to Sammamish Plateau Water and Sewer District to reflect its location and services provided. As stated, at the end of year 2011, the District served approximately 16,890 water customers and 10,433 sewer customers.

The location of the District within Washington State and an aerial photograph of the area are presented in Figures 1-1 and 1-2, respectively.
LEGEND:
- DISTRICT CORPORATE BOUNDARY

DATA SOURCE: KING COUNTY AND SAMMAMISH PLATEAU WATER & SEWER DISTRICT
ORTHOPHOTO SOURCE: USDA NAIP 2013
1.3.1 WASTEWATER SYSTEM PLANNING

The following document was consulted in the preparation of this Wastewater Comprehensive Plan:

**Sammamish Plateau Water and Sewer District, Wastewater Comprehensive Plan, MWH Global, Inc., October 2003**

The 2003 Wastewater Comprehensive Plan evaluated the service area, developed land use and flow projections, provided existing and future collection system analysis, developed Critical Link improvement projects, and established a capital improvement program and financial evaluation over a 20-year planning horizon. According to the Plan, Critical Link projects are identified “…as projects that would provide access for sewer service to a large unsewered area or to areas where customers have expressed interest in obtaining sewer service.”

Projects that have been implemented following the recommendations and acceptance of the 2003 Plan include regional, critical link, lift station and local collection projects.

**Regional Projects:**

- King County Metro Extension (FR2);
- 20-inch Low-Pressure Extension on East Lake Sammamish Parkway SE (FR3); and
- SE 56th Street (FR4).

**Critical Link Projects:**

- Wakefield Tract F 8-inch Sewer Main (FR5);
- 228th Sewer – North of Park Hill at Issaquah (FR6);
- East Lake Sammamish Pkwy Crossing at 212th Way (MB1);
- Pine Lake Creek Trunk 8-inch Sewer Collector (NL5); and
- 228th to SE 20th Sewer Main (SH2).

**Pipeline Projects:**

- Flow split at S-10 N (aka, North Lake) Lift Station (NL4);
- Inglewood Corner Improvements (NL18);
- Beaver Lake Park 8-Inch Gravity Main (SH1).
Lift Station Projects:

- Mallard Bay Lift Station (MB3);
- Good Samaritan Interim Lift Station (NP7).

### 1.3.2 WATER SYSTEM PLANNING

_Sammamish Plateau Water and Sewer District, Water Comprehensive Plan, HDR, Inc., December 2010_

The Sammamish Plateau Water and Sewer District Water Comprehensive Plan discusses the existing water system facilities, water usage and forecasted demands for future design criteria, system expansion, and water system improvements. The recommended water system improvements include new distribution and transmission main upgrades and replacements, water storage capacity improvements, and booster pump station improvements necessary for long-term growth. The Water Comprehensive Plan was adopted by Resolution No. 4143 on April 2, 2012 including the 2012 Amendment adding Overdale to the District water service area.

### 1.4 REGULATIONS AND RELATED PLANS

Wastewater collection system planning includes an analysis of the District’s ability to comply with the applicable regulatory requirements while providing a high level of service for existing and future customers. These requirements are outlined in federal, state and local regulations, and enforced by a number of agencies. This section presents the various legislation, regulations, permits, agencies, and design standards that may affect District wastewater operations. The discussion presented here is general in nature; specific issues will be addressed as they occur within the context of following chapters.

#### 1.4.1 NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) was established in 1969 and requires federal agencies to determine environmental impacts on all projects requiring federal permits or funding. If the project is determined to be environmentally insignificant a Finding of No Significant Impact (FONSI) is issued, otherwise an Environmental Impact Statement (EIS) is required. It is not anticipated that District activities will fall under NEPA regulation.
1.4.2 FEDERAL CLEAN AIR ACT

The Federal Clean Air Act requires all wastewater facilities to plan to meet the air quality goals of the region. The permitting of facilities is based upon a mass balance of air emissions being performed to review if a facility is required to seek an air permit from a federal and/or local permitting agency. At this time it is not anticipated that the current or future facilities would require a federal permit since currently only large wastewater treatment facilities are required to have permits. Puget Sound Clean Air Agency is the regional air quality authority, which does not require a permit for the construction and operation of collection system facilities. Puget Sound Clean Air Agency is the air quality authority for King, Pierce, and Snohomish Counties.

1.4.3 STATE WATER POLLUTION POLICY ACT

The intent of the state Water Pollution Policy Act is to “…maintain the highest possible control standards to ensure the purity of all waters of the state consistent with public health and the enjoyment, and the propagation and protection of wildlife, birds, game, fish and other aquatic life, and industrial development of the state.” Under the RCW 90.48 and the WAC 173-240, the Washington State Department of Ecology issues permits for wastewater treatment facilities and also land application of wastewater under WAC 246-271. The District is not permitted for either wastewater treatment or land application of wastewater.

1.4.4 STATE ENVIRONMENTAL POLICY ACT

The WAC 173-240-050 requires a statement in all wastewater comprehensive plans regarding proposed projects in compliance with the State Environmental Policy Act (SEPA), if applicable. The capital improvements proposed in this plan will fall under SEPA regulations. A non-project SEPA checklist is included in the Appendix A of this report to comply with the requirements of SEPA. In most cases a Determination of Non-Significance (DNS) is issued, however, if a project will have a probable significant adverse environmental impact that cannot be mitigated, an EIS will be required. Utility lines 8 inches in diameter or smaller are categorically exempt from SEPA review; however, the District may wish to prepare a SEPA review for construction projects in environmentally sensitive areas.
1.4.5 GROWTH MANAGEMENT ACT

The Washington State Growth Management Act (GMA) was enacted in 1990 and requires certain local governments to plan for the population growth that will occur over the next 20 years within an established Urban Growth Area. The GMA also requires cities and the county to classify critical area (wetlands, aquifer recharge areas, fish and wildlife habitat areas, geologically hazardous areas, and frequently flooded areas) and to establish development regulations to protect these areas.

The District is not required to plan under the GMA. However, the District’s water and wastewater plans must be approved by Ecology and King County. In addition, the GMA requires that the District’s plans be consistent with planning efforts of local governments within the District’s boundary.

This Plan is consistent with population, zoning, and land use in the Cities of Issaquah and Sammamish, and areas of Unincorporated King County.

1.4.6 SHORELINE MANAGEMENT ACT PERMIT

A Shoreline Permit is required on all projects that cost $5,000 or more that are located on the water or within a shoreline area. Shorelines are defined by lakes or reservoirs of 20 acres or greater, streams with a mean annual flow of 20 cubic feet per second or greater, marine waters, and an area inland 200 feet from the ordinary high water mark. There are multiple shorelines within the District including areas surrounding both Lake Sammamish and Pine Lake. District projects near these shorelines are evaluated on a case by case basis for the shoreline permit requirement.

1.4.7 FLOODPLAIN DEVELOPMENT PERMIT

Local governments that are participating in the National Flood Insurance Program are required to review projects (including wastewater collection facilities) in a mapped floodplain and impose conditions to reduce potential flood damage from floodwater. A Floodplain Development Permit is required prior to construction. Areas where a Floodplain Development Permit may be required include the flood hazard areas. Floodplain areas are located primarily northeast of District Boundaries, within the Snoqualmie River Valley. However, a small floodplain area exists where wetlands are located, at the south end of Lake Sammamish, northwest of the intersection of SE 56th Street and East Lake Sammamish Parkway SE. (See further discussion under Critical Areas later in this chapter.)
1.4.8 HYDRAULIC PROJECT APPROVAL

Under the Washington State Hydraulic Code (WAC 220-110), the Washington State Department of Fish and Wildlife (WDFW) requires a Hydraulic Project Approval (HPA) for activities that will “use, divert, obstruct, or change the natural flow or bed” of any water of the state. For District activities such as pipeline crossings of streams, an HPA may be required, and must include provisions necessary to minimize project specific and cumulative impacts to fish.

Because of Endangered Species Act (ESA) listings throughout Washington, WDFW and National Marine Fisheries Service (NMFS) are in the process of revising the Hydraulic Code to protect species listed as threatened or endangered. If NMFS determines that the revisions are sufficient to protect listed species, the revised code will constitute an acceptable Habitat Conservation Plan under Section 10 of the ESA. When an acceptable Habitat Conservation Plan is approved, NMFS issues an Incidental Take Permit allowing incidental take of a listed species if the permit applicant has complied with the Habitat Conservation Plan. This Incidental Take Permit expires after an agreed upon period of time, and may be revised by NMFS. Applicants holding an HPA permit predating the adoption of proposed changes to the Hydraulic Code, should they be implemented, will not be required to adhere to revisions to the Hydraulic Code for those revisions made after the HPA has been obtained. Only if the existing HPA is modified, becomes inactive, expired, or is withdrawn by WDFW, should the permittee be obligated to adhere to the revised Hydraulic Code. WDFW plans to adopt and implement the proposed changes to the Hydraulic Code in spring 2014.

1.4.9 LOCAL PERMITS

When the District proposes construction and maintenance of facilities in public right-of-ways, King County, and the Cities of Sammamish and Issaquah will issue a permit (Right-of-Way in King County and Sammamish, Street Use in Issaquah) that specifies construction standards such as traffic control, work hours, and safety issues, as well as design and restoration standards to allow construction and maintenance of facilities in their respective rights of way.

Depending on the type and location of the project, local jurisdictions may require other permits, such as conditional use permits, shoreline substantial development permits, building permits, and grading permits. The Uniform Plumbing Code (UPC) is also under the jurisdiction of the land use agencies.
1.4.10 REGULATORY AGENCIES

The above regulations, permits, and programs are administered by various local, state, and federal agencies. The history, purpose, and authority of these agencies are discussed below.

1.4.10.1 United States Environmental Protection Agency

The stated mission of the Environmental Protection Agency (EPA) is to protect human health and to safeguard the natural environment upon which life depends. EPA’s purpose includes protecting all Americans from significant human health risks, ensuring that national environmental efforts are based on the best available scientific information, ensuring that federal laws are enforced fairly, and that environmental protection contributes to making our communities and ecosystems diverse, sustainable, and economically productive. The Washington State Department of Ecology (Ecology) currently administers National Pollutant Discharge Elimination System (NPDES) permits and State Revolving Fund (SRF) loans on behalf of the EPA.

1.4.10.2 United States Fish and Wildlife Service

Under the ESA, the United States Fish and Wildlife Service (USFWS) is responsible for the protection of all non-marine life such as Bull Trout. Though USFWS may choose to invoke the blanket prohibitions of Section 9, the “threatened” status of Bull Trout allows more flexibility to establish regulations designed to protect these species. These regulations, known collectively as the Section 4(d) rule, outline activities likely to result in a “take” of a threatened species, as well as exempted activities. The activities would be identified through a project specific SEPA process.

1.4.10.3 National Marine Fisheries Service

Under the ESA, NMFS is responsible for the protection of marine life, including the anadromous salmon such as the Puget Sound Chinook. When a species is listed as “endangered” the prohibitions against “take” of the species are immediate under Section 9 of the ESA. Though NMFS may choose to invoke the blanket prohibitions of Section 9, the “threatened” status of the Puget Sound Chinook allows more flexibility to establish regulations designed to protect these species. These regulations, known collectively as the Section 4(d) rule, outline activities likely to result in a “take” of a threatened species, as well as exempted activities. The activities would be identified through a project specific SEPA process.
1.4.10.4 United States Army Corps of Engineers

Under the Clean Water Act (CWA), the US Army Corps of Engineers (Corps) is authorized to regulate discharge of fill and dredged material to waters of the United States, including wetlands. The Corps employs a system of General or Nationwide Permits for blanket authorization of activities, such as utility lines that have a minimal adverse impact on the environment. In situations where adverse impact is probable, the Corps may issue an Individual Permit after reviewing an analysis of alternatives, identified through a project’s SEPA process. Enforcement actions may be brought by the Corps or the EPA.

1.4.10.5 Washington State Department of Ecology

The mission of Department of Ecology’s (Ecology) Water Quality Program is to protect, preserve, and enhance surface and ground water quality and to promote the wise management of water for the benefit of current and future generations. Ecology performs various functions under state and federal authority and has both local and regional offices. Ecology is also responsible for awarding low-interest loans for water pollution control projects through the Washington State Water Pollution Control Revolving Fund (SRF) and grants and low-interest loans through the Centennial Clean Water Fund.

Ecology issues permits under the State Water Pollution Control Act, Section 401 Water Quality Certification, and NPDES permits in compliance with the CWA under EPA authority. Ecology regulates discharge or waste to the state’s groundwater, discharge of industrial or commercial waste to sewers, and the use of reclaimed water through the State Waste Discharge permit program. Ecology’s regional offices issue Temporary Modification of Water Quality Criteria Permits for construction near or in water that might cause short-term water quality violations.

The District also works with Ecology for reporting spills. The Spill Prevention, Preparedness and Response Program (Spills Program) is governed by Ecology with a mission to protect Washington’s environment, public health, and safety by prevention and active response for oil spills and other hazardous materials. The District must report spills to Ecology according to the Emergency Planning and Community Right-To-Know Act (EPCRA), also known as the Superfund Amendments and Reauthorization Act (SARA) which was signed into federal law in 1986 and the State of Washington adopted the federal Title III law and regulations in 1987. A State Emergency Response Commission (SERC) was formed to oversee requirements imposed by SARA, including the formation of the
local emergency planning committees and the development of a statewide master plan for hazardous materials incident response. The Program’s Northwest Regional Office is located in Bellevue, Washington. The emergency spills contact phone number is 1-800-OILS-911.

1.4.10.6 Washington State Department of Fish and Wildlife

Under WAC 220-110 and RCW 75.20, any form of work that uses, diverts, obstructs, or changes the natural flow or bed or any fresh water of the state requires HPA from WDFW. Approval would be required for all District construction projects that cross or otherwise take place in streams.

1.4.10.7 Washington State Department of Health and King County Public Health Department

Note that this department is responsible for individual wells and Class B water systems.

On-site septic systems in Washington State are governed by the Washington State Department of Health in accordance with the 246 WAC, Chapter 246-272A On-Site Sewage Systems. The Department of Health reviews and approves plans for large on-site systems with flows between 3,500 and 100,000 gallons per day. The Department of Health partners with local jurisdictions to review locations, design, installation, operation and maintenance, and monitoring of on-site sewage systems. The King County Public Health Department oversees all on-site septic systems located in King County, with flows less than 3,500 gallons per day. Sanitarians based out of the Eastgate Environmental Health Services location provide regulatory services for those septic systems located within the District’s service area.

1.4.11 LAND USE JURISDICTIONS

Land use jurisdiction boundaries are illustrated in Figure 1-3. Figure 1-3B provides a comparison of the District’s existing Sewer Annexed Area and Future Sewer Service Area.

1.4.11.1 King County

The King County Comprehensive Plan oversees and manages project growth within unincorporated King County. The Plan also designates areas for future growth through use of plans, policies and regulations. The Comprehensive Plan includes a land use map of unincorporated King County that defines future growth according to identified land use and densities. The Plan also defines an
LEGEND:
- DISTRICT CORPORATE BOUNDARY
- EXISTING SEWER ANNEXED AREA BOUNDARY
- PARCELS - KING COUNTY GIS

WATER

JURISDICTION:
- BELLEVUE
- CARNATION
- ISSAQUAH
- KIRKLAND
- NEWCASTLE
- REDMOND
- SNOQUALMIE

DATA SOURCE: KING COUNTY AND SAMMAMISH PLATEAU WATER & SEWER DISTRICT
LEGEND:

- **District Existing Sewer Annexed Boundary**
- **District Future Sewer Service Boundary**
- **Parcels - King County GIS**
- **Water**

DATA: SOURCE - KING COUNTY AND SAMMAMISH PLATEAU WATER & SEWER DISTRICT

SAMMAMISH PLATEAU WATER & SEWER DISTRICT

WASTEWATER COMPREHENSIVE PLAN

FIGURE 1-3B

EXISTING AND FUTURE SEWER SERVICE BOUNDARIES
urban growth boundary (UGB) which public utilities, such as the District, are required to support. The UGB also generally describes the area within which sanitary sewer service may be provided.

The District has agreements with King County as the regional wastewater purveyor. The King County Agreement for Sewage Disposal dated August 16, 1973, with the March 19, 1987 Extension of Agreement for Sewage Disposal and the October 2, 1992 Amendment to Agreement for Sewage Disposal, are in Appendix B. The 1973 Agreement, 1987 Extension and 1992 Amendment set forth the terms and conditions for District sewerage to be provided to and accepted by King County, and the method of billing and payment associated with King County’s transmission and treatment of the sewerage. The 1973 Agreement is in effect until July 1, 2036.

King County may also issue Industrial Waste Discharge Permits. Those issued in the District are typically limited to temporary stormwater discharge from construction sites. One customer has a Minor Discharge Authorization permit for electronic assembly operations processes. The industrial wastewater volume is limited by the Discharge Permit 722-03, and the total volume from the facility is similar to adjacent customers. This discharge has been permitted since 2002 and there have been no deleterious effects to the District’s sewer system. A list of current Industrial Waste Discharge Permits in the District is provided in Appendix B, along with Discharge Permit 722-03.

1.4.11.2 City of Sammamish

The City of Sammamish Comprehensive Plan was prepared in accordance with the GMA and the King County Countywide Planning Policies. It discusses regional growth management concerns, current land-use analysis including projections for Potential Annexation Areas (PAA), emphasizes the importance of protecting and preserving environmentally sensitive areas, establishes policies to guide development of surface transportation, and defines long-term financial and anticipated growth for new or improved City facilities through a capital investment program. The City of Sammamish was incorporated in 1999.

1.4.11.3 City of Issaquah

The City of Issaquah’s Comprehensive Plan was adopted in 1995, with most sections amended in 2011 and the most recent amendments made in 2013 and 2014. It provides guidelines to manage projected growth, protect sensitive and natural environments, and ensure that capital facilities are adequate and financially
feasible. It shows PAA for current and future growth and lists policies to improve City infrastructure and transportation as development occurs.

1.4.12 ADJACENT WASTEWATER PURVEYORS

Wastewater purveyor boundaries are shown in Figure 1-4.

1.4.12.1 City of Issaquah

The District’s sewer service boundary with Issaquah’s corporate boundary can be generally described as the urban area east of Lake Sammamish, east of Issaquah Creek, north and east of I-90, north of Locust Street, and north and west of the Issaquah Highlands. The City of Issaquah limits extend into the District’s sewer service area.

The southwest portion of the existing District Corporate Limits was added through a series of annexations prior to the Grand Ridge urban development proposal that became the Issaquah Highlands. The following two paragraphs clarify the current purveyor of water and sewer service to these areas.

The area within the District’s Corporate Limits located in the southeast and southwest quarters of Section 23, Township 24 North, Range 6 East was annexed for water service only, and is not in the District’s sewer service area. The portion of these quarter sections south of SE Black Nugget Road is provided both water and sewer service by the City of Issaquah. The portion north of SE Black Nugget Road is provided water service by the District, and is not eligible for sewer service as it is in the Rural area.

The areas within the District’s Corporate limits located in the southeast quarter of Section 22, Township 24 North, Range 6 East was annexed for both water and sewer service. The portion located in the Issaquah Highlands planned development area is provided both water and sewer service by the City of Issaquah. The new Lakeside development area located east of Highlands Drive NE (aka North Sammamish Plateau Access Road and the North/South Spar Couplet E-Line) is provided water service by the City of Issaquah and sewer service by the District.

No formal action has been taken to withdraw from the District’s Corporate limits the areas in Section 22 and 23 where all service is provided by the City of Issaquah. The Corporate limit boundary will be adjusted when this formal action has been completed. The District’s Future Sewer Service Boundary shown in many figures
does indicate the District’s intended sewer service area, unless further adjustments are made through interlocal agreement.

The District provides sewer service to one property within the City of Issaquah’s sewer service area with three customers located at 980 1st Avenue NE, immediately south of Locust Street. The sewer service is provided under the Agreement for Temporary Sewer Service, between Lakeside Industries, the City of Issaquah and the District. There is also an associated Supplement to Agreement for Temporary Sewer Service between the District and Lakeside Industries. Both Agreements are provided in Appendix C.

1.4.12.2 Northeast Sammamish Sewer & Water District Sewer

NESSWD borders the Sammamish Plateau Water and Sewer District service area to the north and is bounded by Lake Sammamish to the west, the City of Redmond to the northwest and the UGB to the northeast. The District and NESSWD coordinate provision of sewer service along their joint boundary through consideration of which purveyor can most efficiently provide service, without duplication of facilities. The boundary description has many turns and is best understood by referring to Figure 1-4.

Agreements supporting the permanent boundary location are provided in Appendix D and include:

- Agreement dated October 22, 1982- setting the general joint boundaries. This Agreement allowed the District and NESSWD to enter into cooperative agreements to serve properties that may lie in the physical service area of one service purveyor but which are more effectively served by the other agency.

- Interlocal Agreement for the Inglewood Basin/Northlake Sammamish Interceptor Sewer Study dated 6 May 1985-NESSWD and the District entered into agreement to begin a joint study of feasible alternatives to carry sewage through the Inglewood basin. This terms and conditions of this Interlocal Agreement were approved by the District in Resolution No. A-617 dated 20 May 1985.

- Interlocal Sewer Service Agreement approved by Resolution No. A-618 dated May 6, 1985 – regarding the provision of sewer service to the Demery Hill development by NESSWD.
• Transfer of sewer service area to NESSWD by Resolution 2070 dated February 10, 1997 – regarding 5 acres including the Cedar Park development.

• Transfer of sewer service area to NESSWD by Resolution 2332 dated August 17, 1998 – regarding 11.5 acres including the Sammamish Heights Estates plat and Scheckler 218th NE Short Plat L99S0028.

• Transfer of area to NESSWD by Resolution 2436 dated April 19, 1999 – regarding 5 acres including the Sammamish Plateau Estates Short Plat #SHP001009.

• Transfer of sewer service area to NESSWD by Resolution 2596 dated May 15, 2000 – regarding 5.2 acres including the Tax Parcels 2725069074 and 2725069086.

• Transfer of area to SPWSD from NESSWD by Resolution 3104 dated November 3, 2003 – regarding 5 acres including a portion of the plat of Llama Landing.

There are also a series of sewer service agreements that are associated with individual lots located within the District’s sewer service boundary, but are provided service from NESSWD. Two agreements are for temporary sewer service between NESSWD and owners of property in the District’s sewer service area. The others are associated with provision of permanent service from NESSWD.

Agreements for permanent sewer service from NESSWD without boundary modification include:

• Agreement for Sewer Service Provision by NESSWD (then Sahalee Sewer District) for Rook Property and Short Plat by Letter dated September 1982.

  Tax Parcel 1240100088: 21615 NE 16th and
  Tax Parcel 1240100094: 21623 NE 16th

  These properties are within the sewer service boundary of the District but are able to receive gravity service from NESSWD. The District did not oppose sewer service provision by NESSWD on a permanent basis.
• Sewer Service Agreement between NESSWD and Robert Moore and Diane Moore dated July 1987.

Tax Parcel 1240100080: 21401 NE 16th Street

This property is within the sewer service boundary of the District but is able to receive gravity service from NESSWD. NESSWD has agreed to provide sewer service to this property. The terms and conditions of this service agreement are described in the Agreement, which was signed in July 1987.


Tax Parcel 3575305520: 21133 NE 16th Street

This property is within the sewer service boundary of the District but is able to receive gravity service from NESSWD. NESSWD was willing to provide sewer service to this property. The terms and conditions of this service agreement are described in the Agreement, which was signed in January 1988.

• SPWSD Board approval for direct gravity service from NESSWD sewer main installed in NE 16th. Minutes dated November 6, 1995.

Tax Parcel 3575302285: 20619 NE 16th Street
Tax Parcel 3575302295: 20621 NE 16th Street
Tax Parcel 3575302300: 20609 NE 16th Street
Tax Parcel 3575302350: 1602 207th Avenue NE

These properties are within the sewer service boundary of the District but are able to receive gravity service from NESSWD. NESSWD was willing to provide sewer service to these properties. There are no individual service agreements.

• Direct gravity service available from NESSWD

Tax Parcel 1240100156: 1420 218th Avenue NE

This property is within the sewer service boundary of the District but is able to receive gravity service from NESSWD. NESSWD was
willing to provide sewer service to these properties. There is no individual service agreement.

Agreements for temporary sewer service from NESSWD include:

- Temporary Sewer Service Agreement between NESSWD (then Sahalee Sewer District) and Ernest E. Peterson and Phyllis A. Peterson dated April 1981.

  Tax Parcel 1240100153: 1244 218th Avenue NE and
  Tax Parcel 1240100152: 1250 218th Avenue NE

  These properties lie within the natural service area of the District, but gravity service was not available from the District. NESSWD has agreed to provide temporary sewer service to this property. The terms and conditions of this service agreement are described in the Agreement, which was signed in April 1981. A follow-up letter from 1986 indicated approval of service to a portion of the property proposed for segregation at that time.

- Temporary Sewer Service Agreement dated June 1983 and Addendum dated November 1983 between NESSWD (then Sahalee Sewer District) and Keith Creager.

  Tax Parcel 3575305500: 1530 - 211th Avenue NE
  Tax Parcel 3575305501: 1522 - 211th Avenue NE

  This property lies within the natural service area of the District, but gravity service was not available from the District. NESSWD agreed to provide temporary sewer service using a pressure system, to two homes on these properties. The terms and conditions of this service agreement are described in the Agreement, which was signed in June 1983.

  The owner requested a permit from King County to build and maintain the sewer service, part of which would be located in the public right-of-way. The permit was denied and the addendum was approved allowing the NESSWD to build and maintain the sewer service for this property owner within the public right-of-way. The Addendum was approved in November 1983.
Copies of the NESSWD agreements for temporary sewer service listed above are included in Appendix D.

1.5 SERVICE AREA

The Sammamish Plateau Water and Sewer District is located in King County approximately 15 miles east of the City of Seattle along the Interstate 90 corridor, immediately north of the City of Issaquah bordered by Lake Sammamish to the west and the Snoqualmie River Valley to the east. The District boundary has been created through multiple annexation actions, each approved by land use agencies, including the Boundary Review Board. While the District Corporate Boundary extends north to NE 100th, the sewer service area does not extend north of SR 202 because that area is all rural. The District provides water and sewer services for the City of Sammamish with the exception of the northeast portion, the north central portion of the City of Issaquah, and for areas of unincorporated King County in the District’s service area. The District is located on terrain characterized by rolling upland hills with crests ranging in elevation from 350 to 620 feet and the lowlands along the southerly and westerly service boundaries near Lake Sammamish range in elevations of 30 and 75 feet.

1.5.1 PHYSICAL DESCRIPTION

The District’s sewer service area is surrounded by distinct landscapes and water features. With a current service area covering approximately 20 square miles, the terrain is comprised of the Eastern Puget Lowlands along the southerly and westerly service perimeters and the plateau region. The eastern shores of Lake Sammamish serve as a natural border on the westerly boundary of the District’s service area. The District’s future sewer service boundary on the north and east is largely governed by the UGB, in general terms the sewer service area is enclosed by SR 202 on the north and east and I-90 on the south. Topography of the District and surrounding areas is shown in Figure 1-5.

1.5.1.1 Surface Water

Numerous other water bodies and wetland areas are located within the District boundaries such as Laughing Jacobs Lake, Pine Lake, Beaver Lake, and Yellow Lake. Drainage tributaries include North Fork of Issaquah, Many Springs Creek, Pine Lake Creek, Laughing Jacobs Creek, Ebright Creek, Eden Creek, George Davis Creek, and Evans Creek. These bodies run from the steep west slopes and carved ravines of the plateau and eventually into Lake Sammamish. The eastern boundary of the District includes Patterson Creek, which eventually discharges to the Snoqualmie River.
1.5.1.2 Geology and Soils

The District’s geologic features lend themselves to a diverse subsurface which varies from well-graded glacial sands and gravels to depositions of poorly-graded silt sedimtations. The District lies primarily on Alderwood soils (glacial till). The till is generally sub-rounded to well-rounded, glacially transported clasts, evidenced by the areas’ largely undulating surfaces. The soils near and along the westerly boundary, nearing the shores of Lake Sammamish, include moderate to well sorted stratified sand and gravel. There are also various areas of mass-wasting deposits with geologic formations such as sidewalls and ravines historically carved and shaped as a result of torrent precipitous weather patterns and subsequent landslides. The landslides have led to obscure underlying deposits and topography such as fines concentrations and the mentioned site features. Erosion and landslides have been mitigated by the King County and the Cities of Sammamish and Issaquah in recent years by regulating clearing and grading, and applying buffer zones and building setbacks to site-sensitive areas.

Areas to the north of Pine Lake and along the District’s easterly service boundary contain greater concentrations of silt and granular sediment. These areas generally have poorly graded stratified sediment. Land features include large depressions, or troughs, largely created over extensive time periods from deposition due to stagnant melting ice.

To the south, greater concentrations of sand and gravel are found due to the influence of ambient rivers and streams. This area has shown signs of vulnerability to water erosion as evidenced by expanding ravines and gullies. Also, with recent expansions, specifically land and urban development and the increase of resulting runoff – paired with the absence of finely graded materials – the conditions have also contributed to landslides and wasting. The District does not have a comprehensive stormwater plan as all stormwater, roadway and transportation design and maintenance is governed by the three land-use agencies, Sammamish, Issaquah, and King County. The locations of the soil classifications within and adjacent to the District are presented in Figure 1-6.

1.5.1.3 Climate

Considered part of the East Puget Lowlands and positioned along the approach to the Cascade Mountain Range via the Snoqualmie Pass Summit Highway, the District experiences moderately wet, cold winters and dry, warm summers. According to National Oceanic and Atmospheric Administration (NOAA) the annual average temperature is 44 degrees Fahrenheit with an average low
temperature of 15 degrees Fahrenheit in the winter and an average high
temperature of 83 degrees Fahrenheit in the summer. Winds are typically
generated from the west heading east from the Puget Sound up the Eastern
Lowlands and through the Snoqualmie Valley with annual high wind speeds
averaging 33 mph with a daily average wind speed of 1 mph. The referenced
NOAA weather station is located in Sammamish, Washington, near Sunny Hills
Elementary School.

The District collects weather data at the District office at 1510 228th Avenue SE in
Sammamish. Precipitation data for the District is summarized in Table 1-1. The
greatest average rainfall is in November.

**TABLE 1-1**

<table>
<thead>
<tr>
<th>Month</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>AVG.</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>5.17</td>
<td>5.45</td>
<td>6.46</td>
<td>6.57</td>
<td>5.73</td>
<td>4.92</td>
<td>5.72</td>
</tr>
<tr>
<td>February</td>
<td>2.57</td>
<td>1.75</td>
<td>2.48</td>
<td>4.18</td>
<td>3.96</td>
<td>3.15</td>
<td>3.02</td>
</tr>
<tr>
<td>March</td>
<td>5.50</td>
<td>5.21</td>
<td>5.28</td>
<td>6.55</td>
<td>7.03</td>
<td>3.18</td>
<td>5.46</td>
</tr>
<tr>
<td>April</td>
<td>2.75</td>
<td>4.22</td>
<td>4.16</td>
<td>5.00</td>
<td>3.08</td>
<td>6.57</td>
<td>4.30</td>
</tr>
<tr>
<td>May</td>
<td>2.14</td>
<td>3.85</td>
<td>5.45</td>
<td>4.39</td>
<td>2.69</td>
<td>2.01</td>
<td>3.42</td>
</tr>
<tr>
<td>June</td>
<td>2.56</td>
<td>0.95</td>
<td>4.10</td>
<td>2.56</td>
<td>3.74</td>
<td>1.80</td>
<td>2.62</td>
</tr>
<tr>
<td>July</td>
<td>1.00</td>
<td>0.10</td>
<td>0.99</td>
<td>0.84</td>
<td>0.63</td>
<td>0.09</td>
<td>0.61</td>
</tr>
<tr>
<td>August</td>
<td>3.39</td>
<td>1.31</td>
<td>0.62</td>
<td>0.18</td>
<td>0.00</td>
<td>2.38</td>
<td>1.31</td>
</tr>
<tr>
<td>September</td>
<td>1.50</td>
<td>3.53</td>
<td>4.01</td>
<td>0.89</td>
<td>0.38</td>
<td>6.50</td>
<td>2.80</td>
</tr>
<tr>
<td>October</td>
<td>2.42</td>
<td>7.15</td>
<td>4.48</td>
<td>4.20</td>
<td>6.31</td>
<td>1.89</td>
<td>4.41</td>
</tr>
<tr>
<td>November</td>
<td>7.22</td>
<td>9.57</td>
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<td>6.67</td>
<td>8.01</td>
<td>4.76</td>
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<tr>
<td>December</td>
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<td>2.75</td>
<td>9.44</td>
<td>0.69</td>
<td>7.57</td>
<td>2.81</td>
<td>4.53</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>40.14</td>
<td>45.84</td>
<td>53.46</td>
<td>42.72</td>
<td>49.13</td>
<td>40.06</td>
<td>45.23</td>
</tr>
</tbody>
</table>

1.5.1.4 Critical Areas

King County Department of Permitting and Environmental Review has compiled
information and generated a Sensitive Areas Map which illustrates critical or
*_sensitive* areas that exist within King County. Sensitive areas identified on the map
include erosion and slide hazards, seismic areas, flood hazards, streams, and
wetlands. The map identifies several sensitive areas within the District’s corporate
boundary.

Erosion and slide hazards are identified areas that are considered unstable.
Commonly due to steep slopes, loosely compacted or unconsolidated soils and
often without or lacking vegetation, these areas are at risk to erosion or sliding.
The District has approximately 6,500 acres of erosion and slide hazard areas within the corporate boundary. Erosion and slide sensitive areas are predominantly found along the easterly corporate boundary and the shores of Lake Sammamish where there’s a significant change in topography. The sensitive areas along the Lake Sammamish shores are within the North Lake Sammamish, Central Lake Sammamish and Mallard Bay and Freegard sewer basins, whereas the slide areas along the eastern slopes of the plateau are in the Trossachs and Northeast Plateau sewer basins (sewer basins are described in the Existing Sewer System section later in this chapter). Critical areas within the District are shown in Figure 1-7.

Flood hazards are areas that are prone to flooding during peak runoff periods. The District service area contains flood hazards mostly located near water bodies. A large flood plain is located south of Lake Sammamish, confined to the District’s Mallard Bay and Freegard sewer basins. Another flood hazard is located in the District’s Trossachs sewer basin along Patterson Creek. Figure 1-8 identifies the floodplain areas within and around the District.

Streams are considered sensitive because they are often tributaries and therefore affect much larger water bodies and ecosystems. The District has several sensitive streams identified as salmon bearing. These streams, which meander through mostly the west and central sewer basins, include Pine Lake Creek, Many Springs Creek, George Davis Creek, Ebright Creek, Eden Creek and Laughing Jacobs Creek. They drain into Lake Sammamish flowing east-to-west from the elevated plateau region to the east.

Tributaries to Evans Creek are located primarily in the northeast sewer basins, flowing north. The North Fork of Issaquah Creek and Jordan Creek flow into Issaquah Creek. Issaquah Creek then flows through the Freegard sewer basin and drains into Lake Sammamish. Patterson Creek, another sensitive stream, flows through the Trossachs sewer basin and along the easterly boundary of the District to the Snoqualmie River.

Wetlands, according to the CWA enacted by the Environmental Protection Agency (EPA), are those areas that are saturated by surface or groundwater either all year or periods throughout the year including the growing season. Wetlands generally include swamps, marshes, bogs and similar areas. The District contains approximately 1,175 acres of identified wetlands that are spread throughout the District’s service area. Glacial soils and areas with flatter topography are a combination that results in wetland areas within the District.
1.5.1.5 Aquifer Susceptibility

King County has identified areas within the District that overlie significant groundwater resources and are particularly susceptible to groundwater contamination. These high vulnerability areas that have a significant number of private septic systems could be considered for future sewer extensions and provide public sewer. This would reduce the amount of septic tank effluent from entering the aquifer and thereby reducing the potential of contamination to the groundwater supply and nearby water wells. King County’s aquifer susceptibility map is provided as Figure 1-9. This general overview of aquifer susceptibility is different than the Critical Aquifer Recharge Area and Wellhead Protection delineations developed with more detailed information for areas around drinking water wells. The Critical Aquifer Recharge Area and Wellhead Protection Area delineations can be found in King County I-Map Groundwater Program Map and in the District’s Water Comprehensive Plan.

1.6 LAND USE PLANNING

The current land use for the District is shown in Figure 1-10. There are three different land use classifications within the District to correlate with the Cities of Sammamish and Issaquah, and areas of unincorporated King County, which all are provided sewer service by the District. These zoning designations are used to develop buildout population estimates later in Chapter 2.

1.7 WATER SYSTEM

The District owns and operates a water supply, storage and distribution system. The District’s water system, partitioned by the Redmond-Fall City Road, is divided in two distinct water service zones: (1) the Plateau Zone, and (2) the Cascade View Zone. The Plateau Zone, located south of Redmond-Fall City Road, has 11 operational wells, six storage tanks, and five major pressure zones and booster pump stations. The Cascade View Zone is supplied by three wells and has two active storage tanks, and three major pressure zones and two booster pump stations.

The District currently provides water service to areas that are designated rural and therefore will continue to use septic systems. The Cascade View Zone, the water service area north of Redmond-Fall City Road, is all rural, and there are rural fringes along the eastern and southern portions of the Plateau Zone as well. In addition, a large number of properties within the urban area of the District still use septic systems. Approximately half of the residential population that resides
within the District’s water service boundary has private on-site septic systems. A map of the District’s water service system is provided as Figure 1-11.

1.8 EXISTING SEWER SYSTEM

As of 2011, the District’s sewer service area covers approximately 20 square miles, and provides service to the City of Sammamish with the exception of the northeast portion, the north central portion of the City of Issaquah and for areas of unincorporated King County in the District’s service area, serving approximately 10,433 customers. Sewer system facilities include gravity sewers, grinder pumps and low-pressure mains, a control structure, lift stations, and force mains. The sewer service area is divided into 13 sewer basins. The sewer basins are further divided into sub basins which are designated according to topography and natural flow patterns. A representation of the District’s sewer service area and its 13 sewer basins is shown in Figure 1-12.

1.8.1 REGIONAL WASTEWATER SYSTEM

The District sewer collection system flows into and is treated by the KCDNR sewer system. Currently, all flows are directed to the south to Renton (Southern Diversion), but future plans include a second connection to the King County system to the north (North Diversion).

1.8.1.1 Southern Diversion – Renton

Currently, all sewage produced within the District sewer service area is sent to the King County system at the south end of the District.

Sewage from all of the District’s sewer basins, less the Freegard sewer basin, flows into two, parallel 20-inch pipes beginning at SE 43rd Way and East Lake Sammamish Parkway SE, extending south along East Lake Sammamish Parkway to SE 56th, and then west along SE 56th to the bridge over Issaquah Creek. Just east of the bridge the flows from the Freegard sewer basin connect, and the two pipes combine into a single pipe crossing the bridge. West of the bridge the single pipe splits into two parallel pipes once again. The two pipelines extend along SE 56th Street (as NW Sammamish Road), eventually connecting into the KCDNR Sewer System at Manhole R17-36, near the entrance to Lake Sammamish State Park.

King County is working with the District to take over ownership and operation of the interceptor system along East Lake Sammamish Parkway and SE 56th Street. When this is completed, the District will have two connection points to the
KCDNR system; one at the Control Structure and the other at the Freegard Lift Station connection point at 221<sup>st</sup> and SE 56<sup>th</sup> Street.

From the entrance to Lake Sammamish State Park, the King County system currently conveys the sewage to their South Treatment Plant in Renton, Washington. Wastewater flows to the Sunset Pump Station, and is pumped from the Sunset Pump Station to the Heathfield Lift Station. The sewage then flows by gravity into the South Treatment Plant.

The South Treatment Plant (STP) currently serves approximately 730,000 customers from King County’s East Service area. The East Service Area treats wastewater primarily on the eastside of Lake Washington, with service boundaries reaching Kirkland to the north, Issaquah to the east, and Auburn - including parts of Pierce County - to the south. Lake Washington is a natural boundary to the west.

The STP was constructed in 1958, now covering approximately 94 acres in Renton, Washington, and is located north of Interstate 405 approximately 1 mile east of Interstate 5. The STP is designed for an average wet-weather flow of 115 million gallons per day (mgd) with an instantaneous maximum capacity of 325 mgd. All wastewater entering the Plant receives secondary chemical treatment with anaerobic digestion, generating Class “B” biosolids, before being pumped via a 12-mile effluent pipeline to its deepwater outfall in the Puget Sound. The outfall is 10,000-feet long, 625-feet deep, and equipped with four diffusers, each 500 feet in length.

1.8.1.2 North Diversion – Brightwater Treatment System

In response to increased growth in the region, King County constructed Brightwater Treatment System (Brightwater), a regional wastewater treatment plant, to treat sewage in Washington’s King and Snohomish Counties. Brightwater is intended to provide relief to King County’s South Treatment Plant in Renton by accepting future flows from areas either currently or potentially treated by the South Treatment Plant. Areas as far south as Issaquah, including the District, will contribute future sewage flows to Brightwater. Further discussion of the North Diversion is provided in Chapter 4.

Brightwater is positioned on a 114-acre site, located just north of the City of Woodinville at the intersection of State Route 9 and State Route 522. The treatment process includes screens and degritting equipment, and primary clarifiers for primary treatment, and fine screens, aeration basins, and membrane tanks for secondary treatment. Brightwater can produce Class A reclaimed water which can
be used for non-potable resources such as irrigation and nutrient-rich biosolids that can be recycled for fertilization or soil amendment. Brightwater is designed to treat a buildout average daily flow of 54 mgd and a peak-hour flow of 170 mgd.

The conveyance system includes 13 miles of pipeline built in a deep-bore tunnel connecting the treatment plant in Woodinville to its outfall location at Point Wells in the Puget Sound, near the King and Snohomish County border. The outfall, located approximately 600 feet below the surface, consists of two 60-inch-diameter effluent pipes discharging treated wastewater one mile into the Puget Sound via a 500-foot diffuser.

Brightwater construction began in 2006 and began treatment operations in September 2011. The conveyance system and outfall became fully operational in fall 2012. The regional sewer map, which includes Brightwater and its forecasted conveyance system, is shown in Figure 1-13.

### 1.8.2 DISTRICT WASTEWATER SYSTEM

The District’s wastewater collection system is comprised of gravity sewers, grinder pumps and low-pressure force mains, lift stations and force mains, a control structure and low-pressure interceptors. There are no controlled overflow locations in the District. The likely locations of uncontrolled overflows that could occur with a lift station failure are noted in Section 4.3.1.

#### 1.8.2.1 Gravity System

The District’s preferred method for sewer collection and transmission is the installation of gravity sewers. The District’s gravity wastewater collection and transmission system is comprised of approximately 150 miles of pipe varying in size from 8-inch collectors to 36-inch interceptors, and is relatively new with approximately 90 percent of the system being constructed since 1980.

According to the District’s Standard Specifications, gravity collection system sewer pipe should be installed using polyvinyl chloride (PVC) or epoxy-lined ductile iron. Gravity sewer installed at a slope of 20 percent, or greater, should be composed of C-900 or lined ductile iron. Most of the District’s gravity sewer is composed of PVC pipe. District sewer system specifications and standards are provided in Appendix E. The District’s sewer collection system is shown in Figure 1-14.
1.8.2.2 Grinder Pumps

The varied topography of the District’s service area makes it difficult to serve all properties using the preferred method of installing a gravity collection system with gravity side sewers. If a property cannot be served by gravity sewer mains and gravity side sewers, then an individual grinder pump may be installed to pump sewage up to the sewer main. Grinder pumps are commonly installed at residences that are positioned at a lower elevation than the adjacent gravity sewer main. When there are small areas that cannot flow by gravity to the system, a series of individual grinder pumps may pump into a District-owned low pressure force main.

In 1990, the District adopted a policy to own and maintain all grinder pump systems installed within the District’s sewer service area and provided a standard specification for grinder pump systems used. As of 2013, the District currently maintains 420 grinder pump systems which are located primarily in low-lying areas and near shorelines such as Pine Lake, Beaver Lake, and Lake Sammamish. The District has a standard grinder pump system and requires each house to have its own individual grinder pump system. A summary of the District’s grinder pump systems by sewer basin is provided in Table 1-2.

There are approximately 20 privately owned and maintained grinder pump systems that were installed prior to adoption of the District ownership policy. These are not included in the District totals.
### TABLE 1-2
Grinder Pumps

<table>
<thead>
<tr>
<th>Sewer Basin</th>
<th>Grinder Pumps&lt;sup&gt;(1)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaver Dam</td>
<td>1</td>
</tr>
<tr>
<td>Central Lake Sammamish</td>
<td>86</td>
</tr>
<tr>
<td>Freegard</td>
<td>9</td>
</tr>
<tr>
<td>Inglewood East</td>
<td>11</td>
</tr>
<tr>
<td>Laughing Jacobs</td>
<td>7</td>
</tr>
<tr>
<td>Mallard Bay</td>
<td>35</td>
</tr>
<tr>
<td>North Lake Sammamish</td>
<td>187</td>
</tr>
<tr>
<td>North Sunnyhills</td>
<td>18</td>
</tr>
<tr>
<td>Northeast Plateau</td>
<td>0</td>
</tr>
<tr>
<td>South Pine Lake</td>
<td>28</td>
</tr>
<tr>
<td>Tiburon</td>
<td>0</td>
</tr>
<tr>
<td>Trossachs</td>
<td>10</td>
</tr>
<tr>
<td>Yellow Lake</td>
<td>28</td>
</tr>
<tr>
<td><strong>Total Grinder Pumps</strong></td>
<td><strong>420</strong></td>
</tr>
</tbody>
</table>

<sup>(1)</sup> As of November 2013.

1.8.2.3 Low-Pressure Force Mains

The District system includes some low-pressure collection sewer mains to convey wastewater, similar to sewer force mains. However, instead of being fed by lift stations, the low pressure force mains are fed by grinder pumps.

1.8.2.4 Lift Stations

When gravity service is not feasible for an area, lift stations and associated force mains are constructed to receive and transport the District’s sewage. The District currently has 19 sewer lift stations, operating in 11 of the 13 sewer basins within the District’s sewer service area. Laughing Jacobs is the District’s only sewer basin without a permanent lift station. The Tiburon Basin does not have any sewer service yet, but will require a lift station when service is provided. A new interim lift station (Benham Ridge) will be added in the Tiburon Basin in 2014.

Lift stations are installed according to District-approved plans and specifications, and may be wet well/dry well or utilize submersible pumps. The lift station capacity determines the type of lift station, and whether an on-site standby generator is required. Permanent lift stations may be either full size or "mini" lift
LEGEND:

- **District Future Sewer Service Boundary**
- **King County Wastewater Treatment Plants**
- **Other Agency WWTP**
- **District Major Sewer Lines**
- **Interceptors**
- **Water**
- **District Corporate Boundary**

DATA SOURCE: KING COUNTY AND SAMMAMISH PLATEAU WATER & SEWER DISTRICT

SAMMAMISH PLATEAU WATER & SEWER DISTRICT

WASTEWATER COMPREHENSIVE PLAN

FIGURE 1-13
REGIONAL SEWERS

M:\SammPlat\11475 WW Comp Plan\GIS\REGIONAL SEWER.mxd
stations. Full size lift stations have permanent standby generators. The District is revising its standard to submersible pumps for safer and easier maintenance. In general, 100 ERUs is the maximum threshold criteria for use of a mini-lift station. Mini-lift stations may use duplex grinder pump systems. Mini-lift stations over 50 ERUs are required to have an on-site standby generator, although some mini-lift stations in remote areas or with limited emergency capacity may also be required to have on-site standby generators.

The District may allow interim lift stations when the permanent gravity system to serve an area will not be available at the time of service provision. Interim lift stations are built to permanent standards, but are expected to be abandoned eventually. Temporary lift stations are allowed when permanent downstream gravity collection systems are assured to be available within 3 years. Temporary lift stations may have reduced standards and requirements.

A schematic representation of the District’s existing and future system of sewage lift stations is shown in Figure 1-15 and Figure 1-16, respectively.

### 1.8.2.5 Force Mains

The District currently maintains 15 miles of force main, ranging in size from 4 to 20 inches in diameter, primarily composed of ductile iron and HDPE pipe. District force mains are extensions from the nineteen active sewer lift stations. Force mains often discharge into the gravity system. However, the topography in the District’s sewer service area has led to several situations where force mains from multiple lift stations manifold together into a common force main. District force main specifications and standards are provided in Appendix E.

### 1.8.2.6 Control Structure

The District has a Control Structure that is located on SE 43rd Way and approximately 216th Avenue SE. The Control Structure was designed and originally used to create static head in the downstream interceptor system, and to develop scouring velocities during periodic flow release to prevent solid deposits in the long, flat low-pressure force main interceptor that followed. When first installed, the Control Structure operated as a regular flushing facility due to the low volume of flows generated by the District’s initial sewer customers.

The Control Structure no longer acts as a regular flushing facility because the District currently passes enough flow to provide sufficient scour. Wastewater still enters the Control Structure and is screened for large debris, before reentering the system. The structure is also equipped with an outside accessed hopper with flap
gate that the District uses to discharge sewage waste from its Vactor Trucks. The Control Structure can also be used for flow storage during brief periods of downstream maintenance. King County owns and maintains a calcium nitrate system onsite to reduce the development of odors downstream.

1.8.2.7 Low-Pressure Interceptors

The District’s system also includes low-pressure sewer interceptors. These include approximately 5.6 miles of low-pressure interceptors along SE 43rd Way and the two parallel 20-inch-diameter mains located south of the intersection of SE 43rd Way and East Lake Sammamish Parkway SE. The mains extend from this location south to SE 56th Street, and then west to the entrance to Lake Sammamish State Park, where the pipes join with the King County system.

The head pressure for these interceptors is supplied from the Central Lake Lift Station, the Mallard Bay Lift Station, static head pressure from flows traveling through the Control Structure, and the Freegard Lift Station.

The low pressure sewer interceptors from the Control Structure westward are slated to be turned over to King County for operation and maintenance as part of the King County system.

1.8.2.8 Septic Systems

The District has approximately 3,486 on-site septic systems in operation within its sewer service area (as of the end of 2011). A large portion of those properties containing on-site septic systems do not have the ability to connect to the District’s existing sewer system because sewer has not yet been extended to their area. There are 767 District water customers in the rural area that also use septic systems, and are not allowed or expected to connect to a sewer system.

The King County Health Department has jurisdiction over septic systems. The District does not maintain or provide services for individual on-site septic systems, but does offer services for community drain field systems. Further information concerning on-site septic systems and sewer connections is discussed in Chapter 6.
EXISTING SEWER SYSTEM SCHEMATIC

LEGEND:
- Sewer Basin Name
- Control Structure
- Lift Station
- Future Lift Station
- Interim Lift Station
- Abandoned Lift Station
- Gravity Main
- Force Main
- Interim Force Main
- Low Pressure Gravity Interceptor
- King County Interceptor
1.9 SEWER CONNECTION POLICIES

Planning policies are important in guiding the development of a sanitary sewer system. The three land use agencies in the District each have requirements for sewer connections, which are administered by the District. The District has adopted many resolutions regarding sanitary sewer system planning that are included in the District Resolutions, Board motions and adopted plans. District policies, including sewer connection policies, are provided in Chapter 6. The three land use agencies within the District’s service area are the Cities of Issaquah and Sammamish, and Unincorporated King County.