

**KING COUNTY CONVEYANCE SYSTEM
IMPROVEMENT PROJECT**

**MILL CREEK / GREEN RIVER SUBREGIONAL
PLANNING AREA**

TASK 220 REPORT

EXISTING FACILITIES

February 2000



KING COUNTY
Department of Natural Resources

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INTRODUCTION

This section describes existing and proposed sewerage facilities within the Mill Creek/ Green River Subregional Planning Area . The discussion is divided into King County's regional facilities and facilities owned by local service agencies (local sewer agencies).

REGIONAL FACILITIES

King County owns and operates several wastewater pump stations, interceptors, and trunk sewers in the Mill Creek / Green River Subregional Planning Area (MC/GR). Figure 210-6 shows the King County facilities in the MG/CR. Wastewater facilities are located in King County's East Section service area, which contains approximately 90,000 sewered acres, extending from Juanita/Kirkland and Woodinville in the north to just north of the Pierce/King County border. All East Section flow is treated at the East Section Reclamation Plant (ESRP) in Renton. This section describes key King County facilities that serve the Mill Creek / Green River Subregional Planning Area.

WASTEWATER TREATMENT FACILITIES

There are no wastewater treatment facilities in the Mill Creek / Green River Subregional Planning Area.

CONVEYANCE FACILITIES

King County owns the Clark Fork Trunk and the North Soos Trunk in the Soos Creek Water and Sewer District (Soos Creek WSD). In Auburn, the county owns the M Street Trunk, N Sewer Interceptor, Algona–Pacific Interceptor, West Valley Interceptor, Auburn West Valley Gravity Sewer, Auburn West Interceptor, and Auburn Interceptor Sections 1 and 2. In Kent, King County owns the West Hill Trunk, ULID No. 1 Contract No. 4 Kent Interceptor, ULID 250 Kent Interceptor, Kent Cross Valley Interceptor, Auburn Interceptor Section 3, Mill Creek Trunk, South Interceptor (in construction) and South 277th Street Trunk (in construction).

PUMP STATIONS

Table 220-1 lists and describes the major pump stations relevant to regional sewer service in the Mill Creek / Green River Subregional Planning Area. The Pacific Pump Station serves the King County sewer basin of Pacific, which includes most of the city of Pacific, except for the area east of the White River. The city has annexed areas on the south and west and plans to route flow from them to this pump station. Black Diamond Pump Station serves the King County sewer basin of Covington, which includes the city of Black Diamond. It pumps flow to Soos Creek WSD Lift Station 11. Lakeland Hills Pump Station serves the King County sewer basins of White River and Lakeland Hills.

King County Conveyance System Improvements

Table 220-1. Pump Stations Significant to Regional Sewer Service in Mill Creek/Green River Subregional Planning Area

| Name (Number) and Location | Type of Station | Number of Pumps | Pump Rate (gpm) | Pump Size (inches) | Force Main Size (inches) | Destination | Emergency Power | Year Built | Remarks | TDH (feet) |
|------------------------------------|-----------------|-----------------|------------------------|--------------------|--------------------------|---------------------------|-----------------|------------|--|------------|
| KING COUNTY | | | | | | | | | | |
| Lakeland Hills | Dry/wet | 2 | #1 – 5000 #2 – 7360 | | 12 | Lakeland Hills Force Main | Portable | 1982 | Space for a third pump; parallel 20-inch force main not used. | |
| Black Diamond Pacific | Dry/wet | 2 | #1 – 660 #2 – 660 | | 12 | Algona–Pacific Trunk | | | | 27.5 |
| CITY OF AUBURN | | | | | | | | | | |
| 22 nd Street | Dry/wet | | 550 | | | M Street Trunk | | <1979 | | 50 |
| 8 th Street | Dry/wet | | 100 | | | M Street Trunk | | <1979 | | 11 |
| D Street | Dry/wet | | | | | Auburn Interceptor | | <1979 | | 26.5 |
| Dogwood | Dry/wet | | 200 | | | M Street Trunk | | <1979 | | 30 |
| Ellingson Road (A Street) | Dry/wet | | 500 | | | Lakeland Hills Force Main | | <1979 | | 52 |
| F Street | | | | | | M Street Trunk | | <1979 | Replaced at adjacent site since 1979. | 20 |
| R Street | Dry/wet | | 100 | | | M Street Trunk | | <1979 | | 15 |
| Riverside | | | | | | M Street Trunk | | >1979 | | |
| CITY OF KENT | | | | | | | | | | |
| Horseshoe Acres | Dry/wet | 2 | #1 – 650 #2 – 650 | | | Auburn Interceptor | | <1980 | Upgraded to 2,000 gpm and new motors, impellers, and electrical. | |
| 7942 S 261 st Street | | | | | | S 277 th Trunk | | | Upgrading in progress to eliminate upstream pump stations. | |
| Soosette Creek | | | | | | | | | | |
| 11808 SE 256 th Street | | | | | | | | | | |
| Linda Heights | | | 330 | | | West Hill Interceptor | Onsite | | | |
| 3406 S 248 th Street | | | | | | | | | | |
| CITY OF PACIFIC | | | | | | | | | | |
| 5 th Avenue SW & Tacoma | Dry/wet | 2 | #1 – 250 #2 – 250 | | | Pacific Pump Station | | | | 42 |
| West Cedar Glen | Dry/wet | 2 | #1 – 121 #2 – 121 | | | Pacific Pump Station. | | | | 20 |
| Sundown Meadows | Dry/wet | 2 | #1 – 250 #2 – 250 | | | Pacific Pump Station | | | | 16.6 |
| | | | | | | | | | | 6.6 |

Table 220-1. Pump Stations Significant to Regional Sewer Service in Mill Creek/Green River Subregional Planning Area
(continued)

| Name (Number) and Location | Type of Station | Number of Pumps | Pump Rate (gpm) | Pump Size (inches) | Force Main Size (inches) | Destination | Emergency Power | Year Built | Remarks | TDH (feet) |
|--|-----------------|-----------------|-------------------------------------|--------------------|--------------------------|--|-----------------|------------|--|------------|
| SOOS CREEK WATER AND SEWER DISTRICT | | | | | | | | | | |
| Lift Station 10 Clark Fork 14321 SE 255 th Place | Dry/wet | 3 | #1 – 2500 #2 – 2500 #3 – 3300 | 8 10 10 | 16 | West to Kent–Cascade Relief Interceptor then to Mill Creek Interceptor (will flow to 277 th Trunk when it is completed) | Onsite | | 1991–1993: #1 and #2, new pump and motor; #3, new motor. Future: upgrade/relocation to Lift Station 10B site planned. | |
| Lift Station 11 Covington 18401 SE Timberlane Boulevard | Dry/wet | 3 | #1 – 1700 #2 – 3200 #3 – 3200 | 8 8 10 | 14 | West to Kent Cascade Relief Interceptor then to Mill Creek Interceptor (will flow to 277 th Trunk when it is completed) | Onsite | | 1992: ventilation modified; #1 and #3, new motors and controls; 1996: #2, new pump, motor, and controls. Future: 400,000-gallon emergency storage planned. | |
| Lift Station 14 Crystal View SE 256 th Street & 171 st Avenue SE | Dry/wet | 2 | #1 – 500 #2 – 500 | 4 4 | 6 | West to Lift Station 10 | Portable | | | |
| Lift Station 15 Cedar Downs 25331 Witte Road SE Lift Station 15B Maple Valley 24006 215 th Avenue SE | Dry/wet | 2 | #1 – 900 #2 – 900 | 4 4 | 6 | West to Lift Station 11 | Onsite | | 1990: #1 and #2, motors replaced, station remodeled, to be replaced by Lift Station 15B. | |

COMPARISON TO 1958 PLAN

Existing King County facilities have been built according to the sewer comprehensive plan defined by the *1958 Metropolitan Seattle Sewerage and Drainage Survey* (the 1958 Plan) and subsequent amendments adopted by resolution.

ISSUES AND PROBLEMS

A meeting of King County Wastewater Treatment Division personnel was held in December 1998 to discuss issues and problems in the East Section service area. Comments are summarized below.

M STREET TRUNK

No overflows have been reported from this gravity sewer but it is suspected of reaching hydraulic limits. This sewer appears on the list of storm-affected facilities.

PACIFIC PUMP STATION

It was suggested that the sewer comprehensive plan had recommended eliminating the pump station and extending a gravity line to serve that area. The amendment to the comprehensive plan that pertains to this area is the *Comprehensive Sewage Disposal Plan, Green River Sewerage Area and Portion of White River Watershed*, November 1973 (Resolution No. 2025). The amendment provides for an interceptor and pump station to serve the area. Participants stated that the pump station has reached the end of its useful life, does not meet confined space standards, and has reliability problems. There is no overflow bypass other than the street) and no standby or backup power. Participants indicated that no capacity issues have arisen, even though the Pacific/Algona sewers are very leaky and have high inflow and infiltration rates.

LAKELAND HILLS PUMP STATION

Participants reported that an elementary school at a low elevation has been affected twice by overflows. Problems noted include corrosion damage to the force main and wet well, lack of standby power or telemetry, and access that does not meet the standards of WSHA/OSHA (state and federal Occupational Safety and Health Administration). Pumps run constantly at full speed, indicating capacity and reliability concerns, and high infiltration and inflow are suspected.

LOCAL FACILITIES

There are no wastewater treatment facilities in the Mill Creek / Green River Subregional Planning Area . All wastewater is conveyed to the East Section Reclamation Plant at Renton.

ALGONA

Figure 210-9 shows the city boundaries and local service areas for the cities of Auburn, Algona, and Pacific. No information is available on conveyance facilities, pump stations, known rehabilitation requirements, planned system changes, ownership, or operation and maintenance of facilities for Algona.

AUBURN

The following information is from the *Comprehensive Sewerage Plan for the Sewage Collection System, City of Auburn, Washington, 1979* dated March 1982 (prepared by URS Company).

Service area boundaries shown in the sewer comprehensive plan differ significantly from King County's current boundary (see Figure 210-9). Auburn service basins can be roughly correlated to King County's *Regional Wastewater Services Plan (RWSP)*. The service area extends beyond the 1958 plan boundary, and basins do not correlate well with each other.

All Auburn flow leaves the city through the Auburn Interceptor. Some flow enters the Auburn Interceptor directly. Other flows are routed first through the N Sewer Interceptor or the M Street Trunk.

CONVEYANCE FACILITIES

Approximately 82 miles of interceptor, trunk, and lateral sewers along with nine pump stations serve portions of 17 sewer basins. The quantity of flow through pump stations in 1979 was itemized in the sewer comprehensive plan.

PUMP STATIONS

See Table 220-1 for information on major pump stations in Auburn.

KNOWN REHABILITATION REQUIREMENTS

Rehabilitation requirements as defined by the 1979 sewer comprehensive plan are outdated.

PLANNED SYSTEM CHANGES

Three new pump stations were proposed: Riverside Avenue Pump Station serving Lee Hill, Second Street Pump Station serving the upper Green River basin and part of the Soos Creek basin, and Lakeland Hills Pump Station. The Dogwood Pump Station was to be replaced with a gravity main. The C Street Pump Station and D Street Pump Station are to be replaced by gravity sewers connecting to King County facilities. The E Street Pump Station is to be relocated.

OPERATION AND MAINTENANCE

Cleaning and video inspection of sewer pipes and manhole inspection are performed continuously, one quarter section at a time. In addition, temporary summer employees are hired to inspect manholes. All new sewers are video inspected before acceptance.

COMPARISON TO 1958 PLAN

Existing King County facilities have been built according to the sewer comprehensive plan defined by the 1958 Plan and amendments subsequently adopted by resolution.

BLACK DIAMOND

Figure 210-10 shows the Black Diamond city boundary and local service area. The following information is from the *Enumclaw-Black Diamond Regional Sewerage Study* dated June 1970 (prepared by Metropolitan Engineers), *Facility Plan for Wastewater Treatment System* dated June 1988 and *Comprehensive Sewerage Plan* dated October 1988 (both prepared by Brown and Caldwell), in addition to information provided by King County.

CONVEYANCE FACILITIES

Flow collected in Black Diamond is pumped through approximately 40,000 lineal feet of force main and gravity conveyance pipeline to Lift Station 11 (Covington Pump Station) owned by Soos Creek WSD. Black Diamond flow is conveyed to the King County regional system through the Soos Creek sewer system under an agreement that limits service to 3,600 people (1 million gallons per day) in Black Diamond.

PUMP STATIONS

The city of Black Diamond operates and maintains a small pump station serving the Morganville area.

KNOWN REHABILITATION REQUIREMENTS

The city's agreement with Soos Creek WSD limits the extent of infiltration and inflow permissible in the system. This limit has been reported to be exceeded, which may trigger improvements to reduce infiltration and inflow. Black Diamond is contributing a share of the cost of the improvements to the Soos Creek WSD South End conveyance system along SE 256th Street.

COMPARISON TO 1958 PLAN

The Black Diamond service area was not included in the 1958 Plan Sewerage Area.

KENT

Figure 210-11 shows the Kent city boundary and local service area. The following information is from the *City of Kent Comprehensive Sewerage Plan* dated December 1980 (prepared by URS Company).

CONVEYANCE FACILITIES

According to the sewer comprehensive plan, Kent has approximately 445,000 feet of sewer pipe.

PUMP STATIONS

See Table 220-1 for information on major pump stations in Kent.

KNOWN REHABILITATION REQUIREMENTS

Many pipeline rehabilitation projects, mostly in the downtown Kent area, were planned for the 1980s. Upgrading of the Aero-Kent and Horseshoe Acres pump stations was also planned. System extensions to serve unsewered areas were planned under the developer extension process.

PLANNED SYSTEM CHANGES

Planned system changes as defined by the 1980 sewer comprehensive plan are outdated.

OPERATION AND MAINTENANCE

Cleaning and video inspection of sewer pipes and manhole inspection are performed continuously, one section at a time, with a goal of covering the entire system every five years. All new sewers are video inspected before acceptance.

COMPARISON TO 1958 PLAN

Existing King County facilities have been built according to the sewer comprehensive plan defined by the 1958 Plan and amendments subsequently adopted by resolution.

PACIFIC

Figure 210-9 shows the Pacific city boundaries and local service area. The following information is from the *City of Pacific Sanitary Sewer System Plan* dated March 1991 (prepared by Gardner Consultants, Inc.).

The city of Pacific covers approximately 1,250 acres and may annex an additional 1,280-acre area to the south. The sewer service area covers approximately 1,342 acres. The city service area boundary differs a little from the King County service area boundary, mostly on the western side. There is one major drainage basin that includes three small subbasins served by lift stations, as well as area served by gravity. Flow from another basin southeast of the White River goes to Auburn. Another basin is located west of SR 167. The major city basin boundaries are approximately equal to the King County basin boundaries.

CONVEYANCE FACILITIES

The sewer comprehensive plan does not describe the conveyance facilities.

PUMP STATIONS

See Table 220-1 for specific information on pump stations in Pacific. The city owns and operates three pump stations: Sundown Meadows Pump Station serves a small area in the northeastern corner of the city. Fifth Ave SW & Tacoma Pump Station serves west Cedar Glen

and additional area in the southern part of the city. West Cedar Glen Pump Station serves a small area in the southern part of the city.

KNOWN REHABILITATION REQUIREMENTS

It is assumed that half of the sewer system is in need of immediate repair, and the remainder is assumed to need total replacement over a 20-year period. A video inspection program was started to prioritize rehabilitation efforts. The 4-inch asbestos-cement force main out of the Fifth Avenue SW & Tacoma Boulevard Lift Station must be replaced.

PLANNED SYSTEM CHANGES

According to the sewer comprehensive plan, the Fifth Avenue SW & Tacoma Boulevard Lift Station is to be replaced or relocated outside the Tacoma Boulevard roadway. The system hydraulic model predicts that Pacific Pump Station will surcharge, starting about 2005. As much as 25,000 linear feet of additional sewers are planned within the current service area. City annexation of additional area to the south would expand the service area. Four additional lift stations are planned. The two lift stations east of the White River are to be routed to Auburn's Lift Station A. As much as 18,000 linear feet of additional sewers are planned within the annexed service area.

COMPARISON TO 1958 PLAN

Existing King County facilities have been built according to the sewer comprehensive plan defined by the 1958 Plan and subsequent amendments adopted by resolution.

SOOS CREEK WATER AND SEWER DISTRICT

The following information is from a letter dated October 29, 1998 from the Soos Creek WSD to King County and from the *1996 Soos Creek Water and Sewer Plan* dated January 1997 (prepared by Hedges & Roth Engineering, Inc.).

Figure 210-12 shows the Covington and Maple Valley city boundaries and local service areas, as well as the local service area for Soos Creek WSD. The Soos Creek WSD serves areas within the boundaries of Kent and Renton, but the majority of its service area is in urban unincorporated King County. Land use designations are predominantly residential (generally four to eight dwelling units per acre). The Soos Creek WSD has specific service agreements with Kent, Renton, Black Diamond, and Cedar River WSD, as well as an informal planning and service guideline agreement with Auburn.

The Soos Creek WSD is divided into three major service areas designated north, southeast, and southwest. The north system has many discharge points through other jurisdictions. There is only one discharge point for the southeast and southwest basins at this time. The major portion of new development is occurring in the two south service areas. The service areas are further divided into 21 drainage basins. The Soos Creek WSD basins can be correlated to the King County basins fairly well. Correlation is lower between Soos Creek WSD basins and 1958 Plan basins.

CONVEYANCE FACILITIES

According to the sewer comprehensive plan, the Soos Creek WSD maintains approximately 350 miles of gravity sewer ranging in size from 6-inch to 27-inch diameter. About 58 percent of the pipe is 8-inch diameter. Most of the system is concrete or reinforced concrete pipe, with newer pipe that is predominantly polyvinyl chloride (PVC). There are approximately 6,667 manholes.

Pipe capacity was analyzed in the 1996 sewer comprehensive plan for three timeframes: 1996 (current), 2015, and ultimate build-out (i.e., full development). Acceptability of surcharge was based on upstream consequences. In the north service area, no unacceptable surcharge was found for the 1996 analysis. In 2015, there will be $\pm 1,667$ feet of pipe with serious surcharge (Springbrook Interceptor). By build-out, there will be $\pm 1,982$ feet of pipe with unacceptable surcharge.

In the southeast and southwest service areas, surcharged lines identified in the 1996 analysis will have adequate capacity after the project to bypass Lift Station 11 is completed. For 2015, 5,400 feet of pipe showed unacceptable surcharge, but this should be alleviated by the South 277th Interceptor. By build-out, 7,447 feet show serious surcharge and another 4,888 feet show moderate surcharge.

There are about 22.4 miles of force mains. Approximately half the pipe is 6- to 12-inch diameter, and about 40 percent of the pipe is 14- to 20-inch diameter. Of the remaining pipe, about 6 percent is 22- to 30-inch diameter, and about 6 percent is 1.25- to 4-inch diameter force main.

Capacity of the South End conveyance system is estimated at 5.75 mgd.

PUMP STATIONS

See Table 220-1 for specific information on Soos Creek WSD pump stations. There are 24 functioning lift stations. Several stations have been designed to be relocated as necessary. Four stations (5B, 8, 9, and 12) serve the north service area, and the remainder are part of the southeast and southwest service areas. South area Lift Stations 10, 11, 14, and 15 do not have storage capacity to contain large wet-weather events or to store sewage during an emergency.

Those stations have a history of overflow. Pump stations have radio-based telemetry for monitoring from the district office.

KNOWN REHABILITATION REQUIREMENTS

It is anticipated that about 28 percent of the gravity sewer installed before the mid-1970s will need replacement in the next 10 to 15 years. In the north service area, the Lift Station 5B outfall must be repaired or replaced (involving 2,200 linear feet of 15- to 21-inch diameter pipe and 215 linear feet of 8-inch diameter gravity pipe).

PLANNED SYSTEM CHANGES

The following changes are listed in the sewer comprehensive plan for the south service area.

- The Soos Creek WSD proposes to replace approximately 1,000 linear feet of the Kent–Cascade Relief Interceptor. The 21-inch diameter pipe would be replaced with 27-inch diameter PVC pipe to increase capacity from 4,500 gallons per minute (gpm) to 7,500 gpm. This upgrade should provide adequate capacity until about the year 2005, based on predicted growth.
- Parts of the South End conveyance system would be reconfigured to minimize the number of times sewage is pumped and to increase capacity at selected lift stations. Recommended changes include construction of Lift Station 15B and a force main (16,300 linear feet of 18-inch pipe) to replace Lift Stations 15, 22, and 30. A 7,200-linear-foot gravity sewer would be constructed from Lift Station 15 to the new Lift Station 15B. Lift Station 10 would be relocated to become Lift Station 10B. A decant facility and 860,000 gallons of underground emergency storage would be built on the site. At Lift Station 11, 400,000 gallons of emergency storage would be constructed underground, and ±1,100 linear feet of 8- to 30-inch diversion sewer with manholes would be installed.
- A low-pressure force main with individual grinder pumps is proposed to serve Lake Sawyer. Lift Station 36 would be built to pump flow away from Lake Sawyer.
- Lift Station 19 would be removed when a gravity sewer is built as a developer improvement to serve the surrounding area. This area may be served by the city of Kent if the city can provide service first.

- When SE 272nd Street is widened, Lift Station 24B flow is proposed to be replaced with ±500 linear feet of 10- to 12-inch gravity sewer through an area with severe ground water problems.
- Gravity pipe upstream from Lift Station 11 (±1,000 linear feet) would be upsized to 12-inch diameter.

OPERATION AND MAINTENANCE

The Soos Creek WSD has a mutual aid agreement with other participating water and sewer districts to provide personnel and equipment to the other districts that request assistance during emergencies.

Maintenance is performed by Soos Creek WSD staff. Video inspection is required on all new pipe installations. There is no schedule for video inspection of existing pipes. Manholes are inspected at the time of construction and whenever problems are reported. Cleaning is scheduled according to the history of problems in each pipe. Some pipes are cleaned every few months.

COMPARISON TO 1958 PLAN

Existing King County facilities have been built according to the sewer comprehensive plan (defined by the 1958 Plan and subsequent amendments adopted by resolution), although only two short sections of sewer line have been built. Soos Creek WSD has expanded service using pump stations to move flow out of the district and into the nearest King County interceptor. This has created a local sewer system very different from that envisioned in the 1958 Plan and its amendments. In general, pump stations are located along alignments defined by the 1958 Plan. The urban growth area boundary has significantly reduced the Soos Creek WSD service area and the 1958 Plan basin area.