2010 Wastewater Master Plan

Prepared for

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INTRODUCTION

Parametrix was selected in February 2008 to prepare an update to the City's Wastewater Master Plan. This update completes work prepared by Crane and Merseth Engineering in 2004 which provided a summary of the existing system, a list of projects for the existing system Capital Improvements Plan (CIP), several options for sewering areas presently unsewered, system hydraulic modeling, and general background data. The 2010 Plan summarizes Crane and Merseth's work, provides a link to future planning and CIP tasks, recommends future maintenance projects for the collection system, offers technical guidance for the sewering of presently unsewered areas, reviews existing Intergovernmental Agreements (IGAs) with neighboring public agencies, and assesses staffing needs.

The intent of this introduction is to provide a brief overview of previous planning work to help bridge the understanding of previous planning efforts with this current effort.

EXECUTIVE SUMMARY

Chapter 1, The Existing System Summary. This chapter reviews the existing sanitary sewer collection system. Information provided within this chapter:

- Current (2009) service population of 20,920.[1]
- Projected 2030 service population of 22,249.[2]
- Current system has 396,327 feet (75.1 miles) of collection system piping, 1650 manholes and five raw sewage pumping stations.
- Wastewater treatment primarily provided by the Kellogg Creek wastewater treatment facility.

Chapter 2, The Existing System Study Area Definition. This chapter describes the study area considered. Figures are provided that depict the Milwaukie service area and collection system sub basins. The six major collection system sub basins are identified as North Milwaukie, Mid-Milwaukie, Johnson Creek, South Milwaukie, Harmony, and Lower Kellogg. Wastewater sewer service is provided by Clackamas County Service District No. 1 (CCSD #1) in areas to the east and south of Milwaukie.

Service billings from CCSD #1 to Milwaukie prior to 2010 were based on flow measurements. This method has recently been changed to an equivalent dwelling unit based (EDU) rate through negotiations with CCSD#1.

The City of Portland borders Milwaukie on the north and provides sewer service as far south as Johnson Creek. Service is provided through the Lents trunk line. Milwaukie

[1] Based on data from the Portland State University Population Research Center, Population Estimates for Oregon Estimated and Its Counties and Incorporated Cities: April 1 1990 to July 1 2009, prepared March 2010.

[2] Based on a linear growth rate of 0.28% per year between 2005 and 2030

pays Portland a charge based upon water consumption records for approximately 15 residential and commercial properties connected to the Lents line. An additional 75 will be connected to the Lents line as properties in the NE Sewer Extension project area connect to the City's system.

Oak Lodge Sanitary District provides sanitary sewer service outside the southwest perimeter of the Milwaukie system. An agreement between the Oak Lodge Sanitary District and the City governs the charges Milwaukie pays for the collection and treatment of sewage from these customers.

Chapter 3, The Existing System - Current and Future Conditions. The intent of this chapter is to document existing conditions and estimate future flow impacts. The characteristics of each basin are described in detail. Information includes service acreage, current and future peak flows, length of piping, and information on pump stations and flow meters. The chapter also contains a summary of the existing system deficiencies and an infiltration and inflow analysis by basin.

Chapter 4, The Existing System Future Flows Analysis. This chapter updates demographic projections from the 1994 Master Plan. It outlines the methodology used for collection system modeling using the hydraulic model Stormwater Wastewater Management Model (SWMM). Sewage quantity parameters used in modeling and the availability of flow data are also described in this chapter. Flow data includes portable flow meter data gathered by City staff from several locations in the collection system. This field data was used to establish diurnal flow patterns. In addition, flow information was used from the Harmony meter and the Milwaukie meter to provide modeling data. The completed model along with an operating guide was provided as part of Crane and Merseth's work.

Chapter 5, The Existing System Capital Improvement Projects Identification. This chapter provides a review of the CIP projects identified in the 1994 Master Plan. Eight of the 13 projects identified have been completed or are no longer needed. Five projects from the previous plan are recommended in the updated CIP. One additional project is recommended; the Johnson Creek siphon replacement. In addition, the status of the Kellogg Creek Wastewater Treatment Plant is reviewed with a recommendation to fund efforts to guide its future disposition.

CIP recommendations are summarized below:

- Initiate a detailed flow monitoring program.
- Conduct CCTV inspections of all basins.
- Replace existing sewer from the boat ramp to the Kellogg WWTP with 30 inch line or construct a 21 inch parallel sewer line.
- Replace the Johnson Creek siphon or consider a bypass.

- Systematically replace existing clay and concrete mains.
- Guide the deposition of the Kellogg WWTP.

Chapter 6, CCSD#1 Agreements. This chapter provides a review of previous agreements with CCSD#1, a review of the proposed Intergovernmental Agreement (IGA) between CCSD#1 and Milwaukie.

Chapter 7, Collection System Asset Management. This chapter provides an abbreviated sewer collection system asset management strategy for the City of Milwaukie. It will enable the City to make informed decisions on how to most effectively allocate resources for capital improvements to the collection system on an annual basis.

Chapter 8, Waverly Heights Sewer System Analysis. The purpose of this chapter is to provide an analysis of the existing sewer collection system within Waverly Heights, a residential neighborhood within the City of Milwaukie, and to recommend future sewer service options. Several viable options for the City of Milwaukie to improve the management of the sanitary sewer system within the Waverly Heights community are presented.

Chapter 9, Lents Sewer Line Analysis. The purpose of this chapter is to examine the existing sewer collection system of the Lents Trunk line and the City of Milwaukie's agreement with the City of Portland. The Lents Trunk line begins near 162nd Avenue and SE Foster Road and ends in the Sellwood neighborhood of Portland at the Willamette River.

Chapter 10, Staffing Needs. The purpose of this chapter is to provide a recommendation for staffing needs within the City of Milwaukie's Engineering and Wastewater Operations departments.

Chapter 11, Cost of Service Study. A cost of service study was prepared (an update of one prepared for the City in 2005) and is summarized in Chapter 11. The study addresses the planned capital improvements and provides a defensible wastewater SDC to generate funding to meet the infrastructure needs of growth without unduly burdening existing residents and business owners.

Recommended Wastewater Rate Increase Schedule

Fiscal Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Increase	7%	8%	8%	7%	7%	4.5%	4.5%	4.5%	4.5%	4.5%

An updated System Development Charge (SDC) for the collection system was also calculated in the analysis. Shown in the table below is the recommended wastewater SDC in terms of charge per Equivalent Dwelling Unit (EDU) (the fee assessed to a single family house that connects to the system).

SDC component	*Current Rate*	*Recommended Rate*
Improvement	$ 566.00	$ 613.00
Reimbursement	$ 327.00	$ 476.00
Administrative	$ -	$ 12.00
Total (per EDU)	$ 893.00	$ 1,101.00

This recommendation is an increase of $208 over the City's current rate.

Cost of service recommendations are summarized below.

1. Construct the Capital Improvement Projects listed in Chapter 5. The utility's rate structure should include provision for the construction of the projects.
2. Begin funding system replacement with a rate that recognizes and accounts for depreciation of the system's depreciation.
3. Begin funding of the Capital Maintenance Program per Chapter 7. Following the recommendations of this plan, which identifies specific areas to be corrected after prioritizing the inspected system, continue to inspect the system and prioritize corrective action.
4. Obtain easements for the existing Waverly area sewer where they do not exist for completing option 4 from the alternatives section of Chapter 8. Option 4 proposes to relocate existing lines that run north south on private property to both Cambridge Lane and the abandoned railroad right-of-way adjacent to the Waverly golf club. This solution will provide better service as well as access to operations for routine maintenance.
5. Conduct a study of the City boundary for interjurisdictional connections and draft new IGA's with those providers to provide a clear understanding of billing and maintenance issues.
6. Implement the new SDC and Rate recommendations.

SUPPORTING DOCUMENTS

Information contained in this plan was obtained from Milwaukie Public Works Engineering and Operations records and staff, the Sewerage Facilities Plan, 1994 – CH2M Hill, Clackamas County Water Environment Services, the City of Portland Bureau of Environmental Services, and the Oak Lodge Sanitary District. Earlier engineering studies including the Evaluation of Central Milwaukie and Brookside Basin Sanitary Sewers, (Rehabco Pipe Services, March 1985), Johnson Creek Area Sanitary Sewer Study, (Clackamas County, 1989), Johnson Creek Sanitary Sewer Feasibility Study (CH2M Hill, January 2004) were used to provide background information for the study.

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CHAPTER 1. THE EXISTING SYSTEM SUMMARY

STUDY FINDINGS

Milwaukie currently (2009) provides sanitary sewer service to about 20,920 people, a population which is expected to increase to about 22,249 by the year 2030. Milwaukie's sanitary sewer customers are comprised of single and multifamily residences and commercial, institutional, and industrial customers.

This study found that the City's sanitary sewer system is well operated and provides for public health in a safe, economical fashion. No significant problems were identified and the system operates within the rules and regulations as set forth by the Department of Environmental Quality. Milwaukie relies on Clackamas County for sewage treatment services at the Kellogg Creek Wastewater Treatment Facility, located on the Willamette waterfront near Jefferson Street.

The sanitary sewer utility has about 396,327 feet (75.1 miles) of pipe, about 1615 manholes and five raw sewage pumping stations. All routine maintenance of the system is provided by City public works staff. In addition, public works staff is responsible for system inventory, scheduled inspections, emergency call-outs, flow monitoring, and new construction inspection. Occasionally, City staff is used for new, or replacement construction projects when the project is small and time and staff are available.

Milwaukie has provided sanitary sewer service to its citizens since about 1926. Earliest service included sanitary sewers discharging to local streams. In the 1950's, the City constructed a wastewater treatment plant along Johnson Creek, west of Highway 99E. All sewers conveyed sewage to the plant until 1973 at which time Milwaukie began receiving treatment service from Clackamas County at their Kellogg Creek Wastewater Treatment Plant. This facility continues to provide service to the city.

With construction of the Kellogg Creek plant and construction of sanitary sewers to many unincorporated areas east of the city, Milwaukie was able to provide sewer service to areas previously unserved. Currently, most of Milwaukie's sewage flows by gravity directly to the treatment plant. Sewage from the southeast area of the city flows to a metering station on Lake Road where it enters the Clackamas County system. Sanitary sewage is also pumped from small stations on the east side of the city into upper portions of the Clackamas County system.

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CHAPTER 2. THE EXISTING SYSTEM STUDY AREA DEFINITION

CITY OF MILWAUKIE

The City serves almost all of the population within its boundaries with sanitary sewer service. Figure 2-1 shows the current city limit line, the Urban Growth Management Area (UGMA), and highlights the current area within the city limits where sanitary sewer service is provided. The UGMA contains about 6,870 acres while the City currently serves about 3081 acres of that area within the city limits.

Figure 2-2 shows the current City's sanitary sewer service area and city limit. This figure also shows the major drainage basins of the City's sanitary sewer system. The City's sewer system is divided into seven discrete basins, generally defined by topography, each with a discrete outlet for sanitary sewage collected in the basin. In most cases, flows from these basins are combined prior to reaching their terminus at the Kellogg Creek Wastewater Treatment Facility. These seven major basins are named:

- North Milwaukie,
- Mid-Milwaukie,
- Brookside
- Johnson Creek,
- South Milwaukie,
- Harmony, and
- Lower Kellogg.

Most of the City's service area is contained within three of the basins; North Milwaukie, Mid-Milwaukie and Harmony. These three basins account for 2,717 acres of the served area.

Sewage from the Johnson Creek basin is directed into the City of Portland's sanitary sewer system, and sewage from the Lower Kellogg basin flows directly into the Clackamas County Service District No. 1 system.

ADJACENT SERVICE PROVIDERS

Due to topographical constraints with service boundaries, districts are often faced with inter-connections with adjacent entities. Milwaukie is bordered by three separate service providers which have connections to our system as well as Milwaukie connections to theirs. These connections cause confusion due to multiple utility bills and necessary follow ups between billing departments. It is recommended that the City conduct a study that analyzes the interjurisdictional accounts and provides a billing process that is accurate and efficient.

Clackamas County Service District No. 1

Sanitary sewage service is provided to areas east and south of the city by CCSD #1. This large system provides sanitary sewer service to most of the urbanized area of the county

outside the incorporated areas. Portions of the Milwaukie sewer system discharge directly to the CCSD #1 system, either through small pumped areas on the east side of the city or by direct gravity service (Lower Kellogg Basin) along Kellogg Creek to the south.

The Harmony Basin, a large area serving the southeast third of the city also discharges to the CCSD #1 system. Flows from this area are large enough that a special meter located near the intersection of SE Harmony and SE Linwood was installed to measure the quantity of sewage discharged from Milwaukie to the CCSD #1 system. This is one of the two meters that record flows that the service billings from Clackamas County to Milwaukie are based on.

City of Portland

The City of Portland borders Milwaukie on the north, providing service as far south as Johnson Creek Boulevard. Portland's Lents Trunk line is a large sanitary sewer trunk line located along the Springwater Trail near Johnson Creek. The location of this line provides service to several Milwaukie residences and commercial areas along Johnson Creek Boulevard. Sewage from the small Johnson Creek Pump Station (S4) is also directly pumped into the Lents Trunk. Milwaukie pays the City of Portland a charge based upon water consumption records for approximately 15 residential and commercial properties connected to the Lents Trunk. Sewage from the Precision Castparts plant is also collected by the Lents Trunk line through a gravity connection.

The City of Milwaukie has studied the feasibility and cost of diverting the flows from Precision Castparts and nearby commercial properties into the Milwaukie system. A study by CH2M Hill in January 2004 has shown that the cost of making this change is expensive and no change in the system is warranted.

Oak Lodge Sanitary District

The Oak Lodge Sanitary District provides sanitary sewage service at the southwest perimeter of the Milwaukie system through agreement between the City and the District. Several Milwaukie residences, both single and multi-family, are connected to the Oak Lodge system. Sewage flows are routed to Oak Lodge because the topography of this area allows the use of gravity service without the use of a pump station. Milwaukie pays a charge to the Oak Lodge Sanitary District for collection and treatment of sewage from these customers. The City has no plans to change this part of the system in the foreseeable future. There are also accounts that are billed to the Oak Lodge Sanitary District for residences located in the sewer district, and outside the city and served by the City's collection system.

Figure 2-1. City Limits and Urban Growth Management Boundary

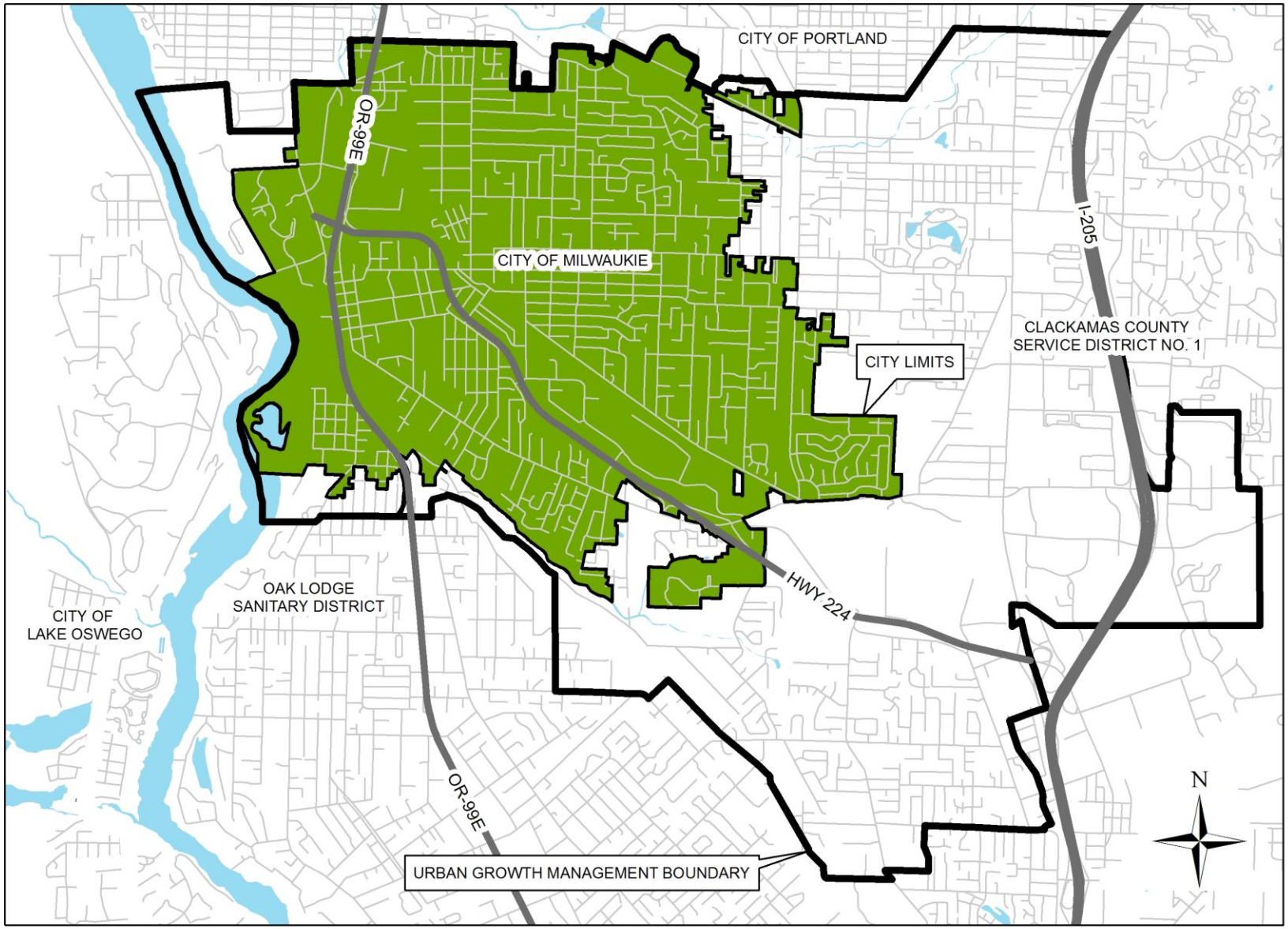

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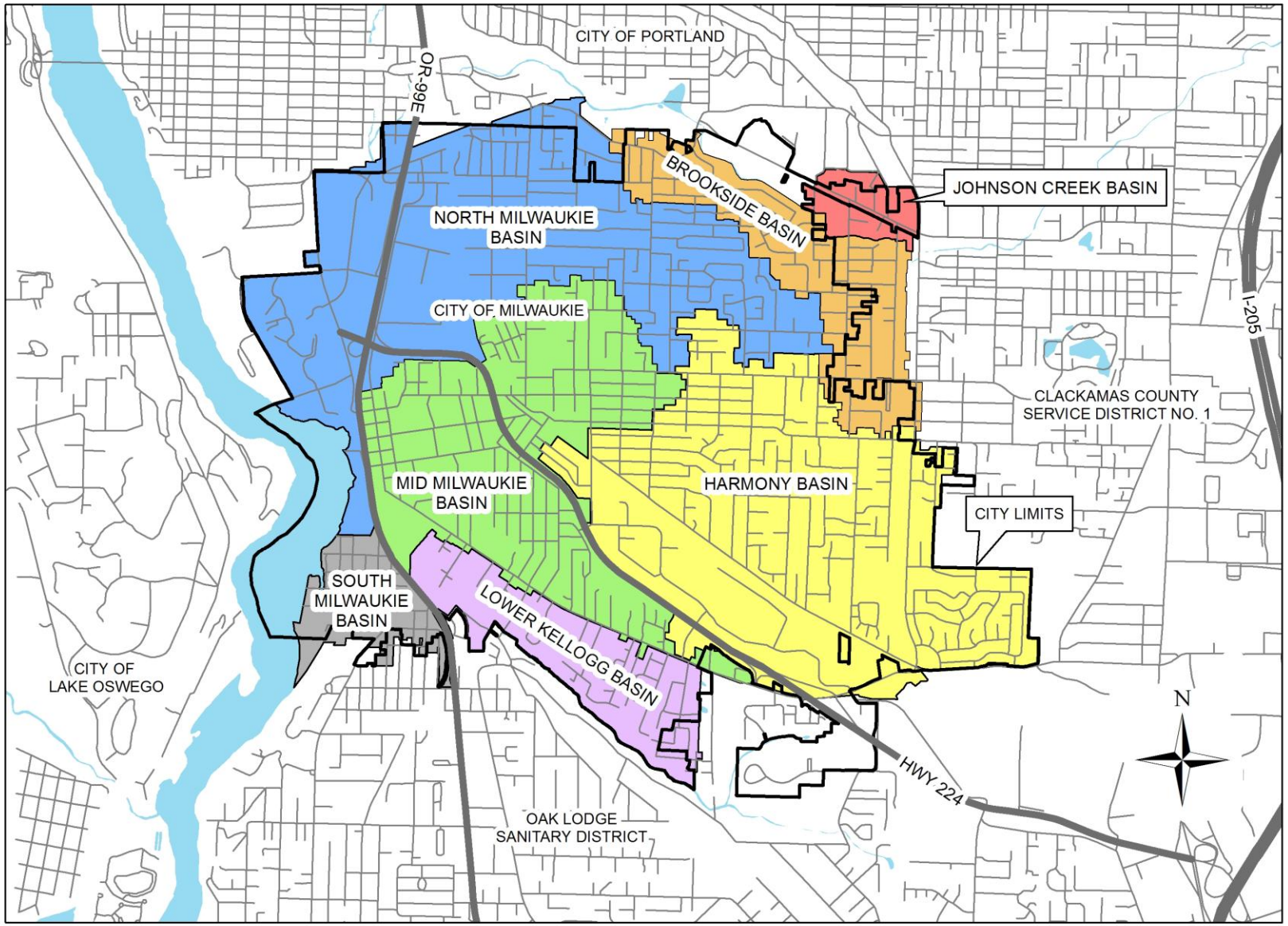
Figure 2-2. Sub-Basin Boundaries



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CHAPTER 3. THE EXISTING SYSTEM CURRENT AND FUTURE CONDITIONS

A number of parameters must be considered when evaluating the current and future potential of the sanitary sewer system to provide safe, economical service to the customers of the City. Major parameters include the inventory of the existing system, current and projected population, service area boundary, land use and zoning, geographic areas that may be added to the system, condition of the existing system, and operation and maintenance functions and programs.

EXISTING SANITARY SEWER SYSTEM

The existing sanitary sewer system is shown on Figure 3-1. The City's sanitary sewer system is divided into seven basins based on their topography, each with an outlet for sanitary sewage collected in the basin. These basins are named: North Milwaukie, Mid-Milwaukie, Brookside, Johnson Creek, South Milwaukie, Harmony, and Lower Kellogg.

These basins each serve areas containing a mix of land uses and in some cases flow to sanitary sewer systems outside the Milwaukie system. Most of Milwaukie's sanitary sewage is collected into the sewer system served by the Clackamas County Kellogg Creek Wastewater Treatment Facility located at the west end of Jefferson Street on the Willamette River. Milwaukie pays Clackamas County to provide wastewater treatment of the City's sewage at the plant. The City also reimburses the County for a share of the operation and maintenance costs of the county-owned interceptor system that conveys sewage from the City's system to the treatment plant.

POPULATION ESTIMATES

A review of the historical growth patterns in Milwaukie indicates a slow upward trend in place over the past several decades. Recent statistics indicate that population growth and increases in the number of new homes and businesses in the city of Milwaukie has been slow. Statistics collected between 2003 and 2008 show an average annual population growth of 0.92 percent.

The 2009 city population as estimated by the Portland State University Population Research Center was 20,920, an increase of 380 people from the year 2000. Discussions with the City's Planning Director indicate there is no compelling reason that the growth rate experienced in the past few years will change over time (except for the redevelopment potential noted below). With this premise, forecasted population can be expected to increase to about 22,249 by the year 2030. In addition, parcels that are zoned and suitable for new development are scattered throughout the city and currently comprise about 34 acres of land in total. The parcels may continue to develop and in some cases, these are large enough to be divided into several lots. Development of these lots is included in the population growth cited above.

Based on a recent review of Milwaukie's growth capacity, given both current zoning and the construction of new housing units between 1997- 2008, staff can make the following conclusions about Milwaukie's planned capacity for growth.[3]

- The City's current zoning provides a capacity for approximately 3,200 housing units.
- The City's current zoning for downtown allows the construction of approximately 1,300 housing units.
- The City's current zoning of the larger Town Center area, excluding downtown, allows the construction of up to approximately 980 units.
- The City's current zoning for the rest of the residential zones (R10, R7 and R5), allows the construction of up to approximately 700 units through partitions, subdivisions, and creation of accessory dwelling units.

NORTH MILWAUKIE BASIN

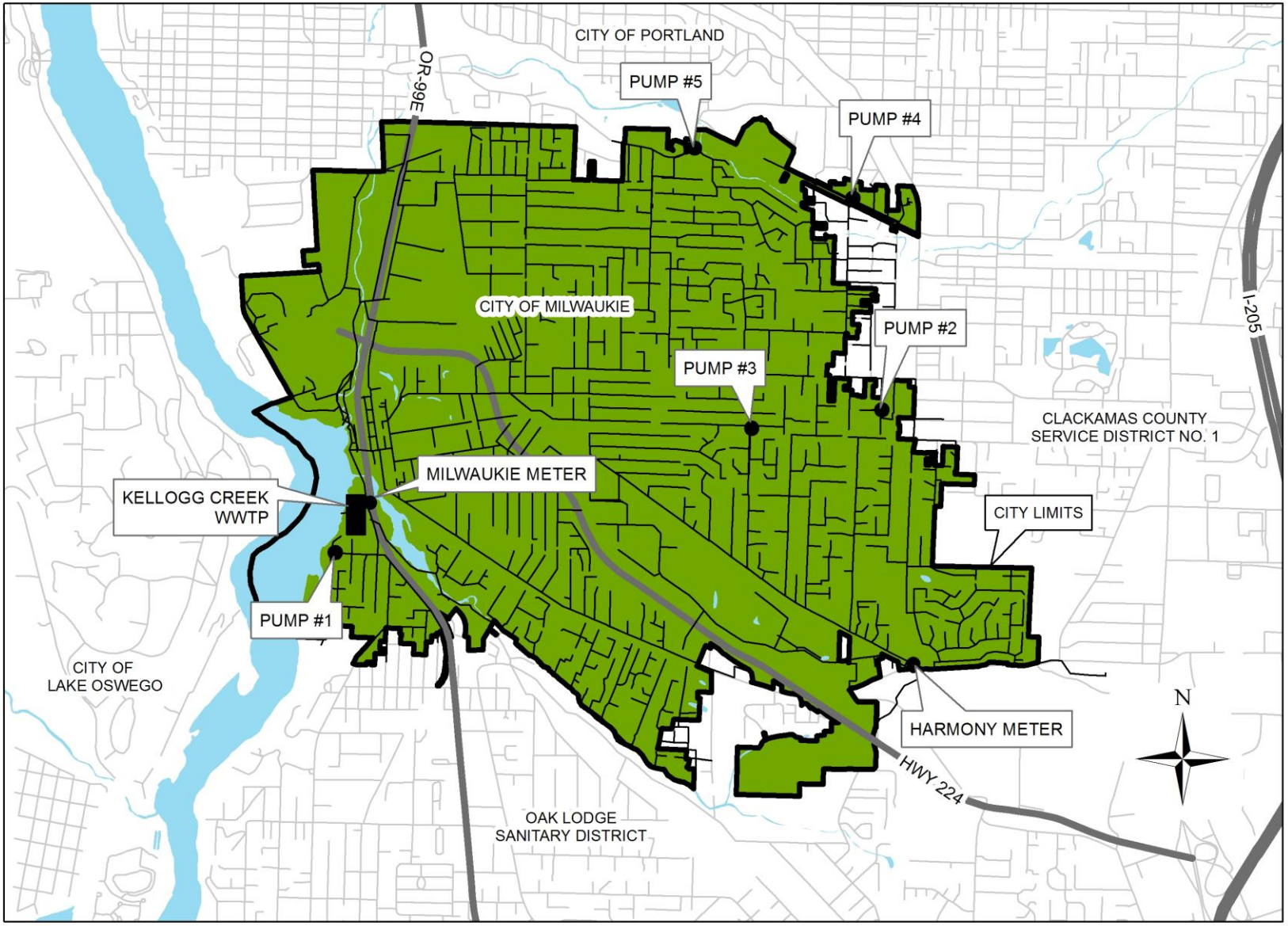
The North Milwaukie Basin serves the areas extending across the northern one-third of the city, extending from the Willamette River on the west to the city limits on the east and south to a line generally following Logus Road. This basin covers about 1063 acres and serves a variety of land uses such as single family residential, multifamily residential and commercial. The sewage generated in this area is conveyed by a trunk line terminating at the Kellogg Creek WWTP. This line extends north from the plant, crosses Johnson Creek several times, extends along North Main through the industrial area, and crosses the railroad to SE Boyd. From there it extends south on SE 32nd and east in SE Filbert Street. East of the railroad, most of the land is in residential use.

A sub-basin of the North Milwaukie basin is the Brookside area where sewage is collected into the Brookside Pump Station (S5). The Brookside area covers about 160 acres and is primarily in residential use. The Brookside pump station conveys sewage to a gravity sewer on Filbert Street where it flows to the Kellogg Creek Wastewater Treatment Plant. The Brookside pump station has an overflow relief line connected to the City of Portland Lents Trunk to prevent raw sewage overflows into Johnson Creek should the station fail.

With the extension of service into the Dual Interest Area "A" this basin will see additional flow from approximately 187 more homes. The Brookside pump station will be modified in place to accommodate additional connection flow, along with an extension of the force main from this pump as a Capital Improvement Project in the fiscal year 2011/12.

[3] Source: Planning Department Memo RE: Milwaukie's Regional and Local Density Requirements, April 15, 2008

Figure 3-1. Existing Sanitary Sewer System



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Johnson Creek Basin

The Johnson Creek Basin is a 17 acre service area located north of Johnson Creek Boulevard between Stanley and Linwood Avenues. Sewage from this area is collected at a small pump station (S4) and pumped into the City of Portland's Lents Trunk line. The Johnson Creek basin serves both residential and commercial customers. Sewer bills for this area are collected by the City of Milwaukie and then forwarded to the City of Portland on a monthly basis. If sewage from this small basin is ever routed into the Milwaukie system, it would be connected to the upper end of the Brookside basin.

As a part of providing sewer to the remaining unserved properties in this basin, an additional 72 connections north of Johnson Creek are planned (from the Dual Interest Area "A"). The Northeast Sewer Extension Project will replace Johnson Creek Pump Station (S4) with a larger pump station and located on 55th Avenue north of Johnson Creek. This pump station will convey gravity flow for the area and pump into the Lents trunk line.

Mid-Milwaukie Basin

The Mid-Milwaukie Basin serves the older, central portions of the city, encompassing about 620 acres of land. This area extends generally from Howe Street on the north, 42nd Street on the east, McLoughlin Boulevard on the west and includes the area between Lake Road and the Milwaukie Expressway to the south. Sewage from this area is collected by three major trunk lines which converge at Main and Jefferson Streets and discharge to the Kellogg Creek WWTP. This system includes the oldest portions of the sanitary sewer system, some constructed as early as the 1930's. While no significant structural problems have been observed in this area, it is reasonable to expect, based on the age of the system that failures will begin to occur here first.

Three large trunk sewer lines provide service to the Mid-Milwaukie basin. To the north, a trunk line extends north on 21st to Harrison, terminating near 43rd Street. A second large trunk line extends east on Washington Street to Hwy 224, serving most of the older residential areas between 27th and 37th Streets.

The third trunk line extends southeast from 20th and Jefferson, past the Milwaukie High School and serves the uphill properties along Lake Road as far east as 47th Street.

Sewage from these three trunk lines is collected into a 24" sewer line in Jefferson Street where it is conveyed to the Milwaukie Meter located at the Kellogg Creek Wastewater Treatment Plant.

South Milwaukie Basin

South Milwaukie (Island Station) Basin covers an area of 117 acres and is located south of the Kellogg WWTP and west of McLoughlin Boulevard, to the southern city limits. Except for a few commercial properties located along McLoughlin Boulevard, land use is residential. Sewage from several residential properties, both single family and multi-family, at the south edge of the basin is directed to the Oak Lodge Sanitary District for treatment. The remaining flows from this basin are metered by the Milwaukie Meter located at the Kellogg Creek WWTP.

This basin also contains the Island Pump Station (S1) located along the Willamette River near the intersection of Bluebird and 19th Streets. Sewage from this station is lifted to the gravity sewer located at that intersection.

Harmony Basin

The Harmony Basin, an area of 1035 acres serves the southeast third of the city. This basin is generally bounded on the north by King Road and Logus Avenue and extends to the west to SE 37th Avenue. It also includes sewage generated in the Milwaukie Marketplace and the industrial/commercial uses located in the International Way area. Flows from this area are large enough that a special meter located near the intersection of SE Harmony and SE Linwood was installed to measure the quantity of sewage discharged from Milwaukie to the CCSD #1 system. Billings from Clackamas County to Milwaukie are based on the flow recorded by this meter, and the City pays for conveyance and treatment of the sewage.

A sub basin in the Harmony area is served by a sewage pump station near the intersection of Home and Monroe Avenues. This Home and Monroe Pump Station (S3) serves an area of 123 acres within the Harmony Basin which is a mix of residential and commercial uses. Some earlier studies refer to this area as the King Road Basin.

The Harmony Basin also contains the small Harrison Pump Station (S2) to serve three homes with basements located near the intersection of SE Harrison and SE 59th Street. These homes are situated such that gravity sewer service is not available.

Lower Kellogg Basin

A number of residences located along the north side of Kellogg Creek are provided sanitary sewer service using direct connections to the CCSD #1 Lower Kellogg Interceptor. This area encompasses about 230 acres and serves about 370 residences, both single family and multifamily. A few commercial customers are located on Lake Road along with Rowe Junior High School.

Table 3-1 summarizes the inventory of facilities located in the Milwaukie system and major system components are shown on Figure 3-1.

Table 3-1. City of Milwaukie Sanitary Asset Inventory Current and Projected Populations

Sanitary Basins	Area		Sanitary Peak Flow		Sanitary Sewer Inventory	
	Current (acre)	*Buildout (acre)*	*Current (gpm)*	*Buildout (gpm)*	*Total Length (ft)*	*Diameter Range (inches)*
North Milwaukie	903	903	632	632	130,814	6-27”
Mid-Milwaukie	620	620	434	434	82,525	6-18”
Harmony	1035	1092	725	764	131,491	6-18”
Brookside	160	255	112	179	2,126	6-12”
Lower Kellogg	230	240	161	168	27,951	6-10”
South Milwaukie	117	117	82	82	17,749	8-15”
Totals:	*3065*	*3227*	*2146*	*2259*	*392,656*	*6-27"*

Pump Stations	Location	Capacity	Force Main length/dia	SCADA	S/B Power
S1	Island Station - located west of SE 19th and Bluebird	215 gpm	95 ft. of 4” force main	Yes	Yes
S2	Harrison and SE 59th Avenue	100 gpm	10' of 4” DI Pipe	Yes	Yes
S3	Intersection of Home and Monroe - Discharges to a gravity sewer on SE Home Avenue	400 gpm	1100' of 8” DI Pipe	Yes	Yes
S4	Johnson Creek Boulevard and Stanley	200 gpm	120' of 4” DI Pipe	Yes	Yes
S5	Located at Brookside and Johnson Creek Boulevard	550 gpm	1,978' of 8” DI Pipe	Yes	Yes

Flow Meters	Type	Size	Owner
Harmony Meter	Palmer Bowlus Flume w/ Sigma 950 Meter	18”	Clackamas County - Water Environment Services
Milwaukie Meter (Kellogg Creek)	Sigma Ultrasonic 950 - Area/Velocity Sensor	30”	Clackamas County - Water Environment Services

Table 3-1 shows current and future populations in each of the major drainage basins of the City's existing sanitary sewer system.

Table 3-2. Future Sub-Basin Demographics

Sanitary Sub Basin	2010	2030
North Milwaukie	5,294	5,319
Mid-Milwaukie	4,353	4,378
Harmony	7,513	7,876
South Milwaukie	717	727
Lower Kellogg	1,410	1,442
Brookside / Johnson Creek	1,633	2,507
Totals:	*20,920*	*22,249*

Notes:

1. 2010 Residential occupancy assumed at 3.1 people/residence.
2. 2030 Residential occupancy projection based off available developable area at 3.1 people/residence.
3. Commercial and Industrial zoned lots excluded in all basins.

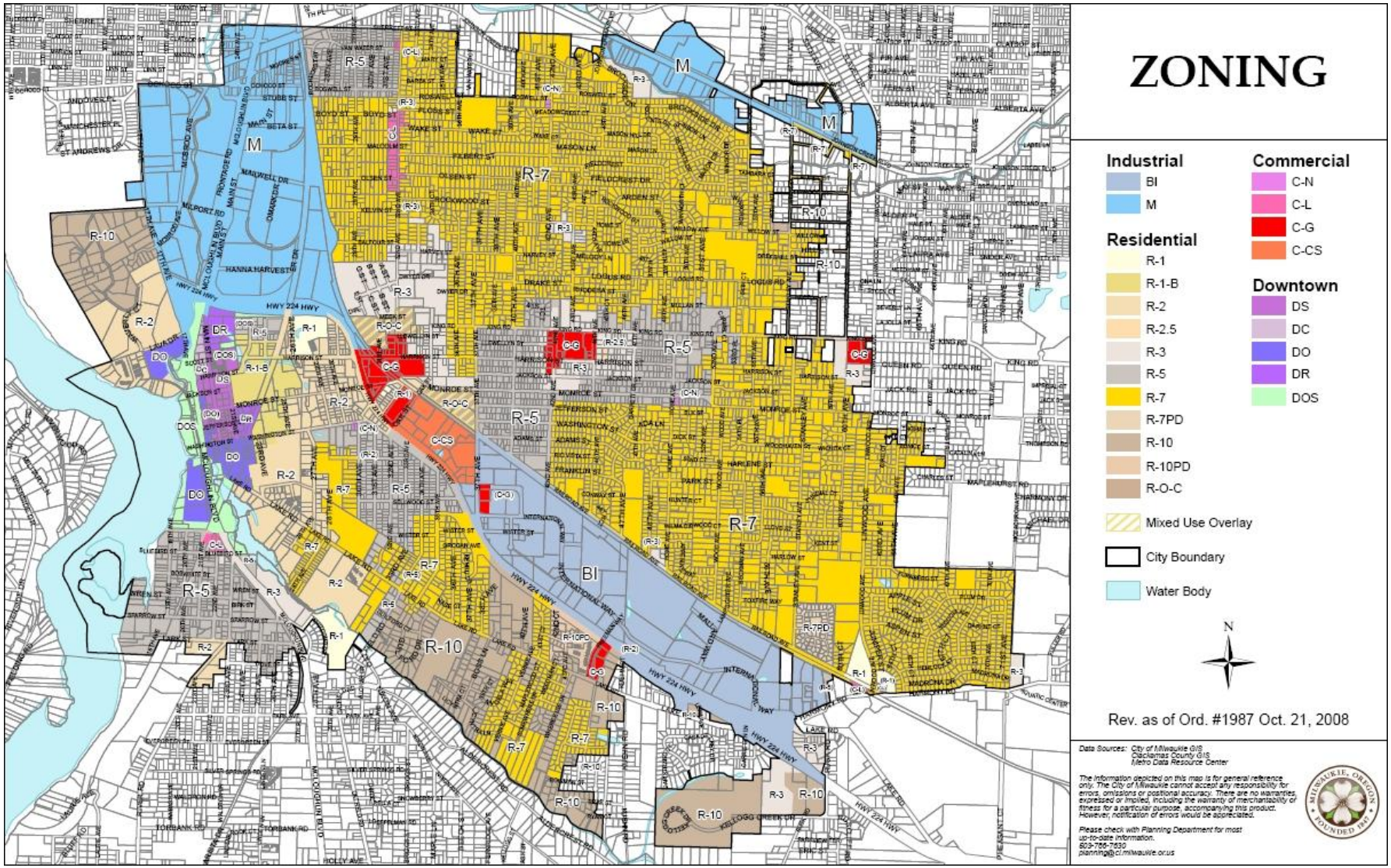
SERVICE AREA BOUNDARY

Milwaukie's development is guided by established boundaries. City ordinances state that sanitary sewer service is provided to only those property owners who are within the incorporated boundaries of the city. Milwaukie does not serve properties outside that boundary.

LAND USE AND ZONING

The current zoning map for the city is shown as Figure 3-2. No major changes in land use, zoning practices or application are currently being considered. Changes in local economics or redevelopment of a major land parcel could impact sanitary sewer services and cause need for a capital improvement project to add capacity to the conveyance system.

Figure 3-2. Current City Zoning Map



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EXISTING SYSTEM CONDITION

Discussions with City staff from both the engineering and maintenance groups indicate that there are no significant problem areas in the system. City crews maintain all sewers, manholes, and appurtenant structures, conducting visual inspections of the system using a closed-circuit television system owned by the City. City crews are aware of several areas where older pipelines have shown evidence of deterioration and bear closer monitoring.

These include:

- Chronic problem areas where a low spot in the line causes odor generation and release, debris accumulation and similar symptoms. These known trouble spots are inspected quarterly, flushed, and cleaned as needed.
- The older downtown system which was constructed using terra cotta pipe. This material is no longer produced or installed in this area.
- The 24-inch trunk line serving the North Milwaukie Basin. This line parallels Johnson Creek several times and was designed with "inverted siphons" to allow continuous gravity service into the Kellogg Creek Wastewater Treatment Facility. Inverted siphons can be effective but require more frequent inspection and intensive maintenance. This line is particularly difficult to inspect since it carries most of the City's sewage flow and is not readily accessible to maintenance vehicles.
- The area bounded by Balfour and Sherrett, and 32nd and the railroad is also an older area where root intrusion, protruding taps and similar indications of poor materials or construction indicate at best an area of continued high maintenance and infiltration and at worst, extensive system replacement.

None of these areas are causing immediate problems but City staff should continue to monitor their conditions closely and document the location, type, and severity of any problems. In addition, once a problem is identified, maintenance managers will work with public works engineers to determine the best repair approach. City repair crews may be assigned to correct small problem areas with larger problems typically solved through public contracting with construction contractors who specialize in underground utility work.

Some of the older pipelines in the system have reached the end of their functional life. Most of the 4.02 miles of clay pipelines are lacking joint integrity and susceptible to infiltration. The concrete pipes (61.86 miles) have better joints but are beginning to suffer material deterioration. A schedule of pipeline replacement is recommended for these reasons.

The City's five pump stations have all been upgraded to include provisions for standby power and are monitored using remote telemetry (SCADA).

INFILTRATION/INFLOW (I/I)

A part of the analysis of the existing system includes evaluation of the infiltration and inflow conditions. This requires daily flow measurement at specified manholes, with recording flow levels at frequent time intervals. Flow monitoring was provided by City staff and was done at five selected points in the system. These readings, taken during both dry and wet seasons provide definitive information regarding the infiltration into the system. These flow measurements were taken at specific manholes, each of which carries the total flows from a specific sub basin of the system. The sub basins were selected as they represent the City's flows under varying land uses and topographic conditions.

As compared with other municipal systems located in the metropolitan area, infiltration was found to be within acceptable ranges given the age of the system. Several reasons may account for this; among these are good long term maintenance practices, good initial construction, and low ground water conditions even during the wet season. Of course, infiltration is never "acceptable" if the source is known and can be economically corrected. However, it is frequently found that the costs of correction exceed the benefits. A detailed Infiltration/Inflow Analysis would be needed to determine the cost effectiveness of an I/I removal program.

In addition, an I/I Analysis study would determine whether most of the I/I comes from service laterals connecting individual homes to the public system, or if the I/I comes directly into the public system. It is frequently found that over half of all infiltration originates in the private service laterals. Inflow is more frequently found to occur in the public system.

Table 3-3. Infiltration and Inflow Quantities

Harmony Basin	Date of Measurement	Area (acers)	Flow (mgd)	I/I Average (gpad)	Monitored Flow (gpm)	Total Pipe Length (ft)
Total Basin		1034				116,000
Linwood Sub-Basin		175		140	17	
Home/Monroe Sub-Basin		123				
Dry Weather Low Flow Averages						
	January 21, 2003		0.615	595		
	February 12, 2003		0.851	823		
	July 15, 2003		0.846	818		
	August 20, 2003		0.783	757		
Average			0.77375	748.25		
Wet Weather Low Flow Averages						
	February 17, 2003		1.109	1073		
	September 8, 2003		0.764	739		
Average			0.9365	906		

Milwaukie Meter Basins	Date of Measurement	Area (acers)	Flow (mgd)	I/I Average (gpad)	Monitored Flow (gpm)	Total Pipe Length (ft)
Total Basin		1683				218,400
North Milwaukie Basin		1063				121,000
Brookside 1A Sub-Basin		43				
Brookside 1B Sub-Basin		117		1538		
Johnson Creek Sub-Basin		17				1,400
Mid-Milwaukie Basin		620				78,500
Hopspital		64		113	5	
Commercial		80		180	10	
High School		130		388	35	
South Milwaukie		117				17,500
Dry Weather Low Flow Averages						
	July 15, 2003		1.08	642		
	August 20, 2003		0.793	471		
Average			0.9365	556.5		
Wet Weather Low Flow Averages						
	September 8, 2003		0.971	577		
Average			0.971	577		

OPERATION AND MAINTENANCE

Ongoing maintenance activities are conducted throughout the system by city staff. This study found that the City's sanitary sewer system is well operated and provides for public health in a safe, economical fashion. No significant problems were identified and the system operates within the rules and regulations as set forth by the Oregon Department of Environmental Quality. Periodic inspection of problem areas and non-problem areas are conducted by City staff. Records of these inspections and their findings are kept as part of the public works file. The City has also invested in equipment designed specifically for maintenance of the sanitary sewer system. These include a closed-circuit television inspection van, a hydro-flusher unit designed to thoroughly clean debris from sewers and manholes, and a pneumatic vacuum unit designed to remove debris from sewers and manholes without the need for crews to enter the manholes.

A key element of the City's sanitary sewer operation is the grease control program. Grease discharged into the sanitary sewer by residential and commercial users can be a major concern for the operators. Grease cools and accumulates in the sewer. Large deposits of congealed grease cause flow restrictions, buildup of organic and inorganic materials, further restricting flows.

The grease control program, or Fat, Oils and Grease (FOG) Program, requires approximately 60 commercial customers such as restaurants and other users/producers of grease, fat, or oils to operate a grease trap. These traps intercept grease, fats, and oils before the sewage enters the public system. The customer is required to clean the trap periodically and maintain it in a good operating condition. The City has recently devoted staff time to perform these routine inspections.

The City also owns and uses a flow monitoring unit. This equipment, together with the software necessary for its proper use is available to field crews for flow monitoring. Measuring sewage flows at specific, key points in the system provides a long-term history of the change in total flows and changes in diurnal flow patterns resulting from growth, land use changes, or development of a new large commercial or institutional customer in the upstream basin. Sudden changes in what have been typical flow patterns can indicate an acute problem while gradual changes in these flows as noted over many years of flow monitoring records will indicate the degree of gradual deterioration of the upstream system.

Flow monitoring should become a routine part of the City's operation and maintenance program. Together with monitoring rainfall, groundwater elevations, and the growth of the sewer system into newly served areas, parameters such as the gallons per acre per day of infiltration, hourly and daily peak sanitary flows, per capita sewage flows, and similar ratios may indicate detrimental changes in the sanitary sewer system. A routine logging of these data into the City's GIS system will provide a historical record, useful in forecasting upcoming maintenance project needs.

CHAPTER 4. THE EXISTING SYSTEM FUTURE FLOWS ANALYSIS

PURPOSE

This chapter of the report presents the estimates of sewage flows (quantity and rate) that may be anticipated when development occurs within the existing service area. Sanitary sewers are traditionally designed with future growth in mind and sizes of new lines account for predictable growth. Since demographic projections change in reaction to unanticipated conditions, the ability to accurately predict the extent to which a city will grow or the density and type of land use that will occur is limited and periodic reassessments of flow projections are necessary. This report updates the demographic projections from the 1994 Master Plan using more recent data and experiences.

This scope of services does not include development of a dynamic hydraulic model of the City's sanitary sewer system. A model was developed for use in the 1994 Master Plan and the data base portions of it have been recovered. This Master Plan scope of work was modified to allow preparation of a new model using the historic data base. The new model is not as technically sophisticated as the 1994 model but is easily sufficient to predict peak flows in the Milwaukie system. This updated model is provided to the City as part of the contract along with a brief users guide.

Since the new model utilizes existing data about the sewer system and the inventory that was incorporated at that time, most of the City's system is included in the current model. Sewer line extensions or other changes to the sewer system constructed since 1994 have not been added to the model, however all properties discharging sewage to the system are accounted for in the model. This model is used in the Master Plan to forecast future flows in the City's sanitary sewer system.

BACKGROUND

Almost all sanitary sewers function by using gravity to move waste water through the system to the point of treatment. Once the route and diameter of a sewer has been selected, the slope of the line determines its capacity and therefore the limits of sewage flow that can be conveyed. Minimum slopes are determined by setting the flow velocity criteria to be at least two and a half feet per second. At this velocity, suspended solids in the sewage will tend to remain suspended and be carried to the treatment plant. Except for unusual circumstances where the pipe slope can be increased, a minimum slope is desired as this provides the most economical construction depth.

In most sewer systems, not all areas are able to flow by gravity to the treatment plant. Where this is the case, a pumping station is constructed to lift sewage to a high point where it can resume gravity-driven flow to its destination. Pumping stations provide a good point at which to measure flows since they provide a control structure and opportunity for measuring and recording instantaneous and total flows. Milwaukie has five sewage pumping stations in its system. Only the

Brookside Pump Station has the facilities to monitor flows. The other stations are smaller and were not designed with flow monitoring capabilities. Since the City has portable flow monitoring equipment, it is not necessary to install permanent flow monitors at the other stations.

System flow data is also gathered through metered connections to CCSD #1 system. Sewers located in the southeast portion of the city and between the Milwaukie Expressway and Railroad Avenue are connected directly to the CCSD #1 system. These flows are metered near the intersection of SE Harmony and SE Linwood Avenue. Most of the remainder of the City's system connects to the CCSD #1 system at the Kellogg Creek Wastewater Treatment Plant where they are metered. Sewage flows have also been monitored at several other locations throughout the system by Milwaukie's field personnel.

SEWAGE QUANTITY PARAMETERS

A number of factors are used to calculate the potential sewage flows at a given time and at any point in the sewer system. These include:

1. Acreage served
2. Number of Equivalent Dwelling Units – EDUs (residences)
3. Average household population
4. Average per capita water consumption
5. The diurnal pattern
6. Average and peak infiltration and inflow flows
7. Commercial and industrial land uses

Acreage, Residences and Population Served

Table 3-1 shows a listing of the acreage, and the estimated peak sanitary sewage flows from each sub basin.

Average daily household sewage discharge assumes that almost all of the potable water used by a household is disposed of through the sewer system. This slightly overestimates the sewage flows since a small fraction of the total water used may be carried away, evaporated, spilled, etc. Using measured flows as determined using data from metered water consumption records provided by the City provides the best estimate of the amount of sewage generated by an individual home. Typically, winter use records are analyzed to minimize the effects of irrigation and other summer water uses which do not enter the sewer system. For this project, records from three customer classes were analyzed; single family residential, multifamily residential and commercial/industrial. These records indicate that an average single family household uses 190 gallons of water per day during the winter season, or 76 gallons per capita per day. This compares with 79 gallons of water per day for a typical multifamily residence. The summary water use records analyzed do not differentiate between single family and multifamily residences so; the data for multifamily units were taken from usage records from a single 9-unit complex.

On average, commercial records show daily water consumption averaged over a 2-month period to be 618 gallons/day. This is equivalent to water used by 7.8 dwelling units. Commercial customers will be factored into the flow calculations using the flow equivalent of 7.8 residences for each commercial use.

ANALYSIS OF 2004 FLOWS

Local Basin Monitoring Results

During preparation of the 1994 Master Plan, a hydraulic model was prepared based on use of the EPA SWMM flow model. This model predicted a number of locations in the system where sewage flows would exceed the pipe capacity causing an overload condition. Since these predictions were estimated based on the best available information, the study recommended that the City staff monitor high flow conditions during the subsequent years to see if the model was accurate in its flow level predictions.

A part of preparation of this Master Plan involved having City staff install a portable flow meter and gather data from a number of locations in the sewer system. Flow data were collected at the following locations.

1. Brookside – installed in MH 1419 entering the pump station from the east
2. SE Harrison – MH 2017, line entering from the east
3. SE Harmony – MH 3348, east of the Linwood Avenue intersection
4. SE 23rd – MH 2217, just north of Washington Street
5. SE 32nd and Harrison – MH 2017 line entering from the north

These locations were selected to provide information on areas of the city where varying land uses exist and differences in flow patterns could be expected. For example, data collected at SE 32nd and Harrison includes a mix of residential sewage mixed with flows from the Providence Milwaukie hospital complex, while flow data from the location at SE 23rd north of Washington primarily includes mixed commercial uses and some residences.

Data on flows from these locations were reduced and compared with modeled flows. In most cases, a reasonable correlation between actual and modeled flows was observed.

Diurnal Flow Pattern

A key element of sewage flow forecasting includes understanding and use of the diurnal flow pattern that describes the rise and fall in flow in conjunction with typical human activities. This flow pattern defines the ratio between the average flow and peak flow that can be expected. Since sewers are designed based on forecasted peak flow rates, this "peaking factor" ratio is very important. Flows from Milwaukie residents are continuously monitored at the Harmony Metering Station and the Kellogg Creek Wastewater Treatment Facility. In addition, flows were monitored at five locations in the Milwaukie system to determine the diurnal pattern and associated flow parameters.

Analysis of flows metered at several of the key manholes show an average diurnal pattern ranging from a low of 0.33 times average to a peak flow of 1.9 times average flows on a typical summer day. Design textbooks suggest a peaking factor of from 2.0 to 2.5 depending on local conditions. For this study, a peaking factor of 2.5 will be used to conservatively estimate the maximum sanitary sewage component of the total flow.

CCSD #1 – Metered Flows

Records of gross flows are collected by CCSD #1 and used for billing purposes. These flows have been recorded for a number of years and are kept by staff at CCSD #1. In this study, flow records for "typical" summer and winter days were used to give an indication of the amount of infiltration and inflow (I/I) that enters the system as extraneous water through faults in the lines.

Readings at both the Harmony Meter and the Milwaukie (Kellogg Creek) Meter indicate that, on average, infiltration is not a significant concern when measured over areas this large. The more discrete monitoring of flows in smaller basins as referenced above also provided indications of infiltration and inflow rates. In both cases, infiltration and inflow do not appear to contribute a significant amount of water to the total flows. Even though the record indicates a relatively minor level of infiltration and inflow, it does provide a good basis for monitoring changes in the system as it deteriorates.

Infiltration rates calculated for the Harmony Basin and the basins measured at the Milwaukie Meter range from 750 gallons per acre per day (gpad) to 900 gpad in the Harmony Basin and about 560 gpad for the Milwaukie Meter basins. The increase in the winter infiltration flows in the Harmony Basin, from 750 gpad to 900 gpad, is not a significant cause for concern at this time. Ongoing monitoring and analysis of these data is recommended.

Infiltration rates measured at the Milwaukie Meter indicate miniscule change between summer and winter flows. This is somewhat unusual as winter rates could reasonably be expected to increase due to higher groundwater levels and the generally wetter winter season experienced in western Oregon. Regardless of the reason for the unusual nature of these monitoring results, City staff should continue to monitor these flows and be aware of any changes in the patterns.

FUTURE FLOW PROJECTIONS

Since the infiltration rates are considerably below what is normally experienced, it is suggested that a higher figure be used in forecasting future flows. Improvements in pipe materials, repair technology for failing systems and installation inspection have improved the longevity of sewer systems and may have a positive long term impact on limiting infiltration rates. In the interests of providing a somewhat conservative estimate of future flows, this report will use 2,500 gallons per acre per day as the projected infiltration rate.

Future flows are therefore predicated on the following assumptions:

- Average per capita domestic sewage contribution = 80 gallons per capita per day
- Residential peaking factor = 2.5
- Infiltration = 2,500 gpad
- Population, density, land use based on the current comprehensive plan and zoning regulations

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CHAPTER 5. EXISTING SYSTEM

CAPITAL IMPROVEMENT PROJECT IDENTIFICATION

An analysis of the hydraulic and operational conditions of the sanitary sewer system provides information for the identification of capital improvement projects which will be needed as the system ages and the city grows. A review of the progress made in implementing the capital improvement projects identified in the 1994 Master Plan is presented in Table 5-1. Some of the projects were necessary to the continued sound operation of the system and were completed as planned. Upon further investigation of the recommended projects, some were determined to be unnecessary and withdrawn from the list. The rest have been carried over onto the new project list and remain areas of concern. The withdrawn projects are not vital to public health and not constructing them won't adversely affect operation of the system.

Table 5-1. Milwaukie Sanitary Sewer 1994 Master Plan Recommendations

Completed	1.	Home & Monroe Pump Station – Upgrade pumps to 400 gpm and replace controls.
Completed	2.	Divert Brookside flows to the City of Portland or extend force main to 32nd Avenue.
Withdrawn	3.	Construct a 200-foot bypass sewer around the Lakeside Apartments.
Completed	4.	Replace Brookside Pump Station pumps and controls.
CMP	5.	Initiate detailed flow monitoring program.
Ongoing	6.	Conduct CCTV inspections of all mainline.
Completed	7.	Replace 1040 feet of trunk with 12" line.
Withdrawn	8.	Inspect 30th Avenue sewer, monitor maintenance costs, replace 100 ft of line if ponding continues.
Withdrawn	9.	Harrison and Hwy 224 – Inspect sheared line, reconstruct if necessary.
Completed	10.	Plum and Sequoia – Inspect sheared line, reconstruct if necessary.
Completed	11.	42nd Avenue Sewer – Inspect to confirm low point, reconstruct if necessary.
Future CIP	12.	Jefferson Street to the Kellogg Creek WWTP – replace existing sewer with 30" line or construct a 21" parallel sewer line.
Completed	13.	32nd Avenue to Sherrett – Extend sewer to unserved area.

The following discussion identifies capital improvement projects which are either carried over from the 1994 listing or identified in this study and listed by the basin in which they occur.

Kellogg Creek Wastewater Treatment Plant

As described in Chapter 3 of this report, Milwaukie receives wastewater treatment services from Clackamas County at the Kellogg Creek Wastewater Treatment Plant. The vast majority of City's wastewater flow is collected for treatment at this plant. Milwaukie residents are well acquainted with this facility since it is located on the Willamette River in downtown Milwaukie. It was

constructed during 1973 – 75 and has been a topic of discussion for City and County officials for a number of years.

In 2003, Clackamas County began a study of options for the future of the Kellogg Creek plant including removing it from the site and diverting sewage currently treated there to another treatment location. That study included involvement by City staff and was prepared with their input.

The final draft of the study, submitted in April 2004, recommended decommissioning the Kellogg Creek plant and rerouting sewage flows to the Tri-City plant in Oregon City.

As a result of the IGA, the City established a rate structure that included a portion for the funding of the decommissioning. The rate structure adopted in 2005 provided for 6% annual rate increases through 2010 and a 3.75% rate increase in 2011.

The recommendations of the study did not move forward due to political and legal issues raised by the constituency of the CCSD #1. The Citizen's Advisory Council (CAC) for CCSD #1 was formed as a result of the desire by residents of unincorporated Clackamas County to maintain control over the sewer district. The CAC studied capacity solutions for the district. Three options were studied: site new plant, rebuild Kellogg, or shift treatment to the Tri-City plant. The last option, shifting more of the district's treatment need from Kellogg to the Tri-City plant, was determined to be the best solution. The Kellogg plant would continue to be used with its ultimate disposition unspecified.

The County began a partnering process with area cities, Oak Lodge sewer district and unincorporated area in early 2008 in an attempt to develop a framework for the governance of the area's sewer service providers. Included in the scope of the partnership was determining a process for transferring treatment to the Tri-City plant if the Kellogg plant was decommissioned.

The City's position on the disposition of the Kellogg treatment plan has not solidified. However, in 2009 and 2010 the City hosted open houses engaging the services of several experts and citizens in a design charette focused on a modification of the plant that will make it a "good neighbor", functioning in its urban environment without degrading the riverfront.

Accomplishment of this goal will require a combined political, financial, and community development effort. Politically, working with the County and the sewer partnership is necessary as the plant is a regional facility.

Plans for the redevelopment of the Kellogg Treatment plant are very preliminary and it is not in the scope of this master plan to include its financial impact in the capital improvement plan or rate analysis. However, the City should develop a financial plan for the future of the Kellogg Treatment plant and it would be prudent to begin to provide funding for the studies and preliminary work that will be needed. It is recommended that a modest amount of funding ($50,000) be set aside annually to provide for the future redevelopment of the Kellogg plant.

North Milwaukie Basin

The 24" diameter line crossing Johnson Creek, an inverted siphon, shows significant overloading during peak flow periods. This system is designed to surcharge however and is not considered to be a significant operations problem. It is imperative that this be inspected regularly and any debris which may impede flow through the siphon removed.

Cleaning the line is recommended, especially if it has not been cleaned in some time. This will require a detailed work plan since the line must be closed off to be cleaned. This will cause significant backup of sewage in the upstream system. Typically, cleaning of a critical part of the system requires work to be done during the lowest flow periods of the day, usually between 2 am and 5 am. The elevation of sewage in the upstream system must be monitored closely and precautions taken to avoid overflows from the system during the cleaning operation.

The City was notified by the Johnson Creek Watershed Council in the summer of 2008 that the crossing closest to the mouth of the creek was too high and presented a barrier to fish passage. Also noted was that the concrete armoring this part of the crossing has largely fallen off, exposing portions of the siphon pipe. Investigation of the pipe condition and the possible need for its replacement is needed. The City is working with the Watershed Council on a plan to rebuild the stream bed and protect the pipeline.

The blocks immediately east of McLoughlin Boulevard, between Scott Street and Jefferson Street, are served by a badly aging sewer main. This area contains about fifteen buildings, several with multiple tenants. The existing main is an 8-inch vitrified clay pipe, which was installed in the 1920's. Because of its current location, material and age, maintenance of the pipe is increasingly difficult and there is potential for serious failure.

A new main was placed within adjacent street right-of-way in 2009. Reconnecting the laterals to the new main is the responsibility of the property owners although the City developed a grant program to assist in the cost of the connection. The program runs through September of 2011. Connecting the laterals to the new main will be necessary as decommissioning of the old main is desired by 2014.

Brookside Basin

The 1994 Master Plan identified a portion of the 10-inch sewer in Brookside Drive as overcapacity (due to its flat slope) at the time of that report. Also identified was that at ultimate build-out the sewer in Brookside Drive would be over capacity from SE Regents Drive to the pump station. The recommendation was to replace 1,040 feet of the Brookside Trunk with larger, 12-inch diameter pipe. This project was completed in early 2011 in conjunction with the NE Sewer Extension project.

The 15-inch diameter line that runs in SE Filbert Street between 32nd Avenue and 42nd Avenue is expected to be overloaded at ultimate build-out. Modeling indicates that this line was operating at 100 percent capacity in 1994 and was expected to be at 104 percent by 2010. To alleviate this capacity problem, the

trunk line in SE Filbert should be replaced with a new 18-inch diameter line. However this sewer is over 20 feet deep and would be difficult to build. An alternative would be to construct force main on Filbert St between 42nd Avenue and 32nd Avenue, extending the existing force main from the Brookside Pump Station. This would bypass the Brookside Basin Flow of 0.8 MGD (currently) around the Filbert Street Constriction and alleviate the problem at a less expensive cost than replacing the trunk line in Filbert.

Lower Kellogg Basin

No capital improvement projects were identified in this basin.

Mid-Milwaukie Basin

The model used in the 1994 Master Plan indicated that the 24-inch diameter interceptor that runs from the lower end of Jefferson Street to the Kellogg Creek WWTP was operating at over its design capacity during peak flow conditions at that time. The recommendation of that Plan was to either replace the 24-inch interceptor with a 30-inch or build a 21-inch relief sewer alongside the existing line to carry the flow from the Mid-Milwaukie Basin. Subsequent observations of that line have shown no significant issues relating to its capacity or ability to carry sewage flows. It is recommended that the replacement of the line will be planned for but not as an urgent need.

Harmony Basin

No capital improvement projects were identified in this basin.

South Milwaukie Basin

No capital improvement projects were identified in this basin.

Johnson Creek Basin

The NE sewer Extension project completed in early 2011, provides sewer service to 261 properties in the unincorporated area identified as Dual Interest Area "A" in the UGMA. Properties are annexed into the City as they connect to the system. The connection fees, established by the reimbursement district formed for the sewer project, will refund the project costs. It is anticipated that the cash flow from the connections will fund the approximate $100,000 annual loan repayment cost over the 20 year loan repayment period.

CHAPTER 6. CCSD #1 AGREEMENTS

This chapter provides a review of previous agreements with CCSD #1, a review of the proposed Intergovernmental Agreement (IGA) between CCSD #1 and Milwaukie, and makes recommendations for consideration by Milwaukie regarding the proposed IGA.

HISTORY OF AGREEMENTS WITH CCSD #1

November 3, 1969. This basic agreement established the terms under which the City would utilize a wastewater treatment plant constructed and operated by CCSD #1 (also called the District). This agreement generally outlined contract terms including lump sum payment amounts, unit charges, and other technical aspects of the agreement. The term of the agreement was set at 10 years or until the treatment plant was expanded to 7.5 MGD, whichever occurred first. Lump sum payment percentages were established for facilities construction. A unit charge of $85 per million gallons of sewage conveyed to the District was set. This agreement was superseded the following year by the agreement dated November 25, 1970, discussed below.

November 25, 1970, Basic Agreement. This agreement serves as the Basic Agreement between the City of Milwaukie and the District. The agreement states the District will construct and operate a sewage collection system and treatment plant known as the Kellogg Creek Water Pollution Control Plant. The plant was to be constructed with an average design flow of 10 MGD and a design population equivalent of 100,000 persons.

The term of the agreement was for a period of 10 years or until the District expanded and put into operation a 15 MGD plant or larger, whichever occurred first. Either party could terminate the agreement with 180 days written notice.

The basic agreement established that Milwaukie would make an annual lump sum payment on the anniversary of the effective date of this agreement. The annual lump sum charge was to be a proportional share of money necessary per year to retire the debt incurred to construct a wastewater treatment plant. The proportional share of the retirement was determined as follows:

- 40% of all costs incurred in constructing a 10 MGD wastewater treatment plant.
- 13.5% of all costs incurred in constructing the Lower Kellogg Creek Interceptor.
- 11.2% of all costs incurred in constructing the Mount Scott Creek Interceptor west of Linwood Avenue.

The agreement states that "the annual lump sum charge shall cover that portion of plant capital costs deemed applicable to Milwaukie for treatment of up to an average 4.0 million gallons per day sewage flow from Milwaukie. Should the average yearly Milwaukie sewage flow to the district exceed 4.0 million gallons per day, or the recomputed minimum as provided hereinafter, the annual lump sum payment shall increase proportionately to the increase in flow above 4.0 MGD, or the recomputed minimum, using the above initial formula as a base,

excluding costs of interceptor lines". The agreement provides provisions for a reduction in the lump sum payment in the event the District contracts with others outside the District to provide sewage treatment services at the Kellogg Creek Plant. The agreement provides that should the average yearly sewage flow to the Kellogg Creek Plant exceed 10 MGD less Milwaukie's minimum proportion, the annual Milwaukie lump sum payment shall be renegotiated with the payment being based on actual contribution by Milwaukie.

A unit charge of $85 per million gallons of sewage transmitted by Milwaukie was established by this agreement. This fee was to be paid monthly upon billing by the District. This fee was to cover operation and maintenance and generally consisted of direct supervision, labor, operating materials and supplies, maintenance, repair and replacement of plant machinery and equipment, and administration. The agreement provided for annual revision of this charge. In no case was Milwaukie's operation and maintenance charge to exceed 65% of the annual total operation and maintenance cost for the plant, provided Milwaukie's flow did not exceed 4.0 MGD.

One comment of note: the unit charge portion of the base agreement was rescinded by Agreement No. 4 (discussed below) in July 1984 and replaced with alternate language.

August 31, 1978, First Amendment to Basic Agreement. Milwaukie and the District agreed that the amount of a lump sum payment from Milwaukie to the District for capital construction of the Kellogg Wastewater Treatment Plant was $1,763,631.92. A payment schedule for this amount was established over a 20 year period, commencing November 25, 1978 and ending November 25, 1997. This agreement also provides an alternate lump sum payment schedule in the event of early termination of the agreement.

July 14, 1983, Second Amendment to Basic Agreement. This amendment extends the Basic Agreement beyond the original 10 year term and provides a new termination date of June 30, 1984.

July 1, 1984, Agreement No. 4, Third Amendment to Basic Agreement. Agreement No. 4 rescinds the unit charge portion of the Basic Agreement. The revised language is repeated below:

> "A charge to be known as a unit charge shall be made by the district to Milwaukie, based upon a rate per million gallons of sewage transmitted by Milwaukie to the District to be paid monthly by Milwaukie upon being billed therefore by the District as hereinafter set forth. The unit charge shall include actual current cost of operation and maintenance consisting of direct supervision, labor, operating materials and supplies, maintenance, repair and replacement of plant machinery and equipment, and administration. In no case shall Milwaukie's operation and maintenance charges exceed 65% of the annual total operation and maintenance cost for the plant, provided Milwaukie's flow does not exceed 4.0 MGD."

Agreement No. 4 also establishes that when connections to the District sewage system by Milwaukie are in a location where flow measurement facilities are

impractical or unwarranted, the contributing flow shall be determined by using the number of connections on the contributing line multiplied by an average sewage flow of 300 gallons per day per residential connection, or upon justified other volumes of flow. Flows for commercial establishments are to be estimated using the average daily water used for the preceding year based on water meter records.

July 1, 1986, Agreement No. 5, Fourth Amendment to the Basic Agreement. Agreement No. 5 extends the terms of all previous agreements to June 30, 1987, and thereafter on a month to month basis until such time as the parties either renew the agreement or enter into a new agreement. The City also agreed to pay the district $49,517.20 for 222 newly discovered unmetered units connected to Milwaukie's sewer system. This amount was to be paid in six equal monthly installments beginning July 1, 1986.

July 1, 1987, Agreement No. 6, Fifth Amendment to the Basic Agreement. Agreement No. 6 extends the terms of all previous agreements to June 30, 1988 and thereafter on a month-to-month basis until renewed or such time as the parties may enter into a new agreement.

November 2, 1989. This agreement is not a part of the Basic Agreement. Milwaukie agrees to pay $37,441 as its share of the cost of a sewerage facilities study in the District's North Clackamas Service Area, Milwaukie's existing collection system, and the Kellogg Creek Water Pollution Control Plant to assess current operating performance, project future loads and treatment requirements, and any facility modifications or additions that may be necessary to meet them.

August 21, 2001, **Intergovernmental Agreement**. This agreement is not a part of the Basic Agreement. Milwaukie acknowledges and agrees that it owes the district $356,508 for wastewater treatment services and capital improvements through the period ending June 30, 2000. Payments are to be made in five annual installments, with interest, at the Government Investment Pool rate. Of note is that this agreement assumes an obligation to pay for capital improvements after initial construction that is not established in the Basic Agreement or any amendments. Other general contract language is included in this agreement.

December 17, 2002, Intergovernmental Agreement. This agreement is not a part of the Basic Agreement. The City and District agree that Milwaukie is obligated for an additional $891,670.40 for capital improvement costs beginning on July 1, 2000 through June 30, 2001. Given previous amounts paid by Milwaukie based on the August 21, 2001 agreement, the parties agree that Milwaukie currently owes the district $1,137,351.80 for wastewater treatment services and capital improvements through the period ending June 30, 2001. This amount is in addition to any sums previously paid by Milwaukie. Payment is to be made in 10 annual installments beginning June 1, 2003. This agreement also contains other general language.

September 1, 2005, Clearwater Agreement. This agreement is not a part of the Basic Agreement. The agreement was ratified by the City on August 2, 2005 but never officially implemented as the constituents of CCSD#1 intervened and repealed its provisions to decommission the Kellogg Creek Water Pollution Control Facility. The agreement was to have been between CCSD #1, the Tri

City Service District, and Milwaukie for regionalized wastewater treatment services. The parties agreed to support the implementation of the Clearwater project. The parties agreed to form a Clearwater Advisory Committee to perform various functions in the process of implementation of the Clearwater plan no later than September 1, 2005. Of particular note in this agreement is that the District agreed to transfer ownership of the property on which the Kellogg Plant is sited (except for the raw sewage pump station and necessary road access) to the City following decommissioning, demolition and remediation of any environmental contaminants or hazards discovered on the site after structures are removed by the end of calendar year 2012. The District agreed to cooperate with the City as to possible relocation or modification of the pump station in connection with the redevelopment of the property.

As stated in the agreement, Milwaukie was to pay the district a one-time payment of $4,500,000 towards the capital costs for the Clearwater Project payable as follows: the first payment of $450,000 when the Trolley Trail pipeline starts construction, a second payment of $1,800,000 when the facilities that would replace the Kellogg Plant's capacity begin construction. A final payment of $2,250,000 was specified when the Kellogg Plant would be decommissioned.

This agreement also stipulated a wholesale wastewater treatment and transmission rate that the City would pay to the District as an amount per equivalent dwelling unit (EDU) not to exceed $13 per EDU per month for the July 1, 2006 through June 30, 2007 fiscal year. This rate was to begin on July 1, 2006 and replace the unit charge used from earlier agreements. Future wholesale rates will be considered by the Districts only after review of the rates by the Clearwater Advisory Committee.

Per the agreement, the City also would collect a new transmission and treatment system development charge as adopted by the District for each new equivalent dwelling unit added to the system beginning on July 1, 2006, on behalf of the District. This charge was based on the District's costs of expanding capacity at the Tri-City site and was subject to review and comment by the Clearwater Advisory Committee before adoption.

The agreement also establishes the City having one seat on the Clearwater Advisory Committee and afforded full participation rights on the committee.

The agreements listed above were the principal agreements reviewed with respect to wastewater cost and capacity issues between Milwaukie and the District. In the course of review of these agreements, additional, less comprehensive agreements with the District were reviewed. A brief summary of these agreements is given below.

December 16, 1986. This agreement between Milwaukie and the District was related to a property known as the Crosswhite property. The District and Portland entered into an agreement allowing the District to provide sewage service within the Southeast Relieving Interceptor Drainage basin by utilizing the Johnson Creek Interceptor of the Lents Trunk Sewer Line. A property known as the Crosswhite property was desirous of annexing to the District while the City was considering urban service boundary adjustments. Milwaukie and the District agreed that the Crosswhite property should be served immediately while issues pertaining to the urban service boundary were discussed. The parties agreed that

if the Crosswhite property sought annexation to the District, neither party would file objections with government bodies. The District also agreed that it would not annex or provide service within the unincorporated area served by the Johnson Creek Interceptor for a period of 12 months or when a long-term service agreement was reached, whichever occurred sooner. The agreement stated that the District could commence accepting further petitions for annexation of service.

July 25, 2002. This agreement establishes that Milwaukie will adopt and keep current an Industrial Pretreatment Program meeting all federal and Oregon statutory and regulatory requirements.

July 1, 2010 An IGA between the City and CCSD#1 governing the construction and use of two main sections, "West Fork" and "Johnson Creek trunk line", serving the NE Sewer Extension Area. The agreement provides for the cost sharing of the mains and stipulates that CCSD#1 will be the owner maintainer of the mains. The City is provided the right to use and connect to the line.

At the time of the publication of this Master Plan, the City and CCSD#1 are in the process of working out an agreement to specify the terms of the relationship between the City and CCSD#1. Terms of the agreement are not established however from previous proposals it is anticipated that the new agreement will establish a revised wholesale treatment rate structure based on a per EDU basis. It is recommended that as the City reviews the draft agreement the following be considered:

- Clarification on what the City will pay for and what the City is actually paying for in order to minimize the opportunities for misunderstandings and conflict in the future. For example: how will capital expenses be defined? (By dollar amount? Only new construction?) If a new wholesale rate is established, what is the expectation of CCSD #1 on Milwaukie's contribution for capital expenses? What facilities, if any, will capital expenses be assessed on?

- The City should clearly understand the basis for the determination of the rate, how the assessment cost was determined, and how those charges are billed to the City. While the technical methodology does not necessarily need to be spelled out in the IGA itself, the City should request and receive calculations outlining the basis for the wholesale wastewater treatment service rate.

- The agreement should not provide CCSD#1 control over the City's flow and costs incurred by the City. There should be some protection for the City. For example: under what conditions may CCSD #1 limit wastewater discharges? What protocols will exist for notification so the City is not left with an emergency or high cost situation? How will the City be allowed to be a participant in the determination of whether discharges are causing violations of CCSD #1 permit? CCSD #1 should not be the sole determiner of whether Milwaukie's flow was causing a violation and be able to either stop flow or charge for it.

- The agreement should include language that acknowledges that Milwaukie's wastewater will include wastewater flow from commercial and/or industrial sources receiving pre-treatment, and not be limited strictly to domestic wastewater.

- The City might consider whether to use the agreement as an opportunity to clarify future service area issues in Dual Interest Areas A and B.

- The IGA may be the place to clarify and restate future plans for the Kellogg Creek Wastewater Treatment Plant.

Copies of the agreements reviewed in this chapter are included in Appendix A.

CHAPTER 7. COLLECTION SYSTEM ASSET MANAGEMENT STRATEGY

This chapter provides an abbreviated sewer collection system asset management strategy for the City of Milwaukie. It will enable the City to make informed decisions on how to effectively allocate resources for capital improvements to the collection system on an annual basis.

BACKGROUND

In its simplest form, asset management is maintaining a desired level of service for collection system assets at the lowest life cycle cost. Lowest life cycle cost refers to the best appropriate cost for rehabilitating, repairing, or replacing an asset. Asset management is implemented through an asset management program which typically includes a written asset management plan (AMP).[4] The AMP typically includes the following core components:

1. An assessment of the current state of assets.
2. Defining the level of service required.
3. Assessing which assets are critical to sustained performance.
4. Determining the lowest life cycle cost.
5. Determining the best long-term funding strategy.

A significant amount of data was collected by the City on the collection system for the 2004 Wastewater Master Plan using sewer TV inspections.

CAPITAL IMPROVEMENT AND MAINTENANCE (REPAIR) PROJECTS (CIP/CMP)

The City of Milwaukie provided Parametrix with a list of sixty-eight collection lines with associated integrity ratings. Some of these lines have been repaired since being inspected. Parametrix developed an asset management strategy to address the highest priority CIP/CMPs. This list was reviewed by City staff to confirm that the top ranked collection lines corresponded to those staff felt were most in need of improvements.

Using the information obtained from City staff, Parametrix staff reviewed sewer inspection videos. The following list outlines the findings and recommendations made for each collection line in order of priority and labeled by upstream and downstream manhole identification numbers. Additional information is contained in Table 7-1 and shown on Figures 7-1 through 7-21.

[4] Definition was taken from the USEPA Asset Management Best Practices Guide.

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Table 7-1. Repair Project List with Associated Details, Notes, and Recommendations

Project #	Upstrm MH		Dwnstrm MH	Address	File #	Date Reviewed	Length, ft	Material	Dia, in	Upstream Depth	DwnStream Depth	Pipe Surface Cover	Apparent Land Use Type	Observations and Comments	Recommendation
1	**2008**	-	**2007**	2323 SE HARRISON	A2 - D12	6/26/2008	147	Concrete	10	5.5	2.58	Asphalt Street	Residential/Commercial	Sewer tape started filming at 7.7' Belly for approximately 80' in first part of pipe	Full replacement
2	**1102**	-	**1101**	1509 SE OXFORD	A2 - T6	6/26/2008	172	Clay	8	4.83	7.58	Asphalt Street	Residential	Holes, cracks and roots at various points in pipe	CIPP or full replacement
3	**3397**	-	**3396**	6726 SE HEMLOCK	A3 - D2	6/27/2008	130.6	Concrete	8	9.25	7.75	Asphalt Street	Residential	Belly from 25' down grade of MH 3397 to end of pipe (MH 3396)	Full replacement
4	**1190**	-	**1189**	2100 SE OCHOCO	A1 - T4	7/2/2008	35.5	Concrete	8	5.75	5.75	Asphalt Street	Industrial	Water appeared stagnant (no flow). Full radial crack at 33' from MH 1190. Lack of notes on Detail Sheet.	Full replacement
5	**2030**	-	**2004**	2146 SE MONROE	A2 - T8	8/19/2008	270	Clay	8	8.8	11.91	Asphalt Street	Downtown business district	Off-set joint about 10' downstream of MH 2030 and bellies throughout the service line with medium I/I close to MH 2030.	Full replacement
6	**1222**	-	**1220**	8607 SE VAN WATERS	A1 - D10	7/1/2008	337	Concrete	8	12	8.25	Asphalt Street	Residential	Bellies and visible gaskets within first 225' of video	Full replacement
7	**4008**	-	**4007**	11845 SE 26TH	A4 - D5	7/1/2008	37.3	Concrete	8	7.6	10	Trees and Shrubs/Asphalt	Residential	Water appears stagnant with deepest part (belly) at 26' from MH 4008. Significant build-up at entrance to MH 4007	Full replacement
8	**3033**	-	**3032**	4040 SE INTERNATIONAL	A3 - D16	6/30/2008	354.2	Concrete	15	10.5	11.5	Asphalt Street	Commercial/Industrial	Two significant bellies of short length and there appears to be a couple of plumber service connections in need of grease traps.	Replace 40' segment between 211' and 260' from MH 3033 and 10' segment between 330' and 340'
9	**1309**	-	**1308**	9053 SE 41ST	A1 - D7	6/30/2008	285.4	Concrete	8	3.83	12	Asphalt Street	Residential	1 significant belly in line for about 70 ft	Replace ~70 ft of pipe from MH 1309 to 70 ' downstream
10	**3461**	-	**3460**	11084 SE 64TH	A3 - D17	6/30/2008	207	Concrete	8	7.67	10.42	Asphalt Street	Residential	One significant belly. Noticed some minor pipe joint offsets within the first 50' downstream of MH 3461 (do not appear to be problematic).	Replace ~9' of pipe from 72' to 81' from MH 3461
11	**1055**	-	**1054**	9404 SE 42ND	A1 - D8	6/30/2008	252.7	Concrete	12	15.17	19.17	Asphalt Street	Residential	Two bellies with one sag approximately 170' in length and the other about 24' in length.	Full replacement
12	**5052**	-	**5051**	12113 SE RIVER	A5 - T2	6/30/2008	305	Concrete	8	6	6	Asphalt Street	Residential	Medium infiltration (1-5 gpm) happening at many of the joints. No Bellies and good flow.	CIPP or full replacement
13	**1591**	-	**1133**	9809 SE 17TH	A1 - T5	7/2/2008	222	Concrete	6	4	5.42	Asphalt Street	Commercial	Cracks throughout the service line with minor amount of roots and joint 205' downstream of MH 1591. no bellies noted.	CIPP or full replacement
14	**1575**	-	**1144**	1520 SE MAIN	A1 - T5	7/2/2008	143.2	Concrete	8	9.5	10	Trees and Shrubs	Downtown business district	Significant belly within lower 80-90' fo pipe.	Replace entire line
15	**1169**	-	**1168**	9079 SE FRONTAGE	A1 - T4	7/2/2008	116.5	Concrete	10	8	8	GRAVEL/Asphalt	Industrial	Medium infiltration happening at joints in four locations throughout the line. Belly noted at exit of MH 1169 to about 15' downstream	Replace line.
16	**1166**	-	**1029**	2400 SE MAILWELL	A1 - T5	N/A	403.2	Concrete	8	8	9.33	Asphalt Street	Industrial	Minor amounts of structural failure and evidence of infiltration throughout line.	CIPP or full replacement
17	**1495**	-	**1494**	9505 SE 55TH	A1B - D1	6/30/2008	75.5	Concrete	8	6.6	5.9	Asphalt Street	Residential	Belly noted from 16' to 22' stream of MH 1494 and Infiltration noted 2' upstream.	Replace 22' of line from entrance to 22' upstream of MH 1494, or CIPP.
18	**1163**	-	**1162**	9501 SE FRONTAGE	A1 - T2	7/2/2008	405.4	Concrete	10	9.8	11.5	OPEN AREA	Industrial	Infiltration noticed at many points within first 250' of pipe. Build-up found at many of the joints creating pooling. Roots enter at joints from about 280' downstream of MH 1163 to end of pipe.	CIPP or full replacement
19	**3094**	-	**3093**	4405 SE RIO VISTA	A3 - D7	6/30/2008	297.2	Concrete	8	9.17	9.42	Asphalt Street	Residential	Heavy amounts of roots coming though at joints, holes in pipe and service connections.	CIPP or full replacement
20	**1204**	-	**1203**	3461 SE ROSWELL	A1 - D7	6/30/2008	363.1	Concrete	8	8.83	8.33	Asphalt Street	Residential	Light roots throughout line with no noticeable bellies and steady flow.	CIPP
21	**1196**	-	**1037**	8810 SE ROCKVORST	A1 - D11	N/A	177	Concrete	8	9.17	13.75	SIDEWALK	Residential	Video of line not saved to disk properly, so no review tape. Report shows heavy roots throughout with belly in lower 45' of pipe.	CIPP or full replacement

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Figures 7-1 through 7-21. Capital Maintenance Projects

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Project 2

MH 1102 - MH 1101

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Project 3

MH 3397 - MH 3396

Figure 7-3
Capital Maintanence Projects
MILWAUKIE
Dogwood City of the West

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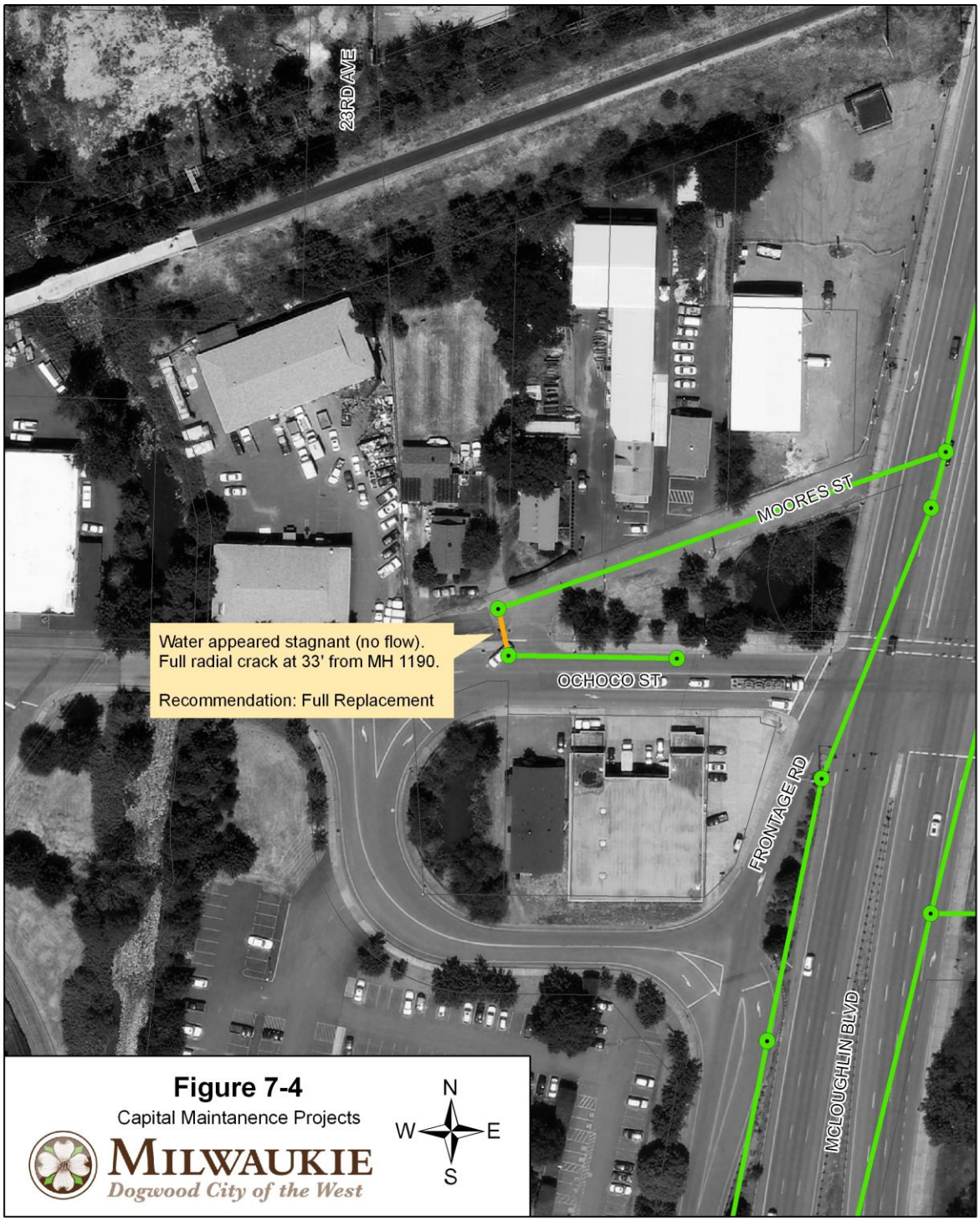
Project 4

MH 1190 - MH 1189



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Project 5

MH 2030 - MH 2004

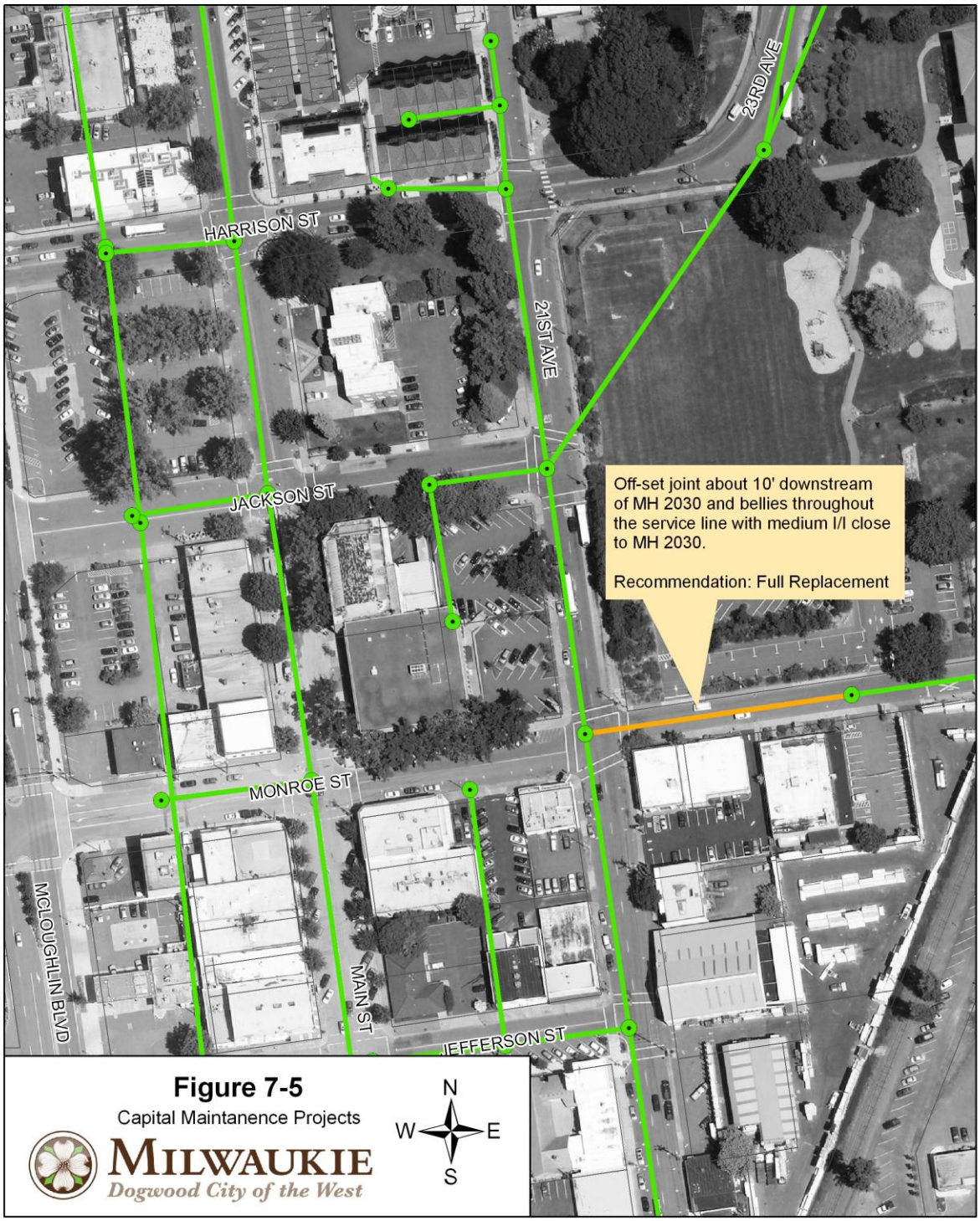

Figure 7-5
Capital Maintanence Projects
MILWAUKIE
Dogwood City of the West

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Project 6

MH 1222 - MH 1220

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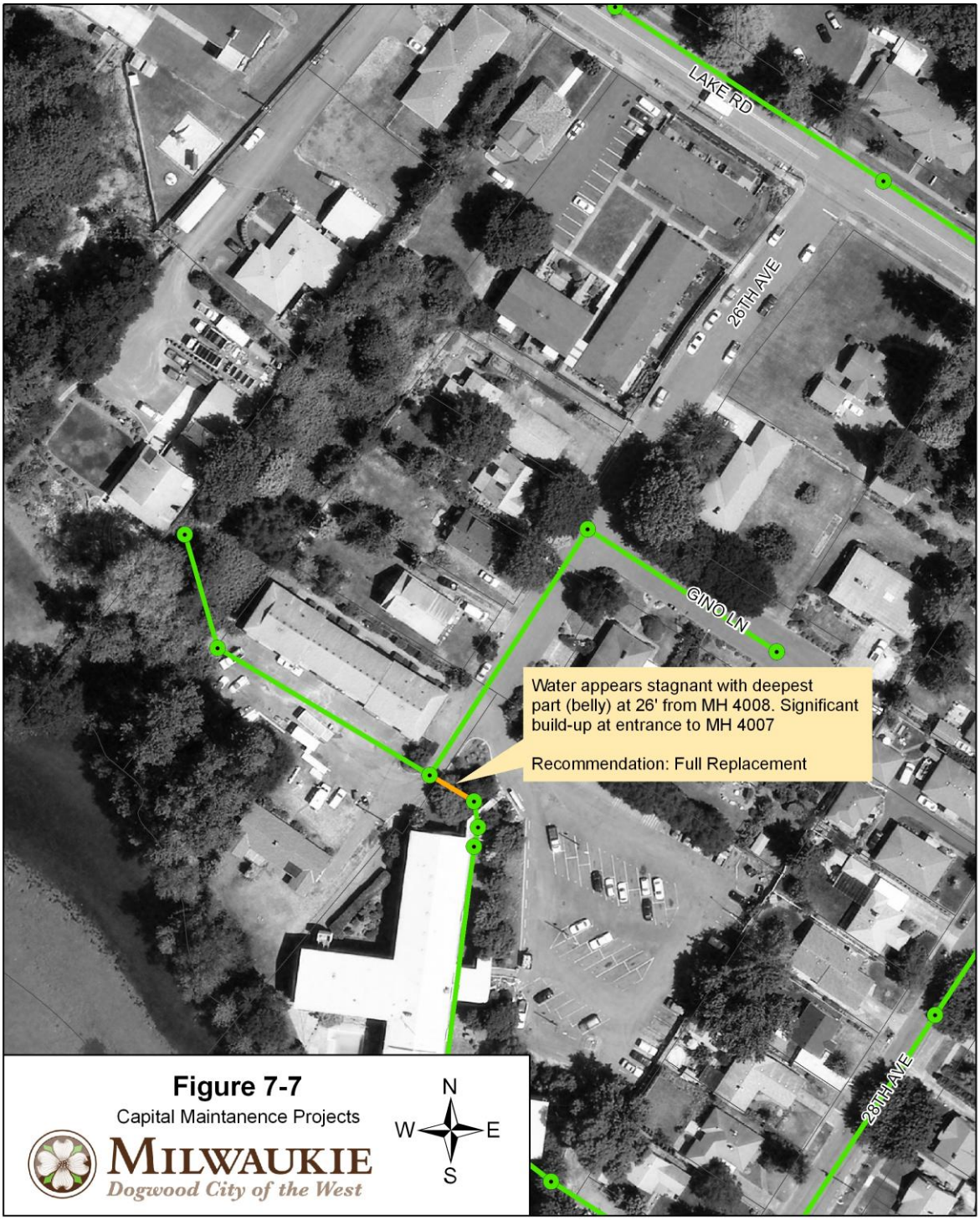
Project 7

MH 4008 - MH 4007



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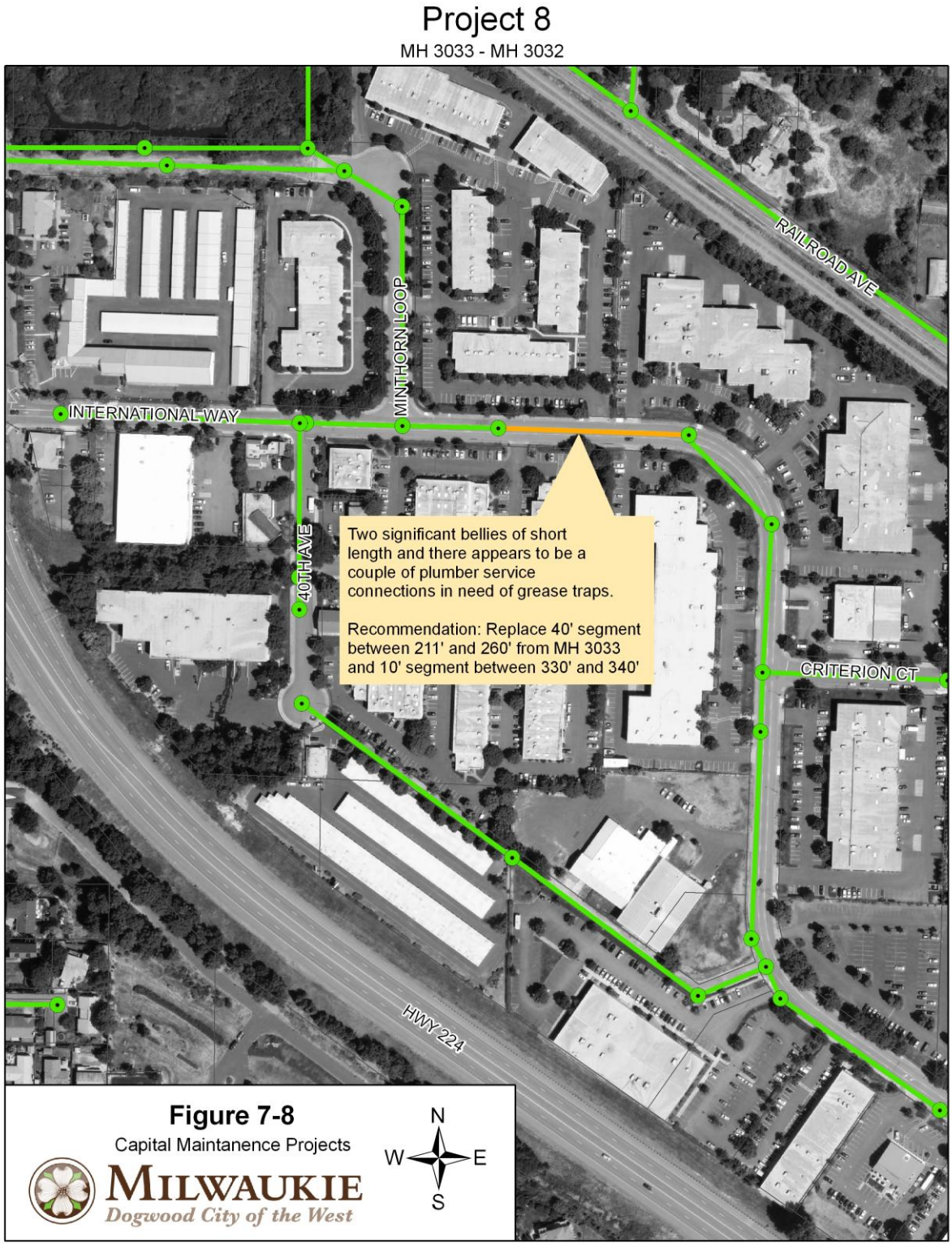
Project 8
MH 3033 - MH 3032
RAILROAD AVE
MINTHORN LOOP
INTERNATIONAL WAY
40TH AVE
Two significant bellies of short length and there appears to be a couple of plumber service connections in need of grease traps.
Recommendation: Replace 40' segment between 211' and 260' from MH 3033 and 10' segment between 330' and 340'
CRITERION CT
HWY 224
Figure 7-8
Capital Maintanence Projects
MILWAUKIE
Dogwood City of the West
N
W
E
S

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Project 9

MH 1309 - MH 1308

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Project 10

MH 3461 - MH 3460

Figure 7-10
Capital Maintanence Projects
MILWAUKIE
Dogwood City of the West

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Project 11

MH 1055 - MH 1054

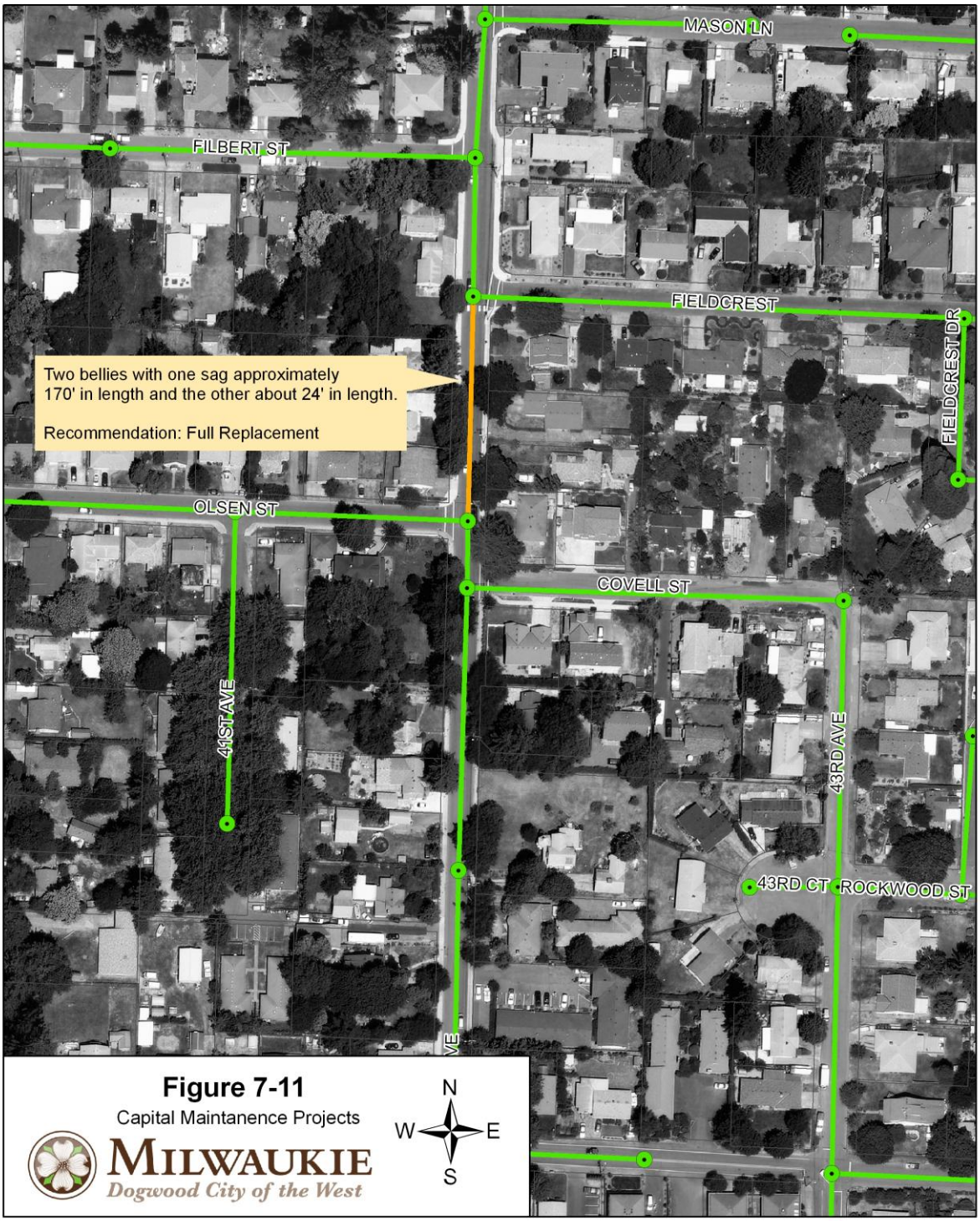

Figure 7-11
Capital Maintanence Projects
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Dogwood City of the West

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Project 12

MH 5052 - MH 5051

Figure 7-12
Capital Maintanence Projects
MILWAUKIE
Dogwood City of the West

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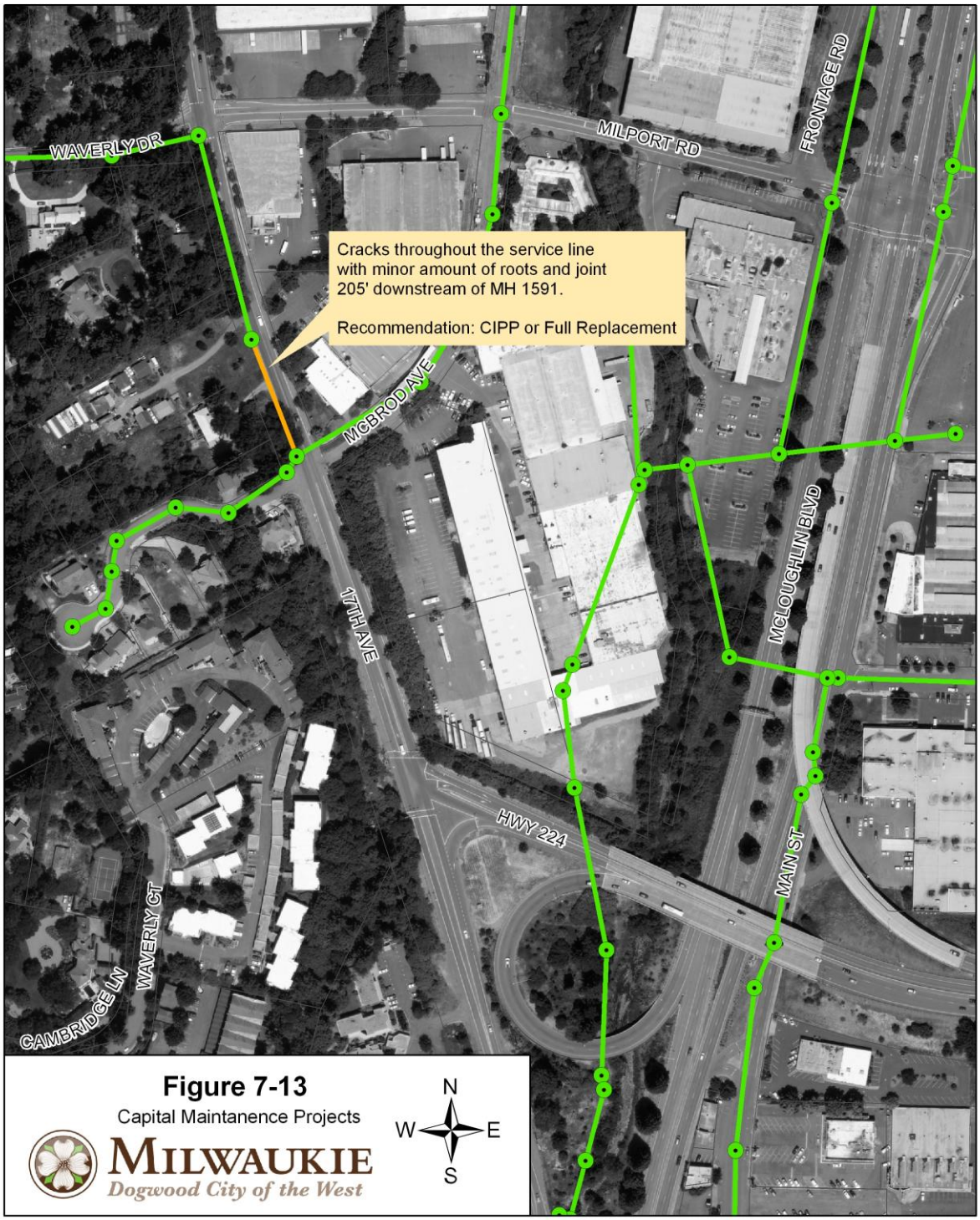
Project 13

MH 1591 - MH 1133



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Project 14

MH 1575 - MH 1144

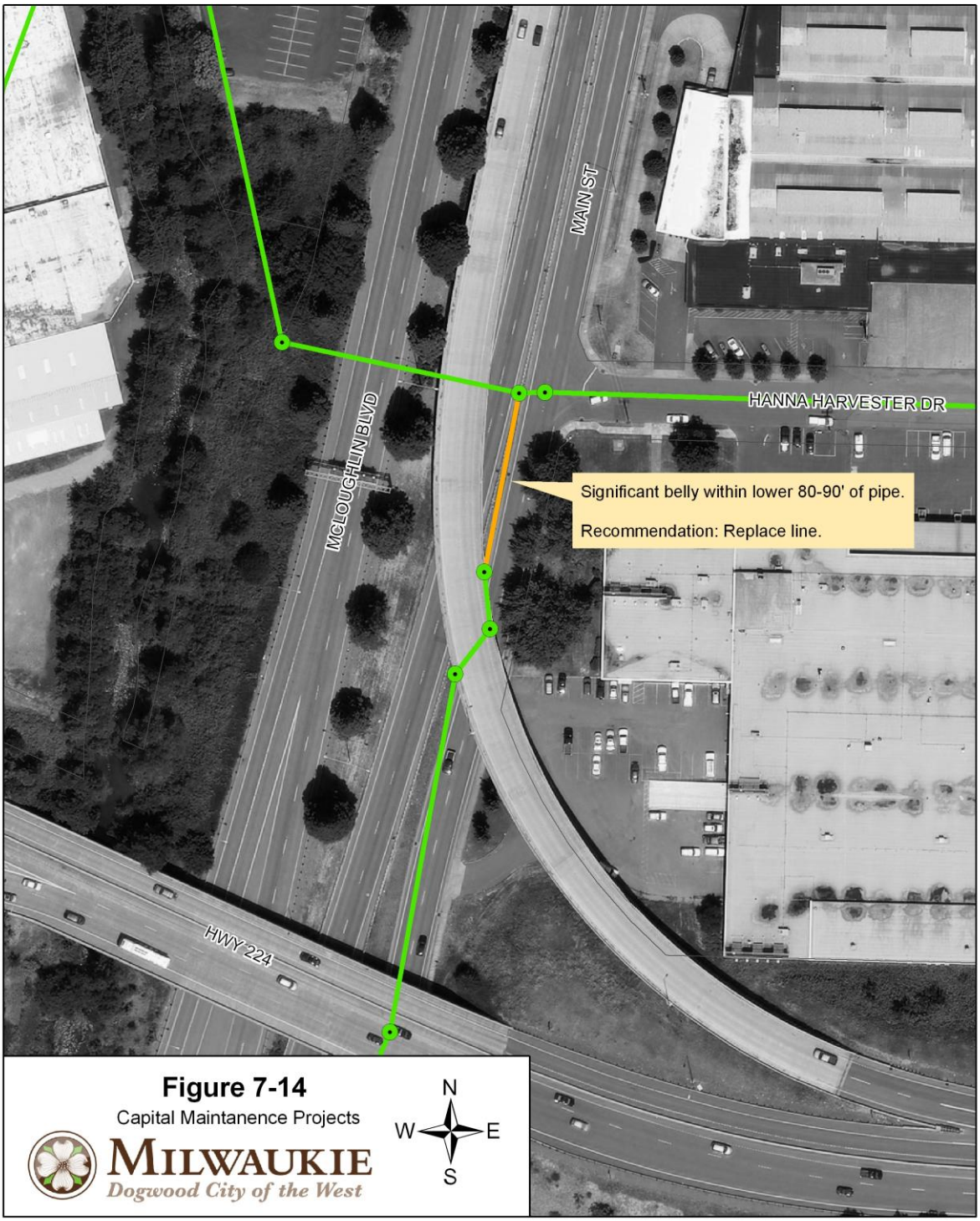

Figure 7-14
Capital Maintanence Projects
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Dogwood City of the West

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Project 15

MH 1169 - MH 1168

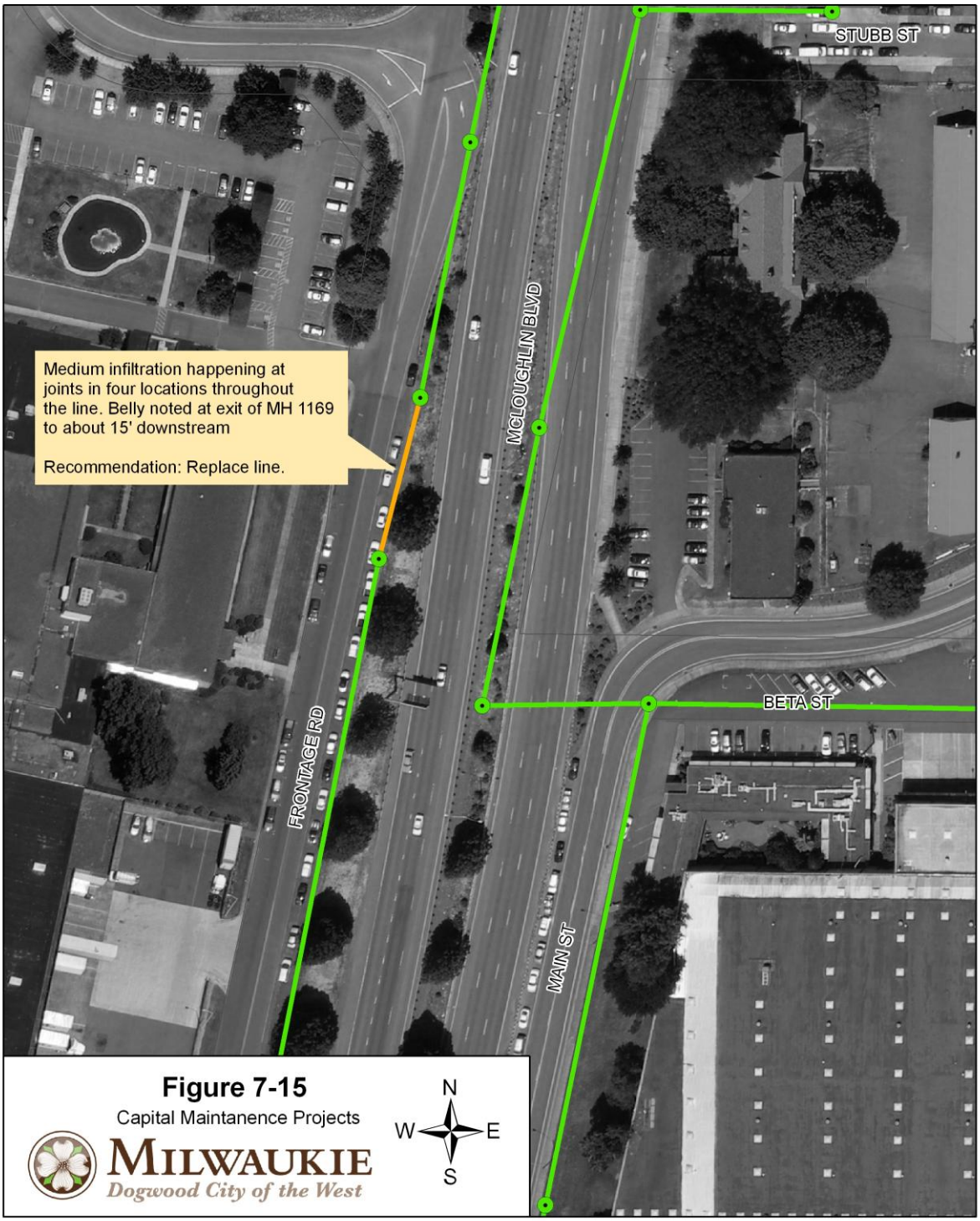

Figure 7-15
Capital Maintanence Projects
MILWAUKIE
Dogwood City of the West

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Project 16

MH 1166 - MH 1029

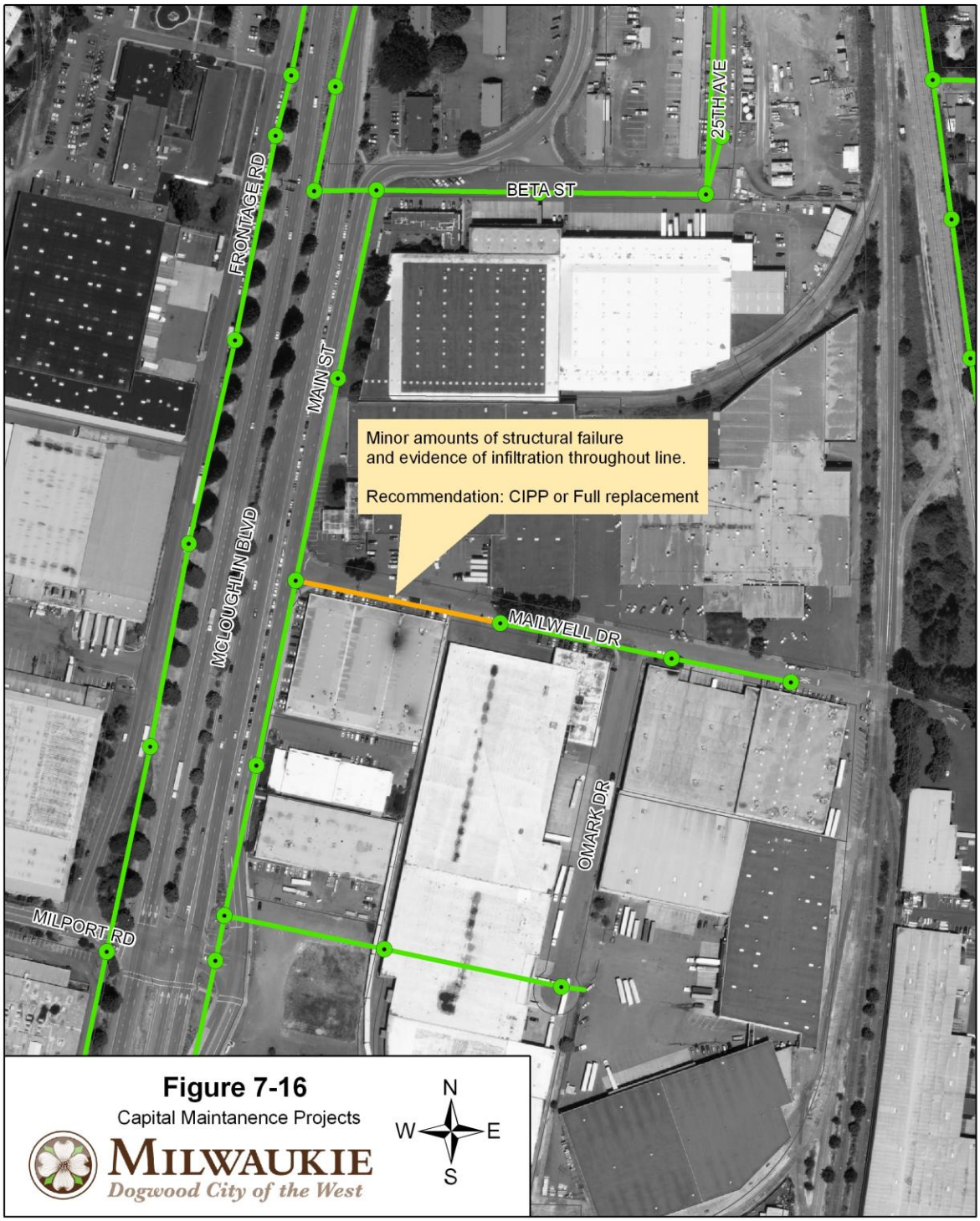

Figure 7-16
Capital Maintanence Projects
MILWAUKIE
Dogwood City of the West

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Project 17

MH 1495 - MH 1494

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Project 18

MH 1163 - MH 1162

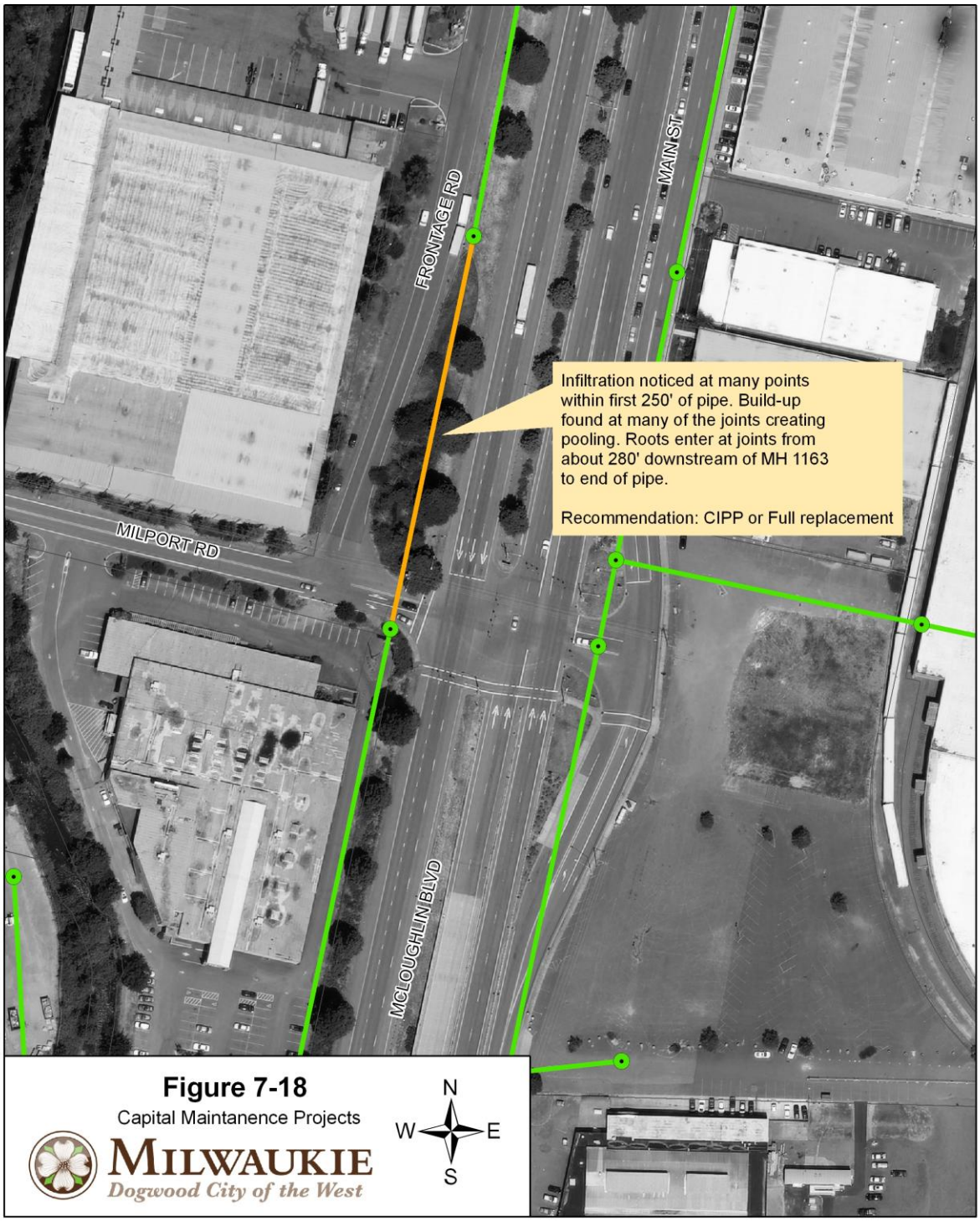

Figure 7-18
Capital Maintanence Projects
MILWAUKIE
Dogwood City of the West

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Project 19

MH 3094 - MH 3093

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Project 20

MH 1204 - MH 1203

Figure 7-20
Capital Maintanence Projects
MILWAUKIE
Dogwood City of the West

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Project 21

MH 1196 - MH 1037

Figure 7-21

Capital Maintanence Projects

MILWAUKIE
Dogwood City of the West

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1. **2008 – 2007** (10"): A significant belly from exit of upstream MH 2008 to 80' downstream. It is recommended that the entire pipe be replaced and laid to proper grade.
2. **1102 – 1101** (8"): Multiple sections of infiltration occurring throughout length of line with spots of deterioration and roots visible. It is recommended that the entire pipe be replaced and laid to proper grade.
3. **3397 – 3396** (8"): A belly starting at 39-ft downstream of MH 3397 to just before the entrance to MH 3396. It is recommended that the entire pipe be replaced and laid to proper grade.
4. **1190 – 1189** (8"): Water appeared to be stagnant without a clear direction of flow. There was a radial crack at 33-ft downstream of MH 1190. It is recommended that the entire length of pipe be replaced and laid to proper grade.
5. **2030 – 2004** (8"): No video was available to view for this collection line, but the inspection report showed bellies of varying severity along the full length of the pipe. It is recommended that the entire pipe be replaced and laid to proper grade.
6. **1222 – 1220** (8"): Multiple bellies of varying severity throughout the first 235-ft of the line downstream of MH 1222 with visible gasket observed at three locations. It is recommended that the entire pipe be replaced and laid to proper grade.
7. **4008 – 4007** (8"): Belly running the full length of the pipe with significant build-up at the downstream entrance to MH 4007. It is recommended that the entire pipe be replaced and laid to proper grade.
8. **3033 – 3032** (15"): Couple of plumber service lines with significant grease buildup, a belly between 220-ft and 260-ft downstream of MH 3033 and another belly between 330-ft and 340-ft downstream of MH 3033. It is recommended that the 40-ft and 10-ft sections of pipe be replaced and grease traps be required of the users connected to this line.
9. **1309 – 1308** (8"): Significant belly from the exit of MH 1309 to about 70-ft downstream. It is recommended that this 70-ft section of pipe be replaced and laid to proper grade.
10. **3461 – 3460** (8"): Significant belly from 73-ft to 80-ft downstream of MH 3461. It is recommended that this 7-ft section of pipe be replaced and laid to proper grade.
11. **1055 – 1054** (12"): Two bellies within the pipe totaling about 200-ft in length (80% of pipe length). It is recommended that the entire pipe be replaced and laid to proper grade.
12. **5052 – 5051** (8"): Light to medium amounts of infiltration occurring throughout the length of the pipe. It is recommended that the pipe be lined with CIPP (cured-in-place pipe) or similar.
13. **1591 – 1133** (6"): Deterioration throughout the length of the pipe with radial cracks, broken joints, and light root intrusion. It is recommended that the pipe be lined via CIPP or similar.

14. **1575 – 1144** (8"): Belly from 55-ft downstream of MH 1575 to the entrance of MH 1144. It is recommended that the entire pipe be replaced and laid to proper grade.
15. **1169 – 1029** (10"): Medium amounts of infiltration happening at various points throughout the pipe and a 15' long belly directly downstream of MH 1169. It is recommended that the entire pipe be replaced and laid to proper grade.
16. **1166 – 1029** (8"): Light infiltration was occurring throughout the pipe with points of deterioration. It is recommended that the pipe be lined with CIPP or similar.
17. **1495 – 1494** (8"): Infiltration just upstream of MH 1494 and a belly from 16-ft to 22-ft upstream of MH 1494. It is recommended that the 22-ft section of pipe upstream of MH 1494 be replaced and laid to proper grade.
18. **1163 – 1162** (10"): Infiltration noted throughout first 250-ft of pipe downstream of MH 1163. Roots and build-up noted at joints for about 25-ft upstream of MH 3093. It is recommended that the entire pipe be replaced and laid to proper grade.
19. **3094 – 3093** (8"): Heavy amounts of roots noted at joints and service connections causing deterioration of the pipe approximately 110-ft downstream of MH 3094. It is recommended that the entire pipe be replaced and laid to proper grade, and vegetation surrounding problem areas be removed if possible.
20. **1204 – 1203** (8"): Light amount of roots noted at joints in portions of pipe. It is recommended that the City provide annual chemical cleaning of this pipe to maintain flow or consider CIPP or similar.
21. **1196 – 1037** (8"): No tape provided. Inspection report shows root intrusion throughout pipe with a belly noted at 116-ft to 160-ft downstream of MH 1196. It is recommended that the entire pipe be replaced and laid to proper grade, and any vegetation surrounding problem areas be removed if possible.

NOTES:

A. In cases where partial line replacement in recommended, additional analysis is required to assess the actual length of pipe needing replacement to correct grade problems. In some cases, longer lengths of replacement may be required in order to not impact upstream or downstream flows.

B. Information related to surface cover, pipe material, and invert elevations was provided by City staff. It is assumed that the information provided in the inspection reports and on video is current.

C. Collection lines with significant bellies (more than half the pipe full) have caused historical maintenance problems for City staff and were all assumed to be replacement projects and in cases where more than half the line was showing signs of deficiencies, the recommendation was to replace the entire line.

D. Cured-in-place pipe (CIPP) was recommended in instances of root intrusion, infiltration, and light structure deficiencies as it is less intrusive and more economical in many situations.

Project Costs and Timeline

Table 7-2 outlines associated costs for each of the recommended actions. In some cases, more than one approach appeared feasible. Most improvement projects involve either replacement of existing pipes or pipe lining (assumed to be CIPP for estimating purposes). In the case of pipe replacement, cost[5] was based on length of pipe to be replaced, average depth of the pipe for excavation and fill, surface cover to be restored, and the assumption that the replacement pipe would be SDR 35 PVC. Table 7-3 provided unit cost data for each of these components. In instances were replacement would occur in a high traffic area, lump sum estimates of traffic control costs were added to the construction cost. The only factors taken into account for CIPP were diameter and length of the pipe.

[5] All estimated material and construction costs were taken from the 2008 RS Means Heavy Construction Cost Data Reference Guide.

Table 7-2. Estimated Construction Costs for Repair Projects

Program Year	Project #	Upstrm MH		Dwnstrm MH	Diameter, in	Improvement Length, ft	Average depth, ft	Surface cover	Replacement Cost	Cured-in-place Pipe (CIPP)
1	1	**2008**	-	**2007**	10	147	4	Asphalt Street	$ 11,900.00	
	2	**1102**	-	**1101**	8	172	6	Asphalt Street	$ 12,900.00	$ 10,400.00
	6	**1127**	-	**1126**	10	228.3	5	Gravel	$ 11,600.00	$ 18,800.00
	3	**3397**	-	**3396**	8	130.6	9	Asphalt Street	$ 10,600.00	
	4	**1190**	-	**1189**	8	35.5	6	Asphalt Street	$ 5,000.00	
	5	**2030**	-	**2004**	8	270	10	Asphalt Street	$ 21,900.00	
	6	**1222**	-	**1220**	8	337	10	Asphalt Street	$ 29,300.00	
2	7	**4008**	-	**4007**	8	37.3	9	Trees & Shrubs	$ 5,000.00	
	8	**3033**	-	**3032**	15	50	11	Asphalt Street	$ 5,000.00	
	9	**1309**	-	**1308**	8	70	8	Asphalt Street	$ 5,700.00	
	10	**3461**	-	**3460**	8	9	9	Asphalt Street	$ 5,000.00	
	11	**1055**	-	**1054**	12	252.7	17	Asphalt Street	$ 23,200.00	
	12	**5052**	-	**5051**	8	305	6	Asphalt Street	$ 22,900.00	$ 18,500.00
	13	**1591**	-	**1133**	6	222	5	Asphalt Street	$ 14,400.00	$ 10,000.00
	14	**1575**	-	**1144**	8	143.2	10	Trees & Shrubs	$ 8,200.00	
	15	**1169**	-	**1168**	10	116.5	8	Gravel	$ 6,600.00	
3	16	**1166**	-	**1029**	8	403.2	9	Asphalt Street	$ 32,700.00	$ 24,400.00
	17	**1495**	-	**1494**	8	22	6	Asphalt Street	$ 5,000.00	$ 4,600.00
	18	**1163**	-	**1162**	10	405.4	11	Open Area	$ 23,100.00	$ 33,400.00
	19	**3094**	-	**3093**	8	297.2	9	Asphalt Street	$ 24,100.00	$ 18,000.00
	20	**1204**	-	**1203**	8	363.1	9	Asphalt Street	$ 29,400.00	$ 22,000.00
	21	**1196**	-	**1037**	8	177	11	Asphalt	$ 14,300.00	$ 10,700.00

Table 7-3. Improvements

DIG UP AND REPLACE

	Asphalt Restoration	
Pipe Diameter	**0' - 8' Excavation, Cost/LF**	**8' - 15' Excavation, Cost/LF**
6"	$65	$71
8"	$75	$81
10"	$81	$87
12"	$86	$92
15"	$93	$99

	Native/Gravel Restoration	
Pipe Diameter	**0' - 8' Excavation, Cost/LF**	**8' - 15' Excavation, Cost/LF**
6"	$35	$41
8"	$45	$51
10"	$51	$57
12"	$56	$62
15"	$63	$69

CAST-IN-PLACE PIPE

Pipe Diameter	**Cost/LF**
6"	$41
8"	$55
10"	$75
12"	$95
15"	$129

Assumptions:

1. Cost estimates based on 2008 RS Means cost estimating guide.

For all recommended improvements, Parametrix recommends that the collection lines be reinspected prior to construction to ensure that the proposed corrective action is still appropriate.

The City of Milwaukie annually allocates approximately $800,000 for CIP/CMPs. Approximately 25% of the operating budget is held for contingency. Based on the expected cost for the projects from Table 7-2, the repair projects were divided up over a five-year timeline as shown in Table 7-4. For the most part, the projects were divided into years based on prioritization. For these years, the estimated cost of construction is well below the annual allocated budget.

Table 7-4. Proposed Year of Construction

Year	Project #	Upstrm MH		Dwnstrm MH	Land Use Area		Replacement Cost
1	1	**2008**	-	**2007**	Residential/Commercial	$	11,900.00
	2	**1102**	-	**1101**	Residential	$	12,900.00
	3	**3397**	-	**3396**	Residential	$	10,600.00
	4	**1190**	-	**1189**	Industrial	$	5,000.00
	5	**2030**	-	**2004**	Downtown business district	$	21,900.00
	6	**1222**	-	**1220**	Residential	$	29,300.00
					Total	**$**	**91,600.00**
2	7	**4008**	-	**4007**	Residential	$	5,000.00
	8	**3033**	-	**3032**	Commercial/Industrial	$	5,000.00
	9	**1309**	-	**1308**	Residential	$	5,700.00
	10	**3461**	-	**3460**	Residential	$	5,000.00
	11	**1055**	-	**1054**	Residential	$	23,200.00
	12	**5052**	-	**5051**	Residential	$	22,900.00
	13	**1591**	-	**1133**	Commercial	$	14,400.00
	14	**1575**	-	**1144**	Downtown business district	$	8,200.00
	15	**1169**	-	**1168**	Industrial	$	6,600.00
					Total	**$**	**96,000.00**
3	16	**1166**	-	**1029**	Industrial	$	32,700.00
	17	**1495**	-	**1494**	Residential	$	5,000.00
	18	**1163**	-	**1162**	Industrial	$	23,100.00
	19	**3094**	-	**3093**	Residential	$	24,100.00
	20	**1204**	-	**1203**	Residential	$	29,400.00
	21	**1196**	-	**1037**	Residential	$	14,300.00
					Total	**$**	**128,600.00**

The list of Capital Improvement Projects (CIP) was presented in Chapter 5 and included below in Table 7-5. The Financial Analysis follows in chapter 12. Replacement of the system is also included.

Table 7-5. Capital Improvement Projects

WASTEWATER DIVISION PRIORITY PROJECTS					
FY	**Project Numbers**	**PROJECT DESCRIPTION**	**PROJECT ORIGINATION**	**COST**	**TOTAL PER FY**
2012	0315	Harrison St. L.R.T. Xing (600' Milwaukie/ 230' Light Rail)	Clay Pipe Replacement Associated with Light Rail Project	$ 210,000	$ 840,000
	0316	Monroe St. L.R.T. Xing (305' Milwaukie/ 305' Light Rail)	Clay Pipe Replacement Associated with Light Rail Project	110,000	
	0317	Washington St. L.R.T. Xing + 21st Ave. (280' Milwaukie/ 350' Light Rail)	Clay Pipe Replacement Associated with Light Rail Project	100,000	
	0318	Adams Street L.R.T. Improvements (195')	Clay Pipe Replacement Associated with Light Rail Project	70,000	
	0319	Lake Rd L.R.T. Xing (700' Milwaukie/ 261' Light Rail)	Clay Pipe Replacement Associated with Light Rail Project	250,000	
	0266	Fix Identified Trouble Spots	Each year. 2010 Wastewater Master Plan	100,000	
2013	0272	Brookside Forcemain Extension	2010 Wastewater Master Plan	450,000	550,000
	0266	Fix Identified Trouble Spots	Each year. 2010 Wastewater Master Plan	100,000	
2014	0266	Fix Identified Trouble Spots	Each year. 2010 Wastewater Master Plan	100,000	680,000
	0320	Sewer Manhole Replacement/Rehab	Each year beginning in FY 2012. 1859 total replaced over 150 years (Manhole Value=$4,000/EA)	50,000	
	0321	Remaining Clay Sewer Line Replacement	Each year beginning in FY 2013. 21,218 feet replaced over 10 years (Mainline Value = $250/LF)	530,000	
2015	0266	Fix Identified Trouble Spots	Each year. 2010 Wastewater Master Plan	100,000	680,000
	0320	Sewer Manhole Replacement/Rehab	Each year beginning in FY 2012. 1859 total replaced over 150 years (Manhole Value=$4,000/EA)	50,000	
	0321	Remaining Clay Sewer Line Replacement	Each year beginning in FY 2013. 21,218 feet replaced over 10 years (Mainline Value = $250/LF)	530,000	
2016	0266	Fix Identified Trouble Spots	Each year. 2010 Wastewater Master Plan	100,000	680,000
	0320	Sewer Manhole Replacement/Rehab	Each year beginning in FY 2012. 1859 total replaced over 150 years (Manhole Value=$4,000/EA)	50,000	
	0321	Remaining Clay Sewer Line Replacement	Each year beginning in FY 2013. 21,218 feet replaced over 10 years (Mainline Value = $250/LF)	530,000	
Future Years	NA	Remaining Concrete Sewer Line Replacement	Each year beginning in year 2022. 326,601 feet replaced over 75 years (Mainline Value = $250/LF)	1,088,000	
	NA	Johnson Creek Blvd. (45th to 55th)	2010 Wastewater Master Plan	750,000	
	NA	Johnson Creek Siphon	2010 Wastewater Master Plan	750,000	
	NA	Jefferson Street Siphon	2010 Wastewater Master Plan	800,000	
				5 YEAR TOTAL	**$3,430,000**

Additional Recommendations

After reviewing the capabilities of the asset management software and staff at the City of Milwaukie, there are a few recommendations that may help to further improve the efficiency of prioritizing assets needing improvements. While the current version of Hanson® rates deficiencies in collection lines, it does not appear to have a way of rating the collection lines based on the location within the system. This allows for instances where collection lines of lower overall importance to appear to be a higher priority than those in critical areas. The fact that the City staff had to reprioritize the list initially provided to Parametrix shows a key example of this inefficiency. To address this problem, it is recommended that Hanson® rating values and inspection data be entered into the ArcGIS attribute table of the collection system layer for each evaluated collection line. Each collection line could then be color coded based on a range of rating values to show the observer where lines of highest priority are located. This methodology could be further refined by assigning multipliers to lines in critical areas to show a higher priority. It would then be at the discretion of the City staff to determine order of priority. We recommend that the City consider consulting with a GIS specialist to aid the Asset Management Technician in developing this strategy.

A second area to potentially improve efficiency is with respect to the handling and recording of data from sewer TV inspections. The following recommendations are suggested:

- Due to changes in staff, equipment, and technology, a formal protocol should be established for the archiving of sewer TV inspections to allow for efficient retrieval.
- Notes regarding starting and ending addresses, surface cover, and manhole depths should be consistently recorded in the field and verified at the City office for inclusion in inspection reports. Inspection reports should also include the pipe diameter, material, and invert elevations when possible.

CHAPTER 8. WAVERLY HEIGHTS SEWER SYSTEM ANALYSIS

INTRODUCTION AND SCOPE

The purpose of this technical memorandum is to provide an analysis of the existing sewer collection system within Waverly Heights, a residential neighborhood within the city of Milwaukie, in terms of existing lateral conditions and recommendations for future sewer service in this area. Waverly Heights is located in Milwaukie, Oregon, near the intersection of Pacific Highway (Highway 99E) and Clackamas Highway (Highway 224). This neighborhood is surrounded on the north and west by the Waverly Country Club, on the bank of the Willamette River, on the east by SE 17th Avenue, and on the south by SE Lava Drive. Figure 8-1 provides a map of the location. This map was developed with information provided by the City of Milwaukie. This memo will present different viable options for the City of Milwaukie to help improve management of the sanitary sewer system within the Waverly Heights community. These options will then be evaluated based on advantages and disadvantages of the option. The option with the best advantages and fewest disadvantages will be recommended to the City of Milwaukie. This recommendation will be based on best available information and further conceptual design should be performed before implementation to assure proper functioning and performance of the option.

EXISTING CONDITIONS

The segments of sewer pipe under analysis include approximately 737 lineal feet (LF) on Waverly Drive, ending at the intersection of Waverly Drive and SE 17th Avenue, and approximately 3,700 LF within the Waverly Heights residential area and paralleling the southern portion of the Waverly Country Club golf course.

TV inspection reports provided by the City of Milwaukie provided information on the existing conditions of the sewer main and laterals. Majority of the existing sewer main is 8" concrete pipe with some segments of PVC pipe and VCP clay pipe. Intrusion of roots, lateral and radial cracking, debris, and structural deterioration were all noted in the TV reports, specifically in the clay pipe. Table 8-1 shows the details of the sewer manholes and mains.

Within the Waverly Heights area, there exists limited documented information regarding the existing sewer service laterals. There are also anticipated "party lines" in which a residence's service lateral has been used for another residence to connect to. Party lines can be problematic for issues concerning ownership and maintenance. If an issue were to arise in which a "party line" fails, there is no protocol for who would be responsible for damages and repair because there are several contributors to the sewer line and the City of Milwaukie has not accepted the line as a public line in which they would manage repair or maintenance.

A visual inspection was performed to determine the location and accessibility of the manholes. The manholes located within Waverly Drive and Cambridge Lane are located within the road and provide easy access for maintenance and construction. A significant number of the manholes within the residential area, however, are located within wooded

areas or areas overgrown with vegetation and are more difficult to access. Table 8-1 provides information regarding access for the segments of pipe and manholes.

Table 8-1. Summary Table

Inspection No.	From	To	Length	Pipe Size (In.)	Pipe Material	Access	No. of Laterals	Roots	Cracking	Other
3708	1595	1594	294	8	PVC	Paved Road	2	N	N	
3709	1594	1593	276	8	PVC	Paved Road	2	N	N	
3710	1593	1592	167.4	8	PVC	Paved Road	1	N	N	
4906	1106	1111	16.4			Covered with high grass	0	N	N	Near MH 1111, PVC meets concrete pipe; camera could not pass through this point
3995	1524	1522	109.7	8	CP	In Cambridge Lane	1	N	N	
3994	1522	1114	121.7	8	CP	In Cambridge Lane	1	N	N	
3996	1114	1103	184	8	CP	In Cambridge Lane	2	N	N	
3997	1103	1102	777	6	VCP Clay Pipe	1103 MH is in roadway; 1102 is on private property.	3	Y	N	Entire line was not “TV’ed” because line changes from 8” to a 6”
4050	1102	1101	172	8	VCP Clay Pipe	Both MHs on private property; 1101 easy to locate and access, 1102 could not be seen.	2	Y	Lateral (2), Radial (3)	Heavy structural deterioration also noted
4051	1101	1100	35.4	8	CP	Both MHs on private property; easy to locate and access.	0	N	N	
4052	1100	1099	123	8	CP	Both MHs on private property; easy to locate and access.	0	N	N	Recent replacement of existing wye with PVC pipe
4090	1099	1098	230	8	CP	Both MHs on private property; covered in grass, easy access.		Y(2)		
4098	1098	1097	165	8		Both MHs on private property; covered in grass, easy access.	0	Y	Lateral	
4099	1097	1096	165	8	CP	1096 is located near power utility pole, covered in small shrubbery; easy access.	0	N	N	Debris found
4151	1095	1094	777	8	CP	Neither MH could be seen; in overgrown corridor with power poles and lines; behind country club chipping course.	0	N	N	
4054	1113	1098	777	8	Unknown	1113 located with “MH” sign, behind 2’ rock wall, wooded area, not easy access.	0	N	N	

EASEMENTS

The City of Milwaukie provided any recorded easement information on record. This information was used to determine which sewer mains were currently within utility easements. An internet search was also performed in an effort to locate any other easements on record. However, none were located. A professional title search should be performed in pursuit of these easements.

There is an existing abandoned railroad right-of-way, making up the west boundary of the Waverly Heights neighborhood. Sewer pipe from manhole 1096 southeast to manhole 1094 is within this abandoned right-of-way. Also located within this right-of-way are power poles and power lines; this suggests that this right-of-way has been converted to a utility easement, however, no documentation to support this was found.

Several manholes are located within private property lines. However, the only easement found for any of these sewer lines is for the section of pipe between 1095 and 1094 lying within the property line of 10230 Cambridge Lane. This easement is within the southwesterly 40 feet of tax lot 2000 and is owned by the City of Milwaukie. It is outlined within said easement that the City of Milwaukie is responsible for "…laying down, inspecting, maintaining, and replacing…" the sewer located within this easement.

There are several 8-foot wide walkways that are designated from Cambridge Lane to the Waverly Country Club. The locations of these walkways can be seen on Figure 8-1. There is a sewer main and manhole located within one of these walkways; it is unclear whether or not this sewer line is privately or publicly owned.

ALTERNATIVE ANALYSIS

There are five possible alternatives for this system. The first alternative would be to leave the system as-is, as seen in Figure 8-1. The advantages for this alternative include low to zero cost and no risk of conflict between City personnel and residences of Waverly Heights. Disadvantages include possible failure in the system, specifically is the clay lines. Another disadvantage is that there would remain no clear delineation of ownership between residences and the City for sewer mains and laterals.

The second alternative would be to replace only the clay lines. Figure 8-2 shows the location of the clay lines to be replaced. Advantages to this alternative include low cost and replacement of lines that could potentially fail. A disadvantage to this alternative is that it does not remedy the problem regarding ownership and responsibility for payment of sewer mains and laterals within the Waverly Heights community.

The third alternative would be to replace existing clay lines, relocate manholes #1101, #1100, #1099, and #1098 to within the abandoned railroad right-of-way for the City to take over complete ownership of the sewer mains associated with these manholes and to construct new public lines for residences with party lines to connect to. This option can be seen in Figure 8-3. The new line would be along Waverly Drive with three new manholes. This alternative would provide the City of Milwaukie with a new line that is guaranteed to be large enough to handle all waste from the homes nearby. In addition to the security of a large enough line, the line will also be new and will not be at risk of failure.

Figure 8-1. Milwaukie WW System Master Plan Existing Sewer System Option 1

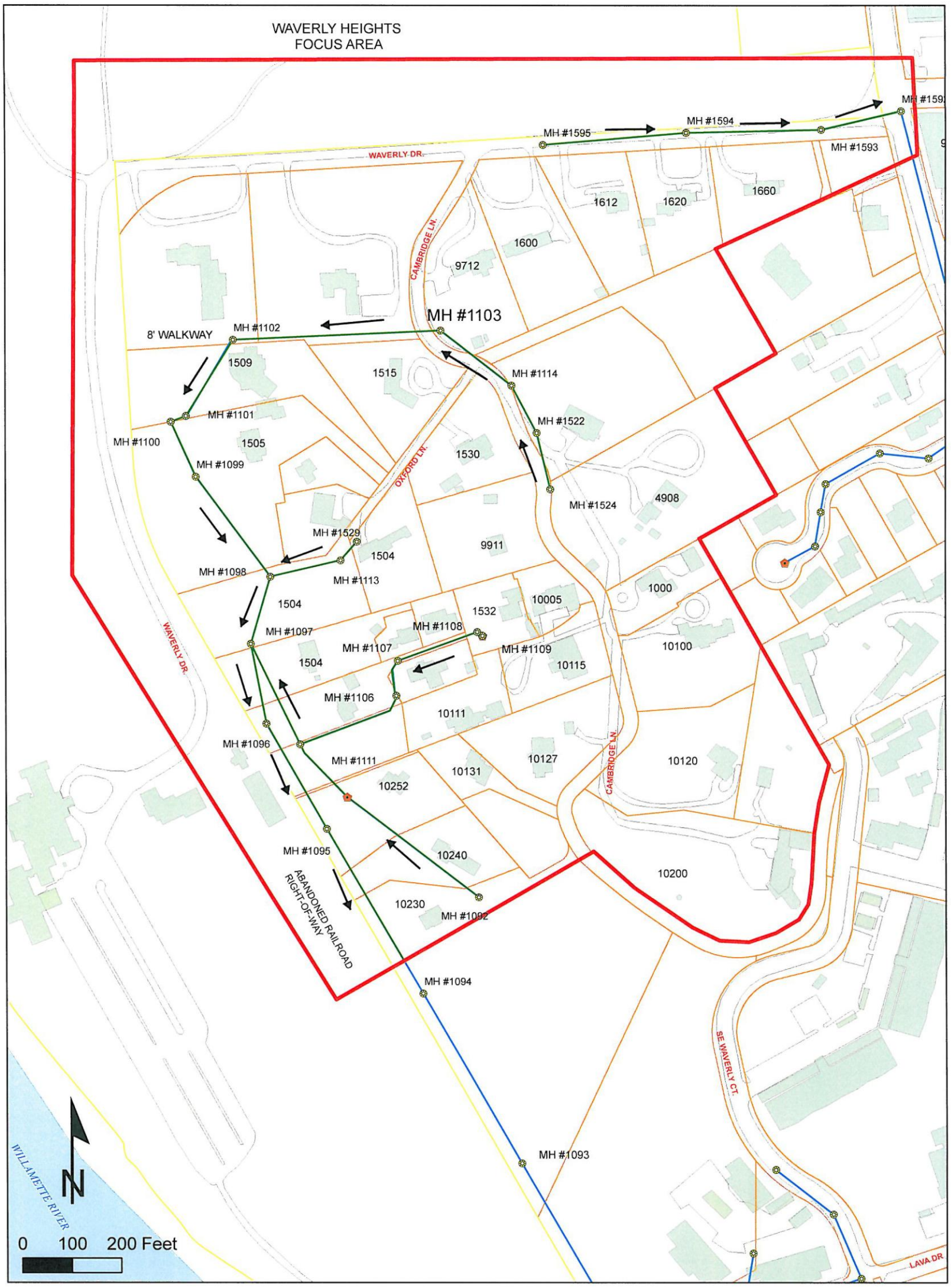

Figure 8-1: Milwaukie WW System Master Plan Existing Sewer System Option 1

Legend

- County lots
- City lots
- Buildings
- Paved
- Existing manhole
- Existing cleanout
- Focus area boundary
- Public line
- Lines outside focus area
- Indicates direction of flow in sanitary line

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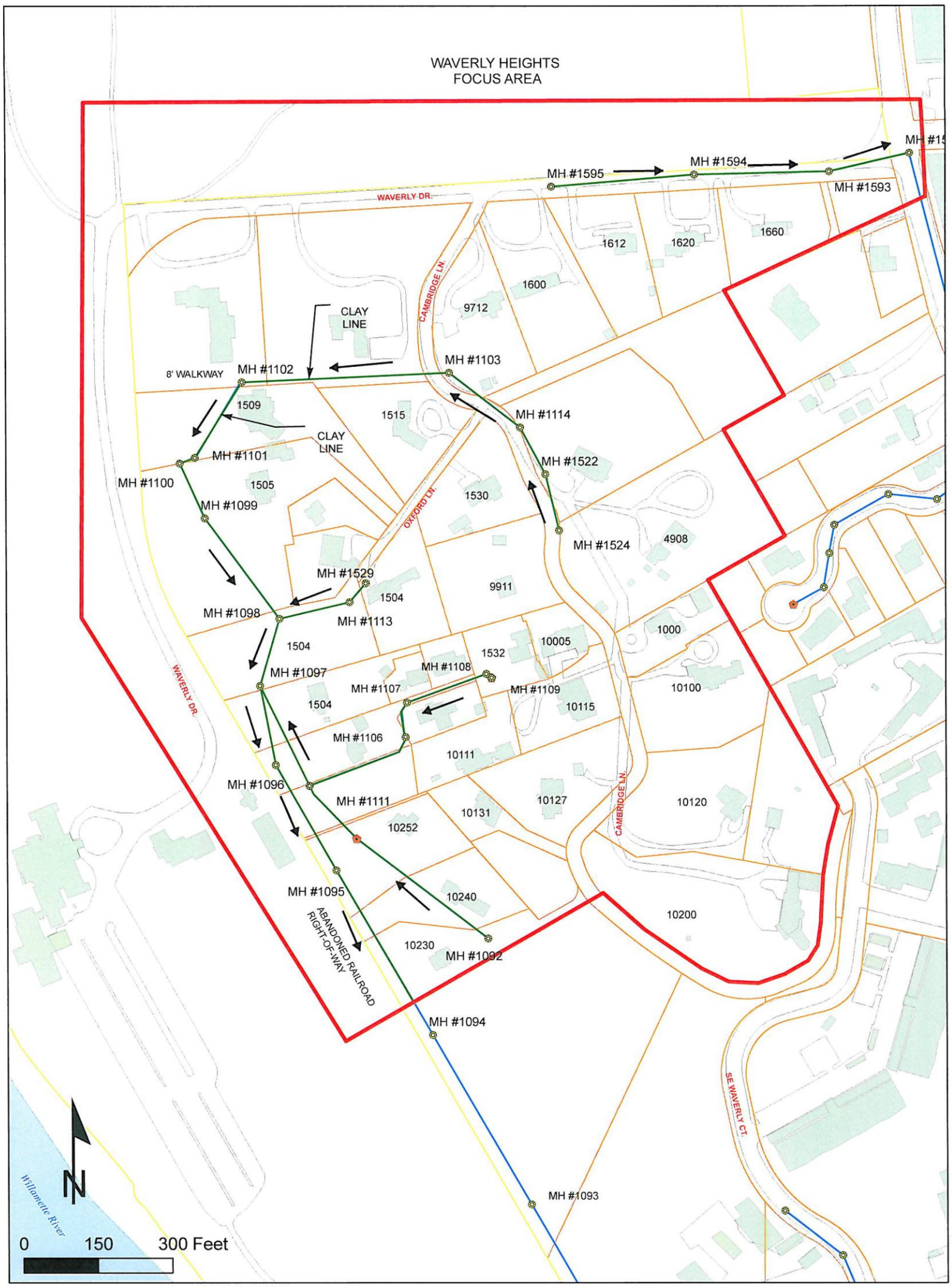
Figure 8-2. Milwaukie WW System Master Plan Option 2



Legend

- County lots
- City lots
- Buildings
- Paved
- Existing manhole
- Existing cleanout
- Focus area boundary
- Public line
- Lines outside focus area
- Indicates direction of flow in sanitary line

Figure 8-2: Milwaukie WW System Master Plan Option 2

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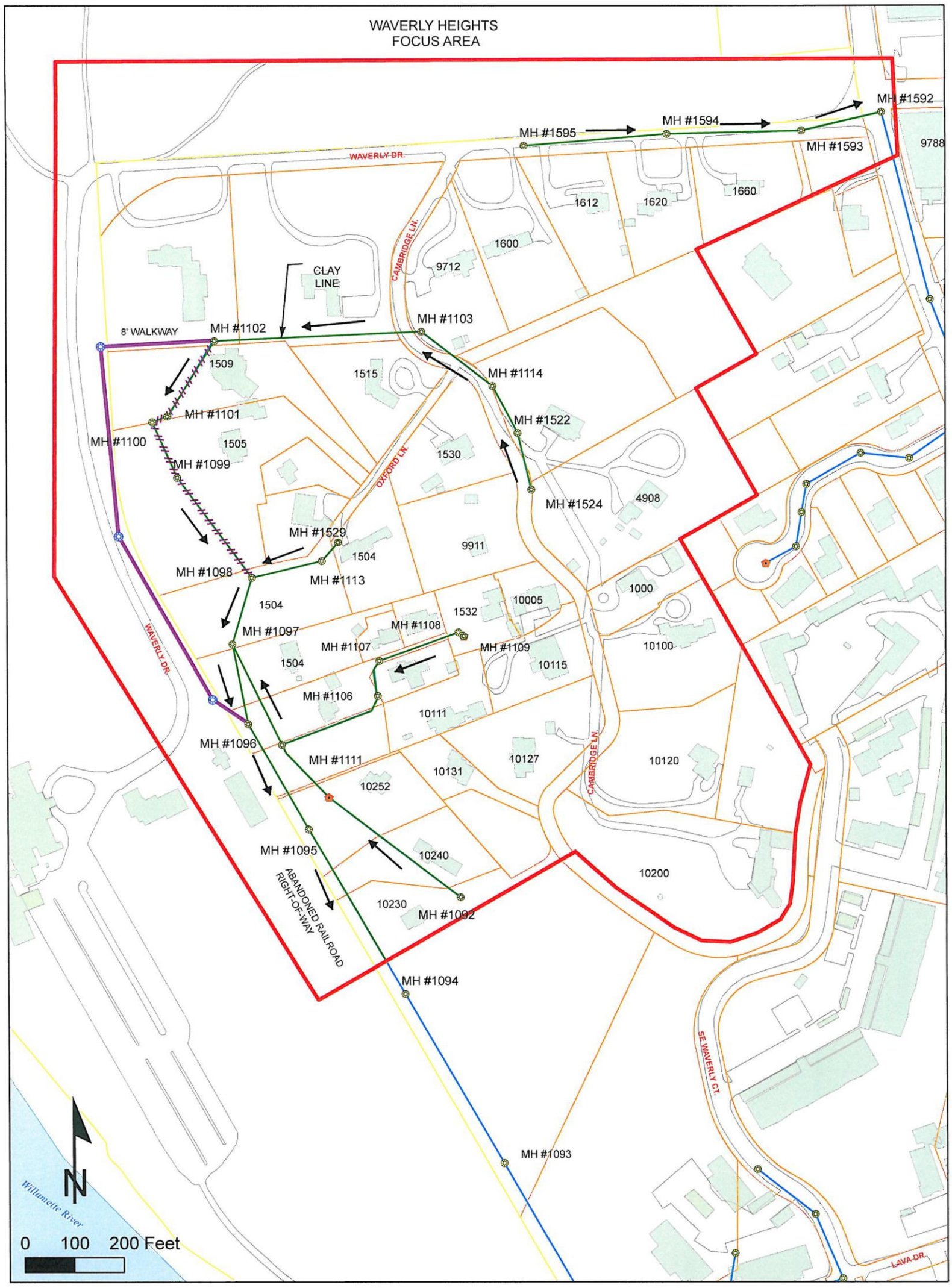
Figure 8-3. Milwaukie WW System Master Plan Option 3



Legend

- County lots
- City lots
- Buildings
- Paved
- New manhole
- Existing manhole
- Existing cleanout
- Public line
- Lines outside existing focus area
- Proposed improvements
- Abandon existing
- Indicates direction of flow in sanitary line

Figure 8-3: Milwaukie WW System Master Plan Option 3

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The relocation of manholes #1101, #1100, #1099, and #1098 to within the abandoned railroad right-of-way would be advantageous to the City because it would allow for this line to be located within an area outside of private property. This would allow for easier maintenance and delineation of ownership. The disadvantages to this option are that there would still remain many sewer lines which are potential party lines. These lines are problematic because there is no delineation of ownership and maintenance costs for the City of Milwaukie and also for the homeowner. Another disadvantage to this option is the need for additional easements.

The fourth option would be to relocate manholes #1101, #1100, #1099, and #1098 to within the abandoned railroad right-of-way and also to add three new sewer mains: Line A, Line B, and Line C as seen on Figure 8-4. With this option, the line between manhole #1092 and manhole #1111 could be abandoned. Line A and Line B are gravity flow, intercepting the existing sewer main to the west which flows southeast. Line C would be located within Cambridge Lane.

An advantage to this option is that it cleans up the existing "party lines" located within the area. Table 8-2 shows how each of these properties can be connected to the new system. Another advantage is that this option would eliminate the line between manhole #1092 and manhole #1111, which is undersized and at risk of failure.

Table 8-2. Option 4 Service Connection

Address	Location of New Service Connection
1515	Line between MH 1103 and MH 1102
1530	Line between MH 1522 and MH 1114
9911	New Line A or maintain existing
4908	New Line C
10000	New Line C
10100	New Line C
10120	New Line C
10200	Line between MH 1094 and MH 1093
1532	New Line A
10005	New Line A
10115	New Line B
10127	New Line B
10131	New Line B
10111	New Line B
1504	New Line A or maintain existing
10252	New Line B
10240	Line between 1095 and 1094
10230	Line between MH 1095 and MH 1094
1505	West to new line
1509	West to new line or between MH 1102 and MH 1103
Property at end of Cambridge with no address.	Could pump up Cambridge or obtain an easement from one of its neighbors to connect to Line B or the line at the base of the hill.

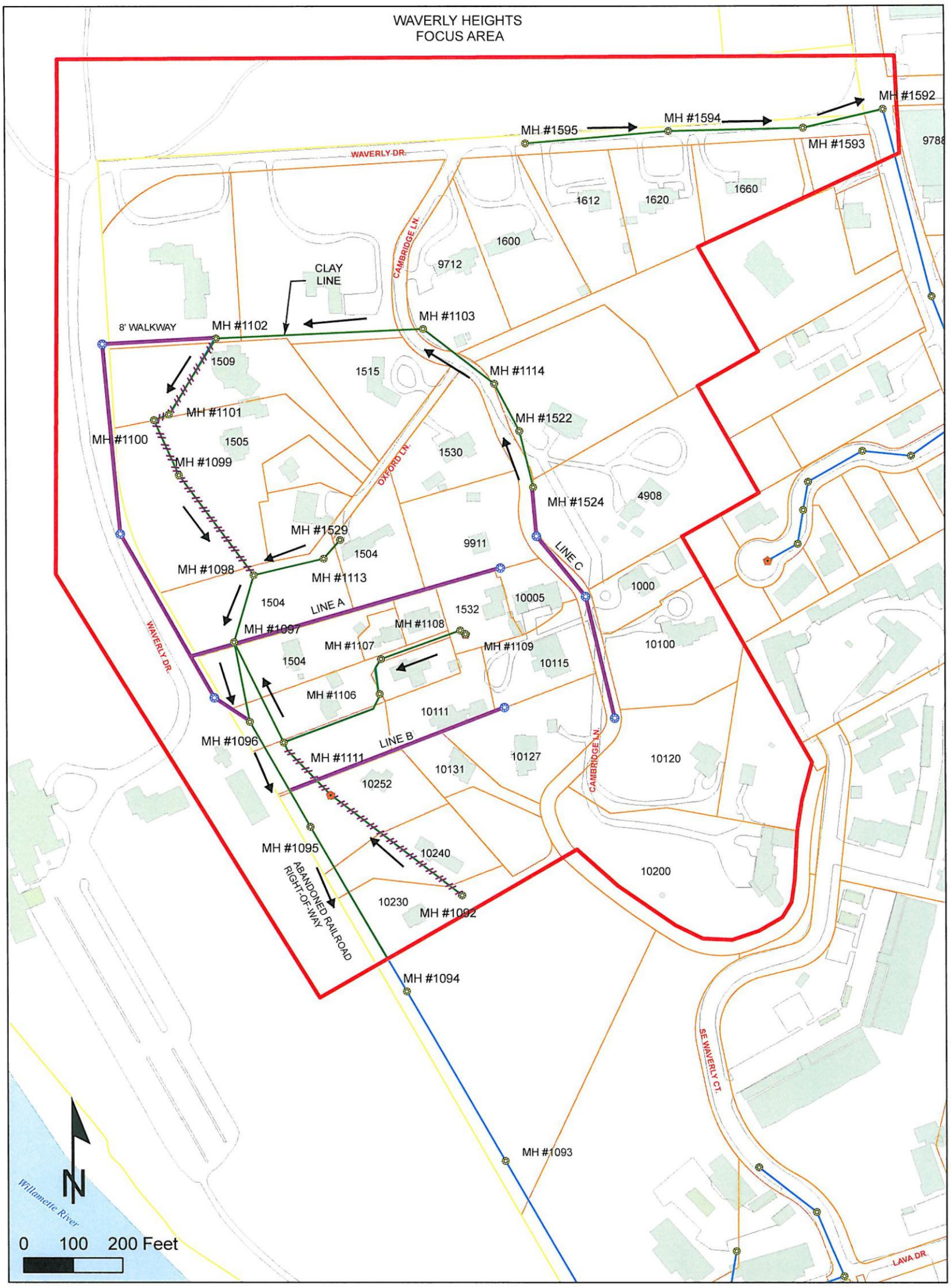
A disadvantage to this option is that it could be cost intensive. This option would require the City to purchase easements from the properties which would be affected by Lines A and B. Line C would be located within Cambridge Lane, and as such, would require no easement.

The fifth option is similar to Option 4 but includes abandoning the line from the cleanout on property 1532 to manhole #1111. An advantage to this option is that it removes another line which is potentially a "party line" with new sewer lines. The disadvantage to this option, however, is that the properties which potentially use this line would need to gain easements through other properties to reach Line A or Line B, in addition to the City needing to purchase easements for Lines A and B. Property owners may have conflict with needing to purchase easements for their sewer connections to these new lines, arguing that their current connection is working properly. Table 8-3 shows how affected properties can connect to the proposed improvements.

Table 8-3. Option 5 Service Connection

Address	Location of New Service Connection
1515	Line between MH 1103 and MH 1102
1530	Line between MH 1522 and MH 1114
9911	New Line A or maintain existing
4908	New Line C
10000	New Line C
10100	New Line C
10120	New Line C
10200	Line between MH 1094 and MH 1093
1532	New Line A
10005	New Line A
10115	New Line B
10127	New Line B
10131	New Line B
10111	New Line B
1504	New Line A or maintain existing
10252	New Line B
10240	Line between 1095 and 1094
10230	Line between MH 1095 and MH 1094
1505	West to new line
1509	West to new line or between MH 1102 and MH 1103
Interior properties, connected to the line from property 1532 to MH #1111	Line A or Line B
Property at end of Cambridge with no address	Could pump up Cambridge or obtain an easement from one of its neighbors to connect to Line B or the line at the base of the hill.

Figure 8-4. Milwaukie WW System Master Plan Option 4



Legend

- County lots
- City lots
- Buildings
- Paved
- New manhole
- Existing manhole
- Existing cleanout
- Public line
- Lines outside focus area
- Proposed improvements
- Abandon existing
- Indicates direction of flow in sanitary line

Figure 8-4: Milwaukie WW System Master Plan Option 4

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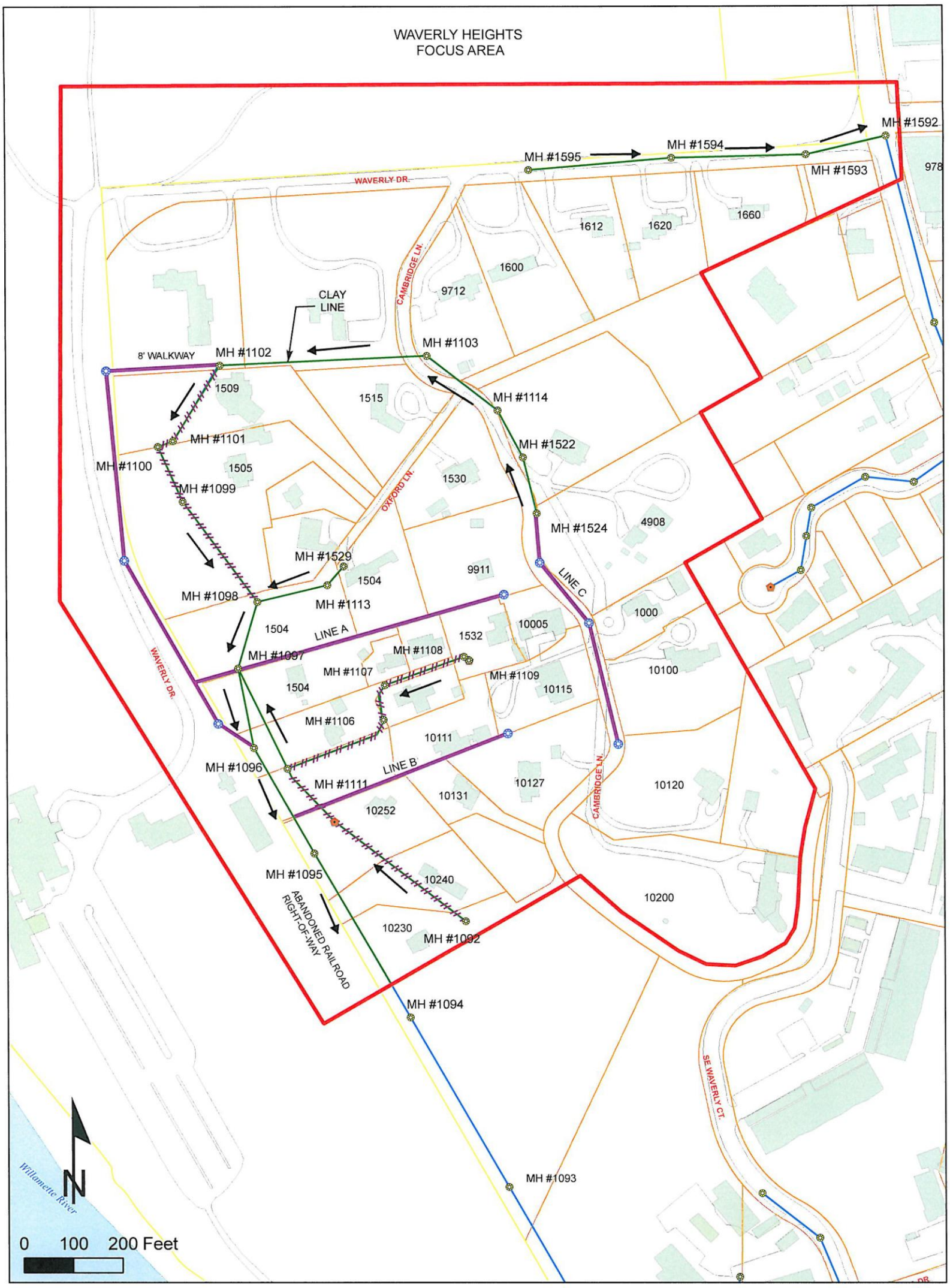
Figure 8-5. Milwaukie WW System Master Plan Option 5



Legend

- County lots
- City lots
- Buildings
- Paved
- New manhole
- Existing manhole
- Existing cleanout
- Public line
- Lines outside focus area
- Proposed improvements
- Abandon existing
- Indicates direction of flow in sanitary line

Figure 8-5: Milwaukie WW System Master Plan Option 5

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CONCLUSIONS/RECOMMENDATIONS/RESULTS

The sewer collection system in Waverly Heights consists of sewer lines within City of Milwaukie property and also within private property. Most of the piping of this system is concrete and PVC and in good shape; however there are segments of clay pipe that are cracking and deteriorating. In addition, there is extremely limited easement information for the parts of the system that are within private property lines as well as locations of existing sewer laterals. This provides difficulties in determining ownership and responsibility for maintenance. It is recommended that easements or documentation of responsibility and ownership be created, if not already existing, for all existing sanitary manholes and collection pipes within Waverly Heights.

A very basic cost estimate has been produced to compare costs associated with each of the above options, see Table 8-4 below. Cost assumptions for this estimate are very basic and should be used for comparison purposes only, not for final costs.

Table 8-4. Cost Comparison

	Number	Unit	Cost/Unit	Cost
Option 1				
Manholes	0	EA	$3,000	$0
New Line	0	LF	$200	$0
Connections	0	EA	$500	$0
			Total	**$0**
Option 2				
Manholes	0	EA	$3,000	$0
New Line	600	LF	$200	$120,000
Connections	0	EA	$500	$0
			Total	**$120,000**
Option 3				
Manholes	3	EA	$3,000	$9,000
New Line	1500	LF	$200	$300,000
Connections	3	EA	$500	$1,500
			Total	**$310,500**
Option 4				
Manholes	9	EA	$3,000	$27,000
New Line	3650	LF	$200	$730,000
Connections	19	EA	$500	$9,500
			Total	**$766,500**
Option 5				
Manholes	9	EA	$3,000	$27,000
New Line	3650	LF	$200	$730,000
Connections	19	EA	$500	$9,500
			Total	**$766,500**

Option 4 and Option 5 show the same construction cost. However, Option 5 will require purchasing of easements as well as some additional cost associated with abandoning a larger amount of existing pipe.

It is also recommended that the City proceed with Option 4, as mentioned above, which includes replacement of all clay pipes because of the documented cracking, root invasion, and structural deterioration of the existing clay pipe within Waverly Heights, and the relocation of manholes #1097 through #1101 to a future easement at the base of the hill extending the current alignment of the existing 8" main to the north. Option 4 also includes constructing Lines A, B, and C. Option 4 is recommended over Option 5 because Option 5 includes abandoning the line from property 1532 to manhole #1111. This line currently seems to be functional and performing this abandonment may stir argument from property owners to the City, as well as require additional funds and purchasing of easements. Option 4 will be placed in the proposed CIP as part of the clay pipe replacement, prioritized with the other clay pipes according to repair need parameters.

Lines A and B will be gravity flow to intercept the existing main at the western edge of Waverly Heights. Line C, located within Cambridge Lane will also be a gravity main, joining with the existing line already located within Cambridge Lane to the north. Constructability of Line C appears to be possible regarding elevation change. It is recommended that more precise surveying or measurements be performed at the possible location of Line C to ensure this.

CHAPTER 9. LENTS SEWER LINE ANALYSIS

INTRODUCTION AND SCOPE

The purpose of this technical memorandum is to provide an analysis of the existing sewer collection system of the Lents Trunk line and the City of Milwaukie's agreement with the City of Portland (referred hereinafter as "IGA"). The Lents Trunk line begins near 162nd Avenue and SE Foster Road and ends in the Sellwood neighborhood of Portland at the Willamette River. The location of the Lents Trunk line can be seen in Figure 9-1 (this figure was prepared by and provided by the City of Portland).

EXISTING CONDITIONS

The City of Milwaukie and the City of Portland operate under an existing agreement with regard to providing sewer service to connections outside their respective city limits. The agreement outlines that each City may accept sewage from services within the other City's limits pending approval from the City Engineer and requiring that the City who is accepting the sewage charges the service with rates similar to comparable services within its own city limits.

The City of Milwaukie has future plans to connect some Milwaukie residences to the Portland line. Figure 9-2 shows an estimate of which properties the City of Milwaukie services, which properties the City of Portland services, and which properties are for potential future connections (this figure was prepared and provided by the City of Milwaukie). These services would be regulated by the existing agreement between the City of Portland and the City of Milwaukie. Currently, there are some inefficiencies between the cities regarding maintaining accurate records for number of services that each City is treating for the other and with billing. Some properties are paying City of Milwaukie sewage costs and others are paying higher rates for City of Portland sewage costs. The City of Milwaukie wishes to determine a just way to remedy the cost difference with existing customers and also with future customers.

ANALYSIS

The City of Milwaukie has future plans to connect current Milwaukie residences onto the Lents Trunk line, to be treated by the City of Portland. Discussions between the City of Milwaukie and the City of Portland have concluded that Portland has the capacity to add on such services. Hydraulic modeling during peak flows shall be done to ensure that the system will not be overloaded due to these connections.

The City of Milwaukie desires an analysis of the current IGA. Review of the current IGA reveals that it is lacking in detail and direction.

The current IGA between the City of Milwaukie and the City of Portland operates by requiring each City to provide a report to the other, at the beginning of each quarter, with "all new sewer connections to the other City's sewer system made during the previous quarter, including the address and number of equivalent dwelling units at each connection" (3(c)). The IGA then goes on to address how many equivalent dwelling units (EDUs) are awarded to different types of buildings. However, according to the IGA, the "City responsible for treatment of the sewage shall bill the other for such

service at the rate charged to similar properties within its City boundaries" (4(a)). This statement does not enforce billing in terms of EDUs, which are required to be reported quarterly. This inconsistency provides difficulty for the City of Milwaukie or the City of Portland to add or remove any such services from being treated by the other City. In addition, it appears that such reports have not been maintained. Upon requesting information detailing each City's current services with the other, reports were unable to be located. This suggests that completion of reports should be overseen more steadily in order to keep up accurate records.

Another issue raised with the current IGA is the cost discrepancy between properties. In some instances, neighbors are paying different rates strictly due to which City is treating their sewage. The City of Milwaukie wishes to make sewage rates as close in range as possible. One of the causes for these discrepancies is that each City is required to bill the other for rates similar to properties within their own city limits, as stated in 4(a) of the IGA. Also, in terms of monthly sewage rates, the City of Milwaukie has a minimum monthly charge, whereas the City of Portland does not. This means that people using Milwaukie services will always pay a minimum monthly charge, regardless if they use less water; people using Portland services will pay for what they use.

To be able to compare rates and costs between the City of Milwaukie and the City of Portland, information regarding number of accounts, and billing per account for residential and commercial areas was gathered. The City of Portland was unable to identify the number of accounts they billed out and therefore an approximation of 300 gallons per day per home was used to compare sewage costs per service. Commercial wastes are difficult to compare because costs depend on sewage characteristics. As a result, only residential services will be analyzed.

The City of Milwaukie has five residential accounts which contribute sewage to the City of Portland for a bi-monthly billing of $196.80. When broken down, the average cost per month per account for a residential service for the City of Milwaukie is $56.02. Currently the City of Milwaukie measures sewage flow based on water usage. During three winter months, the City of Milwaukie uses a residences average monthly water usage to determine a monthly sewage flow for the entire year.

The City of Portland is being charged by the City of Milwaukie $6.13 per 100 cubic feet of sewage. When converted, this cost becomes $0.0082 per gallon. On average, a residence will use 300 gallons per day. For a residence contributing 300 gallons per day (9,000 gallons per month) at $0.0082 per gallon, the City of Milwaukie charges the City of Portland $73.80 per month per residence.

Table 9-1 provides a summary of charges.

Table 9-1. City of Milwaukie Summary of Charges Bi-Monthly Billing to Portland

	Commercial		
	Bi-Monthly	**Accounts**	**Average/Month/Account**
Johnson Creek	$28,234.43	4	$3,529.30
Stanley Pump Station Cycle 1	$571.73	5	$57.17
Stanley Pump Station Cycle 2	$780.59	2	$195.15
Total:	**$29,586.75**	**11**	**$3,781.62**
	Residential		
	Bi-Monthly	**Accounts**	**Average/Month/Account**
Johnson Creek	$63.03	1	$31.52
Stanley Pump Station Cycle 1	$6.62	1	$3.31
Stanley Pump Station Cycle 2	$127.15	3	$21.19
Total:	**$196.80**	**5**	**$56.02**

Two additional Intergovernmental Agreements were reviewed for purposes of analyzing the City of Milwaukie and City of Portland IGA: "City of Portland and Unified Sewerage Agency Wholesale Sewer Service Agreement," (hereinafter called the "USA IGA") and the "Dunthorpe-Riverdale Service District and City of Portland Sewage Transportation, Treatment, Maintenance and Engineering Service Agreement," (hereinafter called the "Dunthorpe IGA").

The USA IGA also utilizes a sewage charge based on EDUs. Each month, each party (Party A and Party B) determines the number of EDUs producing flow and will then provide information in a report. If Party A has a greater number of EDUs than Party B, then Party A will pay the difference in EDUs between Party A EDUs and Party B EDUs at Party B's current sewage rate to Party B. If Party B has a greater number of EDUs than Party A, then the opposite calculation is carried out for Party B to pay Party A.

Also outlined in the USA IGA are charges for use of the bypass connection during times of overflow. During times when the use of the emergency bypass is necessary, the charge for using so will be three (3) times the usual sewage rate.

For future connections to the system, the USA IGA outlines that there is no limit to the number of connections which may be made, however, connection permits and all applicable fees must be made.

The Dunthorpe IGA uses a sewage charge based on EDUs as well. This IGA was based on a flat number of EDUs purchased at the onset of the agreement. Since then, additional EDUs have been purchased. Additional EDUs may be purchased at any time, at the current connection charge per EDU. Monthly charges are determined using the number of EDUs connected within each party multiplied by the average winter water use per month.

The Dunthorpe IGA also includes clauses detailing operation and maintenance services for both parties.

CONCLUSIONS/RECOMMENDATIONS/RESULTS

The City of Milwaukie and the City of Portland have designed an agreement which allows each City to accept sewage from the other City for a fee. Currently, the City of Milwaukie bills the City of Portland an estimated $73.80 per account and the City of Portland bills the City of Milwaukie an average of $56.02 per account per month. The number of accounts billed by the City of Milwaukie for Portland accounts is an unknown. However, looking at average cost per account, the City of Milwaukie is charging the City of Portland approximately $17 more dollars per account per month. This difference in cost could be compensating for a lower number of accounts with the City of Portland or for a difference in commercial sewage costs. However, for purposes of this analysis, commercial costs were not taken into consideration. To accurately compare overall costs for each City, commercial sewage characteristics with associated costs, as well as both commercial and residential monthly flows would need to be included in the analysis.

Upon review of the City of Milwaukie and the City of Portland IGA, as well as the review of the USA IGA and the Dunthorpe IGA, it is recommended that the City of Milwaukie pursue an updated IGA with the City of Portland. The current IGA makes it difficult for the City of Milwaukie to allow for future connections and to move forward with any possible future plans within City limits. The current IGA is vague in terms of monthly billing for each party involved and also provides limited documentation of reports. The USA IGA seems to be an effective model because payment is based on the difference in EDUs between parties each quarter. This method requires both parties to produce reports quarterly, and also allows for changes in EDUs made within each quarter, as compared to yearly.

Figure 9-1. Lents Trunk Sewer and Contributing Basins

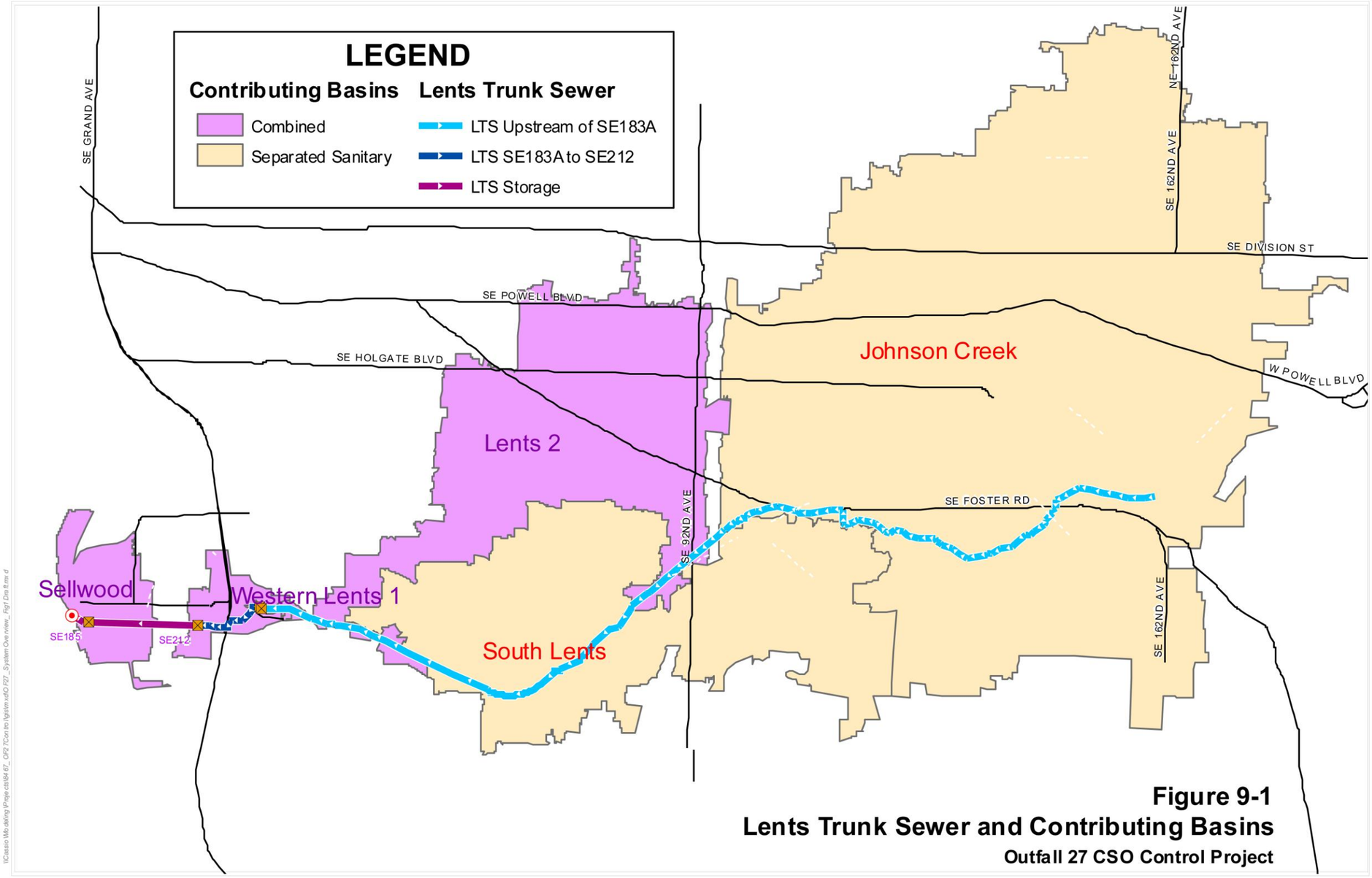

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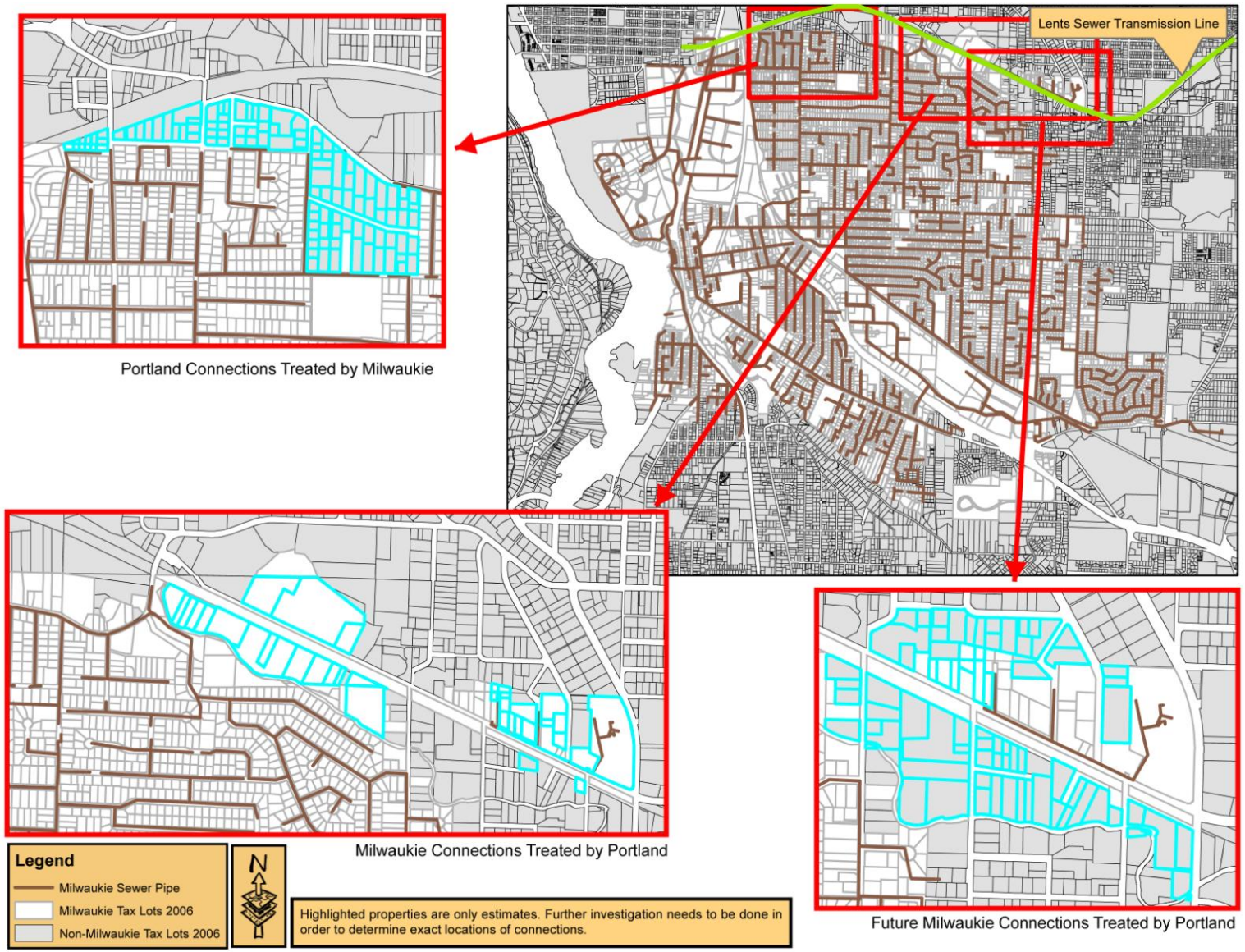
Figure 9-2. Interconnection Map



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CHAPTER 10. STAFFING NEEDS

The purpose of this chapter is to provide a recommendation for staffing needs within the City of Milwaukie's Engineering and Wastewater Operations departments. Metrics used will come from reviews of current and expected future regulatory requirements, past staffing history within the city, comparisons to staffing within other similar municipalities, and projected capital improvement projects within the city. Using this information, recommendations will be made regarding the City's Departmental staffing needs.

REGULATORY REQUIREMENTS

While there are currently no state or federal regulations directly governing the number of engineering and operations staff required for a given city size, National Pollutant Discharge Elimination System (NPDES) permits do indirectly require that adequate staffing be available to effectively manage maintenance and improvement projects within the collection system to minimize the number and severity of combined and sanitary sewer overflows. In addition, those cities that choose to run their own Industrial Pretreatment Program must also account for staffing requirements assuming the program is managed through the engineering department. EPA currently recommends developing a Capacity, Management, Operations and Maintenance (CMOM) Program to help cities efficiently coordinate staffing with asset management to reduce noncompliance. While this is not currently a mandatory requirement, the EPA has been considering making it one over the past several years. We recommend the City of Milwaukie track the progression of CMOM regulations and consider developing a CMOM Program before regulations are in place.

CITY'S CURRENT AND HISTORICAL STAFFING

The City of Milwaukie engineering department currently has 4 FTE consisting of three senior level engineers and one mid-level engineers. 1 FTE is dedicated to managing wastewater projects for the 396,495 linear feet of sewer line and 5 pump stations. According to City staff, the recent historical staffing has been approximately 5 FTE engineers. It was estimated that about half of the wastewater design projects are done internally. The remaining projects are outsourced to consulting firms. The Wastewater Department currently consists of 4 FTE staff members dedicated to sewer collection system maintenance.

COMPARISON TO OTHER MUNICIPALITIES

According to the 2007 Oregon Population Report, the city of Milwaukie has approximately 20,920 residents. Based on this number and the City's proximity to a metropolitan area, three other municipalities of similar size and location in Oregon were interviewed to determine the number of full-time equivalent senior engineers, junior to mid-level engineers, technical staff, and administrative staff dedicated to wastewater operations. Questions were also asked as to the staffing levels and equipment used within the O&M departments. These municipalities included Newberg, Forest Grove, and Sherwood. In addition to staffing inquiries, Parametrix staff also asked questions

related to wastewater infrastructure and annual capital maintenance and improvement project budgets for comparison purposes.

Forest Grove (population 20,775) currently has an agreement with Clean Water Services (CWS) for wastewater treatment. The City is responsible for maintaining all sewer lines less than 24" in diameter (approximately 350,000 linear feet). All pump stations and sewer lines 24" and larger are maintained by CWS. In addition, CWS also runs the Industrial Pretreatment Program for Forest Grove's collection system and the wastewater treatment plant. Forest Grove's Engineering Department currently staffs two FTE senior engineers and four FTE junior to mid-level engineers with one administrative staff member. When asked if they were comfortable with the level of staffing, the answer was positive with the exception that extra thought needed to be put into determining how to fill vacancies left by retiring staff members in the future. In speaking with Forest Grove staff, approximately 30% of their work is related to sewer systems. Their CIP/CMP budget was approximately $320,000 last year. When asked what types of work they do in house, the response was largely design review. They estimate that they only do about 5% of design work in house. The Forest Grove O&M department currently has 3.5 FTEs working on the collection system with one TV van and one vacuum truck.

The City of Newberg (population 21,675) has an engineering department consisting of 2 FTE senior engineers (one for water/wastewater projects and one for transportation projects with each giving help to the other when needed), 2.5 FTE junior to mid-level engineers, 2 FTE engineering technicians, and 2 administrative assistants. The percent of time dedicated to wastewater collection system related projects is roughly 30-40% with this department doing both review and design. In speaking with Newberg staff, this department considers its staff size adequate to handle usual projects. Although it was difficult to estimate, the City staff claims that it may perform approximately 50% of its design projects internally, depending on size. The City maintains approximately 391,000 linear feet sewer pipe, 7 pump stations, and a wastewater treatment plant. It also coordinates its own Industrial Pretreatment Program which is staffed through the Operations Department. The annual CIP/CMP budget is between $10 and $15 million due to the City maintaining its own sewer and water treatment plant. No information was readily available regarding how much of this was dedicated to collections system CIPs. As for the O&M department, the City currently has 2 staff members dedicated to the sanitary collection system. In speaking with the Newberg O&M staff, they are understaffed in this department and are hoping to increase staff size to 6 members. The City currently has one vacuum truck and one TV van that is shared with the water and storm system O&M departments.

The City of Sherwood (population 16,365) has an engineering department consisting of 2 senior engineers, 3 junior to mid-level engineers, 2 engineering technicians, and one administrative assistant according to the City's website. Attempts at making contact with the engineering department were unsuccessful. Therefore, answers as to the number of FTEs working on sanitary collection system projects, amount of design done in-house, and the annual CIP budget were unavailable. Based on the online copy of the City's 2005 Wastewater Master Plan, the City maintains approximately 294,000-feet of sewer line. This does not include the lines over 24-inches in diameter which are maintained by Clean Water Services. The City does not maintain any pump stations, a wastewater treatment

plant, or an industrial pretreatment program. The O&M department currently has 2 FTEs working on the sewer collection system with one TV van and one vacuum truck.

PROJECTED CAPITAL IMPROVEMENT NEEDS

Based on the results of this 2010 Wastewater Master Plan, the City has 10 capital improvement projects (CIP) to be constructed within the next 5 years. These projects include potential relocation of lines that will require engineering design and review. Approximately 22 capital maintenance projects (CMP) are planned within the next 5 years. One of the CIPs was recently solicited for engineering services (August 2008). The other CIP project is scheduled to be performed in Year 2 (2009 – 2010 FY). It is likely that this project would also be performed by outside consultants. Engineering Department staffing needs for CMP projects is largely related to coordinating internally with City crews, design reviews (if necessary), coordinating a project for an outside contractor, tracking work progress, and documenting work completed.

RECOMMENDATION

Because of the number of design projects within the 5 year time frame, there does not appear to be a need for additional staffing in the engineering department based on sewer improvement project needs alone. However, this TM did not analyze staffing needs for other Milwaukie public works projects or departments. The past history of the City with regard to staffing levels and the comparison to other municipalities shows that there may be a need to hire an additional junior to mid-level engineer if other projects (transportation, water, etc.) are significant. In addition, as regulatory requirements for improving sanitary collection systems continue to increase, the City may benefit from having additional resources to address these issues. With regard to the City of Milwaukie's O&M department, the staffing level and field equipment appears to be adequate based on comparisons with other municipalities.

Most of the City's current engineering staff are relatively new to the City. The City may wish to implement a program for training replacement staff or developing a succession plan to increase future year's continuity and retention of knowledge base. This issue was identified as a concern by the City of Forest Grove.

The collection system maintenance appears to be well served by the current staffing level, a staffing level that is comparable with similar cities in the area.

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CHAPTER 11. FINANCIAL ANALYSIS (COST OF SERVICE STUDY/SDC)

INTRODUCTION / BACKGROUND

In March 2008, the City of Milwaukie contracted with Financial Consulting Solutions Group, Inc. (FCS GROUP), through Parametrix, Inc., to perform a revenue requirement analysis for its wastewater service and update its wastewater system development charge (SDC). The City of Milwaukie is a mature city experiencing ongoing demands on its aging wastewater system. The City's wastewater service will incur significant financial obligations associated with improvements to its collection infrastructure and County charges that are expected to increase to fund needed County treatment facility improvements.

With the study, the City wished to develop a rate revenue requirement forecast that addressed the planned capital improvements and the expected County treatment charge increase as well as to produce a defensible wastewater SDC that would generate funding to meet the infrastructure needs of growth without unduly burdening existing residents and business owners.

Consistent with these objectives, the following general approach was used in the wastewater revenue requirement analysis and the update of the City's wastewater SDC:

- **SDC Methodology.** In this step, we worked with City staff to isolate the recoverable portion of existing and planned facility costs and calculate SDC alternatives.
- **Revenue Requirements Analysis.** Incorporating policy recommendations received at the beginning of the study, we projected operations and capital revenue requirements for the wastewater service for a 10-year study period. This projection included an assumed increase in County treatment charges of approximately 50%, based on FY 2008 charges.
- **Documentation and Presentation.** In this step, we wrote this report describing the recommended SDC methodology, the revenue requirements analysis, and the resulting rate forecast, drafted adopting resolutions, and participated in Council and Citizens Utility Advisory Board (CUAB) meetings.

REVENUE REQUIREMENTS ANALYSIS

The City of Milwaukie faced a significant increase in its treatment charges from Clackamas County in FY 2009 and is likely to face additional increases in the future. At the same time, its aging wastewater infrastructure requires annual improvements to maintain and meet system needs. For the ten years beginning in fiscal year 2012, annual capital expenditures will average nearly $800,000 (based on today's cost and as escalated to year of construction) and the County's higher treatment charges are expected to average over $3,000,000 per year.

Cash Flow and Debt Coverage Tests

The revenue requirement analysis models the financial impacts of the capital program and County charges in addition to budgeted expenses to determine the amount of rate revenue needed in a given year to meet the wastewater service's overall expected financial obligations. At least two separate conditions must be satisfied in order for rates to be sufficient: The wastewater service must generate revenues adequate to meet cash needs, and revenues must satisfy debt coverage requirements.

The cash flow test identifies all cash requirements as projected in each given year. Cash requirements include operations and maintenance expenses, treatment charges, policy-driven additions to working capital, and capital improvement costs. If the wastewater service collected replacement funding, it would also be included in the test as an expense. These expenses are compared to the total projected revenues, including interest on fund balances. Shortfalls are then used to estimate the necessary rate increases.

The debt coverage test measures the ability of rate revenues to meet both legal and policy-driven revenue obligations. Loans typically require that rate revenues equal at least the wastewater service's ongoing operating and maintenance expenditures plus 1.5 times its annual debt service. For the purpose of the coverage test, ongoing operating expenses exclude policy-driven additions to working capital, rate-funded capital expenditures, and replacement funding (which the wastewater service does not currently collect). It is assumed that the wastewater service could delay these costs in a given year, if necessary, in order to meet its debt service obligations.

Revenues should be sufficient to satisfy both tests. If revenues are found to be deficient by one or more of the tests, then the greater deficiency drives the rate increase. As noted above, the coverage test ensures that the wastewater service meets its legal and policy debt coverage requirements, and revenues may exceed actual cash needs. Consequently, capital expenditures may be partially funded with cash surpluses that result from rate revenues in excess of cash needs, due to debt coverage requirements.

Operating Expenses

The revenue requirement analysis uses the City's FY 2009 wastewater budget as the basis for forecasting future revenue needs. The analysis is dependent on economic, financial and policy-based assumptions incorporated into the forecasting model.

Revenues and expenses were projected for future fiscal years using the following annual escalation factors:

- General Cost Inflation: 2.0% – applied to non-personnel operating expenditures
- Country Treatment Charges: 5.0%
- Labor Inflation: 4.5% – applied to operating expenditures related to personnel
- Construction Inflation: 2.0% – applied to capital improvement project costs
- Customer (and Revenue) Growth: 0.02% – based on an estimated 10 new accounts per year
- Fund Earnings: 5.0%

Minimum and maximum operating reserve balances have been sustained to both ensure that there are sufficient funds to cushion any temporary declines in revenue and to allow for excess funds to be used for capital expenditures. These parameters are set at 45 days (minimum) and 50 days (maximum) of cash operating expenses. Balances greater than the maximum are set aside for capital purposes.

Capital Expenses and Funding

The revenue requirement analysis incorporated the schedule of capital improvement projects contained in the City's Capital Improvement Plan. Several sources are available to fund the capital costs associated with this improvement program. These sources include:

1. Developer Funding – Includes developer-constructed facilities, often as a condition of development.
2. Accumulated Capital Reserves – Including receipts from system development charges.
3. Direct Rate Funding.
4. Loans.

All planned project costs incorporated into the rate study were expected to be funded from capital reserves and, eventually, direct rate funding.

The City has a loan of $4,000,000 from the State's Department of Environmental Quality (DEQ), however the proceeds will fund improvements that serve only the NE Sewer Extension (NESE) area portion of the Dual Interest Area (DIA), and the debt service is expected to be fully funded by direct assessments to new connections within the NESE.

Revenue Requirement Forecast

The results of the revenue requirement analysis are summarized in the tables that follow. As noted before, the rate forecast is developed to project annual revenue needs and determine the rate increases necessary to support those needs. The required increases that are initially projected are then smoothed to provide relatively small and predictable annual increases.

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Table 11-1. Revenue Requirement Analysis with Capital Improvement Program Funding Summary

City of Milwaukie

Wastewater Fund

(amounts in thousands)

	ACTUALS					Current Year	+ 1	+ 2	+ 3	+ 4	+ 5	+ 6	+ 7	+ 8	+ 9	+ 10	+ 11	+ 12	+ 13	+ 14	+ 15	+ 16	+ 17	+ 18	+ 19	+ 20
							PROJECTED				PROJECTED			PROJECTED			PROJECTED			PROJECTED			PROJECTED			
	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31
Resources																										
Beginning fund balance	$2,837	$2,766	$2,403	$2,397	$2,876	$2,111	$2,352	$1,949	$1,609	$1,307	$1,181	$1,197	$1,369	$1,547	$1,731	$1,923	$2,081	$2,244	$2,047	$1,893	$1,785	$1,727	$1,720	$1,770	$1,877	$2,050
Wastewater charges - base	2,805	3,105	3,241	3,536	4,262	4,263	4,349	4,641	5,013	5,415	5,849	6,259	6,698	7,000	7,316	7,647	7,993	8,355	8,733	9,172	9,633	10,117	10,625	11,158	11,718	12,306
Wastewater - rate increases	-	-	-	-	-	85	291	371	401	433	409	438	301	315	329	344	360	376	437	459	482	506	531	558	586	615
Interest	125	112	117	62	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
Miscellaneous	1	2	4	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Franchise fees (external)	-	-	79	55	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
Intergovernmental - grants	-	-	-	-	-	1,115	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proceeds from debt issuance	-	-	-	-	2,229	2,000	-	-	-	-	-	-	-	-	750	-	-	-	-	-	-	-	-	-	-	-
Proceeds from Reimb District	-	-	-	-	-	21	139	139	139	139	139	139	139	139	139	139	139	50	50	50	50	50	50	50	50	50
Transfers from other funds	47	60	197	196	-	392	196	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total revenues	2,978	3,279	3,638	3,854	6,592	7,977	6,076	5,252	5,654	6,088	6,498	6,937	7,239	7,555	8,635	8,231	8,593	8,882	9,321	9,782	10,266	10,774	11,307	11,867	12,455	13,072
Total Resources	$5,815	$6,045	$6,041	$6,251	$9,468	$10,088	$8,428	$7,201	$7,263	$7,395	$7,679	$8,134	$8,608	$9,102	$10,366	$10,154	$10,674	$11,126	$11,368	$11,675	$12,051	$12,501	$13,027	$13,637	$14,332	$15,122
Requirements																										
Personal services	$315	$328	$339	$363	$381	$380	$415	$434	$454	$474	$495	$517	$540	$564	$589	$616	$644	$673	$703	$735	$768	$803	$839	$877	$916	$957
Materials & services (base)	189	103	118	100	93	95	97	99	101	103	105	107	109	111	113	115	117	119	121	123	125	128	131	134	137	140
M&S (Franchise Fee to Streets)	224	241	247	256	265	270	275	281	287	293	299	305	311	317	323	329	336	343	350	357	364	371	378	386	394	402
M&S (Contract treatment costs)	1,544	1,422	1,391	1,488	2,978	2,770	2,909	3,054	3,207	3,367	3,535	3,712	3,898	4,093	4,298	4,513	4,739	4,976	5,225	5,486	5,760	6,048	6,350	6,668	7,001	7,351
M&S (Capital Reserve M&S)	-	-	606	-	443	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M&S (internal service charges)	281	280	132	47	370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt service	-	-	-	-	-	1,115	1,110	109.5	109.0	108.5	108.0	107.5	107.0	106.5	106.0	144.9	144.4	143.9	143.4	142.9	142.4	141.9	141.4	140.9	140.4	139.9
Transfers to other funds	308	1,222	599	661	458	966	1,014	1,065	1,118	1,174	1,233	1,295	1,360	1,428	1,499	1,574	1,653	1,736	1,823	1,914	2,010	2,111	2,217	2,328	2,444	2,566
Capital outlay																										
Scheduled capital projects	188	46	212	460	2,369	2,140	659	550	680	694	707	722	736	751	1,516	781	797	1,088	1,110	1,132	1,155	1,178	1,201	1,225	1,250	1,275
CIP UNFUNDED AMOUNT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total expenditures	3,049	3,642	3,644	3,375	7,357	7,736	6,479	5,593	5,956	6,213	6,482	6,765	7,061	7,370	8,444	8,073	8,430	9,079	9,475	9,890	10,324	10,781	11,258	11,759	12,282	12,831
							-16.25%	-13.68%	6.50%	4.32%	4.34%	4.36%	4.37%	4.38%	14.57%	-4.39%	4.42%	7.70%	4.36%	4.38%	4.39%	4.42%	4.43%	4.45%	4.45%	4.47%
Ending Fund Balance																										
Policy requirement (25%)	638	594	708	564	1,133	879	924	967	1,012	1,059	1,109	1,160	1,215	1,271	1,331	1,393	1,459	1,528	1,600	1,675	1,754	1,838	1,925	2,016	2,112	2,213
Reserve for debt service	-	-	-	-	-	-	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
Reserves for capital	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Over (under) Policy	2,128	1,809	1,689	2,312	978	1,473	969	586	239	66	32	153	276	404	536	632	729	463	237	54	(83)	(174)	(211)	(195)	(118)	23
Total ending fund balance	2,766	2,403	2,397	2,876	2,111	2,352	1,949	1,609	1,307	1,181	1,197	1,369	1,547	1,731	1,923	2,081	2,244	2,047	1,893	1,785	1,727	1,720	1,770	1,877	2,050	2,292
Total Requirements	$5,815	$6,045	$6,041	$6,251	$9,468	$10,088	$8,428	$7,201	$7,263	$7,395	$7,679	$8,134	$8,608	$9,102	$10,366	$10,154	$10,674	$11,126	$11,368	$11,675	$12,051	$12,501	$13,027	$13,637	$14,332	$15,122
Utility Rate Information:																										
% Wastewater rate increases		6.1%	6.0%	6.0%	6.0%	2.00%	6.70%	8.00%	8.00%	8.00%	7.00%	7.00%	4.50%	4.50%	4.50%	4.50%	4.50%	4.50%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Wastewater portion of average bill	$21.45	$22.77	$24.12	$25.55	$33.08	$34.00	$36.30	$39.20	$42.30	$45.70	$48.90	$52.30	$54.70	$57.20	$59.80	$62.50	$65.30	$68.20	$71.60	$75.20	$79.00	$83.00	$87.20	$91.60	$96.20	$101.00

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The City's annual wastewater revenue requirement is forecasted through FY 2031. After initial rate increases of 7 to 9%, the fund is sustained by 4 to 5% increases. It must be noted that each rate increase would need to take effect before the start of each fiscal year in July.

Importantly, if customer connections within the Dual Interest Area fail to materialize as planned, the debt service on the DEQ loan may need to be borne wholly by the existing wastewater customer base. Over the ten year study period, debt service on the loan would average approximately $106,000 per year. Adding this burden to the above forecast would result in annual rate increases of 20.44% in FY 2010, 6.61% in 2011, and 5.20% through FY 2018.

Below, the City's planned capital improvement program spending is shown, with forecasted fund balances. It is *important* to note that the City will consume much of that portion of the Capital Fund that had been earmarked for future Kellogg de-commissioning costs. However, the fund balance will end the study period with no less than $1 million.

Finally, it is important to note that this forecast was developed based on the assumption that the City would fully fund its capital program with existing fund balances and rate revenues. Accordingly, any grant funding or low-interest loans that the City receives would have a material and beneficial impact on the rate forecast. Additionally, planned project costs have a significant impact on required rate increases. To the extent that these costs are higher than expected or are delayed to a later year, there will be a material impact on rate requirements.

SYSTEM DEVELOPMENT CHARGE METHODOLOGY

A system development charge is a one-time fee imposed on new development (and some types of re-development) at the time of development. The fee is intended to recover a fair share of the costs of existing and planned facilities that provide capacity to serve growth.

Oregon Revised Statute (ORS) 223.297 - 223.314 defines SDCs and specifies how they shall be calculated, applied, and accounted for. By statute, an SDC is the sum of two components:

- A **reimbursement fee**, designed to recover costs associated with capital improvements already constructed or under construction, and
- An **improvement fee**, designed to recover costs associated with capital improvements to be constructed in the future.

The reimbursement fee methodology must be based on "the value of unused capacity available to future system users or the cost of the existing facilities", and must further consider prior contributions by existing users and gifted and grant-funded facilities. The calculation must also "promote the objective of future system users contributing no more than an equitable share to the cost of existing facilities." Reimbursement fee proceeds may be spent on any capital improvements related to the systems for which the SDC applied. Thus, wastewater SDCs must be spent on wastewater improvements.

The improvement fee methodology must include only the cost of projected capital improvements or portions of improvements needed to increase system capacity for future users. In other words, the cost(s) of planned projects or portions of projects that correct existing deficiencies, or do not otherwise increase capacity for future users, may not be included in the improvement fee calculation. Improvement fee proceeds may be spent only on capital improvements, or portions thereof, which increase the capacity of the systems for which they were applied.

Reimbursement Fee Methodology

The calculation of the reimbursement fee, described in detail in Section IV, is fairly straightforward under the approach taken. In short, it is the dollar value of unused, available, system capacity divided by the capacity it will serve. The unit of capacity used becomes the basis of the fee – e.g., meter equivalents, wastewater fixture units, or equivalent dwelling units. In addition to the cost or value of the system, Oregon law (ORS 223.304) requires that the reimbursement fee methodology also incorporate the following:

- "Ratemaking principles employed to finance publicly owned capital improvements", taken to mean that the fees must be calculated to equitably recover appropriate costs;
- "Prior contributions by existing users", taken to mean that the cost of contributed assets should not be included in the reimbursement fee basis;
- "Gifts or grants from federal or state government or private persons", taken to mean that gifted or grant-funded assets should not be included in the reimbursement fee basis; and
- "Other relevant factors identified by the local government imposing the fee".

Finally, the methodology must promote the objective of future system users contributing no more than an equitable share to the cost of existing facilities.

In the case of wastewater, the application of the statutory framework is straightforward. The reimbursement fee will serve to "reimburse" those who funded construction of the system, namely ratepayers, net of the adjustments noted.

Improvement Fee Methodology

The improvement fee calculation, like that of the reimbursement fee, is straightforward. In short, it is the eligible dollar cost of capacity-increasing capital projects divided by the capacity they will serve. Again, the unit of capacity used becomes the basis of the fee. The overriding issue to consider in the improvement fee calculation is the identification and separation of capacity-increasing capital costs.

For most projects, the "capacity" method was utilized to allocate costs to the improvement fee basis. Under the capacity approach, the cost of a given project is allocated to growth proportionately by the capacity made available for growth. As an example, assume we are allocating the $1 million cost of upsizing a collection main from 8" to 10" to meet the needs of growth. The capacity of a 10" main is 1,250 gallons per minute. The capacity of an 8" main is 800 gallons per minute. The allocation to growth

would be determined as follows: (1,250 – 800) / 1,250 x $1 million, or 36% x $1 million, which is $360,000.

However, several projects were either designed to serve only existing customers or only future customers. Such projects were allocated either 0% or 100% to growth, respectively.

Summary

In general, an SDC is calculated by adding the applicable reimbursement fee component to the applicable improvement fee component. Each separate component is calculated by dividing the eligible cost by the appropriate measure of growth in capacity. The unit of capacity used becomes the basis of the charge. A sample calculation is shown below.

Table 11-2. Sample Calculation Table

Reimbursement Fee		Improvement Fee		SDC
Eligible cost of capacity in existing facilities / Growth in system capacity demand	+	Eligible cost of planned capacity-increasing capital improvements / Growth in syste, capacity demand	=	SDC ($/unit)

SDC (Improvement Fee) Credits

The law requires that credits be provided against the improvement fee, for the construction of qualified public improvements. Oregon Revised Statute 223.304 states that, at a minimum, credits be provided against the improvement fee for:

> "the construction of a qualified public improvement. A 'qualified public improvement' means a capital improvement that is required as a condition of development approval, identified in the plan and list adopted pursuant to ORS 223.309 and either:
>
> (a) Not located on or contiguous to property that is the subject of development approval; or
>
> (b) Located in whole or in part on or contiguous to property that is the subject of development approval and required to be built larger or with greater capacity than is necessary for the particular development project to which the improvement fee is related."

The law further states that credits

> "may be granted only for the cost of that portion of such improvement that exceeds the local government's minimum standard facility size or capacity needed to serve the particular development project or property."

The challenge is to craft a credit approach that meets statutory requirements *and* the City's assumed general objectives for cash flow, prioritization of capital projects, and orderly but sustained development. It must be noted that we believe it is important for the City to retain as much control as possible over the prioritization and implementation of its capital plans. These plans are created to address total system needs – not just the

needs of growth. Without control over how and when those needs are addressed, the re-prioritization of projects over time can leave important City needs unmet. To avoid this outcome, credits should:

- be only for the portion of the actual, estimated, or agreed-upon cost of capacity *in excess of that needed to serve the particular development*;
- include no cash reimbursement;
- be for planned projects only; and
- be provided only upon completion of a "qualified public improvement".

We recommend that the City maintain its current SDC credit policy, which is in compliance with statutory requirements and incorporates our recommended guidelines.

Indexing Charge for Inflation

Oregon law (ORS 223.304) allows for the periodic indexing of system development charges for inflation, as long as the index used is:

> "(A) A relevant measurement of the average change in prices or costs over an identified time period for materials, labor, real property or a combination of the three;
>
> (B) Published by a recognized organization or agency that produces the index or data source for reasons that are independent of the system development charge methodology; and
>
> (C) Incorporated as part of the established methodology or identified and adopted in a separate ordinance, resolution or order."

We propose that City index its charges to the *Engineering News Record* (ENR) Construction Cost Index (CCI) for the City of Seattle, and adjust the charges annually as per that index. There is no comparable Oregon-specific index.

WASTEWATER SDC

As shown below, the City's existing wastewater SDC is applied according to equivalent dwelling units. For non-residential accounts, 16 wastewater fixture units comprise one EDU.

Table 11-3. Existing Wastewater SDC Schedule

Charge	Amount	Charge Basis
Reimbursement Fee	$ 327	EDU / 16 Fixture Units
Improvement Fee	$ 566	EDU / 16 Fixture Units
Total SDC	**$ 893**	**EDU / 16 Fixture Units**

The proposed charge includes the application methodology of the existing wastewater SDC. Two potential alternatives were also reviewed. One charge is calculated based on EDUs, in which the EDU value is established by projected volume instead of fixture

units, and the second is based on the size of the water meter and its associated flow capacity.

In addition, we evaluated the feasibility of charging a separate SDC in the Dual Interest Area, opting instead to develop a charge to be applied uniformly throughout the service area. The calculation of the proposed charge is summarized below.

Capacity Basis

In order to estimate growth in equivalent dwelling units during the study period – the denominator in both the reimbursement and improvement fee calculations – the following approach was taken.

- In the City's 2004 Draft Wastewater Master Plan an initial EDU total of 7,110 was estimated. It was also estimated that 7,953 EDUs would be served at build-out in 2014. This total reflects average annual customer growth of 1.31% per year.
- Applying the 1.31% growth rate to the initial EDU total of 7,110 resulted in a 2008 estimate of 7,436 EDUs.

Additionally, the City provided a report of customers by meter size. Utilizing cold water flow factors, based on a 5/8" x 3/4" meter, it was determined that the City served 8,999 meter equivalents.

Additionally, the number of wastewater fixture units in the system was estimated. The number of wastewater fixture units is based on fixture unit values assigned to different fixture types by the Uniform Plumbing Code. Applying the following assumptions, which link wastewater fixture units and meter size, resulted in an estimate of 148,533 total wastewater fixture units for City customers.

Table 11-4. SDC Data Analysis

Current Customers by Meter Size				Fixture Unit Calculation	
Meter Size	Customers	Flow Factor	Total MEs	Fixture Units	Total
5/8" x 3/4"	6,083	1.00	6,083.00	16	97,328
1"	275	2.50	687.50	20	5,548
1-1/2"	105	5.00	525.00	79	8,254
2"	159	8.00	1,272.00	193	30,749
3"	16	16.00	256.00	261	4,174
4"	5	25.00	125.00	392	1,958
6"	1	50.00	50.00	522	522
Totals	**6,644**		**8,999**		**148,533**

Finally, as a portion of the project costs included in the improvement fee cost basis would serve new connections within the Dual Interest Area, the 305 future accounts within the DIA were added to the number of EDUs served at build-out. This resulted in a future total of 8,258 EDUs.

To project total meter equivalents and wastewater fixture units served at build-out, 2008 totals were grown proportionately with equivalent dwelling units. According, ending meter equivalents and wastewater fixture units totaled 9,993 and 164,954, respectively.

Reimbursement Fee Cost Basis

In order to estimate the cost of unused capacity in the existing wastewater system – the numerator in the reimbursement fee calculation – the following approach was taken.

- The City provided a schedule of wastewater assets as of FY 2008 that would serve the build-out customer base. These assets had an original cost total of $6,986,088.
- Of an ending customer base of 8,258 EDUs, growth – including DIA customers – of 822 EDUs represents 9.96% of the future customer total. Accordingly, the unused capacity cost from 2000 was reduced by 22.9% to account for customer growth that had occurred since that evaluation. Doing so reduced the cost of unused capacity to $2,963,589.
- Accordingly, based on growth's share of system capacity, 9.96% of existing asset costs were allocated to the reimbursement fee cost basis. This resulted in an initial unused capacity cost total of $695,470.
- The sum of the costs of unused capacity, $695,470, less a pro-rata share of outstanding debt principal of 3,056,208 resulted in a reimbursement fee cost basis of $391,222.

Reimbursement Fee Calculation

The reimbursement fee was then calculated as the reimbursement fee cost basis, $391,222, divided by forecasted customer growth, 822 EDUs, 995 meter equivalents, and 16,421 wastewater fixture units. The result of this calculation is a reimbursement fee of $476 per EDU, $393 per meter equivalent, and $23.82 per wastewater fixture unit.

Improvement Fee Cost Basis

The following approach was taken to determine the cost of capacity-increasing capital improvements for inclusion in the improvement fee cost basis.

- The City provided a wastewater capital improvement plan with a list of needed capital improvement projects. The sum of this list of project costs in current dollars was $2,750,000.
- In allocating project costs to growth, the following steps were taken: (1) projects that did not increase capacity for future customers were given a 0% growth allocation; (2) projects that provided capacity for only future customers were given a growth allocation of 100%; and (3) projects that provided capacity for both existing customers and future customers were given a growth allocation equal to growth's share of the future customer base – 9.96%. The sum of each project's growth allocation resulted in a total $1,354,380 of improvement fee-eligible costs.
- Finally, the current improvement fee fund balance, $800,178, was deducted from the total eligible cost to (1) recognize that the fund balance is available for spending on the project list and (2) prevent new customers from paying for those project costs twice. The resulting improvement fee cost basis was $554,202.

Improvement Fee Calculation

The improvement fee was then calculated as follows. The cost basis of $554,202 was divided by total forecasted growth, 822 EDUs, 995 meter equivalents, and 16,421 wastewater fixture units, to establish the improvement fee of $674 per EDU, $557 per meter equivalent, and $33.75 per wastewater fixture unit.

Recommended System Development Charge

The recommended wastewater SDC is the sum of the reimbursement fee and the improvement fee for each respective basis, adjusted by an administrative cost recovery factor of 1.13%. The administrative cost recovery factor was derived by dividing the amortized cost of this study by forecasted annual SDC revenues. The resulting recommended SDCs were $1,163 per EDU, $961 per meter equivalent, and $58.22 per wastewater fixture unit.

Note that the charge based on EDUs diverges from the fixture unit SDC due to the fact that many customers install upsized meters for irrigation purposes, resulting in an understated fixture unit charge. The resulting recommended SDCs are provided below.

Table 11-5. Recommended SDCs

SDC Charge Basis	Charge per Unit
Equivalent Dwelling Units	$1,163 per EDU
Meter Equivalents	$961 per ME
Wastewater Fixture Units	$58.22 per Fixture Unit

The following tables summarize the charge applications based on meter equivalents and fixture units.

Table 11-6. Charge Applications – Meter Equivalents

Meter Size	Meter Flow Factor	Meter SDC
1”	2.5	$ 2,275
1.5”	5	$ 4,551
2”	8	$ 7,281
3”	16	$ 14,563
4”	25	$ 22,755
6”	50	$ 45,509
8”	53.33	$ 48,540

Table 11-7. Charge Applications – Fixture Units

Fixture	Fixture Units	Fixture Charge
Bar Sink	1.0	$ 55.15
Bathtub	4.0	$ 220.59
Bath/Shower combo	4.0	$ 220.59
Bidet	1.0	$ 55.15
Clotheswasher, domestic	4.0	$ 220.59
Dishwasher, domestic	1.5	$ 82.72
Kitchen sink, domestic	1.5	$ 82.72
Laundry sink	1.5	$ 82.72
Lavatory	1.0	$ 55.15
Shower	2.0	$ 110.30
Water closet – 1.6 gpf gravity tank	2.5	$ 137.87

APPENDIX A

City of Milwaukie Intergovernmental Agreements

A G R E E M E N T

THIS AGREEMENT made and entered into this 3 day of November, 1969, by and between the CITY OF MILWAUKIE, OREGON, a municipal corporation, hereinafter referred to as Milwaukie, and CLACKAMAS COUNTY, OREGON, a municipal corporation, acting for and in behalf of CLACKAMAS COUNTY SERVICE DISTRICT NO. 1, hereinafter referred to as the District.

RECITAL:

Clackamas County Service District No. 1 is a service district organized under the provisions of Oregon Revised Statute 451.010 et seq for the purpose of constructing, operating and maintaining sanitary facilities. Milwaukie is a duly incorporated city within the state of Oregon adjacent to the area served by Clackamas County Service District No. 1. The District will construct and operate a sewage collection system and treatment plant; it will be known as Kellogg Creek Water Pollution Control Plant. In the first instance, the treatment plant will be constructed to receive five million gallons of liquid per day (5 mgd). It is mutually agreeable and advantageous to the parties that Milwaukie use the sewage collection system and treatment plant of the District for disposal of domestic and industrial sewage waste collected by the city. The purpose of this agreement is to further the foregoing and provide for the disposition under the hereinafter described terms of domestic and industrial sewage waste from Milwaukie.

For the foregoing purposes, the parties agree as follows:

TERM:

The term of this agreement shall be for a period of ten years from the date hereof or until the treatment plant has been expanded and put into operation as a 7.5 mgd plant or larger, whichever date first occurs. Either party, however, upon 180 days written notice to the other, may terminate the agreement. In the event a sewage treatment plant is not under construction by January 1, 1972, this agreement shall be automatically terminated.

GENERAL COVENANTS:

The District agrees to accept, treat and dispose of domestic and industrial sewage collected by and transmitted to its Kellogg Creek Water Pollution Control Plant by Milwaukie during the term of the agreement and Milwaukie agrees to pay for said service at rates hereinafter prescribed.

PAYMENT:

The rates to be paid to the District by Milwaukie for the foregoing service shall be determined as follows:

A. ANNUAL LUMP SUM PAYMENT. Milwaukie shall pay annually on each anniversary of the effective date of this agreement and proportionately for any portion of a year less than a whole year, a sum to be known as the "annual lump sum" charge. Said annual lump sum charge is a proportionate amount of money necessary per year to retire the debt incurred to construct said sewage system and to be repaid in 30 years. Milwaukie's proportionate share of the debt retirement shall be determined by the following formula: Initially said proportion is set at 25% of all costs incurred in constructing a 5 mgd treatment plant; 13.5% of all costs incurred in constructing the Lower Kellogg Creek Interceptor as shown on figure 3 attached and 11.2% of all costs incurred in constructing the Mount Scott Creek Interceptor west of Linwood Avenue. "Costs" shall include but not be limited to all construction, engineering, right of way procurement, attorneys fees and bond sale costs. The purpose of the annual lump sum is to defray Milwaukie's proportionate share of the cost of construction of the treatment plant and interceptor sewer.

The annual lump sum charge shall cover that portion of plant capital costs deemed applicable to Milwaukie for treatment of up to 1.25 million gallons per day (mgd) sewage flow from Milwaukie. Should the average yearly Milwaukie sewage flow to the District exceed 1.25 mgd the annual lump sum payment shall increase proportionately to the increase in flow above 1.25 mgd, using the above initial formula as a base, excluding cost of interceptor lines.

Should the District receive a State and/or Federal construction grant for any of the facilities jointly used by the parties, the annual lump sum

charge shall be revised to a sum that will bear the same proportion of cost to capital expended to construct said facilities without the aid of Federal and/or State construction grants.

B. UNIT CHARGE. A charge to be known as a unit charge shall be made by the District to Milwaukie at the initial rate of $85.00 per million gallons of sewage transmitted by Milwaukie to the District to be paid monthly by Milwaukie upon being billed therefor by the District as hereinafter set forth. The unit charge shall cover operation and maintenance consisting of direct supervision, labor, operating materials and supplies, maintenance, repair and replacement of plant machinery and equipment, and administration. In any future revision of the unit charge, the factor of administration shall be determined at the rate of 10% of labor cost. By "labor cost" is meant the total cost of labor, that is, base pay together with all increments and benefits furnished to or for the employee by the employer or district.

The unit charge of $85.00 per million gallons shall be annually revised. The basis for a revised unit charge shall be the actual operating and maintenance cost for the preceding year divided by the total plant flow for that year. The operating and maintaining cost used shall be limited to those items outlined above. In no case shall Milwaukie's operation and maintenance charge exceed 50 per cent of the annual total operation and maintenance cost for the plant, provided Milwaukie's flow does not exceed 1.25 mgd.

The unit charge shall be paid monthly and within thirty days after being billed therefor by the District.

PLACE OF PAYMENT AND NOTICE:

Any notice to which Milwaukie shall be entitled under this agreement, shall be delivered or sent to City Hall, Milwaukie, Oregon. Place of payment and notice for District shall be at Clackamas County Courthouse, Oregon City, Oregon. Place for notices and payment may be changed by written notice from the party changing its address.

MISCELLANEOUS:

Composite samples of wastes from Milwaukie shall be collected by the District periodically. Should the average strength of Milwaukie's waste flow to the District plant exceed for a period of 15 days that of normal domestic

sewage, a 5-day 20° C bio-chemical oxygen demand (BOD) or suspended solids (SS) concentration in excess of 240 milligrams per liter (mg/l), the District may upon ten days written notice to Milwaukie bring about a renegotiation of the amount of the annual lump sum and unit charges then being paid by Milwaukie with the end in view of basing it on flow, BOD and suspended solids as outlined in the District industrial waste ordinance.

Flow measurement facilities shall be installed by Milwaukie, at its expense, at locations as agreed upon by the District and Milwaukie. Each measurement facility shall conform to the District industrial waste ordinance.

For connections to the District sewage system by Milwaukie where a flow measurement facility is impractical or unwarranted, the contributing flow shall be estimated by using the number of connections on the contributing line multiplied by an average sewage flow of 400 gallons per day per residential connection or upon justified other volumes of flow. Flows for commercial establishments shall be estimated using the average daily water use for the preceding year based on water meter records.

The City of Milwaukie and industrial waste contributors in Milwaukie whose sewage shall be treated at the District plant shall be subject to all Sections of the District industrial waste ordinance. In no event shall any industry discharge wastes to the District plant without the approval of the District and the City.

Milwaukie agrees to pass such laws or regulations and to enforce the same to the best of its ability to prevent excessive infiltration of storm water and groundwater into its sewer lines for delivery of sewage to the District plant.

In the event the parties are not able to agree upon any provision of this agreement, the matter shall be submitted to arbitration. That is, each of the parties shall select an arbitrator and the two arbitrators, in the event of inability to agree, shall select a third arbitrator, and the conclusion of a majority of the arbitrators, when made in writing to the parties shall be conclusive as between the parties. The parties shall share the costs of arbitration in equal proportions.

EFFECTIVE DATE:

The effective date of this agreement and from which all times and anniversary dates shall be measured shall be that upon which the District has facilities in operation to treat sewage.

IN WITNESS WHEREOF the parties have caused these presents to be executed by appropriate officers and pursuant to enabling resolutions the day and year first hereinabove set forth.

CITY OF MILWAUKIE, OREGON

BY: _____
Mayor

BY: _____
Recorder

BOARD OF COUNTY COMMISSIONERS FOR CLACKAMAS COUNTY, OREGON acting for and in behalf of CLACKAMAS COUNTY SERVICE DISTRICT NO. 1

BY: _____
Commissioner

BY: _____
Commissioner

BY: _____
Commissioner

A G R E E M E N T

THIS AGREEMENT made and entered into this 25th day of November, 1970, by and between the CITY OF MILWAUKIE, OREGON, a municipal corporation, hereinafter referred to as Milwaukie, and CLACKAMAS COUNTY, OREGON, a municipal corporation, acting for and in behalf of CLACKAMAS COUNTY SERVICE DISTRICT NO. 1, hereinafter referred to as the District. This agreement supersedes the agreement of 3 November 1969, between the participants.

Recital:

Clackamas County Service District No. 1 is a service district organized under the provisions of Oregon Revised Statute 451.010 et seq for the purpose of constructing, operating and maintaining sanitary facilities. Milwaukie is a duly incorporated city within the State of Oregon adjacent to the area served by Clackamas County Service District No. 1. The District will construct and operate a sewage collection system and treatment plant; it will be known as Kellogg Creek Water Pollution Control Plant. In the first instance, the treatment plant will be constructed to receive an average flow of ten million gallons of liquid per day (10 mgd). Sewage flow is used herein to define the equivalent connected population, the basis being 100 gallons per capita per day. The design population equivalent of the initial Kellogg Creek Water Pollution Control Plant will be 100,000 persons. It is mutually agreeable and advantageous to the parties that Milwaukie use the sewage collection system and treatment plant of the District for disposal of domestic and industrial sewage waste collected by the city. The purpose of this agreement is to further the foregoing and provide for the disposition under the hereinafter described terms of domestic and industrial sewage waste from Milwaukie.

For the foregoing purposes, the parties agree as follows:

TERM:

The term of this agreement shall be for a period of ten years from the date hereof or until the treatment plant has been expanded and put into operation as

a 15 mgd plant or larger, whichever date first occurs. Either party, however, upon 180 days written notice to the other, may terminate the agreement. In the event a sewage treatment plant is not under construction by 1 January 1973, this agreement shall be automatically terminated.

The District agrees to accept, treat and dispose of domestic and industrial sewage collected by and transmitted to its Kellogg Creek Water Pollution Control Plant by Milwaukie during the term of the agreement and Milwaukie agrees to pay for said service at rates hereinafter prescribed.

PAYMENT:

The rates to be paid to the District by Milwaukie for the foregoing service shall be determined as follows:

A. ANNUAL LUMP SUM PAYMENT. Milwaukie shall pay annually on each anniversary of the effective date of this agreement and proportionately for any portion of a year less than a whole year, a sum to be known as the "annual lump sum" charge. Said annual lump sum charge is a proportionate amount of money necessary per year to retire the debt incurred to construct said sewage system and to be repaid in not less than 20 years or as mutually agreed by both parties. Milwaukie's proportionate share of the debt retirement shall be determined by the following formula: Initially said proportion is set at 40% of all costs incurred in constructing a 10 mgd treatment plant; 13.5% of all costs incurred in constructing the Lower Kellogg Creek Interceptor as shown in Figure 3 attached and 11.2% of all costs incurred in constructing the Mount Scott Creek Interceptor west of Linwood Avenue. "Costs" shall include but not be limited to all construction, engineering, right-of-way procurement, attorneys' fees and bond sale costs. The purpose of the annual lump sum is to defray Milwaukie's proportionate share of the cost of construction of the treatment plant and interceptor sewer.

The annual lump sum charge shall cover that portion of plant capital costs deemed applicable to Milwaukie for treatment of up to an average 4.00 million gallons per day (mgd) sewage flow from Milwaukie. Should the average yearly Milwaukie sewage flow to the District exceed 4.00 mgd, or the recomputed minimum as provided hereinafter, the annual lump sum payment shall increase proportionately to the increase in flow above 4.00 mgd, or the recomputed minimum, using the above

initial formula as a base, excluding cost of interceptor lines. The minimum annual Milwaukie lump sum charge shall be reduced in the event the District contracts with others outside the District to provide sewage treatment services at the Kellogg Creek plant. The adjustment in Milwaukie's minimum charge shall be based on reducing the 4.00 mgd capacity allowance by 40 per cent of the capacity allowance contracted to others outside the District. Should the average yearly sewage flow to the Kellogg Creek plant exceed 10 mgd less Milwaukie's minimum proportion, the annual Milwaukie lump sum payment shall be renegotiated with the payment being based on actual contribution by Milwaukie.

Should the District receive a State and/or Federal construction grant for any of the facilities jointly used by the parties, the annual lump sum charge shall be revised to a sum that will bear the same proportion of cost to capital expended to construct said facilities without the aid of Federal and/or State construction grants.

B. rescinded by Agreement No. 4, in 1984.

B. UNIT CHARGE. A charge to be known as a unit charge shall be made by the District to Milwaukie at the initial rate of $85.00 per million gallons of sewage transmitted by Milwaukie to the District to be paid monthly by Milwaukie upon being billed therefor by the District as hereinafter set forth. The unit charge shall cover operation and maintenance consisting of direct supervision, labor, operating materials and supplies, maintenance, repair and replacement of plant machinery and equipment, and administration. In any future revision of the unit charge, the factor of administration shall be determined at the rate of 10% of labor cost. By "labor cost" is meant the total cost of labor, that is, base pay together with all increments and benefits furnished to or for the employee by the employer or District.

The unit charge of $85.00 per million gallons shall be annually revised. The basis for a revised unit charge shall be the actual operating and maintenance cost for the preceding year divided by the total plant flow for that year. The operating and maintaining cost used shall be limited to those items outlined above. In no case shall Milwaukie's operation and maintenance charge exceed 65 per cent of the annual total operation and maintenance cost for the plant, provided Milwaukie's flow does not exceed 4.00 mgd.

The unit charge shall be paid monthly and within thirty days after being billed therefor by the District.

PLACE OF PAYMENT AND NOTICE:

Any notice to which Milwaukie shall be entitled under this agreement, shall be delivered or sent to City Hall, Milwaukie, Oregon. Place of payment and notice for District shall be at Clackamas County Courthouse, Oregon City, Oregon. Place for notices and payment may be changed by written notice from the party changing its address.

MISCELLANEOUS:

Composite samples of wastes from Milwaukie shall be collected by the District periodically. Should the average strength of Milwaukie's waste flow to the District plant exceed for a period of 15 days that of normal domestic sewage, a 5-day 20°C bio-chemical oxygen demand (BOD) or suspended solids (SS) concentration in excess of 240 milligrams per liter (mg/l), the District may upon ten days' written notice to Milwaukie bring about a renegotiation of the amount of the annual lump sum and unit charges then being paid by Milwaukie with the end in view of basing the adjusted annual lump sum amount and unit charges on flow, BOD and suspended solids as outlined in the District industrial waste ordinance.

Should another contractual participant have waste flows in excess of normal domestic sewage strengths, as defined above, their treatment charges shall be adjusted as described above for Milwaukie to determine justification for reducing annual lump sum charges for other contractual participants.

Flow measurement facilities shall be installed by Milwaukie, at its expense, at locations as agreed upon by the District and Milwaukie. Each measurement facility shall conform to the District industrial waste ordinance.

For connections to the District sewage system by Milwaukie where a flow measurement facility is impractical or unwarranted, the contributing flow shall be estimated by using the number of connections on the contributing line multiplied by an average sewage flow of 400 gallons per day per residential connection or upon justified other volumes of flow. Flows for commercial establishments shall be estimated using the average daily water use for the preceding year based on water meter records.

This P deleted by Agreement Nov. 1984

The City of Milwaukie and industrial waste contributors in Milwaukie whose sewage shall be treated at the District plant shall be subject to all Sections of the District industrial waste ordinance. In no event shall any industry discharge wastes to the District plant without the approval of the District and the City.

Milwaukie agrees to pass such laws or regulations and to enforce the same to the best of its ability to prevent excessive infiltration of storm water and groundwater into its sewer lines for delivery of sewage to the District plant.

In the event the parties are not able to agree upon the interpretation of any provision of this agreement, or are unable to resolve any negotiations, matter of disagreement arising out of this agreement, the matter shall be submitted to arbitration. That is, each of the parties shall select an arbitrator and the two arbitrators, in the event of inability to agree, shall select a third arbitrator, and the conclusion of a majority of the arbitrators, when made in writing to the parties shall be conclusive as between the parties. The parties shall share the costs of arbitration in equal proportions.

EFFECTIVE DATE:

The effective date of this agreement and from which all times and anniversary dates shall be measured shall be that upon which the District has facilities in operation to treat sewage and notifies the City in writing.

IN WITNESS WHEREOF the parties have caused these presents to be executed by appropriate officers and pursuant to enabling resolutions the day and year first hereinabove set forth.

CITY OF MILWAUKIE, OREGON

Mayor Ronald A. Graf

Recorder Ruth E. Fuller

BOARD OF COUNTY COMMISSIONERS FOR CLACKAMAS COUNTY, OREGON, acting for and in behalf of CLACKAMAS COUNTY SERVICE DISTRICT NO. 1

Chairman Fred Stefani

Commissioner Thomas D. Telford

Commissioner [illegible]

AGREEMENT

This agreement is made this 31st day of August, 1978 between the CITY OF MILWAUKIE, OREGON, a municipal corporation, herein called "Milwaukie", and CLACKAMAS COUNTY SERVICE DISTRICT NO. 1, herein called "District".

RECITALS:

The circumstances of this agreement are that on November 25, 1970, Milwaukie and District entered into an agreement wherein District agreed to construct a sewage treatment plant and collection system and to accept, treat and dispose of sewage from Milwaukie in consideration of the payment by Milwaukie to District of an annual lump sum payment and a unit charge. This agreement relates to the annual lump sum payment provided for in the November 25, 1970 agreement between the parties.

AMOUNT OF LUMP SUM PAYMENT:

The parties agree that the amount of lump sum payment due District from Milwaukie is the sum of $1,763,631.92. The agreement of the parties of November 25, 1970 provides that the annual lump sum payment shall be reduced in the event that the District contracts with others outside of the District to provide the sewage treatment services, in the event that the District should receive state or federal grants designated for the reimbursement of costs incurred in the construction of the District's sewage collection system and treatment plant. The parties agree that the amount of

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A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW

lump sum payment herein agreed upon is correct as of the 1st day of January, 1978, but is subject to further reduction in the event the District contracts with others outside of the District to provide sewage treatment services, receives grants after the 1st day of January, 1978.

PAYMENT OF ANNUAL LUMP SUM PAYMENT:

Milwaukie shall pay to District the annual lump sum payment on the dates and in the amounts set forth below:

Payment Date	Amount
November 25, 1978	$159,560.58
November 25, 1979	159,936.04
November 25, 1980	107,166.59
November 25, 1981	106,695.21
November 25, 1982	107,160.45
November 25, 1983	107,402.28
November 25, 1984	107,408.86
November 25, 1985	107,188.07
November 25, 1986	107,852.83
November 25, 1987	108,232.13
November 25, 1988	108,324.21
November 25, 1989	108,103.21
November 25, 1990	107,973.42
November 25, 1991	36.248.02
November 25, 1992	37,154.60
November 25, 1993	36,853.14
November 25, 1994	37,592.00
November 25, 1995	37,092.12
November 25, 1996	37,631.46
November 25, 1997	38,056.80

To the extent that the payments provided for herein differ from the payments required by the agreement of November 25, 1970, the provisions of this agreement shall constitute a modification of the terms of the November 25, 1970 agreement.

PAYMENT OF LUMP SUM PAYMENT IN EVENT OF TERMINATION:

The parties' agreement of November 25, 1970 provides that the agreement shall terminate ten years from the date

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thereof or when the treatment plant has been expanded or upon 180 days written notice by either party to the other. In the event that the agreement is terminated for any reason prior to the final payment due under the preceding paragraph on November 25, 1998, the payments due from Milwaukie to the District shall be recomputed on the basis of the following schedule with the payment due for the year of termination prorated from the preceding payment date to the date of termination. In the event that the payments actually made by Milwaukie to District shall have been less than the amount due on the termination date as computed pursuant to this paragraph, the difference shall be paid not later than the next November 25th following the date of termination, and there shall be no further obligation to pay any scheduled future payment.

Payment Date	Amount
November 25, 1970	$ 8,337.16
November 25, 1971	28,690.83
November 25, 1972	39,370.38
November 25, 1973	75,827.42
November 25, 1974	80,348.36
November 25, 1975	82,767.98
November 25, 1976	82,411.40
November 25, 1977	82,767.98
November 25, 1978	82,190.66
November 25, 1979	82,481.53
November 25, 1980	82,997.21
November 25, 1981	82,632.14
November 25, 1982	82,992.46
November 25, 1983	83,179.74
November 25, 1984	83,184.84
November 25, 1985	83,013.85
November 25, 1986	83,528.68

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November 25, 1987	83,822.44
November 25, 1988	83,893.75
November 25, 1989	83,722.59
November 25, 1990	83,622.07
November 25, 1991	28,072.97
November 25, 1992	28,775.09
November 25, 1993	28,541.62
November 25, 1994	29,113.84
November 25, 1995	28,726.70
November 25, 1996	29,144.41
November 25, 1997	29,473.82

RATIFICATION:

Except as modified by this agreement, the parties ratify and confirm the terms of the agreement between them of November 25, 1970.

IN WITNESS WHEREOF, the parties have caused this agreement to be executed on the day and year first hereinabove written pursuant to enabling resolution duly adopted by the governing body of each of the parties.

CITY OF MILWAUKIE, OREGON

By: Bill Hupp
MAYOR

ATTEST: Dorothy E. Farrell
City Recorder

BOARD OF COUNTY COMMISSIONERS
Clackamas County, Oregon
Acting as the Governing Body of
Clackamas County Service District No. 1

By Ralph Groener
Chairman

Commissioner

Commissioner

HIBBARD, CALDWELL, CANNING, BOWERMAN & SCHULTZ
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
P. O. BOX 667 — 710 CENTER STREET

EXTENSION AGREEMENT

THIS EXTENSION AGREEMENT is made this 14th day of July, 1983, effective November 25, 1980, by and between the CITY OF MILWAUKIE, OREGON, a Municipal Corporation (herein called "Milwaukie") and CLACKAMAS COUNTY SERVICE DISTRICT NO. 1, a County Service District (herein called "District").

RECITALS:

On or about November 25, 1970, these parties entered into an Agreement wherein District agreed to construct a sewage treatment plant and collection system and to accept, treat and dispose of sewage from Milwaukie in consideration of the payment by Milwaukie to District of an annual lump sum and a unit charge. The term of that contract was for a period of ten (10) years from November 25, 1970 until November 24, 1980. On or about August 31, 1978, the parties executed an agreement modifying the original Agreement relating to the schedule for the annual lump sum payment. The 1978 agreement provided for payments through November 25, 1997. The parties wish to extend the original agreement, as modified, from November 25, 1980 to June 30, 1984. The parties have therefore agreed:

1. Extension of Agreement. The Agreement, as modified by the agreement dated August 31, 1978, is hereby extended from November 25, 1980 to June 30, 1984. Milwaukie and District hereby ratify all acts pursuant to this Agreement performed by each from November 25, 1980 until the date this Agreement is executed.

2. All terms and conditions of the original Agreement and the agreement of August 31, 1978 are hereby approved and ratified.

CITY OF MILWAUKIE, OREGON,
a Municipal Corporation

By: Jay Burgess
Mayor

By: Laurie Perkins
Recorder

Dated: 8-2-83

CLACKAMAS COUNTY SERVICE DISTRICT NO. 1, a County Service District
Board of Directors

By:

By: Ralph Groener

By: Hal Harlan

Dated:

84-1814

AGREEMENT NO. 4

THIS AGREEMENT is made the 1st day of July, 1984 between the CITY OF MILWAUKIE, OREGON, a Municipal Corporation (herein called "Milwaukie"), and CLACKAMAS COUNTY SERVICE DISTRICT NO. 1, a County Service District (herein called "District").

RECITALS:

District accepts, treats and disposes of sewage from Milwaukie. The rights and duties of the parties are defined in three (3) agreements with this fourth as a further modification and extension:

Agreement No. 1, November 25, 1970 to terminate in ten (10) years.

Agreement No. 2, August 31, 1978, addresses annual lump sum payment provision of No. 1 Agreement.

Agreement No. 3, July 14, 1983, extends terms of Nos. 1 and 2 to June 30, 1984.

Agreement No. 4 addresses costs of Milwaukie, provides representation for Milwaukie in budgeting process, adjusts flow rates for non-metered users, adjusts budget to more properly reflect non-flow related revenues, and provides for a termination date.

Except as herein modified, Agreement Nos. 1 and 2 shall remain in effect. Agreement No. 3, being an extension of the terminal date only for Nos. 1 and 2, is unaffected hereby.

IT IS AGREED AS FOLLOWS:

BUDGET COMMITTEE.

District maintains a budget committee to annually prepare and present a budget to the Board of County Commissioners, the governing authority for District. Milwaukie shall recommend an advisory member to the committee, familiar with City of Milwaukie finances.

RATES.

1. The Paragraph B., UNIT CHARGE, in Agreement No. 1 is rescinded and this paragraph, RATES, replaces it.

B. RATES. A charge to be known as a unit charge shall be made by the District to Milwaukie, based upon a rate per million gallons of sewage transmitted by Milwaukie to the District to be paid monthly by Milwaukie upon being billed therefor by the District as hereinafter set forth. The unit charge shall include actual current cost of operation and maintenance consisting of direct supervision, labor, operating materials and supplies, maintenance, repair and replacement of plant machinery and equipment, and administration. In no case shall Milwaukie's operation and maintenance charge exceed sixty five percent (65%) of the annual total operation and maintenance cost for the plant, provided Milwaukie's flow does not exceed 4.00 mgd.

The unit charge shall be paid monthly and within thirty (30) days after being billed therefor by the District.

For connections to the District sewage system by Milwaukie where a flow measurement facility is impractical or unwarranted ("non-metered receivers" as defined in the original Agreement), the contributing flow shall be determined by using the number of connections on the contributing line multiplied by an average sewage flow of 300 gallons per day per residential connection or upon justified other volumes of flow. Flows for commercial establishments shall be estimated using the average daily water use for the preceding year based on water meter records.

Non-flow receivers are those users of the sewerage system who discharge sewage having a greater strength than the average strength of domestic sewage, but do not increase sewage flow. These users are charged for the difference between their strength of sewage and the average strength of domestic sewage. Non-flow receivers shall be reflected in the billing process to proportionately reduce the total plant expense in relation to the share of that expense borne by the unit charge.

MISCELLANEOUS.

The final paragraph of the penultimate page of Agreement No. 1 is eliminated.

TERM.

The above identified Agreement Nos. 1 and 2 and this No. 4 shall extend to June 30, 1986, and thereafter on a month-to-month basis until such time as the parties may either renew this agreement or enter a new agreement.

IN WITNESS WHEREOF, the parties have caused these presents to be executed by appropriate officers and pursuant to enabling resolutions the day and year first hereinabove set forth.

CITY OF MILWAUKIE, OREGON

By: Ronald D. Knisell
Mayor

By: Greg Eades
Deputy City Recorder

BOARD OF COUNTY COMMISSIONERS FOR CLACKAMAS COUNTY, OREGON, acting for and in behalf of CLACKAMAS COUNTY SERVICE DISTRICT NO. 1

By:
Chairman

By: Ralph Groener
Commissioner

By: Dale Harlan
Commissioner

86-706

AGREEMENT NO. 5

This Agreement is effective this first day of July, 1986, between THE CITY OF MILWAUKIE, OREGON, a municipal corporation (herein called "Milwaukie"), and CLACKAMAS COUNTY SERVICE DISTRICT NO. 1, a County Service District (herein called "District").

RECITALS:

District accepts, treats and disposes of sewage from Milwaukie. The rights and duties of the parties are defined in four (4) agreements, with this fifth as a further modification extension:

Agreement No. 1, November 25, 1970, to terminate in ten (10) years.

Agreement No. 2, August 31, 1978, addresses annual lump sum payment provisions of No. 1 agreement.

Agreement No. 3, July 14, 1983, extends terms of Nos. 1 and 2 to June 30, 1984.

Agreement No. 4 addresses costs of Milwaukie, provides representation for Milwaukie and budgeting process, adjusts flow rates for non-metered users, adjusts budget to more properly reflect non-flow related revenues, and provides for a termination date.

Agreement No. 5 extends agreement Nos. 1, 2 and 4 from July 1, 1986, to June 30, 1987, and provides for payment by City to District for newly discovered unmetered units which have connected to City's sewer system. The cost for these new units from the time of connection is $49,517.80.

Except as herein modified, Agreements Nos. 1, 2 and 4 shall remain in effect. Agreement No. 3, being an extension of the terminal date only for Nos. 1 and 23, is unaffected hereby.

IT IS AGREED AS FOLLOWS:

TERM:

The above Agrements Nos. 1, 2 and 4, and this Agreement No. 5, shall extend to June 30, 1987, and thereafter on a month-to-month basis until such time as the parties may either renew this Agreement, or enter into a new Agreement.

UNMETERED CONNECTIONS:

City agrees to pay District $49,517.20 for 222 newly discovered unmetered units which have connected to City's sewer system. City agrees to pay this amount in six (6) equal monthly installments in the amount of $8,252.86, commencing July 1, 1986, and on the first day of each month thereafter until paid in full.

IN WITNESS WHEREOF, the parties have caused these presents to be executed by appropriate officers and pursuant to enabling Resolutions the day and year first hereinabove set forth.

BOARD OF COUNTY COMMISSIONERS FOR CLACKAMAS COUNTY, OREGON, acting for and in behalf of CLACKAMAS COUNTY SERVICE DISTRICT NO. 1

By: _____
Chairman

By: _____
Commissioner

By: _____
Commissioner

CITY OF MILWAUKIE, OREGON, A Municipal Corporation

By: _____
Mayor

By: _____
City Manager

By: _____
Interim Finance Director

87.1005

AGREEMENT NO. 6

This Agreement is effective the first day of July, 1987, between the CITY OF MILWAUKIE, OREGON, a municipal corporation ("Milwaukie") and CLACKAMAS COUNTY SERVICE DISTRICT NO. 1, a County Service District ("District").

RECITALS:

District accepts, treats and disposes of sewage from Milwaukie. The rights and duties of the parties are defined in five (5) agreements, with this sixth as a further modification and extension:

Agreement No. 1, November 25, 1970, to terminate in ten (10) years.

Agreement No. 2, August 31, 1978, addresses annual lump sum payment provisions of Agreement No. 1.

Agreement No. 3, July 14, 1983, extends terms of Agreements No. 1 and 2 to June 30, 1984.

Agreement No. 4 addresses costs of Milwaukie, provides representation for Milwaukie and budgeting process, adjusts flow rates for non-metered users, adjusts budget to more properly reflect non-flow related revenues, and provides for a termination date.

Agreement No. 5 extends Agreements No. 1, 2 and 4 from July 1, 1986, to June 30, 1987, and provides for payment by Milwaukie to District for newly discovered unmetered units which have connected to Milwaukie's sewer system. The cost for these new units from the time of connection is $49,517.80.

EXHIBIT A

Agreement No. 6 extends Agreements No. 1, 2, 4 and 5 from July 1, 1987, to June 30, 1988.

Except as herein modified, Agreements No. 1, 2, 4 and 5 shall remain in effect. Agreement No. 3, being an extension of the terminal date only for Numbers 1 and 2, is unaffected hereby.

IT IS AGREED AS FOLLOWS.

TERM:

The above Agreements No. 1, 2, 4 and 5 and this Agreement No. 6 shall extend to June 30, 1988, and thereafter on a month-to-month basis until renewed or such time as the parties may enter into a new agreement.

IN WITNESS WHEREOF, the parties have caused this Agreement No. 6 to be executed by appropriate officers and pursuant to enabling Resolutions the day and year first hereinabove set forth.

CITY OF MILWAUKIE, OREGON,
a Municipal Corporation

By: Roger Hall
Mayor

By: Jean L Widner
City Recorder
"Milwaukie"

BOARD OF COUNTY COMMISSIONERS
OF CLACKAMAS COUNTY, OREGON,
acting as the governing body of
Clackamas County Service
District No. 1, a County
Service District

By: _____
Chairman

By: _____
Commissioner

By: _____
Commissioner
"District"

AGREEMENT

THIS AGREEMENT IS MADE this 2 day of November, 1989 by and between CLACKAMAS COUNTY SERVICE DISTRICT NO. 1 ("District") and THE CITY OF MILWAUKIE ("City").

RECITALS:

District provides sewerage treatment facilities to the City pursuant to previous agreements. The parties agree that it is necessary to obtain professional engineering services to prepare a sewerage facility plan for the District's North Clackamas Service Area and the City's system. This is necessary to assess the current operating processes and to determine future loads and treatment requirements and any facility modifications necessary to meet them. Therefore, pursuant to ORS 190.010, the parties agree:

1. The parties agree that District shall enter into a contract with CH2M Hill Northwest, Inc. ("CH2M") whereby CH2M will perform a sewerage facility study in the District's North Clackamas Service Area, the City's existing collection system and the Kellogg Creek Water Pollution Control Plant to assess current operating performance and project future loads and treatment requirements and any facility modifications or additions that may be necessary to meet them.

2. CH2M and District have agreed or will agree that these services shall be performed on a cost plus fixed fee basis

in the amount of $450,308. Of this, City agrees to pay $37,441 as its share of the cost of the study. This amount shall be paid by the City within thirty (30) days of the date this contract between CH2M Hill, Inc. and the District is executed.

3. The parties agree that the District shall undertake to represent the interests of the District and the City in all matters with CH2M Northwest, Inc.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date and year first hereinabove stated.

BOARD OF COUNTY COMMISSIONERS
CLACKAMAS COUNTY, OREGON as the governing body of Clackamas County Service District No. 1

By _____
Chairperson

By _____
Commissioner

By _____
Commissioner

CITY OF MILWAUKIE

By Roger A. Hall
Mayor

By _____
Recorder

WES

INTERGOVERNMENTAL AGREEMENT

THIS INTERGOVERNMENTAL AGREEMENT ("Agreement") is made this 21st day of ~~June~~ August, 2001, by and between the City of Milwaukie, a municipal corporation ("City") and Clackamas County Service District No. 1, a county service district (District).

RECITALS

The City receives wastewater treatment services from the District pursuant to an Agreement between the parties dated November 25, 1970 and amended at various times, collectively referred to as the ("Agreement").

WHEREAS, the Agreement provides that the City shall pay an allocated share of operations, maintenance, repair, replacement and capital improvements on an annual basis.

WHEREAS, the District has constructed various capital improvement projects at the Kellogg Creek Wastewater Treatment Plant which benefit the City and District and City representatives have reviewed the costs thereof and agree that the City is obligated for an additional $356,508 for wastewater treatment services and capital improvements through June 30, 2000.

WHEREAS, the parties wish to provide for payment of that amount over a five-year period and being fully advised, now therefore the parties agree as follows:

1. **OBLIGATION OF THE CITY.** The City acknowledges and agrees that it currently owes the District $356,508 for wastewater treatment services and capital improvements through the period ending June 30, 2000. The parties agree this amount is in addition to sums previously paid by the City and received by the District.

2. **PAYMENT TERMS.** In consideration of the District's deferral of receipt of immediate payment of the amount owed, the parties agree that the City shall pay District $356,508, which amount shall commence to accrue interest on July 1, 2001 at the annual average rate paid by the Local Government Investment Pool commencing on that date and as adjusted over the term of this Agreement. The remaining balance and accrued interest to the date of payment shall be payable in five annual installments due on June 1, 2002 and on each succeeding June 1 until fully paid, but in no event after June 1, 2006. The District shall provide the City an invoice no less than 30 days prior to the date each payment is due. The City may prepay all or a portion of the amount at any time without penalty. However, any partial payment shall not relieve or defer the City's obligation to make regular installment payments as provided hereunder.

3. **DEFAULT.** If payment is not made within ten days of its due date as defined herein, the District may declare a default by providing written notice to the City at the address set forth below. If the City does not cure the default within ten days after such notice the District shall be entitled to the remedies provided herein. Except for nonpayment, if either party defaults under the terms of this Agreement then the nonfaulting parties shall provide a notice to that party within 30 days of the breach detailing the reasons therefore.

The defaulting party shall have 30 days from the receipt of notice to commence to diligently resolve the default. Failure to do so shall entitle the nondefaulting parties to the remedies provided herein.

4. **TERMINATION.** If a default remains uncured after the time provisions of this Agreement then the nondefaulting party may seek all remedies at law or equity provided under Oregon law.

5. **JURISDICTION AND VENUE.** The parties agree that disputes under this Agreement shall be resolved under the laws of the State of Oregon and that jurisdiction and venue lies in the Circuit Court of the State of Oregon for the County of Clackamas.

6. **ATTORNEY FEES.** If a suit or action is filed to enforce any of the terms of this Agreement, the prevailing party shall be entitled to recover from the other party, in addition to costs and disbursements provided by statute, any sum which a court, including any appellate court, may adjudge reasonable as attorney fees.

7. **WAIVER.** The failure of a party to enforce any provision of this Agreement shall not constitute a waiver by that party of that or any other provision.

8. **NOTICE.** Notices shall be sent to

City Manager, City of Milwaukie
10722 SE Main Street
Milwaukie, OR 97222

Director, Clackamas County Water
Environment Services
9101 SE Sunnybrook Road
Clackamas, OR 97015

9. **MERGER.** This Agreement constitutes the entire Agreement between the parties, no waiver, consent, modification or change of terms of this Agreement shall bind either party unless in writing and signed by both parties. Such waiver, consent, modification or change, if made, shall be effective only in the specific instance and for the specific purpose given. There are no understandings, agreements, or representations, oral or written, not specified herein regarding this Agreement.

CITY OF MILWAUKIE

By: James Bernard, Mayor
Name: James M Bernard
Title: Mayor

CLACKAMAS COUNTY SERVICE DISTRICT NO. 1, a county service district

By: Michael Lynch
Name:
Title: Chair

Millicent Morrison
Millicent Morrison,
Recording Secretary

AGREEMENT

THIS AGREEMENT is made this 16th day of December, 1986, by and between CLACKAMAS COUNTY SERVICE DISTRICT No. 1, a County Service District, (hereinafter District) and CITY OF MILWAUKIE, a municipal corporation, (hereinafter called City).

RECITALS

The District and the City of Portland have entered into an agreement to allow District to provide sewage service within the Southeast Relieving Interceptor Drainage Basin by utilizing the Johnson Creek Interceptor of the Lents Trunk Sewer Line. Presently, there is some property commonly known as the Crosswhite property that is desirous of annexing to the District and the parties hereto agree that service should be provided to it. The parties further find that the City is considering an urban service boundary to the east and south of its present boundaries in unincorporated Clackamas County. The parties agree that the Crosswhite property should be served immediately while issues pertaining to the urban service boundary are discussed. NOW, THEREFORE, pursuant to the provisions of ORS 190.003 et seq, City and District agree as follows:

1. City and District hereby agree that if the Crosswhite property seeks annexation to District, neither party will file objections with any governmental body having jurisdiction of the matter.

2. The District agrees it will not annex or provide

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(4)

service within the unincorporated area served by Johnson Creek Interceptor for 1) twelve months, or 2) when a long-term service agreement is reached and an urban service boundary established, whichever of 1) or 2) occurs sooner. After twelve months, parties may agree to extend this agreement for further discussions; however, the District may commence accepting further petitions for annexation for service.

IN WITNESS WHEREOF, the authorized representative of the City and the District, as parties hereto, acting pursuant to their authority granted them, hereby agree.

CITY OF MILWAUKIE
A municipal corporation

Mayor

CLACKAMAS COUNTY SERVICE DISTRICT NO. 1

By: David J. Abraham
David J. Abraham, Director
Clackamas County Department of Utilities

APPROVED AS TO FORM:

Attorney for City

APPROVED AS TO FORM:

Attorney for District

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CLACKAMAS COUNTY
DEPT. OF
UTILITIES

HIBBARD, CALDWELL, BOWERMAN, SCHULTZ & HERGERT, P.C.
ATTORNEYS AT LAW • P.O. BOX 667, OREGON CITY, OREGON 97045-3753 • (503) 656-5200

INTERGOVERNMENTAL AGREEMENT

FOR INDUSTRIAL PRETREATMENT PROGRAM IMPLEMENTATION

This Intergovernmental Agreement For Industrial Pretreatment Program Implementation ("Agreement"), effective as of the 25th day of July, 2002, is made and entered by and between the City of Milwaukie ("Milwaukie"), a municipal corporation, and Clackamas County Service District No. 1 ("District"), a county service district formed pursuant to ORS Chapter 451.

RECITALS

WHEREAS, the District is a county service district organized and operating under ORS Chapter 451, with the power to provide sanitary sewer services within its service territory, and provides transmission, pumping and treatment of sanitary sewage for Milwaukie;

WHEREAS, Milwaukie is an Oregon municipal corporation organized pursuant to its Charter and presently provides sanitary sewer collection services within its boundary;

WHEREAS, the District and Milwaukie desire to provide for an integrated Industrial Pretreatment Program within the City of Milwaukie as required by the Oregon Department of Environmental Quality ("Oregon DEQ") and the United States Environmental Protection Agency ("EPA"); and

WHEREAS, the District and Milwaukie have the authority to enter into this Agreement pursuant to their respective Charters or Principal Acts and ORS Chapter 190.

NOW, THEREFORE, IN CONSIDERATION OF THE MUTUAL COVENANTS AND AGREEMENTS CONTAINED HEREIN, THE PARTIES AGREE AS FOLLOWS:

AGREEMENT

1. Industrial Pretreatment Regulation

1.1 Within six months of the effective date of this agreement, Milwaukie shall adopt and keep current an industrial pretreatment program ordinance meeting all federal and Oregon statutory and regulatory requirements (the "Milwaukie Pretreatment Program"). The Milwaukie Pretreatment Program shall satisfy, among other requirements, the provisions of 40 CFR Part 403, OAR Chapter 340, Division 41, and the National Pollutant Discharge Elimination System Permit issued by the Oregon DEQ to the District.

1.2 Milwaukie shall ensure that the Milwaukie Pretreatment Program is at least as effective as the District's industrial pretreatment program rules and regulations, and provides to the District the authority to access Milwaukie's facilities and the facilities of non-domestic users

of the sanitary sewer system within Milwaukie for purposes of inspection, sampling and any other activity relating to implementation of the Milwaukie Pretreatment Program.

1.3 Milwaukie shall amend the Milwaukie Pretreatment Program from time to time as necessary to ensure compliance with all applicable federal and Oregon statutory and regulatory requirements.

2. Fees and Charges

2.1 Milwaukie shall establish by ordinance such fees and charges, including but not limited to permit fees, user fees and cost of service fees, as are necessary to compensate the District for the costs of administering and implementing the Program ("Fees and Charges"). Such Fees and Charges shall be not less than the fees and charges that the District may set in its rules and regulations. Milwaukie shall amend the Milwaukie Pretreatment Program from time to time to ensure that the Fees and Charges remain consistent with, and not less than, the fees and charges set by the District.

2.2 Milwaukie hereby delegates to the District, and the District hereby accepts, the authority to assess and collect the Fees and Charges within the City of Milwaukie. The parties agree that the District shall retain all Fees and Charges to compensate the District for administering and implementing the Milwaukie Pretreatment Program and for treating discharges regulated under the Program.

3. District Implementation of the Milwaukie Pretreatment Program

3.1 Except as otherwise provided in this Agreement, Milwaukie hereby delegates to the District, and the District hereby accepts, the authority to administer, implement and enforce the Milwaukie Pretreatment Program.

3.2 The District implementation of the Milwaukie Pretreatment Program shall include, but not be limited to, preparation, issuance and enforcement of industrial user permits, wastewater sampling and analysis, industrial user inspection, and record keeping and reporting as required to maintain compliance with federal and Oregon statutory and regulatory requirements.

3.3 Nothing in this Agreement shall be interpreted or construed as requiring the District to take any action whatsoever to operate, inspect, maintain, repair or replace any of the sewer lines or other sewer facilities owned or operated by Milwaukie.

4. Milwaukie Implementation of Pretreatment Program

4.1 Milwaukie shall provide notice to all new Milwaukie non-domestic users of the sanitary sewer (non-domestic users) of the requirements under the Milwaukie Pretreatment Program and of the District's implementation responsibilities. Milwaukie shall consult with the District in developing the notice and, at a minimum, the notice shall include:

4.1.1 Information describing the industrial user permitting process and requirements, the wastewater discharge prohibitions and limitations, and the enforcement response requirements;

4.1.2 The name, telephone numbers and addresses of appropriate District and City officials responsible for implementation of the Milwaukie Pretreatment Program.

4.2 Milwaukie shall develop and implement a process to ensure that new non-domestic users of the sanitary sewer system are identified and surveyed to obtain the information necessary to evaluate the need for an industrial wastewater discharge permit under the Milwaukie Pretreatment Program ("Industrial User Survey"). Milwaukie shall implement the Industrial User Survey as a part of its building permit and zoning programs.

4.2.1 Milwaukie shall notify each non-domestic user applying for connection to the sanitary sewer of the potential need to obtain an industrial wastewater discharge permit from the District, and shall ensure that each such non-domestic user completes and submits to Milwaukie a non-residential questionnaire prior to permitting the sanitary sewer connection;

4.2.2 Milwaukie shall, on or before the 10th day of each month, submit to the District a report listing the names and addresses of all non-domestic users applying for sanitary sewer connection in the preceding month, and copies of all non-residential questionnaires completed in the preceding month;

4.2.3 Milwaukie shall not permit a non-domestic user to discharge to the sanitary sewer system until after the District has either: (a) issued an industrial wastewater discharge permit to the non-domestic user, or (b) determined that the non-domestic user is not required to obtain a industrial wastewater discharge permit.

4.3 Milwaukie shall develop and implement an Emergency Spill Response Plan. The Plan shall establish the actions Milwaukie will take in the event of a spill of material that enters or threatens to enter the sanitary sewer system in an amount or concentration that may damage the treatment system, interfere with treatment processes, affect biosolids quality, cause a pass-through or create other unsafe conditions. Milwaukie shall consult with the District in developing the Emergency Spill Response Plan and, at a minimum, the Plan shall contain the procedures for providing spill control and containment, and for notifying the Kellogg Creek Water Pollution Control Plant and the District's Source Control Office.

4.4 Milwaukie shall provide the District with access to all records and other documents generated, compiled, assembled or obtained by Milwaukie and relating to the Milwaukie Pretreatment Program.

5. Reporting

The District shall, where appropriate, include the Milwaukie Pretreatment Program and the implementation of that Program in the District's reports required under the federal and Oregon statutory and regulatory requirements.

6. Governing Law

This Agreement shall be construed and enforced in accordance with the laws of the State of Oregon.

7. Non-Waiver

Failure by any party to require performance by the other party of any provision hereof shall in no way affect such party's rights to enforce the same, nor shall any waiver by any party of the breach hereof be held to be a waiver of the succeeding breach or a waiver of this non-waiver clause.

8. Binding Effect and Agreement

The covenants, conditions and terms of this Agreement shall extend to, be binding upon, and inure to the benefit of the representatives, successors and assigns of the parties hereto.

9. Merger

This Agreement embodies the entire agreement and understanding between the parties hereto and supersedes all previous agreements and understandings with respect to the matters addressed herein.

10. Term

This Agreement shall remain in full force and effect as long as the District provides wastewater treatment service or until either party provides 180 days advance written notice to terminate, whichever occurs earlier.

11. Notices

Any notice herein required or permitted to be given shall be given in writing and shall be effective when actually received and may be given by hand delivery or by United States mail, first class postage prepaid, addressed to the parties as follows:

If to Milwaukie:

Director of Community
Development and Public Works
City of Milwaukie
6101 SE Johnson Creek Blvd.
Milwaukie, OR 97206

If to the District:

Source Control Coordinator
Water Environment Services
Clackamas County
15941 S. Agnes Ave., Bldg. B
Oregon City, OR 97045

12. Disputes

In the event that a dispute arises regarding this agreement that cannot be resolved by the staff members working on the matters, the parties agree that the dispute shall be submitted to the Milwaukie City Manager and to the Clackamas County Administrator and if the City Manager and County Administrator are unable to resolve the dispute, the parties agree that the dispute shall be resolved by arbitration in accordance with the then effective arbitration rules of the Arbitration Service of Portland or the American Arbitration Association, whichever organization is selected by the party that first initiates arbitration by filing a claim in accordance with the filing rules of the organization selected. Nothing in this section shall preclude the parties from attempting to resolve disputes by mediation at any time.

IN WITNESS WHEREOF, the parties have, pursuant to official action that the respective governing bodies duly authorized in the same, caused their respective officers to execute this Agreement on their behalf.

Dated this 25th day of July, 2002.

CITY OF MILWAUKIE

By: _____

Attest: Pat DuVal

CLACKAMAS COUNTY BOARD OF COMMISSIONERS, acting on behalf of Clackamas County Service District No. 1

By: _____

Attest: _____

INTERGOVERNMENTAL AGREEMENT BETWEEN CLACKAMAS COUNTY SERVICE DISTRICT NO. 1 AND THE CITY OF MILWAUKIE FOR THE PROVISION OF WASTEWATER TREATEMENT SERVICES

THIS INTERGOVERNMENTAL AGREEMENT FOR THE PROVISION OF WASTEWATER TREATEMENT SERVICES (this "Agreement") is entered into this _____ day of _____, 2008 by and between CLACKAMAS COUNTY SERVICE DISTRICT NO. 1, a county service district and the CITY OF MILWAUKIE, an Oregon municipality.

RECITALS

WHEREAS, the Parties are authorized to enter into agreements regarding the provision of services to their residents, customers and service areas pursuant to their respective charter or principal acts and ORS 190.010; and

WHEREAS, the Parties share a substantial common boundary and interlinked wastewater systems; and

WHEREAS, CCSD No. 1 and Milwaukie are currently parties to the Prior IGAs regarding the contractual provision of wastewater treatment and related services to Milwaukie by CCSD No. 1; and

WHEREAS, CCSD No. 1 anticipates constructing new treatment capacity and upgrading existing conveyance systems to the Tri-City Plant that requires a substantial expenditure of capital funds; and

WHEREAS, CCSD No. 1 and Milwaukie desire to terminate the Prior IGAs and enter into a new agreement to reflect a Wholesale treatment rate structure based on a per-equivalent dwelling unit basis instead of an assessment for operations and capital based on Flows and Load; and

WHEREAS, the Parties desire to provide for public health and safety, compliance with state and federal environmental laws, coordination of statutes, ordinances, and methods of implementation; and application of codes, implementation, and enforcement practices.

NOW THEREFORE, the Parties hereby agree as follows:

SECTION 1. DEFINITIONS

1.1 "BCC" means the Board of County Commissioners of Clackamas County, acting as the governing body of CCSD No. 1.

1.2 "BOD" means biochemical oxygen demand, a discharge category contained in the NPDES Permit with a restriction.

1.3 "CCSD No. 1" means the Clackamas County Service District No. 1 or its successor, as such entity's boundaries may be adjusted by annexation or other boundary actions from time to time.

1.4 "DEQ" means the Oregon State Department of Environmental Quality, or its successor.

1.5 "Domestic Sewage" means sanitary wastes normally collected from residential establishments, and shall include commercial and industrial wastes of similar strength to residential wastes or quality, and other commercial and/or industrial wastes that are pre-treated in accordance with CCSD No. 1 and/or Milwaukie requirements meeting DEQ and EPA guidelines. Domestic Sewage shall exclude ground water, storm water, drain water and industrial wasted not pre-treated in accordance with CCSD No. 1 and/or Milwaukie requirements meeting DEQ and EPA guidelines.

1.6 "EPA" means the United States Environmental Protection Agency, or its successor.

1.7 "Equivalent Dwelling Unit" or "EDU" is a unit of measure applied to a user of the sewage system. The number of Equivalent Dwelling Units assigned to any such user (for example, an apartment house, motel, school, hospital, nursing home, and any other public, industrial, or commercial establishment) shall be the numerical ratio of the monthly volume of wastewater contributed by such user to the monthly volume of wastewater contributed by a typical single family residence.

1.8 "Flow" means that certain volume of wastewater as measured by gallons per day that is delivered to a wastewater treatment system.

1.9 "Force Majeure Event" means each and any of war, insurrection, terrorism, strikes, walkouts, riots, floods, drought, earthquakes, fires, casualties, acts of God, governmental restrictions imposed or mandated by governmental entities other than the Parties, enactment of conflicting state or federal laws or regulations, new or supplementary environmental regulation, litigation or similar bases for excused performance which is not within reasonable control of the party to be excused.

1.10 "I/I" means infiltration and inflow into a sewer system.

1.11 "Influent Points" means the points at which Milwaukie's Internal System intersects CCSD No.1's Wholesale collection system at the Kellogg Creek Wastewater Treatment Plant.

1.12 "Internal System" means all non-Wholesale sewer lines and other sewer facilities upstream from the Influent Points owned and operated by Milwaukie.

1.13 "Load" means that certain strength and biological characteristics of wastewater that is delivered to a wastewater treatment system.

1.14 "Milwaukie" means the City of Milwaukie as such entity's boundaries may be adjusted by annexation or other boundary actions from time to time.

1.15 "NPDES Permit" means a National Pollutant Discharge Elimination System Permit granted to CCSD No.1, pursuant to the Federal Water Pollution Control Act, as amended.

1.16 "Parties" means CCSD No. 1 and Milwaukie.

1.17 "Pretreatment IGA" means that certain intergovernmental agreement dated July 25, 2002 by and between the Parties regarding the creation and implementation of an industrial pretreatment program.

1.18 "Prime Rate" means the interest rate banks charge to large corporations for short-term loans, as published in the Wall Street Journal or other similar publication.

1.19 "Prior IGAs" means each and all of those certain intergovernmental agreements dated November 3, 1969 as subsequently amended or supplemented from time to time and all subsequent IGAs regarding similar subject matter, most recently on December 17, 2002, except the Pretreatment IGA.

1.20 "Rules" means the Sanitary Sewer Rules and Regulations of CCSD No. 1 as such may be amended from time to time.

1.21 "SDCs" means system development charges as established in ORS 223.297 through ORS 223.314.

1.22 "TSS" means total suspended solids, a discharge category contained in the NPDES Permit with a restriction.

1.23 "Wholesale" means a systemic provision of wastewater treatment services via a wastewater treatment plant or other similar structure, and excluding therefrom the collection and conveyance system (e.g. piping and interceptors) necessary to deliver wastewater to the wastewater treatment plant.

For the purposes of this Agreement, terms used but not defined herein shall have the meaning ascribed to them in the Rules.

SECTION 2. SERVICES PROVIDED BY CCSD NO. 1

2.1 Wastewater Treatment Service. CCSD No. 1 shall receive, transport, and treat Domestic Sewage discharged by Milwaukie on a wholesale per-EDU basis. CCSD No. 1 shall accept such delivery and treat the wastewater in a manner consistent with the requirements of the Clean Water Act and all applicable state laws for the term of this Agreement subject to Section 2.2 hereof and barring foreseen or unforeseen events or circumstances which are beyond CCSD No. 1's control.

2.2 Capacity Limit. CCSD No. 1 may in its sole discretion either (i) limit the amount of Domestic Sewage delivered by Milwaukie, or (ii) levy an additional charge reflecting additional incurred costs, if receipt of such Domestic Sewage is contributing to violations of CCSD No. 1's NPDES Permit or is otherwise required to comply with applicable law, including but not limited to the Clean Water Act or development restriction laws.

2.3 Operation, Replacement, and Maintenance of Facilities. CCSD No. 1 shall be responsible for the operation, replacement and maintenance of all applicable wastewater treatment facilities. Such facilities shall be operated, replaced and maintained in accordance with generally accepted standards, and the standards established by the EPA, DEQ, the Oregon Health Department and other federal, state and local agencies.

2.4 Designation of Service Provider. The Parties agree that Milwaukie shall provide and be responsible for all aspects of its Internal System, the collection (retail) sanitary sewer service and surface water management service and all other acts necessary, customary, and incidental to providing retail sewer service and to deliver all appropriate wastewater to the conveyance and treatment system of CCSD No. 1.

SECTION 3. RATES

3.1 Wholesale Rate. CCSD No. 1 shall assess a per-EDU wholesale rate to Milwaukie that shall be updated from time to time (the "Rate"). Based on current calculations for cost recovery[1], the Rate for wholesale wastewater treatment service for Milwaukie in Fiscal Year 2008/2009 is estimated to be $22.05 per EDU, as modified by Section 3.3. CCSD No. 1 shall bill Milwaukie monthly for the service based on a formula of the Rate multiplied by the number of EDUs served in Milwaukie, and Milwaukie shall remit payment within thirty (30) days. Late payments by Milwaukie shall accrue an interest penalty of the Prime Rate plus three percent (3%) annual rate, compounding monthly.

[1] Calculations assume approximately 9,815 EDU connections in the City of Milwaukie. Total amount to be charged to Milwaukie per FY08/09 budget is $2,082,946. To the extent the number of EDU connections differs, the rate to be charged will differ.

Nothing contained herein shall be deemed a restriction or a limitation on Milwaukie's ability to add such other charges to its customers as it deems appropriate.

3.2 Modification of Rate. The BCC shall annually have the opportunity to adjust the Rate based on all factors the BCC considers material for making such a decision, including requirements for the maintenance, operation, anticipated capital expenditures, administration, overhead, and expansion of CCSD No. 1's sewer system, and principal and interest, reserve requirements or other financial covenants on any outstanding debt instruments. Milwaukie shall have the opportunity to review any proposed Rate changes and offer comments to the BCC prior to any adjustment.

3.3 Initial Phase-In of Rate. The Rate methodology adopted by the BCC would have produced a Rate for Milwaukie for 2008/09 of approximately $22.00 per EDU. Recognizing that this Rate would have represented a substantial increase over what Milwaukie is currently charged, the BCC has directed that the full Rate for Milwaukie be phased-in over three fiscal years. The initial Rate for Milwaukie shall be $18.00 per EDU beginning July 1, 2008 and continuing for the 2008/09 fiscal year. Based on current calculations, the Rate for fiscal year 2009/10 shall be approximately $20.00 per EDU and the Rate for fiscal year 2010/11 shall be approximately $22.00 per EDU. This calculation is based on the methodology adopted by the BCC to appropriately insure that Milwaukie is contributing it proportionate amount to the capital program of CCSD No. 1. The calculation for FY2009/10 and FY2010/11 may be adjusted at the sole discretion of the BCC to incorporate actual borrowing amounts and interest rates experienced by CCSD No. 1. Nothing contained herein shall limit or otherwise impair the ability of the BCC to increase the Rate during any period upon a change of circumstances or a revision of calculation, or based on any factors deemed relevant by the BCC, including but not limited to a change of estimated capital expenditures or the estimated number of EDUs in Milwaukie.

3.4 Reporting Requirements. At the time of execution of this Agreement, Milwaukie shall deliver to CCSD No. 1 a written report stating the current number of connections to the Milwaukie system, including an estimate of the number of EDUs of Domestic Sewage being delivered to CCSD No. 1 systems. Milwaukie shall thereafter provide CCSD No. 1 with bimonthly reports on the number of new sewer connections into the City system, and their relative EDU contribution to the wastewater system.

3.5 Connection Audit. CCSD No. 1 shall have the right but not the duty to inspect the records of Milwaukie to confirm the reports provided pursuant to Section 3.4 above. CCSD No. 1 may also inspect all such records to ascertain all pertinent information if Milwaukie fails to make the reports required in Section 3.4 above, and in such instance may hire an outside party to conduct such a review at Milwaukie's expense.

3.6 System Development Charges. The Parties will work cooperatively in sharing information for each to develop revised SDCs in developing a uniform methodology. Each Party shall collect SDCs within its boundaries for its wastewater system. Milwaukie acknowledges and accepts that a component of the Rate structure

included in this Agreement is designed to substitute for SDC funds that would otherwise be available to CCSD No. 1 if Milwaukie was annexed into the district.

3.7 Books and Accounts. Milwaukie shall keep full and complete books of accounts showing the number of connections to its sewerage system, the maintenance and operation costs incurred in connection with the collection and conveyance system, its efforts to reduce "I/I" and otherwise comply with Sections 4.2 and 4.3, and its response to emergency and non-emergency spills or additions to the sewerage system. The costs of keeping those books shall be considered an operational cost to Milwaukie. In addition to the right set forth in Section 3.5, CCSD No. 1 shall have the right to audits such books, records and accounts annually. More frequent audits, if requested by CCSD No. 1, shall be at the expense of CCSD No. 1.

3.8 Obligation to Collect. Milwaukie shall collect sufficient funds to pay CCSD No. 1 the amounts required to fulfill Milwaukie's obligations under Section 3.1 hereof. Milwaukie's payments to CCSD No. 1 shall be prior and superior to any charge or lien of any revenue bonds issued by Milwaukie that are payable from the revenues of its sewerage utility rates. Milwaukie shall also establish rates and collect fees sufficient to pay for the (i) maintenance, replacement and operation of Milwaukie's Internal System and surface water system, including Milwaukie's payments to CCSD No. 1 for management of its pretreatment program, and (ii) principal and interest on any city debt instruments financed by revenue and/or that constitute a charge on the revenue of Milwaukie's Internal System.

SECTION 4. SYSTEM MANAGEMENT AND COORDINATION

4.1 Coordination of Systems. CCSD No. 1 and Milwaukie shall coordinate the operations of the wastewater collection, conveyance and treatment systems to optimize treatment and environmental benefits. In the event of plant distress, flash floods, excess infiltration and inflow, illegal materials delivered to the treatment system, or other similar event, CCSD No. 1 shall coordinate with Milwaukie regarding the possible diversion, backup, transfer or other management option for the handling of wastewater flow. To the extent necessary, in CCSD No. 1's judgment, to insure compliance with the NPDES Permit, CCSD No. 1 staff may direct Milwaukie staff to take such actions as are appropriate to avoid violation of the NPDES Permit, including but not limited to diversions, restrictions, cleanup or blocking efforts, or any other action reasonably necessary to avoid damage to the wastewater treatment facility's ability to treat wastewater, any environmental damage, or risks to human health or safety.

4.2 Sewage Quality. The Parties agree to work together to develop ordinances and programs, as needed, to mitigate BOD and TSS levels which are higher than acceptable norms, as determined by either regulatory requirements or by generally accepted environmental practices as such may change over time. The parties shall also coordinate to insure that CCSD No. 1 treatment facilities do not experience NPDES Permit violations with respect to any imposed regulatory guideline, including but not limited to BOD or TSS levels. This includes pretreatment of industrial wastes, management of emergency or non-

emergency spills into the sewer and/or stormwater system, and proper maintenance of collection and conveyance infrastructure.

4.3 Treatment of Domestic Sewage Only. Milwaukie acknowledges and agrees that CCSD No. 1 shall only be required to treat Domestic Sewage. CCSD No. 1 may reject all non-conforming forms of wastewater, and may refuse to transport and/or treat Domestic Sewage from those portions of Milwaukie's sewage collection system which do not conform to DEQ, EPA, or CCSD No. 1 standards for Domestic Sewage.

4.4 Pretreatment Ordinances. Milwaukie has previously implemented a pre-treatment program consistent with the Rules, called the "Milwaukie Pretreatment Program" (the "Program"). CCSD No. 1 may require changes to the Program to remain consistent with requirements imposed by state or federal law, the Rules, or current practices of CCSD No. 1, and may include, but is not limited to: developing procedures, forms and instructions; categorizing dischargers; records keeping; compliance tracking; establishment of annual limits; sampling, testing and monitoring; preparation of control documents; enforcement, including collection of fees, penalties, and other extraordinary charges; and preparation of permits.

4.5 Rules and Regulations. Milwaukie shall assure that its sewerage ordinances are at least as effective as CCSD No. 1's Rules.

4.6 Milwaukie Internal System. Milwaukie shall operate and maintain its Internal System at its sole expense, including all of its facilities as required to deliver the wastewater to CCSD No. 1's system or facility. Milwaukie shall observe generally accepted standards and practices in the construction, operation, replacement and maintenance of its Internal System with particular attention to the following: (i) minimizing entry in the sewerage system of groundwater and/or I/I; (ii) maintaining a favorable character and quality of Domestic Sewage in accordance with the standards set forth in Section 4.2 hereof; (iii) eliminating septicity and objectionable odors, entry of petroleum waste or other chemicals and/or wastes detrimental to sewer lines, pumping stations, wastewater treatment plants, and the waters of the State of Oregon; (iv) eliminating hazardous and toxic wastes; and (v) maintaining an efficient and economical utility operation while achieving optimum pollution and environmental control.

4.7 Mutual Notification. The Parties agree to provide each other with written notice of any condition that may violate this Agreement or applicable laws, regulations, or permits. The discharge Party agrees to give verbal notice to the other Party immediately upon becoming aware of the violating discharge. A written report on the nature and amount of the violating discharge will be prepared and provided to the other Party within 24 hours of the time the violating discharge is identified. If the Party does not correct such a condition within a reasonable time of written notice thereof, the offending party shall pay any reasonable and necessary costs and expenses incurred by the other party in connection with such condition. If either Party discharged in to the wastewater system any solids, liquids, gases, toxic substances, or other substance which is reasonably believed to cause or will cause damage to the system, or is creating a public

nuisance or a hazard to life or property, that Party shall discontinue the discharge of such substances. Because substandard condition of Domestic Sewage may cause serious damage to the wastewater treatment facilities, both Parties shall comply with generally accepted standards regarding the composition of Domestic Sewage, and after compliance, may thereafter caused to be arbitrated the allocation of cost associated with necessary corrective actions in accordance with Section 5 of this Agreement.

4.8 Allocation of Penalty. The Parties shall cooperate with each other to determine the source of possible violations of applicable law, regulations and permits (including applicable NPDES Permits). In the event CCSD No. 1 is fined or otherwise penalized by local, state, or federal agencies for failure to operate or maintain the wastewater treatment system in accordance with the requirements of the agencies, and it is demonstrated to CCSD No. 1's satisfaction that such violation or failure is due, in whole or in part, to Milwaukie's discharge of Domestic Sewage in violation of this Agreement, then Milwaukie shall pay its allocated share (as determined by CCSD No. 1 or the dispute resolution mechanism pursuant to Section 5, as applicable) of the costs of such fines or penalties, including its share of the associated administrative, legal, and engineering costs incurred by CCSD No. 1 in connection with these fines or penalties.

4.9 Services Provided by Milwaukie.

4.9.1 **Sanitary Sewer**. In any area now of hereafter becoming part of Milwaukie, Milwaukie shall provide all collection sewer services, billing and collection, inspection, and the like with respect to the sewer collection system. Milwaukie shall have sole ownership and responsibility to operate, maintain, repair and replace facilities or to permit, design and construct collection sewer facilities, subject to Section 4.6. Milwaukie shall have sole discretion as to the methods of financing such facilities, provided Milwaukie insures compliance with Section 3.8 hereof.

4.9.2 **Surface Water Management**. Milwaukie shall be solely responsible for all aspect of surface water management within its boundaries and to comply with the obligation imposed on it pursuant to the NPDES Permit, its MS4 Permit, and other applicable laws and regulations.

4.10 Services Provided by CCSD No. 1.

4.10.1 **Sanitary Sewer**. In any area now of hereafter becoming part of CCSD No. 1, CCSD No. 1 shall have sole ownership and responsibility to operate, maintain, repair and replace facilities or to permit, design and construct collection, conveyance, or treatment sewer facilities. CCSD No. 1 shall have sole discretion as to the methods of financing such facilities.

4.10.2 **Surface Water Management**. Unless otherwise agreed with an appropriate governmental entity, CCSD No. 1 shall be solely responsible for surface water management within its boundaries.

SECTION 5. DEFAULTS AND DISPUTE RESOLUTION

5.1 Defaults. Subject to a Force Majeure Event, extensions of time by mutual consent in writing, or the special circumstances described in Section 5.2, failure or unreasonable delay by any Party to substantially perform any provision of this Agreement, or breach of any term of this Agreement, shall constitute a default (a "General Default"). In the event of an alleged General Default, the party alleging such a violation shall give the other party not less than 30 days notice in writing specifying the nature of the alleged General Default and the manner in which the General Default may be cured satisfactorily. During this 30-day period, the party in charge shall not be considered in default for the purposes of termination or instituting legal proceedings. The defaulting party must cure such General Default within such 30 day period unless it submits a written notice to the other party alleging (i) an inability to cure within 30 days and setting forth a plan to expeditiously cure the General Default, or (ii) disputing the General Default notice and requesting dispute resolution as set forth in Section 5.3.

5.2 Special Defaults. Except in the case of a Force Majeure Event, failure by Milwaukie to comply with the terms set forth in Section 3, including but not limited to failure to (i) pay amounts due within the proscribed time period, (ii) maintain appropriate records, (iii) disclose new connections or EDU levels, or (iv) prevent inappropriate liens, charges, or superiority claims (each, a "Special Default") shall constitute an immediate and material breach of this Agreement. The occurrence of a Special Default shall immediately vest CCSD No. 1 with the right to terminate this Agreement with 60 days prior written notice to Milwaukie without need of any opportunity to cure or other action, step or process, including any set forth in Sections 5.1 and 5.3.

5.3 Dispute Resolution Steps. Except as otherwise provided in Section 5.2, the Parties agree to attempt to settle any disputes or General Defaults pursuant to the following process:

5.3.1 **Negotiation**. The City Manager of Milwaukie and the Director of CCSD No. 1 or other persons designated by each of the disputing parties will negotiate on behalf of the entities they represent. If the dispute is resolved at this step, there shall be a written determination of such resolution, signed by each the City Manager and the Director, and as appropriate may be ratified by the governing bodies of the Parties.

5.3.2 **Mediation**. If the dispute cannot be resolved within 30 days of the beginning of negotiation as set forth in Section 5.3.1, the Parties shall submit the matter to non-binding mediation. The Parties shall attempt to agree on a mediator. If the Parties cannot agree, the parties shall request a list of five (5) mediators from an entity or firm providing mediation services. The Parties will attempt to mutually agree on a mediator from the list provided, but if they cannot agree, each Party shall select one (1) name. The two selected shall select a third person. The dispute shall be heard by a panel of three (3) mediators if the Parties did not reach agreement on one mediator, and any common cost of mediation shall be borne equally by the Parties who shall each bear their own costs and fees therefore. If the dispute is resolved at this step, there shall be a written determination of

such resolution, signed by each the City Manager and the Director, and ratified by the governing bodies of the Parties which shall be binding upon the Parties.

5.3.3 **Binding Arbitration**. After exhaustion of the preceding processes, any remaining dispute shall be submitted to binding arbitration under the jurisdiction of the Circuit Court of the State of Oregon for Clackamas County pursuant to ORS Chapter 36.

SECTION 6. TERM AND TERMINATION

6.1 Term. This Agreement shall be effective as of July 1, 2008 and terminate on June 30, 2015 unless terminated earlier pursuant to Section 6.2 hereof or extended pursuant to Section 6.4 hereof.

6.2 Early Termination. This Agreement may be terminated prior to the Termination Date upon (i) the mutual written consent of the Parties, or (ii) upon 180 days prior written notice by one Party to the other.

6.3 Termination of Prior IGAs. Each and all of the Prior IGAs are hereby terminated and shall have no further force or effect, excepting therefrom the Pretreatment IGA, which shall continue with full force and effect.

6.4 Extensions. CCSD No. 1 and Milwaukie may by written letter mutually agree to extend the terms of this Agreement in 5 year increments for an additional 20 years.

SECTION 7. ADDITIONAL PROVISIONS

7.1 Other Necessary Acts. Each party shall execute and deliver to the other all such further instruments and documents as may be reasonably necessary to carry out this Agreement in order to provide and secure to the other parties the full and complete enjoyment of rights and privileges hereunder.

7.2 Severability and Waiver. In case any one or more of the provisions contained in this Agreement shall be invalid, illegal, or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions contained herein shall not be affected or impaired in any way. One or more waivers by either Party of any provision, term, condition or covenant shall not be construed by the other Party as a waiver of subsequent breach of the same by the other Party.

7.3 Amendment. The Agreement may be amended at any time by mutual written agreement. The Parties specifically acknowledge and agree that this Agreement may require substantive revision if the community partnership for wastewater treatment services under discussion as of the date of this Agreement is formed.

7.4 Force Majeure. In addition to the specific provisions of this Agreement, performance by any party shall not be in default where delays or default is due to a Force Majeure Event.

7.5 No Third-Party Beneficiaries. The parties to this Agreement are the only parties entitled to enforce its terms. Nothing in this Agreement gives, is intended to give, or shall be construed to give or provide, any benefit or right, whether directly or indirectly or otherwise, to third persons.

7.6 Nonwaiver. Failure by any party at any time to require performance by any other party or parties of any of the provisions hereof shall in no way affect such party's rights hereunder to enforce the same, nor shall any waiver by any party or parties of the breach hereof be held to be a waiver of any succeeding breach or a waiver of this nonwaiver clause.

7.7 Governing Laws. This Agreement shall be governed and construed in accordance with the laws of the State of Oregon without giving effect to the conflict of law provisions thereof. Venue in connection with any legal proceeding affecting this Agreement shall be in the Circuit Court of the State of Oregon for Clackamas County.

7.8 Number and Gender. Whenever applicable, the use of the singular number shall include the plural, the use of the plural number shall include the singular, and the use of any gender shall be applicable to all genders.

7.9 Successors and Assigns. This Agreement is to be binding on the successors and assigns of the Parties hereto. No assignment of this Agreement shall be effective until the assignee assumes in writing the obligations of the assigning Party, and delivers such written assumption to the original Party to this Agreement.

7.10 Notice. Any notice herein required or permitted to be given, shall be given in writing and shall be effective upon receipt for hand delivery or facsimile or upon actual receipt or 3 days after mailing, whichever is earlier, for notices delivered by U.S. mail, first class postage prepaid, addressed to the Parties as follows:

CCSD No. 1
c/o Water Environment Services
Attn: Director
9101 S.E. Sunnybrook Blvd., 4th Floor
Clackamas, Oregon 97015

City of Milwaukie
Attn: City Manager
10722 SE Main Street
Milwaukie, Oregon 97222

Changes to the above shall be by notice to the other in the manner provided in this Section 7.10.

7.11 No Waiver. No failure by Milwaukie or CCSD No. 1 to insist on the strict performance of any agreement, term, covenant, or condition of this Agreement or to exercise any right or remedy consequent on a breach, and no acceptance of full or partial Rent during the continuance of any such breach, constitutes a waiver of any such breach or of such agreement, term, covenant, or condition. No agreement, term, covenant, or condition to be performed or complied with by either Party, and no breach by either Party, shall be waived, altered, or modified except by a written instrument executed by the non-breaching Party. No waiver of any breach shall affect or alter this Agreement, but each and every agreement, term, covenant, and condition of this Agreement shall continue in full force and effect with respect to any other then-existing or subsequent breach.

7.12 Cumulative Remedies. Each right and remedy provided for in this Agreement shall be cumulative and shall be in addition to every other right or remedy provided for in this Agreement or now or hereafter existing at law or in equity or by statute or otherwise, and the exercise or beginning of the exercise by Milwaukie or CCSD No. 1 of any one or more of the rights or remedies provided for in this Agreement or now or hereafter existing at law or in equity or by statute or otherwise shall not preclude the simultaneous or later exercise by the party in question of any or all other rights or remedies provided for in this Agreement or now or hereafter existing at law or in equity or by statute or otherwise.

[signature page follows]

IN WITNESS WHEREOF, the Parties have, pursuant to official action that the respective governing bodies duly authorized the same, caused their respective officers to execute this Agreement on their behalf on the date stated above.

CITY OF MILWAUKIE,
a municipal corporation

By:_____

Title: Mayor

ATTEST: _____

Title: City Recorder

CLACKAMAS COUNTY SERVICE DISTRICT NO. 1, a county service district

By:_____

Title: Chair

ATTEST: _____

Title: Secretary