City of Alameda
Sewer Master Plan

RMC
water and environment

FINAL REPORT

November 2015

November 30, 2015

Ms. Erin Smith
Acting Deputy Public Works Director
City of Alameda
950 West Mall Square, Room 110
Alameda, CA 94501-7575

Subject: Sewer Master Plan

Dear Ms. Smith:

RMC Water and Environment is pleased to submit this Final Report for the City of Alameda's Sewer Master Plan. The report presents the results of a comprehensive analysis of the City's sanitary sewer system to support the City's ongoing efforts to upgrade its sewer infrastructure and comply with its Consent Decree with the U.S. EPA and State and Regional Water Boards.

The study included the development of a "pipe rating model" to prioritize sewers for rehabilitation and replacement based on their likelihood and potential consequence of failure, focusing primarily on their physical condition as documented by the results of closed-circuit television inspections conducted over the past several years. The study also included a detailed capacity assessment of the sanitary sewer system based on land use plans for future development and redevelopment and an updated hydraulic model of the sewer system.

The information presented in the report provides a firm basis for establishing project priorities and budgets for the City's 20-year Capital Improvement Program and will help inform City decisions on providing additional hydraulic capacity where needed. The report also supports the City's compliance with the Sewer System Management Plan requirements of the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems.

We appreciate the opportunity to have worked with the City on this challenging project and thank City staff for their assistance and guidance throughout the study.

Sincerely,

Gisa Ju

Gisa M. Ju, P.E.
Project Manager

Complex Challenges | Innovative Solutions

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City of Alameda
Sewer Master Plan
Final Report

Prepared by:

RMC water and environment

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November 2015

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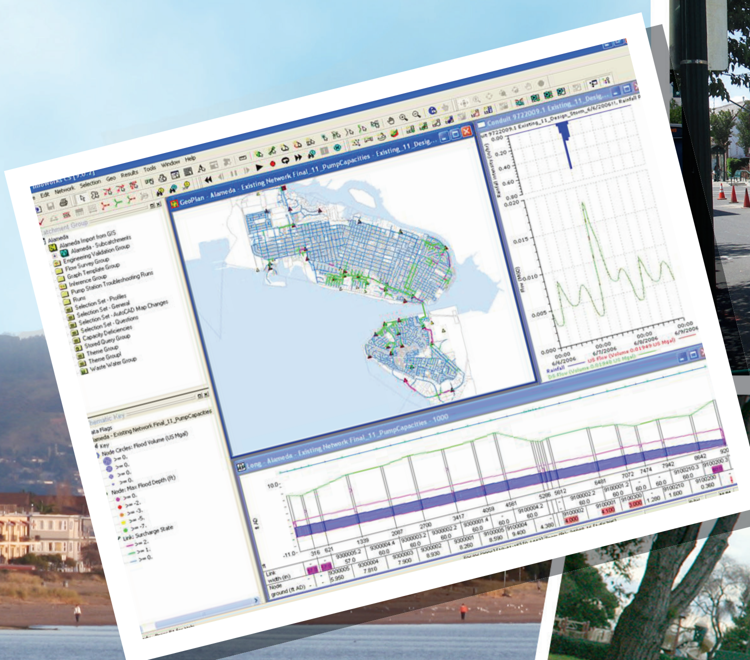
List of Abbreviations

ADWF	Average Dry Weather Flow
AMIP	Asset Management Implementation Plan
AO	Findings of Violation and Order for Compliance (Administrative Order)
APN	Assessor Parcel Number
Baykeeper	San Francisco Baykeeper
BWF	Base Wastewater Flow
CCTV	Closed-Circuit Television
CDO	Cease and Desist Order
CIP	Capital Improvement Program or Capital Improvement Plan
CIPP	Cured-in-Place Pipe
City	City of Alameda
CMMS	Computerized Maintenance Management System
d/D	Ratio of flow depth to pipe diameter
DWF	Dry Weather Flow
EBMUD	East Bay Municipal Utility District
ENR CCI	Engineering News Record Construction Cost Index
EPA	U.S. Environmental Protection Agency
FMLR	Flow Modeling and Limits Report
fps	Feet per second
FY	Fiscal Year
GIS	Geographic Information System
gpd	Gallons per day
GWDR	General Waste Discharge Requirements for Sanitary Sewer Systems
GWI	Groundwater Infiltration
HDPE	High Density Polyethylene (Pipe)
HOA	Homeowner Association
I/I	Infiltration and Inflow
MIP	(Alameda Point) Master Infrastructure Plan
MFR	Multi-Family Residential
mgd	Million Gallons per Day
MH	Manhole
MWWTP	EBMUD Main Wastewater Treatment Plant

NAS	(Alameda) Naval Air Station
NASSCO	National Association of Sewer Service Companies
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
PACP	Pipeline Assessment and Certification Program
PDWF	Peak Dry Weather Flow
PS	Pump Station
PSL	Private Sewer Lateral
PVC	Polyvinyl Chloride (Pipe)
PWWF	Peak Wet Weather Flow
RCP	Reinforced Concrete Pipe
RDI/I	Rainfall Dependent Infiltration and Inflow
RMC	RMC Water and Environment
R/R	Rehabilitation/Replacement
RWQCB	Regional Water Quality Control Board, San Francisco Bay Region
SECAP	System Evaluation and Capacity Assurance Plan
SFR	Single Family Residential
SO	Stipulated Order for Preliminary Relief
SQR	Structural Quick Rating
SSES	Sewer System Evaluation Survey
SSMP	Sewer System Management Plan
SSO	Sanitary Sewer Overflow
SWRCB	State Water Resources Control Board
VCP	Vitrified Clay Pipe
WWF	Wet Weather Facility or Wet Weather Flow
WWPF	Wet Weather Peaking Factor

Executive Summary



Executive Summary

This report presents the results and recommendations of the Sewer Master Plan for the City of Alameda (City). The report was prepared by RMC Water and Environment (RMC) under an agreement with the City dated August 26, 2014. The Master Plan evaluates the capacity and condition of the City's sanitary sewer system and establishes the basis for the City's 20-year sewer system Capital Improvement Program (CIP).

ES-1 Existing Sewer System and Service Area

The City's sewer system serves a population of about 76,000 within the Alameda city limits. The system includes approximately 140 miles of City-owned sanitary sewers and 42 sewage pump stations, including 14 miles of pipes and 9 pump stations located in Alameda Point, the former Alameda Naval Air Station site. In addition, there are over 10 miles of pipelines and 7 pump stations located in Alameda that are part of the East Bay Municipal Utility District (EBMUD) wastewater system, which serves as the "backbone" of Alameda's sewer network. All wastewater is conveyed to EBMUD's South Interceptor in Oakland via inverted siphon pipelines underneath the Oakland Estuary, from where the flow is conveyed north to EBMUD's Main Wastewater Treatment Plant located near the eastern terminus of the San Francisco-Oakland Bay Bridge. During periods of wet weather when the capacity of the interceptor is exceeded, flows in the South Interceptor may be diverted to EBMUD's Oakport and San Antonio Creek Wet Weather Facilities (WWFs) in Oakland for storage and/or discharge. **Figure ES-1** shows the existing Alameda sewer system.

Over 75 percent of Alameda's sewer system consists of 8-inch and smaller diameter pipe, and over 90 percent is 12 inches and smaller. The oldest portions of the system date to the early 1900s; however, over 30 percent of the system has been rehabilitated or replaced in the past 30 years. Most older sewers are constructed of clay pipe materials, with plastic materials used for newer sewer construction and rehabilitation.

The sewer system also includes approximately 19,000 private sewer laterals. The property owner is responsible for maintenance and repair of the entire service lateral to the connection to the City's sewer main. However, the City takes responsibility for replacement of the lower portion of the lateral (within the public right-of-way) when the public sewer main to which it is connected is rehabilitated or replaced, or if the lower lateral fails, whichever occurs first. The sewer system also includes a number of private sewer systems, primarily on Harbor Bay Isle and in new developments on the western side of the main Alameda island; these private systems are the responsibility of individual Homeowner Associations.

ES-2 Background and Master Plan Objectives

Prior to this Master Plan, the City's last comprehensive evaluation of the sanitary sewer system was conducted as part of the region-wide wet weather infiltration/inflow (I/I) studies conducted in the 1980s by EBMUD and its seven tributary agencies ("Satellites"), including Alameda. The findings of those studies resulted in a long-term program of sewer system improvements, which included sewer rehabilitation and construction of relief sewers in the Satellite collection systems, and improvements to EBMUD's system to handle wet weather flows. The EBMUD improvements included construction of three WWFs, which provided storage and primary-level treatment and disinfection for wastewater discharged during wet weather periods. The programs developed based on the 1980s studies were accepted by State and federal regulators as an appropriate solution to the region's wet weather issues, and were approved as part of Cease and Desist Orders and National Pollutant Discharge Elimination System (NDPES) Permits issued to EBMUD and the Satellites at the time.

Since the 1980s, the City has constructed needed relief sewers and rehabilitated or replaced over 30 percent of the sewers in its system. In the late 1980s, in order to further reduce I/I, the City was also the first of the Satellites to also adopt an upper lateral compliance program to provide for repair or replacement of private sewer laterals at time of property sale or transfer or major remodel. This program has resulted in the rehabilitation or replacement of over 6,000 private laterals city-wide since that time (the City has since joined the EBMUD Regional Private Sewer Lateral program).

Starting in 2007, however, a series of regulatory decisions resulted in the remand of EBMUD's permit for its WWFs, and Stipulated Orders for Preliminary Relief (SOs) were subsequently issued by the U.S. Environmental Protection Agency (EPA) to both EBMUD and the Satellites requiring asset management programs and plans to reduce wet weather flows. Recognizing the need to address the capital demands of its aging sewer system, in 2010 the City adopted a program of increases to its sewer service charge to fund needed improvements. In September 2014, EBMUD and the Satellites entered into a Consent Decree (CD) with EPA, the State Water Resources Control Board (SWRCB), and San Francisco Bay Regional Water Quality Control Board (RWQCB) intended to eliminate discharges from the WWFs over an approximate 20-year period. For Alameda, the CD-required "Work" includes specified annual amounts of sewer rehabilitation, inspection, and cleaning; as well as continued implementation of private sewer lateral compliance and inflow elimination programs; and pump station renovation.

Since 2004, the City has also had to comply with other regulatory requirements, including the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems adopted by the SWRCB in 2006. These regulations include the requirement to prepare and adopt a Sewer System Management Plan (SSMP). The SSMP must include programs for addressing the operation and maintenance of the system and assessing and upgrading its capacity and condition.

Therefore, based on these requirements, as well as the City's commitment to providing a high level of service to its customers, the primary objectives of the Sewer Master Plan are to:

- Confirm that the system has adequate capacity to handle peak wet weather flows, as required for the System Evaluation and Capacity Assurance Plan element of the SSMP
- Satisfy the Rehabilitation and Replacement Plan requirements of the SSMP and CD
- Establish a firm basis for project priorities and budgets in the City's 20-year Capital Improvement Program

ES-3 Basis of Planning

This Sewer Master Plan utilizes the information that the City has collected through its maintenance, inspection, and monitoring activities to perform an assessment of system condition and capacity; and utilizes the results of those assessment to identify and prioritize sewer system capital improvement needs. The basic tool used to develop the CIP was a "Pipe Rating Model," which assigns a risk score to each gravity pipe in the system and provides a means of helping to prioritize pipes for rehabilitation and replacement.

The risk of asset failure is calculated by quantifying the likelihood of failure (LOF) and consequence of failure (COF) for each sewer asset. LOF is the probability of asset failure, which can be a result of a structural failure, capacity deficiency, or maintenance issue that causes a blockage or overflow. COF is defined as the impact on level of service resulting from asset failure. The risk of failure is defined as:

Risk = LOF x COF

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Sources: ESRI Basemap

Legend

Gravity Sewers

- ≤ 8"
- 10" - 15"
- > 15"
- Private Sewers
- Force Mains
- EBMUD Interceptor
- Alameda Pump Stations
- EBMUD Pump Stations
- Alameda City Limit

City of Alameda
Sewer Master Plan

Figure ES-1a
Existing Sewer System
(Alameda Island)

City of Alameda
Sewer Master Plan

Figure ES-1b
Existing Sewer System
(Harbor Bay Isle)

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Sources: ESRI Basemap

The following four LOF indicators were used in the Pipe Rating Model:

- Structural Condition
- Operation & Maintenance (O&M) Condition
- Capacity Deficiency
- I/I Contribution (relative impact on flows to EBMUD interceptor and discharges from EBMUD's WWFs)

The following three COF indicators were used in the Pipe Rating Model:

- Flow Volume (Economic Impact)
- Community (Social) Impact.
- Environmental Impact

A scoring system was developed to quantify each of these factors based on relevant parameters (e.g., number and type of defects observed from sewer inspection; extent of sewer surcharge predicted by hydraulic modeling; location with respect to busy streets, commercial areas, storm drain inlets and and water bodies; etc.), and assign relative weights to each factor. The risk scores were then calculated for each pipe and used to establish initial priorities for rehabilitation and replacement, which were modified based on other factors such as pavement condition, maintenance issues, and location.

ES-4 Capacity Assessment

The capacity of Alameda's sewer system was assessed through use of a hydraulic model. The model was originally developed as part of the City's *Sanitary Sewer System Hydraulic Analysis* study completed in 2010 and was updated for this study. The modeled system consists of the majority of the existing sewer system (except for Alameda Point), including the EBMUD pipelines on Alameda. (A model of the future Alameda Point sewer system was developed separately, as discussed later in this section.) Flow loads to the model were developed from assessor parcel data, other sources of information (e.g., school enrollment), and estimates of additional flows from potential future developments based on information provided by the City's planning staff. Data from flow monitoring programs conducted by the City and by EBMUD during the 2009/10 and 2010/11 wet weather seasons were used to estimate the amount of I/I for various areas of the system and to confirm, through model calibration, that the hydraulic model reasonably simulates the actual performance of the system during both dry and wet weather conditions.

The capacity of the system was assessed with respect to a design storm condition, defined as a design rainfall event falling under saturated soil conditions with the timing of the storm such that the peak I/I flows occur at about the same time as the peak diurnal base wastewater flow in most areas. The design rainfall is a 7-hour historical storm (known as the "EBMUD design event"), which was defined for the 1980s I/I studies and has been used since that time by the Satellites and EBMUD for wet weather evaluations. The storm has an approximate *rainfall* return period of 5 years, but based on the assumed timing of the storm under design event conditions, it is generally thought to create a return period of peak wastewater *flow* that is greater (less frequent) than the return period of the rainfall event.

The hydraulic model was run with the design event to identify areas of the sewer system that would not have adequate capacity to convey the peak wet weather flows generated by that event. Capacity was considered inadequate whenever the model predicted that the peak flows would result in surcharge (flow above the crown of sewer pipes) to within five to six feet of manhole rims.

The modeling indicated that overall, the Alameda system has adequate capacity to convey peak wet weather flows. Only two potential capacity deficiencies were identified, both located within and/or downstream of the Harbor Bay Business Park area. Proposed sewer capacity improvements (pipe upsizing along Harbor Bay Parkway and Beach Road) were developed for these areas.

The modeling also provided updated estimates of peak wet weather flows to the modeled system pump stations, which were compared to the existing and planned station firm capacities (firm capacity is the capacity of the pump station with the largest pump out of service). A number of the system pump stations have already been planned for capacity upgrades as part of the City's Pump Station Renovation program. The results indicated that all of the pump stations (except those with only a single pump) have adequate existing or planned firm capacity to handle estimated peak wet weather flows. However, all of the pump stations with only one pump have high level gravity bypass pipes that can prevent overflows if the pump is out of service or pump capacity is exceeded.

Note that climate change and predicted sea level rise may result in increased rainfall and higher groundwater levels in the system in the future. However, as the City continues to rehabilitate and replace sanitary sewers, and property owners replace their private service laterals, these changes are not expected to result in any further capacity issues in the Alameda sewer system.

ES-4.1 Alameda Point

The sewer system serving Alameda Point is hydraulically separate from the system serving the rest of the City. The flows from Alameda Point discharge to EBMUD's Pump Station R, located on the north side of the site, from where they are pumped directly to the inlet of the Alameda siphons.

As part of the preparation of the City's *Master Infrastructure Plan (MIP)* for Alameda Point, a hydraulic model of the future trunk sewer system was developed by RMC in order to estimate system flows and confirm the sizing of the backbone sewer infrastructure proposed in the MIP. The flow estimates were based on the ultimate development of approximately 1,400 residential units and 5.5 million square feet of commercial floor space. The sewer improvements would be constructed in phases, with completely new sewer infrastructure constructed initially in the "Development Area" of the site, and incremental rehabilitation and replacement of the infrastructure in the "Reuse Area". Based on the model analysis, the proposed backbone sewer network as developed in the MIP was found to be adequate to convey the wastewater flows anticipated to be generated in Alameda Point.

ES-5 Condition Assessment

Closed-circuit television (CCTV) inspection of sewer pipelines is the primary method used by the City to assess the physical condition of its system. Since 2009, the City has inspected about 85 percent of the pipes in the system. Each defect observed during CCTV inspection is assigned a code indicating its type and severity, which allows a grade to be assigned to the defects and to the overall pipe segments. The defect grades were used to compute Structural Condition LOF scores (on a scale of 1 to 10) for all of the inspected pipes (for pipes that have not yet been inspected or could not be inspected due to access issues or obstructions, their age was used as a surrogate for structural condition). Pipes that have low Structural Condition LOF scores are primarily those sewers that have been rehabilitated or replaced over the past 30 years and newer sewers constructed with plastic materials since the 1970s. Almost 15 percent of the pipes have a score of 10, indicating that their structural condition is poor or is likely to be poor due to age, and are in need of near-term rehabilitation or replacement.

ES-6 Recommended Capital Improvement Program

The City's sewer system Capital Improvement Program (CIP) includes three primary components: sewer rehabilitation and replacement; capacity improvements; and pump station renovation, as presented below.

ES-6.1 Sewer Rehabilitation and Replacement

The Pipe Rating Model was used as the primary tool for initial prioritization of sewers for rehabilitation and replacement. Risk scores were calculated for each pipe based on the LOF and COF factors described previously. For purposes of grouping pipes into potential sewer rehabilitation projects, other factors including pavement condition, pipe material, location (proximity), and City staff input were also considered.

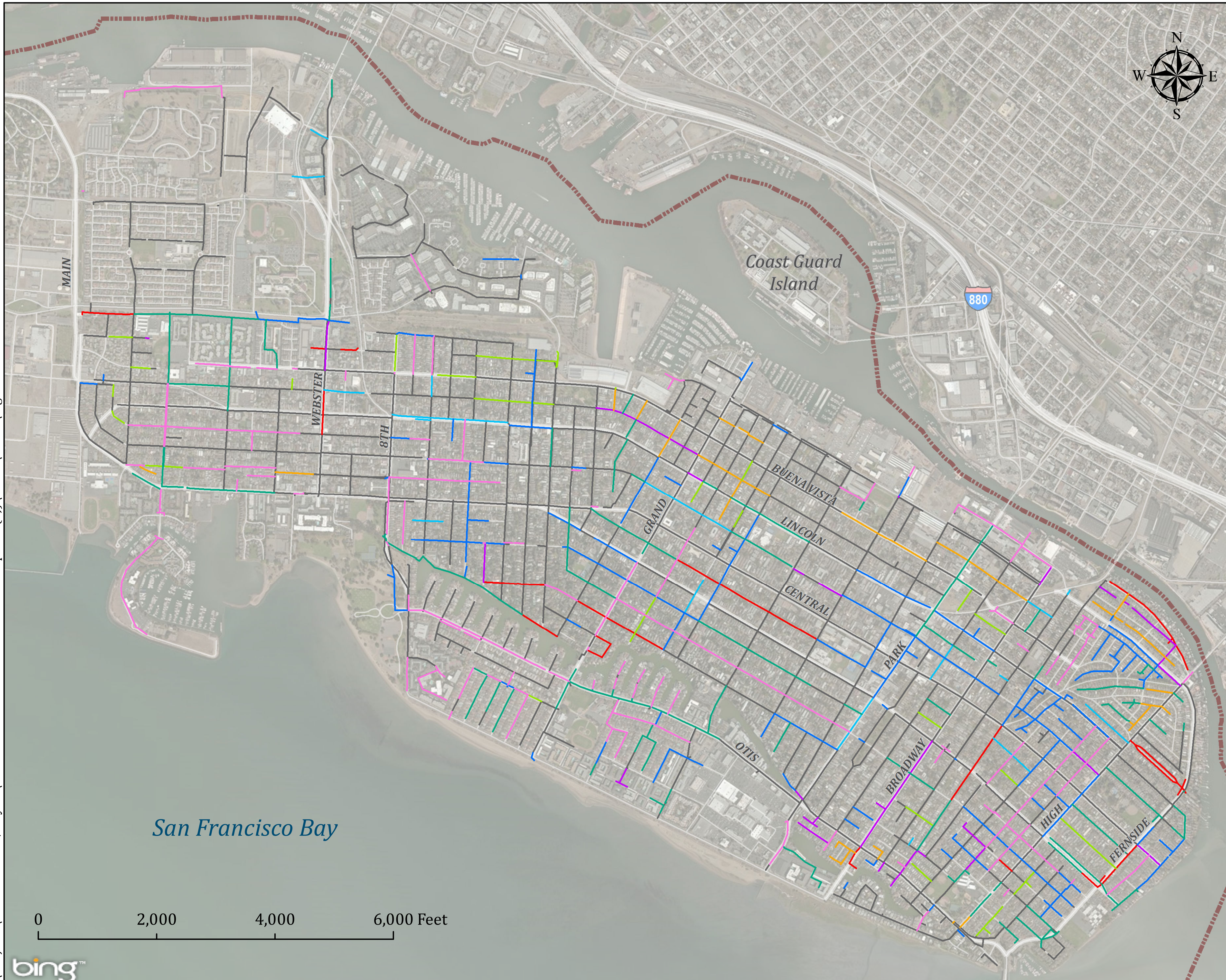
The City's approach to sewer rehabilitation involves complete replacement of the sewer main and associated manholes and lower laterals. Replacement is typically accomplished by pipe bursting or by open-cut remove-and-replace construction. The sewers are replaced with pipes of plastic material, which minimizes the potential for I/I. The cost of sewer replacement varies based on pipe size, depth, and soil and groundwater conditions.

The sewer rehabilitation CIP was developed based on the following three primary criteria:

- Meet the minimum annual sewer rehabilitation footage requirements of the Consent Decree.
- Maintain consistency with the City's annual capital improvement budget based on the financial plan and sewer service charge schedule that has been adopted by the City Council.
- Prioritize mini-basins for rehabilitation based on risk scores as calculated by the Pipe Rating Model and other factors such as pipe material, pavement condition, and proximity.

The City's current annual capital budget available for sewer rehabilitation projects is approximately $5,450,000 (the budget provides for a 3 percent annual increase over the next four years). This budget would be adequate to meet Consent Decree footage requirements (2.6 miles per year on a cumulative basis) at an average sewer rehabilitation cost of $397/ft (assuming open-cut pipe replacement). Because some projects will have lower cost and some higher, the challenge is to find the most appropriate balance of cost and footage while adhering to the Pipe Rating Model risk scores to the extent possible and incorporating other factors as noted above.

Figure ES-2 and **Table ES-1** present the recommended 20-year sewer rehabilitation CIP developed by RMC and City staff by application of the three guiding criteria described above. Based on this program, by the end of 20 years the City will have rehabilitated or replaced over 75 percent of its gravity sewer system. The City may elect to modify the CIP schedule as needed to accommodate budget constraints and changes in project priorities as additional inspection data and other information are collected over time. Such information may include the need for coordination with street paving or other infrastructure or utility projects; need to address new or recurring maintenance problems in the system; or specific data provided by EBMUD as to priority areas for focusing I/I reduction efforts.



Legend

Project Year

1
2
3
4
5
6-10
11-15
16-20
Not Scheduled
Alameda City Limit

City of Alameda
Sewer Master Plan

Figure ES-2a
Recommended
Sewer Rehabilitation CIP
(Alameda Island)

RMC water and environment

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Sources: ESRI Basemap

City of Alameda
Sewer Master Plan

Figure ES-2b
Recommended
Sewer Rehabilitation CIP
(Harbor Bay Isle)

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Sources: ESRI Basemap

Table ES-1: Recommended 20-year Sewer Rehabilitation CIP

Project Year	Fiscal Year	Length of Pipe (miles)	Estimated Capital Cost ($ Million)[a]
1	FY 15/16	3.33	6.97
2	FY 16/17	2.78	5.41
3	FY 17/18	2.73	5.29
4	FY 18/19	2.80	5.40
5	FY 19/20	2.89	5.41
6	FY 20/21	2.84	5.54
7	FY 21/22	2.95	5.52
8	FY 22/23	2.71	5.37
9	FY 23/24	2.81	5.38
10	FY 24/25	2.41	5.47
11	FY 25/26	2.52	5.56
12	FY 26/27	2.47	5.48
13	FY 27/28	2.72	5.50
14	FY 28/29	2.61	5.54
15	FY 29/30	2.70	5.43
16	FY 20/31	2.72	5.39
17	FY 31/32	2.51	5.37
18	FY 32/33	2.90	5.48
19	FY 33/34	2.56	5.49
20	FY 34/35	2.60	5.51
Total 20-year CIP		**54.6**	**105.0**

a. Estimates represent current (FY2015/16) costs.

ES-6.2 Sewer Capacity Improvements

As noted previously, the model indicates the potential need for additional sewer capacity in sections of Harbor Bay Parkway and Beach Road. The proposed projects are listed in **Table ES-2**. Project C1 would be required to address a predicted existing capacity deficiency; Project C2 would only be required in the future when additional development in the Harbor Bay Business Park occurs. However, it is recommended that the City monitor these locations before constructing improvements to confirm the capacity issues under peak wet weather flows.

Table ES-2: Proposed Sewer Capacity Improvement Projects

Project ID[a]	Project Name	Description	Estimated Capital Cost ($)[b]
C1	Harbor Bay Parkway Sewer Capacity Improvement	Replace approx. 1,535 lf of 10” pipe with 15” pipe on Harbor Bay Pkwy. between Loop Road and Harbor Bay Pkwy. I PS	798,000
C2	Harbor Bay Parkway/Beach Road Sewer Capacity Improvement	Replace approx. 3,800 lf of 12” & 15” pipe with 15” & 18” pipe on Harbor Bay Pkwy. and Beach Rd. downstream of Harbor Bay Pkwy. I PS to Seminary Ave.	1,993,000

a. Projects C1 and C2 were identified as Projects C-3 and C-4, respectively, in the 2010 *Sewer System Hydraulic Model Analysis* report.
b. Costs calculated based on open-cut pipe replacement. Construction using trenchless techniques such as pipe bursting may be feasible and less costly. Estimates represent current (FY2015/16 costs).

ES-6.3 Pump Station Renovation Program

The City’s 2012 *Pump Station Renovation Plan* developed a program for pump station improvements to be implemented in approximately five phases. Pump stations were grouped according to priority for improvements. The current program, which has been modified since the original Pump Station Renovation Plan, includes six pump station groups, proposed for construction through FY 2019/20. (Note: the first group of pump station improvements has already been completed). **Table ES-3** summarizes the remaining pump station improvement groups, target schedule, and estimated costs. The pump station improvements vary by station but may include new pumps, conversion to submersible pumps, relocation, or re-building. Standardization of pumps and equipment has also been a major objective of the pump station renovations.

Table ES-3: Pump Station Renovation CIP

Pump Station Group	Estimated Capital Cost ($)[a]	Est. Construction Schedule
Group 2	2,350,400	FY 15/16
Group 3	1,016,800	FY 16/17
Group 4	5,250,000	FY 16/17 to 18/19
Group 5	3,060,000	FY 18/19 to 19/20
Group 6	2,483,500	FY 20/21
Total	**14,160,700**	

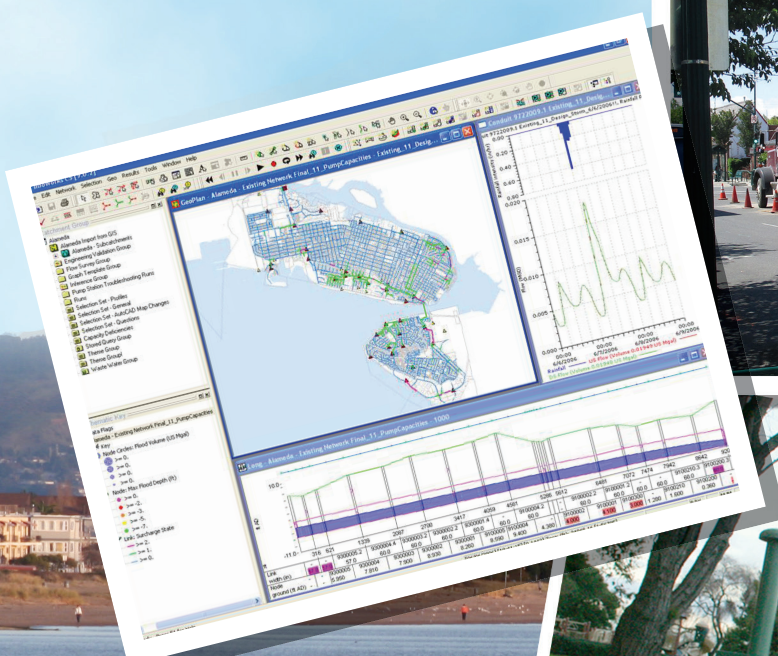
a. Estimates represent current (FY2015/16) costs.

ES-7 Implementation Recommendations

The following recommendations for implementing the Sewer Master Plan and overall sewer improvement program are listed below:

- **Force Main Condition Assessment.** The City has about 6 miles of force mains ranging in size from 4 to 16 inches and in length from approximately 25 to over 7,000 feet, constructed of various types of pipe materials. The condition of the force mains is largely unknown. A recent failure in the Park/Otis force main has focused attention on the need for a more systematic program for assessment of the condition of the force mains. It is therefore recommended that the City develop and implement a force main condition assessment program. The force mains should be prioritized and assessment methods tailored to each pipe based on age, material, size (or flow), location, and length, and whether or not the associated pump station has a high level gravity pipeline bypass. Based on the results of the assessments, potential improvements to address identified force main condition deficiencies should be incorporated into the sewer system CIP.
- **GIS Updates.** The City should continue to maintain and update its geographic information system (GIS) and sewer mapping to reflect new or updated information obtained from sewer inspections, sewer improvement projects, and ongoing maintenance activities.
- **Sewer Rehabilitation Plan Updates and Funding.** The sewer rehabilitation plan presented in this Master Plan is intended to provide a roadmap for the City's efforts over the coming years. To meet the sewer rehabilitation requirements of the Consent Decree, it is recommended that the 3 percent annual increase in sewer rates be extended beyond FY 19/20 in 5-year increments for the duration of the Consent Decree. It is expected that the sewer rehabilitation plan will be continually refined based on new information and changing conditions and priorities. The plan should be incorporated into the City's GIS and computerized maintenance management system (CMMS) so that the information is readily available and easily updated.
- **Master Plan Updates.** This Master Plan has been prepared to facilitate both use of the information in capital improvement project planning and design, as well as to allow the City to update the Plan in the future as the need arises. The Master Plan should be updated whenever there are major changes in planning assumptions or priorities, or at a minimum every eight to ten years.

Chapter One
Introduction



Chapter 1 Introduction

This report presents the results and recommendations of the Sewer Master Plan for the City of Alameda (City). The report was prepared by RMC Water and Environment (RMC) under an agreement with the City dated August 26, 2014. This introductory chapter provides background information on the City's sewer system and service area, discusses the objectives and scope of the Master Plan, and describes the contents and organization of the Master Plan report.

1.1 Study Area

The study area for this Master Plan, shown in **Figure 1-1**, consists of the City of Alameda. The City has a population of about 76,000. The main portion of the City comprises the island of Alameda, which is located west of the City of Oakland and is separated from Oakland by the Oakland Inner Harbor (Oakland Estuary). The remaining portion of the City is located on Harbor Bay Isle (formerly known as Bay Farm Island), located immediately to the north of and adjacent to the Oakland International Airport. (Note: Harbor Bay Isle is technically not an island but is connected to the mainland south of the airport.) The northwestern end of the main Alameda island comprises the former Alameda Naval Air Station (NAS), now known as Alameda Point. Alameda is connected to Oakland via two underground tubes at Webster Street and three bridges on the southern end of the main island, and the main island is also connected to Harbor Bay Isle via bridge.

Alameda is largely residential in nature with major commercial areas located along Webster and Park Streets and the Town Center (South Shore) shopping center on Otis Drive. The College of Alameda is located adjacent to the intersection of Webster Street and Ralph Appezzato Memorial Parkway. Older industrial areas, now being planned for redevelopment, are located along the northern and eastern waterfront. Significant recent and ongoing residential and retail development has occurred in the area of the former Fleet Industrial Supply Center, now known as Alameda Landing, and major redevelopment of Alameda Point is in the planning stage.

1.2 Existing Sewer System

The City's sanitary sewer system, shown in **Figure 1-2**, includes approximately 140 miles of City-owned sanitary sewers (including 6 miles of force mains), approximately 3,000 manholes and other sewer structures, and 42 sewage pump stations. Approximately 125 miles of the total system pipeline length and 33 pump stations are located on the main part of the Alameda island and Harbor Bay Isle, and approximately 14 miles of pipeline and 9 pump stations are located in the City-owned portion of Alameda Point. A large portion of Alameda Point was formally transferred to City ownership in 2013, including the collection system and building laterals. The remainder (including an additional 3 miles of sewers) will be transferred at a later date after cleanup operations are completed; however, the City maintains the entire Alameda Point collection system under a contract with the U.S. Navy.

There are over 10 miles of pipelines and seven pump stations located in Alameda that are part of the East Bay Municipal Utility District (EBMUD) wastewater interceptor system, as well as over 14 miles of privately-owned sanitary sewers that are the responsibility of individual Homeowner Associations (HOAs). Most of these private sewers are located on Harbor Bay Isle or in the Bayport development located east of Alameda Point between Willie Stargell Avenue and Ralph Appezzato Memorial Parkway. The U.S. government owns and is responsible for the sanitary sewer system serving the Coast Guard Housing area located north of Bayport.

Wastewater generated in the City's collection system is discharged into EBMUD interceptor pipelines in Alameda and then conveyed through three inverted siphons that connect to EBMUD's South Interceptor in

Oakland. The wastewater is treated at EBMUD's Main Wastewater Treatment Plant (MWWTP) located near the eastern terminus of the San Francisco-Oakland Bay Bridge. EBMUD also receives flows from six other "Satellite" collection system agencies: the cities of Albany, Berkeley, Emeryville, Oakland, and Piedmont, and the Stege Sanitary District.

The City's sewer system is divided into 25 sewer drainage basins, which are grouped into "Interceptor Tributary Areas" (ITAs) defined primarily by their connection points to the EBMUD interceptor. The sewer basins and ITAs are shown in **Figure 1-3.**

Over 75 percent of Alameda's gravity sewer system consists of 8-inch and smaller diameter pipe, and over 90 percent is 12 inches and smaller. **Table 1-1** tabulates the footage of City-owned gravity sewers (not including Alameda Point) by diameter. System force mains range in size from 4 to 16 inches in diameter.

Table 1-1: Gravity Sewer System Inventory

Pipe Size (in.)	Length (feet)	Length (miles)	Percent of Total
Unknown	3,032	0.6	0.5%
<8	212,363	40.2	32.6%
8	288,736	54.7	44.4%
10	57,461	10.9	8.8%
12	28,212	5.3	4.3%
14-16	32,705	6.2	5.0%
18-21	23,353	4.4	3.6%
24-30	4,646	0.9	0.7%
Total*	**650,508**	**123.2**	**100.0%**

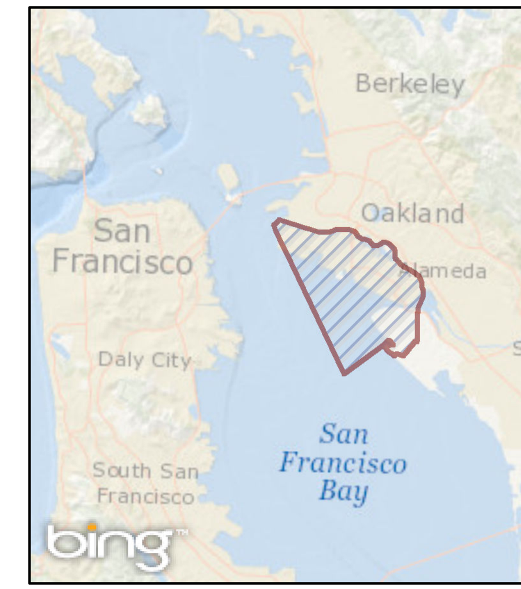
* Not including Alameda Point. Total includes about 3 miles of lower laterals that are included in the City's sewer GIS.

The oldest portions of the sewer system date to the early 1900s; however, over 30 percent of the system has been rehabilitated or replaced in the past 30 years. Most older sewers are constructed of clay pipe materials including vitrified clay pipe (VCP), terra cotta, and clay tile, with plastic materials, primarily polyvinyl chloride (PVC) and high-density polyethylene (HDPE) used for newer sewer construction and rehabilitation.

The sewer system also includes approximately 19,000 private sewer laterals. In Alameda, the property owner is responsible for maintenance and repair of the entire service lateral from the building drain to the connection to the City's sewer main. However, the City takes responsibility for replacement of the lower portion of the lateral (within the public right-of-way) when the public sewer main to which it is connected is rehabilitated or replaced, or if the lower lateral fails, whichever occurs first.

Legend

Alameda City Limit



City of Alameda
Sewer Master Plan

Figure 1-1
Study Area

J:\Projects\0232 Alameda, City of\0232-013 Alameda Sewer MP Model Update (SJ)\G. GIS\MXDs\Fig1-1_StudyArea.mxd

Sources: ESRI Basemap

Legend

Gravity Sewers

- ≤ 8"
- 10" - 15"
- > 15"
- Private Sewers
- Force Mains
- EBMUD Interceptor
- Alameda Pump Stations
- EBMUD Pump Stations
- Alameda City Limit

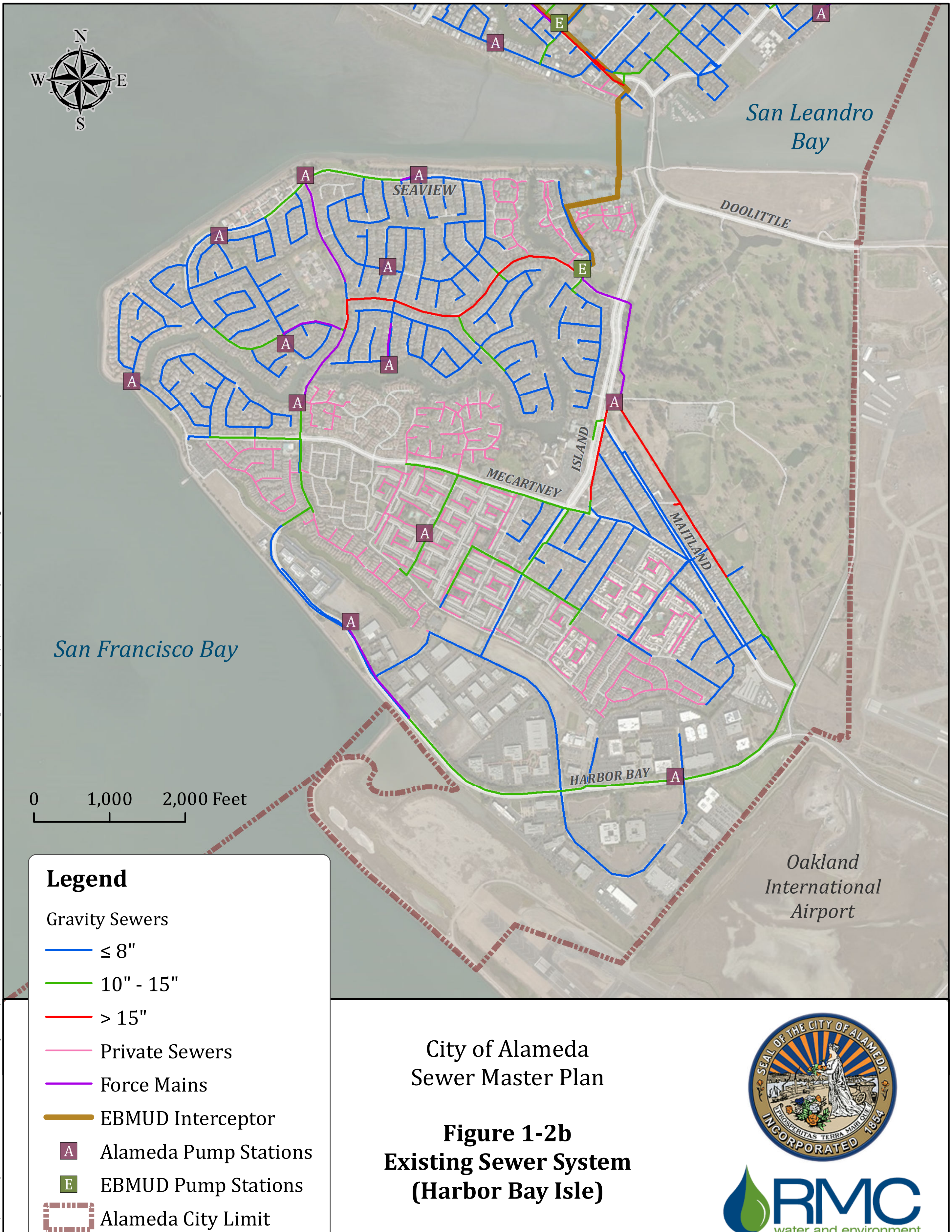
City of Alameda
Sewer Master Plan

Figure 1-2a
Existing Sewer System
(Alameda Island)

RMC water and environment

J:\Projects\0232 Alameda, City of\0232-013 Alameda Sewer MP Model Update (SJ)\G. GIS\MXDs\Fig1-2a ExSewerSystem.mxd

Sources: ESRI Basemap

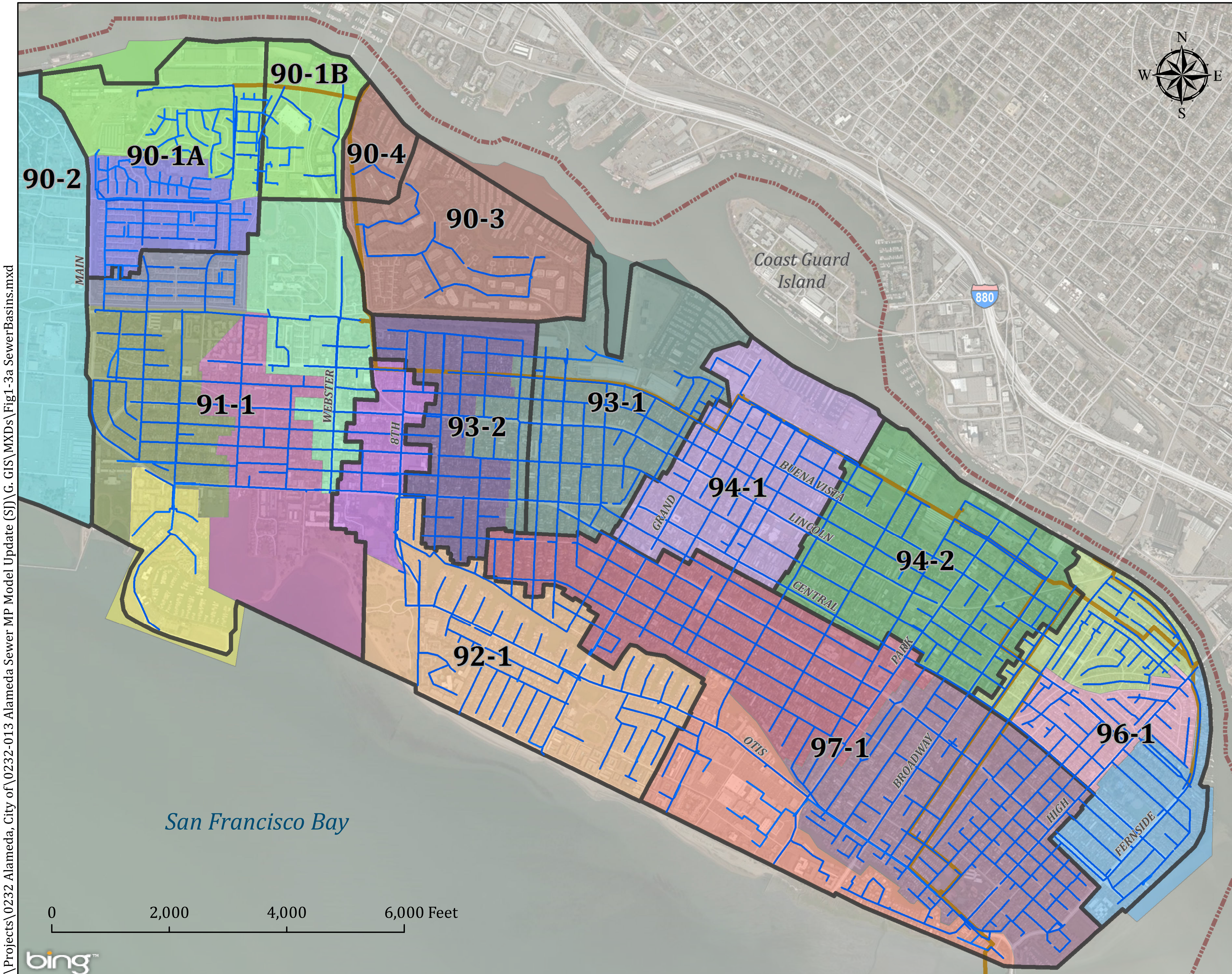


City of Alameda
Sewer Master Plan

Figure 1-2b
Existing Sewer System
(Harbor Bay Isle)

J:\Projects\0232 Alameda, City of\0232-013 Alameda Sewer MP Model Update (SJ)\G. GIS\MXDs\Fig1-2b ExSewerSystem.mxd

Sources: ESRI Basemap



Sources: ESRI Basemap

Legend

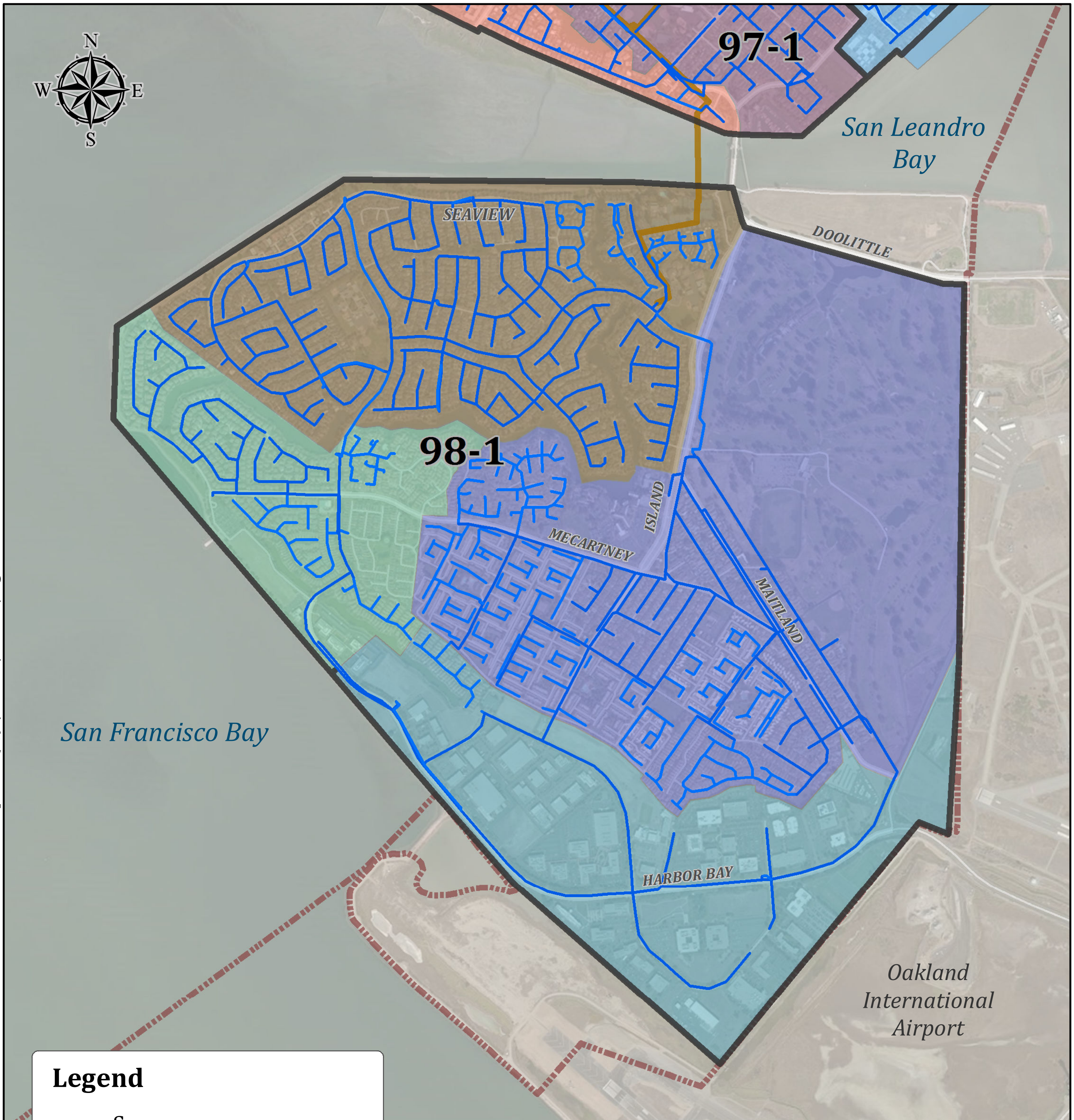
- Sewers
- EBMUD Interceptor
- 91-1 Alameda ITAs & ID
- Alameda Basins (typical)
- Alameda City Limit

City of Alameda
Sewer Master Plan

Figure 1-3a
Sewer Basins and Interceptor Tributary Area (Alameda Island)

SEAL OF THE CITY OF ALAMEDA INCORPORATED 1854

RMC water and environment



Legend

- Sewers
- EBMUD Interceptor
- Alameda ITAs & ID
- Alameda Basins (typical)
- Alameda City Limit

0 1,000 2,000 Feet

City of Alameda
Sewer Master Plan

Figure 1-3b
Sewer Basins and Interceptor Tributary Areas (Harbor Bay Isle)

RMC water and environment

J:\Projects\0232 Alameda, City of\0232-013 Alameda Sewer MP Model Update (SJ)\G. GIS\MXDs\Fig1-3b SewerBasins.mxd

Sources: ESRI Basemap

1.3 Background

The last comprehensive evaluation of the City's sanitary sewer system was conducted in the early 1980s as part of the region-wide East Bay Infiltration/Inflow Study, which included all of the seven satellite collection system agencies that are tributary to the EBMUD system. Each agency prepared its own evaluation, called a Sewer System Evaluation Study (SSES). The studies, completed in 1986, resulted in a long-term plan to upgrade the sewer systems and reduce infiltration and inflow (I/I). At the same time, EBMUD completed a Wet Weather Facilities Plan which identified the need for construction of several wet weather facilities (WWFs) to handle flows that could not be conveyed to its MWWTP during wet weather periods. Three WWFs (Oakport and San Antonio Creek in Oakland serving the southern portion of the EBMUD wastewater service area, and Point Isabel in El Cerrito serving the northern portion of the system) were constructed and went into operation in the 1990s. The WWFs provided storage and/or primary-level treatment and disinfection for wastewater discharged during wet weather periods. At the time, the Satellite sewer capacity improvement projects and rehabilitation programs, combined with EBMUD's WWFs and MWWTP improvements, were considered the most cost-effective solution to the region-wide wet weather issues.

In the period since completion of the SSES, Alameda has eliminated known cross-connections between the sanitary and storm drain systems, constructed relief sewer improvements to provide needed system capacity as identified in the SSES, and rehabilitated or replaced over 30 percent of the sewers in the system (including associated lower laterals). In the late 1980s, the City was also the first of the Satellites to adopt a sewer lateral ordinance requiring the inspection and repair or replacement of private (upper) laterals at sale or transfer of property or major remodel, which has resulted in the rehabilitation or replacement of approximately 6,000 laterals city-wide since that time (the City has since joined the EBMUD Regional Private Sewer Lateral program). Improvements in sewer system management tools and practices have also been implemented, including development of a system inventory and mapping system in a geographic information system (GIS) format; implementation of a new computerized maintenance management system (CMMS) to schedule and document maintenance activities; and closed-circuit television (CCTV) inspection program with capture and storage of data in digital format for use in system condition assessment.

Since 2004, the City has also been required to monitor and electronically report occurrences of sanitary sewer overflows (SSOs), initially to the San Francisco Bay Regional Water Quality Control Board (RWQCB or Regional Board), and later (since 2007) to the State Water Resources Control Board (SWRCB) under the Statewide General Waste Discharge Requirements (GWDR) for Sanitary Sewer Systems adopted in 2006. Under these regulations, the City is also required to prepare and adopt a Sewer System Management Plan (SSMP), including plans and programs for addressing the operation and maintenance of the system and assessing and upgrading its condition and capacity; and to audit and update its SSMP regularly.

Since the late 1970s, the City has operated its wastewater collection system under a National Pollutant Discharge Elimination System (NPDES) permit from the Regional Board, which was last renewed in 2014. In 1986, the Regional Board issued a Cease and Desist Order (CDO) to all of the EBMUD Satellites (re-issued in 1993), which required the Satellites to eliminate wet weather overflows from their collection systems by implementing the improvements proposed in the SSES studies (the 1993 CDO extended the period for compliance from the original plan). Based on completion of the required projects, the 1993 CDO was rescinded in 2011 for all of the Satellites except Oakland.

EBMUD also received an NPDES permit for operation of the WWFs constructed based on the 1980s wet weather studies. However, in 2007 the SWRCB remanded the permit based on a ruling by the U.S. Environmental Protection Agency (EPA) that the WWFs, by not providing full secondary treatment prior to discharge, were operating in violation of the Clean Water Act. This decision triggered the issuance of a CDO to EBMUD requiring it to eliminate discharges from its WWFs, and subsequent compliance orders to both EBMUD and the Satellite agencies.

The first of the orders issued to the Satellites was a Findings of Violation and Order for Compliance, or Administrative Order (AO), issued to each of the Satellites in November 2009. The AO required the agencies to develop and implement programs necessary to reduce SSOs and further reduce I/I which causes or contributes to discharges from EBMUD's WWFs. For Alameda, the requirements of the AO included development of an Asset Management Implementation Plan (AMIP); a Private Sewer Lateral (PSL) Inspection and Repair/Replacement Program; Flow Monitoring and I/I Assessment Plan; Inflow Identification and Elimination Plan; Pump Station Improvement Plan; and a Sewer Cleaning and Inspection Program. The requirements of the AO were converted to a Stipulated Order for Preliminary Relief (SO) in September 2011.

Since 2009, Alameda has prepared the plans and reports and implemented the programs required under the AO and SO. In 2010, the City also completed a *Sanitary Sewer System Hydraulic Analysis*[1], including development of a hydraulic model to evaluate system capacity and identify any needed sewer capacity improvements, and a *Sanitary Sewer Pump Station Assessment Report*[2] to identify needed structural and reliability improvements to the City's sewer pump stations. To address the capital demands of its aging sewer system, the City also completed a sewer rate study[3] in 2010 and adopted a 14 percent annual increase to its sewer service charge for a three-year period.

In 2013, EBMUD and the seven Satellite agencies entered into negotiations with the EPA, SWRCB, and RWQCB (Plantiffs) and two non-governmental organizations, San Francisco Baykeeper and Our Children's Earth Foundation (Intervenor Plantiffs), on a Consent Decree (CD) intended to eliminate discharges from the WWFs over an approximate 20-year period through programs designed to reduce I/I in the Satellite collection systems, as initiated under the AO and SO. The Consent Decree incorporates the requirements of the Satellite and EBMUD SOs, as well as a program to accelerate the identification and elimination of inflow and "rapid infiltration" sources, and processes for documenting compliance toward reducing WWF discharges and eliminating them by the required compliance dates. The CD also imposes monetary penalties for non-compliance with any of the requirements. For the Satellites, including Alameda, the CD-required "Work" includes specified annual amounts of sewer rehabilitation, inspection, and cleaning; as well as continued implementation of PSL compliance and inflow elimination programs; and, for Alameda, the pump station renovation plan. The CD became final in September 2014.

In October 2014, the City updated its sewer rate study[4] to reflect the requirements of the CD, and adopted a sewer service charge increase of 3 percent per year for the next five years effective fiscal year 15/16.

Note that whereas the Alameda Point portion of the City's sewer system is not specifically covered by the Work requirements of the CD (other than for repair of "acute" defects and "hot spot" cleaning of areas with a history or at risk for SSOs), the CD does state that the City must require rehabilitation of existing sewer mains and laterals in Alameda Point as a condition of approving building permits for any property that is developed, redeveloped or re-used. Accordingly, the City's Master Infrastructure Plan (MIP) for Alameda Point provides for rehabilitation and replacement of the sewer infrastructure as part of redevelopment of the former base.

[1] City of Alameda Sanitary Sewer System Hydraulic Analysis, Final Report, RMC Water and Environment, May 2010.
[2] Alameda Sanitary Sewer Pump Station Assessment Report, Schaaf & Wheeler, June 2010.
[3] City of Alameda Sewer Rate Study, Red Oak Consulting, May 2010.
[4] City of Alameda Sewer Rate Study, Bartle Wells Associates, October 2014.

1.4 Study Objectives

The primary objectives of the Sewer Master Plan are to:

- Confirm that the system has adequate capacity to handle peak wet weather flows, as required for the System Evaluation and Capacity Assurance Plan element of the SSMP.
- Satisfy the Rehabilitation and Replacement Plan requirements of the SSMP, AMIP, and CD.
- Establish a firm basis for project priorities and budgets in the City's 20-year Capital Improvement Program.

These objectives, and the basis of planning for the Master Plan, are discussed in more detail in Section 2 of this report.

1.5 Scope of Study

The scope of the Master Plan, as well as a brief discussion of work conducted under each task, is described below.

- **Task 1 – Confirm Basis of Planning, Asset Management Framework, and Coordination with Other Sewer Plans.** This task included a kickoff meeting with City staff to discuss the regulatory and legal requirements that impact the City's sewer system, the City's current and desired levels of service, and how the City is currently managing its assets and setting priorities for system improvements. The purpose of this task was to confirm the basis of planning for the Sewer Master Plan and ensure consistency with other plans, programs, and regulatory mandates.

- **Task 2 – Update Hydraulic Model.** In this task, the hydraulic model of the City's sewer system originally developed in the 2010 study was updated based on the City's latest GIS mapping, pump station information, and existing and projected future land use data. The model calibration for dry and wet weather conditions was confirmed using flow monitoring data collected previously by the City and EBMUD. The model was then used to determine sewer system capacity requirements and identify any potential capacity deficiencies under peak wet weather flow conditions, defined based on a design storm and system performance criteria.

- **Task 3 – Develop and Implement a Risk Model for Prioritizing Sewers for Rehabilitation and Replacement.** This task involved developing a recommended program for sewer rehabilitation and replacement (R/R) through use of a "Pipe Rating Model" that assigns risk scores to pipes based on their likelihood and consequences of failure. The Pipe Rating Model was developed under a separate contract with the City, utilizing the City's GIS and CCTV inspection data.

- **Task 4 – Develop Capital Improvement Program.** Based on the results of Tasks 2 and 3 and the City's Pump Station Renovation Plan, a 20-year CIP was developed for recommended capacity improvements, pump station improvements, and sewer R/R. The estimated cost of the proposed CIP was compared to the City's current and required sewer replacement rate and associated annual budgets.

- **Task 5 – Prepare Sewer Master Plan Report.** This report was prepared to present the results and recommendations of the study.

- **Task 6 – Project Management and Coordination.** Periodic progress meetings and teleconferences were held with City staff to review project status and discuss project issues, and monthly status reports were prepared to document the work completed.

1.6 Report Organization

The contents of each of the chapters and appendices of this Master Plan report are described below.

Executive Summary

The Executive Summary provides a brief, stand-alone summary of the Master Plan report, with emphasis on the major findings and recommendations.

Chapter 1- Introduction

This introductory chapter provides a description of the City's sewer system and service area, background on previous studies and regulatory history and current situation, the objectives and scope of the Master Plan, and the contents and organization of this report.

Chapter 2 – Basis of Planning

This chapter discusses the basis for the Master Plan in the context of regulatory and legal requirements, industry best practices, and the City's desired level of service to its customers. The chapter describes the methodology and criteria utilized for the City's Pipe Rating Model, which was used to help set priorities for sewer rehabilitation and replacement in the Master Plan CIP.

Chapter 3 – Capacity Assessment

This chapter describes the update of the sewer system hydraulic model, basis for estimating model flows, and the calibration of the model for dry and wet weather conditions. This chapter also defines the basis for the capacity assessment of the system, including the design rainfall event and performance criteria; describes the identified capacity deficiencies based on the model results; and presents the needed capacity improvements. A discussion of the planned system improvements in Alameda Point designed to provide adequate conveyance capacity for future flows is also included in this chapter of the report.

Chapter 4 – Condition Assessment

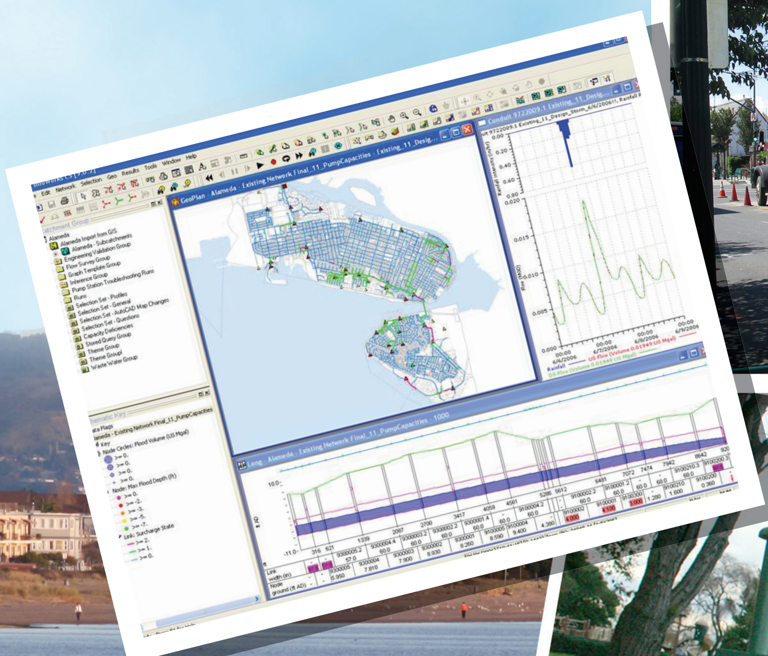
This chapter describes the City's CCTV inspection program and summarizes the condition assessment of the system based on inspection data collected by the City over the past six years.

Chapter 5 – Recommended Capital Improvement Program

This chapter presents the sewer projects that are recommended for inclusion in the City's 20-year CIP based on the results of the capacity and condition assessments and application of the Pipe Rating Model, and the City's pump station renovation plan. The CIP includes a recommended schedule for project implementation and associated capital costs that will form the basis for updates, if needed, to the City's financial plan for the sewer system. Recommendations for project implementation are also provided.

The appendices to the report provide additional detailed information to support the findings and recommendations presented in the report chapters, including selected model hydraulic profiles and detailed tabulation of pipe inventory data and pipe rating model scores.

Chapter Two
Basis of Planning



Chapter 2 Basis of Planning

The overall purpose of this Sewer Master Plan is to establish the basis for the City's Capital Improvement Program (CIP) for its sanitary sewer system for the next twenty years. The Master Plan supports the City's goals for the management and operation of its sanitary sewer system, which include:

- Compliance with applicable State and federal regulations, including the City's NPDES permit and the Statewide GWDR, as well as with the legal requirements of the Consent Decree with the EPA, SWRCB and RWQCB.
- Customer service, such that no capacity-related SSOs occur for storm conditions that do not exceed the City's design event; and such that SSOs and backups caused by sewer blockages are minimized to the greatest extent possible.
- Replacement of sewer assets in a manner that minimizes asset failures and reduces the amount of infiltration and inflow that enters the City's sewer system and the EBMUD interceptor.

The programs implemented by the City to achieve these goals are described in several documents, including the City's Sewer System Management Plan (SSMP) and Asset Management Implementation Plan (AMIP). The programs include on-going maintenance of the sewer system, periodic inspection of sewer assets, investigation of I/I sources, and repair, rehabilitation and replacement of sewer pipes, manholes, and pump stations.

The City's Work section of the Consent Decree specifically requires a minimum amount of sewer rehabilitation (and associated manholes and lower laterals) throughout the duration of the Consent Decree. The required amount of sewer rehabilitation has been established as 13,728 feet (2.6 miles) of mainline sewers annually (on a cumulative basis) through the December 31, 2035.

This Sewer Master Plan utilizes the information that the City has collected through its maintenance, inspection, and monitoring activities to perform an assessment of system condition and capacity; and utilizes the results of those assessments to identify and prioritize sewer system capital improvement needs. This chapter describes the data and tools that support the Sewer Master Plan efforts and the methodology for utilizing that data to develop priorities for sewer rehabilitation and replacement.

2.1 Existing Data and Tools

The City has developed a significant amount of data and tools to support its sewer system management activities. These include:

- ESRI ArcGIS, a geographic information system (GIS) that generates sewer system mapping and contains attribute information on City-owned manholes and pipes in the collection system, including pipe diameters, rim and invert elevations, pipe material, and year of construction or rehabilitation. (Note: Populating this data is an ongoing process, and data are continually updated as new information is obtained from CCTV inspections, maintenance activities, and design surveys.) The GIS is used in conjunction with EMS Webmap Viewer, a web-based tool that allows City staff to view GIS data and maps.
- Granite XP, a closed-circuit television (CCTV) inspection program and database with associated videos and image files for sewer main CCTV inspections conducted since 2009.
- A customized Pipe Rating Model, developed as part of this Sewer Master Plan, which assigns a risk score to each pipe based on likelihood and consequence of failure factors and provides a

means of prioritizing pipes for rehabilitation and replacement. The Pipe Rating Model, described below, was the key tool used for project prioritization for this Sewer Master Plan.

In addition, the City is in the process of implementing Lucity, a computerized maintenance management system (CMMS), which links to the GIS and will contain maintenance and inspection schedules and history (e.g., cleaning results, SSO and blockage records, rehabilitation work, etc.) for all City-owned sewer system assets.

2.2 Pipe Rating Model

The methodology embodied in the Pipe Rating Model is based on guidelines recommended by the National Association of Clean Water Agencies (NACWA).[5] The methodology involves quantifying and assessing the risks posed by the failure or inability of the sewer system to provide the level of service needed to meet the City's sewer system management goals. Using this approach, risk scores can be calculated for each sewer pipe individually. Individual pipe scores can be then be used to prioritize and group pipes into sewer rehabilitation and replacement projects.

The risk of asset failure is calculated by quantifying the likelihood of failure (LOF) and the consequence of failure (COF) of a sewer asset. The likelihood of failure is the possibility of asset failure and is synonymous with the "probability" of failure. The consequence of failure is defined as the impact on level of service resulting from asset failure. The risk equation is defined as follows:

Risk = [(Likelihood) x (Consequence)]

2.2.1 Likelihood of Failure Categories

Four indicators of likelihood of failure were utilized in the Pipe Rating Model:

- Structural Condition: Structural condition was determined based CCTV inspection results, as stored in the Granite XP database. If CCTV inspection data did not exist for a pipe segment, then the likelihood of failure was estimated based on pipe segment age. Structural condition is a strong indicator of likelihood of failure and was heavily weighted.
- Operations & Maintenance (O&M) Condition: The required frequency of sewer cleaning is an indicator of the likelihood of asset failure due to a maintenance-related issue that could lead to an SSO. In addition, pipes that have roots and grease are also indicators of structural integrity which could lead to eventual failure. Data from the City's CCTV inspection program were used to quantify likelihood of failure due to maintenance condition. This likelihood of failure factor was given a lower weighting than other factors since, unlike structural, capacity and I/I issues, preventive maintenance cleaning can be performed to reduce the risk of SSOs due to recurring maintenance problems.
- Capacity Deficiency: This likelihood of failure factor is calculated from hydraulic modeling results. Sewers with insufficient capacity that are predicted to result in significant surcharge or potential overflows under a design event peak wet weather flow condition were considered to have a high likelihood of failure due to capacity deficiency.
- I/I Contribution: This factor is based on the relative impact of I/I in the City's system on flows in the EBMUD interceptor system that contribute to discharges from EBMUD's Wet Weather Facilities (WWFs). Basins contributing higher amounts of I/I (based on peak I/I flow per foot

[5] National Association of Clean Water Agencies, *Implementing Asset Management: A Practical Guide*, 2007

of pipe) are assigned a higher I/I score and may be targeted for improvements to reduce flows to the EBMUD system.

2.2.2 Consequence of Failure Categories

Consequence of failure is assessed by examining the impact on economic, social and environmental factors. This approach, often referred to as the Triple-Bottom-Line approach, involves identifying and quantifying suitable indicators that represent these core categories. For this study, the following indicators were used to assess the Consequence of Failure:

- **Flow Volume (Economic)**: Larger sewer spills or failure of a sewer asset serving a large tributary area can have a significant impact on the cost of fixing the pipe and restoring damaged property and the surrounding area. The size of the sewer was chosen as an indicator of the potential impact of large spills or failure of a major sewer asset.
- **Community (Social)**: Sewer failures can significantly impact commuters, commercial areas, public facilities, and the community in general. Location in major roads or commercial areas, or proximity to critical facilities such as emergency services, hospitals and schools were used as indicators of potential community impact. In addition, sewers located in easements (i.e., not in a public right-of-way) are considered to have a greater social impact hence, were included as a community impact factor.
- **Environmental**: Sewer overflows that reach surface waters can adversely impact water quality and the environment. Distance to surface water and storm drain inlets was used as an indicator of the potential environmental impact of a sewer spill.

2.2.3 Risk Score Calculations

The Pipe Rating Model utilizes data directly from GIS and Granite XP, and indirectly from the hydraulic model developed and used for this Master Plan, to compute LOF scores. Structural and O&M conditions were derived from data from previous and recent CCTV inspection programs collated and managed through Granite XP. Community and environmental COF scores were derived from GIS mapping. The risk score calculations were processed using ArcGIS ModelBuilder tools, which combine a series of GIS processes to automate the risk analysis calculations. The ModelBuilder tools developed for this study will be able to be re-used by the City to update the risk analysis following future data updates to the GIS and CCTV data. The ModelBuillder tools are organized into two toolkits: 1) pre-processing tools and 2) risk analysis tools. The risk score calculations can be displayed on GIS maps.

Figure 2-1 is a conceptual diagram of the Pipe Rating Model framework, illustrating the calculation of asset risk scores. **Table 2-1** and **Table 2-2** present the scoring criteria and weights for the LOF and COF categories, respectively. More detail on the capacity assessment (basis for capacity deficiency LOF factor) and condition assessment (basis for structural condition LOF factor) are provided in Chapters 3 and 4 of this report. The overall risk score results are presented in Chapter 5 and used in the development of the sewer system CIP.

Figure 2-1: Pipe Rating Model Framework

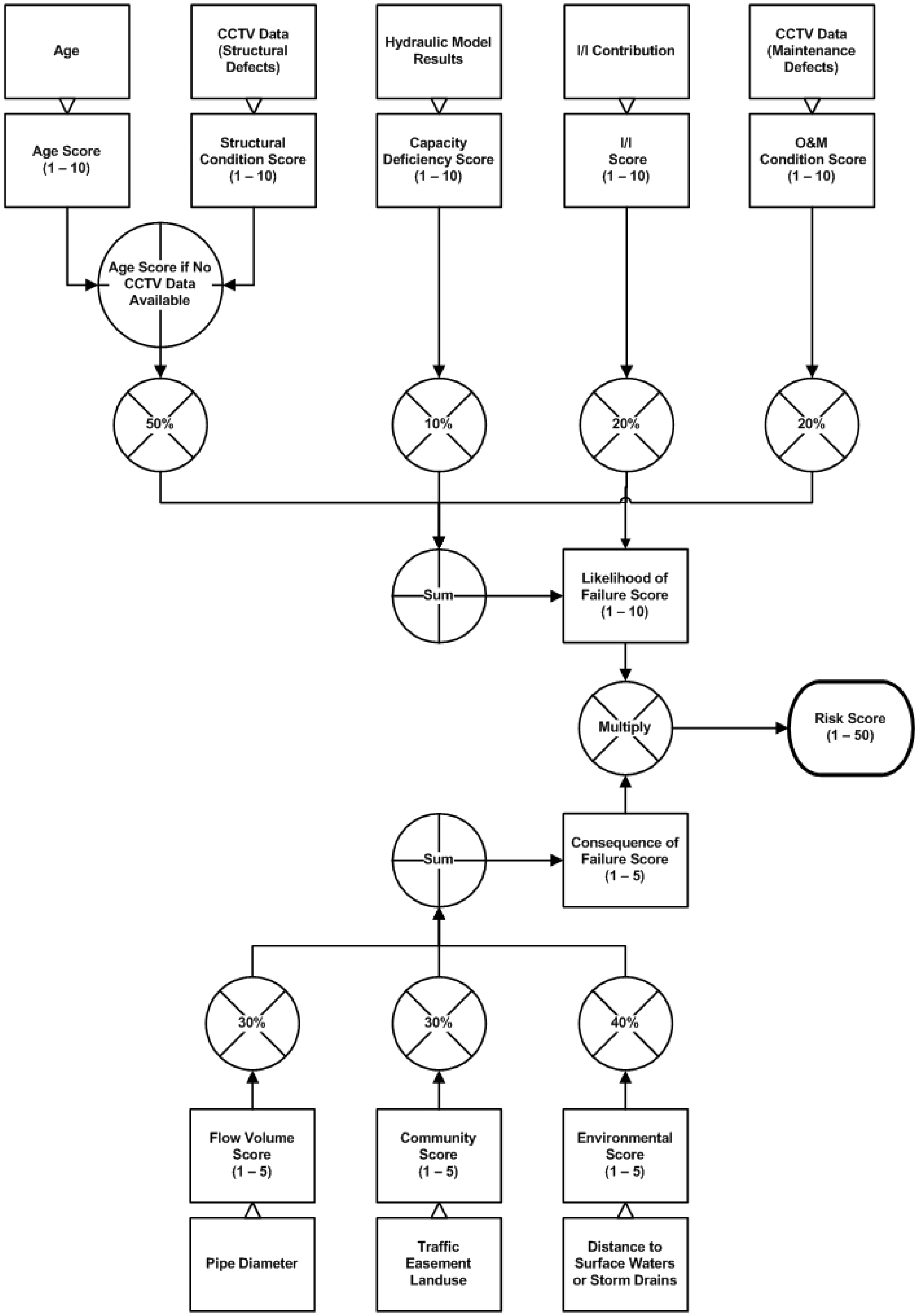


Table 2-1: Likelihood of Failure Scoring

Likelihood Category	Indicator	Weight (%)	Likelihood Score				
			1 (Low)	3	5	8	10 (High)
Structural Condition	Structural Grade Score[a] (from CCTV)	70	<= 2	>2 to 4	>4 to 7	>7 to 9	>9
	Pipe Age[b]		< 20 years	20 to < 40 years	40 to < 60 years	60 to < 80 years	≥ 80 years
O&M Condition	O&M Grade Score[a] (from CCTV)	10	<= 2	>2 to 4	>4 to 7	>7 to 9	> 9
Capacity Deficiency	Model-Predicted Surcharge[c]	10	No surcharge or not in model	Throttled pipe resulting in surcharge under future growth conditions only	Throttled pipe resulting in some surcharge, freeboard ≥ 5 feet	Throttled pipe resulting in significant surcharge, freeboard < 5 feet	Throttled pipe resulting in overflow
Inflow / Infiltration Contribution	Relative Peak I/I Rate[d]	10	Low	N/A	Medium	N/A	High

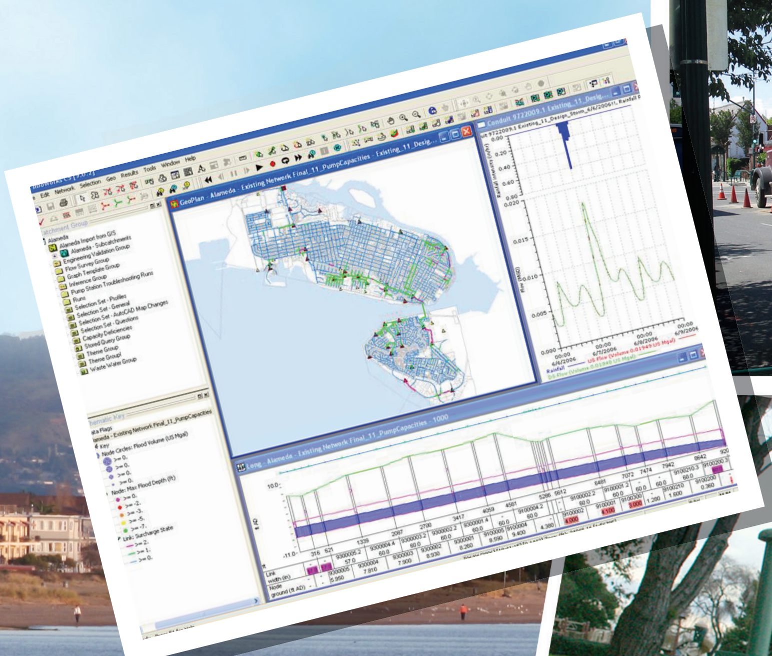
a. See discussion in Chapter 4.
b. Used only if there is no CCTV inspection data for the pipe.
c. See discussion in Chapter 3.
d. Based on peak I/I rate per foot of pipe determined from flow monitoring and modeling.

Table 2-2: Consequence of Failure Scoring

Consequence Category	Indicator	Weight (%)	Consequence Score				
			1 (Low)	2	3	4	5 (High)
Economic	Diameter (Flow Volume)	30	≤ 8"	10" to 15"	16" to 21"	24" to 27"	> 27"
Community[a] (Social)	Road Type	30	Local	NA	Collector	Arterial	Caltrans
	Land Use		Other	N/A	Commercial District	School	Emergency Operations Facilities[b]
	Easements		N/A	N/A	Yes	N/A	N/A
Environmental[c]	Distance to Surface Waters	40	N/A	N/A	N/A	50 to < 250 ft.	< 50 ft.
	Distance to Storm Inlet		N/A	N/A	N/A	50 to < 250 ft.	< 50 ft.

a. Community score based on the highest of Road Type, Land Use, and Easements scores.
b. Includes police and fire stations, city hall, and emergency operations centers.
c. Environmental score based on the highest of Distance to Surface Waters and Distance to Storm Inlet scores.

Chapter Three
Capacity Assessment



Chapter 3 Capacity Assessment

This chapter documents the development of the hydraulic model that was used to assess the capacity of the City's sewer system and presents the results of the capacity assessment. The chapter provides an overview of the model development process, including description of the modeled sewer network and the land use and flow monitoring data used as the basis for estimating wastewater flows and calibrating the model. The chapter also documents the criteria on which the capacity assessment was based and presents the model results and required capacity improvements. A discussion of the future Alameda Point sewer system is also provided.

The modeling utilized InfoWorks™ CS, a fully dynamic hydraulic modeling software supported by a GIS-based modeling interface. The model was originally developed as part of the *Sanitary Sewer System Hydraulic Analysis* completed by RMC for the City in 2010. For this study, the model was updated based on the City's latest sewer GIS and pump station data, and the model "loads" were updated based on current assessor parcel information and projections of future development and redevelopment.

3.1 Modeling Terminology

Key modeling terminology applicable to Alameda's model is defined below.

- **Network** refers to the representation of the physical facilities being modeled. Modeled network components include pipes, manholes, and other control structures such as diversion weirs.
- **Nodes** are primarily manholes and other sewer structures such as mainline cleanouts and pump station wet wells, but also include pipe junctions without structures and model "outfalls" (discharge points from the modeled system). Key data associated with nodes are manhole ground elevations and, for pump stations, wet well bottom elevation and cross-sectional area.
- **Links** are connections between nodes, including pipeline conduits (gravity sewers and force mains). Weirs and pumps are also represented as links in the model. Key data associated with pipes are upstream and downstream node IDs, pipe length, diameter, roughness factor, and upstream and downstream invert elevations. Data required for weirs include width, elevation, and weir coefficient. Pump data include pump type and maximum discharge rates, head-discharge curves if applicable, and pump on/off settings.
- **Subcatchments** (also called sewersheds) are areas that contribute flow to the modeled sewer network. Data associated with subcatchments include sanitary flow (computed based on population, land use, or other available data), type of diurnal sanitary flow profile (which is a function of land use), infiltration/inflow (I/I) parameters, and the node or pipe at which the flow from the subcatchment enters the modeled system.
- **Model loads** are the flows entering the modeled sewer system from each subcatchment. Model loads include residential and commercial sanitary or base wastewater flow (BWF), groundwater infiltration (GWI), and rainfall-dependent I/I (RDI/I). As a sum, they represent the total wastewater flow applied to the model.
- **Models** are the combination of a modeled network, its associated subcatchments and loads, and other data (e.g., rainfall, diurnal profiles, hydraulic boundary conditions, inflows from other areas, etc.) that comprise a specific model scenario.

3.2 Modeled System

The Alameda modeled network consists of the entire existing sewer system (with some exceptions as noted below), including the EBMUD interceptors located within the City and some private sewers that are included in the City's GIS. Some short, upstream terminal pipes (including a number of them that represent lower laterals included in the City's GIS) and sewers located upstream of unmodeled pump stations are not included in the model, nor is the existing system serving Alameda Point. (A model of the future Alameda Point system has been developed separately, as discussed later in this chapter.) The model includes 27 of the 31 City-owned pump stations (not including those at Alameda Point). In total, the network includes about 148 miles of pipelines (123 miles or about 97 percent of the City-owned sewers, 8.7 miles of EBMUD interceptor pipes, and 16.3 miles of private sewers). The network has two model outfalls at the discharge points to the EBMUD Alameda siphons at the Alameda terminus of the Posey Tube. One outfall is the inlet to the original double-barrel siphons, and the second outfall is the inlet to the third siphon that was constructed in 2000 when flows from the Alameda NAS were re-routed to the siphons. The model network is shown in **Figure 3-1**.

Although EBMUD interceptor facilities have been included in the Alameda's hydraulic model, the performance of those facilities were not assessed for this study. The purpose of including EBMUD facilities in the model is to provide a single, hydraulically connected system, since the interceptor essentially serves as the "backbone" of Alameda's sewer system. Furthermore, most of the flow meters used for model calibration, as discussed later in this chapter, were located on the EBMUD interceptors.

3.2.1 Network Data and Data Validation

The data used to define the model network and associated attributes were derived primarily from the City's GIS. The GIS includes the locations of sewer manholes and sewer mains; manhole IDs and rim elevations; and pipe diameters, lengths, material, and invert elevations. The GIS was originally created in 2008 from conversion of the City's AutoCAD sewer maps. Additional updates to the GIS were made as part of the 2010 Sanitary Sewer Hydraulic Analysis project, and more recently through updates from as-built plans from previous sewer rehabilitation and replacement projects and recent CCTV inspection data. The new sewer infrastructure in the Alameda Landing area was also added to the GIS.

After the model network was created by importing the data from GIS, a procedure was followed to validate the network data and to confirm network connectivity. The pumps at the modeled pump stations were added, with data primarily derived from the 2010 hydraulic model (refer to the 2010 *Sanitary Sewer System Hydraulic Analysis* report for additional discussion). Due to the lack of available pump curves for most of the stations, City pump station capacities were determined primarily through information from drawdown tests conducted for the City's 2010 Pump Station Condition Assessment project, and the pumps were modeled as "screw pumps" in the model with maximum discharge capacities based on the drawdown test results Since 2010, the City has upgraded five of its pump stations (BFI, Aughinbaugh, Channing, Eighth/Portola, and Pond/Otis); therefore these stations were modeled as rotodynamic pumps with defined head-discharge curves.

Legend

- Modeled Sewers
- Unmodeled City Sewers
- Modeled Force Mains
- EBMUD Interceptor
- A Modeled City Pump Stations
- A Unmodeled City Pump Stations
- E EBMUD Pump Stations
- Alameda City Limit

City of Alameda
Sewer Master Plan

Figure 3-1a
Modeled Sewer System (Alameda Island)

RMC water and environment

Sources: ESRI Basemap

J:\Projects\0232 Alameda, City of\0232-013 Alameda Sewer MP Model Update (SJ)\G. GIS\MXDs\Fig3-1a ModeledNtwk.mxd

Legend

- Modeled Sewers
- Unmodeled City Sewers
- Modeled Force Mains
- EBMUD Interceptor
- Modeled City Pump Stations
- Unmodeled City Pump Stations
- EBMUD Pump Stations
- Alameda City Limit

City of Alameda
Sewer Master Plan

Figure 3-1b
Modeled Sewer System
(Harbor Bay Isle)

RMC water and environment

J:\Projects\0232 Alameda, City of\0232-013 Alameda Sewer MP Model Update (SJ)\G. GIS\MXDs\Fig3-1b ModeledNtwk.mxd

Sources: ESRI Basemap

3.2.2 Model Subcatchments

Subcatchments define areas tributary to the modeled pipe network. Each subcatchment is assigned to a manhole or sewer pipe in the modeled system to define where the model load from that subcatchment enters the modeled sewer system.

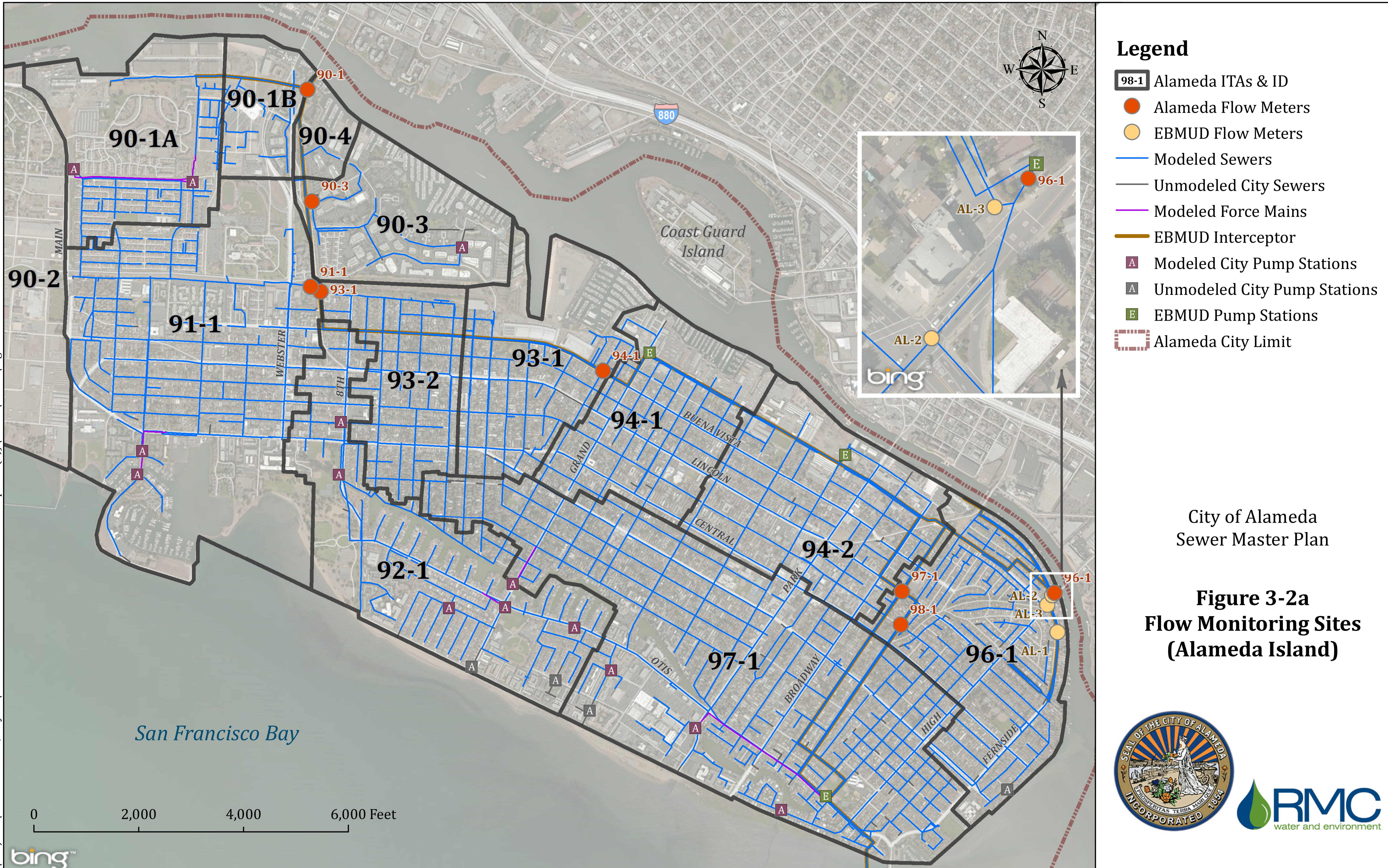
3.3 Flow Monitoring

The purpose of flow monitoring is to quantify flows in the system and to provide data with which to calibrate the hydraulic model (discussed later in this chapter). As noted previously, most flow monitoring in Alameda has been conducted by EBMUD along the interceptor system. The EBMUD flow monitoring data used for this study include programs conducted during the 2009/10 and 2010/11 wet weather seasons (November through March or April). The City also conducted flow monitoring at three sites during the 2010/11 season (December through January) in an area of the system (Basin 96) identified as having higher than average infiltration/inflow (I/I) rates. **Table 3-1** lists the EBMUD and City flow meter locations and pipe diameters. **Figure 3-2** is a map showing the locations of the flow meters.

Table 3-1: Flow Meter Locations

Meter ID	Location	Meter Manhole ID[a]	Pipe Upstream Manhole ID	Pipe Dia. (in.)[b]
EBMUD Meters				
90-1	Downstream end of Mitchell Interceptor	9100100	9100101	20[c]
90-3	Influent line to Marina Village Lift Station	9100311	9100311	15
91-1	Influent line to EBMUD PS F	9110201	9110203	30
93-1	Constitution Way s/o Atlantic Ave.	9100007	9100004	60
94-1	Buena Vista Ave. at Paru St.	9300009	9400001	54
96-1	Influent line to EBMUD PS B	9110201	9630001	24
97-1	Pearl St. at Lincoln Ave.	EBMUDMC1	9610002	21
98-1	Versailles Ave. at Santa Clara Ave.	EBMUDM02	EBMUDM01	24
City Meters				
AL-1	Fernside Blvd. s/o High St.	9630004	9630005	15
AL-2	High St. at Fernside Blvd.	9632001	9632002	14
AL-3	Marina Dr. at High St.	9640001	9640002	12

a. All meters installed in inlet pipe to manhole (i.e., at downstream manhole of pipe), except Meter 90-3.
b. Nominal pipe diameter; actual pipe inside diameter may differ.
c. Slip-lined 24-inch pipe.



City of Alameda
Sewer Master Plan

Figure 3-2a
Flow Monitoring Sites
(Alameda Island)

RMC water and environment

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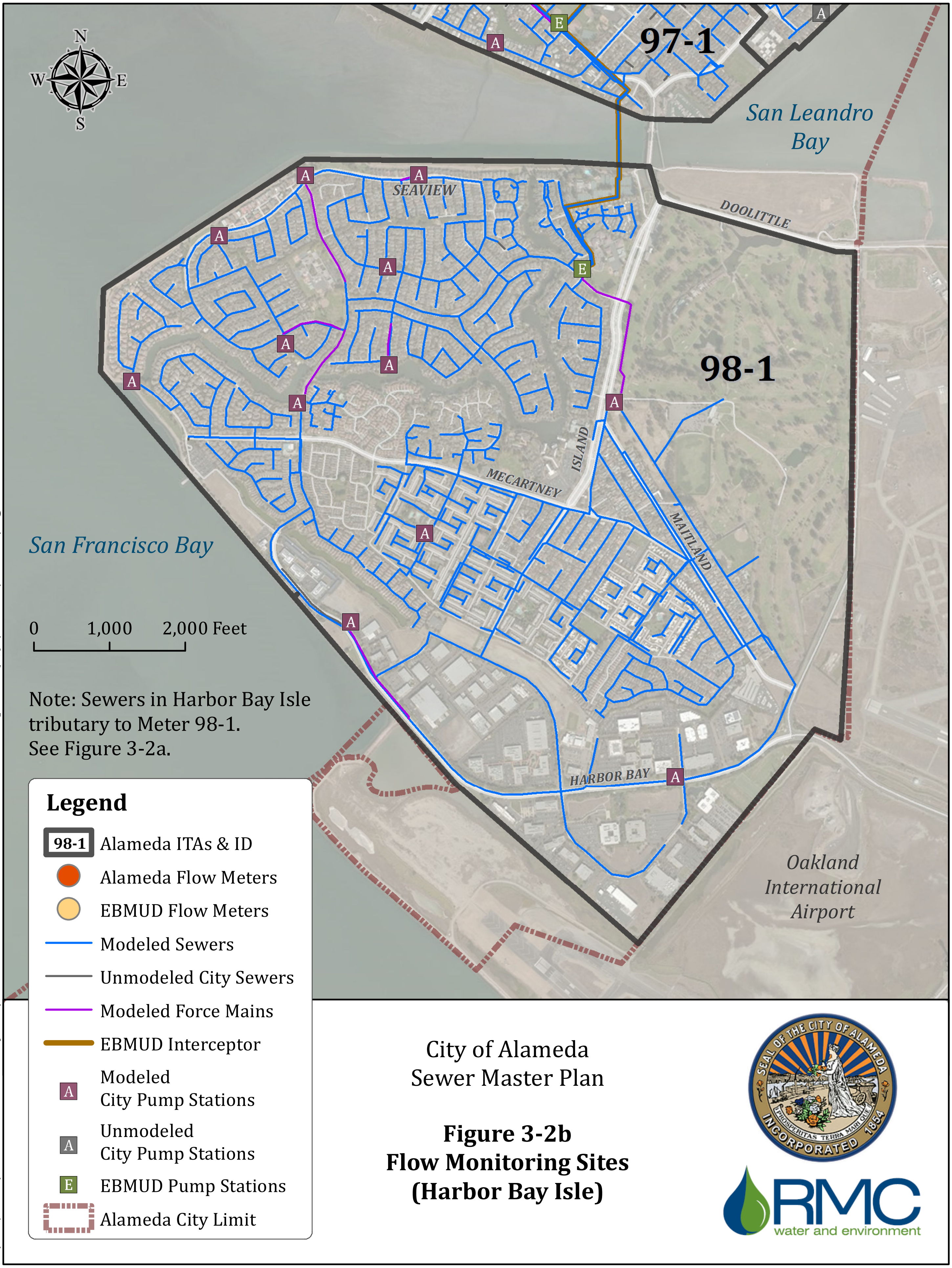
Sources: ESRI Basemap



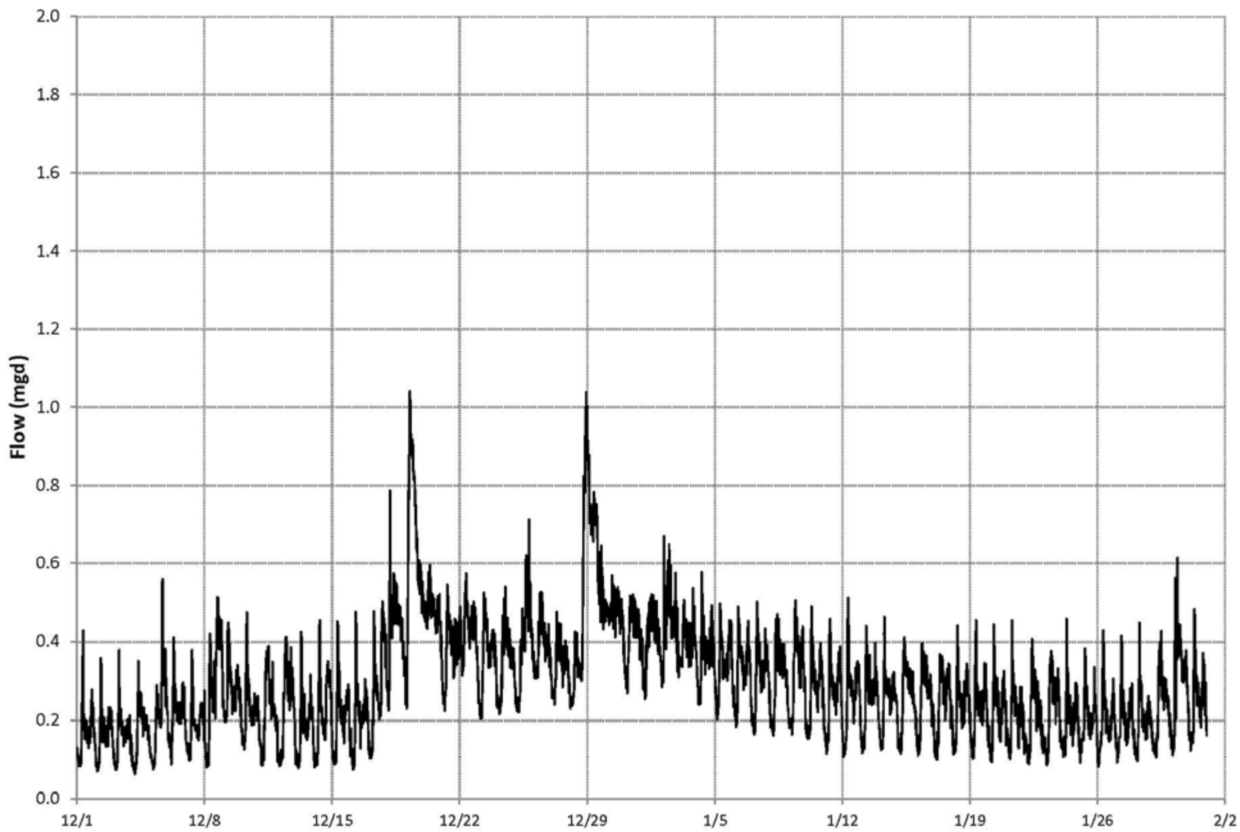
City of Alameda
Sewer Master Plan

Figure 3-2b
Flow Monitoring Sites
(Harbor Bay Isle)

Sources: ESRI Basemap

Major rainfall events during the flow monitoring periods occurred in January and March 2010, December 2010, and March 2011. Rainfall data were captured at a rain gauge installed in Alameda at EBMUD's PS C. **Figure 3-3** shows a plot of measured flow for one of the City's flow meters during the 2010/11 wet weather season, illustrating the increase in flows during storm events in late December 2010.

Figure 3-3: Example Flow Monitoring Data (Meter AL-2, Dec. 2010-Jan. 2011)



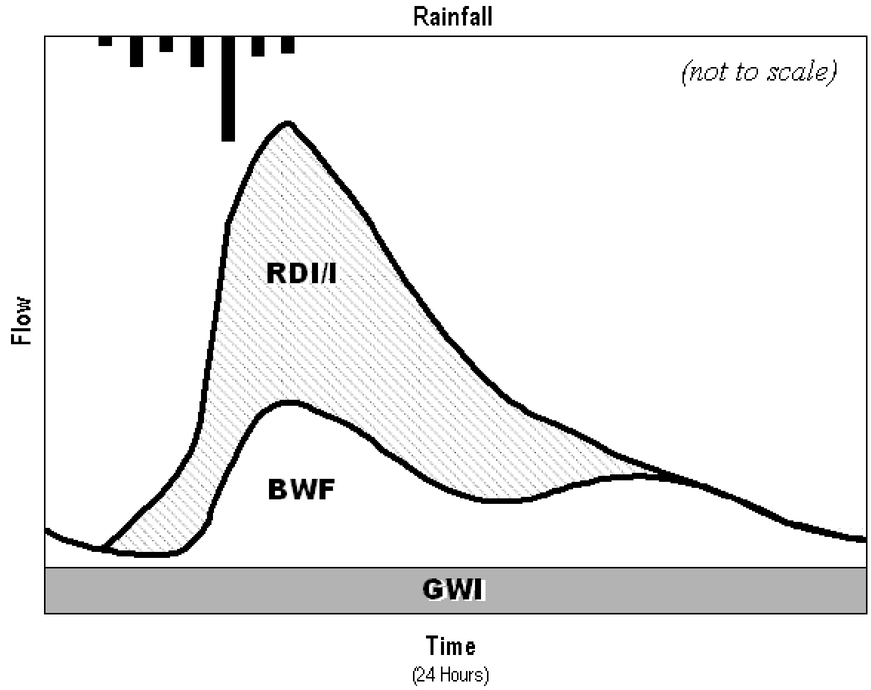
3.4 Flow Estimating Methodology

This section describes the methodology for estimating wastewater flows for loading to the hydraulic model.

3.4.1 Wastewater Flow Components

Wastewater flows typically include three components: base wastewater flow (BWF), groundwater infiltration (GWI), and rainfall-dependent infiltration/inflow (RDI/I). BWF represents the sanitary and process flow contributions from residential, commercial, institutional, and industrial users of the system. GWI is groundwater that infiltrates into the sewer through defects in pipes and manholes. GWI is typically seasonal in nature and remains relatively constant during specific periods of the year. RDI/I is storm water inflow and infiltration that enter the system in direct response to rainfall events. RDI/I can occur through direct connections such as holes in manhole covers or illegally connected roof leaders or area drains (called "direct inflow"), or through defects in sewer pipes, manholes, and service laterals. RDI/I typically results in short term peak flows that recede quickly after the rainfall ends. These three flow components are illustrated conceptually in **Figure 3-4**.

Figure 3-4: Wastewater Flow Components



3.4.2 Base Wastewater Flow

Existing base wastewater flows for Alameda were estimated at the parcel level (over 17,000 connected parcels) based primarily on parcel use information contained in the Alameda County assessor parcel database. Additional flows from new or anticipated future development and redevelopment, originally identified in the 2010 study, were updated based on information provided by City Planning Services staff.

Existing Flows

Existing BWF was determined based on assessor parcel data using the Parcel Use Code (PUC) and other information (number of dwelling units, building square footage) contained in the database. Each parcel was also assigned a user type for purposes of assigning unit flow rates and diurnal BWF profiles (discussed later in this section). In some cases where the parcel was indicated as not vacant but dwelling units or building square footage were not populated in the assessor data, estimates were made based on the type of land use, number of addresses for the parcel (for multi-family parcels), or an assumed floor-area-ratio or FAR (typically 0.4) applied to the parcel size. The number of students for public schools and major private schools located in the Alameda were researched from available information on relevant websites, as were number of rooms for hotels, motels, and nursing homes. Many parcels identified as “exempt public agency” (PUC 300) did not have unit or building square footage information, so these were screened to determine type of use and data populated accordingly. All assumptions made to assign parcel land uses and quantities are documented directly in the model database.

The model database was configured such that the “population” field represents the number of dwelling units (for residential parcels), students (for schools), rooms (for hotels/motels and nursing homes), or square footage of building floor space (for office and commercial parcels), and corresponding unit flow factors were applied to compute the parcel BWF. The same unit flow factors as used in the 2010 study were applied for this model update. The flow factors are listed in **Table 3-2**. It is recognized that these factors, particular for residential flows, may be conservative and clearly higher than wastewater flow rates under current drought conditions. The factors likely represent a pre-drought condition, and may also be assumed to include some normal groundwater infiltration. As discussed later, the factors resulted in a reasonably good match to flow monitoring data from 2009/10 and 2010/11 winter seasons, which were used to calibrate the model.

Table 3-2: Base Wastewater Flow Unit Flow Factors

User Type	Flow Factor	Typical Use Type
Residential Single Family	240 gpd/DU	
Residential Multi-Family	170 gpd/DU	
General Commercial	0.1 gpd/sq. ft.	retail/offices/business park
Non-Residential High Use	0.5 gpd/bldg sq ft	restaurants/car washes
Non-Residential Medium Use	0.25 gpd/bldg sq ft	medical facilities/mixed uses
Non-Residential Very Low Use	0.02 gpd/bldg sq ft	warehouses/distribution centers
Schools	15 gpd/student	elementary/middle/high/college
Hotels/Motels	150 gpd/room	
Nursing Homes	150 gpd/room	

Future Flows

Although Alameda is largely built out, there are several areas of current and projected future development and redevelopment. The 2010 study developed estimates of potential future development based on information available at that time from EBMUD's 2040 Water Supply Management Program. A few of the future developments identified in 2010 have already been constructed and some are no longer likely. For this study, the future development estimates were confirmed and/or updated through review by City Planning Services staff. The developments are shown on **Figure 3-5** and listed in **Table 3-3**. Development names and relevant assumptions are also documented directly in the model database.

As with existing BWF, future development estimates were developed on a parcel basis (in some cases where multiple uses are projected on a single parcel, "dummy" parcels were created to subdivide the original parcel into the different land uses areas). BWF estimates for future development were computed using the same BWF unit flow factors as those applied for existing BWF, as shown in Table 3-2.

BWF Diurnal Profiles

In domestic wastewater systems, BWF varies throughout the day, typically peaking early on weekday mornings (later on weekends) and again in the evening hours in residential areas. BWF patterns in commercial and industrial areas depend on specific land use types but are typically characterized by a more uniform flow that lasts throughout working hours.

The variations in BWF on a typical day are represented by diurnal profiles. Diurnal profiles are defined by a set of hourly factors that are applied to the average BWF for each subcatchment. For Alameda, separate sets of diurnal profiles were defined for residential and non-residential development and for weekdays and weekends (for residential flow). A typical non-residential profile was applied to retail and service establishments that tend to have steady flows throughout normal business hours, including weekends. Business parks may have a similar weekday flow pattern as other non-residential uses, but may have lower flows during weekends. Therefore, a separate Business Park profile was used, primarily for the Harbor Bay Business Park. **Figure 3-6** shows the diurnal profiles used in the model, which are the same patterns as used for the 2010 study.

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Sources: ESRI Basemap

Legend

Future Developments or Redevelopments

Other Vacant Parcels

Alameda City Limit

City of Alameda
Sewer Master Plan

Figure 3-5a
Future Developments
(Alameda Island)

RMC water and environment

Legend

Future Developments or Redevelopments

Other Vacant Parcels

Alameda City Limit

0 1,000 2,000 Feet

City of Alameda
Sewer Master Plan

Figure 3-5b
Future Developments
(Harbor Bay Isle)

RMC water and environment

J:\Projects\0232 Alameda, City of\0232-013 Alameda Sewer MP Model Update (SJ)\G. GIS\MXDs\Fig3-5bNew FuDvpt.mxd

Sources: ESRI Basemap

Table 3-3: Potential Future Developments

No.	Name	Description
1	Coast Guard Housing	This parcel is the site of the former Coast Guard housing development. It is proposed for redevelopment to single-family residential. The size of the development area is approximately 36 acres and zoned for a maximum of 435 DUs.
2	Alameda Landing Phase II	Located north of Mitchell Avenue. Proposed redevelopment to approximately 400,000 SF of office space and 20,000 SF of commercial uses
3	Alameda Landing Resid. Phase II	Located north of Mitchell Avenue and currently vacant. Proposed for development of 56 DUs to be completed in 2016
4	Alameda Landing Resid. Phase I	Located west of Fifth St. and north of Willie Strargell Ave. 220 residential DUs (partially completed).
5	Shipways	Located at 1200 Marina Village Parkway, east of Invincible. Planned for residential development up to 30 DUs/acre, which may yield up to 146 DUs.
6	Del Monte	Planned for 380 residential DUs and 30,000 SF of commercial uses.
7	Encinal Terminal	Located north of Entrance Rd. Currently low intensity industrial uses. Potential redevelopment as mixed use with 234 residential DUs (likely multi-family) and 50,000 SF of non-residential uses.
8	Marina Cove II	Approximately 89 residential DUs (in construction)
9	City Maintenance Yard	Planned for redevelopment with 41 residential DUs.
10	Pennzoil Site	Located at Fortman Way and Grand St. Currently used as low intensity industrial uses. Size of redevelopment area is approximately 4.1 acres. Planned for future residential development at 21 DU/acre, yielding 78 units.
11	Alameda Marina	1801 Clement. Planned for 156 DUs on 8.66 acres.
12	Alameda Marina	2033 Clement. Planned for 240 DUs on 13.34 acres.
13		2100 Clement. Planned for 52 single family attached townhouse units.
14	Boatworks	Located north of Clement between Park and Blanding. Currently used as low intensity industrial uses. Proposed redevelopment as residential with 182 single-family DUs by 2017.
15	Former Ron Goode Toyota	1801 and 1825 Park St. Total of 20 residential units.
16	Housing Authority	2437 Eagle Ave. Affordable housing project with 22 single family attached units.
17	Mapes Ranch	11 single family DUs.
18	Esplanade	Located in Harbor Bay Business Park. Approximately 110,000 SF of business park office development on 9.2 acres.
19	VF Outdoor	55,288 SF service facility on 2.8 acres
20	Marriott Hotel	100-room hotel
21	Hampton Inn	New 72-room hotel expansion in detached building.
22	Potential hotel	Located West of Harbor Bay between Maitland and Garden. Currently vacant, approximately 5 acres. Potential hotel development (about 200 rooms) by 2020.

Note: Table does not include development on Alameda Point.

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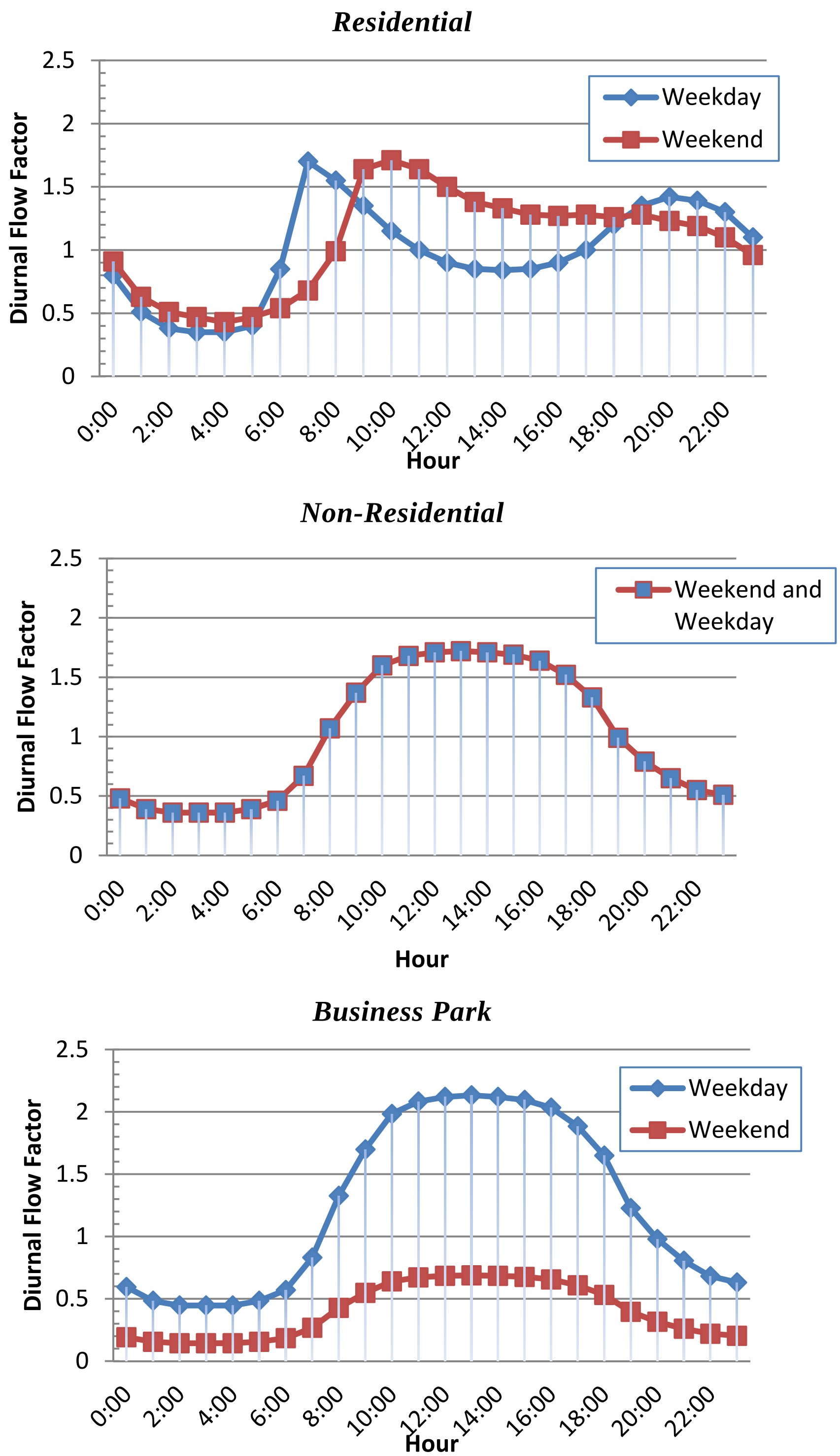
Figure 3-6: Diurnal Profiles



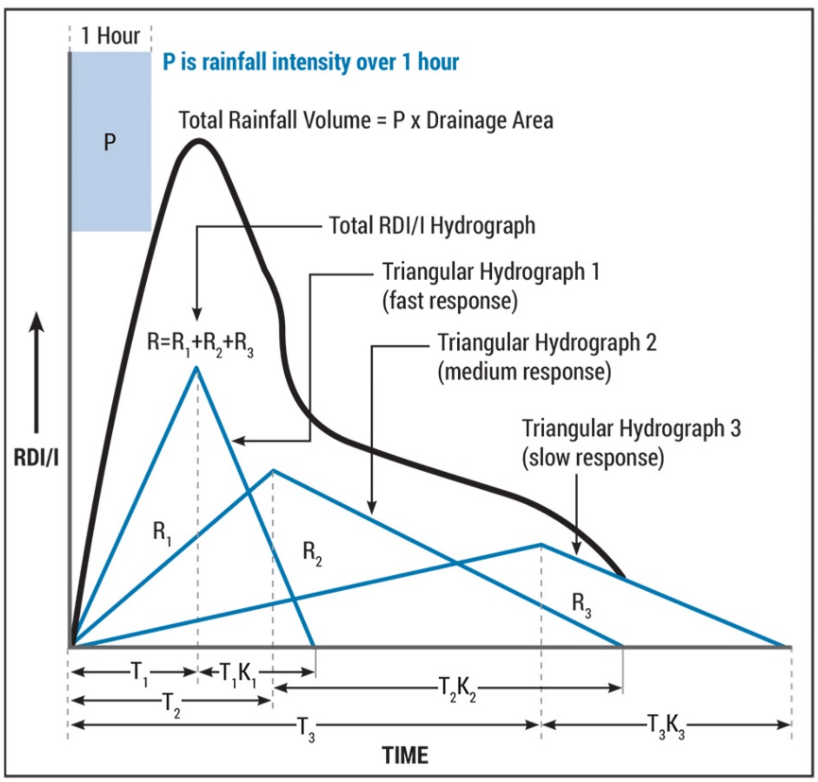
3.4.3 Groundwater Infiltration

GWI is typically applied in the model as a constant load in addition to the BWF. The amount of GWI in any particular area is determined during model calibration by comparing the modeled flows to actual observed non-rainfall period flows at points in the system where flow meter data are available. Where modeled is less than monitored flow, the difference may be due to GWI. The GWI determined at the monitoring location is then distributed to the meter tributary area on a per-acre basis. Note that because GWI is seasonal in nature, the modeled GWI represents an increase in GWI rate during the wet weather season rather than a dry season (summertime) GWI. As noted previously, the BWF unit rates used in the model are assumed to also include some baseline GWI.

3.4.4 Rainfall-Dependent I/I

RDI/I flows result from rainfall events that produce infiltration and inflow of storm water runoff into the sewer system. RDI/I flows are defined by the magnitude, shape, and timing of the RDI/I response. RDI/I varies depending on many factors, including the magnitude and intensity of the storm event, area topography, type of soil, and the condition of the sewers, manholes, and sewer service laterals. In a dynamic model, RDI/I is typically computed as a percentage of the rainfall (sometimes referred to as the "R value") falling on the contributing area of a subcatchment for each of three or more hydrograph components, representing different response times to rainfall, e.g., fast, medium, and slow, as illustrated in **Figure 3-7.** (The contributing area is assumed to be the sum of the area of all developed parcels, except for large open areas such as parks.) Summing all of the component hydrographs for the entire duration of the rainfall event results in the total RDI/I hydrograph for the event for that subcatchment. Note that although the "slow" RDI/I component can contribute significantly to the total RDI/I volume, the "fast" component has the biggest impact on the magnitude of the peak wet weather flow.

Figure 3-7: RDI/I Hydrograph Components



The model parameters defining the RDI/I flows to the system within a given meter area are determined by comparing modeled wastewater flow at the meter location to the measured wastewater flow during one or more rainfall events, as discussed in the model calibration section later in this chapter. The same calibrated parameters are generally applied to all subcatchments within each meter area.

3.5 Model Calibration

Model calibration is the process of comparing model-computed flows to observed (monitored) flows and adjusting various model parameters until the model is accurately simulating flows in the sewer system. The model was calibrated for both dry and wet weather conditions.

3.5.1 Dry Weather Calibration

Non-rainfall periods during the flow monitoring periods were used for comparing flow data to the model results. Periods that were not impacted by previous rainfall and in which a majority of the meters showed consistent readings were selected for dry weather calibration.

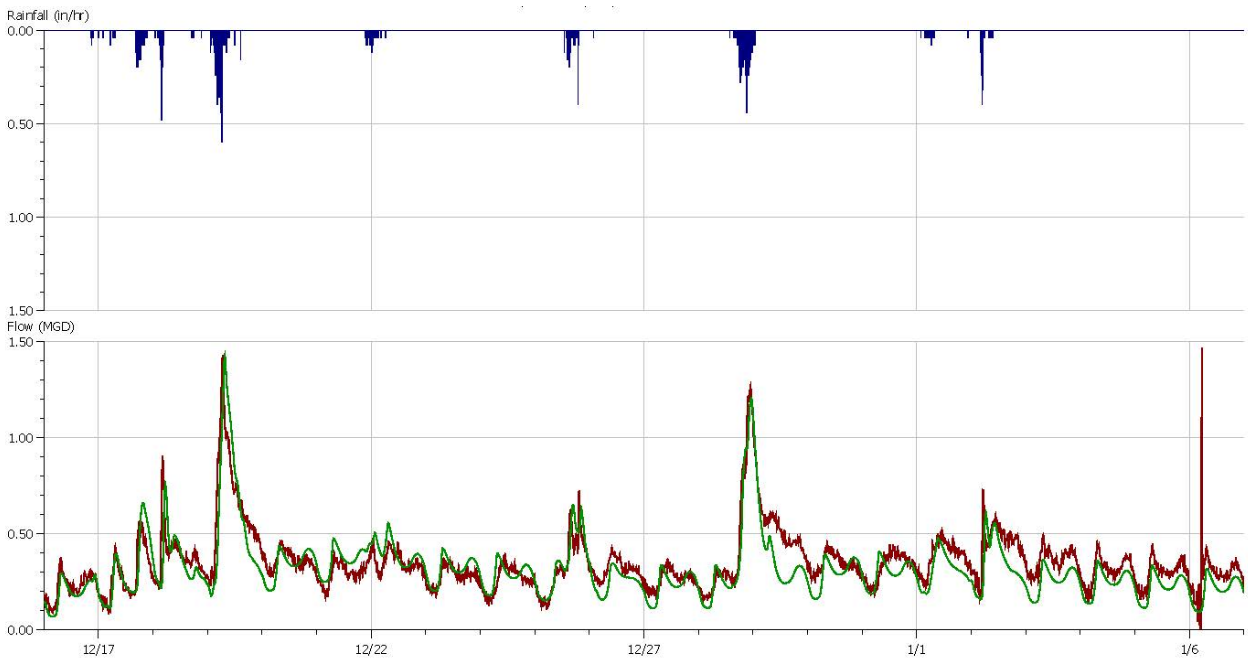
The primary focus of the dry weather calibration was to confirm that the calculated BWF based on the unit flow factors and diurnal curves applied for this study was generally consistent with the measured flows at the meter locations, and to identify which areas of the system appeared to have additional GWI above that reflected in the baseline BWF rates. Based on the comparison of metered to model-simulated flows over seven-day dry periods in January and early March 2011, GWI was added to the model for Basins 90B (except Alameda Landing area where the sewer infrastructure has been completely replaced), 96C1, 96C2, and 97 to achieve a reasonable match to the flow monitoring data overall. One exception was Meter 90-3 (Marina Village Lift Station influent), in which the modeled flows were significantly higher than monitored flows from 2011. It is likely that considerable development may have occurred in this area since the flow monitoring was conducted, resulting in the differences in flows at this location.

3.5.2 Wet Weather Calibration

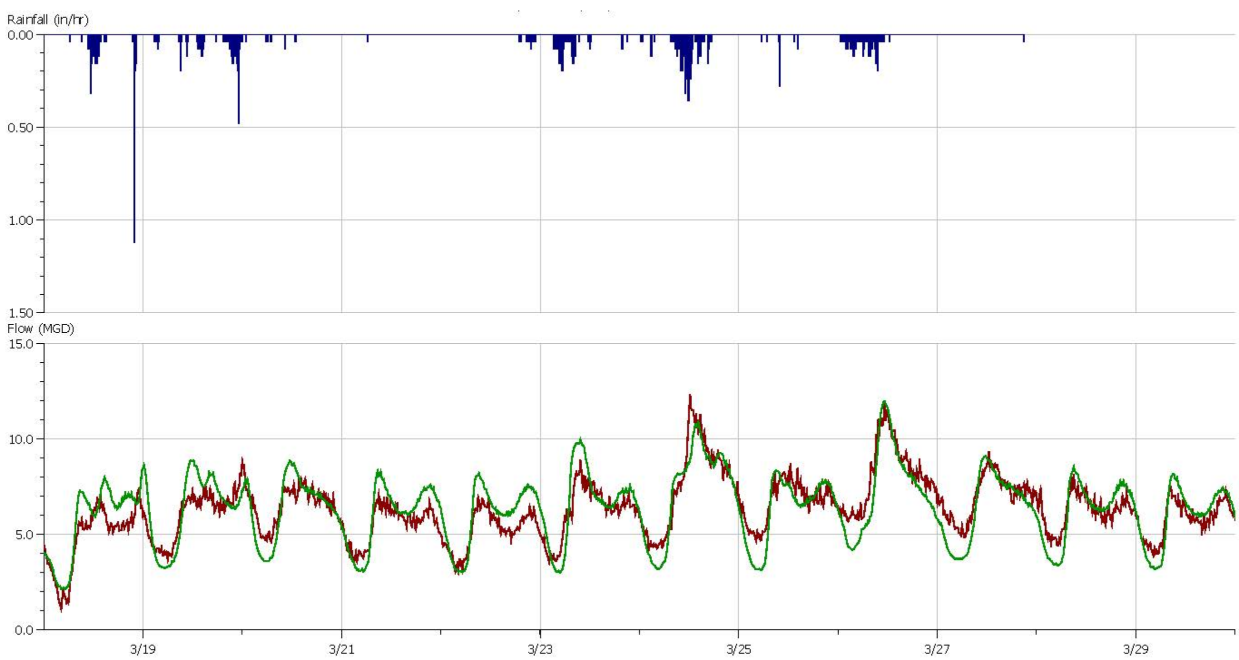
During wet weather calibration, parameters are adjusted to simulate the volume and timing of RDI/I for monitored storm events. Wet weather calibration focused on the December 2010 and March 2011 storm periods, when several significant storms occurred. The wet weather calibration resulted in a reasonably good match between modeled and metered flows for both peak and volume. **Figure 3-8** shows two examples of wet weather calibration graphs. The red line represent the observed (monitored) flow, and the green line represents the model-simulated flow. Rainfall is shown as the dark blue bars across the top of the plots.

Figure 3-8: Example Wet Weather Flow Calibration Graphs

Meter AL-1, December 2010



Meter 94-1, March 2011



3.6 Design Flow and Performance Criteria

Sewer system capacity is assessed with respect to the system's performance under a design flow condition. The subsections below define the design flow criteria used for the capacity assessment and the criteria for assessing system performance and identifying system capacity deficiencies.

3.6.1 Design Storm Condition

The use of wet weather design events as the basis for sewer capacity evaluation is a well-accepted practice. The approach is to first calibrate a hydraulic model of the system to match wet weather flows from observed storm(s), and then apply the calibrated model to a design rainfall event to identify capacity deficiencies and size needed improvement projects. The design event may be synthesized from rainfall statistics, or may be an actual historical rainfall event of appropriate duration and intensity. Other considerations for the design event include the spatial variation of the rainfall and the timing of the storm relative to the diurnal BWF pattern.

Selection of a design rainfall event is typically based on an allowable probability or frequency of occurrence (i.e., risk tolerance), often expressed as the return period. It is recognized that while wet weather overflows are highly undesirable, it is not cost-effective to provide capacity for the largest possible storm event. Regulatory agencies have not adopted standard criteria for return periods, so each agency must choose a target return period based on desired level of service, potential impacts of overflows, and cost.

EBMUD and the Satellites have historically used a design rainfall event that was selected during the 1980s wet weather I/I studies based on historical rainfall frequency analysis. The "EBMUD design event" is a historical storm that occurred on December 5, 1952, considered to be a 5-year return period rainfall event for durations of 1 to 5 hours. These durations are representative of RDI/I response and travel times in small to medium size collection system drainage areas, therefore considered to be appropriate for capacity analysis of the EBMUD satellite systems. The December 5, 1952 rainfall recorded at the Oakland Airport (1.57 inches over 7 hours with a peak hour intensity of 0.64 inches) is adjusted for other locations within the EBMUD service area based on mean annual precipitation. For Alameda, the adjustment factor is approximately 0.97, resulting in a total storm rainfall of 1.52 inches and a peak hour intensity of 0.62 inches.

Figure 3-9 shows a histogram of the design event rainfall for Alameda on an hourly basis. Note that the actual rainfall is modeled in 15-minute increments rather than the hourly increments that were used for the 1980s analyses. The peak hour rainfall was distributed into 15-minute intervals based on the 15-, 30-, and 60-minute return period statistics presented in the Alameda County Hydrology Manual. As such, the peak 15-minute rainfall for Alameda has a peak *intensity* of about 1.35 inches per hour, as shown in **Figure 3-10**.

Figure 3-9: Historical Design Rainfall Event for Alameda

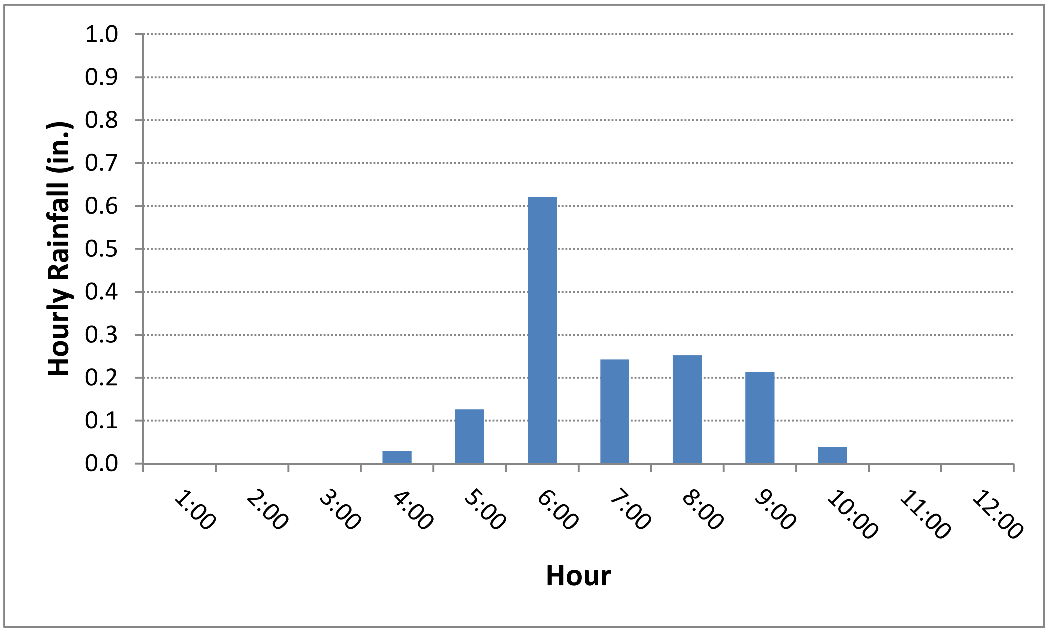
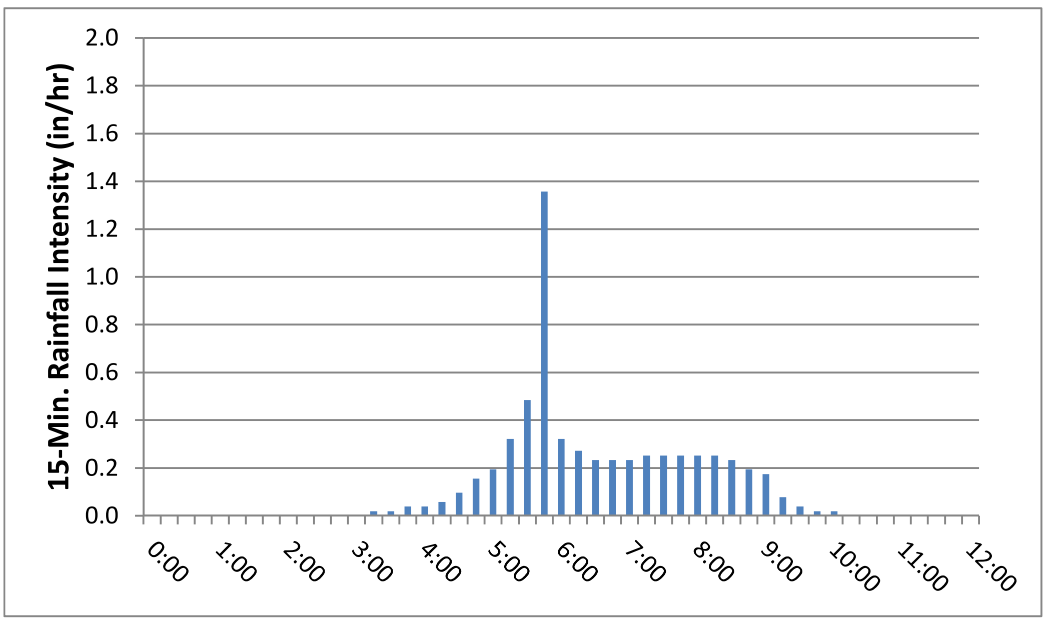


Figure 3-10: Design Event Rainfall Intensity



The timing of the design storm also affects the resultant peak wet weather flows. If the design storm is timed such that the peak RDI/I occurs at roughly the same time as the peak BWF ("peak-on-peak"), the total PWWF will be higher than if the design storm occurs under average or lower-than-average BWF conditions. For Alameda, the EBMUD design event is timed such that the peak rainfall occurs at approximately 8 a.m. on a weekend day (to reflect the slightly higher weekend morning peak in primarily residential areas), resulting in peak RDI/I occurring at or near the time of peak BWF flow (which typically occurs around 10 a.m. on a weekend) for most areas of the system. For business park areas on Harbor Bay Isle, the peak rainfall intensity of the design storm is timed to occur at about 11 a.m. on a weekday to reflect the higher mid-day base wastewater flows in that area.

The design event is also assumed to occur under saturated soil conditions, yielding maximum I/I response. This assumption, together with the timing of the storm to produce peak-on-peak results, is generally thought to create a return period of the peak wastewater *flow* that is greater than the return period of the design rainfall event.

3.6.2 Capacity Deficiency Criteria

Capacity deficiency or performance criteria are used to determine when the capacity of a sewer pipeline is exceeded to the extent that a capacity improvement project (e.g., a relief sewer or larger replacement sewer) is required. Capacity deficiency criteria are sometimes called "trigger" criteria in that they trigger the need for a capacity improvement project. These criteria may differ from "design criteria" that are applied to determine the size of a new facility, which may be more conservative than the performance criteria.

It is important that the capacity deficiency criteria be coordinated with the peak design flow criteria. For example, if the peak design flow considers only peak dry weather flow and little or no I/I, the deficiency criteria should be conservative (e.g., require pipes to flow less than full during dry weather flow to allow capacity for I/I that may increase the flow under a wet weather condition). On the other hand, if the peak design flow includes I/I from a large, relatively infrequent design storm event, it is appropriate to allow the sewers to flow full or even surcharged to some extent, since the peak flows will be infrequent and brief in duration.

For Alameda, since the design storm peak wet weather flow (PWWF) represents a relatively infrequent return period event, the City considers it acceptable to allow surcharging over the pipe crown, provided the hydraulic grade line (water level) remains at least five to six feet below the ground surface. During peak dry weather conditions, however, sewers should be able to convey the peak flow without surcharge.

3.7 Capacity Analysis Results

The hydraulic model was used to simulate flows for the design event and identify areas of the Alameda sewer system that fail to meet the specified performance criteria during predicted design event PWWF. No capacity deficiencies in the system were identified for dry weather conditions.

Under design PWWF conditions, the model shows several areas where backwater surcharge is predicted due to insufficient pump station capacity. The City has already planned for upgrades to these pump stations as part of its Pump Station Renovation program.

The only sewers with identified pipe capacity deficiencies are the 10-inch sewer in Harbor Bay Parkway upstream of the Harbor Bay Parkway I Pump Station, and the 12- and 15-inch sewers in Harbor Bay Parkway and Beach Road downstream of the pump station. The model indicates that the 10-inch sewer is predicted to be capacity deficient under existing design storm PWWF conditions; and the 12- and 15-inch sewers downstream of the pump station would be deficient in the future. These are the same areas identified as potential future capacity deficiencies in the 2010 study. Note that there are no predicted overflows in the model under either the existing or future PWWF scenarios.

"Solution model" runs were made with assumed improvements (pipe upsizing) to address the predicted pipe capacity deficiencies identified above. **Figure 3-11** shows the locations of these predicted pipe capacity deficiencies. **Appendix A** includes model plots of the hydraulic profile of the Harbor Bay Parkway and Beach Road sewer under future design event PWWF conditions with and without improvements.

For the "solution model" runs, pump stations were modeled without limiting capacity so as to be able to convey all flows reaching them to downstream pipes without backwater due to pump capacity limitations. **Table 3-4** summarizes PDWF and PWWF to each pump station compared to existing or planned firm and total capacity. A pump station should be able to convey the design peak flow with the largest pumping unit out of service (firm capacity). The table shows that all of the pump stations (other than those with only a single pump) have adequate existing or planned firm capacity. The five modeled pump stations that have only one pump, however, all have high level gravity bypass pipes which can prevent overflows if the pump is out of service or pump capacity is exceeded.

3.7.1 Capacity Deficiency LOF Scores

The results of the hydraulic modeling were used to assign Capacity Deficiency Likelihood of Failure (LOF) scores for modeled pipes. As shown in Table 2-1, scores were based on the magnitude of predicted sewer surcharge under design event PWWF conditions. The 10-inch sewer in Harbor Bay Parkway upstream of the Harbor Bay Parkway I Pump Station (between the two intersections with Loop Road) is predicted to surcharge to within 5 to 6 feet of the ground under existing PWWF conditions, therefore was assigned a capacity deficiency LOF score of 3. The pipe in Harbor Bay Parkway and Beach Road downstream of the pump station would only be surcharged under future flows, therefore was assigned a capacity deficiency LOF score of 2. All other pipes were assigned a score of 1 (no deficiency).

City of Alameda
Sewer Master Plan

Figure 3-11
Location of Model-Predicted Pipe Capacity Deficiencies

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Sources: ESRI Basemap

Table 3-4: Pump Station Capacities and Design Flows

Pump Station	No. of Pumps		Firm Capacity (mgd)	Max. Capacity (mgd)	Future PDWF (mgd)	Future PWWF (mgd)
Adelphian	2	*	0.29	0.52	0.036	0.11
Aughinbaugh	2		0.90	1.09	0.16	0.35
Bayview	1		--	0.78	0.046	0.074
BFI	2		4.25	4.69	1.42	3.00
Catalina	2	*	1.15	1.73	0.39	0.79
Channing	1		0.21	0.27	0.075	0.18
Cola Ballena	2		0.19	0.30	0.046	0.066
Dublin	2	*	0.38	0.50	0.11	0.27
Eighth/Portola	2		1.87	3.17	0.81	1.31
Eighth/Taylor	2		0.56	0.89	0.26	0.39
Grand Street	2		0.83	1.33	0.019	0.042
Grand/Otis	2	*	1.07	1.66	0.43	0.71
Haile	1		--	0.11	0.037	0.042
Harbor Bay Parkway I	3	*	1.87	3.17	0.59	1.27
Harbor Bay Parkway II	2		0.36	0.48	0.12	0.22
LS 6	2		0.47	0.75	0.27	0.46
Marina Village	4		2.10	2.24	0.36	0.46
Park/Otis	2	*	1.37	1.58	0.64	0.97
Pond/Otis	1		0.42	0.69	0.11	0.17
Sand Beach	1		--	0.06	0.063	0.11
Seaview I	2		0.34	0.54	0.037	0.081
Seaview II	1		--	0.14	0.029	0.069
Sheffield/Cumberland	1		--	0.06	0.040	0.097
Tideway	2	*	0.47	0.68	0.13	0.17
Triumph/Independence	2		0.31	0.50	0.11	0.14
Verdemar	2	*	0.35	0.69	0.12	0.20
Willow/Whitehall	2	*	0.36	0.72	0.23	0.30

* Capacity based on planned pump upgrades.
Pump capacity for BFI Pump Station provided by Waterworks Engineers; all others provided by Schaaf & Wheeler Engineers.

3.8 Alameda Point

As part of the development plan for Alameda Point, the City prepared a *Master Infrastructure Plan*[6] (MIP) that describes the proposed backbone infrastructure to serve the area, including the sewer collection system. As part of this effort, flow estimates were developed for the development project site, and a hydraulic model of the proposed trunk sewer system was created and used to confirm the adequacy of the proposed sewer infrastructure. The model utilized flow parameters and hydraulic criteria consistent with the modeling for the rest of the City's sewer system that are described in this chapter of the report. The modeling methodology and results were summarized in a technical memorandum[7], which is also included as an appendix to the MIP.

The existing sewer system serving Alameda Point was largely constructed by the U.S. Navy over the past 70 years. The system includes about 14 miles of gravity sewers, 2 miles of force mains, and 15 sewer pump stations. All flow is conveyed to EBMUD's Pump Station R, located on the north side of Alameda Point adjacent to Navy Way, from where it is pumped through a 20-inch force main to the Alameda siphon inlet structure. Because most of the sewer infrastructure will be replaced as part of the Alameda Point development, and the sewer attribute data (rim and invert elevations, etc.) for the existing system were incomplete, only the proposed system and future scenarios (described below) were included in the modeling work.

The ultimate development of Alameda Point is expected to include over 1,400 residential dwelling units and 5.5 million square feet of commercial floor space. The development is expected to take place in stages, with the portion identified as the "Development Area", largely located on the eastern side of the site, being developed first with all new sewer infrastructure. Development of the remainder of the site, called the "Reuse Area," would proceed incrementally over time, initially making use of the existing infrastructure with some rehabilitation to address existing deficiencies and reduce I/I. Ultimately, new sewer infrastructure would also be constructed in the Reuse Areas as well.

Accordingly, three model scenarios were analyzed for Alameda Point

- **Scenario A –** Full development in the Development Area with new sewer infrastructure conveying flow to Pump Station R; existing uses in the Reuse Area utilizing existing sewer infrastructure but tying into major trunks constructed as part of the Development Area to convey flow to Pump Station R.
- **Scenario B –** Scenario A plus additional development in the Reuse Area, but still utilizing existing sewer infrastructure with some rehabilitation to address deficiencies and reduce I/I.
- **Scenario C -** Full development and all new sewer infrastructure in both the Development and Reuse Areas.

Figure 3-12 depicts the modeled sewer network and subcatchments. Based on the model analysis, the proposed backbone sewer network as developed in the MIP would be adequate to convey the Alameda Point flows to Pump Station R.

[6] Alameda Point Master Infrastructure Plan, Carlson, Barbee & Gibson, March 2014.
[7] Technical Memorandum - Draft, Alameda Point Sanitary Sewer Flow Estimates and Modeling, RMC Water and Environment, June 2013.

Legend

- E EBMUD Pump Station R
- L Lift Station
- Modeled Sewer Scenario A & B
- Additional Modeled Sewer Scenario C
- Development Area
- Reuse Area

City of Alameda
Sewer Master Plan

Figure 3-12
Alameda Point
Proposed Sewer System
Modeled Network

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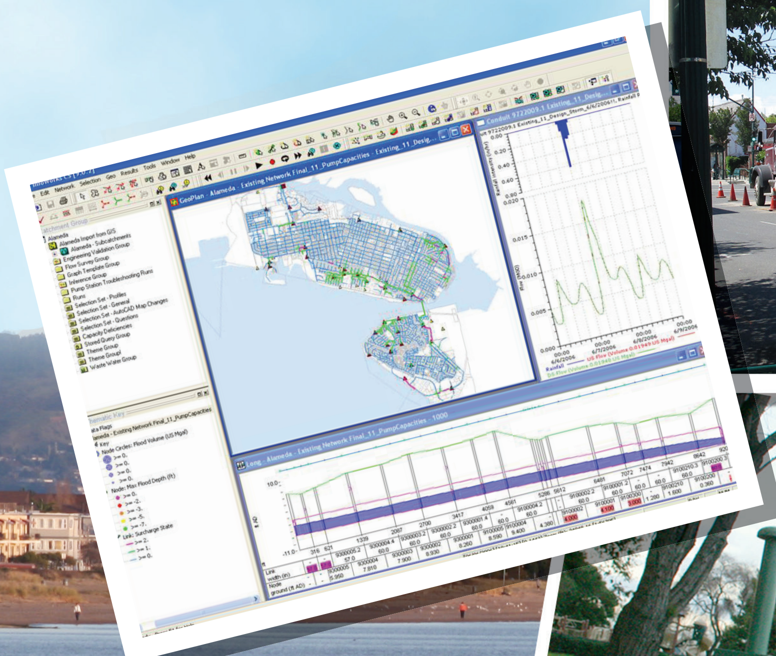
Sources: ESRI Basemap

Chapter Four
Condition Assessment



Chapter 4 Condition Assessment

This chapter provides a brief summary of the overall physical condition of the Alameda sewer system based on closed-circuit television (CCTV) inspection results, and presents the methodology used to determine Structural Condition Likelihood of Failure (LOF) scores for the Pipe Rating Model. The condition assessment focuses on the structural condition of the sewer pipes. The City also conducts manhole inspections and addresses any acute problems as they are found. However, since manholes are replaced or rehabilitated along with sewer mains as part of sewer rehabilitation and replacement projects, manhole condition was not specifically used as a parameter in the asset risk assessment and prioritization of sewer rehabilitation projects.

4.1 CCTV Inspection Program

CCTV inspection is the basic method used by the City to gather the data required to assess sewer condition. The City's CCTV inspection program was initiated in 2009, and seven phases of the program were conducted over the past seven years by contractor, with the majority of the work completed in 2014-15. The City also purchased its own CCTV inspection camera and data collection software and equipment in 2011, and conducted some inspections in 2011 and 2012, but primarily uses the equipment for maintenance troubleshooting and other activities rather than formal condition assessment. The inspections (both by contractor and City) include digital capture of CCTV data, video, and still images using Granite XP sewer inspection data management software.

4.2 Condition Grading and LOF Scores

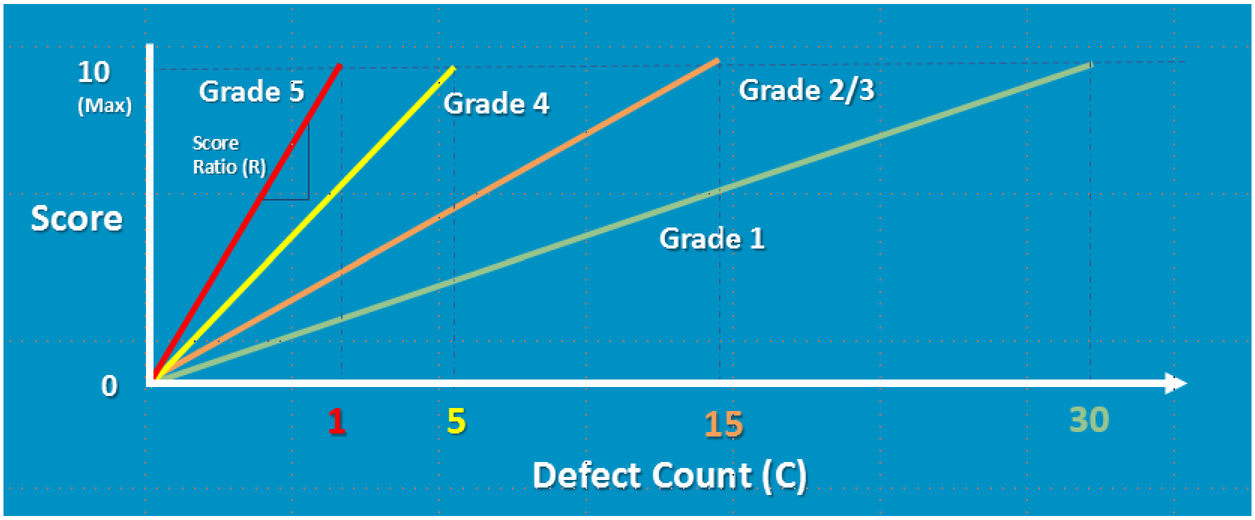
The City uses the Pipeline Assessment and Certification Program (PACP) system developed by the National Association of Sewer Service Companies (NASSCO), which has become the standard of the industry for sewer condition assessment. PACP utilizes standard observation codes to describe different types of structural and maintenance-related defects and construction features, with defect grades assigned to each defect based on its type and severity.

Under the PACP standard, all structural defects are assigned a Structural Grade of 1 to 5, with Grade 5 representing severe defects and Grade 1 representing minor defects. (Maintenance defects are assigned similar O&M grades.) The grades for individual defects observed on a manhole-to-manhole pipe segment can be combined in various ways to determine an overall structural condition rating for the pipe. The PACP manual suggests several approaches for this purpose, including summing the grades of all defects or averaging the grades. While such approaches may be useful for screening pipes in terms of overall condition, they may not be particularly useful for prioritizing pipe replacement. What is most important in such decisions is the presence of major defects and the number of such defects. For example, a single Grade 5 defect in a pipe may require immediate action, while five Grade 1 defects would not, even though they both have a PACP overall segment grade score of 5.

For the purposes of evaluating the Likelihood of Failure (LOF) resulting from structural defects, a scoring system that consolidates the PACP grades was developed for this study. The scoring system provides a single 'structural grade score' based on the CCTV data which ranges from 0 to 10 and accounts for multiple defect ratings and the number of defects. Although a high maximum structural grade is a good indicator of the need for a near-term pipe rehabilitation or repair, the number and severity of other defects in the pipe should also be considered. Therefore, the calculation of the structural grade score gives higher score values for more severe defects but still considers the number of less severe structural defects. Using this approach, all pipes with at least one Grade 5 structural defect are given the maximum structural grade score of 10, but lesser grade defects can also contribute to the structural grade score depending on the number and grade of these defects. **Figure 4-1** illustrates the computation of structural grade scores. The Structural Condition

LOF score is then determined based on the range in which the structural grade score falls, as shown in Table 2-1.

Figure 4-1: Computation of Structural Grade Scores



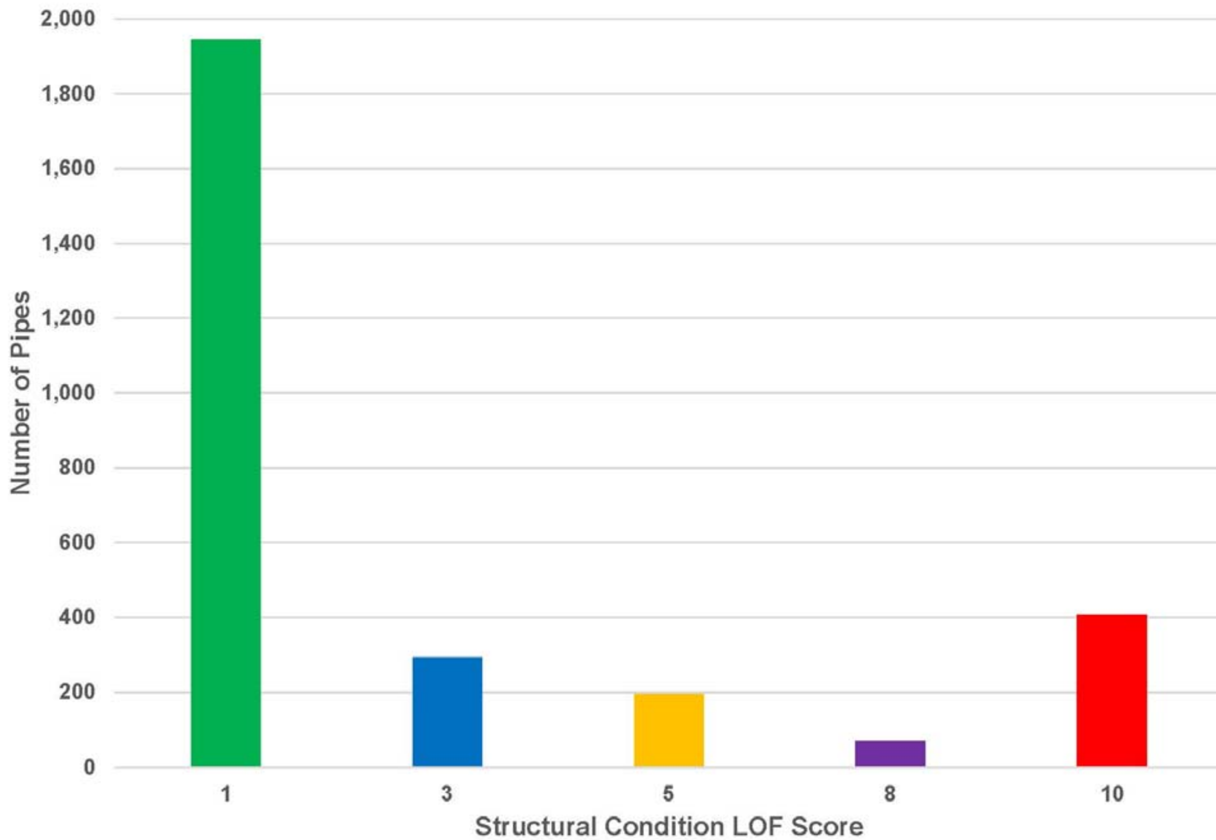
- Grade score = Score Ratio (R) x Defect Count (C)
- Total Structural Grade Score = (R_5 x C_5) + (R_4 x C_4) + ($R_{2/3}$ x $C_{2/3}$) + (R_1 x C_1)
- Maximum score = 10

In addition to structural condition, a pipe may be assigned an O&M grade score if the CCTV data shows significant O&M defects such as grease, debris, or root intrusion. The O&M grade score is based on a similar calculation approach as the structural grade score except the Grade 4 and 5 defects are combined and the score ratios are lower. As with the Structural Condition LOF, the O&M Condition LOF score is then determined based on the range in which the O&M grade score falls, as shown in Table 2-1.

4.3 Condition Assessment Results

Figure 4-2 is a chart showing the overall distribution of the Structural Condition LOF scores for the system, and **Figure 4-3** provides a map showing the Structural Condition LOF score each inspected sewer pipe. Note that the Structural Condition LOF scores for pipes that have not yet been inspected (approximately 450 pipes or about 15 percent of the sewers in the system) were estimated based on the age of the pipe (these scores are not shown on the map but are included in the graph in Figure 4-2). As shown in the graph, over 75 percent of the pipes in Alameda's sewer system have low Structural Condition LOF scores (1 or 3), indicating that they are in good condition. These are primarily the sewers that have been rehabilitated or replaced over the past 30 years and newer sewers (e.g., constructed with plastic materials since the 1970s). Almost 15 percent of the pipes have a score of 10, indicating that their structural condition is poor or is likely to be poor due to age, and are in need of near-term rehabilitation or replacement.

Figure 4-2: Distribution of Structural Condition LOF Scores



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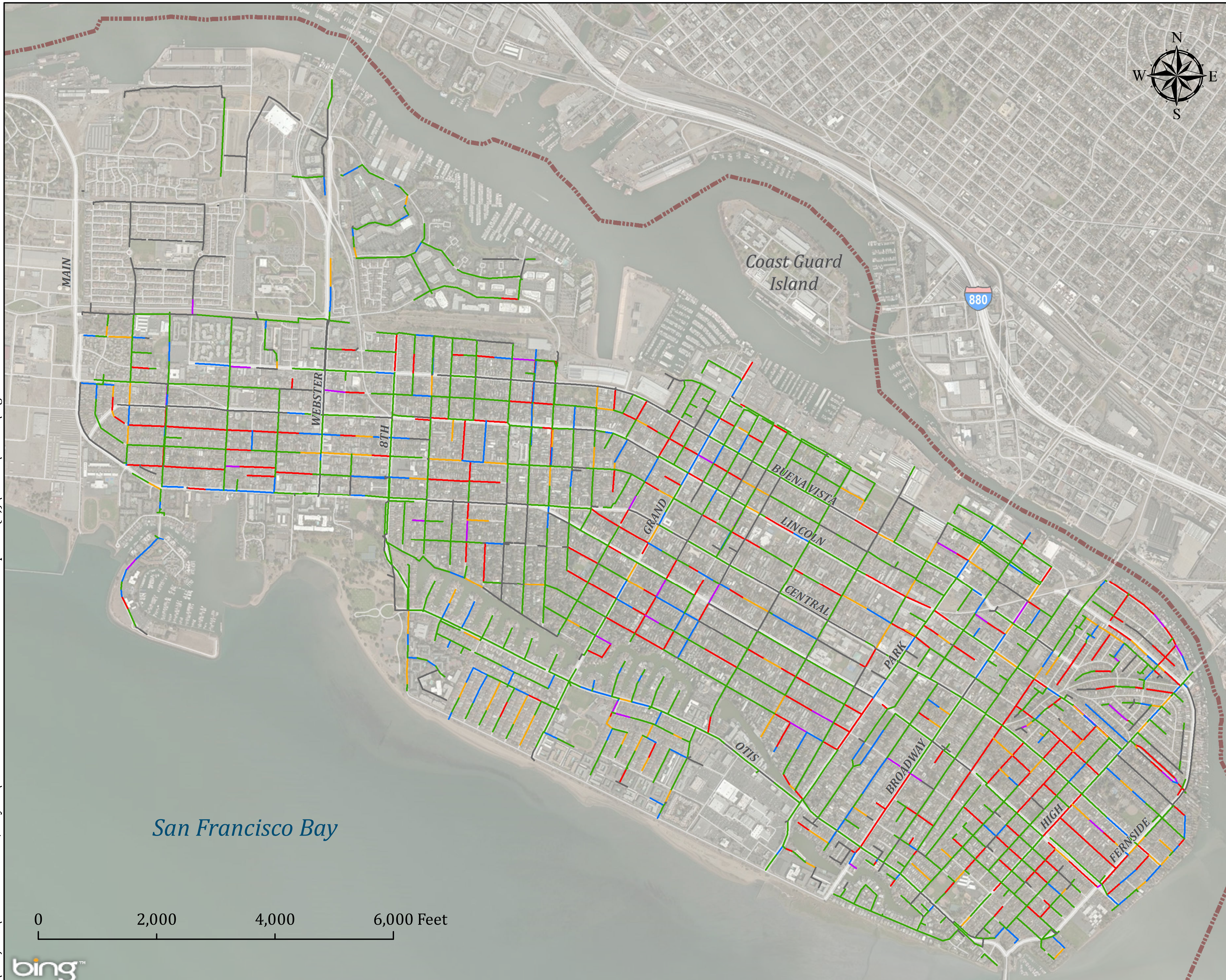

Legend

Likelihood of Failure (LOF) Scores

- 10
- 8
- 5
- 3
- 1
- Not Inspected
- Alameda City Limit

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Sewer Master Plan

Figure 4-3a
Structural Condition LOF Scores of Inspected Sewers (Alameda Island)

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Sources: ESRI Basemap

City of Alameda
Sewer Master Plan

Figure 4-3b
Structural Condition LOF Scores of Inspected Sewers (Harbor Bay Isle)

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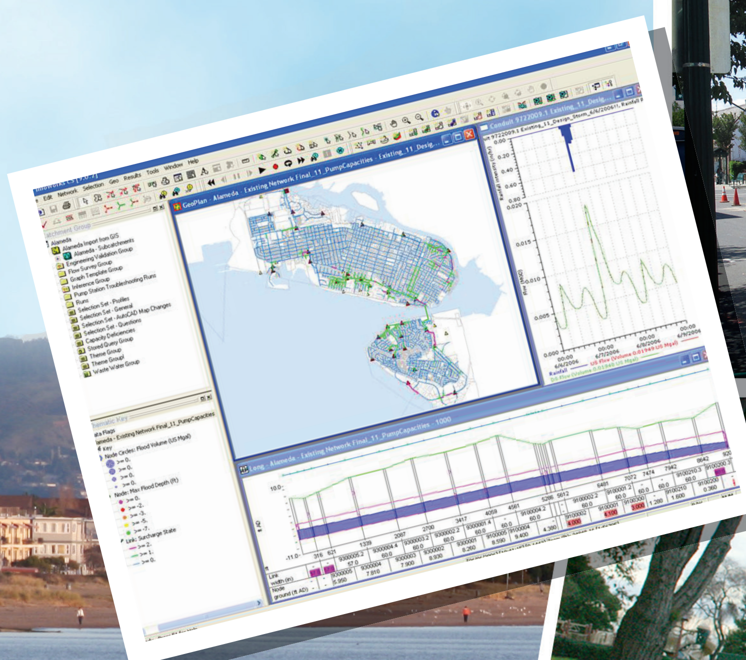
Sources: ESRI Basemap

Chapter Five

Recommended Capital Improvement Program



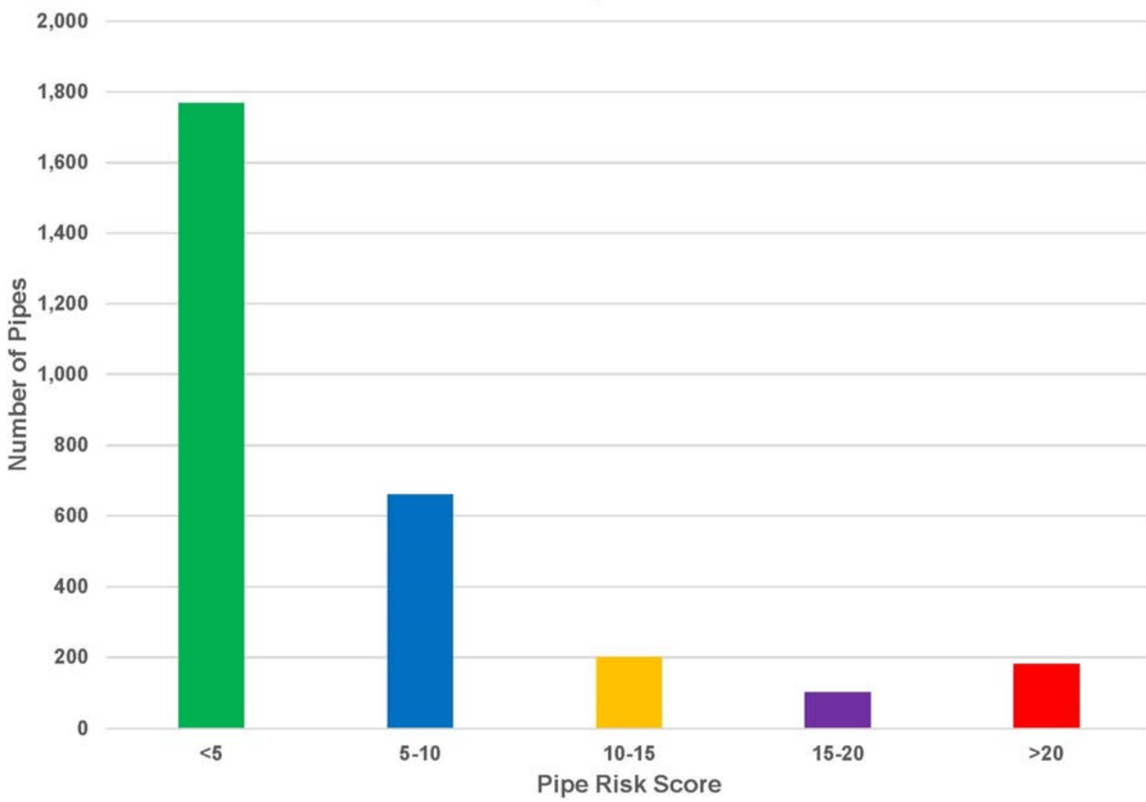
Chapter 5 Recommended Capital Improvement Program

The previous chapters of this report presented the results of the capacity and condition assessments of the Alameda sewer system and the methodology used in the City's Pipe Rating Model to assess the relative risk of sewer failure in order to provide information to help prioritize pipes for rehabilitation and replacement. This chapter presents the Pipe Rating Model results, describes the approach for using those results and other information to define and prioritize rehabilitation projects and schedules, and presents the recommended 20-year Capital Improvement Program (CIP) including estimated costs and schedule for improvements.

5.1 Pipe Rating Model Results

The Pipe Rating Model was used to calculate the total risk score for each City-owned gravity sewer pipe in the Alameda sewer system. The risk scores represent the product of the Likelihood of Failure (LOF) and Consequence of Failure (COF) for each sewer pipe, considering its structural condition, capacity requirements, size, location, and other risk factors, as described in Chapter 2. **Figure 5-1** is a chart showing the overall distribution of the risk scores for the system, and **Figure 5-2** provides a map showing the risk score of each sewer pipe. A detailed tabulation of sewer inventory data and the LOF, COF, and total risk scores for each gravity sewer mainline pipe in the system is included in **Appendix B.**

Figure 5-1: Distribution of Sewer Pipe Risk Scores



It should be noted that some pipes that have previously been rehabilitated or are of relatively recent construction (as evidenced by plastic pipe materials) do have structural defects noted in the CCTV inspection data which results in an elevated Structural Condition LOF score, indicating that they may be in need of spot repairs or in some cases more extensive rehabilitation. Many of these defects are sags, which are primarily maintenance-related issues but have not been found to result in any problems to date. The City will evaluate these pipes on a case-by-case basis to determine what, if any, action is needed; and some may be added to the rehabilitation projects if the need for corrective action is indicated.

5.2 Sewer Rehabilitation Costs

The City's approach to sewer rehabilitation involves complete replacement of the sewer main and associated manholes and lower laterals. Replacement is typically done by open-cut remove-and-replace construction, but pipe bursting may be used if appropriate, and pipes are generally replaced with either HDPE or PVC pipe.

To develop average unit costs for sewer rehabilitation for use in estimating the costs of sewer projects for the CIP, recent construction bids from City sewer projects and similar projects constructed by nearby cities were reviewed. All of these projects involved primarily open-cut replacement or pipe bursting of primarily smaller diameter sewers with replacement of associated manholes and lower laterals.

Based on this review, two sets of unit costs were developed for Alameda: costs for construction in areas with relatively stable soil conditions, and costs for construction in areas with more unstable soils (e.g. fill material) and higher groundwater levels, characteristic of areas on the perimeter of the main Alameda Island and much of Harbor Bay Isle. Construction in these poor soil areas may require more substantial trench shoring (e.g., sheet piles for deeper excavations) and more extensive dewatering.

The basic unit construction costs assume open-cut sewer main replacement, and include replacement of manholes and lower laterals and installation of cleanouts at the property line. The unit costs include associated construction costs (mobilization/demobilization, traffic control, bypass pumping, post-construction video and testing, etc.). Total estimated construction costs include an 8 percent minimum allowance for contingencies, plus a 15 percent allowance for design engineering and construction management (based on experience from City's recent projects). Unit costs for construction in poor soil conditions were developed by applying a higher contingency allowance to the basic unit construction costs, ranging from 20 percent for 8-inch sewers to 70 percent for larger (21- to 30-inch) pipes, which are typically deeper. Based on these factors, the net capital costs for construction in poor soils would be 10 to 50 percent higher than construction in stable soils, depending on pipe diameter. The unit costs are shown in **Table 5-1.** Note that costs for deeper construction and/or pipes in poor soils areas could potentially be reduced by use of trenchless methods, which would be evaluated during project design.

The cost estimates presented in this report are planning or conceptual level estimates, and are considered to have an estimated accuracy range of -30 to +50 percent. This level of accuracy corresponds to an "order of magnitude" or "Class 5" cost estimate as defined by the American Association of Cost Estimators. These estimates are suitable for use for budget forecasting, CIP development, and project evaluations, with the understanding that refinements to the project details and costs would be necessary as projects proceed into the design and construction phases. All estimates presented in this report are assumed to represent current (FY2015/16) construction costs for the San Francisco Bay Area.

Legend

Risk Scores:

- >20
- 15-20
- 10-15
- 5-10
- <5
- Alameda City Limit

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Figure 5-2a
Sewer Pipe Risk Scores
(Alameda Island)

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J:\Projects\0232 Alameda, City of\0232-013 Alameda Sewer MP Model Update (SJ)\G. GIS\MXDs\Fig5-2a RiskScores.mxd

Sources: ESRI Basemap

Legend

Risk Scores:

- >20
- 15-20
- 10-15
- 5-10
- <5
- Alameda City Limit

0 1,000 2,000 Feet

City of Alameda
Sewer Master Plan

Figure 5-2b
Sewer Pipe Risk Scores
(Harbor Bay Isle)

RMC water and environment

J:\Projects\0232 Alameda, City of\0232-013 Alameda Sewer MP Model Update (SJ)\G. GIS\MXDs\Fig5-2b RiskScores.mxd

Sources: ESRI Basemap

Table 5-1: Sewer Replacement Unit Costs

Pipe Size (in.)	Basic Unit Construction Cost ($/ft)[a]	Total Capital Cost ($/ft) Stable Soils[b]	Total Capital Cost ($/ft) Poor Soils[c]
8	280	344	378
10	295	363	472
12	312	384	499
15	325	400	520
18	337	415	539
21	307	378	568
24	346	426	640
27	384	472	710
30	422	519	781

a. Assumes open-cut pipe replacement, including replacement of manholes and lower laterals.
b. Includes 8 percent allowance for contingencies plus 15 percent of basic unit construction for engineering design and construction management.
c. Includes 20 to 70 percent allowance for contingencies (based on pipe size) plus 15 percent of basic unit construction cost for engineering design and construction management.

5.3 Sewer System Capital Improvement Program

The sewer system capital improvement program (CIP) includes three components: sewer rehabilitation, sewer capacity improvements, and pump station renovation.

5.3.1 Sewer Rehabilitation Projects

The sewer rehabilitation CIP was developed based on the following three primary criteria:

- Meet the minimum annual sewer rehabilitation footage requirements of the Consent Decree.
- Maintain consistency with the City's annual capital improvement budget based on the financial plan and sewer service charge schedule that has been adopted by the City Council.
- Prioritize sewers for rehabilitation based on risk scores as calculated by the Pipe Rating Model and other factors such as pipe material, pavement condition, and proximity.

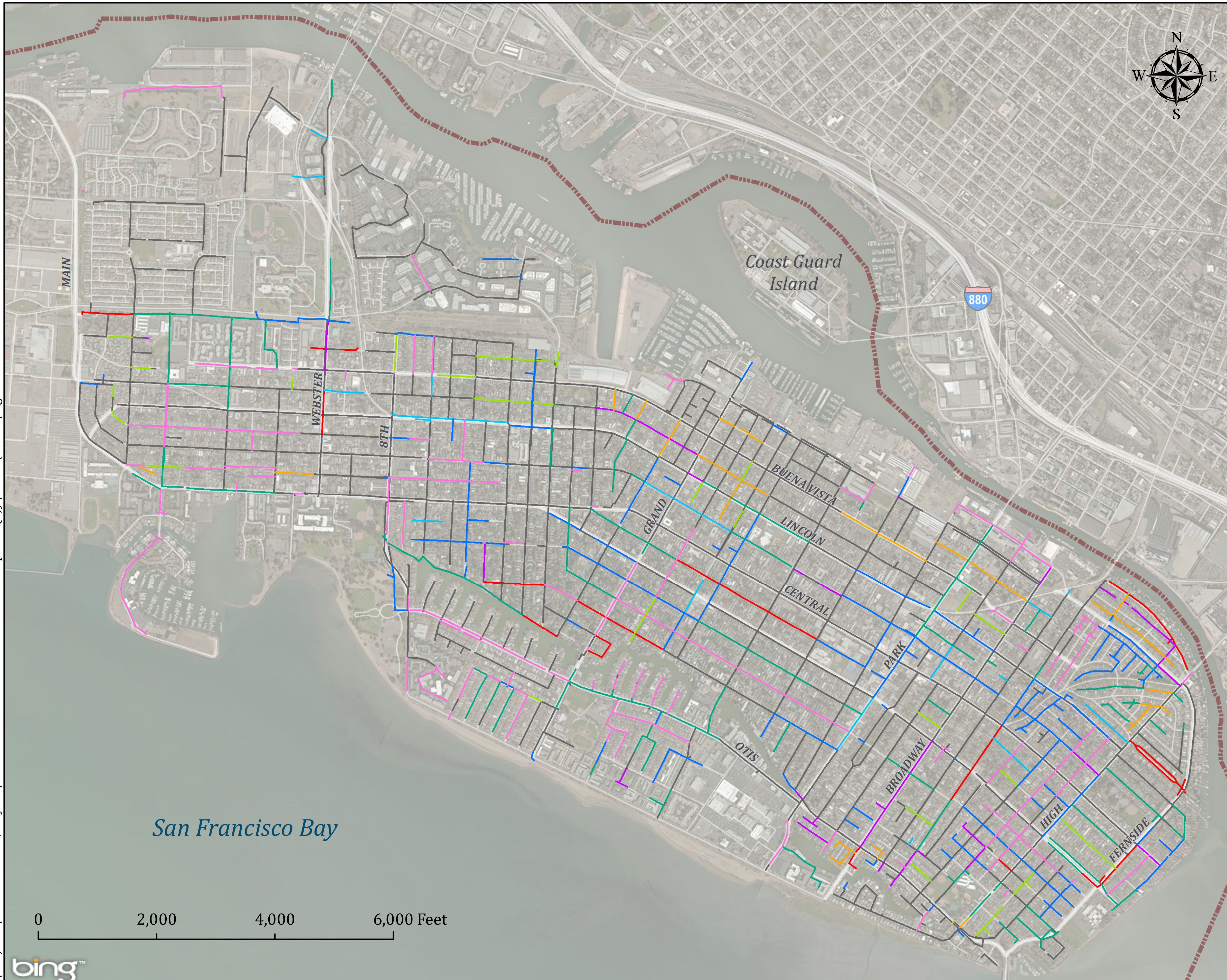
The City's FY15/16 annual capital budget available for sewer rehabilitation projects is approximately $5,450,000 (the budget provides for a 3 percent annual increase over the following four years). This budget would be adequate to meet Consent Decree footage requirements (2.6 miles per year on a cumulative basis) at a current average sewer rehabilitation cost of $397/ft assuming that the 3 percent annual increase in sewer rates is extended in five-year increments for the duration of the Consent Decree. Because some projects will have lower cost and some higher, the challenge is to find the most appropriate balance of cost and footage while still adhering to overall rankings indicated by the Pipe Rating Model risk scores to the extent possible and incorporating other factors as noted above.

Table 5-2 presents the recommended 20-year sewer rehabilitation CIP developed by RMC and City staff by application of the three guiding criteria described above, and **Figure 5-3** shows the location of the proposed projects. Based on this program, by the end of 20 years the City will have rehabilitated or replaced over 75 percent of its gravity sewer system. The City may elect to modify the CIP schedule as needed to accommodate budget constraints and changes in project priorities as additional inspection data and other information are collected over time. Such information may include coordination with street paving or other infrastructure or utility projects; new or recurring maintenance problems in the system; or incorporate specific information provided by EBMUD as to priority areas for focusing I/I reduction efforts.

Table 5-2: Proposed 20-Year Sewer System Rehabilitation CIP

Project Year	Fiscal Year	Length of Pipe (miles)	Estimated Capital Cost ($ Million)[a]
1	FY 15/16	3.33	6.97
2	FY 16/17	2.78	5.41
3	FY 17/18	2.73	5.29
4	FY 18/19	2.80	5.40
5	FY 19/20	2.89	5.41
6	FY 20/21	2.84	5.54
7	FY 21/22	2.95	5.52
8	FY 22/23	2.71	5.37
9	FY 23/24	2.81	5.38
10	FY 24/25	2.41	5.47
11	FY 25/26	2.52	5.56
12	FY 26/27	2.47	5.48
13	FY 27/28	2.72	5.50
14	FY 28/29	2.61	5.54
15	FY 29/30	2.70	5.43
16	FY 20/31	2.72	5.39
17	FY 31/32	2.51	5.37
18	FY 32/33	2.90	5.48
19	FY 33/34	2.56	5.49
20	FY 34/35	2.60	5.51
Total 20-year CIP		**54.6**	**105.0**

a. Estimates represent current (FY2015/16) costs.



City of Alameda
Sewer Master Plan

Figure 5-3a
Recommended
Sewer Rehabilitation CIP
(Alameda Island)

SEAL OF THE CITY OF ALAMEDA INCORPORATED 1854

RMC water and environment

Sources: ESRI Basemap

Legend

Project Year

- 1
- 2
- 3
- 4
- 5
- 6-10
- 11-15
- 16-20
- Not Scheduled
- Alameda City Limit

City of Alameda
Sewer Master Plan

Figure 5-3b
Recommended
Sewer Rehabilitation CIP
(Harbor Bay Isle)

J:\Projects\0232 Alameda, City of\0232-013 Alameda Sewer MP Model Update (SJ)\G. GIS\MXDs\Fig5-3b CIPs.mxd

Sources: ESRI Basemap

5.3.2 Capacity Improvements

As noted in Chapter 3, the model indicates that the 10-inch sewer in Harbor Bay Parkway upstream of the Harbor Bay Parkway I Pump Station is predicted to be capacity deficient under existing design storm PWWF conditions; and the 12- and 15-inch sewer downstream of the pump station would be deficient in the future. Two capacity improvement projects are recommended to address these potential deficiencies, as listed in **Table 5-3**. However, it is recommended that the City monitor these locations before constructing improvements to confirm the capacity issues under peak wet weather flows.

Table 5-3: Proposed Sewer Capacity Improvement Projects

Project ID[a]	Project Name	U/S MHID	D/S MHID	Description	Estimated Capital Cost ($)[b]
C1	Harbor Bay Parkway Sewer Capacity Improvement	10110117	10110109	Replace approx. 1,535 lf of 10" pipe with 15" pipe on Harbor Bay Pkwy. between Loop Road and Harbor Bay Pkwy. I PS	798,000
C2	Harbor Bay Parkway/Beach Road Sewer Capacity Improvement	10110108	10013219	Replace approx. 2,900 lf of 12" pipe with 15" pipe and 900 lf of 15" pipe with 18" pipe on Harbor Bay Pkwy. and Beach Rd. downstream of Harbor Bay Pkwy. I PS to Seminary Ave.	1,993,000

c. Projects C1 and C2 were identified as Projects C-3 and C-4, respectively, in the 2010 *Sewer System Hydraulic Model Analysis* report.
d. Costs calculated based on open-cut pipe replacement in poor soil conditions per unit costs shown in Table 5-1. Construction using trenchless techniques such as pipe bursting may be feasible and less costly. Estimates represent current (FY2015/16) costs.

5.3.3 Pump Station Renovation

The City has conducted extensive assessments of its sewer pump stations as part of separate studies. Information on estimated peak wet weather flows from hydraulic modeling have been considered in developing recommendations for pump station improvements, as well as other considerations including safety, reliability, structural condition, and ease of operation and maintenance. The City's 2012 *Pump Station Renovation Plan* developed a program for pump station improvements to be implemented in approximately five phases. Pump stations were grouped according to priority for improvements. The current program, which has been modified since the original Pump Station Renovation Plan, includes six pump station groups, proposed for construction through FY 2019/20. (Note: the first group of pump station improvements, which included Aughinbaugh, BFI, Channing, Eighth/Portola, and Pond/Otis pump stations, has already been completed). **Table 5-4** presents the remaining pump station improvement groups, target schedule, and estimated costs. The pump station improvements vary by station but may include new pumps, conversion to submersible pumps, relocation, or re-building. Standardization of pumps and equipment has also been a major objective of the pump station renovations.

Table 5-4: Pump Station Renovation CIP

Group	Pump Station/Item	Estimated Capital Cost ($)	Est. Construction Schedule
2	Adelphian	346,200	
	Verdemar	265,700	
	Harbor Bay Parkway II	408,100	
	Willow/Whitehall	634,600	
	Haile	169.700	
	Bay Fairway	219,500	
	Contingency	306,500	
	Subtotal	**2,350,400**	**FY 15/16**
3	Seaview I	124,700	
	Seaview 2	134,500	
	Eastshore Myers	128,387	
	Bayview	151,287	
	Sand Beach	146,200	
	Encinal Boat Ramp	122,800	
	Triumph/Independence	153,100	
	Lift Station 6	27,800	
	Grand	27,800	
	Subtotal	**1,016,800**	**FY 16/17**
4	Harbor Bay Parkway I	850,000	
	Cola Ballena	850,000	
	Marina Village	1,000,000	
	Catalina	850,000	
	Grand/Otis	850,000	
	Park/Otis	850,000	
	Subtotal	**5,250,000**	**FY 16/17 to 18/19**
5	Sheffield-Cumberland	500,000	
	Eighth/Taylor	540,000	
	Tideway	670,000	
	Eighth/Portola	800,000	
	Willow	400,000	
	Dublin	150,000	
	Subtotal	**3,060,000**	**FY 18/19 to 19/20**
6	Eastshore Myers	300,000	
	Triumph/Independence	437,000	
	Bayview	368,000	
	Sand Beach	333,500	
	Bay Fairway Hall	310,000	
	Seaview I	390,000	
	Seaview 2	345,000	
	Subtotal	**2,483,500**	**FY 20/21**
	TOTAL	**14,160,700**	

a. Estimates represent current (FY2015/16) costs.

5.4 Implementation Recommendations

5.4.1 Force Main Condition Assessment

The City owns and maintains approximately 6 miles of force mains ranging in size from 4 to 16 inches in diameter, and in length from approximately 25 to over 7,000 feet. These force mains are located throughout the main island, Harbor Bay Isle, and Alameda Point. The City has conducted an inspection program to investigate the condition of its gravity sewers (other than those in Alameda Point), but as yet does not have a formal program for condition assessment of its force mains. In July 2015, the City experienced a structural failure in one of its force mains, a 30- to 40-year-old 8-inch transite (asbestos cement) pipe from the Park/Otis Pump Station (a diversion to the parallel gravity trunk sewer in Otis Drive will be implemented as a permanent solution, which will allow abandonment of most of the force main length).

It is therefore recommended that the City develop and implement a force main condition assessment program to address the condition of its sewer force mains. The force mains should be prioritized for assessment based on age, material, size (or flow), location, and length, and whether or not the associated pump stations also have high level bypass gravity pipelines. Initially, the assessment could focus on the longest force mains (e.g., the seven that are over 1,000 feet in length) and the 15 force mains associated with pump stations that do not have gravity bypass lines.

Methods of inspection should be tailored to the pipe material, size and length, location and access, and other factors, but could include CCTV inspection (if possible), external corrosion investigations, or various pipe wall thickness and pipe leakage assessment methods. Based on the results of the assessments, potential improvements to address any identified force main condition deficiencies should be developed and incorporated into the sewer system CIP.

5.4.2 GIS Updates

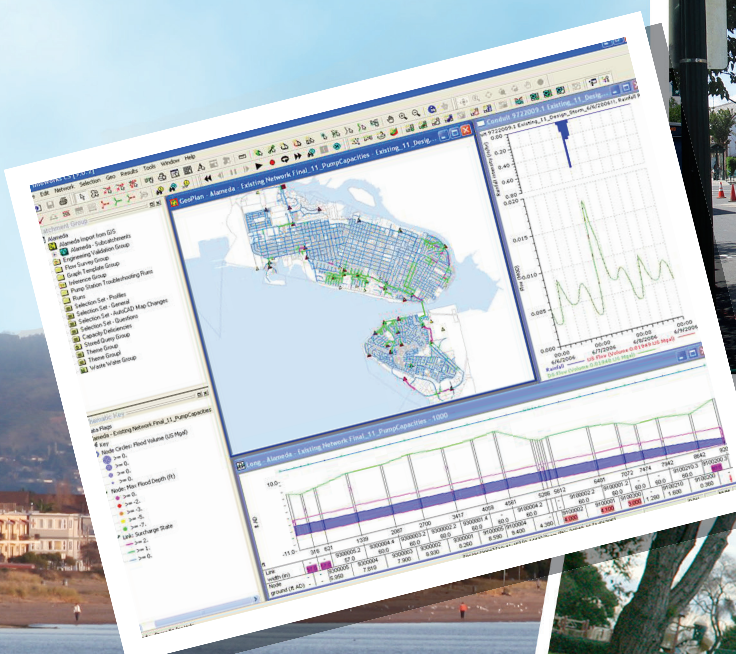
The City has made significant improvements in its geographic information system (GIS) and sewer mapping over the past few years. As new information is collected through sewer inspections, surveys associated with sewer design projects, and on-going maintenance activities, the GIS should be updated in order to keep the sewer inventory and maps current. This is particularly important, as the GIS serves as the basic inventory database for the City's computerized maintenance management system (CMMS) and hydraulic model. The City should also establish consistent standards for manhole numbering and graphic representation of new pipes that are constructed as part of new developments and sewer rehabilitation and replacement projects.

5.4.3 Sewer Rehabilitation Plan Updates and Funding

The sewer rehabilitation plan presented in this Master Plan is intended to provide a roadmap for the City's sewer rehabilitation and replacement efforts over the coming years. To meet the sewer rehabilitation requirements of the Consent Decree, it is recommended that the 3 percent annual increase in sewer rates be extended beyond FY 19/20 in 5-year increments for the duration of the Consent Decree. It is expected that the sewer rehabilitation plan will be continually refined based on new information and changing conditions and priorities. The City intends to incorporate the sewer rehabilitation schedules into its GIS and CMMS so that the information is readily available and easily updated.

5.4.4 Master Plan Updates

This Master Plan has been prepared to facilitate both use of the information in capital improvement project planning and design, as well as to allow the City to update the Plan in the future as the need arises. The Master Plan should be updated whenever there are major changes in planning assumptions or priorities, or at a minimum every eight to ten years.



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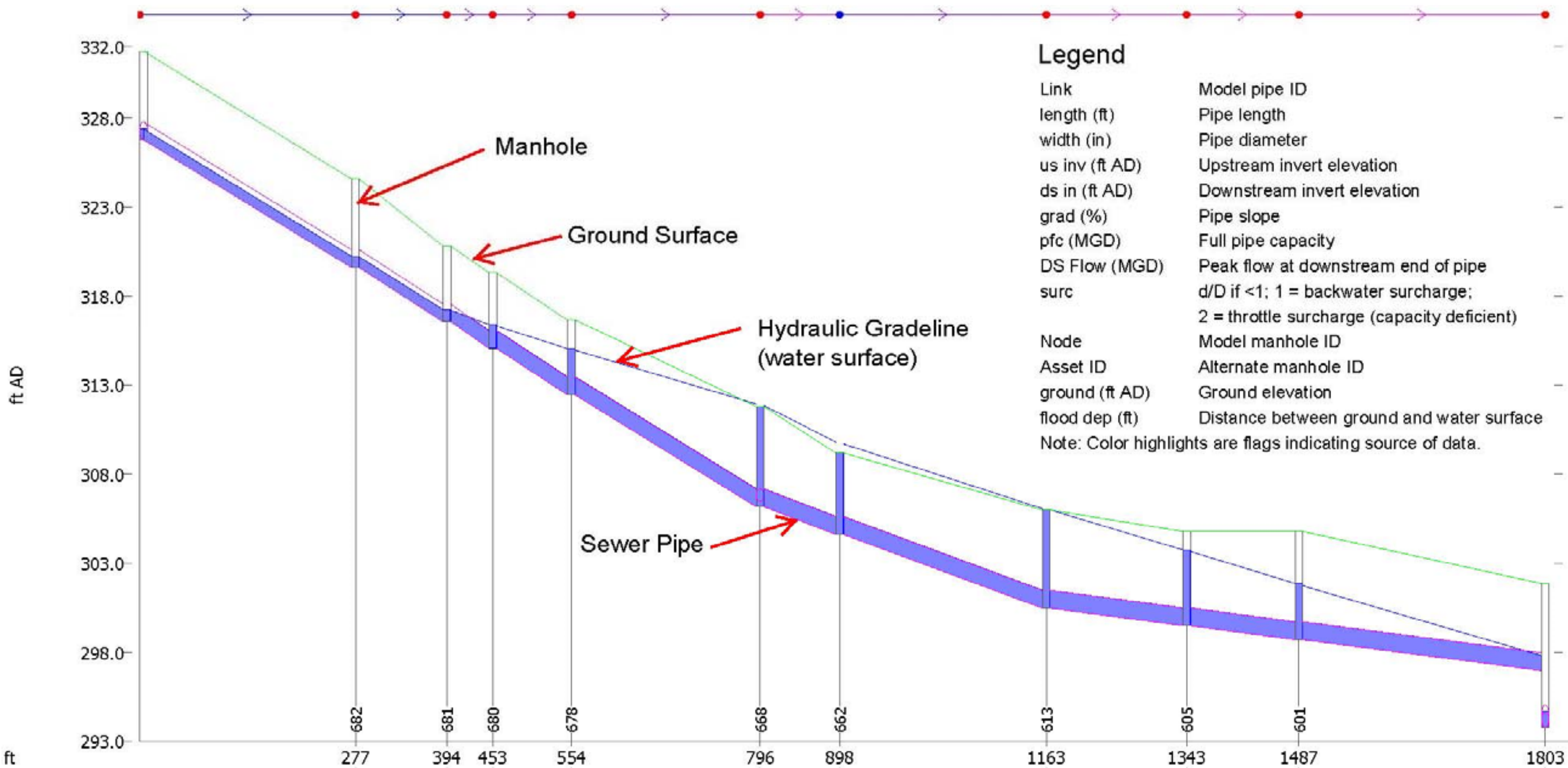
Appendix A
Sewer Model Hydraulic Profile Plots of Predicted Capacity Deficiencies

Appendix A - Sewer Model Hydraulic Profile Plots of Predicted Capacity Deficiencies

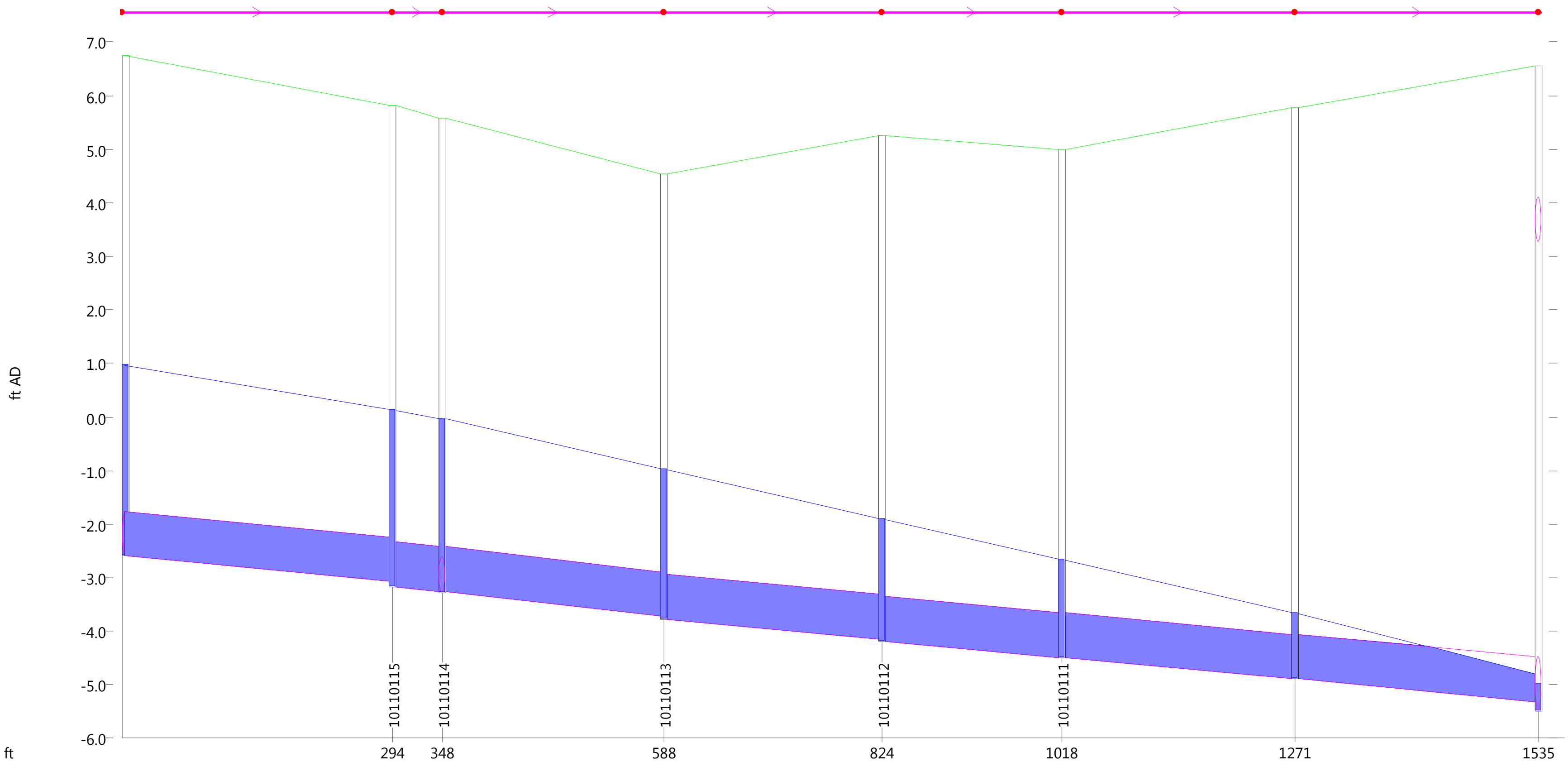
Model Profile Legend



Link	5837.1	682.1	681.1	680.1	678.1	668.1	662.1	613.1	605.1	601.1
length (ft)	277.0	117.0	59.0	101.0	242.0	102.0	265.0	180.0	144.0	316.0
width (in)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
us inv (ft AD)	326.783	319.613	-	315.058	312.444	306.180	304.630	300.500	299.510	298.730
ds inv (ft AD)	319.613	316.585	-	312.444	306.180	304.630	300.500	299.510	298.730	297.000
grad (%)	2.588	2.588	2.588	2.588	2.588	1.520	1.558	0.550	0.542	0.547
pfc (MGD)	3.71	3.71	3.71	3.71	3.71	2.84	2.88	1.71	1.70	1.70
DS Flow (MGD)	2.30485	2.30576	-	2.53147	2.54765	3.45051	2.62876	2.55746	2.54577	2.54206
surc	0.61	0.67	1.00	1.00	1.00	2.00	1.00	2.00	2.00	2.00

Node	5837	682	681	680	678	668	662	613	605	601	593
Asset ID											
ground (ft AD)	331.750	324.583	-	-	316.667	311.800	309.200	306.000	304.800	304.800	301.880
flood dep (ft)	-4.370	-4.361	-3.582	-2.929	-1.630	-0.000	0.000	-0.000	-1.040	-2.921	-7.190

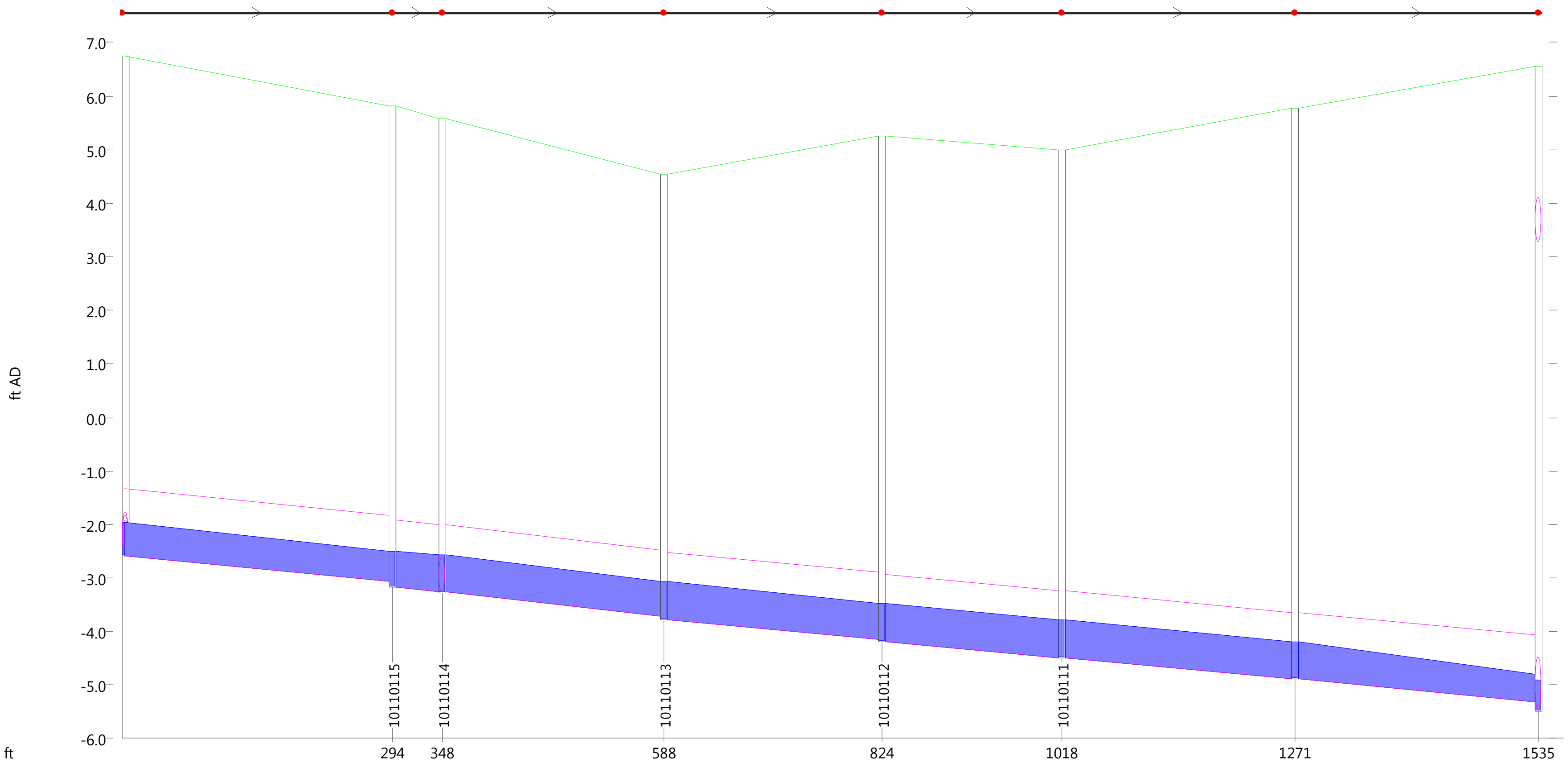
Harbor Bay Parkway u/s of Harbor Bay Parkway I Pump Station (existing development, design storm weekday)



Link	10110117.1	-	10110114.1	10110113.1	10110112.1	10110111.1	10110110.1
length (ft)	294.0	54.0	240.0	236.0	194.0	253.0	264.0
width (in)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
us inv (ft AD)	-2.590	-3.170	-3.250	-3.770	-4.190	-4.490	-4.890
ds inv (ft AD)	-3.070	-3.250	-3.720	-4.140	-4.490	-4.890	-5.310
grad (%)	0.163	0.148	0.196	0.157	0.155	0.158	0.159
pfc (MGD)	0.57	0.55	0.63	0.56	0.56	0.56	0.56
surc	2.00	2.00	2.00	2.00	2.00	2.00	2.00
DS Flow (MGD)	0.7488	0.7492	0.8725	0.8724	0.8724	0.8724	0.8724

Node	10110117	10110115	10110114	10110113	10110112	10110111	10110110	10110109
ground (ft AD)	6.760	5.820	5.580	4.550	5.260	5.000	5.780	6.560
level (ft AD)	0.978	0.134	-0.028	-0.971	-1.896	-2.660	-3.655	-4.969
flood dep (ft)	-5.782	-5.686	-5.608	-5.521	-7.156	-7.660	-9.435	-11.529

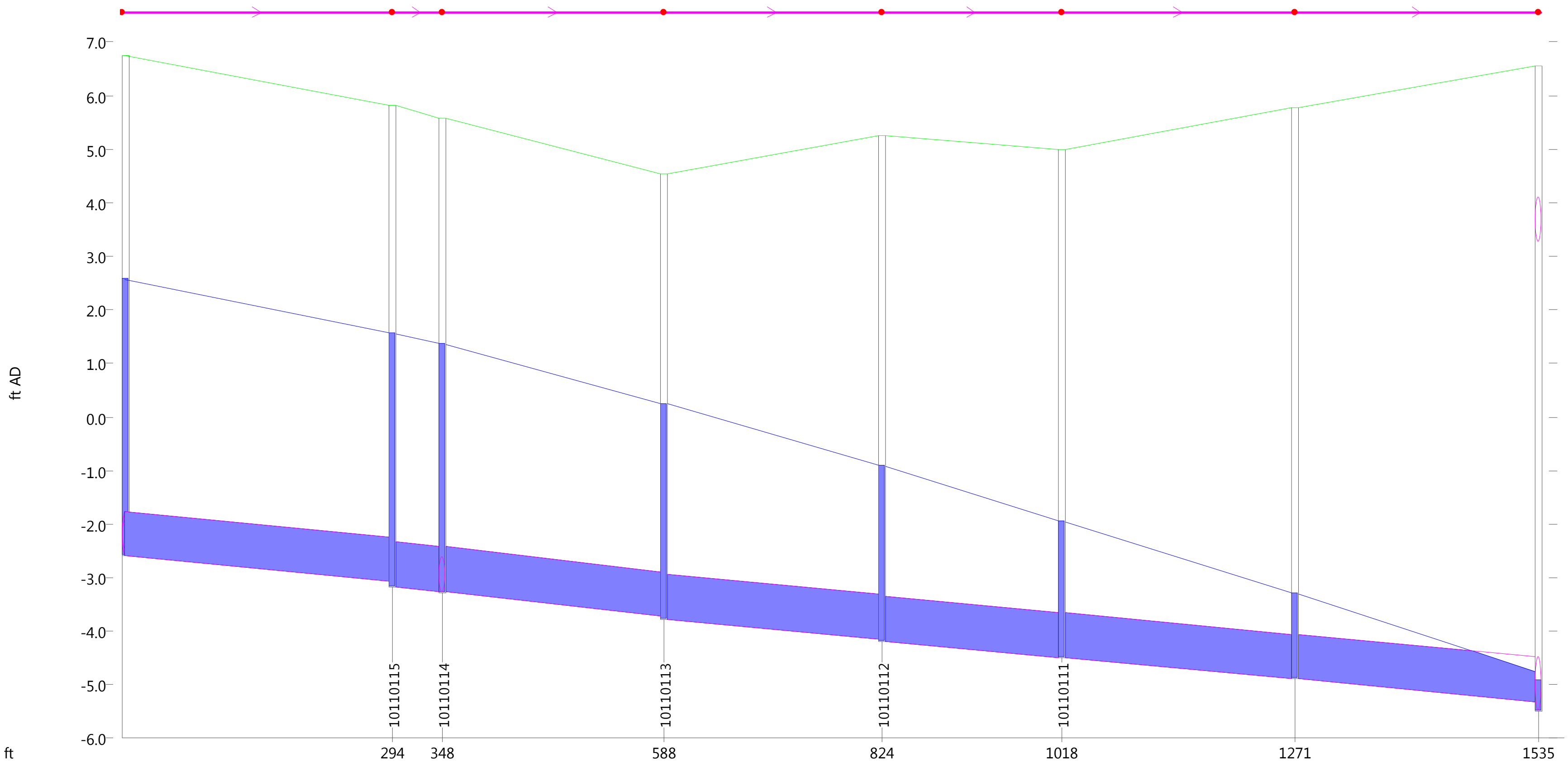
Harbor Bay Parkway u/s of Harbor Bay Parkway I Pump Station (existing development, design storm weekday), with capacity deficiency relieved by replacement of 10” with 15” pipe



Link	10110117.1	-	10110114.1	10110113.1	10110112.1	10110111.1	10110110.1
length (ft)	294.0	54.0	240.0	236.0	194.0	253.0	264.0
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
us inv (ft AD)	-2.590	-3.170	-3.250	-3.770	-4.190	-4.490	-4.890
ds inv (ft AD)	-3.070	-3.250	-3.720	-4.140	-4.490	-4.890	-5.310
grad (%)	0.163	0.148	0.196	0.157	0.155	0.158	0.159
pfc (MGD)	1.69	1.61	1.85	1.65	1.64	1.66	1.67
surc	0.51	0.54	0.54	0.57	0.58	0.57	0.56
DS Flow (MGD)	0.8810	0.8810	1.0353	1.0352	1.0351	1.0350	1.0349

Node	10110117	10110115	10110114	10110113	10110112	10110111	10110110	10110109
ground (ft AD)	6.760	5.820	5.580	4.550	5.260	5.000	5.780	6.560
level (ft AD)	-1.951	-2.497	-2.575	-3.054	-3.469	-3.773	-4.185	-4.910
flood dep (ft)	-8.711	-8.317	-8.155	-7.604	-8.729	-8.773	-9.965	-11.470

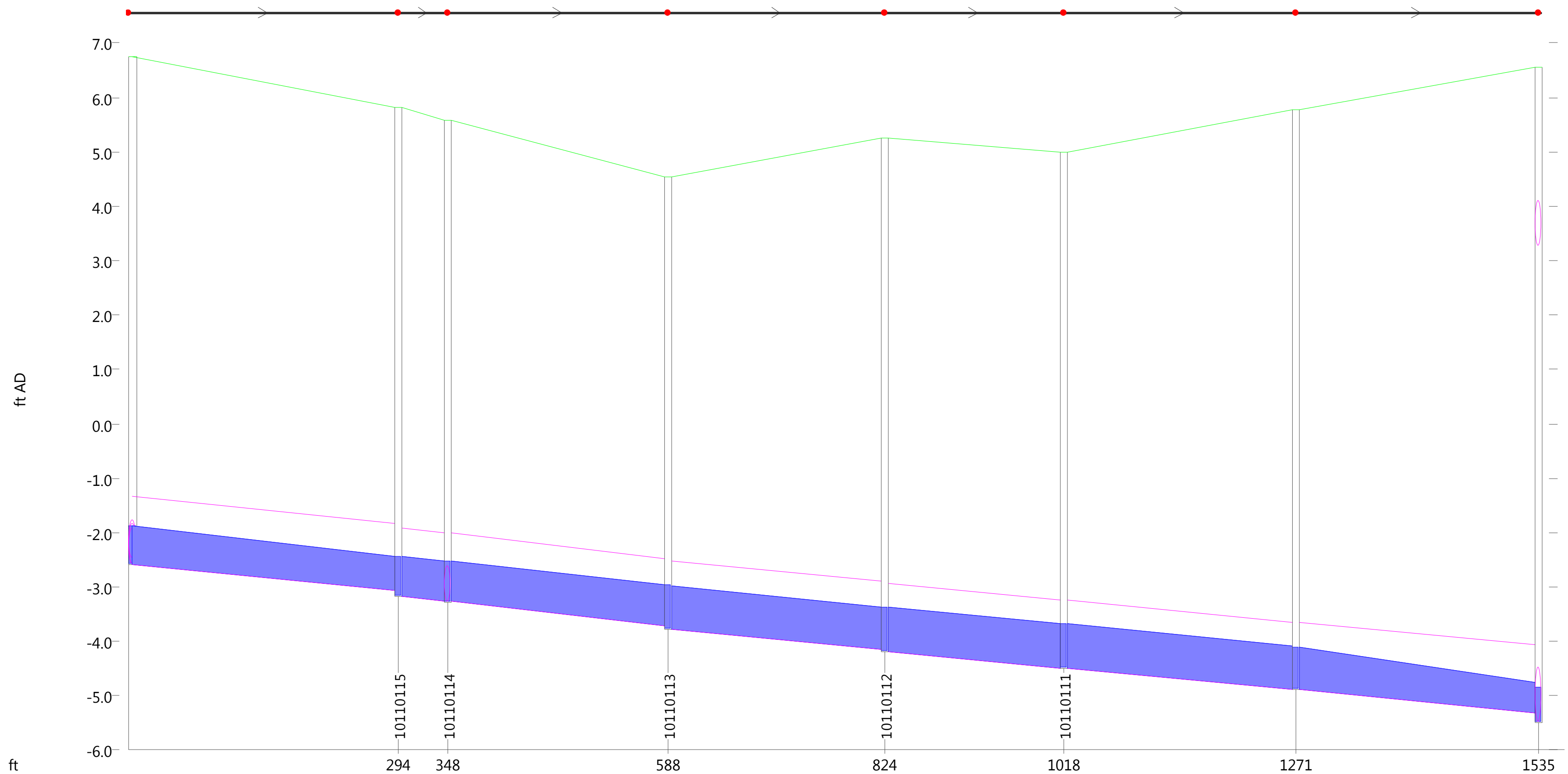
Harbor Bay Parkway u/s of Harbor Bay Parkway I Pump Station (future development, design storm weekday)



Link	10110117.1	-	10110114.1	10110113.1	10110112.1	10110111.1	10110110.1
length (ft)	294.0	54.0	240.0	236.0	194.0	253.0	264.0
width (in)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
us inv (ft AD)	-2.590	-3.170	-3.250	-3.770	-4.190	-4.490	-4.890
ds inv (ft AD)	-3.070	-3.250	-3.720	-4.140	-4.490	-4.890	-5.310
grad (%)	0.163	0.148	0.196	0.157	0.155	0.158	0.159
pfc (MGD)	0.57	0.55	0.63	0.56	0.56	0.56	0.56
surc	2.00	2.00	2.00	2.00	2.00	2.00	2.00
DS Flow (MGD)	0.8245	0.8251	0.9487	0.9797	1.0149	1.0149	1.0149

Node	10110117	10110115	10110114	10110113	10110112	10110111	10110110	10110109
ground (ft AD)	6.760	5.820	5.580	4.550	5.260	5.000	5.780	6.560
level (ft AD)	2.582	1.564	1.369	0.257	-0.908	-1.940	-3.282	-4.916
flood dep (ft)	-4.178	-4.256	-4.211	-4.293	-6.168	-6.940	-9.062	-11.476

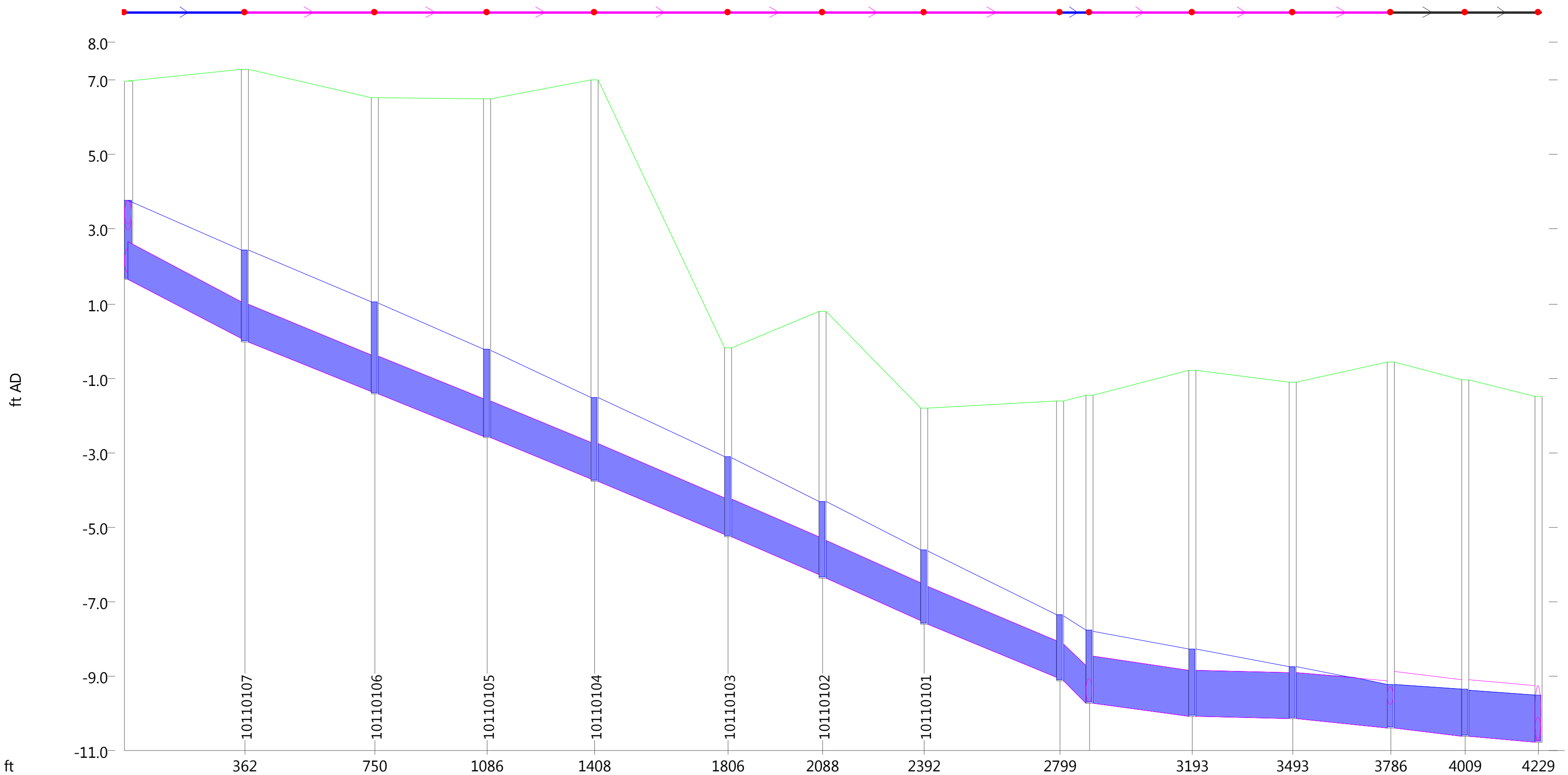
Harbor Bay Parkway u/s of Harbor Bay Parkway I Pump Station (future development, design storm weekday), with capacity deficiency relieved by replacement of 10" with 15" pipe



Link	10110117.1	-	10110114.1	10110113.1	10110112.1	10110111.1	10110110.1
length (ft)	294.0	54.0	240.0	236.0	194.0	253.0	264.0
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0
us inv (ft AD)	-2.590	-3.170	-3.250	-3.770	-4.190	-4.490	-4.890
ds inv (ft AD)	-3.070	-3.250	-3.720	-4.140	-4.490	-4.890	-5.310
grad (%)	0.163	0.148	0.196	0.157	0.155	0.158	0.159
pfc (MGD)	1.69	1.61	1.85	1.65	1.64	1.66	1.67
surc	0.57	0.59	0.60	0.64	0.66	0.65	0.64
DS Flow (MGD)	1.0473	1.0474	1.2002	1.2316	1.2673	1.2672	1.2672

Node	10110117	10110115	10110114	10110113	10110112	10110111	10110110	10110109
ground (ft AD)	6.760	5.820	5.580	4.550	5.260	5.000	5.780	6.560
level (ft AD)	-1.876	-2.432	-2.513	-2.965	-3.368	-3.674	-4.094	-4.834
flood dep (ft)	-8.636	-8.252	-8.093	-7.515	-8.628	-8.674	-9.874	-11.394

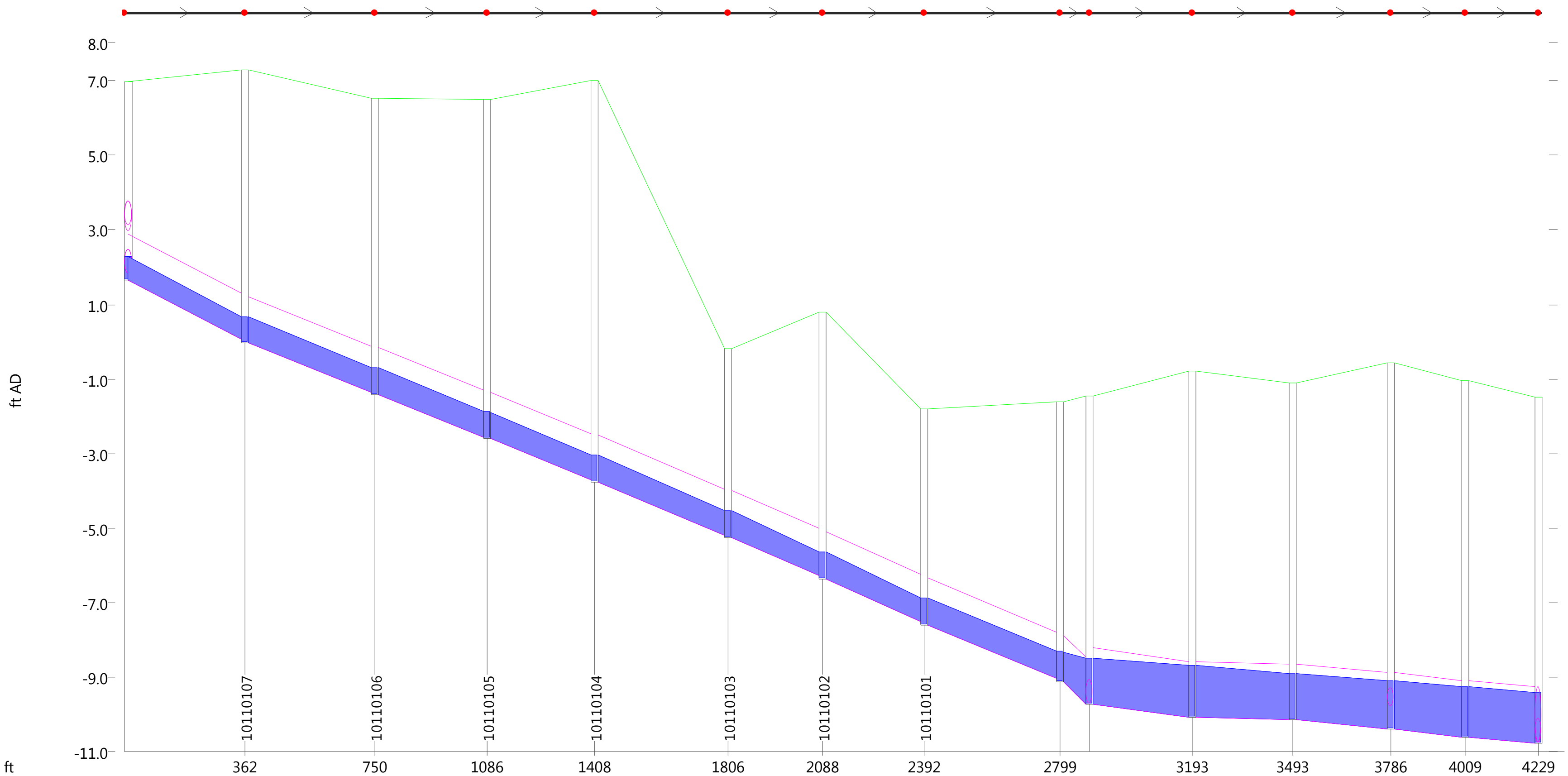
Harbor Bay Parkway and Beach Road d/s of Harbor Bay Parkway I PS (future development, design storm weekday, with upstream relief)



Link	10110108.1	10110107.1	10110106.1	10110105.1	10110104.1	10110103.1	10110102.1	10110101.1	-	10013224.1	10013223.1	10013222.1	-	-
length (ft)	362.0	388.0	336.0	322.0	398.0	282.0	304.0	407.0	88.0	306.0	300.0	293.0	223.0	220.0
width (in)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	15.0	15.0	15.0	18.0	18.0
us inv (ft AD)	1.650	-0.030	-1.420	-2.600	-3.760	-5.250	-6.360	-7.590	-	-9.710	-10.080	-10.140	-10.370	-10.590
ds inv (ft AD)	0.060	-1.370	-2.550	-3.710	-5.200	-6.260	-7.490	-9.030	-	-10.080	-10.140	-10.370	-10.590	-10.750
grad (%)	0.439	0.345	0.336	0.345	0.362	0.358	0.372	0.354	-	0.121	0.020	0.078	0.099	0.073
pfc (MGD)	1.53	1.35	1.34	1.35	1.39	1.38	1.40	1.37	1.87	1.45	0.59	1.17	2.13	1.83
surc	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	2.00	2.00	2.00	0.83	0.84
DS Flow (MGD)	1.3787	1.3722	1.3928	1.4294	1.4500	1.4735	1.4875	1.4876	-	1.6347	1.6418	1.6485	1.6556	1.6594

Node	-	10110107	10110106	10110105	10110104	10110103	10110102	10110101	10013227	-	10013223	10013222	10013219	-	-
ground (ft AD)	6.970	7.290	6.540	6.500	7.000	-0.200	0.800	-1.800	-1.600	-1.450	-0.780	-1.090	-0.570	-1.040	-
level (ft AD)	3.781	2.454	1.038	-0.228	-1.507	-3.112	-4.296	-5.601	-7.353	-7.758	-8.247	-8.728	-9.207	-9.351	-
flood dep (ft)	-3.189	-4.836	-5.502	-6.728	-8.507	-2.912	-5.096	-3.801	-5.753	-6.308	-7.467	-7.638	-8.637	-8.311	-

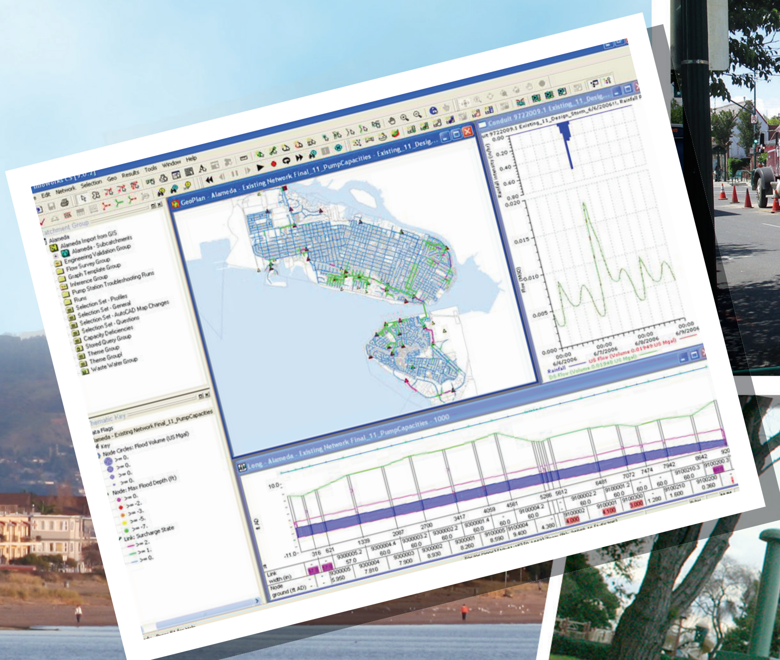
Harbor Bay Parkway and Beach Road d/s of Harbor Bay Parkway I PS (future development, design storm weekday, with upstream relief), with capacity deficiency relieved by replacement of 12" and 15" pipe with 15" and 18" pipe.



Link	10110108.1	10110107.1	10110106.1	10110105.1	10110104.1	10110103.1	10110102.1	10110101.1	-	10013224.1	10013223.1	10013222.1	-	-
length (ft)	362.0	388.0	336.0	322.0	398.0	282.0	304.0	407.0	88.0	306.0	300.0	293.0	223.0	220.0
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	18.0	18.0	18.0	18.0	18.0
us inv (ft AD)	1.650	-0.030	-1.420	-2.600	-3.760	-5.250	-6.360	-7.590	-	-9.710	-10.080	-10.140	-10.370	-10.590
ds inv (ft AD)	0.060	-1.370	-2.550	-3.710	-5.200	-6.260	-7.490	-9.030	-	-10.080	-10.140	-10.370	-10.590	-10.750
grad (%)	0.439	0.345	0.336	0.345	0.362	0.358	0.372	0.354	-	0.121	0.020	0.078	0.099	0.073
pfc (MGD)	2.77	2.45	2.42	2.45	2.51	2.50	2.55	2.48	3.39	2.36	0.96	1.90	2.13	1.83
surc	0.52	0.56	0.57	0.57	0.57	0.57	0.57	0.58	0.99	0.94	0.94	0.85	0.90	0.90
DS Flow (MGD)	1.4685	1.4684	1.4916	1.5325	1.5533	1.5816	1.5958	1.5942	-	1.7321	1.7303	1.7322	1.7376	1.7400

Node	-	10110107	10110106	10110105	10110104	10110103	10110102	10110101	10013227	-	10013223	10013222	10013219	-	-
ground (ft AD)	6.970	7.290	6.540	6.500	7.000	-0.200	0.800	-1.800	-1.600	-1.450	-0.780	-1.090	-0.570	-1.040	-
level (ft AD)	2.298	0.677	-0.704	-1.880	-3.046	-4.530	-5.641	-6.860	-8.304	-8.468	-8.671	-8.884	-9.089	-9.244	-
flood dep (ft)	-4.672	-6.613	-7.244	-8.380	-10.046	-4.330	-6.441	-5.060	-6.704	-7.018	-7.891	-7.794	-8.519	-8.204	-

Appendix B
Sewer Inventory Data and Pipe Rating Model Scores



Appendix B - Sewer Inventory Data and Pipe Rating Model Scores

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
10010201-9811407	405	8	TRUSS			1990	3	2.5	3.8	9.5	
10010202-10010201	33	8	PVC			1990	1	1.5	3.5	5.3	
10010203-9811407	13	15	PVC			1990	1	1.1	4.1	4.5	
10010204-10010206	229	15	PVC			1990	1	1.5	3.8	5.7	
10010205-10010204	192	15	PVC			1990	1	1.5	3.4	5.1	
10010206-10010203	394	15	PVC			1990	1	1.5	4.1	6.1	
10010400-10010205	98	15	PVC			1990	1	1.5	1.8	2.7	
10010401-10010400	72	15	PVC			1990	1	1.5	0.9	1.3	
10010801-9811609	324	12	PVC			1960	1	1.5	2.9	4.4	
10010816-10010801	314	12	PVC			1960	1	1.5	2.9	4.4	
10011001-10010816	245	10	PVC			1960	1	1.5	2.9	4.4	
10011002-10011001	15	10	CAS			1960	1	1.5	2.5	3.8	19
10011002-Verdemar	49	10	VCP			1960	1	1.1	3.1	3.4	19
10011003-10011002	52	10	VCP			1960	1	1.5	2.5	3.8	19
10011011-10011003	210	10	VCP			1960	1	1.5	2.9	4.4	19
10011019-10011011	99	10	VCP			1960	1	1.5	2.9	4.4	19
10011027-10011019	138	10	VCP			1960	1	1.5	2.9	4.4	19
10011037-10011027	90	10	VCP			1960	1	1.5	2.9	4.4	19
10011040-10011037	122	10	PVC			1960	1	1.5	2.9	4.4	
10011301-10011708	68	10	VCP			1970	1	1.5	2.9	4.4	18
10011303-10011301	148	10	VCP			1970	1	1.5	2.9	4.4	18
10011309-10011303	213	10	TRUSS			1970	1	1.5	2.9	4.4	
10011310-10011309	110	10	VCP			1970	1	1.5	2.9	4.4	18
10011314-10011310	216	10	VCP			1970	1	1.5	2.9	4.4	18
10011320-10011314	259	10	VCP			1970	1	1.1	2.9	3.2	19
10011325-10011320	122	10	VCP			1970	1	1.5	2.9	4.4	19
10011329-10011325	203	10	VCP			1970	1	1.5	2.9	4.4	19
10011331-10011329	124	10	VCP			1970	1	1.5	2.9	4.4	19
10011335-10011331	202	8	VCP			1970	1	1.5	3.2	4.8	19
10011401-9811604	133	8	VCP			1960	1	1.5	3.2	4.8	
10011402-10011401	230	8	VCP			1960	1	1.5	2.6	3.9	
10011403-10011402	119	8	VCP			1960	1	1.5	2.6	3.9	
10011404-10011402	258	8	VCP			1960	1	1.5	2.6	3.9	
10011405-10011404	195	8	VCP			1960	1	1.5	2.2	3.3	
10011501-10011708	227	8	VCP			1970	3	2.9	3.5	10.2	13
10011512-10011501	321	8	VCP			1970	1	1.1	3.5	3.9	13
10011520-10011512	250	8	VCP			1970	1	1.5	3.5	5.3	13
10011523-10011520	56	8	VCP			1970	1	1.5	3.5	5.3	13
10011601-9811603	272	8	VCP			1960	1	1.5	3.2	4.8	11
10011602-10011601	294	8	VCP			1960	1	1.5	2.2	3.3	11
10011603-10011602	246	8	VCP			1960	1	1.5	2.2	3.3	11
10011701-9811602	274	10	VCP			1950	3	3.2	3.5	11.2	11
10011702-10011701	264	10	VCP			1960	3	3.0	2.5	7.5	11
10011703-10011702	271	8	VCP			1960	3	2.9	2.2	6.4	4
10011704-10011703	272	8	VCP			1960	3	2.5	2.2	5.5	4
10011705-10011702	46	10	VCP			1960	1	1.5	0.9	1.3	11
10011706-10011705	216	10	VCP			1960	1	1.6	1.8	2.9	11
10011707-10011706	154	6	VCP			1960	1	1.5	2.2	3.3	2
10011708-10011706	271	10	VCP			1960	1	1.5	3.8	5.7	11
10011709-10011704	21	8				1960	-1	4.3	2.2	9.5	4
10011801-9811601	249	6	VCP			1950	5	4.3	3.2	13.8	8
10011802-10011801	228	6	VCP			1950	1	1.5	2.2	3.3	8
10011901-10012906	248	6	VCP			1950	10	7.8	2.6	20.3	3
10011902-10011901	271	6	VCP			1950	3	2.7	2.2	5.9	3
10012001-10012002	275	8	VCP			1960	8	6.4	2.6	16.6	7
10012001-10012905	293	6	VCP			1960	10	7.6	2.6	19.8	7
10012002-10012112	346	8	CAS			1960	3	2.9	2.6	7.5	7
10012101-10011708	206	10	VCP			1960	1	1.5	2.9	4.4	18
10012102-10012101	192	10	VCP			1960	1	1.1	2.9	3.2	18

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
10012103-10012102	317	8	VCP			1960	1	1.5	2.6	3.9	18
10012104-10012102	236	10	VCP			1960	1	1.1	2.9	3.2	18
10012111-10012104	22	10	VCP			1970	1	1.5	2.5	3.8	18
10012112-10012111	354	8	VCP			1960	3	2.5	2.6	6.5	7
10012113-10012111	252	10	VCP			1960	1	1.5	2.5	3.8	18
10012114-10012113	184	8	VCP			1960	3	2.9	2.2	6.4	20
10012118-10012114	59	8	VCP			1970	1	1.5	2.2	3.3	20
10012201-10012903	258	8	VCP			1950	10	7.8	2.6	20.3	9
10012202-10012201	283	8	VCP			1960	10	7.8	2.6	20.3	9
10012204-10012202	227	8	VCP			1960	1	1.5	2.6	3.9	20
10012205-10012118	244	8	VCP			1960	1	1.6	2.6	4.2	20
10012205-10012204	63	8	VCP			1970	1	1.5	2.6	3.9	20
10012301-10013008	45	8	VCP			1950	1	1.5	2.6	3.9	
10012302-10012301	220	8	VCP			1950	1	1.5	2.6	3.9	
10012313-10012302	120	8	VCP			1970	1	1.5	2.6	3.9	
10012314-10012313	214	8	VCP			1970	1	1.5	2.6	3.9	
10012325-10012314	347	8	VCP			1970	1	1.5	2.6	3.9	
10012333-10012325	355	8	VCP			1970	1	1.5	2.6	3.9	
10012339-10012333	36	8	PVC			1970	1	1.5	2.6	3.9	
10012340-10012339	159	8	PVC			1980	1	1.1	2.6	2.9	
10012346-10013008	189	6	VCP			1950	10	7.8	2.6	20.3	3
10012401-10012113	228	10	VCP			1970	1	1.5	2.9	4.4	20
10012501-10012804	331	8	VCP			1960	1	1.1	2.6	2.9	
10012502-10012501	203	8	VCP			1960	3	3.0	2.6	7.8	6
10012503-10012502	255	8	VCP			1960	1	1.5	2.2	3.3	6
10012504-10012501	230	8	VCP			1960	1	1.5	2.6	3.9	
10012505-10012504	107	8	VCP			1970	1	1.5	2.6	3.9	
10012505-10012506	169	8	VCP			1970	1	1.5	2.6	3.9	
10012506-10012510	102	8	VCP			1970	1	1.5	2.6	3.9	
10012510-10012513	117	8	VCP			1970	1	1.5	2.6	3.9	
10012513-10012313	197	8	VCP			1970	1	1.5	2.6	3.9	
10012600-10012339	360	8	VCP			1980	1	1.5	2.6	3.9	
10012701-10012804	136	8	VCP			1960	1	1.5	2.6	3.9	
10012702-10012701	138	8	VCP			1960	1	1.5	2.6	3.9	
10012703-10012702	230	8	VCP			1960	1	1.5	2.6	3.9	
10012704-10012703	325	8	VCP			1960	1	1.5	2.6	3.9	
10012705-10012704	333	8	VCP			1960	3	2.5	2.2	5.5	13
10012706-10012703	134	8	VCP			1960	1	1.5	2.6	3.9	
10012708-10012705	25	8	VCP			1960	1	1.5	2.2	3.3	
10012720-10012706	151	8	TRUSS			1980	1	1.5	2.2	3.3	
10012801-10013021	56	8	VCP			1950	3	2.5	3.2	8.0	9
10012802-10012801	313	6	VCP			1950	1	1.5	3.2	4.8	6
10012803-10012802	298	6	VCP			1950	5	4.6	2.6	12.0	6
10012804-10012801	232	8	VCP			1960	1	1.5	3.2	4.8	9
10012805-10012804	173	8	VCP			1960	1	1.5	2.6	3.9	9
10012901-10013008	289	6	VCP			1950	10	7.6	3.5	26.6	7
10012902-10012901	303	6	VCP			1950	8	6.4	3.5	22.4	7
10012902-10013103	389	6	VCP			1950	3	2.9	2.6	7.5	10
10012903-10012902	254	6	VCP			1950	5	4.3	3.5	15.1	7
10012904-10012903	90	6	VCP			1950	1	1.5	3.5	5.3	7
10012905-10012904	150	6	VCP			1950	5	4.3	3.5	15.1	7
10012906-10012905	223	6	VCP			1950	5	4.3	3.5	15.1	7
10012907-10012906	56	6	VCP			1950	1	1.5	3.5	5.3	7
10012908-10012907	154	6	VCP			1950	3	2.9	3.2	9.3	7
10013001-9811706	221	8	VCP			1950	5	4.3	3.1	13.3	5
10013002-10013001	222	6	VCP			1950	10	7.8	3.5	27.3	5
10013003-10013002	256	6	VCP			1950	5	4.3	3.5	15.1	5
10013004-10013003	225	6	VCP			1950	3	2.5	3.1	7.8	5
10013005-10013004	256	6	VCP			1950	3	2.5	3.5	8.8	5

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
10013006-10013005	301	8	VCP			1950	5	4.4	3.2	14.1	5
10013007-10013006	314	6	VCP			1950	5	4.4	2.2	9.7	5
10013008-10013007	317	6	VCP			1950	8	6.5	2.6	16.9	5
10013008-10013017	49	8	VCP			1950	3	2.9	3.5	10.2	6
10013009-10013008	295	6	VCP			1950	8	6.4	3.5	22.4	6
10013010-10013009	348	6	VCP			1950	5	4.3	2.6	11.2	6
10013011-10013002	49	8	VCP			1950	1	1.5	3.5	5.3	5
10013012-10013011	255	6	VCP			1950	5	4.3	3.5	15.1	5
10013013-10013012	285	6	VCP			1950	5	4.3	2.2	9.5	5
10013014-10013013	257	6	VCP			1950	8	6.4	3.2	20.5	5
10013015-10013014	309	6	VCP			1950	5	4.6	3.5	16.1	5
10013016-10013015	303	6	VCP			1950	3	2.7	3.1	8.4	5
10013017-10013016	274	6	VCP			1950	1	1.3	3.5	4.5	5
10013017-10013217	255	8	VCP			1950	3	3.2	2.6	8.3	9
10013018-10013017	312	6	VCP			1950	5	4.6	2.6	12.0	6
10013019-10013018	334	6	VCP			1950	5	4.3	2.6	11.2	6
10013019-10013020	359	6	VCP			1950	10	7.6	2.6	19.8	6
10013020-10013021	323	6	VCP			1950	3	3.0	2.8	8.4	6
10013021-10013226	238	8	VCP			1950	1	1.3	3.2	4.2	9
10013022-10013021	225	6	VCP			1950	1	1.5	2.8	4.2	6
10013101-9811707	303	6	VCP			1950	5	4.3	2.6	11.2	10
10013102-10013101	309	6	VCP			1950	5	4.3	2.6	11.2	10
10013103-10013102	314	6	VCP			1950	3	2.9	2.6	7.5	10
10013201-BFI	42	30				1950	-1	6.4	4.0	25.6	2
10013202-10013201	33	21				1950	-1	6.4	3.4	21.8	3
10013203-10013202	288	21	HDPE			1950	1	1.5	3.4	5.1	
10013204-10013203	297	21				1950	-1	6.4	1.8	11.5	
10013206-10013204	301	21				1950	-1	6.4	1.8	11.5	
10013213-10013206	297	21				1950	-1	6.4	1.8	11.5	
10013214-10013213	354	18				1950	-1	6.4	3.8	24.3	
10013215-10013214	85	18	VCP		Cyclic Phase 11	1950	10	7.4	3.8	28.1	
10013216-10013214	343	18				1950	-1	6.4	3.2	20.5	14
10013217-10013216	347	18	VCP			1950	3	2.7	3.2	8.6	14
10013218-10013217	220	18	VCP			1950	1	1.1	3.2	3.5	14
10013219-10013218	223	18	VCP			1950	3	2.5	2.8	7.0	14
10013220-10013219	249	6	PVC			1950	3	2.9	2.6	7.5	
10013222-10013219	293	15	VCP			1950	3	2.8	2.5	7.0	14
10013223-10013222	300	15	VCP			1950	3	2.8	2.9	8.1	14
10013224-10013223	306	15	VCP			1950	1	1.4	2.9	4.1	14
10013225-10013226	237	6	VCP			1950	1	1.5	2.6	3.9	14
10013226-10013224	14	8	VCP			1950	1	1.5	2.6	3.9	14
10013227-10013224	88	12	PVC			1980	1	1.8	3.5	6.3	
10110001-Harbor Bay Parkway II	49	8				1990	-1	2.9	3.2	9.3	
10110002-10110001	90	10	PVC			1990	1	1.5	3.5	5.3	
10110003-10110002	164	8	PVC			1990	1	1.5	3.5	5.3	
10110004-10110003	189	0				1990	-1	2.9	3.2	9.3	
10110005-10110004	235	0				1990	-1	2.9	3.2	9.3	
10110006-10110005	196	0				1990	-1	2.9	3.2	9.3	
10110007-10110006	352	0				1990	-1	2.9	3.2	9.3	
10110008-10110007	56	0				1990	-1	2.9	3.2	9.3	
10110009-10110002	221	8	PVC			1990	1	1.1	3.2	3.5	
10110011-10110009	222	8	PVC			1990	1	1.5	3.2	4.8	
10110012-10110011	150	8	PVC			1990	1	1.5	3.5	5.3	
10110013-10110012	208	8	PVC			1990	1	1.5	3.5	5.3	
10110013-10110014	207	8	PVC			1990	1	1.5	3.5	5.3	
10110014-10110015	222	8	PVC			1990	1	1.5	3.5	5.3	
10110015-10110016	170	8	PVC			1990	1	1.5	3.2	4.8	
10110016-10110017	122	8	PVC			1990	1	1.5	2.8	4.2	
10110017-10110018	97	8	PVC			1990	1	1.5	2.4	3.6	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
10110018-10110019	102	8	PVC			1990	1	1.5	1.2	1.8	
10110019-10110020	114	8	CAS			1990	1	1.5	1.2	1.8	
10110020-10110021	60	8	PVC			1990	1	1.5	1.2	1.8	
10110021-10010400	442	10	PVC			1990	1	1.5	1.8	2.7	
10110101-10013227	407	12	PVC			1980	1	1.8	3.1	5.6	
10110102-10110101	304	12	PVC			1980	1	1.8	1.5	2.7	
10110103-10110102	282	12	PVC			1980	1	1.8	3.5	6.3	
10110104-10110103	398	12	PVC			1980	10	8.1	3.5	28.4	
10110105-10110104	322	12	PVC			1980	8	6.7	3.5	23.4	
10110106-10110105	336	12	PVC			1980	1	1.8	3.5	6.3	
10110107-10110106	388	12	PVC			1980	3	3.2	3.5	11.2	
10110108-10110107	362	12	PVC			1980	3	3.2	3.8	12.2	
10110109-10110108	105	10	PVC			1980	3	2.9	3.8	11.0	
10110109-Harbor Bay Parkway I	42	12	TRUSS			1980	1	1.5	3.1	4.6	
10110110-10110109	264	10	PVC			1980	1	2.0	3.8	7.6	
10110111-10110110	253	10	PVC			1980	5	4.8	3.8	18.2	
10110112-10110111	194	10	PVC			1980	1	2.0	3.8	7.6	
10110113-10110112	236	10	PVC			1980	1	2.0	3.8	7.6	
10110114-10110113	240	10	PVC			1980	1	2.0	3.5	7.0	
10110115-10110114	54	10	PVC			1980	1	2.0	3.5	7.0	
10110117-10110115	294	10	PVC			1980	1	2.0	3.8	7.6	
10110118-10110117	294	10	PVC			1980	1	1.5	3.8	5.7	
10110119-10110118	239	10	PVC			1980	1	1.5	3.8	5.7	
10110120-10110119	241	10	PVC			1990	1	1.5	3.5	5.3	
10110121-10110120	237	10	PVC			1990	1	1.5	3.8	5.7	
10110122-10110121	275	10	PVC			1990	1	1.5	3.8	5.7	
10110123-10110122	265	10	PVC			1990	1	1.5	3.5	5.3	
10110124-10110123	228	10	PVC			1990	1	1.5	3.8	5.7	
10110125-10110124	299	10	PVC			1990	1	1.5	3.8	5.7	
10110126-10110125	335	10	PVC			1990	1	1.5	3.8	5.7	
10110126-10110205	335	8	PVC			1990	1	1.5	3.5	5.3	
10110201-10110002	156	8	PVC			1990	1	1.1	3.5	3.9	
10110202-10110201	216	8	PVC			1990	5	4.3	3.5	15.1	
10110203-10110202	268	8	PVC			1990	1	1.5	3.5	5.3	
10110204-10110203	112	8	PVC			1990	1	1.5	3.5	5.3	
10110205-10110204	343	8	PVC			1990	1	1.5	3.5	5.3	
10110301-10110204	54	8	PVC			1990	1	1.5	3.2	4.8	
10110302-10110301	325	8	PVC			1990	1	1.5	3.2	4.8	
10110303-10110302	270	8	PVC			1990	3	2.9	3.2	9.3	
10110304-10110303	185	8	PVC			1990	5	4.3	3.2	13.8	
10110305-10110304	149	8	PVC			1990	1	1.5	3.2	4.8	
10110305-10110410	381	8	PVC			1990	3	2.9	3.2	9.3	
10110401-10110117	265	8	PVC			1980	3	2.9	3.2	9.3	
10110402-10110401	319	8	PVC			1980	5	4.3	3.2	13.8	
10110403-10110402	158	8	PVC			1980	1	1.5	3.2	4.8	
10110404-10110403	202	8	PVC			1980	1	1.5	3.2	4.8	
10110405-10110404	253	8	PVC			1990	3	2.9	2.8	8.1	
10110406-10110405	252	8	PVC			1990	1	1.5	1.2	1.8	
10110407-10110406	172	8	PVC			1990	1	1.5	1.2	1.8	
10110407-10110408	349	8	PVC			1990	1	1.5	1.2	1.8	
10110408-10110409	321	8	PVC			1990	5	4.3	3.2	13.8	
10110409-10110428	325	8	PVC			1990	1	1.5	3.2	4.8	
10110410-10110409	363	8	PVC			1990	5	4.3	3.2	13.8	
10110428-10011523	50	8	PVC			1990	1	1.5	3.5	5.3	
10110501-10110114	349	8	PVC			1980	3	2.9	3.2	9.3	
10110502-10110506	188	8	PVC			1980	3	2.9	3.2	9.3	
10110506-10110501	95	8	PVC			1980	1	1.5	3.2	4.8	
10110601-10110117	291	8	TRUSS			1980	1	1.3	3.2	4.2	
10110602-10110601	207	8	TRUSS			1980	1	1.5	2.8	4.2	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
10110603-10110602	224	8	TRUSS			1980	3	2.9	2.8	8.1	
10110604-10110603	185	8	TRUSS			1980	1	1.5	3.2	4.8	
10110605-10110604	231	8	TRUSS			1980	1	1.5	3.2	4.8	
10110606-10110605	213	8	TRUSS			1980	1	1.5	3.2	4.8	
10110607-10110606	223	8	TRUSS			1980	1	1.5	3.2	4.8	
10110608-10110607	219	8	TRUSS			1980	1	1.5	3.2	4.8	
10110609-10110608	273	8	TRUSS			1980	1	1.5	2.8	4.2	
10110610-10110609	160	8	TRUSS			1980	1	1.5	2.8	4.2	
10110701-10110705	123	8	PVC			1980	3	2.9	3.2	9.3	
10110702-10110701	316	8	PVC			1980	8	6.4	3.2	20.5	
10110705-10110108	153	8	PVC			1980	3	2.9	3.2	9.3	
10110801-10110108	371	8	PVC			1980	3	2.9	3.2	9.3	
10110802-10110801	80	8	PVC			1980	1	1.5	3.2	4.8	
10110803-10110802	145	8	PVC			1980	1	1.5	3.2	4.8	
1210001-1220383	52	15	VCP			1900	1	1.5	0.9	1.3	20
1210001-1220403	53	15	VCP	1988	I&I Phase 1	1900	1	1.5	0.9	1.3	
1210002-1210001	268	12	VCP			1900	1	1.5	0.9	1.3	20
1210003-1210002	286	12	VCP			1900	1	1.5	2.5	3.8	20
1210004-1210026	23	15				1900	-1	7.8	2.5	19.5	11
1210005-1210004	66	15	VCP			1900	1	1.1	2.5	2.8	11
1210006-1210005	61	15	VCP			1960	1	1.5	2.9	4.4	19
1210007-1210006	341	15	VCP			1960	1	1.1	3.5	3.9	
1210007-1210021	123	18	PVC		I&I Phase 3	1993	1	1.5	2.8	4.2	
1210008-1210007	211	15				1960	-1	4.3	3.5	15.1	6
1210009-1210008	284	15				1960	-1	4.3	3.1	13.3	6
1210010-1210009	271	15				1960	-1	4.3	3.1	13.3	6
1210011-1210013	15	15				1960	-1	4.3	3.4	14.6	5
1210012-1210008	120	4				1960	-1	4.3	2.8	12.0	6
1210013-1210010	212	15				1960	-1	4.3	3.1	13.3	6
1210013-1210022	365	18	PVC		I&I Phase 3	1993	1	1.5	3.2	4.8	
1210021-1210027	158	18	PVC		I&I Phase 3	1993	1	1.5	2.8	4.2	
1210022-1210028	340	18	PVC		I&I Phase 3	1993	1	1.5	3.2	4.8	
1210023-1210001	55	15	VCP		I&I Phase 1	1988	-1	2.9	0.9	2.6	
1210024-1210023	275	15	VCP		I&I Phase 1	1988	1	1.5	0.9	1.3	
1210025-1210003	45	8				1900	-1	7.8	2.2	17.2	11
1210025-1210024	264	15	VCP		I&I Phase 1	1988	1	1.5	2.5	3.8	
1210026-1210025	44	8				1900	-1	7.8	2.2	17.2	11
1210026-Eighth/Portola	44	15				1900	-1	7.8	3.1	24.2	11
1210027-1210026	227	18	PVC		I&I Phase 3	1993	-1	2.9	2.8	8.1	
1210028-1210007	138	18	PVC		I&I Phase 3	1993	1	1.5	3.2	4.8	
1210101-1210005	309	10	VCP			1900	1	1.8	2.9	5.2	11
1210102-1210101	259	10	VCP			1900	1	1.8	3.5	6.3	11
1210104-1210102	19	10	VCP			1900	1	1.5	3.5	5.3	13
1210105-1210104	54	10	VCP			1900	1	1.5	3.1	4.6	13
1210106-1210105	98	10	VCP			1900	1	1.5	3.5	5.3	13
1210107-1210106	267	10	VCP			1900	1	1.5	3.5	5.3	13
1210108-1210107	262	10	VCP			1900	1	1.5	3.1	4.6	13
1210109-1210108	276	10	VCP			1900	3	2.9	1.5	4.4	13
1210110-1210109	360	8	VCP			1900	5	4.6	1.2	5.5	13
1210111-1210110	372	8				1900	-1	7.8	1.2	9.4	13
1210112-1210111	423	8				1900	-1	7.8	1.2	9.4	13
1210117-1210112	700	10				1900	-1	7.8	3.5	27.3	1
1210118-1210109	188	6	VCP			1900	1	1.1	0.6	0.7	10
1210201-1210111	37	8	PVC		Cyclic Phase 11	1900	1	1.5	0.6	0.9	
1210202-1210201	129	8	PVC	2014	Cyclic Phase 11	1900	-1	1.5	0.6	0.9	
1210301-1210112	222	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	0.6	0.9	
1210301-9740015	299	8	PVC	2014	Cyclic Phase 11	1900	1	1.3	0.6	0.8	
1210400-1210117	10	10	PVC	1988	I&I Phase 1	1900	-1	2.9	2.9	8.4	
1210401-1210400	22	8	PVC	1988	I&I Phase 1	1900	1	1.5	2.6	3.9	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
1210402-1210401	41	8	PVC	1988	I&I Phase 1	1900	3	2.7	2.6	7.0	
1210404-1210402	34	8	PVC	1988	I&I Phase 1	1900	1	1.5	2.2	3.3	
1210405-1210404	226	8	PVC	1988	I&I Phase 1	1900	1	1.5	2.6	3.9	
1210406-1210405	253	8	PVC	1988	I&I Phase 1	1900	1	1.5	2.6	3.9	
1210503-1210509	39	8	PVC		Grand St. PS	2008	1	1.5	2.6	3.9	
1210504-1210503	96	8	PVC			1900	1	1.5	3.5	5.3	
1210505-1210504	275	6	VCP			1900	10	7.8	2.2	17.2	1
1210506-1210505	265	6	VCP			1900	10	7.8	0.6	4.7	1
1210506-1210508	298	6	VCP			1900	8	6.0	0.6	3.6	1
1210507-1210504	55	8	VCP			1900	1	1.5	3.1	4.6	17
1210508-1210507	229	8	PVC	1988	I&I Phase 1	1900	1	1.5	3.1	4.6	
1210508-1210601	296	8	PVC			1900	1	1.5	2.2	3.3	
1210509-Grand Street	93	10	PVC		Grand St. PS	2008	-1	1.5	2.9	4.4	
1210601-1210405	265	8	VCP			1900	5	4.3	2.6	11.2	9
1210701-1210405	445	8	PVC	1988	I&I Phase 1	1900	1	1.3	2.6	3.4	
1210703-1210701	250	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	0.6	0.9	
1210801-1210001	280	8	VCP			1900	1	1.8	0.6	1.1	
1210802-1210801	140	6	VCP			1900	1	1.6	0.6	1.0	
1210803-1210801	367	8	VCP			1900	1	1.8	0.6	1.1	20
1210804-1210803	353	6	VCP			1900	1	1.1	2.2	2.4	20
1220001-9100005	12	21	VCP			1900	1	1.5	3.2	4.8	16
1220002-1220001	331	8	PVC		I&I Phase 1	1988	3	2.7	2.6	7.0	
1220003-1220002	244	8	PVC		I&I Phase 1	1988	1	1.5	2.8	4.2	
1220003-9110008	247	8	PVC		I&I Phase 1	1988	1	1.5	2.8	4.2	
1220004-1220001	348	21	PVC	1988	I&I Phase 1	1900	1	1.5	3.2	4.8	
1220005-1220004	316	8	PVC	1988	I&I Phase 1	1900	1	1.5	3.5	5.3	
1220005-9310702	357	6	PVC			1900	1	1.5	0.6	0.9	
1220007-1220004	363	8	PVC	1988	I&I Phase 1	1900	1	1.5	3.5	5.3	
1220009-1220004	346	21	VCP		I&I Phase 1	1988	1	1.5	3.2	4.8	
1220010-1220009	108	6	VCP			1900	1	1.5	3.2	4.8	5
1220011-1220018	325	8	PVC	1988	I&I Phase 1	1900	10	7.8	1.5	11.7	
1220012-1220009	58	21	VCP		I&I Phase 1	1988	1	1.5	3.8	5.7	
1220013-1220023	274	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	0.6	0.9	
1220013-9110021	353	8	PVC			1900	1	1.5	3.2	4.8	
1220014-1220012	331	21	VCP		I&I Phase 1	1988	1	1.5	3.2	4.8	
1220014-9310110	322	6	VCP			1900	3	2.9	2.6	7.5	10
1220015-1220014	297	8	PVC	1988	I&I Phase 1	1900	3	2.9	2.6	7.5	
1220016-1220015	293	8	PVC	1988	I&I Phase 1	1900	5	4.3	2.6	11.2	
1220017-1220016	285	8	PVC	1988	I&I Phase 1	1900	10	7.8	2.6	20.3	
1220017-9110026	297	8	PVC	1988	I&I Phase 1	1900	3	2.5	3.2	8.0	
1220018-1220014	316	21	VCP		I&I Phase 1	1988	1	1.5	4.1	6.1	
1220019-1220018	475	8	PVC	1988	I&I Phase 1	1900	1	1.5	1.5	2.3	
1220020-1220019	58	8	PVC	1988	I&I Phase 1	1900	1	1.5	1.5	2.3	
1220021-1220011	326	8	PVC	1988	I&I Phase 1	1900	5	4.3	1.5	6.5	
1220021-1220201	365	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	2.6	3.9	
1220021-9110028	260	8	PVC	1988	I&I Phase 1	1900	5	4.3	3.1	13.3	
1220022-1220012	274	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	2.6	3.9	
1220023-1220022	273	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	0.6	0.9	
1220101-1220380	71	8				1900	-1	7.8	1.5	11.7	6
1220101-Eighth/Taylor	33	8	PVC		Cyclic Phase 5	2009	-1	1.5	0.6	0.9	
1220102-1220101	242	8	HDPE	2009	Cyclic Phase 5	1900	3	2.9	0.6	1.7	
1220102-1220380	309	6	HDPE	2007	Cyclic Phase 4	1900	3	2.9	1.5	4.4	
1220201-1220102	344	8	HDPE	2009	Cyclic Phase 5	1900	3	2.9	2.6	7.5	
1220202-9110029	135	10	HDPE	2014		1900	3	2.9	4.1	11.9	
1220203-1220202	220	8	PVC			1900	1	1.5	3.8	5.7	
1220203-1220205	248	8	PVC	2014		1900	1	1.5	2.8	4.2	
1220203-9121111	113	8	PVC			2014	1	1.5	2.8	4.2	
1220205-1220201	271	8	PVC	2014		1900	1	1.5	3.2	4.8	
1220301-1220404	77	8	PVC	1988	I&I Phase 1	1900	1	1.5	3.8	5.7	

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Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
1220303-1220301	184	8	PVC	1988	I&I Phase 1	1900	1	1.5	3.4	5.1	
1220380-1220018	352	21	PVC	1988	I&I Phase 1	1900	1	1.5	2.1	3.1	
1220380-9310120	326	6	VCP			1900	3	2.9	1.5	4.4	18
1220381-1220380	108	12	VCP			1900	1	1.1	1.8	2.0	20
1220383-1220381	244	12	VCP			1900	1	1.3	0.9	1.2	20
1220383-1220401	387	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	3.4	5.1	
1220384-1220380	21	18	VCP		I&I Phase 1	1988	1	1.5	2.1	3.1	
1220401-1220404	266	8	PVC	1988	I&I Phase 1	1900	3	2.9	3.8	11.0	
1220403-1220384	332	18	VCP		I&I Phase 1	1988	1	1.3	2.1	2.7	
1220403-9310122	633	6	VCP			1900	1	1.8	1.8	3.2	
1220404-1220201	325	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	2.6	3.9	
9100103-9100101	189	10	VCP			1960	1	1.5	3.5	5.3	13
9100105-9100103	94	10	VCP			1960	1	1.5	3.5	5.3	13
9100120-9100118	259	15				1950	-1	6.4	1.5	9.6	20
9100121-9100120	220	15				1950	-1	6.4	1.5	9.6	20
9100122-9100118	31	12				1960	-1	4.3	1.5	6.5	20
9100124-9100121	328	10				1950	-1	6.4	1.5	9.6	20
9100125-9100124	99	10				1950	-1	6.4	1.5	9.6	20
9100126-9100125	262	10				1950	-1	6.4	2.7	17.3	20
9100127-9100126	196	10				1950	-1	6.4	2.7	17.3	20
9100128-9100127	36	10				1950	-1	6.4	2.7	17.3	20
9100129-9100128	240	10				1950	-1	6.4	2.7	17.3	20
9100130-9100129	98	8				1950	-1	6.4	2.4	15.4	20
9100140-9100101	228	12	PVC			1970	1	1.1	3.5	3.9	
9100141-9100140	195	12	PVC	2014	Cyclic Phase 10	1970	-1	1.5	3.5	5.3	
9100142-9100141	299	12	PVC	2014	Cyclic Phase 10	1970	-1	1.5	3.5	5.3	
9100144-9100142	149	8	VCP			1970	-1	4.3	3.2	13.8	5
9100145-9100144	173	8	VCP			1970	-1	4.3	3.2	13.8	5
9100148-9100142	141	15	PVC	2014	Cyclic Phase 10	1970	-1	1.5	3.5	5.3	
9100151-9100166	36	15	PVC	2014	Cyclic Phase 10	1970	-1	1.5	3.5	5.3	
9100155-9100151	324	15	PVC	2014	Cyclic Phase 10	1970	-1	1.5	3.5	5.3	
9100158-9100155	298	6	VCP			1970	1	1.5	3.2	4.8	5
9100159-9100158	240	6	VCP			1970	1	1.5	3.2	4.8	5
9100161-9100155	312	15	PVC	2014	Cyclic Phase 10	1970	3	2.9	3.5	10.2	
9100166-9100167	14	15	PVC	2014	Cyclic Phase 10	1970	-1	1.5	3.1	4.6	
9100167-9100148	102	15	PVC	2014	Cyclic Phase 10	1970	-1	1.5	3.5	5.3	
9100211-9100210	26	8	PVC			1980	1	1.3	3.2	4.2	
9100212-9100225	70	8	PVC			1960	1	1.5	3.2	4.8	
9100213-9100212	178	8	PVC			1970	1	1.5	2.6	3.9	
9100215-9100213	263	8	PVC			1970	1	1.5	2.6	3.9	
9100225-9100211	281	8	PVC			1960	3	2.9	3.2	9.3	
9100311-Marina Village	22	15				1980	-1	2.9	3.1	9.0	
9100312-9100311	87	10	VCP			1980	1	1.1	3.1	3.4	
9100314-9100396	15	10	PVC			1980	1	1.5	1.5	2.3	
9100316-9100314	117	10	PVC			1980	1	1.5	1.5	2.3	
9100318-9100316	187	10	PVC			1980	1	1.5	1.5	2.3	
9100320-9100318	88	10	PVC			1980	1	1.5	1.5	2.3	
9100322-9100320	175	10	PVC			1980	1	1.5	1.5	2.3	
9100323-9100322	166	8	PVC			1980	3	2.5	2.8	7.0	
9100325-9100323	146	8	PVC			1980	1	1.5	2.8	4.2	
9100326-9100325	32	8	PVC			1980	3	2.7	2.8	7.6	
9100327-9100326	185	8	PVC			1980	5	4.3	3.2	13.8	
9100329-9100327	178	8	PVC			1980	1	1.5	2.6	3.9	
9100330-9100329	97	8	PVC			1980	3	2.9	2.6	7.5	
9100340-9100311	165	15	PVC			1980	3	2.7	3.1	8.4	
9100341-9100340	162	15	PVC			1980	1	1.8	3.5	6.3	
9100342-9100341	195	15	PVC			1980	5	4.6	3.5	16.1	
9100350-9100342	256	15	HDPE			1980	1	1.5	3.5	5.3	
9100351-9100395	69	15	HDPE			1980	1	1.5	2.9	4.4	

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Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9100353-9100351	160	15	HDPE			1980	1	1.5	2.9	4.4	
9100354-9100353	103	15	HDPE			1980	1	1.5	2.9	4.4	
9100355-9100354	104	12	VCP			1980	1	1.5	2.9	4.4	20
9100357-9100355	249	12	VCP			1980	1	1.5	3.8	5.7	20
9100358-9100357	198	12	VCP			1980	1	1.5	3.8	5.7	20
9100361-9100358	141	12	VCP			1980	1	1.5	3.8	5.7	20
9100362-9100361	56	6	PVC			1980	1	1.5	3.2	4.8	
9100363-9100361	314	8	HDPE			1980	1	1.5	2.6	3.9	
9100365-9100361	250	12	PVC			1980	1	1.5	2.9	4.4	
9100367-9100365	220	12	PVC			1980	1	1.5	2.9	4.4	
9100369-9100367	186	12	PVC			1980	1	1.5	2.9	4.4	
9100370-9100369	183	12	PVC			1980	1	1.5	2.9	4.4	
9100372-9100370	255	12	PVC			1980	1	1.5	2.9	4.4	
9100374-9100372	144	12	PVC			1980	1	1.1	2.9	3.2	
9100376-9100374	300	12	PVC			1980	10	7.8	2.9	22.6	
9100378-9100376	179	12	CIPP			1980	1	1.1	2.9	3.2	
9100380-9100378	135	12	CIPP			1980	1	1.1	2.9	3.2	
9100382-9100380	48	12	PVC			1980	1	1.5	2.9	4.4	
9100382-Triumph/Indep	30	12	PVC			1980	1	1.3	2.9	3.8	
9100384-9100382	49	10				1980	-1	2.9	2.9	8.4	9
9100385-9100382	28	12	PVC			1980	1	1.5	2.9	4.4	
9100386-9100385	328	10	PVC			1980	1	1.5	2.9	4.4	
9100388-9100386	199	8	PVC			1980	1	1.5	2.6	3.9	
9100390-9100388	146	8	PVC			1980	1	1.5	2.6	3.9	
9100392-9100390	310	8	PVC			1980	1	1.5	2.6	3.9	
9100393-9100392	102	8	PVC			1980	1	1.5	2.6	3.9	
9100395-9100350	241	15	HDPE			1980	1	1.5	3.5	5.3	
9100396-9100312	216	10	PVC			1980	1	1.5	3.1	4.6	
9100400-9100354	85	10	HDPE			1980	1	1.5	2.9	4.4	
9100402-9100400	210	10	HDPE			1980	3	2.9	2.9	8.4	
9100403-9100402	73	8	TRUSS			1980	1	1.5	2.6	3.9	
9100406-9100403	245	8	TRUSS			1980	1	1.5	2.6	3.9	
9100410-9100402	264	10	PVC			1980	1	1.5	2.9	4.4	
9100412-9100410	97	10	PVC			1980	1	1.5	3.8	5.7	
9100414-9100412	188	8	PVC			1980	1	1.5	3.5	5.3	
9100416-9100414	134	8	PVC			1980	1	1.5	3.5	5.3	
9100430-9100428	56	10				1980	-1	2.9	2.7	7.8	9
9100431-9100430	325	10				1980	-1	2.9	2.7	7.8	9
9100432-9100384	277	10	PVC			1980	-1	2.9	2.9	8.4	
9100432-9100431	213	10				1980	-1	2.9	3.1	9.0	9
9100433-9100432	87	10	VCP			1980	1	1.1	3.1	3.4	
9100435-9100433	79	10	VCP			1980	1	1.1	3.1	3.4	
9100501-LS6	26	4				2006	-1	1.5	2.8	4.2	20
9100602-9100603	48	15			Bayport Trunkline	2006	-1	1.5	1.5	2.3	
9100603-9100122	166	12				1960	-1	4.3	1.5	6.5	20
9100604-9100602	235	15	PVC		Bayport Trunkline	2006	1	1.5	1.5	2.3	
9100605-9100604	361	15	PVC		Bayport Trunkline	2006	1	1.5	1.5	2.3	
9100606-9100605	329	15	PVC		Bayport Trunkline	2006	1	1.5	1.5	2.3	
9100607-9100606	401	15	PVC		Bayport Trunkline	2006	1	1.5	1.5	2.3	
9100702-9100701	397	10	PVC			2014	-1	1.5	1.5	2.3	
9100703-9100702	167	10	PVC			2014	-1	1.5	1.5	2.3	
9100704-9100703	132	10	PVC			2014	-1	1.5	1.5	2.3	
9100705-9100704	77	8	PVC			2014	-1	1.5	0.6	0.9	
9100706-9100705	69	8	PVC			2014	-1	1.5	0.6	0.9	
9100707-9100706	47	8	PVC			2014	-1	1.5	0.6	0.9	
9100708-9100707	213	8	PVC			2014	-1	1.5	0.6	0.9	
9100709-9100708	125	8	PVC			2014	-1	1.5	0.6	0.9	
9100710-9100709	120	8	PVC			2014	-1	1.5	0.6	0.9	
9100711-9100710	17	8	PVC			2014	-1	1.5	0.6	0.9	

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Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9100712-9100711	214	8	PVC			2014	-1	1.5	1.2	1.8	
9100713-9100712	119	8	PVC			2014	-1	1.5	1.2	1.8	
9100718-9100701	109	8	PVC			2014	-1	1.5	1.2	1.8	
9100719-9100718	127	8	PVC			2014	-1	1.5	2.8	4.2	
9100720-9100719	261	8	PVC			2014	-1	1.5	2.8	4.2	
9100721-9100720	158	8	PVC			2014	-1	1.5	3.2	4.8	
9110001-9110203	108	8				1900	-1	7.8	3.2	25.0	2
9110002-9110001	377	8				1900	-1	7.8	3.8	29.6	2
9110003-9110002	212	8	PVC		I&I Phase 1	1988	1	1.5	3.2	4.8	
9110004-9110003	45	8	PVC		I&I Phase 1	1988	1	1.5	2.8	4.2	
9110005-9110004	251	6	VCP			1900	10	7.8	2.8	21.8	1
9110006-9110039	243	6	VCP			1900	1	1.5	3.2	4.8	1
9110007-9110002	361	8				1900	-1	7.8	3.8	29.6	2
9110008-9110007	352	8	PVC		I&I Phase 1	1988	1	1.5	3.2	4.8	
9110009-9110007	10	8	PVC		I&I Phase 1	1988	-1	2.9	3.8	11.0	
9110009-9110039	360	8	PVC		I&I Phase 1	1988	-1	2.9	3.8	11.0	
9110010-9110008	147	6	VCP			1900	1	1.5	2.8	4.2	20
9110011-9110042	75	8	PVC		I&I Phase 1	1988	1	1.5	2.8	4.2	
9110013-9110011	100	8	PVC			1900	1	1.5	2.8	4.2	
9110015-9110013	72	6	VCP			1900	1	1.5	2.8	4.2	20
9110017-9110007	38	10	HDPE	2014	Cyclic Phase 11	1900	-1	1.5	4.1	6.1	
9110018-9110017	298	10	HDPE	2014	Cyclic Phase 11	1900	-1	1.5	4.1	6.1	
9110019-9110018	353	6	VCP			1900	8	6.5	3.5	22.8	5
9110020-9110019	321	6	VCP			1900	10	8.1	3.5	28.4	5
9110021-9110018	418	8				1900	-1	7.8	3.8	29.6	1
9110022-9110005	48	0				1900	-1	7.8	1.9	14.8	1
9110023-9110021	300	8	PVC			1900	1	1.5	3.2	4.8	
9110024-9110023	315	8	PVC			1900	3	2.9	0.6	1.7	
9110024-9120315	134	8	PVC			1900	-1	7.8	0.6	4.7	
9110025-9110021	180	8	VCP			1900	1	1.5	3.8	5.7	1
9110026-9110025	151	8	VCP			1900	1	1.1	3.8	4.2	1
9110027-9110026	313	10	HDPE	2014		1900	1	1.5	4.1	6.1	
9110028-9110027	262	8	PVC	1988	I&I Phase 1	1900	5	4.3	3.5	15.1	
9110029-9110027	10	8	PVC			1900	1	1.5	3.5	5.3	
9110031-9120000	98	8	PVC		I&I Phase 1	1988	-1	2.9	3.8	11.0	
9110032-9110031	36	8	PVC		I&I Phase 1	1988	-1	2.9	3.8	11.0	
9110035-9121209	50	8	PVC	2009	Cyclic Phase 5	1900	-1	1.5	2.8	4.2	
9110036-9110041	5	8	PVC		Cyclic Phase 5	2009	1	1.1	1.2	1.3	
9110039-9110002	10	8				1900	-1	7.8	3.8	29.6	2
9110039-9110032	355	8	PVC		I&I Phase 1	1988	-1	2.9	3.8	11.0	
9110041-9121205	30	8			Cyclic Phase 5	2009	-1	1.5	1.2	1.8	
9110042-9110009	290	8	PVC		I&I Phase 1	1988	1	1.1	3.2	3.5	
9110101-9110203	139	8	VCP			1990	1	1.5	3.2	4.8	13
9110104-9110101	125	8	VCP			1990	3	2.9	3.5	10.2	13
9110107-9110104	131	8	VCP			1990	3	2.5	3.5	8.8	
9110110-9110107	168	8	VCP			1990	3	2.9	3.5	10.2	13
9110113-9110110	480	8	VCP			1990	5	4.1	3.2	13.1	13
9110203-9110202	331	30				1900	1	1.6	4.4	7.0	10
9120000-9110203	39	30	VCP			1900	1	1.5	4.4	6.6	10
9120001-9120000	59	30	VCP			1900	1	1.5	4.4	6.6	10
9120002-9120001	267	30	VCP			1900	1	1.6	4.4	7.0	10
9120003-9120002	162	30	VCP			1900	1	1.3	4.0	5.2	10
9120004-9120003	72	30	VCP			1900	1	1.3	4.0	5.2	10
9120005-9120010	290	27	VCP			1900	1	1.8	4.1	7.4	10
9120010-9120004	243	27	VCP			1900	1	1.8	4.1	7.4	10
9120101-9120005	163	18	VCP			1960	3	2.7	3.8	10.3	15
9120102-9120101	338	18	VCP			1960	1	1.8	3.4	6.1	15
9120103-9120109	60	18	VCP			1960	-1	4.3	3.4	14.6	15
9120104-9120103	92	18	VCP			1960	1	1.5	3.4	5.1	15

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9120105-9120104	114	18	VCP			1960	1	1.5	3.4	5.1	15
9120106-9120105	143	18				1960	5	4.3	3.8	16.3	15
9120108-9120110	70	8	VCP			1960	-1	4.3	0.6	2.6	20
9120109-9120102	75	18	VCP			1960	1	1.5	3.4	5.1	15
9120110-9120106	274	8	VCP			1960	-1	4.3	2.6	11.2	20
9120201-9120806	138	15				1960	-1	4.3	3.8	16.3	10
9120301-9120807	182	18	VCP			1900	1	1.5	3.8	5.7	12
9120302-9120301	316	18	VCP			1900	1	1.1	3.8	4.2	12
9120303-9120302	161	18	VCP			1900	1	1.5	3.8	5.7	12
9120304-9120303	161	18	VCP			1900	1	1.5	3.8	5.7	12
9120305-9120304	280	8	VCP			1960	3	2.9	2.6	7.5	20
9120306-9120305	299	8	VCP			1960	3	2.9	2.6	7.5	20
9120307-9120304	12	18	VCP			1900	1	1.5	3.2	4.8	20
9120308-9120307	342	8	VCP			1960	8	6.2	2.6	16.1	20
9120309-9120307	333	18	VCP			1900	1	1.5	4.1	6.1	11
9120309-9120310	621	6	VCP			1900	1	1.5	3.5	5.3	13
9120310-9120403	411	6	AC			1900	1	1.5	3.5	5.3	13
9120311-9120309	412	18	VCP			1900	1	1.5	4.1	6.1	11
9120312-9120311	297	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9120314-9120332	215	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9120314-9120334	213	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9120315-9121102	401	10	PVC		I&I Phase 4	1994	1	1.5	2.9	4.4	
9120316-9120311	328	18	VCP			1900	1	1.5	2.1	3.1	
9120316-9120409	347	6	VCP			1900	10	7.8	0.6	4.7	18
9120317-9120316	431	6	VCP			1900	10	7.4	0.6	4.4	16
9120318-9120317	329	6	VCP			1900	3	2.9	0.6	1.7	16
9120318-9120320	435	8	PVC	2003	I&I Phase 8	1900	10	7.6	1.5	11.4	
9120319-9120315	333	8	PVC		I&I Phase 4	1994	1	1.5	0.6	0.9	
9120319-9120317	429	6	VCP			1900	10	7.6	0.6	4.6	16
9120320-9120316	328	18	VCP			1900	1	1.1	1.2	1.3	
9120324-9120320	285	18	VCP			1900	1	1.1	1.2	1.3	
9120325-9120324	235	6	VCP			1900	8	6.4	0.6	3.8	18
9120326-9120325	341	6	VCP			1900	10	7.8	0.6	4.7	18
9120327-9120326	281	6	VCP			1900	10	7.8	0.6	4.7	18
9120327-9121106	275	8	PVC		I&I Phase 4	1994	1	1.5	0.6	0.9	
9120328-9120324	56	18	VCP			1900	1	1.5	1.2	1.8	
9120328-9121802	348	6	VCP			1900	10	7.8	0.6	4.7	18
9120329-9120328	333	18	VCP			1900	1	1.5	1.8	2.7	
9120330-9120329	13	18	VCP			1900	1	1.1	2.1	2.3	
9120332-9120311	215	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9120333-9120312	200	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	0.6	0.9	
9120334-9120315	213	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	0.6	0.9	
9120400-9120809	401	15	VCP			1900	1	1.5	3.8	5.7	12
9120401-9120400	58	15	VCP			1900	1	1.6	3.4	5.4	12
9120402-9120401	350	15	VCP			1900	3	2.5	3.4	8.5	12
9120403-9120402	367	15	VCP			1900	1	1.5	3.8	5.7	12
9120405-9120423	210	12	VCP			1900	3	2.9	2.9	8.4	19
9120406-9120333	200	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	0.6	0.9	
9120406-9120405	325	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	2.6	3.9	
9120407-9120405	350	12	VCP			1900	1	1.5	2.9	4.4	19
9120408-9120407	344	6	VCP			1900	10	7.6	0.6	4.6	18
9120409-9120408	344	6	VCP			1900	10	7.8	0.6	4.7	18
9120411-9120407	179	12	VCP			1900	1	1.5	0.9	1.3	19
9120412-9120411	270	6	PVC			1900	1	1.5	0.6	0.9	
9120413-9120411	152	12	VCP			1900	1	1.5	0.9	1.3	19
9120414-9120413	322	8	PVC	2003	I&I Phase 8	1900	1	1.5	1.5	2.3	
9120415-9120320	334	8	PVC	2003	I&I Phase 8	1900	1	1.5	1.5	2.3	
9120415-9120414	368	8	PVC	2003	I&I Phase 8	1900	1	1.5	1.5	2.3	
9120416-9120413	332	12	VCP			1900	1	1.5	2.5	3.8	14

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9120417-9120416	13	6	VCP			1900	1	1.5	2.2	3.3	
9120417-9120633	311	6	VCP			1900	10	7.8	2.2	17.2	4
9120417-9122007	342	6	VCP			1900	10	7.4	2.2	16.3	14
9120419-9120416	15	0				1900	-1	7.8	1.9	14.8	5
9120423-9120403	165	12	VCP			1900	1	1.5	3.8	5.7	19
9120501-9120809	28	15	VCP			1900	1	1.1	3.8	4.2	11
9120601-9120811	146	10	PVC	2003	I&I Phase 8	1900	1	1.5	3.8	5.7	
9120602-9120601	248	10	PVC	2003	I&I Phase 8	1900	1	1.5	3.8	5.7	
9120603-9120602	225	6	TRUSS			1900	3	2.9	3.5	10.2	
9120604-9120602	393	6	VCP			1940	5	4.6	3.5	16.1	4
9120606-9120602	252	10	PVC	2003	I&I Phase 8	1900	1	1.5	3.8	5.7	
9120607-9120606	327	6	VCP			1900	1	1.5	2.6	3.9	
9120608-9120606	253	10	PVC	2003	I&I Phase 8	1900	1	1.5	2.9	4.4	
9120609-9120608	323	6	VCP			1900	10	7.8	2.6	20.3	4
9120610-9120609	98	6	VCP			1900	1	1.5	2.2	3.3	
9120611-9120608	249	10	PVC	2003	I&I Phase 8	1900	1	1.5	2.9	4.4	
9120612-9120611	317	8	PVC	2014	Cyclic Phase 11	1900	1	1.1	3.5	3.9	
9120612-9122001	319	8	PVC	2014	Cyclic Phase 11	1900	-1	1.5	3.5	5.3	
9120613-9120611	226	8	PVC	2014	Cyclic Phase 11	1940	1	1.5	3.5	5.3	
9120613-9120910	225	8	PVC	2014	Cyclic Phase 11	1940	1	1.5	3.5	5.3	
9120614-9120611	397	10	PVC	2003	I&I Phase 8	1900	5	4.3	2.9	12.5	
9120615-9120614	312	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	0.6	0.9	
9120616-9120615	312	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	2.6	3.9	
9120616-9122003	21	6	VCP			1900	1	1.5	2.6	3.9	19
9120617-9120614	194	8	PVC	2013	Cyclic Phase 9	1940	-1	1.5	2.2	3.3	
9120618-9120614	335	10	PVC	2003	I&I Phase 8	1900	3	2.9	0.9	2.6	
9120619-9120618	312	6	VCP			1900	10	7.8	0.6	4.7	18
9120620-9120616	328	6	VCP			1900	10	7.9	2.6	20.5	19
9120620-9120619	311	6	VCP			1900	10	8.1	0.6	4.9	18
9120621-9120618	331	10	PVC	2003	I&I Phase 8	1900	5	4.1	0.9	3.7	
9120622-9120621	317	8	PVC	2003	I&I Phase 8	1900	1	1.5	1.5	2.3	
9120624-9120621	274	10	PVC	2003	I&I Phase 8	1900	1	1.5	0.9	1.3	
9120625-9120640	54	8	PVC	2010		1940	1	1.5	1.5	2.3	
9120627-9120640	41	6	VCP			1900	3	2.7	0.6	1.6	
9120628-9120627	235	6	VCP			1900	10	8.1	0.6	4.9	18
9120629-9120628	32	6				1900	-1	7.8	0.6	4.7	3
9120630-9120629	81	6				1900	-1	7.8	1.2	9.4	3
9120631-9120630	106	6				1900	-1	7.8	2.8	21.8	3
9120632-9120631	99	6				1900	-1	7.8	2.8	21.8	3
9120633-9120628	72	6	VCP			1900	10	7.8	0.6	4.7	18
9120638-9120603	51	4				1900	-1	7.8	3.5	27.3	2
9120640-9120624	40	6	VCP			1900	3	2.7	0.6	1.6	
9120806-9120005	133	27	VCP			1900	1	1.3	4.1	5.3	10
9120807-9120818	9	24	VCP			1900	1	1.5	4.1	6.1	11
9120808-9120819	345	24	VCP			1900	1	1.6	4.1	6.6	11
9120809-9130113	386	24				1900	-1	7.8	4.4	34.3	11
9120810-9120809	599	21				1900	1	1.5	4.1	6.1	11
9120811-9120810	11	15				1900	-1	7.8	3.8	29.6	1
9120812-9120811	123	15				1940	-1	6.4	3.8	24.3	1
9120813-9120812	257	15				1940	-1	6.4	2.9	18.6	1
9120814-9120813	48	15				1940	-1	6.4	2.9	18.6	1
9120815-9130014	137	12				1980	-1	2.9	3.5	10.2	1
9120816-9120815	41	0				1980	-1	2.9	2.9	8.4	1
9120818-9120820	340	24				1900	-1	7.8	4.1	32.0	11
9120819-9120807	270	24	VCP			1900	1	1.6	4.1	6.6	11
9120820-9120806	119		VCP			1900	1	1.8	2.9	5.2	11
9120901-9120814	57	12	PVC	2003	I&I Phase 8	1940	1	1.5	3.5	5.3	
9120902-9120901	145	12	PVC	2003	I&I Phase 8	1940	1	1.5	3.5	5.3	
9120903-9120902	169	12	PVC	2003	I&I Phase 8	1940	5	4.3	3.5	15.1	

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9120904-9120903	170	6	VCP			1940	1	1.5	2.6	3.9	
9120906-9120904	199	6	VCP			1940	3	2.9	2.2	6.4	
9120910-9120933	147	15	PVC		I&I Phase 8	2003	1	1.5	3.8	5.7	
9120911-9120910	96	8	VCP			1940	1	1.5	3.2	4.8	10
9120912-9120910	66	12	PVC	2003	I&I Phase 8	1940	1	1.5	3.1	4.6	
9120913-9120912	175	6	VCP			1940	3	2.9	3.2	9.3	
9120914-9120913	190	6	VCP			1940	5	4.3	2.6	11.2	4
9120915-9120914	257	6	PVC			1940	10	7.8	2.6	20.3	
9120916-9120915	87	6	VCP			1940	5	4.3	2.6	11.2	4
9120917-9120916	209	6	VCP			1940	10	7.8	2.2	17.2	4
9120918-9120912	107	10	PVC	2003	I&I Phase 8	1940	1	1.5	3.5	5.3	
9120919-9120918	260	8	PVC	2003	I&I Phase 8	1940	3	2.9	3.5	10.2	
9120920-9120919	253	8	PVC	2003	I&I Phase 8	1940	1	1.5	3.1	4.6	
9120921-9120920	254	8	PVC	2003	I&I Phase 8	1940	1	1.5	3.5	5.3	
9120922-9120921	222	8	PVC	2003	I&I Phase 8	1940	1	1.5	3.1	4.6	
9120923-9120922	222	10	PVC	2003	I&I Phase 8	1940	1	1.5	1.8	2.7	
9120924-9120918	275	8	VCP			1940	3	2.5	3.2	8.0	10
9120925-9120924	243	8	PVC	2010	Cyclic Phase 6	1940	-1	1.5	2.6	3.9	
9120926-9120925	279	8	PVC	2010	Cyclic Phase 6	1940	-1	1.5	2.2	3.3	
9120927-9120926	164	8	PVC	2010	Cyclic Phase 6	1940	-1	1.5	0.6	0.9	
9120928-9120927	154	8	PVC	2010	Cyclic Phase 6	1940	-1	1.5	3.1	4.6	
9120929-9120928	140	8	PVC	2010	Cyclic Phase 6	1940	-1	1.5	3.5	5.3	
9120930-9120929	110	8	PVC	2010	Cyclic Phase 6	1940	-1	1.5	3.5	5.3	
9120931-9120625	235	8	PVC	2010	Cyclic Phase 6	1940	-1	1.5	1.5	2.3	
9120931-9120930	339	8	PVC	2010	Cyclic Phase 6	1940	-1	1.5	3.1	4.6	
9121001-9121102	203	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	3.5	5.3	
9121002-9121001	173	6	VCP			1900	10	7.8	2.8	21.8	4
9121003-9121004	107	6	PVC	2011	Cyclic Phase 8	1900	1	1.5	3.4	5.1	
9121004-9121001	343	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	3.4	5.1	
9121101-9121115	259	10	PVC		I&I Phase 4	1994	1	1.5	3.4	5.1	
9121102-9121101	424	10	PVC		I&I Phase 4	1994	1	1.5	3.8	5.7	
9121105-9110026	376	8	PVC	1988	I&I Phase 1	1900	3	2.9	3.2	9.3	
9121105-9120319	372	6	VCP			1900	10	7.4	0.6	4.4	16
9121106-9120318	419	8	PVC	2003	I&I Phase 8	1900	1	1.5	1.5	2.3	
9121106-9120319	330	8	PVC		I&I Phase 4	1994	1	1.5	0.6	0.9	
9121107-9110029	358	8	PVC	1988	I&I Phase 1	1900	5	4.3	3.5	15.1	
9121107-9121106	395	8	PVC	2003	I&I Phase 8	1900	1	1.5	1.5	2.3	
9121109-9120327	69	8	PVC		I&I Phase 4	1994	1	1.5	0.6	0.9	
9121110-9121109	348	6	VCP			1900	10	7.8	0.6	4.7	3
9121111-9121110	293	6	VCP			1900	10	7.8	2.8	21.8	3
9121112-9121109	76	8	PVC		I&I Phase 4	1994	1	1.5	0.6	0.9	
9121113-9121112	470	6	VCP			1900	10	7.4	0.6	4.4	17
9121114-9121112	259	8	PVC		I&I Phase 4	1994	3	2.9	0.6	1.7	
9121115-9120309	178	10	PVC		I&I Phase 4	1994	1	1.5	3.8	5.7	
9121201-9120330	219	12	VCP			1900	3	2.9	3.0	8.7	13
9121202-9121201	184	6	VCP			1900	1	1.5	1.8	2.7	17
9121203-9121201	345	12	VCP			1900	3	2.9	3.0	8.7	13
9121204-9121203	292	12	VCP			1900	3	2.9	1.8	5.2	13
9121205-9121204	338	12	VCP			1900	1	1.5	1.8	2.7	
9121206-9121205	153	8	VCP			1900	1	1.5	3.1	4.6	17
9121207-9121206	68	8	PVC			1900	1	1.5	3.1	4.6	
9121208-9121206	15	6	VCP			1900	1	1.5	3.1	4.6	17
9121209-1220203	251	10	HDPE	2014		1900	-1	1.5	3.7	5.6	
9121209-1220303	261	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	3.4	5.1	
9121209-9121208	268	6	VCP			1900	1	1.1	3.1	3.4	
9121301-9120330	296	15	VCP			1900	3	2.5	1.8	4.5	13
9121302-9121301	323	14				1900	10	7.8	1.8	14.0	13
9121303-9121302	11	0				1940	-1	6.4	1.2	7.7	13
9121401-Tideway	17	8	VCP			1960	1	1.1	2.6	2.9	16

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9121402-9121405	188	6	VCP			1960	1	1.5	2.6	3.9	16
9121403-9121402	240	6	VCP			1960	5	3.9	2.6	10.1	13
9121404-9121403	300	6	VCP			1960	1	1.6	2.2	3.5	13
9121405-9121401	156	6	VCP			1960	3	2.9	2.6	7.5	16
9121501-9121401	57	8	VCP			1960	1	1.5	2.6	3.9	16
9121502-9121501	77	6	VCP			1960	1	1.5	3.2	4.8	16
9121503-9121502	40	6	VCP			1960	1	1.5	3.2	4.8	16
9121507-9121501	38	8	VCP			1960	1	1.5	3.2	4.8	16
9121601-Cola Ballena	54	10	VCP			1960	1	1.5	2.7	4.1	16
9121602-9121601	88	8	VCP			1960	3	2.9	1.8	5.2	16
9121606-9121601	198	10	VCP			1960	3	2.9	2.5	7.3	16
9121607-9121606	324	10	VCP			1960	3	3.2	3.5	11.2	16
9121608-9121607	245	8	VCP			1960	8	6.2	2.8	17.4	16
9121609-9121608	222	8	VCP			1960	3	2.9	3.2	9.3	16
9121610-9121609	122	8	VCP			1960	1	1.5	3.2	4.8	16
9121611-9121610	124	8	VCP			1960	3	2.9	2.8	8.1	16
9121612-9121611	248	8	VCP			1960	10	7.8	2.8	21.8	16
9121613-9121612	313	4	VCP			1960	1	1.3	3.2	4.2	16
9121614-9121613	229	4				1960	-1	4.3	3.2	13.8	16
9121701-9120417	338	6	VCP			1900	1	1.5	2.6	3.9	14
9121702-9121701	356	6	CIP			1900	3	2.9	3.5	10.2	13
9121801-9120417	348	6	VCP			1900	10	7.6	2.2	16.7	4
9121802-9121801	350	6	VCP			1900	10	7.8	0.6	4.7	18
9122001-9120403	13	6	VCP			1900	1	1.5	3.5	5.3	13
9122003-9122001	373	6	VCP			1900	8	6.4	3.5	22.4	19
9122006-9120620	178	6	VCP			1900	3	2.9	0.6	1.7	19
9122007-9120622	310	8	PVC	2003	I&I Phase 8	1900	1	1.5	1.5	2.3	
9122007-9122006	151	6	VCP			1900	1	1.5	0.6	0.9	19
9130003-9130012	106	8			Bayport	2009	-1	1.5	2.2	3.3	
9130012-9120810	177	8				2000	-1	1.5	3.5	5.3	
9130013-9130014	155	8				2000	-1	1.5	3.2	4.8	
9130014-9120814	300	12				1980	-1	2.9	3.5	10.2	1
9130021-9130003	243	8			Bayport	2009	-1	1.5	2.2	3.3	
9130022-9130021	108	8			Bayport	2009	-1	1.5	0.6	0.9	
9130023-9130022	142	8			Bayport	2009	-1	1.5	0.6	0.9	
9130024-9130023	177	8			Bayport	2009	-1	1.5	0.6	0.9	
9130041-9130023	235	8			Bayport	2009	-1	1.5	0.6	0.9	
9130042-9130041	231	8			Bayport	2009	-1	1.5	1.5	2.3	
9130066-9130248	30	8			Bayport	2009	-1	1.5	1.2	1.8	
9130102-9130113	264	8	PVC		Bayport	2009	8	6.2	2.6	16.1	
9130103-9130102	227	8			Bayport	2009	-1	1.5	2.2	3.3	
9130104-9130103	148	8			Bayport	2009	-1	1.5	0.6	0.9	
9130105-9130104	97	8			Bayport	2009	-1	1.5	1.5	2.3	
9130106-9130105	72	8			Bayport	2009	-1	1.5	1.5	2.3	
9130107-9130106	56	8			Bayport	2009	-1	1.5	1.5	2.3	
9130108-9130107	95	8			Bayport	2009	-1	1.5	1.5	2.3	
9130109-9130108	87	8			Bayport	2009	-1	1.5	1.5	2.3	
9130110-9130109	270	8			Bayport	2009	-1	1.5	0.6	0.9	
9130111-9130110	90	8			Bayport	2009	-1	1.5	0.6	0.9	
9130113-9120808	60	24				1900	-1	7.8	4.1	32.0	11
9130151-9130105	120	8			Bayport	2009	-1	1.5	1.5	2.3	
9130152-9130151	115	8			Bayport	2009	-1	1.5	1.5	2.3	
9130153-9130152	213	8			Bayport	2009	-1	1.5	1.5	2.3	
9130204-9130241	172	8			Bayport	2009	-1	1.5	1.2	1.8	
9130205-9130204	225	8			Bayport	2009	-1	1.5	0.6	0.9	
9130206-9130205	239	8			Bayport	2009	-1	1.5	1.5	2.3	
9130207-9130206	64	8			Bayport	2009	-1	1.5	1.5	2.3	
9130208-9130207	74	8			Bayport	2009	-1	1.5	1.5	2.3	
9130209-9130206	156	8			Bayport	2009	-1	1.5	1.5	2.3	

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9130210-9130209	141	8			Bayport	2009	-1	1.5	1.5	2.3	
9130221-Haile	40	8			Bayport	2009	-1	1.5	0.6	0.9	
9130241-9130242	244	8			Bayport	2009	-1	1.5	1.2	1.8	
9130242-9130243	330	8			Bayport	2009	-1	1.5	1.2	1.8	
9130243-9130244	330	8			Bayport	2009	-1	1.5	1.2	1.8	
9130244-9130245	345	8			Bayport	2009	-1	1.5	1.2	1.8	
9130245-9130246	337	8			Bayport	2009	-1	1.5	2.8	4.2	
9130246-9130247	87	8			Bayport	2009	-1	1.5	2.8	4.2	
9130247-9130248	208	8			Bayport	2009	-1	1.5	2.8	4.2	
9130301-9130245	166	8			Bayport	2009	-1	1.5	1.2	1.8	
9130314-9130312	273	8			Bayport	2009	-1	1.5	1.5	2.3	
9130315-9130312	282	8			Bayport	2009	-1	1.5	1.5	2.3	
9130321-9130301	225	8			Bayport	2009	-1	1.5	0.6	0.9	
9130324-9130321	239	8			Bayport	2009	-1	1.5	0.6	0.9	
9130325-9130324	130	8			Bayport	2009	-1	1.5	0.6	0.9	
9130331-9130324	266	8			Bayport	2009	-1	1.5	0.6	0.9	
9140027-9100708	66	8	PVC			2014	-1	0.8	1.2	1.0	
9140028-9140027	70	8	PVC			2014	-1	1.5	1.2	1.8	
9140029-9140028	238	8	PVC			2014	-1	1.5	1.2	1.8	
9210000-9230021	204	10	VCP			1960	1	1.5	3.8	5.7	12
9210004-9710001	347	10	VCP			1960	3	2.9	3.8	11.0	12
9210005-9210004	137	8	VCP			1960	1	1.5	3.5	5.3	12
9210006-9210005	179	8	VCP			1960	1	1.5	2.2	3.3	17
9210007-9210006	80	8	VCP			1960	1	1.1	0.6	0.7	
9210008-9210007	136	8	VCP			1960	3	2.9	2.2	6.4	17
9210009-9210008	100	8	VCP			1960	1	1.5	2.6	3.9	17
9210010-9210004	130	10	VCP			1960	1	1.5	3.8	5.7	12
9210011-9210010	217	8	VCP			1960	5	3.9	3.5	13.7	12
9210012-9210011	71	8	VCP			1960	1	1.5	2.2	3.3	12
9210013-9210012	167	8	VCP			1960	1	1.5	2.2	3.3	17
9210014-9210013	68	8	VCP			1960	1	1.5	2.6	3.9	17
9210015-9210014	46	8	VCP			1960	1	1.5	2.6	3.9	
9210016-9210015	138	8	VCP			1960	3	2.9	2.2	6.4	17
9210017-9210016	95	8	VCP			1960	1	1.5	2.2	3.3	17
9210018-9210011	311	8	VCP			1960	3	2.9	3.5	10.2	12
9210019-9210018	37	8	VCP			1960	1	1.5	3.5	5.3	12
9210019-Pond/Otis	51	10	VCP			1960	1	1.5	3.5	5.3	
9210020-9210019	282	8	VCP			1960	1	1.5	2.6	3.9	17
9210021-9210020	271	8	VCP			1960	1	1.5	2.6	3.9	17
9210022-9210019	190	8	VCP			1960	1	1.5	3.5	5.3	14
9210023-9210022	106	8	VCP			1960	1	1.5	3.5	5.3	14
9210024-9210023	201	8	VCP			1960	1	1.5	2.6	3.9	17
9210025-9210024	238	8	VCP			1960	1	1.5	2.6	3.9	17
9210026-9210023	263	6	VCP			1960	1	1.5	3.5	5.3	14
9210026-9731012	267	6	VCP			1960	1	1.5	3.1	4.6	14
9211000-9210010	40	8	VCP			1960	3	2.5	3.5	8.8	
9211001-9211000	224	8	VCP			1960	8	6.4	3.5	22.4	18
9211002-9211001	50	6	VCP			1960	1	1.8	3.5	6.3	19
9211003-9211002	278	6	VCP			1960	8	6.4	3.5	22.4	19
9211005-9211001	88	8	VCP			1960	10	7.8	3.5	27.3	18
9211006-9211005	124	8	VCP			1960	5	4.3	3.5	15.1	18
9211007-9211006	134	8	VCP			1960	5	4.3	3.5	15.1	18
9211008-9211007	236	8	VCP			1960	3	2.9	2.6	7.5	18
9211009-9211008	234	8	VCP			1960	1	1.5	2.6	3.9	9
9211010-9211009	202	8	VCP			1960	1	1.5	2.6	3.9	9
9211011-9211010	191	8	VCP			1960	1	1.5	2.2	3.3	15
9211012-9211007	260	8	VCP			1960	1	1.5	2.6	3.9	18
9211013-9211012	235	8	VCP			1960	5	4.3	2.2	9.5	18
9211014-9211013	229	8	VCP			1960	1	1.5	2.6	3.9	18

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9212001-9212010	34	8	PVC			1960	1	1.5	2.6	3.9	
9212002-9731203	37	8	VCP			1960	1	1.1	2.6	2.9	19
9212003-9211003	202	6	VCP			1960	1	1.5	2.2	3.3	19
9212003-9212002	191	6	VCP			1960	1	1.5	2.6	3.9	19
9212004-9212002	256	8	VCP			1960	5	4.3	3.2	13.8	14
9212005-9212004	179	8	VCP			1960	3	2.9	2.6	7.5	14
9212006-9212005	298	8	VCP			1960	10	7.4	2.2	16.3	14
9212007-9212006	232	8	VCP			1960	5	4.6	2.6	12.0	14
9212008-9212004	73	8	VCP			1960	1	1.5	2.6	3.9	14
9212009-9212008	296	8	VCP			1960	5	4.1	2.2	9.0	14
9212009-9212015	15	8	PVC			1960	1	1.1	2.2	2.4	
9212010-Yorkshire/Franciscan	21	10	HDPE			1960	1	1.5	2.9	4.4	
9212011-9212001	262	10	VCP			1960	10	7.9	3.5	27.6	2
9212012-9212011	149	8				1960	-1	4.3	1.2	5.2	2
9212013-9212011	62	8				1960	-1	4.3	1.2	5.2	2
9212015-9212010	275	8	PVC			1960	1	1.5	2.6	3.9	
9220001-9230021	211	10	VCP			1960	1	1.5	3.4	5.1	15
9220002-9220001	298	10	VCP			1960	1	1.5	3.4	5.1	15
9220003-9220002	306	8	VCP			1960	1	1.5	1.5	2.3	
9220004-9220003	145	8	VCP			1960	1	1.5	1.5	2.3	
9220004-9220012	15	8	PVC			1960	1	1.5	1.5	2.3	
9220005-9220004	256	8	VCP			1960	3	3.2	1.5	4.8	
9220006-9220005	298	8	VCP			1960	1	1.8	1.5	2.7	
9220008-Grand/Shoreline	87	0				1960	-1	4.3	2.8	12.0	6
9220009-9220008	64	6				1960	-1	4.3	2.8	12.0	6
9220010-Grand/Shoreline	92	8	PVC			1960	-1	4.3	3.1	13.3	
9220011-9220010	135	8	PVC			1960	1	1.5	3.1	4.6	
9220012-9220011	164	8	PVC			1960	1	1.5	1.5	2.3	
9220013-9220002	48	8	VCP			1960	1	1.1	1.2	1.3	
9221001-9220002	271	8	HDPE	1988	I&I Phase 1	1960	1	1.5	3.2	4.8	
9221002-9221001	255	8	VCP			1960	10	7.8	2.6	20.3	4
9221003-9221002	255	8	VCP			1960	3	2.9	3.2	9.3	16
9221004-9221003	101	8	VCP			1960	1	1.5	2.6	3.9	7
9221005-9221004	20	8	VCP			1960	1	1.1	2.6	2.9	
9221005-Sand Beach	29	8	DI			1960	1	1.5	2.6	3.9	7
9221006-9221005	137	8	VCP			1960	1	1.5	2.6	3.9	7
9221007-9221006	250	8	CP			1960	1	1.5	3.2	4.8	16
9221008-9221007	264	8	VCP			1960	3	2.5	2.6	6.5	12
9221101-9221001	249	8	HDPE	1988	I&I Phase 1	1960	1	1.5	2.6	3.9	
9221102-9221101	297	6	HDPE	1988	I&I Phase 1	1960	5	4.3	2.2	9.5	
9221103-9221102	276	6	HDPE	1988	I&I Phase 1	1960	5	4.6	2.6	12.0	
9221201-9221002	265	8	VCP			1960	5	4.3	2.6	11.2	19
9221202-9221201	300	8	VCP			1960	5	4.4	2.6	11.4	19
9221203-9221202	259	8	VCP			1960	1	1.5	2.6	3.9	19
9221301-9221003	253	8	VCP			1960	1	1.5	2.6	3.9	12
9221302-9221301	299	8	VCP			1960	10	8.1	2.6	21.1	12
9221303-9221302	271	8	VCP			1960	1	1.1	2.6	2.9	12
9221401-9221006	257	8	VCP			1960	5	4.3	2.6	11.2	12
9221402-9221401	300	8	VCP			1960	5	3.9	2.6	10.1	12
9221403-9221402	264	8	VCP			1960	1	1.3	2.6	3.4	
9221501-9221007	249	8	VCP			1960	3	2.9	2.6	7.5	12
9221502-9221501	298	8	VCP			1960	3	2.7	2.6	7.0	12
9221503-9221502	275	8	VCP			1960	1	1.5	2.2	3.3	12
9221601-9221008	265	8	VCP			1960	3	2.5	2.6	6.5	20
9221602-9221601	298	8	VCP			1960	5	4.4	2.2	9.7	20
9221603-9221602	257	8	VCP			1960	1	1.5	2.6	3.9	
9221605-9221603	137	6	VCP			1960	3	2.9	3.2	9.3	20
9221701-9221005	245	8	VCP			1960	3	2.9	3.2	9.3	16
9221703-9221701	244	6	VCP			1960	3	2.9	2.6	7.5	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9221704-9221703	248	6	VCP			1960	1	1.5	2.6	3.9	
9221705-9221704	249	6	VCP			1960	1	1.5	2.6	3.9	
9230001-1210011	252	15	VCP			1960	1	1.3	3.4	4.4	19
9230002-9230001	210	8	VCP			1960	1	1.5	2.2	3.3	
9230003-9230002	317	8	VCP			1960	1	1.5	2.6	3.9	
9230004-9230001	339	15	VCP			1960	1	1.5	3.8	5.7	19
9230005-9230004	272	8	VCP			1960	3	2.9	2.6	7.5	
9230006-9230005	262	8	VCP			1960	5	4.4	2.6	11.4	
9230007-9230004	375	15	VCP			1960	1	1.5	3.8	5.7	19
9230008-9230007	254	8	VCP			1960	3	2.9	2.6	7.5	
9230009-9230008	234	8	VCP			1960	3	3.0	2.6	7.8	
9230010-9230007	379	15	VCP			1960	1	1.1	3.8	4.2	19
9230011-9230010	200	8	VCP			1960	1	1.5	2.6	3.9	
9230012-9230011	214	8	VCP			1960	1	1.5	2.6	3.9	
9230013-9230010	397	15	VCP			1960	1	1.1	3.8	4.2	19
9230014-9230013	200	8	VCP			1960	1	1.5	2.2	3.3	
9230015-9230014	179	8	VCP			1960	1	1.1	2.6	2.9	
9230017-9230013	408	15	VCP			1960	1	1.1	3.8	4.2	19
9230018-9230017	201	8	VCP			1960	1	1.5	2.6	3.9	
9230019-9230018	167	8	VCP			1960	1	1.5	2.6	3.9	
9230020-9230017	387	15	VCP			1960	1	1.8	3.8	6.8	19
9230021-Grand/Otis	77	12	PVC			1960	1	1.5	3.5	5.3	
9230030-9230010	50	6	VCP			1960	1	1.5	2.6	3.9	
9230031-9230030	302	6	CAS			1960	5	4.3	3.2	13.8	19
9230032-9230004	46	8	VCP			1960	1	1.1	2.6	2.9	
9230033-9230032	361	6	VCP			1960	1	1.1	3.2	3.5	19
9230034-9230032	66	8	VCP			1960	1	1.5	2.6	3.9	
9230035-9230034	164	8	VCP			1960	1	1.5	2.2	3.3	
9230036-9230035	121	6	VCP			1960	1	1.5	2.2	3.3	
9230037-9230035	269	6	VCP			1960	1	1.5	2.6	3.9	
9230038-9230037	120	6	VCP			1960	3	2.9	2.2	6.4	
9230039-9230037	246	6	VCP			1960	1	1.5	2.6	3.9	
9230040-9230039	115	6	VCP			1960	1	1.5	2.2	3.3	
9230041-9230039	122	6	VCP			1960	1	1.5	2.6	3.9	
9230045-9230001	16	6	VCP			1960	1	1.5	1.5	2.3	
9230201-1210011	249	8	VCP			1960	1	1.8	2.6	4.7	17
9230202-9230201	259	8	VCP			1960	1	1.1	2.6	2.9	
9230203-9230202	245	8	VCP			1960	1	1.5	2.6	3.9	
9230204-9230203	28	8	VCP			1960	1	1.5	2.2	3.3	
9230301-1210011	416	12	CIPP	1989	I&I Phase 2	1960	5	4.4	2.9	12.8	
9230302-9230301	185	10	CIPP	1989	I&I Phase 2	1960	3	3.0	2.5	7.5	
9230303-9230302	199	10	CIPP	1989	I&I Phase 2	1960	1	1.1	2.9	3.2	
9230304-9230303	168	10	CIPP	1989	I&I Phase 2	1960	3	2.9	2.9	8.4	
9230305-9230304	168	10	CIPP	1989	I&I Phase 2	1960	1	1.5	2.9	4.4	
9230306-9230305	179	10	CIPP	1989	I&I Phase 2	1960	3	3.0	2.5	7.5	
9230307-9230318	80	10	VCP			1960	1	1.5	2.9	4.4	20
9230308-9230307	108	8	VCP			1960	1	1.5	3.2	4.8	20
9230309-9230303	226	8	VCP			1960	5	4.1	2.2	9.0	20
9230310-9230309	233	8	VCP			1960	5	4.3	2.2	9.5	20
9230311-9230310	95	8	VCP			1960	1	1.5	2.2	3.3	20
9230312-9230319	246	10	VCP			1960	-1	4.3	3.1	13.3	20
9230313-9230312	200	10	VCP			1960	-1	4.3	3.5	15.1	20
9230314-9230313	200	8				1960	-1	4.3	3.2	13.8	20
9230315-9230314	250	8				1960	-1	4.3	3.2	13.8	20
9230318-9230306	81	10	VCP			1960	1	1.5	2.9	4.4	16
9230319-9230318	123	10	VCP			1960	-1	4.3	3.5	15.1	20
9240001-9230021	74	6	VCP			1960	1	1.5	3.5	5.3	19
9240002-9240001	192	6	VCP			1960	1	1.5	3.5	5.3	19
9240003-9240002	270	6	VCP			1960	3	2.9	2.6	7.5	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9240004-9221701	327	6	VCP			1960	1	1.5	2.6	3.9	
9240004-9240003	306	6	VCP			1960	1	1.5	2.2	3.3	
9240005-9240002	112	6	VCP			1960	1	1.5	3.5	5.3	19
9240006-9240005	309	6	VCP			1960	1	1.5	2.6	3.9	
9240101-9230021	235	6	VCP			1960	1	1.5	3.5	5.3	14
9300014-9300004	19	12	PVC	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9310001-9300001	298	20	PVC	1998	I&I Phase 6	1900	3	2.9	3.2	9.3	
9310002-9310001	351	20	PVC	1998	I&I Phase 6	1900	1	1.5	3.2	4.8	
9310003-9310002	324	8	VCP			1900	3	2.7	3.2	8.6	9
9310004-9310003	275	8	VCP			1900	1	1.5	3.2	4.8	9
9310005-9310004	44	8	VCP			1900	1	1.5	3.2	4.8	9
9310008-9310005	335	8	PVC	2015	Cyclic Phase 11	1900	1	1.3	3.2	4.2	
9310010-9310005	307	8	VCP			1900	10	7.6	2.6	19.8	4
9310011-9310010	334	8	PVC			1900	1	1.5	2.6	3.9	
9310012-9310011	175	6	PVC			1900	1	1.5	2.2	3.3	
9310013-9310010	313	8	VCP			1900	10	7.8	2.6	20.3	4
9310100-9310002	23	6	VCP			1900	1	1.5	2.6	3.9	16
9310101-9310100	289	6	VCP			1900	1	1.3	2.6	3.4	16
9310102-9300001	14	8				1900	-1	7.8	2.6	20.3	4
9310102-9310101	347	6	VCP			1900	1	1.1	2.6	2.9	16
9310104-9311102	363	14	PVC	1998	I&I Phase 6	1900	1	1.5	3.5	5.3	
9310105-1220010	274	6	VCP			1900	1	1.5	2.2	3.3	5
9310105-9310104	270	6				1900	-1	7.8	1.2	9.4	5
9310107-9310104	39	14	PVC	1998	I&I Phase 6	1900	1	1.5	1.5	2.3	
9310108-9310107	252	6	VCP			1900	10	7.8	1.2	9.4	5
9310109-9310107	329	15	PVC	1998	I&I Phase 6	1900	1	1.5	1.5	2.3	
9310110-9310109	326	6				1900	-1	7.8	0.6	4.7	18
9310112-9310109	329	15	PVC	1998	I&I Phase 6	1900	1	1.5	1.5	2.3	
9310113-9310112	568	6	VCP			1900	5	4.3	1.5	6.5	20
9310113-9311107	694	6	VCP			1900	10	8.1	2.6	21.1	20
9310114-9310113	137	6	VCP			1900	3	2.9	1.5	4.4	20
9310114-9310115	220	6	VCP			1900	3	2.9	1.5	4.4	20
9310114-9310118	332	6	VCP			1900	10	7.8	0.6	4.7	10
9310115-9311203	701	6	VCP			1900	3	2.9	2.6	7.5	
9310115-9311307	419	6	VCP			1900	5	4.1	1.5	6.1	8
9310116-9310112	341	15	PVC	1998	I&I Phase 6	1900	1	1.5	1.5	2.3	
9310117-9310116	596	6	VCP			1900	10	8.1	0.6	4.9	18
9310118-9310117	110	6	VCP			1900	10	7.8	0.6	4.7	18
9310119-9310118	514	6	VCP			1900	10	7.6	0.6	4.6	18
9310120-9310116	323	6	VCP			1900	5	3.9	1.5	5.9	18
9310122-9310116	346	15	PVC	1998	I&I Phase 6	1900	1	1.5	1.5	2.3	
9310123-9310124	448	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.8	2.7	
9310124-9310122	15	8				1900	-1	7.8	1.8	14.0	
9310125-9310123	20	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.8	2.7	
9310127-9310112	15	0				1900	-1	7.8	1.2	9.4	9
9310201-9310124	340	8	PVC	1998	I&I Phase 6	1900	1	1.5	1.2	1.8	
9310202-9310201	292	6	VCP			1900	1	1.1	0.6	0.7	5
9310203-9310201	215	6	VCP			1900	8	6.4	0.6	3.8	5
9310204-9310201	330	8	PVC	1998	I&I Phase 6	1900	1	1.5	2.2	3.3	
9310205-9310204	298	6	VCP			1900	1	1.1	2.2	2.4	7
9310206-9310204	218	6	VCP			1900	1	1.5	2.2	3.3	7
9310207-9310204	231	8	PVC	1998	I&I Phase 6	1900	1	1.5	2.6	3.9	
9310300-9310123	337	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.2	1.8	
9310301-9310205	149	6	VCP			1900	1	1.5	0.6	0.9	7
9310301-9310300	327	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	0.6	0.9	
9310302-9310301	262	6	VCP			1900	1	1.3	0.6	0.8	7
9310302-9310401	382	6	VCP			1900	8	6.7	0.6	4.0	10
9310303-9310301	366	6	PVC	2014	Cyclic Phase 10	1900	1	1.5	0.6	0.9	
9310401-9310503	302	6	VCP			1900	10	7.4	0.6	4.4	10

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9310402-9310401	352	6	VCP			1900	5	4.3	0.6	2.6	10
9310404-9310302	284	6	VCP			1900	1	1.5	0.6	0.9	7
9310406-9310404	37	6				1900	-1	7.8	0.6	4.7	18
9310406-9740021	654	6	VCP			1900	10	7.8	0.6	4.7	2
9310407-9310406	316	6	VCP			1900	3	2.9	0.6	1.7	7
9310407-9311402	48	6	PVC	1998	I&I Phase 6	1900	1	1.5	0.6	0.9	
9310407-9740022	330	8	PVC	2014	Cyclic Phase 11	1900	-1	1.5	0.6	0.9	
9310408-9310302	329	6	VCP			1900	10	7.4	0.6	4.4	10
9310501-9310118	351	6	VCP			1900	1	1.1	0.6	0.7	10
9310502-9310503	318	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.8	2.7	
9310503-9310123	261	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.8	2.7	
9310701-9310003	310	6	VCP			1900	1	1.5	2.6	3.9	18
9310702-9310701	353	6	VCP			1900	10	7.8	0.6	4.7	18
9310801-9310002	303	20	HDPE	1998	I&I Phase 6	1900	1	1.5	3.8	5.7	
9310802-9310801	22	14	PVC	1998	I&I Phase 6	1900	1	1.5	2.9	4.4	
9310803-9310802	264	14	PVC	1998	I&I Phase 6	1900	1	1.5	2.9	4.4	
9310804-9310803	208	6	VCP		Cyclic Phase 11	1900	10	7.8	2.2	17.2	
9310804-9310905	208	8	PVC	2015	Cyclic Phase 11	1900	1	1.5	2.6	3.9	
9310805-9310803	357	14	PVC	1998	I&I Phase 6	1900	1	1.5	0.9	1.3	
9310807-9310805	221	8				1900	-1	7.8	2.2	17.2	4
9310901-9310801	229	18	HDPE	1998	I&I Phase 6	1900	1	1.5	3.8	5.7	
9310904-9310901	196	18	HDPE	1998	I&I Phase 6	1900	1	1.1	3.8	4.2	
9310905-9310904	264	8	HDPE	2015	Cyclic Phase 11	1900	1	1.5	2.6	3.9	
9310907-9310905	318	6	VCP			1900	10	7.8	2.6	20.3	4
9310908-9310907	289	6	VCP			1900	3	2.9	2.6	7.5	4
9310908-9311009	259	12	PVC	1998	I&I Phase 6	1900	1	1.5	2.9	4.4	
9310908-9320103	394	6	VCP			1900	8	6.4	2.6	16.6	4
9310909-9310805	419	6	VCP			1900	1	1.6	2.6	4.2	4
9310909-9310905	358	8	PVC	2015	Cyclic Phase 11	1900	1	1.5	2.6	3.9	
9310910-9310909	344	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.6	3.9	
9310910-9311013	277	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.6	3.9	
9311009-9311016	343	14	HDPE	1998	I&I Phase 6	1900	-1	1.5	3.5	5.3	
9311013-9310908	358	12	PVC	1998	I&I Phase 6	1900	1	1.5	2.9	4.4	
9311014-9311013	198	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.6	3.9	
9311014-9320107	192	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.2	3.3	
9311016-9310904	275	14	HDPE	1998	I&I Phase 6	1900	-1	1.5	3.5	5.3	
9311101-9310805	362	14	PVC	1998	I&I Phase 6	1900	1	1.5	0.9	1.3	
9311102-1220005	332	8	PVC	1988	I&I Phase 1	1900	3	2.9	3.5	10.2	
9311102-9310102	362	6	VCP			1900	5	3.9	2.6	10.1	5
9311102-9311101	301	14	PVC	1998	I&I Phase 6	1900	1	1.5	3.8	5.7	
9311104-9310104	301	6	VCP			1900	10	7.8	2.8	21.8	5
9311104-9311101	365	6	VCP			1900	1	1.3	2.2	2.9	
9311105-9311104	83	8	VCP			1900	1	1.5	2.6	3.9	5
9311106-9311105	362	6	VCP			1900	5	4.3	2.6	11.2	10
9311107-9311105	196	8	VCP			1900	1	1.5	2.6	3.9	5
9311107-9311202	141	8	VCP			1900	1	1.5	2.6	3.9	5
9311202-9311303	367	8	PVC	2015	Cyclic Phase 11	1900	1	1.6	2.6	4.2	
9311203-9311202	215	8	VCP			1900	10	7.8	2.6	20.3	5
9311205-9311203	366	8	VCP			1900	10	7.6	2.2	16.7	5
9311205-9311304	20	12	PVC	1998	I&I Phase 6	1900	1	1.5	0.9	1.3	
9311301-9311013	362	12	PVC	1998	I&I Phase 6	1900	1	1.5	2.9	4.4	
9311303-9310909	364	8	PVC	2015	Cyclic Phase 11	1900	1	1.8	2.6	4.7	
9311303-9311101	419	8	PVC	2015	Cyclic Phase 11	1900	1	1.5	3.5	5.3	
9311303-9311301	590	6	VCP			1900	1	1.5	3.5	5.3	4
9311304-9311301	340	12	PVC	1998	I&I Phase 6	1900	1	1.5	2.9	4.4	
9311305-9311205	66	12	PVC	1998	I&I Phase 6	1900	1	1.5	1.5	2.3	
9311306-9311305	365	6	VCP			1900	1	1.5	1.2	1.8	10
9311306-9320201	408	8	VCP			1900	3	2.9	3.2	9.3	8
9311307-9311313	18	12	PVC	1998	I&I Phase 6	1900	1	1.5	0.9	1.3	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9311308-9311306	319	6	PVC			1900	1	1.6	1.2	1.9	
9311308-9320915	14	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9311310-9311307	318	12	PVC	1998	I&I Phase 6	1900	1	1.5	0.9	1.3	
9311311-9311305	115	12	PVC	1998	I&I Phase 6	1900	1	1.5	1.5	2.3	
9311312-9311311	212	12	PVC	1998	I&I Phase 6	1900	1	1.5	1.5	2.3	
9311313-9311312	310	12	PVC	1998	I&I Phase 6	1900	1	1.5	0.9	1.3	
9311400-9310502	318	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.8	2.7	
9311400-9320323	19	12	PVC	2014	Cyclic Phase 10	1900	-1	1.5	2.1	3.1	
9311401-9311400	307	12	PVC	1998	I&I Phase 6	1900	1	1.5	0.9	1.3	
9311402-9311401	331	12	PVC	1998	I&I Phase 6	1900	1	1.5	0.9	1.3	
9320002-9320005	28	8	VCP			1900	1	1.1	2.6	2.9	4
9320003-9320002	74	8	VCP			1900	1	1.8	2.6	4.7	4
9320004-9320003	16	8	VCP			1900	1	1.5	2.6	3.9	4
9320004-9320005	93	8	VCP			1900	10	7.4	2.6	19.2	4
9320005-9300014	234	12	PVC	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9320006-9320004	178	6	VCP			1900	10	7.8	2.6	20.3	4
9320006-9320097	172	6	VCP			1900	1	1.5	2.6	3.9	4
9320007-9320003	141	6				1900	-1	7.8	3.2	25.0	4
9320008-9320007	36	6				1900	-1	7.8	3.2	25.0	4
9320097-9320099	9	8	PVC			1900	1	1.5	2.6	3.9	
9320098-9320005	106	12	PVC	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9320099-9320098	309	12	PVC	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9320101-9320099	9	6	PVC			1900	1	1.5	2.6	3.9	
9320102-9320101	167	6	VCP			1900	3	2.9	3.2	9.3	7
9320103-9320099	14	10	PVC			1900	1	1.5	2.9	4.4	
9320104-9320103	230	8	VCP			1900	10	7.8	2.6	20.3	7
9320105-9320104	145	6	VCP			1900	1	1.5	3.2	4.8	7
9320107-9320104	130	8	VCP			1900	1	1.5	2.6	3.9	7
9320108-9320299	174	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.2	3.3	
9320108-9320300	179	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.6	3.9	
9320201-9311301	392	6	VCP			1900	10	7.4	3.5	25.9	4
9320201-9320107	361	8	VCP			1900	10	7.6	2.6	19.8	7
9320201-9320306	9	8	PVC			1900	1	1.5	3.5	5.3	
9320204-9320314	356	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320205-9320204	217	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320207-9320208	346	8	PVC	2014	Cyclic Phase 11	1900	-1	1.5	0.6	0.9	
9320207-9749201	346	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	0.6	0.9	
9320208-9320317	342	8	PVC	2014	Cyclic Phase 11	1900	-1	1.5	0.6	0.9	
9320299-9320097	360	8	PVC	1989	I&I Phase 2	1900	3	2.9	2.6	7.5	
9320299-9320107	8	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.2	3.3	
9320300-9300004	17	12	PVC		I&I Phase 2	1989	1	1.5	2.9	4.4	
9320301-9320707	379	10	PVC	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9320302-9320300	264	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.6	3.9	
9320305-9320300	359	8	VCP			1900	1	1.5	2.6	3.9	
9320305-9320322	21	12	PVC		I&I Phase 2	1989	1	1.5	3.8	5.7	
9320306-9320299	361	8	PVC	1989	I&I Phase 2	1900	3	2.9	2.6	7.5	
9320306-9320305	350	6	VCP			1900	10	7.8	3.5	27.3	4
9320307-9320305	311	8	PVC	1989	I&I Phase 2	1900	1	1.5	3.5	5.3	
9320311-9320407	286	8	PVC	1989	I&I Phase 2	1900	3	2.9	0.6	1.7	
9320312-9320908	644	8	VCP			1900	10	8.1	1.2	9.7	13
9320312-9320913	18	8	PVC		I&I Phase 2	1989	1	1.5	1.5	2.3	
9320313-9320312	336	8	PVC	1989	I&I Phase 2	1900	5	4.3	0.6	2.6	
9320314-9311307	360	6	PVC			1900	1	1.5	1.5	2.3	
9320314-9311308	328	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320314-9320312	358	6	VCP			1900	1	1.5	1.5	2.3	
9320315-9320313	331	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320316-9320311	346	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320316-9320315	361	6	PVC	2014	Cyclic Phase 10	1900	1	1.8	1.5	2.7	
9320316-9321223	360	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.5	2.3	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9320317-9320205	93	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320317-9320315	360	6	PVC	2014	Cyclic Phase 10	1900	1	1.5	0.6	0.9	
9320317-9320323	360	6	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.8	2.7	
9320318-9320315	384	8	PVC	1989	I&I Phase 2	1900	3	2.9	0.6	1.7	
9320319-9320301	267	8	HDPE	1989	I&I Phase 2	1900	1	1.8	0.6	1.1	
9320321-9320300	15	12	PVC		I&I Phase 2	1989	1	1.5	2.9	4.4	
9320322-9320321	327	12	PVC		I&I Phase 2	1989	1	1.5	2.9	4.4	
9320323-9311310	351	12	PVC	1998	I&I Phase 6	1900	-1	1.5	0.9	1.3	
9320401-9320702	307	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.6	3.9	
9320402-9320302	91	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	0.6	0.9	
9320402-9320401	354	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.6	3.9	
9320405-9320307	51	8	PVC	1989	I&I Phase 2	1900	1	1.5	3.5	5.3	
9320405-9320707	366	8	PVC	1989	I&I Phase 2	1900	1	1.5	3.5	5.3	
9320406-9320301	359	8	PVC	2014	Cyclic Phase 11	1900	-1	1.5	0.6	0.9	
9320406-9320405	392	8	PVC	1989	I&I Phase 2	1900	3	2.9	2.6	7.5	
9320406-9320908	358	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	1.2	1.8	
9320407-9320505	53	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320409-9320316	269	6	VCP			1900	1	1.5	1.2	1.8	15
9320409-9320511	221	6	VCP			1900	1	1.5	1.8	2.7	8
9320410-9320409	351	4	VCP			1900	-1	7.8	1.2	9.4	8
9320410-9320415	43					1900	-1	7.8	0.3	2.3	8
9320412-9320407	146	6				1900	-1	7.8	0.6	4.7	18
9320414-9320406	322	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320503-9320319	379	8	HDPE	1989	I&I Phase 2	1900	5	4.3	0.6	2.6	
9320504-9320503	133	6	VCP			1900	1	1.5	1.5	2.3	
9320505-9320312	364	6	VCP			1900	1	1.5	1.5	2.3	
9320505-9320414	321	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320505-9320504	229	6				1900	-1	7.8	1.5	11.7	6
9320506-9320503	346	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320507-9320506	296	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320508-9320507	110	6				1900	-1	7.8	0.6	4.7	18
9320510-9321223	60	8	HDPE	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9320511-9320510	347	8	HDPE	1989	I&I Phase 2	1900	1	1.1	1.2	1.3	
9320512-9320511	271	8	PVC	1989	I&I Phase 2	1900	1	1.5	1.8	2.7	
9320512-9749007	268	6	VCP			1900	1	1.1	1.8	2.0	8
9320601-9320610	143	8	PVC	2014	Cyclic Phase 11	1900	3	2.9	0.6	1.7	
9320602-9320601	290	8	PVC	2014	Cyclic Phase 11	1900	1	1.1	0.6	0.7	
9320603-9320601	266	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	1.2	1.8	
9320604-9320603	287	8	PVC	2014	Cyclic Phase 11	1900	-1	1.5	1.2	1.8	
9320606-9320603	434	6	VCP			1900	3	2.9	1.2	3.5	13
9320607-9320503	358	6	PVC			1900	1	1.5	1.5	2.3	
9320607-9320606	126	6	VCP			1900	5	3.9	0.6	2.3	13
9320608-9320607	150	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9320609-9320607	370	6	VCP			1900	10	7.8	0.6	4.7	13
9320610-9320301	162	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	0.6	0.9	
9320701-9300006	11	8				1900	-1	7.8	2.6	20.3	4
9320702-9320701	11	6	PVC		Cyclic Phase 8	2011	-1	1.5	2.6	3.9	
9320704-9320702	311	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.6	3.9	
9320705-9320702	359	6	VCP			1900	10	7.4	2.6	19.2	3
9320706-9320704	363	8	VCP			1900	1	1.5	2.6	3.9	13
9320706-9320705	161	6	VCP			1900	1	1.3	3.5	4.5	2
9320707-9320401	365	10	PVC	1989	I&I Phase 2	1900	5	4.3	2.9	12.5	
9320707-9320705	293	6	VCP			1900	5	4.3	3.5	15.1	2
9320804-9320902	204	6	VCP			1900	5	4.3	3.5	15.1	2
9320804-9321205	223	6	VCP			1900	10	7.4	3.1	22.9	2
9320805-9320902	329	6	VCP			1900	1	1.3	3.2	4.2	13
9320901-9320704	247	8	PVC	2011	Cyclic Phase 8	1900	1	1.5	2.6	3.9	
9320902-9320706	252	6	VCP			1900	10	7.4	3.5	25.9	2
9320902-9320901	372	6	VCP			1900	10	7.8	2.6	20.3	3

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9320903-9300008	10	8	PVC			2000	1	1.1	2.6	2.9	
9320903-9320901	374	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.6	3.9	
9320908-9320305	405	12	PVC	1989	I&I Phase 2	1900	1	1.5	3.5	5.3	
9320909-9320908	180	6	VCP			1900	10	7.8	1.2	9.4	10
9320910-9320306	408	8	PVC	1989	I&I Phase 2	1900	5	4.1	3.2	13.1	
9320910-9320909	166	6	VCP			1900	1	1.5	1.2	1.8	10
9320911-9320908	18	8	PVC		I&I Phase 2	1989	1	1.1	1.2	1.3	
9320912-9320911	312	8	PVC		I&I Phase 2	1989	5	4.3	1.2	5.2	
9320913-9320912	302	8	PVC		I&I Phase 2	1989	3	2.9	0.6	1.7	
9320915-9320910	320	8	PVC	1989	I&I Phase 2	1900	3	3.0	1.2	3.6	
9321010-9300008	17	10				2000	-1	1.5	2.9	4.4	
9321011-9321010	60	10	PVC			2000	1	1.5	2.9	4.4	
9321012-9321011	267	10	PVC			2000	1	1.5	2.5	3.8	
9321013-9321012	236	10	PVC			2000	1	1.5	2.9	4.4	
9321014-9321013	101	10	PVC			2000	1	1.5	2.5	3.8	
9321015-9321014	78	8				2000	-1	1.5	2.8	4.2	20
9321016-9321015	102	8				2000	-1	1.5	2.8	4.2	20
9321017-9321016	199	8				2000	-1	1.5	2.8	4.2	20
9321018-9321016	165	8				2000	-1	1.5	2.8	4.2	20
9321019-9321014	134	8	PVC			2000	1	1.5	2.2	3.3	
9321020-9321019	171	8	PVC			2000	1	1.5	2.2	3.3	
9321021-9321020	204	8	PVC			2000	1	1.5	2.6	3.9	
9321022-9321021	185	8	PVC			2000	1	1.5	2.6	3.9	
9321023-9321022	133	8	PVC			2000	1	1.5	2.6	3.9	
9321024-9321022	185	8	PVC			2000	1	1.5	2.6	3.9	
9321025-9321024	91	8	PVC			2000	1	1.5	2.6	3.9	
9321026-9321024	133	8	PVC			2000	1	1.5	2.2	3.3	
9321027-9321020	272	8	PVC			2000	1	1.5	2.2	3.3	
9321028-9321027	210	8	PVC			2000	1	1.5	2.2	3.3	
9321029-9321028	130	8	PVC			2000	1	1.5	2.2	3.3	
9321030-9321028	93	8	PVC			2000	1	1.5	3.2	4.8	
9321201-9320903	269	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	2.6	3.9	
9321202-9321201	281	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	3.8	5.7	
9321202-9321233	78	8	PVC	2015	Cyclic Phase 11	1900	-1	0.8	3.4	2.7	
9321202-9410015	279	8	PVC	2011	Cyclic Phase 8	1900	-1	1.5	3.8	5.7	
9321203-9321201	366	15	VCP			1900	10	7.4	2.9	21.5	3
9321204-9410012	280	6	VCP			1900	5	4.4	3.1	13.6	5
9321205-9321203	216	6	VCP			1900	1	1.5	3.5	5.3	2
9321206-9321202	364	8	PVC	2015	Cyclic Phase 11	1900	1	1.8	3.4	6.1	
9321206-9321203	281	6	VCP			1900	10	7.4	3.5	25.9	2
9321206-9410005	282	6	VCP			1900	10	7.8	3.5	27.3	2
9321207-9321203	349	15	VCP			1900	10	7.6	2.9	22.0	3
9321208-9321206	349	8	PVC	2015	Cyclic Phase 11	1900	1	1.1	2.2	2.4	
9321208-9321207	280	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	2.6	3.9	
9321208-9410008	279	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	3.2	4.8	
9321209-9321207	33	8	PVC		0	1900	1	1.5	2.6	3.9	
9321210-9320604	270	8	PVC	2014	Cyclic Phase 11	1900	-1	0.8	2.2	1.8	
9321210-9321209	50	8	PVC		Cyclic Phase 11	2014	1	1.5	2.6	3.9	
9321212-9321209	240	15	VCP			1900	3	2.9	2.9	8.4	8
9321213-9321204	284	6	VCP			1900	10	7.8	3.5	27.3	5
9321213-9321212	217	15	VCP			1900	3	2.9	2.9	8.4	8
9321214-9320608	150	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9321214-9321213	253	6	VCP			1900	1	1.5	3.5	5.3	14
9321215-9321214	285	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9321216-9321215	283	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9321217-9321216	32	6	VCP			1900	1	1.5	0.6	0.9	
9321218-9321217	70	6	VCP			1900	1	1.1	0.6	0.7	
9321219-9321218	123	6	VCP			1900	1	1.5	0.6	0.9	
9321220-9321213	272	12	VCP			1900	1	1.5	2.9	4.4	8

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9321221-9321220	276	12	VCP			1900	8	6.4	0.9	5.8	8
9321221-9321222	140	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.5	2.3	
9321222-9321232	214	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.5	2.3	
9321223-9320507	38	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9321224-9321221	253	6	VCP			1900	10	7.4	0.6	4.4	8
9321225-9321223	164	6	VCP			1900	10	7.8	0.6	4.7	15
9321232-9410017	216	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.5	2.3	
9321233-940003	280	8	PVC	2015	Cyclic Phase 11	1900	-1	0.8	3.8	3.0	
9400003-9400002	275	8	PVC	2015	Cyclic Phase 11	1900	1	1.5	3.2	4.8	
9400004-9400000	11	8	PVC	1989	I&I Phase 2	1900	1	1.5	3.2	4.8	
9400013-9400004	286	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9400016-9400004	256	8	PVC		I&I Phase 2	1989	1	1.5	3.8	5.7	
9400017-9400016	94	8	PVC		I&I Phase 2	1989	10	7.8	3.8	29.6	
9400020-9400000	26	15	PVC	1989	I&I Phase 2	1900	1	1.5	3.5	5.3	
9400021-9400020	188	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9400022-9400021	74	8	PVC		I&I Phase 2	1989	1	1.5	3.8	5.7	
9400024-9400005	13	8	PVC	1989	I&I Phase 2	1900	1	1.5	3.2	4.8	
9400025-9400024	200	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9400026-9400024	54	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9400030-9400010	370	6				1970	-1	4.3	3.2	13.8	6
9400032-9400030	176	6	VCP			1970	1	1.5	3.2	4.8	16
9401604-9410603	284	6	VCP			1900	10	7.6	2.6	19.8	3
9401604-9410901	352	8	PVC	1989	I&I Phase 2	1900	1	1.5	3.2	4.8	
9410001-9410003	16	15				1900	-1	7.8	4.1	32.0	
9410002-9410004	346	15	CIPP	1989	I&I Phase 2	1900	1	1.5	4.1	6.1	
9410004-9410001	16	15	CIPP	1989	I&I Phase 2	1900	1	1.5	4.1	6.1	
9410005-9410015	364	15	HDPE	1989	I&I Phase 2	1900	3	2.9	3.8	11.0	
9410006-9410005	293	6	VCP			1900	8	6.4	3.5	22.4	3
9410006-9410501	360	8	PVC	1989	I&I Phase 2	1900	3	2.9	2.6	7.5	
9410007-9410004	231	8	PVC		I&I Phase 2	1989	1	1.5	3.8	5.7	
9410008-9410005	346	12	HDPE	1989	I&I Phase 2	1900	3	2.9	3.8	11.0	
9410009-9410006	348	8	PVC	1989	I&I Phase 2	1900	1	1.5	3.2	4.8	
9410009-9410008	295	8	VCP			1900	10	7.6	3.2	24.3	2
9410010-9410008	245	12	HDPE	1989	I&I Phase 2	1900	3	2.9	3.8	11.0	
9410011-9410010	307	6	VCP			1900	10	7.4	2.2	16.3	9
9410012-9410010	252	12	PVC	1989	I&I Phase 2	1900	1	1.5	3.4	5.1	
9410013-9410012	288	6	VCP			1900	1	1.5	1.5	2.3	5
9410015-9410002	357	15	CIPP	1989	I&I Phase 2	1900	3	2.9	4.1	11.9	
9410016-9410012	258	12	PVC	1989	I&I Phase 2	1900	1	1.5	1.8	2.7	
9410017-9410016	249	10	HDPE	1989	I&I Phase 2	1900	3	2.9	1.8	5.2	
9410018-9410017	281	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9410019-9410018	276	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9410019-9410611	253	10				1900	-1	7.8	0.9	7.0	18
9410019-9411019	280	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9410021-9410017	360	8	HDPE	1989	I&I Phase 2	1900	5	4.3	1.5	6.5	
9410024-9410021	200	8	VCP			1900	10	7.8	1.5	11.7	11
9410026-9410009	327	6				1900	-1	7.8	3.2	25.0	4
9410027-9410026	71	4				1900	-1	7.8	1.2	9.4	4
9410201-EBMUDPSE	53	8				1900	-1	7.8	3.8	29.6	
9410202-9410201	317	8	HDPE	1989	I&I Phase 2	1900	3	2.9	3.8	11.0	
9410203-9410202	182	8	VCP			1900	10	7.8	3.8	29.6	7
9410204-9410202	51	8	VCP			1900	1	1.5	3.8	5.7	7
9410205-9410209	55	8	PVC			1900	1	1.5	2.2	3.3	
9410206-9410205	197	8	TRUSS			1900	1	1.1	2.6	2.9	
9410207-9410206	203	8	PVC			1900	1	1.5	2.6	3.9	
9410208-9410207	240	8	TRUSS			1900	1	1.5	2.6	3.9	
9410209-9410204	136	8	PVC			1900	1	1.5	3.8	5.7	
9410401-9400022	330	8	PVC	1989	I&I Phase 2	1900	1	1.5	3.8	5.7	
9410401-9410002	287	6	VCP			1900	10	8.1	3.2	25.9	3

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9410501-9410015	293	8	PVC	1989	I&I Phase 2	1900	1	1.5	3.2	4.8	
9410501-9410401	359	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.6	3.9	
9410601-9400020	317	15	HDPE	1989	I&I Phase 2	1900	1	1.5	3.5	5.3	
9410602-9410601	195	6	VCP			1900	5	4.3	2.6	11.2	3
9410603-9410601	25	15	HDPE	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9410605-9410501	278	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.2	3.3	
9410605-9410603	360	15	HDPE	1989	I&I Phase 2	1900	3	2.9	2.9	8.4	
9410609-9410806	254	12	HDPE	1989	I&I Phase 2	1900	3	2.9	2.9	8.4	
9410610-9410013	274	6	VCP			1900	1	1.5	1.5	2.3	5
9410610-9410609	251	12	HDPE	1989	I&I Phase 2	1900	1	1.5	2.5	3.8	
9410610-9411013	283	6	VCP			1900	10	7.9	1.5	11.9	5
9410611-9410610	253	10	HDPE	1989	I&I Phase 2	1900	-1	2.9	0.9	2.6	
9410615-9747006	216	6	VCP			1900	1	1.5	0.6	0.9	1
9410616-9410615	201	6	VCP			1900	10	7.6	0.6	4.6	1
9410616-9745016	299	6	VCP			1900	3	2.9	0.6	1.7	1
9410617-9410021	279	6	VCP			1900	3	2.9	0.6	1.7	15
9410617-9747006	284	6	VCP			1900	1	1.5	0.6	0.9	15
9410802-9410905	360	6				1900	-1	7.8	2.6	20.3	4
9410802-9411209	276	6	VCP			1900	5	4.4	3.5	15.4	3
9410803-9410006	275	6	VCP			1900	10	7.8	3.5	27.3	3
9410803-9410605	360	15	HDPE	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9410803-9410802	277	6	VCP			1900	10	7.8	3.5	27.3	3
9410805-9410802	348	8				1900	-1	7.8	2.6	20.3	3
9410806-9410009	268	6	VCP			1900	1	1.5	3.2	4.8	12
9410806-9410803	341	12	HDPE	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9410806-9410805	280	6	VCP			1900	1	1.5	2.6	3.9	
9410807-9410805	279	6	VCP			1900	1	1.1	2.6	2.9	12
9410807-9411209	352	10	PVC	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9410807-9411211	271	6	VCP			1900	5	4.1	2.6	10.7	12
9410808-9410805	414	6	VCP			1900	1	1.5	2.6	3.9	3
9410901-9411003	279	6	VCP			1900	10	7.8	3.2	25.0	6
9410902-9410901	206	6	PVC			1900	1	1.1	3.2	3.5	
9410905-9401604	362	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.6	3.9	
9410905-9410605	273	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9411003-9400005	22	10	PVC	1989	I&I Phase 2	1900	1	1.5	3.5	5.3	
9411004-9411003	321	10	PVC	1989	I&I Phase 2	1900	1	1.5	3.5	5.3	
9411010-9410807	99	10	PVC	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9411011-9411010	305	8	VCP			1900	8	6.4	2.6	16.6	4
9411012-9411011	91	8	PVC			1900	5	4.3	0.6	2.6	
9411012-9411020	4	8	PVC			1900	1	1.5	1.5	2.3	
9411013-9411012	274	6	VCP			1900	1	1.5	1.5	2.3	5
9411015-9411012	210	8	VCP			1900	3	2.9	0.6	1.7	
9411016-9411015	152	8	VCP			1900	3	2.9	0.6	1.7	
9411016-9411021	17	8	PVC	1989	I&I Phase 2	1989	1	1.5	0.6	0.9	
9411017-9411016	150	6				1900	-1	7.8	1.2	9.4	8
9411018-9411010	16	8	PVC		I&I Phase 2	1989	1	1.5	2.6	3.9	
9411019-9411226	276	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9411020-9411018	382	8	PVC		I&I Phase 2	1989	1	1.5	2.2	3.3	
9411020-9411218	260	6	VCP			1900	10	7.8	1.5	11.7	11
9411021-9411020	350	8	PVC		I&I Phase 2	1989	1	1.5	0.6	0.9	
9411201-9400006	35	12	PVC			1900	1	1.5	3.5	5.3	
9411201-9411003	269	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9411202-9411231	237	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.2	3.3	
9411202-9411500	342	8	PVC	1989	I&I Phase 2	1900	1	1.5	3.2	4.8	
9411203-9411201	344	15	RRP	1989	I&I Phase 2	1900	1	1.5	3.5	5.3	
9411204-9411202	241	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.2	3.3	
9411205-9411203	357	15	HDPE	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9411206-9411202	361	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9411206-9411232	239	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.2	3.3	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9411207-9410905	279	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9411207-9411004	392	10	PVC	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9411207-9411205	268	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.2	3.3	
9411208-9411205	365	15	HDPE	1989	I&I Phase 2	1900	-1	2.9	2.9	8.4	
9411209-9411207	358	10	PVC	1989	I&I Phase 2	1900	-1	2.9	2.9	8.4	
9411209-9411208	272	6	VCP			1900	5	4.1	3.5	14.3	3
9411211-9411208	343	15	HDPE	1989	I&I Phase 2	1900	-1	2.9	2.9	8.4	
9411213-9411235	230	6	VCP			1900	10	7.8	1.5	11.7	12
9411214-9411213	330	6	VCP			1900	10	7.6	1.5	11.4	12
9411215-9411214	295	6	VCP			1900	3	2.5	1.2	3.0	12
9411215-9420312	350	10	PVC	1989	I&I Phase 2	1900	1	1.5	3.5	5.3	
9411215-9420350	221	8	PVC	2011	Cyclic Phase 8	1900	1	1.5	1.2	1.8	
9411216-9411211	53	15	HDPE	1989	I&I Phase 2	1900	1	1.5	2.5	3.8	
9411217-9411216	235	15				1900	-1	7.8	2.5	19.5	10
9411218-9411217	216	15				1900	-1	7.8	0.9	7.0	10
9411220-9411218	303	6	VCP			1900	10	7.4	1.5	11.1	11
9411221-9411220	307	6	VCP			1900	1	1.8	1.5	2.7	11
9411222-9411221	303	6	VCP			1900	1	1.1	1.5	1.7	11
9411223-9411218	251	12				1900	-1	7.8	0.9	7.0	10
9411224-9411223	152	4				1900	-1	7.8	1.2	9.4	10
9411225-9411223	256	12				1900	-1	7.8	0.9	7.0	10
9411226-9411016	146	8	VCP			1900	1	1.5	1.5	2.3	
9411226-9411225	265	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9411227-9411225	327	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9411228-9411227	311	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9411228-9420334	319	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9411231-9411203	241	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.6	3.9	
9411232-9411205	244	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.6	3.9	
9411233-9411208	347	8	VCP			1900	1	1.5	3.5	5.3	
9411234-9411233	352	8	PVC			1900	1	1.5	3.1	4.6	
9411235-9411211	100	6	VCP			1900	1	1.5	0.6	0.9	12
9411300-9400007	11	8	PVC	1989	I&I Phase 2	1900	1	1.5	3.2	4.8	
9411303-9411300	243	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9411304-9411303	234	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9411305-9411300	439	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9411491-9411201	239	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9411500-9400007	34	8	PVC	1989	I&I Phase 2	1900	-1	2.9	3.2	9.3	
9411500-9411491	243	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9411501-9411500	43	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9420001-9400008	29	12	PVC	1989	I&I Phase 2	1900	1	1.5	3.5	5.3	
9420002-9411204	233	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.6	3.9	
9420002-9420001	339	10	PVC	1989	I&I Phase 2	1900	1	1.1	3.5	3.9	
9420003-9420002	480	6	VCP			1900	5	3.9	2.6	10.1	16
9420003-9420201	342	8	CAS			1900	1	1.5	3.2	4.8	16
9420004-9411206	475	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.6	3.9	
9420004-9420002	363	10	PVC	1989	I&I Phase 2	1900	1	1.1	2.9	3.2	
9420004-9420354	345	8	PVC			1900	-1	7.8	2.6	20.3	
9420005-9420001	267	8	PVC		I&I Phase 2	1989	1	1.5	3.2	4.8	
9420007-9420001	266	8	PVC		I&I Phase 3	1993	1	1.5	3.2	4.8	
9420008-9420328	220	10	PVC	1989	I&I Phase 2	1900	1	1.5	0.9	1.3	
9420201-9420007	213	8	PVC		I&I Phase 3	1993	1	1.5	3.2	4.8	
9420203-9420003	177	6	VCP			1900	5	4.3	2.6	11.2	11
9420300-9400010	12	15				1900	-1	7.8	3.5	27.3	2
9420302-9420408	75	12	HDPE	2007	Cyclic Phase 4	1900	-1	1.5	3.5	5.3	
9420303-9420302	300	12	HDPE	2007	Cyclic Phase 4	1900	-1	1.5	2.9	4.4	
9420304-9420303	321	12	HDPE	2007	Cyclic Phase 4	1900	-1	1.5	2.9	4.4	
9420305-9420304	312	6	VCP			1900	5	4.3	2.6	11.2	3
9420305-9420402	351	8	PVC	2013	Cyclic Phase 9	1900	1	1.8	0.6	1.1	
9420307-9420304	462	6	VCP			1900	10	7.6	2.6	19.8	3

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9420308-9420304	269	12	HDPE	2007	Cyclic Phase 4	1900	-1	1.5	2.9	4.4	
9420309-9420344	14	10	HDPE	2007	Cyclic Phase 4	1900	-1	1.5	3.8	5.7	
9420310-9420004	322	10	PVC	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9420312-9411234	262	8	PVC			1900	1	1.5	3.5	5.3	
9420312-9420310	39	10	PVC	1989	I&I Phase 2	1900	1	1.5	2.9	4.4	
9420313-9420309	214	10	HDPE	2007	Cyclic Phase 4	1900	1	1.5	3.5	5.3	
9420314-9420313	134	10	HDPE	2007	Cyclic Phase 4	1900	1	1.5	3.5	5.3	
9420315-9420353	144	6	VCP			1900	10	7.8	2.8	21.8	7
9420316-9420315	325	6	VCP			1900	10	7.6	1.2	9.1	7
9420318-9411215	251	10	PVC	1989	I&I Phase 2	1900	1	1.5	1.5	2.3	
9420319-9420314	166	10	HDPE	2007	Cyclic Phase 4	1900	1	1.5	3.5	5.3	
9420321-9420319	322	10	HDPE	2007	Cyclic Phase 4	1900	1	1.5	3.5	5.3	
9420322-9420321	482	6	VCP			1900	5	4.3	3.1	13.3	9
9420324-9420321	24	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	3.5	5.3	
9420325-9420324	242	6	VCP			1900	10	7.8	3.5	27.3	2
9420326-9420325	200	6	VCP			1900	10	7.6	3.1	23.6	2
9420327-9420326	296	6	PVC			1900	1	1.5	1.5	2.3	
9420328-9420318	269	10	PVC	1989	I&I Phase 2	1900	1	1.5	0.9	1.3	
9420328-9420327	193	6	VCP			1900	10	7.8	1.5	11.7	2
9420329-9420352	229	8	HDPE	2007	Cyclic Phase 4	1900	1	1.3	2.8	3.6	
9420330-9420329	239	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9420331-9420330	249	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9420331-9420620	227	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9420332-9420329	295	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9420333-9420332	295	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9420334-9420008	248	10	PVC	1989	I&I Phase 2	1900	1	1.5	0.9	1.3	
9420334-9420333	348	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9420337-9743006	471	8				1900	-1	7.8	1.2	9.4	8
9420338-9420337	347	6				1900	-1	7.8	1.2	9.4	8
9420341-9743006	807	6	VCP			1900	3	3.0	1.2	3.6	1
9420342-9420341	49	6	VCP			1900	1	1.1	0.6	0.7	1
9420344-9420308	81	12	HDPE	2007	Cyclic Phase 4	1900	-1	1.5	2.9	4.4	
9420345-9420344	218	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	3.5	5.3	
9420346-9420309	303	8	HDPE	2009	Cyclic Phase 5	1900	-1	1.5	3.5	5.3	
9420347-9420346	298	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9420348-9420347	309	8	HDPE	2009	Cyclic Phase 5	1900	-1	1.5	3.5	5.3	
9420349-9420314	378	8	PVC	2011	Cyclic Phase 8	1900	1	1.5	3.2	4.8	
9420350-9420349	332	8	PVC	2011	Cyclic Phase 8	1900	1	1.5	0.6	0.9	
9420352-9420324	242	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	3.2	4.8	
9420353-9420314	159	6	VCP			1900	1	1.5	3.2	4.8	7
9420354-9420307	236					1900	-1	7.8	1.9	14.8	3
9420402-9420407	341	8	PVC	2013	Cyclic Phase 9	1900	1	1.1	3.2	3.5	
9420406-9420407	159	8	PVC		I&I Phase 3	1993	-1	2.9	3.2	9.3	
9420407-9420408	313	8	PVC		I&I Phase 3	1993	-1	2.9	3.2	9.3	
9420408-9420300	20	12				1900	-1	7.8	3.5	27.3	2
9420501-EBMUDPSD	35	8	VCP			1900	1	1.1	2.8	3.1	
9420503-9420501	145	8	VCP			1900	1	1.5	3.2	4.8	16
9420504-9420503	11	10	VCP			1900	1	1.5	3.5	5.3	16
9420507-9420504	341	10	VCP			1900	1	1.5	3.5	5.3	16
9420508-9420507	337	10	VCP			1900	1	1.5	3.5	5.3	16
9420510-9420508	291	10	VCP			1900	1	1.5	3.5	5.3	16
9420511-9420510	275	10	VCP			1900	1	1.5	3.5	5.3	16
9420513-9420511	34	10	VCP			1900	1	1.5	3.5	5.3	16
9420514-9420528	107	6	VCP			1900	3	2.9	3.2	9.3	16
9420515-9420513	34	8	VCP			1900	1	1.5	3.2	4.8	16
9420516-9420515	315	6	VCP			1900	1	1.5	3.2	4.8	16
9420516-9420523	314	8	PVC			1900	1	1.5	2.8	4.2	
9420517-9420515	306	8	VCP			1900	1	1.3	3.2	4.2	16
9420518-9420517	311	8	VCP			1900	1	1.5	3.2	4.8	16

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9420520-9420518	303	8	VCP			1900	10	7.8	3.5	27.3	2
9420521-9420520	37	8	PVC			1900	1	1.5	2.8	4.2	
9420522-9420516	299	8	PVC			1900	1	1.5	2.8	4.2	
9420522-9420521	295	8	PVC			1900	1	1.5	2.8	4.2	
9420523-9420524	281	8	PVC			1900	1	1.5	1.2	1.8	
9420524-9420508	354	10	VCP			1900	3	2.9	3.8	11.0	12
9420525-9420524	64	8	PVC			1900	1	1.5	1.2	1.8	
9420526-9420525	243	8	PVC			1900	1	1.5	2.8	4.2	
9420527-9420526	342	8	PVC			1900	1	1.5	3.2	4.8	
9420528-9420513	130	6	VCP			1900	10	7.8	3.2	25.0	16
9420603-9421202	330	10	PVC	1998	I&I Phase 6	1900	-1	1.5	3.5	5.3	
9420604-9420603	370	6	VCP			1900	8	6.0	3.2	19.2	3
9420604-9420802	242	6	VCP			1900	10	7.8	1.2	9.4	3
9420605-9420305	630	6	VCP			1900	1	1.5	3.2	4.8	3
9420605-9420603	361	10	PVC	1998	I&I Phase 6	1900	5	4.3	3.5	15.1	
9420606-9420605	585	6	PVC			1900	1	1.5	3.2	4.8	
9420606-9420802	361	10	VCP			1900	3	2.9	1.8	5.2	12
9420607-9420605	337	10	PVC	1998	I&I Phase 6	1900	1	1.5	3.5	5.3	
9420608-9420607	327	8	VCP			1900	1	1.3	1.5	1.9	
9420610-9420608	85	8	HDPE	2009	Cyclic Phase 5	1900	-1	1.5	1.5	2.3	
9420611-9420610	104	6	VCP			1900	1	1.5	1.2	1.8	
9420612-9420345	252	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	3.1	4.6	
9420612-9420610	63	8	PVC	2009	Cyclic Phase 5	1900	-1	1.5	1.5	2.3	
9420614-9420316	317	6	VCP			1900	10	7.9	1.8	14.2	7
9420614-9420811	339	10	PVC	1998	I&I Phase 6	1900	5	4.3	2.1	9.0	
9420615-9420614	450	6	VCP			1900	10	7.8	1.8	14.0	7
9420617-9420614	198	10	PVC	1998	I&I Phase 6	1900	1	1.5	2.1	3.1	
9420620-9420623	189	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9420622-9420824	468	8	VCP			1900	5	4.6	1.8	8.3	9
9420622-9741009	194	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9420623-9420622	52	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9420702-9400014	13	8	VCP			1900	1	1.5	2.2	3.3	
9420801-9420524	20	10	VCP			1900	1	1.5	1.8	2.7	12
9420801-9420800	12	8	PVC			1900	1	1.5	1.5	2.3	
9420802-9421304	343	10	VCP			1900	5	4.3	1.8	7.7	12
9420804-9420802	295	6	VCP			1900	5	4.3	1.2	5.2	3
9420805-9421302	344	10	PVC	1997	I&I Phase 5	1900	1	1.5	2.9	4.4	
9420807-9420606	328	6	VCP			1900	1	1.5	1.2	1.8	11
9420808-9420805	356	10	PVC	1997	I&I Phase 5	1900	1	1.5	2.9	4.4	
9420809-9420807	436	6	VCP			1900	1	1.3	1.2	1.6	4
9420810-9420606	362	10	VCP			1900	1	1.5	1.8	2.7	11
9420811-9420607	23	10	PVC	1998	I&I Phase 6	1900	1	1.5	1.8	2.7	
9420811-9420837	283	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9420812-9420838	185	10	VCP			1900	1	1.5	1.8	2.7	11
9420813-9420812	300	6	VCP			1900	10	7.8	1.2	9.4	8
9420815-9420812	244	10	VCP			1900	1	1.5	1.8	2.7	11
9420816-9420815	298	6	VCP			1900	1	1.5	1.2	1.8	
9420817-9420815	64	10	VCP			1900	1	1.5	1.8	2.7	11
9420818-9420817	310	8	VCP			1900	10	7.8	1.2	9.4	15
9420820-9420818	246	8	VCP			1900	5	4.3	1.2	5.2	15
9420820-9420906	49	8				1900	-1	7.8	1.2	9.4	8
9420821-9420817	229	10	VCP			1900	1	1.5	1.8	2.7	11
9420822-9420821	200	6	VCP			1900	5	3.9	1.5	5.9	9
9420823-9420821	14	10	VCP			1900	1	1.5	1.8	2.7	
9420824-9420322	466	6	VCP			1900	3	2.9	1.8	5.2	9
9420824-9420617	310	10	PVC	1998	I&I Phase 6	1900	1	1.1	2.1	2.3	
9420824-9420823	475	6	VCP			1900	10	7.9	1.8	14.2	9
9420825-9420823	314	6	VCP			1900	10	7.8	1.5	11.7	8
9420827-9420825	367	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	

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Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9420830-9420823	284	10	VCP			1900	3	2.5	1.8	4.5	9
9420831-9420830	224	6				1900	-1	7.8	1.2	9.4	9
9420835-9725015	325	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9420835-9741010	179	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.2	1.8	
9420836-9420835	32	8	VCP	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9420836-9420909	197	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9420837-9420810	271	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9420838-9420810	111	10	VCP			1900	1	1.5	1.8	2.7	11
9420839-9420808	192	10	PVC	1997	I&I Phase 5	1900	3	2.7	0.9	2.4	
9420840-9420813	281	6	VCP			1900	1	1.5	1.2	1.8	8
9420841-9420804	295	6	VCP			1900	1	1.5	3.2	4.8	3
9420842-9421103	622	6				1900	-1	7.8	2.6	20.3	3
9420843-9420807	185	6	PVC			1900	3	2.9	0.6	1.7	
9420906-9421134	85	10	PVC	1997	I&I Phase 5	1900	1	1.5	1.5	2.3	
9420907-9420906	429	6	VCP			1900	10	7.8	1.2	9.4	15
9420909-9421126	434	6	VCP			1900	1	1.5	1.2	1.8	5
9421101-9400018	13	10	VCP			1900	1	1.5	3.4	5.1	2
9421103-9421300	344	10	PVC	1997	I&I Phase 5	1900	5	4.6	3.5	16.1	
9421104-9421103	249	6	VCP			1900	10	7.4	2.6	19.2	5
9421108-9421103	446	10	PVC	1997	I&I Phase 5	1900	8	6.5	3.8	24.7	
9421109-9421108	238	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	2.6	3.9	
9421110-9421104	293	6	VCP			1900	3	2.7	2.2	5.9	11
9421110-9421109	158	6	VCP			1900	1	1.5	2.2	3.3	11
9421112-9421108	372	8	VCP			1900	1	1.5	2.6	3.9	18
9421113-9421108	233	10	PVC	1997	I&I Phase 5	1900	5	4.3	3.8	16.3	
9421114-9421113	375	6	VCP			1900	10	7.4	2.6	19.2	4
9421115-9420839	128	10	PVC	1997	I&I Phase 5	1900	3	2.7	0.9	2.4	
9421115-9421114	246	6	VCP			1900	8	6.0	0.6	3.6	4
9421116-9421113	338	10	PVC	1997	I&I Phase 5	1900	3	2.9	3.8	11.0	
9421118-9421116	313	6	VCP			1900	1	1.5	2.6	3.9	8
9421119-9421118	107	6	VCP			1900	1	1.5	0.6	0.9	8
9421120-9421119	183	6	VCP			1900	3	2.9	0.6	1.7	8
9421121-9421115	340	10	PVC	1997	I&I Phase 5	1900	1	1.5	1.5	2.3	
9421121-9421119	200	6	VCP			1900	1	1.5	1.2	1.8	8
9421122-9421116	183	10	PVC	1997	I&I Phase 5	1900	1	1.5	3.8	5.7	
9421123-9421122	173	6	VCP			1900	1	1.5	2.2	3.3	12
9421124-9421122	370	10	PVC	1997	I&I Phase 5	1900	3	2.9	3.4	9.9	
9421125-9724014	276	8	PVC	2013	Cyclic Phase 10	1900	1	1.5	1.5	2.3	
9421126-9420825	294	6	VCP			1900	1	1.5	1.5	2.3	8
9421126-9420906	253	6	VCP			1900	1	1.5	1.2	1.8	5
9421126-9421124	624	8	VCP			1900	1	1.5	1.5	2.3	8
9421127-9421125	348	8	PVC	2013	Cyclic Phase 10	1900	1	1.5	1.5	2.3	
9421127-9421132	200	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.5	2.3	
9421127-9641815	240	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9421128-9420909	149	8	VCP	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9421128-9421133	237	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9421128-9724013	321	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	1.2	1.8	
9421130-9421112	91	6				1900	-1	7.8	1.2	9.4	18
9421131-9421112	77	6				1900	-1	7.8	0.6	4.7	18
9421132-9421124	201	8	PVC	2013	Cyclic Phase 10	1900	-1	1.5	1.5	2.3	
9421133-9421127	237	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9421134-9421121	223	10	PVC	1997	I&I Phase 5	1900	1	1.1	1.5	1.7	
9421202-9400012	40	10	PVC	1998	I&I Phase 6	1900	1	1.5	3.5	5.3	
9421300-9421101	17	10	VCP			1900	3	2.9	3.8	11.0	2
9421301-9421300	327	8	PVC		I&I Phase 3	1993	1	1.5	3.2	4.8	
9421301-9421302	296	8	PVC		I&I Phase 3	1993	3	2.9	3.2	9.3	
9421302-9420702	21	6	VCP			1900	1	1.5	2.6	3.9	
9421302-9421303	310	8	PVC		I&I Phase 3	1993	1	1.5	3.2	4.8	
9421303-9421304	284	8	PVC		I&I Phase 3	1993	1	1.5	1.2	1.8	

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Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9421304-9420801	19	10	VCP			1900	1	1.5	1.8	2.7	12
9421305-9421304	69	8	PVC		I&I Phase 3	1993	1	1.5	1.2	1.8	
9421306-9421305	237	8	PVC		I&I Phase 3	1993	1	1.5	2.8	4.2	
9421307-9421306	211	8	PVC		I&I Phase 3	1993	1	1.5	3.2	4.8	
9620003-9620001	76	6				1940	-1	6.4	3.2	20.5	5
9620004-9620001	16	0				1940	-1	6.4	2.3	14.7	5
9630002-OF1	114	0	RCP			1900	1	1.5	3.2	4.8	17
9630008-9630011	37	10	PVC			1900	1	1.7	3.1	5.3	
9630011-9630007	10	10	VCP			1900	1	2.2	2.9	6.4	11
9631701-9640007	143	8	HDPE	2000	I&I Phase 7	1920	3	2.9	3.5	10.2	
9631702-9631701	324	6	VCP			1930					2
9631703-9631701	119	8	HDPE	2000	I&I Phase 7	1920	1	1.5	3.1	4.6	
9631704-9631703	341	8	HDPE	2000	I&I Phase 7	1920	1	1.5	3.1	4.6	
9631705-9631704	353	8	HDPE	2000	I&I Phase 7	1920	1	1.5	3.1	4.6	
9631706-9631705	51	8	HDPE	2000	I&I Phase 7	1920	1	1.5	1.5	2.3	
9631707-9631706	351	8	HDPE	2000	I&I Phase 7	1920	1	1.5	1.5	2.3	
9631708-9631707	127	12	PVC	2000	I&I Phase 7	1920	1	1.5	1.8	2.7	
9631709-9421109	235	8	VCP	2014	Cyclic Phase 10	1900	1	1.5	3.1	4.6	
9631709-9641802	438	16	HDPE	2009	Cyclic Phase 5	1900	1	1.5	4.1	6.1	
9631710-9631708	319	6	VCP			1920	3	2.5	1.5	3.8	
9631711-9631710	254	6	VCP			1920	5	4.3	1.5	6.5	11
9631711-9632302	261	6	VCP			1920	10	8.2	1.5	12.3	6
9631711-9641806	345	6	PVC			1900	1	1.5	1.5	2.3	
9631712-9631711	550	6	VCP			1900	10	7.4	1.5	11.1	7
9631713-9631708	307	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.5	2.3	
9631901-9632001	13	8	PVC	2010	Cyclic Phase 7	1900	1	1.9	3.5	6.7	
9631904-9631901	100	8	HDPE	2010	Cyclic Phase 7	1900	3	3.3	3.2	10.6	
9631905-9631904	150	8	PVC		Cyclic Phase 7	2010	-1	1.9	3.2	6.1	
9631906-9631905	90	8	PVC		Cyclic Phase 7	2010	-1	1.9	2.2	4.2	
9632001-9630002	132	10	VCP			1900	1	1.9	3.8	7.2	17
9632002-9632001	62	14	HDPE	2000	I&I Phase 7	1900	1	1.9	3.8	7.2	
9632003-9632009	52	6	VCP			1920	5	4.7	2.8	13.2	3
9632004-9632002	170	14	HDPE	2000	I&I Phase 7	1900	3	3.3	3.8	12.5	
9632005-9632004	454	6	VCP			1920	10	8.2	2.8	23.0	3
9632006-9632004	10	6	VCP			1920	1	1.9	3.1	5.9	11
9632007-9632006	203	6	VCP			1920	1	1.9	2.8	5.3	13
9632008-9632004	61	14	HDPE	2000	I&I Phase 7	1900	1	1.9	3.4	6.5	
9632009-9632008	239	12	HDPE	2000	I&I Phase 7	1900	5	4.5	3.8	17.1	
9632010-9632009	192	6	VCP			1920	1	1.9	2.8	5.3	3
9632011-9632003	124	6	VCP			1920	5	4.7	2.8	13.2	3
9632012-9632011	201	6	VCP			1920	3	3.4	2.8	9.5	3
9632013-9632012	94	6	VCP			1920	1	1.9	2.8	5.3	13
9632014-9632013	51	6				1920	-1	8.2	2.8	23.0	13
9632015-9632013	117	6				1920	-1	8.2	2.8	23.0	13
9632016-9632013	194	6	VCP			1920	1	1.9	2.8	5.3	13
9632017-9632011	89	6	VCP			1920	1	2.0	2.8	5.6	3
9632018-9632042	112	6	VCP			1920	-1	8.2	2.8	23.0	3
9632019-9632018	113	6				1900	-1	8.2	2.8	23.0	3
9632020-9632018	104	6	VCP			1920	1	1.9	2.8	5.3	3
9632021-9632020	47	6	VCP			1920	10	8.2	2.2	18.0	15
9632022-9632021	409	6	VCP			1920	8	6.6	1.2	7.9	15
9632023-9632022	116	6	VCP			1920	1	1.5	1.2	1.8	15
9632024-9632009	61	14	HDPE	2000	I&I Phase 7	1900	1	1.9	3.4	6.5	
9632025-9632024	241	14	HDPE	2000	I&I Phase 7	1900	3	3.3	3.8	12.5	
9632026-9632025	363	6	VCP			1900	1	1.9	2.8	5.3	13
9632027-9632025	54	14	HDPE	2000	I&I Phase 7	1900	1	1.9	3.4	6.5	
9632028-9632032	308	8	HDPE	2002	Cyclic Phase 1	1900	1	1.9	2.8	5.3	
9632029-9632028	317	8	HDPE	2002	Cyclic Phase 1	1900	-1	1.9	2.8	5.3	
9632030-9632029	318	8	HDPE	2002	Cyclic Phase 1	1900	-1	1.9	2.8	5.3	

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Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9632031-9632039	497	6	HDPE	2007	Cyclic Phase 4	1900	-1	1.9	1.2	2.3	
9632032-9632027	245	14	HDPE	2000	I&I Phase 7	1900	5	4.5	3.8	17.1	
9632033-9632032	61	14	HDPE	2000	I&I Phase 7	1900	1	1.9	3.4	6.5	
9632034-9632033	123	12	HDPE	2000	I&I Phase 7	1900	1	1.9	3.8	7.2	
9632034-9633010	105	8		2015		1900	1	1.9	2.6	4.9	1
9632035-9632034	52	14	PVC	2000	I&I Phase 7	1900	1	1.7	3.8	6.5	
9632035-9632041	15	6	VCP			1900	-1	8.2	3.5	28.7	5
9632036-9632035	970	6	VCP			1900	3	3.3	3.2	10.6	5
9632037-9632035	162	12	HDPE	2000	I&I Phase 7	1900	1	1.9	3.8	7.2	
9632038-9632030	73	6	PVC		Cyclic Phase 1	2002	-1	1.9	2.8	5.3	
9632039-9632030	183	6	HDPE	2002	Cyclic Phase 1	1900	1	1.9	2.8	5.3	
9632040-9632031	119	6	VCP			1900	1	1.9	1.2	2.3	13
9632042-9632017	250	6	VCP			1920	-1	8.2	2.8	23.0	3
9632101-9632037	13	6				1900	-1	8.2	3.5	28.7	
9632102-9632101	289	10	HDPE			1900	1	1.9	2.9	5.5	
9632102-9632201	10	8	PVC			1900	1	1.9	2.2	4.2	
9632103-9632102	289	10	VCP			1900	10	7.8	0.9	7.0	10
9632104-9632103	535	10	VCP			1900	8	6.6	0.9	5.9	10
9632104-9632203	7	8	VCP			1920	1	1.9	0.6	1.1	
9632201-9632037	292	8	HDPE	2000	I&I Phase 7	1900	1	1.7	2.6	4.4	
9632202-9632103	6	8	PVC			1900	-1	8.2	0.6	4.9	
9632202-9632201	298	8	HDPE	2000	I&I Phase 7	1900	5	4.3	2.2	9.5	
9632203-9632208	264	8	HDPE	2000	I&I Phase 7	1900	5	4.7	0.6	2.8	
9632204-9632203	176	8	HDPE	2000	I&I Phase 7	1920	1	1.9	0.6	1.1	
9632205-9632204	88	6	VCP			1920	1	1.9	1.2	2.3	10
9632206-9632205	107	6				1920	-1	8.2	1.2	9.8	10
9632207-9632204	54	8	HDPE	2000	I&I Phase 7	1920	1	1.9	0.6	1.1	
9632208-9632202	265	8	HDPE	2000	I&I Phase 7	1900	3	3.3	0.6	2.0	
9632301-9632207	33	6	VCP			1920	1	1.9	0.6	1.1	6
9632302-9632301	258	6	VCP			1920	3	3.3	0.6	2.0	6
9632303-9632308	98	6	VCP			1920	1	2.0	1.2	2.4	
9632304-9632303	74	6	VCP			1920	1	1.9	1.2	2.3	6
9632305-9632304	176	6	VCP			1920	1	1.9	1.2	2.3	6
9632306-9632305	226	6	VCP			1920	1	1.9	1.2	2.3	6
9632308-9632302	29	6	VCP			1920	1	1.9	0.6	1.1	6
9632309-9632304	95	6	VCP			1920	1	1.9	1.2	2.3	
9632401-9632207	170	6	VCP			1920	10	8.0	1.2	9.6	9
9632402-9632401	202	6	VCP			1920	1	1.9	1.2	2.3	9
9632403-9632401	122	6	VCP			1920	10	8.2	1.2	9.8	9
9632404-9632403	49	6	VCP			1920	1	1.9	0.6	1.1	9
9632405-9632404	109	6	VCP			1920	1	1.9	1.2	2.3	9
9632407-9632405	134	6	VCP			1920	3	3.3	1.2	4.0	9
9632407-9632507	305	6	VCP			1920	1	1.9	1.5	2.8	6
9632408-9632407	41	6	VCP			1920	1	1.9	1.5	2.8	6
9632409-9632408	221	6	VCP			1920	10	8.2	1.5	12.3	6
9632410-9632409	114	6	VCP			1920	10	8.2	1.5	12.3	6
9632411-9632409	42	6	VCP			1920	1	1.9	1.5	2.8	
9632412-9632411	69	6	VCP			1920	1	1.5	1.2	1.8	
9632413-9632412	71	6				1940	-1	6.8	1.2	8.2	9
9632414-9632407	53	6	VCP			1920	1	1.9	1.2	2.3	9
9632415-9632414	116	6	VCP			1920	5	4.7	1.2	5.6	9
9632416-9632415	112	6	VCP			1920	8	6.8	1.2	8.2	9
9632417-9632416	122	6				1920	-1	8.2	1.2	9.8	9
9632418-9632416	92	6				1920	-1	8.2	1.2	9.8	9
9632501-9632202	329	6	VCP			1900	10	8.2	0.6	4.9	17
9632502-9632501	260	6	VCP			1900	10	8.5	0.6	5.1	9
9632503-9632502	262	6	VCP			1900	5	4.3	0.6	2.6	9
9632504-9632501	249	6	VCP			1900	5	5.0	0.6	3.0	17
9632504-9632704	298	6	VCP			1900	10	8.2	3.1	25.4	2

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9632505-9632503	28	4				1900	-1	8.2	0.6	4.9	9
9632506-9632504	291	6	VCP			1900	10	8.2	1.5	12.3	6
9632507-9632506	241	6	VCP			1900	10	8.0	1.5	12.0	6
9632510-9632507	37	6	VCP			1920	1	1.9	1.5	2.8	
9632511-9632510	101	6	VCP			1920	1	1.9	1.2	2.3	
9632512-9632511	76	6	VCP			1920	5	4.3	1.2	5.2	
9632513-9632511	143	6	VCP			1920	3	3.3	1.2	4.0	
9632601-9632201	326	6	VCP			1900	1	1.9	2.2	4.2	19
9632701-9632037	112	8	HDPE	2000	I&I Phase 7	1900	3	3.1	3.5	10.8	
9632701-9633204	270	8	HDPE	2009	Cyclic Phase 5	1900	-1	1.9	2.6	4.9	
9632702-9632701	287	8	HDPE	2000	I&I Phase 7	1900	1	1.9	3.5	6.7	
9632702-9633306	311	6	VCP			1900	3	3.1	3.2	9.9	15
9632703-9632702	181	8	HDPE	2000	I&I Phase 7	1900	1	1.9	3.5	6.7	
9632704-9632601	248	6	VCP			1900	1	2.0	2.2	4.4	19
9632704-9632703	296	6	VCP			1900	10	8.2	3.5	28.7	2
9632705-9632703	126	6	VCP			1900	1	1.9	3.5	6.7	7
9632706-9632705	298	6	VCP			1900	1	1.9	3.1	5.9	7
9632706-9633702	516	8	PVC	2007	Cyclic Phase 4	1900	1	1.9	1.5	2.8	
9632706-9714706	238	6	VCP			1900	10	7.6	1.5	11.4	7
9632707-9632704	431	6	VCP			1900	3	3.1	2.2	6.8	19
9632707-9632706	298	8	PVC	2013	Cyclic Phase 9	1900	1	1.9	1.5	2.8	
9632707-9714705	311	6	VCP			1900	1	1.3	0.6	0.8	19
9632807-9632808	158	8	PVC		Cyclic Phase 7	2010	-1	1.9	2.2	4.2	
9632808-9632809	84	8	PVC		Cyclic Phase 7	2010	-1	1.9	2.2	4.2	
9632809-9632810	69	8	PVC		Cyclic Phase 7	2010	-1	1.9	2.2	4.2	
9632810-9630011	66	8	PVC		Cyclic Phase 7	2010	-1	1.9	2.6	4.9	
9632811-9632807	300	8	PVC		Cyclic Phase 7	2010	-1	1.9	1.8	3.4	
9632812-9632811	294	8	PVC		Cyclic Phase 7	2010	-1	1.9	1.8	3.4	
9632813-9632812	209	8	PVC		Cyclic Phase 7	2010	-1	1.9	1.8	3.4	
9632813-9632815	131	8	PVC		Cyclic Phase 7	2010	-1	1.9	1.8	3.4	
9632814-9631906	150	8	PVC		Cyclic Phase 7	2010	-1	1.9	2.2	4.2	
9632815-9632814	92	8	PVC		Cyclic Phase 7	2010	-1	1.9	1.8	3.4	
9632901-9633004	88	6		2015		1900	8	6.6	2.6	17.2	1
9632902-9632901	235	6		2015		1900	10	7.8	2.6	20.3	1
9632903-9632902	279	6		2015		1900	10	8.3	3.2	26.6	1
9632904-9632903	247	6		2015		1900	10	8.2	2.8	23.0	1
9632905-9632904	44	6		2015		1900	10	8.2	2.8	23.0	1
9633001-9630008	108	8	VCP			1900	10	8.3	3.2	26.6	1
9633002-9633001	146	6	VCP			1900	1	1.9	2.6	4.9	1
9633003-9633001	138	6	VCP			1900	10	8.2	2.6	21.3	1
9633004-9633001	107	8		2015		1900	10	8.2	2.6	21.3	1
9633005-9633004	83	6		2015		1900	3	2.9	2.6	7.5	1
9633006-9633005	241	6		2015		1900	8	6.9	2.6	17.9	1
9633007-9633006	279	6		2015		1900	10	8.0	2.6	20.8	1
9633008-9633007	246	6		2015		1900	-1	1.2	2.2	2.6	1
9633009-9633008	46	6		2015		1900	-1	1.2	2.2	2.6	1
9633010-9632905	90	6		2015		1900	10	7.8	2.6	20.3	1
9633010-9633009	85	6		2015		1900	5	4.7	2.6	12.2	1
9633101-9633205	30	8	PVC		I&I Phase 5	1996	1	1.9	2.6	4.9	
9633102-9633205	36	14	PVC		I&I Phase 5	1996	1	1.9	2.9	5.5	
9633103-9633102	256	14	PVC	1996	I&I Phase 5	1900	1	1.9	2.9	5.5	
9633104-9633103	210	14	PVC	1996	I&I Phase 5	1900	1	1.9	2.9	5.5	
9633105-9633104	207	12	VCP			1900	1	1.9	2.9	5.5	9
9633106-9633105	195	12	VCP			1900	5	4.5	2.9	13.1	9
9633107-9633106	234	12	VCP			1900	5	4.7	2.9	13.6	1
9633108-9633107	306	12	VCP			1900	10	8.5	2.9	24.7	1
9633109-9633108	358	10	VCP			1900	10	8.2	2.9	23.8	1
9633110-9633109	89	10	VCP			1900	8	6.8	2.9	19.7	1
9633201-9633205	60	8	HDPE	2009	Cyclic Phase 5	1900	-1	1.9	2.6	4.9	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9633202-9633201	299	8	HDPE	2009	Cyclic Phase 5	1900	-1	1.9	2.6	4.9	
9633203-9633202	299	8	HDPE	2009	Cyclic Phase 5	1900	-1	1.9	0.6	1.1	
9633204-9633203	301	8	HDPE	2009	Cyclic Phase 5	1900	-1	1.9	0.6	1.1	
9633205-9633206	168	14	PVC		I&I Phase 5	1996	-1	1.9	2.9	5.5	
9633206-9630007	132	14	PVC		I&I Phase 5	1996	-1	1.9	2.9	5.5	
9633301-9633103	69	6	VCP			1900	1	1.9	2.6	4.9	15
9633302-9633301	155	6	VCP			1900	1	1.5	3.2	4.8	15
9633304-9633301	299	6	VCP			1900	1	1.9	2.6	4.9	15
9633305-9633304	301	6	VCP			1900	3	3.3	2.2	7.3	15
9633306-9633305	295	6	VCP			1900	5	4.5	0.6	2.7	15
9633501-9633101	260	6	VCP			1940	10	8.2	2.6	21.3	15
9633502-9633501	383	6	VCP			1940	3	3.3	2.6	8.6	15
9633502-9633509	283	6	VCP			1940	1	1.9	2.6	4.9	15
9633503-9633502	164	6	VCP			1950	10	8.2	2.6	21.3	6
9633504-9633503	133	6	VCP			1950	3	3.3	2.6	8.6	6
9633505-9633504	297	8	VCP			1950	5	4.7	2.6	12.2	6
9633506-9633504	79	6	VCP			1950	1	1.9	2.2	4.2	6
9633509-9633103	235	8	PVC		Cyclic Phase 9	2013	1	1.9	2.6	4.9	
9633701-9633106	236	8	PVC	2007	Cyclic Phase 4	1900	1	1.9	3.5	6.7	
9633702-9633701	507	8	PVC	2007	Cyclic Phase 4	1900	3	3.3	3.1	10.2	
9633801-9633107	58	6	VCP			1900	3	2.9	2.6	7.5	
9633803-9633801	236	8	VCP			1900	5	4.3	2.6	11.2	13
9633804-9633803	282	6	VCP			1900	10	8.2	2.2	18.0	13
9633805-9633804	322	6	VCP			1900	8	6.8	0.6	4.1	13
9633901-9633108	152	6	VCP			1900	10	8.0	2.6	20.8	4
9633902-9633901	555	6	VCP			1900	10	7.8	2.2	17.2	4
9633903-9633902	564	6	VCP			1900	10	8.2	1.2	9.8	4
9633903-9714701	71	6	VCP			1900	10	7.8	1.5	11.7	7
9634001-9633109	50	6	VCP			1900	1	1.5	2.6	3.9	
9634002-9634001	137	6	VCP			1900	1	1.9	2.6	4.9	1
9634003-9634001	442	8	VCP			1900	1	1.9	2.6	4.9	15
9634004-9634003	339	8	VCP			1900	1	1.9	0.6	1.1	15
9634005-9634004	342	6	VCP			1900	1	1.9	1.2	2.3	15
9634101-9633110	371	6	VCP			1900	10	8.5	3.5	29.8	1
9634102-9634101	295	6	VCP			1900	10	8.2	1.5	12.3	15
9634103-9634102	295	4	VCP			1900	5	4.7	1.5	7.0	15
9634103-9714205	256	6	VCP			1900	10	7.8	0.6	4.7	
9634104-9634103	157	4	VCP			1900	10	8.2	1.5	12.3	15
9634201-9633106	271	8	VCP			1940	10	8.0	3.5	28.0	2
9634202-9634201	348	6	VCP			1950	10	7.8	2.6	20.3	17
9634203-9634202	223	6	VCP			1950	3	3.3	2.6	8.6	17
9634204-9634203	106	6	VCP			1950	3	3.3	2.6	8.6	17
9634204-9634301	298	6	VCP			1950	10	8.2	2.6	21.3	17
9634205-9634201	257	8	VCP			1950	5	4.5	3.5	15.8	2
9634206-9634205	192	6	VCP			1950	5	4.5	2.6	11.7	6
9634207-9634205	351	8	VCP			1950	3	3.1	2.6	8.1	6
9634208-9634207	224	6	VCP			1950	5	4.7	2.6	12.2	6
9634208-Eastshore/Myers	39	6	VCP			1950	1	1.5	2.6	3.9	15
9634209-9634208	217	6	VCP			1950	1	1.9	2.6	4.9	15
9634209-9634303	186	6	VCP			1950	3	3.3	2.6	8.6	15
9634301-9633109	201	6	VCP			1950	1	1.9	2.6	4.9	15
9634303-9634301	257	6	VCP			1950	3	3.3	3.5	11.6	15
9634304-9634303	139	6	VCP			1950	1	1.7	3.5	6.0	15
9640007-9640006	21	8	HDPE	2000	I&I Phase 7	1920	1	1.5	3.5	5.3	
9641002-9641001	266	15	VCP			1920	10	7.4	3.5	25.9	2
9641003-9641002	309	6	VCP			1930	10	7.6	2.8	21.3	3
9641004-9641003	320	6				1930	-1	7.8	1.2	9.4	3
9641005-9641004	240	6				1930	-1	7.8	2.8	21.8	3
9641006-9641002	108	15	VCP			1920	10	7.8	2.5	19.5	2

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9641007-9641006	77	15	VCP			1920	10	7.8	0.9	7.0	2
9641008-9641007	234	6	VCP			1920	3	2.9	0.6	1.7	7
9641009-9632002	376	6	VCP			1920	10	8.3	3.2	26.6	2
9641009-9641007	140	6	VCP			1920	5	4.3	0.6	2.6	2
9641010-9641007	106	15	VCP			1920	1	1.1	0.9	1.0	9
9641011-9641010	138	8	VCP			1920	10	7.8	1.2	9.4	9
9641012-9641011	53	6				1920	-1	7.8	1.2	9.4	9
9641013-9641011	52	6				1920	-1	7.8	1.2	9.4	9
9641014-9641010	236	15	VCP			1920	3	2.9	2.5	7.3	9
9641015-9641014	85	10	VCP			1920	1	1.5	2.5	3.8	9
9641016-9641014	143	15	VCP			1920	1	1.5	2.5	3.8	9
9641017-9641016	148	6	VCP			1920	10	7.9	2.8	22.1	12
9641018-9641017	169	6	VCP			1920	1	1.5	2.8	4.2	12
9641020-9641018	20	6	VCP			1920	1	1.5	1.2	1.8	12
9641022-9641020	78	6	VCP			1920	1	1.5	1.2	1.8	12
9641023-9641022	57	6	VCP			1920	1	1.5	0.6	0.9	12
9641024-9641023	345	6	VCP			1920	10	7.4	1.2	8.9	12
9641025-9641024	302	6				1920	-1	7.8	1.2	9.4	12
9641027-9641002	208	6	VCP			1930	10	7.6	2.8	21.3	3
9641031-9641001	514	6	VCP			1930					2
9641032-9641031	383	6	VCP			1930					2
9641033-9641032	73	6				1930					2
9641037-9641008	374	6	VCP			1920	5	3.9	0.6	2.3	7
9641038-9641037	459	6	VCP			1920	10	7.8	2.6	20.3	7
9641101-9641010	128	8	VCP			1920	1	1.3	1.2	1.6	11
9641102-9641101	170	6	VCP			1920	1	1.5	1.2	1.8	11
9641103-9641102	35	6	VCP			1920	1	1.5	1.2	1.8	11
9641104-9641102	38	6	VCP			1920	1	1.5	1.2	1.8	11
9641105-9641104	50	6	VCP			1920	1	1.5	1.2	1.8	11
9641106-9641101	251	8	VCP			1920	1	1.5	1.2	1.8	8
9641107-9641106	368	6				1920	-1	7.8	1.2	9.4	8
9641108-9641106	225	8	VCP			1920	1	1.5	1.2	1.8	8
9641109-9641108	65	8	VCP			1920	1	1.1	1.2	1.3	10
9641110-9641109	290	6	VCP			1920	3	2.9	1.2	3.5	10
9641111-9641110	82	6	VCP			1920	1	1.5	1.2	1.8	10
9641112-9641110	118	6	VCP			1920	8	6.2	1.2	7.4	10
9641113-9641112	203	6	VCP			1920	1	1.5	1.2	1.8	10
9641114-9641113	66	6	VCP			1920	10	7.8	1.2	9.4	10
9641115-9641114	219	6	VCP			1920	10	7.8	1.2	9.4	10
9641116-9641115	52	6	VCP			1920	1	1.5	1.2	1.8	10
9641117-9641116	158	6	VCP			1920	1	1.1	1.2	1.3	10
9641118-9641117	162	6	VCP			1920	1	1.1	1.2	1.3	10
9641119-9641109	284	8	VCP			1920	5	4.4	2.8	12.3	6
9641120-9641119	538	6	VCP			1920	10	8.1	2.8	22.7	6
9641121-9641119	253	8	VCP			1920	5	4.1	2.8	11.5	6
9641122-9641121	205	6	VCP			1920	3	2.9	2.8	8.1	18
9641123-9641122	68	6	VCP			1920	3	2.9	1.2	3.5	18
9641124-9641122	21	6	VCP			1920	1	1.5	1.2	1.8	18
9641125-9641124	47	6	VCP			1920	1	1.5	1.2	1.8	18
9641126-9641124	101	6	VCP			1920	3	2.5	1.2	3.0	18
9641127-9641126	45	6	VCP			1920	1	1.1	0.6	0.7	18
9641128-9641127	452	6	VCP			1920	10	8.1	1.2	9.7	19
9641129-9641128	409	6	VCP			1920	10	7.9	1.2	9.5	19
9641130-9641121	250	6	VCP			1920	5	4.3	2.8	12.0	18
9641131-9641130	59	6	VCP			1920	1	1.5	2.8	4.2	18
9641132-9641130	205	6	VCP			1920	1	1.5	2.8	4.2	18
9641133-9641132	62	6	VCP			1920	1	1.5	1.2	1.8	18
9641134-9641132	21	6	VCP			1920	3	2.7	1.2	3.2	18
9641135-9641134	43	6	VCP			1920	1	1.3	1.2	1.6	18

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9641136-9641134	99	6	VCP			1920	1	1.5	1.2	1.8	18
9641137-9641136	44	6	VCP			1920	1	1.1	0.6	0.7	18
9641138-9641137	457	6	PVC			1920	1	1.3	1.2	1.6	
9641139-9641138	367	6	VCP			1920	5	3.9	1.2	4.7	19
9641301-9641400	146	12	VCP			1930	10	7.8	2.9	22.6	3
9641302-9641301	108	6	VCP			1930					2
9641304-9641301	297	12	VCP			1930	10	7.9	2.9	22.9	3
9641305-9641304	188	6	VCP			1930	10	7.6	2.8	21.3	3
9641307-9641304	420	6	VCP			1930	1	1.1	2.8	3.1	3
9641308-9641304	92	12	VCP			1930	10	7.8	2.9	22.6	9
9641400-9640005	20	12	VCP			1930	1	1.1	2.9	3.2	
9641401-9641001	133	10	VCP			1930	10	7.8	2.9	22.6	1
9641402-9641401	106	6	VCP			1930	1	1.5	2.8	4.2	1
9641403-9641401	251	6	VCP			1930	10	8.1	2.2	17.8	1
9641404-9641403	251	6	VCP			1930	8	6.5	1.8	11.7	1
9641405-9641400	322	6	VCP			1930	10	7.9	2.6	20.5	1
9641405-9641404	243	6	VCP			1930	10	8.1	1.8	14.6	1
9641601-9641400	186	6	VCP			1930	10	8.1	2.6	21.1	1
9641602-9641601	187	6	VCP			1930	10	8.1	2.2	17.8	1
9641701-9641001	209	10	VCP			1930	8	6.4	2.9	18.6	1
9641702-9641701	240	6	VCP			1930	3	2.7	3.2	8.6	1
9641801-9620001	124	16	HDPE	2009	Cyclic Phase 5	1940	1	1.5	3.2	4.8	
9641802-9421104	231	6	VCP			1900	1	1.5	2.6	3.9	5
9641802-9641801	352	16	HDPE	2009	Cyclic Phase 5	1930	1	1.5	3.2	4.8	
9641804-9631709	253	16	HDPE	2009	Cyclic Phase 5	1900	1	1.5	2.1	3.1	
9641805-9641804	219	6	VCP			1930	1	1.5	3.1	4.6	17
9641806-9421116	483	6	PVC			1900	5	4.3	3.5	15.1	
9641806-9641804	324	16	HDPE	2009	Cyclic Phase 5	1900	1	1.5	2.1	3.1	
9641807-9641806	279	16	HDPE	2009	Cyclic Phase 5	1900	1	1.5	2.1	3.1	
9641808-9641807	165	6	VCP			1900	1	1.5	0.6	0.9	5
9641809-9421124	477	6	VCP			1900	1	1.5	1.5	2.3	8
9641809-9641807	276	16	HDPE	2009	Cyclic Phase 5	1900	1	1.5	1.2	1.8	
9641810-9641809	390	16	HDPE	2009	Cyclic Phase 5	1900	1	1.5	1.2	1.8	
9641815-9641810	240	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9710001-9210000	215	10	VCP			1960	3	2.9	3.4	9.9	12
9710002-9710001	45	6	VCP			1960	1	1.5	3.1	4.6	12
9710003-9710002	135	6	VCP			1960	3	2.9	2.6	7.5	17
9711001-9711017	226	8	PVC			1900	1	1.5	2.8	4.2	
9711002-9711001	253	8	VCP			1900	10	7.8	3.5	27.3	
9711003-9711002	142	6	VCP			1920	1	1.5	3.5	5.3	14
9711004-9711002	264	8	VCP			1900	5	3.9	3.5	13.7	14
9711005-9711004	94	6	VCP			1920	1	1.5	3.5	5.3	14
9711006-9711004	258	8	VCP			1900	10	7.8	3.5	27.3	2
9711006-9711007	294	6	VCP			1900	1	1.5	2.6	3.9	9
9711006-9714501	295	6	VCP			1900	1	1.5	2.2	3.3	9
9711007-9721005	261	10	PVC	1997	I&I Phase 5	1900	1	1.5	2.9	4.4	
9711008-9711006	263	8	VCP			1900	10	7.8	2.2	17.2	2
9711010-9711019	228	8	VCP			1900	-1	7.8	0.6	4.7	17
9711010-9714504	296	8	VCP			1900	10	7.8	0.6	4.7	6
9711012-9711010	10	8				1900	-1	7.8	0.6	4.7	17
9711014-9714507	263	8	VCP			1900	1	1.6	0.6	1.0	17
9711014-9714601	296	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9711015-9711014	295	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9711015-9721028	245	8	PVC	1997	I&I Phase 5	1900	1	1.5	0.6	0.9	
9711018-9711019	131	4	HDPE	2014	Cyclic Phase 10	1900	-1	1.5	0.6	0.9	
9711019-9711008	32	8	VCP			1900	-1	7.8	0.6	4.7	17
9712001-9717003	241	6	VCP			1940	5	4.3	3.5	15.1	3
9712002-9712001	251	6	VCP			1940	1	1.5	3.5	5.3	14
9712003-9712002	253	6	VCP			1940	1	1.5	3.5	5.3	14

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9713000-9719008	34	8	PVC			1996	1	1.5	2.6	3.9	
9713001-9713000	220	6	VCP			1950	-1	6.4	2.6	16.6	4
9713002-9713001	141	6	VCP			1950	1	1.5	2.6	3.9	4
9713003-9713001	132	6	VCP			1950	1	1.5	2.6	3.9	4
9713004-9713003	117	6	VCP			1950	1	1.5	2.6	3.9	4
9713005-9713004	231	6	VCP			1950	10	7.8	2.6	20.3	4
9714001-9719000	192	15	PVC			1996	1	1.5	3.1	4.6	
9714002-9714001	249	14	PVC		I&I Phase 5	1997	3	2.9	3.5	10.2	
9714003-9714002	117	6	VCP			1950	1	1.5	2.6	3.9	11
9714004-9714021	272	6	VCP			1950	3	2.9	2.6	7.5	11
9714005-9714004	85	6	VCP			1950	3	2.9	3.2	9.3	11
9714007-9714021	259	15	PVC		I&I Phase 5	1997	1	1.3	2.9	3.8	
9714008-9714007	297	10	VCP			1950	1	1.1	2.5	2.8	11
9714009-9714008	270	8	VCP			1950	1	1.5	2.2	3.3	11
9714010-9714009	238	8	VCP			1950	1	1.5	3.2	4.8	11
9714011-9714010	97	8				1950	-1	6.4	2.6	16.6	11
9714013-9714007	262	14	PVC		I&I Phase 5	1997	1	1.5	2.9	4.4	
9714014-9714009	128	8	VCP			1950	1	1.1	2.8	3.1	11
9714015-9714014	79	8	HDPE			1950	1	1.5	2.6	3.9	
9714017-9714009	199	8	VCP			1950	1	1.5	2.6	3.9	11
9714018-9714017	276	8	TRUSS			1950	3	2.9	2.6	7.5	
9714019-9714018	257	8	TRUSS			1950	5	4.3	2.6	11.2	
9714020-9714019	130	8	HDPE			1950	1	1.5	2.6	3.9	
9714021-9714002	38	14	PVC		I&I Phase 5	1997	1	1.5	2.9	4.4	
9714101-9714013	295	8	VCP			1950	10	7.8	2.6	20.3	11
9714102-9714101	256	6	VCP			1950	1	1.5	2.6	3.9	11
9714103-9714101	261	6	VCP			1950	10	7.8	3.2	25.0	6
9714104-9714103	139	6	VCP			1950	10	7.8	2.2	17.2	8
9714105-9714103	249	6	VCP			1950	1	1.5	2.6	3.9	8
9714106-9714103	260	6	VCP			1950	1	1.5	2.8	4.2	6
9714108-9714106	263	6	VCP			1950	1	1.5	2.6	3.9	8
9714109-9714108	42	6	VCP			1950	1	1.5	2.6	3.9	
9714110-9714106	133	6	VCP			1950	5	4.3	2.8	12.0	6
9714111-9714110	14	6	VCP			1950	10	7.8	2.8	21.8	6
9714112-9714111	98	6	VCP			1950	-1	6.4	2.8	17.9	6
9714113-9714112	24	6	VCP			1950	1	1.5	2.2	3.3	6
9714115-9714113	189	6	VCP			1950	1	1.5	2.2	3.3	6
9714116-9714113	84	6	VCP			1950	1	1.5	2.8	4.2	20
9714117-9714011	33	8				1950	-1	6.4	2.6	16.6	11
9714117-9714017	99	8	VCP			1950	1	1.5	2.6	3.9	11
9714117-9714102	136	6	VCP			1950	1	1.5	2.6	3.9	
9714118-9714115	22	6	VCP			1950	1	1.5	2.2	3.3	6
9714120-9714117	35	8	VCP			1950	1	1.5	2.6	3.9	11
9714201-9714013	261	8	PVC	2015	Cyclic Phase 11	1900	1	1.3	2.6	3.4	
9714202-9714106	296	6	VCP			1950	3	2.9	2.2	6.4	8
9714202-9714201	260	8	PVC	2015	Cyclic Phase 11	1900	1	1.5	2.2	3.3	
9714204-9714113	294	6	VCP			1900	-1	7.8	2.2	17.2	6
9714204-9714202	262	8	PVC	2015	Cyclic Phase 11	1900	1	1.5	0.6	0.9	
9714205-9714204	294	6	VCP			1900	10	7.8	0.6	4.7	18
9714205-9714306	261	6	VCP			1900	10	7.8	0.6	4.7	
9714206-9714204	128	6	PVC		Cyclic Phase 11	2015	-1	0.8	0.6	0.5	
9714301-9714013	124	12	PVC	1997	I&I Phase 5	1900	1	1.5	2.9	4.4	
9714303-9714301	171	12	PVC	1997	I&I Phase 5	1900	1	1.5	2.9	4.4	
9714304-9714303	262	6	VCP			1900	1	1.6	2.6	4.2	4
9714305-9714304	25	6				1900	-1	7.8	2.2	17.2	4
9714306-9714202	293	6	VCP			1900	10	7.8	0.6	4.7	6
9714306-9714305	233	6	VCP			1900	10	7.8	2.2	17.2	4
9714307-9714305	127	0				1900	-1	7.8	1.9	14.8	4
9714401-9714303	112	12	PVC	1997	I&I Phase 5	1900	1	1.5	2.9	4.4	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9714402-9714403	187	8	PVC			1900	10	7.8	3.5	27.3	14
9714403-9714401	180	12	PVC	1997	I&I Phase 5	1900	1	1.5	2.5	3.8	
9714404-9714304	292	6	VCP			1900	1	1.5	2.2	3.3	
9714404-9714403	259	12	PVC	1993	I&I Phase 3	1900	1	1.5	3.4	5.1	
9714406-9714306	295	6	VCP			1900	1	1.1	0.6	0.7	6
9714406-9714404	257	12	PVC	1993	I&I Phase 3	1900	1	1.5	1.8	2.7	
9714407-9714401	136	6	VCP			1900	1	1.5	2.8	4.2	20
9714408-9714205	295	6	VCP			1900	1	1.1	0.6	0.7	18
9714408-9714406	263	12	PVC	1993	I&I Phase 3	1900	1	1.5	1.8	2.7	
9714409-9714408	295	6	VCP			1900	1	1.5	0.6	0.9	18
9714409-9714504	265	6	VCP			1900	1	1.5	0.6	0.9	19
9714410-9714408	264	12	PVC	1993	I&I Phase 3	1900	1	1.5	1.8	2.7	
9714501-9714403	296	8	PVC	1989	I&I Phase 2	1900	1	1.5	2.2	3.3	
9714503-9714404	298	6	VCP			1900	10	7.8	0.6	4.7	1
9714503-9714501	260	6	VCP			1900	1	1.5	2.2	3.3	19
9714504-9714406	295	6	VCP			1900	10	7.6	0.6	4.6	6
9714504-9714503	255	6	VCP			1900	1	1.5	0.6	0.9	19
9714507-9711012	249	8	VCP			1900	3	2.7	0.6	1.6	17
9714507-9714409	297	6	VCP			1900	10	7.8	0.6	4.7	18
9714601-9714409	264	6	VCP			1900	1	1.3	0.6	0.8	19
9714601-9714410	293	8	PVC	1997	I&I Phase 5	1900	1	1.5	1.5	2.3	
9714604-9711014	360	6	VCP			1900	10	7.4	0.6	4.4	17
9714604-9714702	298	6				1900	-1	7.8	1.5	11.7	6
9714606-9714604	309	6	VCP			1900	10	7.6	0.6	4.6	17
9714606-9714705	293	6	VCP			1900	10	7.4	0.6	4.4	8
9714608-9632504	428	6	VCP			1900	10	7.8	0.6	4.7	17
9714608-9632707	293	8	VCP	2013	Cyclic Phase 9	1900	1	1.9	1.5	2.8	
9714608-9714606	312	6	VCP			1900	10	7.6	0.6	4.6	17
9714701-9714410	362	6	VCP			1900	10	7.6	1.5	11.4	7
9714702-9714601	354	8	PVC	1997	I&I Phase 5	1900	1	1.5	1.5	2.3	
9714704-9633903	230	6	VCP			1900	10	7.8	1.5	11.7	7
9714705-9714702	312	8	PVC	1997	I&I Phase 5	1900	1	1.5	1.5	2.3	
9714705-9714704	295	6	VCP			1900	1	1.5	1.5	2.3	8
9714706-9633805	375	6	VCP			1900	5	4.7	0.6	2.8	13
9714706-9714704	77	6	VCP			1900	10	7.8	1.5	11.7	7
9715005-9715004	76	6	VCP			1970	1	1.3	2.2	2.9	
9715006-9715005	280	6	VCP			1970	1	1.5	2.6	3.9	
9716001-9719004	32	6	VCP			1970	1	1.5	2.6	3.9	
9716002-9716001	144	6				1970	-1	4.3	3.2	13.8	6
9716003-9716001	208	6	VCP			1970	1	1.5	2.6	3.9	
9717001-9719024	88	6	VCP			1970	1	1.5	2.6	3.9	
9717002-9717001	34	6	VCP			1970	1	1.5	2.6	3.9	
9717003-9719005	18	6				1940	-1	6.4	3.5	22.4	3
9718001-9719023	142	8	VCP			1950	3	2.9	2.2	6.4	7
9718002-9718001	166	8	VCP			1950	1	1.1	2.8	3.1	
9718003-9718001	128	10	VCP			1950	1	1.5	2.9	4.4	19
9718004-9718003	113	10	VCP			1960	1	1.5	2.9	4.4	19
9718005-9718004	84	8	VCP			1960	1	1.5	2.2	3.3	
9718006-9718004	142	10	VCP			1960	1	1.5	2.9	4.4	19
9718007-9718006	273	8	VCP			1960	1	1.5	2.2	3.3	
9718008-9716003	114	6	VCP			1970	1	1.5	2.6	3.9	
9718008-9718007	194	6	VCP			1970	1	1.5	2.6	3.9	
9718009-9718006	288	8	VCP			1960	1	1.5	2.6	3.9	
9718010-9718009	329	8	VCP			1960	1	1.5	2.6	3.9	
9718011-9718010	29	8	VCP			1960	1	1.5	2.6	3.9	
9718011-Bayview	28	8	PVC			1960	1	1.5	2.6	3.9	
9718012-9718011	206	8	VCP			1960	1	1.5	2.6	3.9	
9718013-9718012	289	8	VCP			1960	1	1.5	2.6	3.9	
9718015-9718012	214	8	VCP			1960	1	1.5	2.2	3.3	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9718016-9718015	95	8	VCP			1960	1	1.5	2.2	3.3	
9718017-9718016	268	8	VCP			1960	1	1.5	2.2	3.3	
9718018-9718013	264	8	VCP			1960	1	1.5	2.6	3.9	
9718018-9718017	114	8	VCP			1960	1	1.5	2.2	3.3	
9718019-9718016	259	8	VCP			1960	1	1.5	2.6	3.9	
9718020-9718019	154	8	VCP			1960	1	1.5	2.6	3.9	
9718021-9718020	30	8	VCP			1960	1	1.5	2.6	3.9	
9718022-9718021	106	8				1960	-1	4.3	3.2	13.8	6
9718023-9718019	119	8	VCP			1960	1	1.5	2.6	3.9	
9719000-9719001	150	15	PVC			1996	-1	1.5	3.5	5.3	
9719001-9719002	147	16	PVC			1970	1	1.5	3.8	5.7	
9719002-9719003	56	16	PVC			1970	1	1.5	3.8	5.7	
9719003-9719004	311	18	PVC			1970	1	1.5	3.2	4.8	
9719004-9719026	140	18	PVC		I&I Phase 5	1997	1	1.5	4.4	6.6	
9719005-9719027	140	8	PVC			1940	1	1.5	3.8	5.7	
9719006-9719005	180	18	PVC		I&I Phase 5	1997	1	1.5	4.4	6.6	
9719006-9719007	54	8	PVC		I&I Phase 5	1997	-1	1.5	2.6	3.9	
9719007-9719008	70	8	PVC		I&I Phase 5	1997	-1	1.5	2.6	3.9	
9719008-9719000	149	12	PVC			1996	1	1.5	3.5	5.3	
9719022-9720001	12	18	PVC		I&I Phase 5	1997	-1	0.8	4.0	3.2	
9719023-9719022	83	18	PVC		I&I Phase 5	1997	-1	0.8	4.0	3.2	
9719024-9719025	17	6	PVC		I&I Phase 5	1970	1	1.5	3.8	5.7	
9719025-9719023	289	18	PVC		I&I Phase 5	1997	-1	1.5	4.4	6.6	
9719026-9719025	145	18	PVC		I&I Phase 5	1997	-1	1.5	4.4	6.6	
9719027-9719026	31	8				1940	-1	6.4	3.4	21.8	3
9720002-9720001	233	30	RCP	1987	I&I Clinton-Park-O	1900	-1	2.9	5.0	14.5	
9720003-9720002	469	30	RCP	1987	I&I Clinton-Park-O	1900	1	1.1	5.0	5.5	
9720004-9720003	332	30	RCP	1987	I&I Clinton-Park-O	1900	1	1.5	5.0	7.5	
9720005-9720004	10	30	RCP	1987	I&I Clinton-Park-O	1900	1	1.5	5.0	7.5	
9720006-9720005	113	30	RCP	1987	I&I Clinton-Park-O	1900	1	1.5	5.0	7.5	
9720007-9720015	49	24	RCP	1987	I&I Clinton-Park-O	1900	1	1.1	4.7	5.2	
9720008-9720007	483	21	RCP	1987	I&I Clinton-Park-O	1900	1	1.5	4.1	6.1	
9720009-9720008	391	21	RCP	1988	I&I Clinton-Park-O	1900	1	1.5	4.1	6.1	
9720011-9720006	46	6				1930	-1	7.8	2.8	21.8	3
9720013-9720014	171	6	VCP			1920	-1	7.8	2.8	21.8	3
9720014-9720011	95	6	VCP			1920	-1	7.8	2.8	21.8	3
9720015-9720006	308	30	RCP	1987	I&I Clinton-Park-O	1900	1	1.3	5.0	6.5	
9720016-9720009	271	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	3.5	5.3	
9721001-9720002	260	10	PVC	1997	I&I Phase 5	1900	1	1.5	2.9	4.4	
9721002-9721001	437	6	VCP			1920	5	4.3	2.6	11.2	4
9721003-9721001	263	10	PVC	1997	I&I Phase 5	1900	1	1.5	2.9	4.4	
9721004-9721003	361	6	PVC			1900	1	1.6	2.6	4.2	
9721005-9721003	258	10	PVC	1997	I&I Phase 5	1900	1	1.5	2.9	4.4	
9721007-9721005	234	6	VCP			1900	5	4.3	2.6	11.2	7
9721009-9711007	225	6	VCP			1900	10	7.8	2.6	20.3	9
9721010-9721009	94	6	VCP			1900	1	1.5	2.2	3.3	9
9721011-9711007	264	10	PVC	1997	I&I Phase 5	1900	1	1.5	2.9	4.4	
9721011-9711008	291	6	VCP			1900	1	1.5	2.6	3.9	2
9721012-9721011	227	6	VCP			1900	1	1.1	2.6	2.9	2
9721013-9721012	85	6	VCP			1900	1	1.5	2.2	3.3	2
9721014-9711010	294	6	VCP			1900	3	2.5	2.2	5.5	6
9721014-9721011	256	10	PVC	1997	I&I Phase 5	1900	1	1.5	2.9	4.4	
9721016-9721014	260	8	PVC	1997	I&I Phase 5	1900	1	1.5	2.2	3.3	
9721017-9721016	206	6	VCP			1900	1	1.5	0.6	0.9	18
9721019-9711015	223	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9721020-9721019	194	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9721021-9721020	32	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9721022-9721021	242	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9721026-9721105	295	6	VCP			1920	10	7.4	0.6	4.4	17

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9721026-9721107	176	8	PVC	2013	Cyclic Phase 9	1900	1	1.9	1.5	2.8	
9721027-9721026	235	8	PVC	2013	Cyclic Phase 9	1900	1	1.9	1.5	2.8	
9721028-9721016	20	8	PVC	1997	I&I Phase 5	1900	-1	1.5	0.6	0.9	
9721029-9721028	125					1900	-1	7.8	0.3	2.3	18
9721101-9711015	358	8	PVC	1997	I&I Phase 5	1900	1	1.5	0.6	0.9	
9721102-9721101	207	6	VCP			1900	3	2.9	0.6	1.7	4
9721103-9721021	325	6	VCP			1900	10	8.1	0.6	4.9	17
9721103-9721102	209	6	VCP			1900	5	4.6	0.6	2.8	4
9721104-9721101	309	6	VCP			1900	10	7.4	0.6	4.4	7
9721105-9721103	314	6	VCP			1900	10	7.6	0.6	4.6	17
9721105-9721104	418	6	VCP			1900	10	8.1	0.6	4.9	5
9721106-9632506	434	6	VCP			1900	10	8.5	0.6	5.1	7
9721106-9714608	296	8	PVC	2013	Cyclic Phase 9	1900	1	1.9	1.5	2.8	
9721106-9721104	311	6	VCP			1900	5	4.1	0.6	2.5	7
9721107-9721106	235	8	PVC	2013	Cyclic Phase 9	1900	1	1.9	1.5	2.8	
9722000-9720003	138	8	VCP			1900	1	1.5	3.5	5.3	2
9722001-9722000	148	6	VCP			1920	1	1.5	2.8	4.2	20
9722002-9722000	235	8	VCP			1900	1	1.5	3.5	5.3	2
9722003-9721004	174	6				1900	-1	7.8	2.6	20.3	2
9722003-9722002	114	8	VCP			1900	10	7.8	3.5	27.3	2
9722004-9722003	169	6	VCP			1920	3	2.9	2.6	7.5	
9722005-9722004	161	6	VCP			1920	1	1.5	2.6	3.9	
9722006-9722004	133	6	VCP			1920	10	7.8	2.2	17.2	5
9722008-9721004	333	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	2.6	3.9	
9722009-9722008	354	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	0.6	0.9	
9722010-9721014	448	6	VCP			1900	10	7.9	2.2	17.4	6
9722010-9722009	376	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	0.6	0.9	
9722012-9722010	465	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	0.6	0.9	
9722013-9722003	498	8	VCP			1900	1	1.5	3.5	5.3	14
9722014-9722013	342	6	VCP			1900	10	7.6	2.6	19.8	4
9722014-9722501	501	8	PVC		I&I Phase 4	1994	1	1.5	2.6	3.9	
9722015-9722013	518	8	VCP			1900	1	1.5	3.1	4.6	14
9722017-9722015	292	8	VCP			1900	10	7.6	1.5	11.4	1
9722018-9722017	309	8	VCP			1900	10	7.9	1.5	11.9	1
9722022-9721105	431	6	VCP			1900	5	3.9	0.6	2.3	5
9722022-9722018	672	6	VCP			1900	10	8.1	1.5	12.2	1
9722023-9631712	399	6	VCP			1900	10	8.2	1.5	12.3	7
9722023-9721027	235	8	PVC	2013	Cyclic Phase 9	1900	1	1.9	1.5	2.8	
9722023-9722022	269	6	VCP			1900	10	7.4	1.5	11.1	1
9722024-9641810	10	6	VCP			1900	1	1.1	1.5	1.7	
9722024-9722023	342	8	PVC	2013	Cyclic Phase 9	1900	1	1.1	1.5	1.7	
9722025-9722018	305	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.5	2.3	
9722501-9722005	15	8	PVC			1920	-1	7.8	2.6	20.3	
9722501-9722507	107	8	PVC		I&I Phase 4	1994	-1	2.9	2.6	7.5	
9722502-9722501	118	6	VCP			1920	1	1.5	2.6	3.9	
9722503-9722014	224	6	VCP			1900	10	7.8	2.6	20.3	4
9722504-9722503	291	6	VCP			1900	1	1.5	2.6	3.9	
9722505-9722503	169	6	VCP			1900	1	1.3	2.6	3.4	
9722506-9722014	513	8	PVC		I&I Phase 4	1994	1	1.5	2.6	3.9	
9722507-9720005	388	8	PVC		I&I Phase 4	1994	1	1.5	2.6	3.9	
9722508-9722506	25	8	PVC		I&I Phase 4	1994	1	1.5	0.6	0.9	
9722509-9722025	30	6	VCP			1900	-1	7.8	1.5	11.7	6
9722509-9722514	309	8	PVC		I&I Phase 4	1994	1	1.5	0.6	0.9	
9722510-9722509	243	8	PVC	2014	Cyclic Phase 10	1900	1	1.8	1.5	2.7	
9722510-9723007	234	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.5	2.3	
9722511-9722509	295	8	PVC		I&I Phase 4	1994	1	1.5	0.6	0.9	
9722512-9722511	292	8	PVC		I&I Phase 4	1994	1	1.5	0.6	0.9	
9722513-9722512	303	8	PVC		I&I Phase 4	1994	1	1.5	0.6	0.9	
9722514-9722508	294	8	PVC		I&I Phase 4	1994	1	1.5	0.6	0.9	

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Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9723001-9720007	768	8	VCP			1900	10	8.1	3.8	30.8	2
9723002-9723001	187	6	VCP			1900	10	7.6	2.2	16.7	2
9723003-9723001	291	8	VCP			1900	10	7.9	3.4	26.9	2
9723004-9723003	446	8	VCP			1900	10	7.6	1.8	13.7	2
9723005-9723004	470	6	VCP			1900	8	6.2	0.6	3.7	13
9723005-9724007	367	8	HDPE	2007	Cyclic Phase 4	1900	3	2.9	0.6	1.7	
9723006-9722506	240	6				1900	-1	7.8	0.6	4.7	13
9723006-9723004	245	6	VCP			1900	8	6.4	0.6	3.8	13
9723007-9723004	655	8	VCP			1900	1	1.3	1.8	2.3	2
9723008-9723019	234	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9723008-9724009	331	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	0.6	0.9	
9723008-9725006	303	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9723010-9722510	258	6	VCP			1900	10	7.8	0.6	4.7	18
9723011-9722510	47	6	VCP			1900	1	1.5	0.6	0.9	
9723012-9723011	96	6	VCP			1900	1	1.5	0.6	0.9	
9723014-9723011	81	4				1900	-1	7.8	0.6	4.7	18
9723015-9723011	82	4				1900	-1	7.8	0.6	4.7	18
9723019-9723007	234	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9724001-9720008	239	8	HDPE	2007	Cyclic Phase 4	1900	3	2.9	2.6	7.5	
9724002-9724001	278	6	VCP			1900	1	1.5	2.6	3.9	9
9724003-9724001	248	8	HDPE	2007	Cyclic Phase 4	1900	3	2.9	2.6	7.5	
9724004-9724003	287	6	VCP			1900	5	4.3	2.2	9.5	9
9724005-9724004	109	4				1900	-1	7.8	2.6	20.3	9
9724006-9724003	257	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	0.6	0.9	
9724007-9724006	369	8	HDPE	2007	Cyclic Phase 4	1900	3	2.9	0.6	1.7	
9724009-9723005	366	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	0.6	0.9	
9724010-9421125	240	6	VCP			1900	5	4.3	0.6	2.6	11
9724011-9723008	254	8	PVC	2007	Cyclic Phase 4	1900	1	1.5	0.6	0.9	
9724012-9724011	230	6	VCP			1900	10	7.6	0.6	4.6	4
9724013-9724010	235	6	VCP			1900	3	2.5	0.6	1.5	11
9724013-9724011	271	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	0.6	0.9	
9724014-9723007	279	8	PVC	2013	Cyclic Phase 10	1900	1	1.3	1.5	1.9	
9724014-9724012	237	6	VCP			1900	5	3.9	0.6	2.3	4
9725001-9720016	259	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	3.1	4.6	
9725002-9725016	241	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9725003-9725002	114	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9725004-9725003	348	8	PVC	2009	Cyclic Phase 5	1900	3	2.9	1.5	4.4	
9725005-9725004	327	8	PVC	2009	Cyclic Phase 5	1900	3	2.9	1.5	4.4	
9725006-9725005	348	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9725009-9725002	111	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9725010-9725009	362	8	HDPE	2009	Cyclic Phase 5	1900	3	2.9	1.5	4.4	
9725011-9725010	104	6				1900	-1	7.8	1.2	9.4	8
9725012-9725017	339	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9725013-9725012	110	8	VCP	2014	Cyclic Phase 10	1900	10	7.8	1.8	14.0	8
9725014-9725012	126	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	1.2	1.8	
9725015-9725014	342	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9725016-9725001	275	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9725017-9725010	346	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	1.5	2.3	
9725200-9720009	168	21	CIPP		I&I Clinton-Park-O	1988	1	1.5	4.1	6.1	
9725201-9725200	227	21	CIPP		I&I Clinton-Park-O	1988	1	1.5	3.8	5.7	
9725202-9725201	20	21	PVC	1988	I&I Clinton-Park-O	1900	1	1.5	4.1	6.1	
9725203-9725202	196	6	VCP			1900	10	7.4	3.2	23.7	2
9725204-9725203	223	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	2.6	3.9	
9725205-9725204	367	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	2.6	3.9	
9725206-9725205	208	8	PVC	2009	Cyclic Phase 5	1900	1	1.5	2.6	3.9	
9725207-9725206	154	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	2.6	3.9	
9725207-9741000	277	21	VCP			1900	10	7.6	3.2	24.3	8
9725208-9725203	116	6	VCP			1900	5	4.3	2.6	11.2	9
9725209-9725208	229	6	VCP			1900	10	7.8	2.2	17.2	9

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Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9725210-9725201	335	21	RCP	1988	I&I Clinton-Park-O	1900	1	1.5	4.1	6.1	
9725211-9725210	331	21	RCP	1988	I&I Clinton-Park-O	1900	1	1.5	3.7	5.6	
9725301-9720009	136	8				1930	-1	7.8	3.5	27.3	2
9725302-9725301	94	4				1930	-1	7.8	2.8	21.8	2
9725303-9725301	187	8				1930	-1	7.8	2.8	21.8	2
9725400-9720008	11	8				1930	-1	7.8	3.5	27.3	
9725401-9725400	250	8	VCP			1930	3	2.9	2.6	7.5	16
9725402-9725401	135	8	VCP			1930	1	1.5	2.6	3.9	16
9725403-9725401	388	8	VCP			1930	5	4.3	2.6	11.2	2
9725405-9725403	228	8	VCP			1930	10	7.8	2.6	20.3	2
9725501-9720007	133	6	VCP			1920	10	7.6	2.6	19.8	1
9725502-9725501	204	6	VCP			1920	3	2.9	2.2	6.4	1
9725503-9725502	144	6	VCP			1920	8	6.2	2.8	17.4	1
9725504-9725501	90	6	VCP			1920	10	7.6	2.8	21.3	3
9725506-9725504	204	6				1920	-1	7.8	2.8	21.8	3
9725507-9725506	74	6				1920	-1	7.8	2.8	21.8	3
9725508-9725507	130	6				1920	-1	7.8	2.8	21.8	3
9725509-9725508	94	6				1920	-1	7.8	2.8	21.8	3
9725510-9725504	243	6				1920	-1	7.8	2.8	21.8	3
9725511-9725510	104	6				1920	-1	7.8	2.8	21.8	3
9725512-9725507	21	6				1920	-1	7.8	2.8	21.8	3
9725601-9720006	45	8	VCP			1930	3	2.5	2.8	7.0	
9725602-9725601	88	6	VCP			1930	10	7.6	2.8	21.3	6
9725603-9725602	154	6	VCP			1930	1	1.5	2.6	3.9	6
9725701-9720004	163	6				1960	-1	4.3	2.6	11.2	2
9725801-9720003	129	6	VCP			1930	3	2.9	3.5	10.2	2
9725802-9725801	130	6	VCP			1930	10	7.4	3.1	22.9	2
9725803-9725801	171	6	VCP			1930	1	1.1	2.8	3.1	
9725901-9725906	271	8	PVC	2014	Cyclic Phase 11	1950	1	1.5	2.6	3.9	
9725901-9725907	130	8	PVC	2014	Cyclic Phase 11	1950	-1	1.5	2.6	3.9	
9725904-9725901	210	8	PVC	2014	Cyclic Phase 11	1950	1	1.6	2.6	4.2	
9725906-9718003	37	8	PVC	2014	Cyclic Phase 11	1950	-1	1.5	2.6	3.9	
9725907-9725908	85	8	PVC	2014	Cyclic Phase 11	1950	-1	1.5	2.6	3.9	
9725908-9720002	20	8	PVC	2014	Cyclic Phase 11	1950	-1	1.5	2.6	3.9	
9731002-9725202	83	12	VCP			1960	1	1.5	3.8	5.7	
9731002-9733000	367	15	PVC			1960	1	1.5	3.5	5.3	
9731003-9731002	299	10	VCP			1960	1	1.5	3.8	5.7	
9731004-9731003	77	10	VCP			1960	1	1.5	3.8	5.7	
9731005-9731004	76	10	VCP			1960	1	1.1	3.4	3.7	
9731006-9731005	124	10	VCP			1960	1	1.5	3.4	5.1	
9731007-9731006	304	10				1960	-1	4.3	3.8	16.3	
9731008-9731007	280	10	VCP			1960	1	1.3	3.4	4.4	
9731009-9731018	117	10	VCP			1960	1	1.5	3.8	5.7	
9731010-9731019	135	10	VCP			1960	1	1.5	3.4	5.1	
9731011-9731010	212	10	VCP			1960	1	1.5	3.8	5.7	14
9731012-9731011	224	8	VCP			1960	1	1.1	3.5	3.9	14
9731018-9731008	109	10	VCP			1960	1	1.5	3.8	5.7	
9731019-9731009	140	8				1960	-1	4.3	3.1	13.3	
9731101-9731011	299	8	VCP			1960	10	7.8	2.6	20.3	13
9731102-9731101	189	8	VCP			1960	1	1.8	2.6	4.7	13
9731103-9731102	60	8	VCP			1960	1	1.5	2.6	3.9	13
9731105-9731103	145	8	VCP			1960	1	1.5	2.6	3.9	13
9731201-9731012	268	8	VCP			1960	1	1.3	2.6	3.4	
9731202-9731203	329	6	VCP			1960	1	1.1	2.6	2.9	19
9731202-9731220	197	6	VCP			1960	5	4.3	2.2	9.5	19
9731203-9210022	259	8	VCP			1960	3	2.9	3.2	9.3	8
9731204-9731201	231	8	VCP			1960	1	1.5	2.6	3.9	
9731205-9731204	38	8	VCP			1960	1	1.5	2.6	3.9	
9731205-Willow/Whitehall	52	10				1960	-1	4.3	2.9	12.5	

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9731206-9731205	251	8	VCP			1960	1	1.3	2.6	3.4	
9731207-9731205	331	8	VCP			1960	3	3.0	2.6	7.8	9
9731208-9731206	347	8	VCP			1960	1	1.5	2.6	3.9	
9731209-9731208	248	8	VCP			1960	5	4.1	2.6	10.7	15
9731210-9731213	50	8	PVC			1960	1	1.5	2.6	3.9	
9731211-9731210	259	8	VCP			1960	3	3.0	3.2	9.6	15
9731212-9731210	143	8	VCP			1960	1	1.3	2.6	3.4	15
9731213-9731209	12	8				1960	-1	4.3	2.2	9.5	15
9731213-Willow	13	8	HDPE			1960	-1	4.3	2.2	9.5	
9731215-9731207	316	8	VCP			1960	1	1.8	2.2	4.0	9
9731216-9731212	98	6	HDPE			1960	3	2.9	2.2	6.4	
9731217-9731205	289	8				1960	-1	4.3	3.2	13.8	9
9731219-9731215	310	8	VCP			1960	1	1.8	2.6	4.7	9
9731220-9731201	125	6	VCP			1960	1	1.5	2.6	3.9	19
9731301-9731007	48	8	VCP			1960	1	1.5	2.8	4.2	
9733000-Park/Otis	39	12				1960	-1	4.3	3.1	13.3	17
9733001-9733000	118	8	VCP			1960	1	1.5	3.2	4.8	17
9733002-9733001	109	8	VCP			1960	1	1.5	3.5	5.3	17
9733003-9733002	213	8	VCP			1960	1	1.5	3.1	4.6	17
9733004-9733003	56	8	VCP			1960	1	1.5	1.2	1.8	15
9733005-9733004	144	8	VCP			1960	10	7.6	1.2	9.1	15
9733007-9733005	269	8	VCP			1960	1	1.5	1.2	1.8	15
9733009-9733007	206	8	VCP			1960	5	4.1	1.2	4.9	15
9733010-9733009	180	8				1960	-1	4.3	1.2	5.2	15
9733011-9733010	188	8				1960	-1	4.3	1.2	5.2	15
9733012-9733011	102	8				1960	-1	4.3	1.2	5.2	15
9733013-9733003	190	8	VCP			1960	3	2.5	1.5	3.8	17
9733014-9733013	189	8	VCP			1960	1	1.1	3.1	3.4	17
9733015-9733014	119	6	TRUSS			1960	1	1.5	3.1	4.6	
9740001-9740008	37	15	PVC	1988	I&I Clinton-Park-O	1900	-1	2.9	2.9	8.4	
9740002-9725207	314	21	VCP			1900	3	2.9	3.2	9.3	8
9740003-9740002	322	21	VCP			1900	8	6.4	1.2	7.7	8
9740004-9740003	306	21	VCP			1900	10	7.8	1.2	9.4	8
9740005-9740004	463	18	RCP	1988	I&I Clinton-Park-O	1900	1	1.5	1.2	1.8	
9740006-9731105	171	8	VCP			1960	1	1.5	2.6	3.9	13
9740006-9740005	480	18	RCP	1988	I&I Clinton-Park-O	1900	1	1.5	3.2	4.8	
9740007-9740006	468	15	PVC	1988	I&I Clinton-Park-O	1900	1	1.5	3.5	5.3	
9740008-9740007	477	15	PVC	1988	I&I Clinton-Park-O	1900	1	1.1	2.9	3.2	
9740009-9740001	244	18	RCP	1988	I&I Clinton-Park-O	1900	1	1.5	3.2	4.8	
9740010-9740009	553	12	VCP			1900	10	7.6	2.9	22.0	1
9740011-1210508	358	6	VCP			1900	1	1.5	1.5	2.3	17
9740011-9740010	562	12	VCP			1900	10	8.1	2.9	23.5	1
9740012-1210406	108	8	PVC	1988	I&I Phase 1	1900	1	1.5	2.2	3.3	
9740012-9740011	559	10	VCP			1900	1	1.8	0.9	1.6	1
9740013-9740012	390	10	VCP			1900	1	1.8	0.9	1.6	20
9740014-1210701	351	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	0.6	0.9	
9740014-9740013	220	10	VCP			1900	1	1.1	0.9	1.0	20
9740015-9740014	361	10	VCP			1900	5	4.1	1.5	6.1	1
9740016-9740015	42	10				1900	-1	7.8	1.5	11.7	1
9740017-9740016	10	10	CAS			1900	1	1.5	1.5	2.3	
9740018-9740017	54	10	VCP			1900	1	1.5	1.5	2.3	1
9740019-9740018	11	10	CAS			1900	1	1.5	1.5	2.3	
9740020-1210202	265	8	PVC	2014	Cyclic Phase 11	1900	-1	1.5	0.6	0.9	
9740020-9740019	249	10				1900	-1	7.8	1.5	11.7	1
9740021-9740020	311	8	VCP			1900	1	1.5	1.2	1.8	1
9740022-9740020	330	8	PVC	2014	Cyclic Phase 11	1900	-1	1.5	0.6	0.9	
9740025-9740011	12	12	PVC		Grand St. PS	2008	-1	1.5	1.8	2.7	
9741000-9741002	11	21	RCP	1988	I&I Clinton-Park-O	1900	1	1.5	3.7	5.6	
9741001-9741000	365	10	VCP			1900	10	7.8	3.4	26.5	5

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9741002-9725211	368	21	RCP	1988	I&I Clinton-Park-O	1900	1	1.1	3.7	4.1	
9741003-9741001	361	12	VCP			1900	10	8.1	1.8	14.6	5
9741005-9741003	342	10	VCP			1900	10	7.6	2.1	16.0	5
9741006-9741005	379	8	VCP			1900	3	2.5	1.8	4.5	9
9741007-9741006	279	6				1900	-1	7.8	1.2	9.4	8
9741008-9420830	224	10	VCP			1900	1	1.5	1.8	2.7	9
9741008-9741006	363	10	VCP			1900	1	1.5	1.8	2.7	9
9741009-9741008	252	8	PVC	2013	Cyclic Phase 9	1900	1	1.5	1.5	2.3	
9741010-9741008	162	8	PVC	2013	Cyclic Phase 9	1900	-1	1.5	1.5	2.3	
9742001-9725207	360	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	3.2	4.8	
9742001-9741001	310	6	VCP			1900	10	7.4	1.2	8.9	16
9742002-9742001	412	6	VCP			1900	8	6.4	0.6	3.8	16
9742003-9741003	338	6	VCP			1900	10	7.6	1.2	9.1	14
9742003-9742001	360	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	0.6	0.9	
9742004-9742003	271	8	PVC			1900	1	1.5	0.6	0.9	
9742005-9742004	386	8	PVC			1900	1	1.5	0.6	0.9	
9742006-9742002	305	6	VCP			1900	10	7.4	0.6	4.4	16
9742007-9742003	341	8	HDPE	2009	Cyclic Phase 5	1900	1	1.5	1.2	1.8	
9742008-9742009	249	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9742008-9743008	215	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9742009-9742007	249	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9742010-9420338	122	6	DI			1900	10	7.8	1.2	9.4	8
9742010-9420622	358	6	VCP			1900	10	7.8	1.2	9.4	9
9742010-9742007	379	8	HDPE	2009	Cyclic Phase 5	1900	-1	1.5	1.2	1.8	
9742011-9742007	349	8	HDPE	2014	Cyclic Phase 10	1900	-1	1.5	1.8	2.7	
9742101-9740002	345	8	HDPE	2007	Cyclic Phase 4	1900	3	2.9	0.6	1.7	
9742102-9725209	121	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	0.6	0.9	
9742102-9742101	341	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	0.6	0.9	
9742201-9740003	239	6	VCP			1900	10	7.4	0.6	4.4	11
9742202-9742201	243	6	VCP			1900	10	7.8	0.6	4.7	11
9742203-9742202	78	6	VCP			1900	3	2.9	0.6	1.7	11
9742302-9740004	382	6	VCP			1900	5	4.3	0.6	2.6	8
9743002-9742005	286	6	VCP			1900	10	7.4	0.6	4.4	14
9743002-9744002	360	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	0.6	0.9	
9743002-9744005	298	6	VCP			1900	10	7.9	0.6	4.7	14
9743003-9743002	342	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	1.2	1.8	
9743004-9743003	361	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9743004-9744011	281	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9743005-9743003	61	8	PVC	2007	Cyclic Phase 4	1900	-1	1.5	1.2	1.8	
9743006-9743005	310	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	1.2	1.8	
9743006-9743007	31	8	HDPE	2007	Cyclic Phase 4	1900	-1	1.5	1.2	1.8	
9743007-9420329	334	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	1.2	1.8	
9743008-9743003	215	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9744002-9740004	358	8	HDPE	2007	Cyclic Phase 4	1900	5	4.3	0.6	2.6	
9744002-9742006	227	6	VCP			1900	10	7.6	0.6	4.6	16
9744002-9745003	936	6	VCP			1900	1	1.1	0.6	0.7	16
9744003-9745003	361	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	0.6	0.9	
9744003-9745006	480	6	VCP			1900	1	1.5	0.6	0.9	14
9744004-9744003	321	8	VCP			1900	10	7.9	0.6	4.7	14
9744005-9744004	321	6	VCP			1900	5	3.9	0.6	2.3	14
9744006-9744007	217	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.8	2.7	
9744007-9744003	338	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	0.6	0.9	
9744009-9744006	217	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.8	2.7	
9744009-9745008	253	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.8	2.7	
9744010-9420334	372	8	HDPE	2007	Cyclic Phase 4	1900	-1	1.5	0.6	0.9	
9744010-9744007	381	8	HDPE	2007	Cyclic Phase 4	1900	-1	1.5	0.6	0.9	
9744010-9745014	480	6	VCP			1900	5	4.1	0.6	2.5	1
9744011-9744007	281	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9745001-9740008	359	6	PVC	1997	I&I Phase 5	1900	3	2.9	3.5	10.2	

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Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9745002-9745001	317	6	VCP			1900	1	1.5	1.5	2.3	16
9745003-9740006	362	8	HDPE	2007	Cyclic Phase 4	1900	1	1.5	2.6	3.9	
9745003-9745002	636	6	VCP			1900	10	7.8	0.6	4.7	16
9745005-9745001	362	6	PVC	1997	I&I Phase 5	1900	3	2.9	1.5	4.4	
9745006-9745005	472	6				1900	-1	7.8	1.5	11.7	14
9745008-9745009	253	8	PVC	2014	Cyclic Phase 10	1900	-1	1.5	1.8	2.7	
9745009-9745005	338	6	VCP			1900	10	7.8	1.2	9.4	9
9745012-9411225	358	8				1900	-1	7.8	0.6	4.7	10
9745012-9745009	379	6	VCP			1900	8	6.0	1.2	7.2	9
9745013-9745012	175	6	VCP			1900	3	2.9	0.6	1.7	1
9745014-9745013	294	6	VCP			1900	10	7.6	0.6	4.6	1
9745016-9745012	115	6	VCP			1900	1	1.3	0.6	0.8	1
9746000-9740009	359	6	VCP			1900	10	7.6	3.5	26.6	6
9746000-9745001	275	6	VCP			1900	1	1.3	1.5	1.9	16
9746001-9746000	278	6	VCP			1900	1	1.3	1.5	1.9	16
9746003-9745005	278	6	VCP			1900	3	2.9	1.5	4.4	7
9746003-9746000	361	6	VCP			1900	3	2.9	1.5	4.4	6
9746005-9746003	341	6	VCP			1900	1	1.5	1.2	1.8	5
9746006-9746005	204	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9746006-9747003	341	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9746007-9746005	293	6	VCP			1900	10	7.4	1.2	8.9	5
9747002-9746003	550	6	VCP			1900	3	2.9	1.5	4.4	7
9747002-9748003	362	6	VCP			1900	10	7.8	0.6	4.7	4
9747002-9748006	253	6	VCP			1900	10	7.8	0.6	4.7	7
9747003-9747002	341	6	VCP			1900	8	6.4	0.6	3.8	18
9747004-9747003	276	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9747004-9748008	278	8	PVC	2014	Cyclic Phase 10	1900	1	1.5	1.8	2.7	
9747006-9410019	363	8				1900	-1	7.8	0.6	4.7	18
9747006-9747003	376	6	VCP			1900	10	7.6	0.6	4.6	18
9747101-9740010	157	6	VCP			1900	1	1.5	2.6	3.9	4
9748001-9740011	358	8	VCP			1900	1	1.5	1.5	2.3	17
9748002-9748001	298	6	VCP			1900	3	2.7	0.6	1.6	16
9748003-9740010	357	6	VCP			1900	10	7.4	2.6	19.2	4
9748003-9746001	276	6	VCP			1900	8	6.0	0.6	3.6	16
9748003-9748002	265	6	VCP			1900	10	7.8	0.6	4.7	16
9748005-9748001	361	8	VCP			1900	3	2.9	1.5	4.4	20
9748006-9748005	313	6	VCP			1900	5	4.4	0.6	2.6	7
9748007-9748005	528	6	VCP			1900	1	1.8	1.5	2.7	7
9748007-9749004	38	6				1900	-1	7.8	1.5	11.7	7
9748008-9748005	341	8	VCP			1900	5	4.3	1.5	6.5	20
9748010-9748008	296	6	VCP			1900	1	1.1	1.8	2.0	8
9748010-9749007	269	6	VCP			1900	10	8.1	1.8	14.6	8
9749001-9740012	360	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	0.6	0.9	
9749001-9748001	562	6	VCP			1900	10	7.9	0.6	4.7	12
9749002-9749001	405	6	VCP			1900	10	7.9	0.6	4.7	12
9749003-9320409	402	6	VCP			1900	1	1.3	1.2	1.6	15
9749003-9749002	388	6	VCP			1900	1	1.5	0.6	0.9	15
9749003-9749004	577	6	VCP			1900	10	7.6	1.5	11.4	7
9749004-9749001	361	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	1.5	2.3	
9749006-9749003	88	6				1900	-1	7.8	0.6	4.7	7
9749007-9749004	341	8	PVC	2014	Cyclic Phase 11	1900	1	1.8	1.5	2.7	
9749009-9321225	395	6	VCP			1900	10	7.4	0.6	4.4	15
9749009-9410021	567	6	VCP			1900	10	7.8	0.6	4.7	15
9749009-9749007	378	8	PVC	2014	Cyclic Phase 11	1900	1	1.8	1.5	2.7	
9749101-9740014	333	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	0.6	0.9	
9749102-9320318	300	8	PVC	1989	I&I Phase 2	1900	1	1.5	0.6	0.9	
9749102-9749101	322	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	0.6	0.9	
9749201-9740015	313	8	PVC	2014	Cyclic Phase 11	1900	1	1.5	0.6	0.9	
9749301-9310407	85				Cyclic Phase 11	1900	-1	7.8	0.3	2.3	

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Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9749302-9749303	56	4	VCP			1900	-1	7.8	0.6	4.7	18
9749303-9749304	52	4	VCP			1900	-1	7.8	0.6	4.7	18
9749304-9749305	33	4				1900	-1	7.8	0.6	4.7	18
9749306-9749307	153	4	VCP			1900	-1	7.8	0.6	4.7	18
9749307-9749308	32	4	HDPE	2015	Cyclic Phase 11	1900	-1	1.5	0.6	0.9	
9749309-9749102	145	6	PVC			2007	-1	1.5	0.6	0.9	
9810001-9811501	78	18	VCP			1980	10	7.4	4.1	30.3	8
9810002-9810001	76	10	VCP			1980	5	4.1	3.8	15.6	2
9810003-9810002	141	10	VCP			1980	1	1.5	3.8	5.7	2
9810004-9810003	122	8	VCP			1980	1	1.5	2.2	3.3	
9810005-9810004	371	8	VCP			1980	1	1.5	2.6	3.9	
9810006-9810003	68	10	VCP			1980	1	1.5	2.5	3.8	
9810007-9810006	184	8	VCP			1980	3	2.9	2.6	7.5	
9810008-9810007	102	8	VCP			1980	1	1.5	2.2	3.3	
9810009-9810007	210	8	VCP			1980	3	2.9	2.6	7.5	
9810010-9810009	237	8	VCP			1980	1	1.5	2.6	3.9	
9810011-9810010	156	6	VCP			1980	1	1.5	2.6	3.9	
9810012-9810011	103	6	VCP			1980	1	1.5	2.6	3.9	
9810013-9810012	285	6	VCP			1980	1	1.5	2.6	3.9	
9810014-9810013	215	6	VCP			1980	1	1.5	2.6	3.9	
9810015-9810013	207	6	VCP			1980	1	1.5	2.6	3.9	
9810016-9810010	221	8	VCP			1980	1	1.5	2.6	3.9	
9810017-9810016	133	6	VCP			1980	1	1.5	2.6	3.9	
9810018-9810017	162	6	VCP			1980	1	1.5	2.6	3.9	
9810019-9810018	35	6	VCP			1980	1	1.5	2.6	3.9	
9810020-9810016	152	8	VCP			1980	1	1.5	3.2	4.8	17
9810021-9810020	88	8	VCP			1980	1	1.5	3.2	4.8	17
9810022-9810021	193	6	VCP			1980	1	1.5	2.6	3.9	
9810023-9810021	223	8	VCP			1980	1	1.5	2.6	3.9	
9810024-9810023	256	6	VCP			1980	1	1.5	2.6	3.9	
9810025-9810024	104	6	VCP			1980	1	1.5	2.6	3.9	
9810026-9810025	155	6	VCP			1980	1	1.5	2.6	3.9	
9810027-9810023	213	8	VCP			1980	1	1.5	2.6	3.9	
9810028-9810027	200	6	VCP			1980	1	1.5	2.6	3.9	
9810029-9810027	206	8	VCP			1980	1	1.5	2.6	3.9	
9810030-9810029	171	6	VCP			1980	1	1.5	2.2	3.3	
9810031-9810001	83	8	VCP			1980	1	1.5	3.5	5.3	14
9810032-9810031	109	8	VCP			1980	1	1.5	3.5	5.3	14
9810033-9810032	163	8	VCP			1980	1	1.5	3.5	5.3	14
9810105-9810033	140	8	VCP			1980	1	1.5	3.5	5.3	14
9810112-9810105	283	8	VCP			1980	1	1.5	3.5	5.3	14
9810140-9810112	92	8	VCP			1980	1	1.5	2.6	3.9	14
9810141-9810140	230	8	VCP			1980	1	1.5	3.2	4.8	14
9810142-9810141	237	8	VCP			1980	1	1.5	3.2	4.8	14
9810143-9810142	68	8	VCP			1980	1	1.5	3.2	4.8	14
9810201-9811508	96	10	VCP			1980	3	2.7	2.9	7.8	2
9810202-9810201	283	8	TRUSS			1980	1	1.5	2.6	3.9	
9810203-9810202	234	6	TRUSS			1980	1	1.5	3.5	5.3	
9810204-9810203	171	6	TRUSS			1980	1	1.5	2.6	3.9	
9810205-9810204	131	6	TRUSS			1980	1	1.5	2.6	3.9	
9810206-9810203	212	6	TRUSS			1980	1	1.5	3.5	5.3	
9810206-9810208	277	6	TRUSS			1980	1	1.5	2.6	3.9	
9810206-9811131	294	6	PVC			1980	1	1.5	3.1	4.6	
9810207-9810202	245	6	TRUSS			1980	1	1.5	2.6	3.9	
9810208-9810207	241	6	TRUSS			1980	1	1.5	2.2	3.3	
9810209-9810202	253	8	TRUSS			1980	1	1.5	3.5	5.3	
9810210-9810209	271	6	TRUSS			1980	1	1.5	2.6	3.9	
9810211-9810210	143	6	TRUSS			1980	1	1.5	2.6	3.9	
9810212-9810210	73	8	TRUSS			1980	1	1.5	2.6	3.9	

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9810213-9810212	93	8	TRUSS			1980	1	1.5	2.6	3.9	
9810214-9810208	253	6	TRUSS			1980	1	1.5	2.6	3.9	
9810214-9810213	242	6	TRUSS			1980	1	1.5	2.6	3.9	
9810215-9810209	250	6	TRUSS			1980	1	1.5	2.6	3.9	
9810216-9810209	242	8	TRUSS			1980	1	1.5	3.5	5.3	
9810217-9810216	100	6	TRUSS			1980	1	1.5	2.6	3.9	
9810218-9810217	172	6	TRUSS			1980	1	1.5	2.6	3.9	
9810219-9810218	136	6	TRUSS			1980	1	1.5	2.6	3.9	
9810220-9810216	157	8	TRUSS			1980	1	1.5	3.5	5.3	
9810221-9810220	344	6	TRUSS			1980	1	1.5	2.6	3.9	
9810222-9810220	250	8	TRUSS			1980	1	1.5	3.5	5.3	
9810223-9810222	294	6	TRUSS			1980	1	1.5	2.6	3.9	
9810224-9810222	225	8	TRUSS			1980	1	1.5	2.6	3.9	
9810226-9810224	184	8	TRUSS			1980	1	1.5	2.6	3.9	
9810227-9810226	241	8	TRUSS			1980	1	1.1	2.6	2.9	
9810301-9811515	99	8	VCP			1980	1	1.5	2.6	3.9	17
9810302-9810301	288	8	TRUSS			1980	1	1.5	2.6	3.9	
9810303-9810302	105	6	PVC			1980	1	1.5	3.2	4.8	
9810304-9810303	98	6	PVC			1980	1	1.5	2.2	3.3	
9810304-9810314	124	8	PVC			1980	1	1.5	2.2	3.3	
9810305-9810302	180	8	TRUSS			1980	1	1.5	3.5	5.3	
9810306-Sheffield/Cumberland	43	8	TRUSS			1980	1	1.1	2.6	2.9	
9810307-9810306	33	8	TRUSS			1980	1	1.5	2.6	3.9	
9810308-9810307	309	6	TRUSS			1980	1	1.5	2.6	3.9	
9810309-9810306	142	8	TRUSS			1980	1	1.5	2.6	3.9	
9810310-9810309	337	8	TRUSS			1980	1	1.5	2.6	3.9	
9810311-9810310	55	8	PVC			1980	1	1.5	2.6	3.9	
9810312-9810311	216	8	PVC			1980	1	1.5	2.6	3.9	
9810313-9810227	120	8	TRUSS			1980	1	1.5	2.6	3.9	
9810313-9810312	127	6	PVC			1980	1	1.5	2.6	3.9	
9810314-9810312	266	6	PVC			1980	1	1.5	2.6	3.9	
9810317-9810307	254	8	PVC			1980	5	4.6	3.5	16.1	
9810318-9810317	283	8	PVC			1980	1	1.5	2.6	3.9	
9810319-9810317	173	8	PVC			1980	1	1.5	2.6	3.9	
9810320-9810319	122	8	PVC			1980	1	1.5	2.6	3.9	
9810322-9810320	92	8	PVC			1980	1	1.5	2.6	3.9	
9810323-9810322	123	8	PVC			1980	1	1.5	2.6	3.9	
9810324-9810322	80	8	PVC			1980	1	1.5	2.6	3.9	
9810325-9810317	107	8	PVC			1980	1	1.5	3.5	5.3	
9810326-9810325	182	8	PVC			1980	1	1.5	3.5	5.3	
9810327-9810326	283	8	PVC			1980	1	1.5	3.1	4.6	
9810327-9811107	262	8	PVC			1980	1	1.5	3.5	5.3	
9810401-9811515	157	8	VCP			1980	1	1.5	2.6	3.9	10
9810403-Channing	64	8	TRUSS			1980	1	1.1	3.2	3.5	
9810404-9810403	209	8	TRUSS			1980	1	1.5	2.6	3.9	
9810405-9810404	202	8	TRUSS			1980	1	1.5	2.6	3.9	
9810406-9810401	150	8	TRUSS			1980	3	2.9	2.6	7.5	
9810406-9810405	69	8	TRUSS			1980	1	1.5	2.6	3.9	
9810407-9810403	263	8	TRUSS			1980	1	1.5	2.6	3.9	
9810408-9810407	215	8	TRUSS			1980	1	1.5	2.2	3.3	
9810409-9810408	236	8	TRUSS			1980	1	1.5	2.2	3.3	
9810410-9810407	282	8	TRUSS			1980	1	1.5	2.6	3.9	
9810411-9810410	166	8	TRUSS			1980	1	1.5	2.6	3.9	
9810412-9810411	106	8	TRUSS			1980	1	1.5	2.2	3.3	
9810413-9810412	184	8	TRUSS			1980	1	1.5	2.2	3.3	
9810414-9810413	185	8	TRUSS			1980	1	1.5	2.2	3.3	
9810416-9810401	222	8	TRUSS			1980	1	1.5	2.6	3.9	
9810417-9810414	68	8	TRUSS			1980	1	1.5	2.2	3.3	
9810417-9810416	222	8	TRUSS			1980	1	1.5	2.2	3.3	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9810418-9810417	44	8	TRUSS			1980	1	1.5	2.8	4.2	
9810419-9810410	221	8	TRUSS			1980	1	1.5	2.6	3.9	
9810501-9811512	188	10	CAS			1980	5	4.6	2.9	13.3	4
9810502-9810501	210	10	CAS			1980	5	4.3	2.9	12.5	4
9810503-9810502	116	8	RCP			1980	1	1.5	2.6	3.9	4
9810503-9810614	68	8				1980	-1	2.9	2.2	6.4	11
9810504-9810503	229	10	PVC			1980	1	1.5	2.9	4.4	
9810505-9810504	131	8	RCP			1980	1	1.5	2.6	3.9	
9810506-9810505	172	8	VCP			1980	1	1.5	2.2	3.3	
9810507-9810506	284	8	VCP			1980	1	1.1	2.6	2.9	
9810508-9810507	71	8	VCP			1980	1	1.5	2.6	3.9	
9810509-9810508	147	6	RCP			1980	1	1.5	2.6	3.9	
9810510-9810504	209	10	RCP			1980	1	1.5	2.9	4.4	
9810511-9810510	99	6	VCP			1980	1	1.5	2.6	3.9	
9810512-9810511	142	6	VCP			1980	1	1.5	2.2	3.3	
9810513-9810510	203	8	VCP			1980	1	1.5	2.6	3.9	
9810514-9810513	161	8	VCP			1980	1	1.5	2.6	3.9	
9810515-9810514	81	8	VCP			1980	1	1.5	2.2	3.3	
9810516-9810513	187	8	VCP			1980	1	1.5	2.6	3.9	
9810517-9810516	209	8	VCP			1980	1	1.5	2.2	3.3	
9810518-9810517	197	8	VCP			1980	1	1.5	2.2	3.3	
9810519-9810518	189	8	TRUSS			1980	1	1.5	2.6	3.9	
9810520-9810519	125	6	RCP			1980	1	1.5	2.6	3.9	
9810521-9810518	177	6	VCP			1980	1	1.5	2.6	3.9	
9810522-9810516	242	8	VCP			1980	1	1.5	2.6	3.9	
9810523-9810522	123	6	RCP			1980	1	1.5	2.6	3.9	
9810524-9810523	50	6	RCP			1980	1	1.5	2.6	3.9	
9810525-9810524	60	6	PVC			1980	1	1.5	2.6	3.9	
9810526-9810503	151	8	VCP			1980	1	1.1	2.6	2.9	
9810527-9810526	136	6	VCP			1980	1	1.5	2.6	3.9	
9810528-9810526	249	6	VCP			1980	1	1.5	2.6	3.9	
9810529-9810528	186	6	VCP			1980	1	1.5	2.6	3.9	
9810530-9810529	164	6	VCP			1980	1	1.5	2.2	3.3	
9810530-9810544	126	6	VCP			1980	1	1.5	2.6	3.9	
9810531-9810528	212	6	VCP			1980	5	4.1	2.6	10.7	
9810532-9810531	258	6	TRUSS			1980	5	3.9	2.6	10.1	
9810534-9810532	149	6	VCP			1980	1	1.5	2.6	3.9	
9810535-9810534	71	6	TRUSS			1980	1	1.1	2.2	2.4	
9810536-9810535	151	6	TRUSS			1980	1	1.5	2.2	3.3	
9810538-9810534	187	6	TRUSS			1980	1	1.5	3.2	4.8	
9810539-9810538	134	6	TRUSS			1980	1	1.5	2.6	3.9	
9810540-9810401	279	6	TRUSS			1980	1	1.5	2.6	3.9	
9810540-9810539	320	6	TRUSS			1980	1	1.5	2.2	3.3	
9810540-9810543	216	6	TRUSS			1980	1	1.5	2.2	3.3	
9810541-9810526	268	6	VCP			1980	1	1.5	2.6	3.9	
9810542-9810541	204	6	VCP			1980	1	1.5	2.2	3.3	
9810543-9810536	221	6	TRUSS			1980	1	1.5	2.2	3.3	
9810543-9810542	279	6	VCP			1980	1	1.5	2.2	3.3	
9810544-9810532	159	6	VCP			1980	1	1.5	2.2	3.3	
9810601-9811508	108	10	PVC			1980	3	2.9	2.9	8.4	
9810602-9810601	58	8	PVC			1980	1	1.5	2.2	3.3	
9810603-9810602	266	8	PVC			1980	1	1.5	2.2	3.3	
9810604-9810603	229	8	PVC			1980	1	1.5	2.6	3.9	
9810605-9810604	211	8	PVC			1980	1	1.5	2.6	3.9	
9810606-9810604	175	8	PVC			1980	1	1.5	2.6	3.9	
9810607-9810602	273	8	PVC			1980	3	2.7	2.6	7.0	
9810608-9810607	188	8	PVC			1980	1	1.5	2.6	3.9	
9810609-9810607	204	8	PVC			1980	1	1.5	2.6	3.9	
9810610-9810609	169	8	PVC			1980	1	1.5	2.6	3.9	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9810611-9810610	324	8	PVC			1980	1	1.5	3.2	4.8	
9810612-9810611	163	8	PVC			1980	1	1.5	2.6	3.9	
9810613-9810612	304	8	PVC			1980	1	1.5	2.6	3.9	
9810614-9810613	145	8	PVC			1980	1	1.5	2.2	3.3	
9810628-9910627	163	8	PVC			1990	1	1.5	2.6	3.9	
9810629-9810628	26	8	PVC			1990	1	1.5	2.6	3.9	
9810629-9910020	243	8	PVC			1990	1	1.5	2.6	3.9	
9811001-Aughinbaugh	39	10	VCP			1980	1	1.5	3.5	5.3	14
9811002-9811001	225	10	VCP			1980	1	1.5	3.8	5.7	14
9811101-9811002	84	10	PVC			1980	1	1.5	3.8	5.7	
9811102-9811101	254	10	PVC			1980	1	1.5	3.8	5.7	
9811103-9811102	210	10	PVC			1980	1	1.5	3.8	5.7	
9811104-9811103	215	8	PVC			1980	1	1.5	3.5	5.3	
9811105-9811104	247	8	PVC			1980	1	1.5	3.5	5.3	
9811106-9811105	253	8	PVC			1980	1	1.5	2.6	3.9	
9811107-9811106	145	8	PVC			1980	1	1.5	3.5	5.3	
9811108-9811105	291	8	PVC			1980	1	1.5	2.6	3.9	
9811109-9811108	273	8	PVC			1980	1	1.5	2.2	3.3	
9811109-9811111	146	8	PVC			1980	1	1.5	2.2	3.3	
9811110-9811104	248	8	PVC			1980	1	1.5	2.6	3.9	
9811111-9811112	123	8	PVC			1980	1	1.5	2.2	3.3	
9811112-9811113	296	8	PVC			1980	1	1.5	2.6	3.9	
9811113-9811114	223	8	PVC			1980	1	1.5	2.6	3.9	
9811114-9811103	248	10	PVC			1980	1	1.5	3.8	5.7	
9811115-9811114	252	10	PVC			1980	1	1.5	3.8	5.7	
9811115-9811118	109	8	PVC			1980	1	1.5	3.5	5.3	
9811116-9811115	175	8	PVC			1980	1	1.5	2.6	3.9	
9811117-9811116	309	8	PVC			1980	1	1.5	2.2	3.3	
9811118-9811119	133	8	PVC			1980	1	1.5	3.5	5.3	
9811119-Seaview 1	28	8	PVC			1980	1	1.5	2.6	3.9	
9811120-9811119	307	6	PVC			1980	3	2.9	2.6	7.5	
9811121-9811120	247	6	PVC			1980	3	2.9	2.6	7.5	
9811122-9811121	104	6	PVC			1980	3	2.9	2.6	7.5	
9811123-9811119	317	8	PVC			1980	1	1.5	3.5	5.3	
9811124-9811123	280	6	PVC			1980	1	1.5	2.8	4.2	
9811125-9811124	124	6	PVC			1980	10	8.1	2.2	17.8	
9811126-9811123	251	6	PVC			1980	1	1.5	3.5	5.3	
9811127-9811126	286	6	PVC			1980	1	1.5	2.2	3.3	
9811128-9811127	169	6	PVC			1980	1	1.5	2.2	3.3	
9811129-9811128	101	6	PVC			1980	1	1.5	2.6	3.9	
9811130-9811126	248	6	VCP			1980	1	1.5	3.5	5.3	14
9811131-9811130	227	6	PVC			1980	1	1.5	3.5	5.3	
9811401-9811402	252	8	VCP			1980	1	1.5	3.5	5.3	17
9811402-9811516	367	21	VCP			1980	1	1.5	3.2	4.8	17
9811403-9811402	259	18	VCP			1980	1	1.1	4.1	4.5	17
9811404-9811403	147	18	VCP			1980	1	1.1	4.1	4.5	17
9811405-Catalina	51	10	VCP			1980	1	1.5	3.5	5.3	12
9811406-9811405	136	15	VCP			1980	1	1.5	3.8	5.7	12
9811407-9811406	345	15	VCP			1980	1	1.3	4.1	5.3	12
9811501-EBMUDPSM	84	24	VCP			1980	1	1.5	4.1	6.1	8
9811502-9811501	171	21	VCP			1980	1	1.3	3.2	4.2	8
9811503-9811517	65	21	VCP			1980	1	1.1	3.2	3.5	8
9811504-9811503	149	21	VCP			1980	1	1.3	3.2	4.2	8
9811505-9811504	194	21	VCP			1980	1	1.3	3.2	4.2	8
9811506-9811505	150	21	VCP			1980	10	7.8	3.2	25.0	8
9811507-9811506	81	21	VCP			1980	1	1.5	3.2	4.8	8
9811508-9811507	239	21	VCP			1980	3	2.9	3.2	9.3	8
9811509-9811508	199	21	VCP			1980	1	1.5	3.2	4.8	17
9811510-9811509	108	21	VCP			1980	1	1.3	2.8	3.6	17

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9811511-9811510	237	21	VCP			1980	3	2.5	2.8	7.0	17
9811512-9811511	236	21	VCP			1980	1	1.5	3.2	4.8	17
9811513-9811512	216	21	VCP			1980	1	1.5	3.2	4.8	17
9811514-9811513	276	21	VCP			1980	1	1.5	2.8	4.2	17
9811515-9811514	390	21	VCP			1980	1	1.1	3.2	3.5	17
9811516-9811515	267	21	VCP			1980	1	1.5	3.2	4.8	17
9811517-9811502	117	21	VCP			1980	1	1.5	3.2	4.8	8
9811601-9811711	63	15	VCP			1950	1	1.5	3.8	5.7	15
9811602-9811601	210	15	VCP			1950	1	1.1	3.8	4.2	15
9811603-9811602	82	15	VCP			1950	1	1.5	3.5	5.3	15
9811604-9811603	276	15	VCP			1960	1	1.5	3.5	5.3	15
9811605-9811604	243	12	VCP			1960	1	1.5	3.5	5.3	15
9811606-9811605	119	12	PVC			1960	1	1.5	3.8	5.7	
9811607-9811606	235	12	PVC			1960	1	1.5	3.8	5.7	
9811608-9811607	250	12	PVC			1960	1	1.5	3.8	5.7	
9811609-9811608	334	12	PVC			1960	1	1.5	2.9	4.4	
9811610-9811614	50	10	VCP			1960	1	1.5	2.9	4.4	
9811611-9811610	174	10	VCP			1960	1	1.5	2.9	4.4	
9811612-9811611	139	10	VCP			1960	1	1.5	2.5	3.8	
9811613-9811612	130	10	VCP			1960	1	1.5	2.9	4.4	
9811614-9811609		10	PVC			1960	1	1.1	2.9	3.2	
9811701-10013201	85	18	VCP			1950	1	1.5	3.4	5.1	10
9811702-9811701	26	18	VCP			1950	1	1.5	2.8	4.2	10
9811703-9811702	191	18	VCP			1950	1	1.6	3.7	5.9	10
9811704-9811703	115	12	VCP			1990	1	1.5	3.5	5.3	10
9811705-9811704	241	12	VCP			1990	1	1.5	3.8	5.7	10
9811706-9811703	72	18	VCP			1950	1	1.6	3.7	5.9	10
9811707-9811706	370	18	VCP			1950	1	1.6	4.1	6.6	10
9811708-9811707	245	18				1950	1	1.8	4.1	7.4	10
9811709-9811708	247	18	VCP			1950	1	1.8	3.8	6.8	10
9811710-9811709	135	18	VCP			1950	1	1.3	3.8	4.9	15
9811711-9811710	193	15	VCP			1950	1	1.5	3.5	5.3	15
9910001-9811001	160	10	VCP			1980	3	2.7	3.8	10.3	14
9910002-9910001	88	10	PSC			1980	1	1.5	3.8	5.7	14
9910003-9910002	245	10	PSC			1980	1	1.5	3.8	5.7	14
9910004-9910003	182	10	PSC			1980	1	1.5	3.8	5.7	14
9910005-9910004	99	10	PSC			1980	1	1.5	3.8	5.7	14
9910006-9910005	235	8	PVC			1980	1	1.5	3.5	5.3	
9910007-9910006	183	8	PVC			1980	1	1.5	3.5	5.3	
9910008-9910007	213	8	PVC			1980	1	1.1	3.5	3.9	
9910009-9910027	35	8	PVC			1980	1	1.5	2.6	3.9	
9910010-9910009	149	8	PVC			1980	1	1.5	3.5	5.3	
9910011-9910010	197	8	PVC			1980	1	1.5	3.5	5.3	
9910012-9910011	207	8	PVC			1980	1	1.5	3.5	5.3	
9910013-9910012	81	8	PVC			1980	1	1.5	3.5	5.3	
9910014-9910013	118	8	PVC			1990	1	1.5	2.6	3.9	
9910016-9910014	133	8	PVC			1990	1	1.5	2.6	3.9	
9910017-9910016	147	8	PVC			1990	1	1.5	2.6	3.9	
9910018-9910017	146	8	PVC			1990	1	1.5	2.6	3.9	
9910019-9910018	106	8	PVC			1990	1	1.5	2.6	3.9	
9910020-9910019	175	8	PVC			1990	1	1.5	2.6	3.9	
9910021-9910020	179	8	PVC			1990	1	1.5	2.6	3.9	
9910027-Seaview II	35	8	PVC			1980	1	1.5	3.2	4.8	
9910101-Seaview II	91	8	PVC			1980	1	1.5	3.2	4.8	
9910102-9910101	262	8	PVC			1980	1	1.5	2.6	3.9	
9910103-9910102	159	8	PVC			1980	1	1.5	2.6	3.9	
9910104-9910103	198	8	PVC			1980	1	1.5	2.6	3.9	
9910105-9910101	222	8	PVC			1980	1	1.5	2.6	3.9	
9910106-9910105	184	8	PVC			1980	1	1.5	2.6	3.9	

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Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9910201-9910005	183	6	PVC			1980	1	1.5	2.6	3.9	
9910202-9910201	231	8	PVC			1980	1	1.5	2.6	3.9	
9910203-9910202	210	8	PVC			1980	1	1.5	2.6	3.9	
9910204-9910203	154	8	PVC			1980	1	1.5	2.2	3.3	
9910205-9910202	157	8	PVC			1980	1	1.5	2.6	3.9	
9910206-9910205	179	8	PVC			1980	1	1.5	2.2	3.3	
9910206-9910207	242	8	PVC			1980	1	1.5	2.2	3.3	
9910207-9910208	180	8	PVC			1980	1	1.5	2.2	3.3	
9910208-9910201	158	8	PVC			1980	1	1.5	2.6	3.9	
9910301-9910002	145	8	PVC			1980	1	1.5	2.6	3.9	
9910302-9910301	55	8	PVC			1980	1	1.5	2.6	3.9	
9910303-9910302	166	8	PVC			1980	1	1.5	2.6	3.9	
9910304-9910303	220	8	PVC			1980	1	1.5	2.6	3.9	
9910305-9910304	139	8	PVC			1980	1	1.5	2.2	3.3	
9910306-9910305	110	8	PVC			1980	1	1.5	0.6	0.9	
9910306-9910307	116	8	PVC			1980	1	1.5	2.2	3.3	
9910307-9910308	272	8	PVC			1980	1	1.5	2.6	3.9	
9910308-9910309	107	8	PVC			1980	1	1.5	2.6	3.9	
9910309-9910302	142	8	PVC			1980	1	1.5	2.6	3.9	
9910401-9910804	149	8	PVC			1990	1	1.5	3.2	4.8	
9910402-9910401	37	8	PVC			1990	1	1.5	2.6	3.9	
9910403-9910402	201	8	PVC			1990	1	1.5	2.6	3.9	
9910404-9910403	112	8	PVC			1990	1	1.1	2.6	2.9	
9910405-9910404	229	8	PVC			1990	1	1.5	2.2	3.3	
9910406-9910403	263	8	PVC			1990	5	4.3	2.6	11.2	
9910407-9910406	155	8	PVC			1990	1	1.5	2.6	3.9	
9910408-9910406	188	8	PVC			1990	3	2.9	2.6	7.5	
9910409-9910408	154	8	PVC			1990	1	1.5	2.6	3.9	
9910410-9910408	323	8	PVC			1990	1	1.5	2.6	3.9	
9910411-9910410	193	8	PVC			1990	1	1.5	2.6	3.9	
9910412-9910411	195	8	PVC			1990	1	1.5	2.6	3.9	
9910412-9910415	171	8	PVC			1990	1	1.5	2.2	3.3	
9910413-9910412	74	8	PVC			1990	1	1.5	2.2	3.3	
9910414-9910413	218	8	PVC			1990	1	1.5	2.2	3.3	
9910415-9910416	112	8	PVC			1990	1	1.5	2.2	3.3	
9910416-9910417	184	8	PVC			1990	1	1.5	2.6	3.9	
9910417-9910418	85	8	PVC			1990	1	1.5	2.2	3.3	
9910418-9910419	96	8	PVC			1990	1	1.5	2.2	3.3	
9910419-9910421	212	8	PVC			1990	1	1.5	2.6	3.9	
9910420-9910419	176	8	PVC			1990	1	1.5	2.2	3.3	
9910421-9910446	163	8	PVC			1990	1	1.5	2.6	3.9	
9910422-9910421	145	8	PVC			1990	1	1.5	2.6	3.9	
9910423-9910422	341	8	PVC			1990	1	1.5	2.6	3.9	
9910424-9910423	271	8	PVC			1990	1	1.5	2.6	3.9	
9910425-9910424	50	8	PVC			1990	1	1.5	2.2	3.3	
9910425-Adelphian	37	8	PVC			1990	1	1.3	2.2	2.9	
9910426-9910425	116	8	HDPE			1990	3	2.9	2.2	6.4	
9910427-9910426	239	8	PVC			1990	1	1.5	2.2	3.3	
9910428-9910427	125	8	PVC			1990	1	1.5	0.6	0.9	
9910429-9910428	146	8	PVC			1990	1	1.5	0.6	0.9	
9910430-9910428	194	8	PVC			1990	1	1.5	0.6	0.9	
9910431-9910430	207	8	PVC			1990	1	1.5	0.6	0.9	
9910432-9910431	109	8	PVC			1990	1	1.5	1.2	1.8	
9910433-9910432	90	8	PVC			1990	1	1.5	2.8	4.2	
9910434-9910431	131	8	PVC			1990	1	1.6	2.2	3.5	
9910435-9910434	328	8	PVC			1990	3	2.9	2.2	6.4	
9910436-9910435	131	8	PVC			1990	1	1.5	2.2	3.3	
9910437-9910436	111	8	PVC			1990	1	1.5	0.6	0.9	
9910438-9910426	140	8	PVC			1990	1	1.5	2.2	3.3	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9910439-9910438	98	8	PVC			1990	1	1.5	1.8	2.7	
9910440-9910439	194	8	PVC			1990	1	1.5	1.8	2.7	
9910441-9910440	248	8	PVC			1990	1	1.5	1.8	2.7	
9910442-9910441	326	8	PVC			1990	1	1.5	1.8	2.7	
9910443-9910442	153	8	PVC			1990	3	2.9	1.8	5.2	
9910444-9910401	163	8	PVC			1990	1	1.5	2.6	3.9	
9910445-9910444	43	8	PVC			1990	1	1.5	2.6	3.9	
9910446-9910445	177	8	PVC			1990	1	1.5	2.6	3.9	
9910447-9910435	176	8	PVC			1990	1	1.5	2.2	3.3	
9910501-9910802	143	8	PVC			1990	1	1.5	2.6	3.9	
9910502-9910501	177	8	PVC			1990	1	1.5	2.6	3.9	
9910503-9910502	52	8	PVC			1990	1	1.5	2.6	3.9	
9910504-9910503	143	8	PVC			1990	1	1.5	2.6	3.9	
9910505-9910504	259	8	PVC			1990	1	1.5	2.6	3.9	
9910506-9910505	126	8	PVC			1990	1	1.5	2.2	3.3	
9910507-9910504	166	8	PVC			1990	1	1.5	2.6	3.9	
9910508-9910507	169	8	PVC			1990	1	1.5	2.6	3.9	
9910509-9910508	153	8	PVC			1990	1	1.5	2.6	3.9	
9910510-9910508	229	8	PVC			1990	1	1.5	2.6	3.9	
9910511-9910501	341	8	PVC			1990	1	1.5	2.6	3.9	
9910512-9910511	50	8	PVC			1990	1	1.5	2.6	3.9	
9910513-9910512	214	8	PVC			1990	1	1.5	2.6	3.9	
9910514-9910513	292	8	PVC			1990	1	1.5	2.6	3.9	
9910601-9910901	118	8	PVC			1980	1	1.5	2.6	3.9	
9910602-9910601	337	10	PVC			1980	3	2.9	3.8	11.0	
9910603-9910602	144	10	PVC			1980	1	1.5	3.8	5.7	
9910604-9910603	165	8	PVC			1980	1	1.5	2.2	3.3	
9910605-9910604	196	8	PVC			1980	1	1.5	2.6	3.9	
9910606-9910605	147	8	PVC			1980	1	1.5	2.6	3.9	
9910607-9910606	168	8	PVC			1980	1	1.5	2.6	3.9	
9910608-9910605	173	8	PVC			1980	1	1.5	2.6	3.9	
9910609-9910608	166	8	PVC			1980	1	1.5	2.6	3.9	
9910610-9910603	141	10	PVC			1980	1	1.5	3.4	5.1	
9910611-9910610	187	10	PVC			1980	1	1.5	3.8	5.7	
9910612-9910611	176	8	PVC			1980	1	1.5	2.6	3.9	
9910613-9910612	161	8	PVC			1980	1	1.5	2.2	3.3	
9910614-9910613	114	8	PVC			1980	1	1.5	2.2	3.3	
9910615-9910614	156	8	PVC			1980	1	1.5	2.2	3.3	
9910616-9910611	252	10	PVC			1980	5	4.3	3.8	16.3	
9910617-9910616	247	8	PVC			1980	3	2.9	2.6	7.5	
9910618-9910617	71	8	PVC			1980	1	1.5	2.6	3.9	
9910619-9910618	174	8	PVC			1980	1	1.5	2.6	3.9	
9910620-9910619	141	8	PVC			1980	1	1.5	2.6	3.9	
9910621-9910620	192	8	PVC			1980	1	1.5	2.6	3.9	
9910622-9910621	62	8	PVC			1980	1	1.5	2.6	3.9	
9910623-9910622	198	8	PVC			1980	1	1.5	2.6	3.9	
9910623-9910624	230	8	PVC			1980	1	1.5	2.2	3.3	
9910624-9910617	253	8	PVC			1980	1	1.5	2.6	3.9	
9910625-9910616	208	8	PVC			1980	1	1.5	3.5	5.3	
9910626-9910625	106	8	PVC			1980	1	1.5	2.6	3.9	
9910627-9910625	238	8	PVC			1980	1	1.5	3.5	5.3	
9910630-9910013	313	8				1980	-1	2.9	3.5	10.2	7
9910630-9910627	188	8	PVC			1990	1	1.5	3.5	5.3	
9910701-9910601	251	8	PVC			1980	1	1.5	2.6	3.9	
9910702-9910701	342	8	PVC			1980	1	1.5	2.6	3.9	
9910703-9910701	230	8	PVC			1980	1	1.5	2.6	3.9	
9910704-9910703	342	8	PVC			1980	1	1.5	2.6	3.9	
9910705-9910703	233	8	PVC			1980	1	1.5	2.6	3.9	
9910706-9910705	342	8	PVC			1980	1	1.5	2.2	3.3	

Gravity Sewer Inventory and Pipe Rating Model Scores

Sewer ID	Length (ft.)	Dia. (in.)	Material	Rehab. Year	Rehabilitation Project	Orig. Year	Struct. Grade Score (CCTV)	Total LOF Score	Total COF Score	Total Risk Score	Project Year
9910707-9910705	316	8	PVC			1980	1	1.5	2.6	3.9	
9910708-9910707	267	8	PVC			1980	1	1.5	2.6	3.9	
9910709-9910708	138	8	PVC			1980	1	1.5	2.6	3.9	
9910710-9910709	79	8	CAS			1980	1	1.5	2.6	3.9	
9910711-9910630	213	8	PVC			1980	1	1.5	2.6	3.9	
9910711-9910709	195	8	PVC			1980	1	1.5	2.6	3.9	
9910801-9811407	399	15	VCP			1990	1	1.5	4.1	6.1	12
9910802-9910801	203	15	VCP			1990	1	1.5	3.8	5.7	12
9910803-9910802	348	15	VCP			1990	1	1.5	3.8	5.7	12
9910804-9910803	249	15	VCP			1990	1	1.5	3.8	5.7	12
9910805-9910804	277	8	PVC			1990	5	4.1	3.5	14.3	
9910806-9910805	38	0	PVC			1990	1	1.5	2.3	3.4	
9910901-Dublin	36	10	TRUSS			1980	1	1.5	3.5	5.3	
9910902-9910901	128	8	PVC			1980	1	1.5	2.6	3.9	
9910903-9910902	182	8	PVC			1980	1	1.5	2.6	3.9	
9910904-9910903	78	8	PVC			1980	1	1.5	2.6	3.9	
9910905-9910904	196	8	PVC			1980	1	1.5	2.6	3.9	
9910906-9910905	118	8	PVC			1980	1	1.5	2.6	3.9	
9910907-9910906	177	8	PVC			1980	1	1.1	2.2	2.4	
9910907-9910909	214	8	PVC			1980	1	1.5	3.5	5.3	
9910908-9811404	68	10	CAS			1980	1	1.5	3.4	5.1	17
9910909-9910910	192	8	PVC			1980	1	1.5	3.5	5.3	
9910910-9910601	260	8	PVC			1980	1	1.5	3.5	5.3	
9910911-9910910	161	8	PVC			1980	1	1.5	2.6	3.9	
Seaview II-9910008	51	8	CAS			1980	1	1.1	3.2	3.5	
Sheffield/Cumberland d2-9810305	28	8	TRUSS			1980	1	1.5	3.5	5.3	
Sheffield/Cumberland-9810305	43	8				1980	-1	2.9	2.2	6.4	17