



MEMORANDUM

TO: HONORABLE MAYOR & CITY COUNCIL
FROM: G. Harold Duffey
Director, Oakland Public Works
SUBJECT: Status of the City's Wastewater Sewer Program
DATE: August 10, 2022

City Administrator
Approval

Date: Aug 11, 2022

INFORMATION

This Informational Memo provides the Mayor, City Council, and community with an update regarding the status of the City's compliance with the Federal Sewer Consent Decree (CD), National Pollutant Discharge Elimination System Permit (NPDES) issued by the Environmental Protection Agency (EPA), and State Waste Discharge Requirements (WDR) for Sanitary Sewer Systems issued by the State Water Resources Control Board (SWRCB) through the reporting period July 1, 2020 through June 30, 2021.

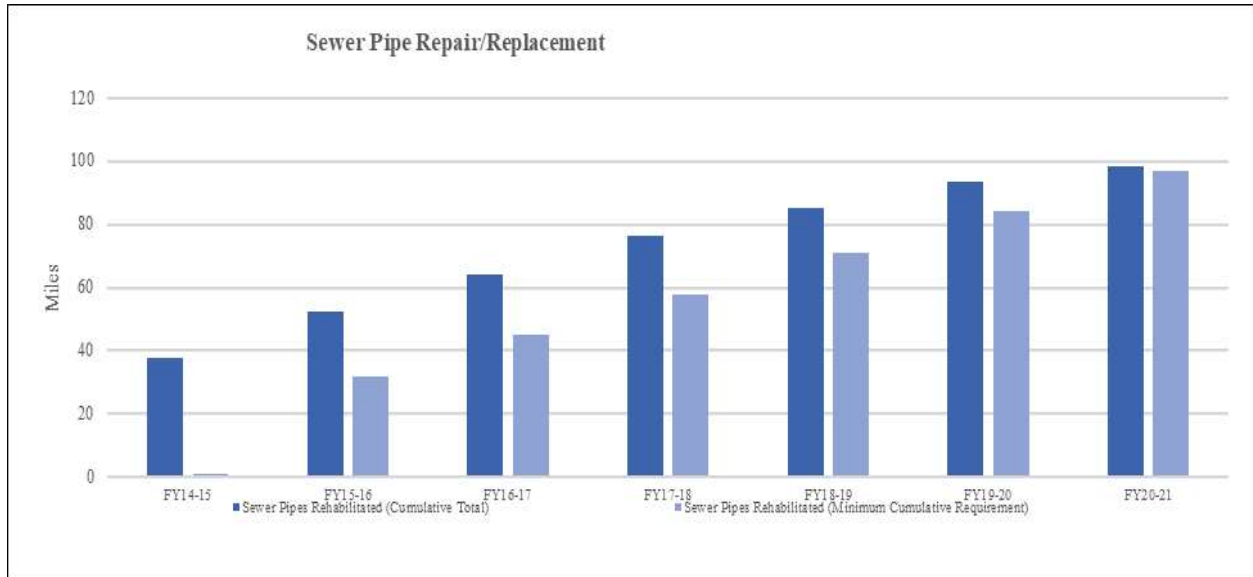
General Overview

The City of Oakland (City) has met the performance mandates and requirements of the CD, as well as both the NPDES and WDR permits, for the reporting period beginning Fiscal Year (FY) 2020-21 (July 1, 2020 and ending June 30, 2021) – this despite continued disruption due to COVID-19 and related sustained materials shortages and supply-chain issues, and abnormal daily water usage patterns.

This report summarizes the accomplishments and compliance efforts related to the administration of the wastewater program as reported in the [Consent Decree Sanitary Sewer Collection System Annual Report, FY 2020-21](#).

The city reported full compliance with the work mandated by the CD to reduce stormwater inflow and infiltration (I&I) into the sanitary sewer system and to prevent sewer system overflows (SSOs). During the reporting period, the City spent approximately fourteen and a quarter million dollars (\$14.25M) on design and construction and rehabilitated approximately five (5) miles of sewer. The cumulative total footage of sewer pipe repaired or replaced met the target minimum amount required by the CD, bringing the total of pipeline that has been renewed and improved since the inception of the CD up to approximately ninety-eight and one-half (98.5) miles – or just over ten percent (10%) of the total sewer system. See **Figure 1, Cumulative Total of Sewer Pipe Rehabilitation**.

Figure 1, Cumulative Total of Sewer Pipe Rehabilitation



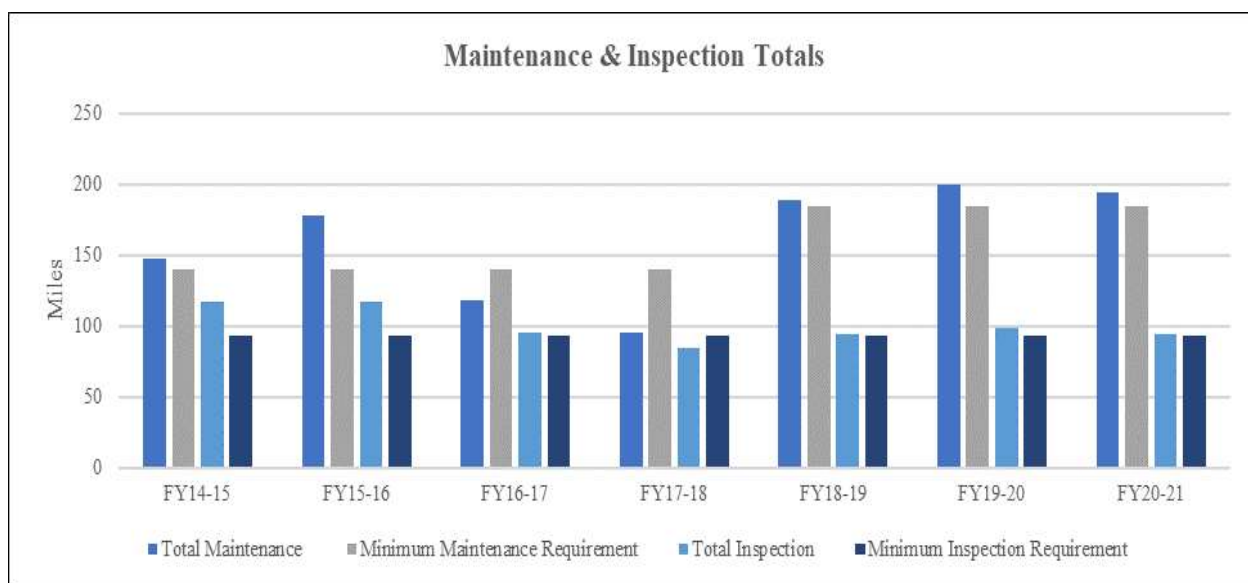
Performance of this work resulted in a combined sixteen percent (16%) reduction of stormwater I&I and effluent flow volumes at the Oak Port and San Antonio Creek wet-weather facilities operated by East Bay Municipal Utility District (EBMUD) that serve a substantial portion of City of Oakland residences and businesses. Reduction of stormwater I&I into the sewer system is critical to the express goal of the CD to eliminate discharges from all three (3) of EBMUD's wet-weather facilities by 2036. See **Figure 2** for the locations of EBMUD's facilities.

Figure 2, EBMUD Wet-Weather Facilities



The City maintained approximately one-hundred ninety-four (194) miles of sewer pipe during the reporting period – which exceeded the minimum annual maintenance requirement by ten (10) miles. In addition, the City maintained over fifty (50) miles of pipeline in designated sub-basins, using chemical root treatment designed to prevent and retard plant root intrusion into the system – primarily in heavily wooded and hard to access easement areas. See **Figure 3, Pipeline Maintenance and Inspection Summary**.

Figure 3, Pipeline Maintenance and Inspection Summary



Per CD mandate, the entire sewer system was maintained over an eight-year (8) period that began prior to inception of the CD and concluded on/about June 30, 2018. The City began a new five-year (5) maintenance cycle on July 1, 2018, and over half of the system – sixty-three percent (63%) – has been maintained over the subsequent three-year (3) period. The maintenance performed included debris and root removal in pipelines using hydraulic, mechanical, and chemical means and methods.

In conjunction with the maintenance activity performed, the City met the minimum annual requirement for inspection work, having inspected ninety-four (94) miles of sewer pipe using closed-circuit tele video during the reporting period, as well – bringing the cumulative total footage for this activity to seven-hundred forty-three (743) miles. The inspection data collected as part of this activity is a critical driver of capital work required by the CD.

Performance of maintenance and inspection work resulted in a slight decrease in the number of SSO events that occurred during the annual reporting period. Of the overflows that did occur, the city successfully mitigated and reduced the impact that they had on the environment and the community. The City realized a twenty-one percent (21%) reduction from the previous reporting period, in overall gallons of wastewater discharged during SSO events. Similarly, the City achieved a twenty-three percent (23%) increase in gallons of wastewater recovered during this reporting period, as well. These outcome changes are largely reflective of faster detection and response time by after-hour staff, and effective emergency response action taken by sewer emergency first-responders, respectively.

The city achieved the following compliance deliverables during the reporting period as set forth in **Table 1, Compliance Deliverables**.

Table 1, Compliance Deliverables

Deliverable	Description of Work	Date of Submittal	EPA/SWRCB Comments
Annual Report FY19/20	Provided a technical report of the status of completion of all mandated I&I reduction and SSO prevention work; analysis of program results; and assessment of the City's compliance with the NPDES/WDR.	9/30/20	None
Response to Regional Technical Support Program Annual Satellite Notification FY19-20	Performed technical evaluation to determine all sources of I&I that the city designated as Linear High Priority, Non-Linear High Priority, or Private High-Priority Source(s).	12/18/20	None
Regional Standards Update	Coordinated with EBMUD and Satellite Agencies to modify and update the regional design standards.	6/30/21	None

The city made the following recommended changes as set forth in **Table 2, Recommended Changes to Work**, focused on the Fats, Oils and Grease (FOG) program.

Table 2, Recommended Changes to Work

Deliverable	Description of Work Performed	Proposed Change
Implementation FOG Control Program	Provide resource(s) and coordination for EBMUD's FOG Program public awareness/outreach campaign.	Oakland to implement a FOG Reduction public awareness/outreach campaign targeted to Food Service Establishments and single/multi-family dwelling units.
Coordinate EBMUD FOG activities in Oakland	Provide FOG-related SSO and/or field observation information to EBMUD for FSE investigation.	Substitute Oakland FOG program for notification to EBMUD.
FOG Investigation(s)	Perform post-SSO inspection to determine if failure was caused by FOG.	No change.
FOG Control Enforcement	Ensure that FSEs implement all necessary FOG abatement measures (e.g., install/maintain Grease Reduction Devices, perform recommended best management practices	No change.

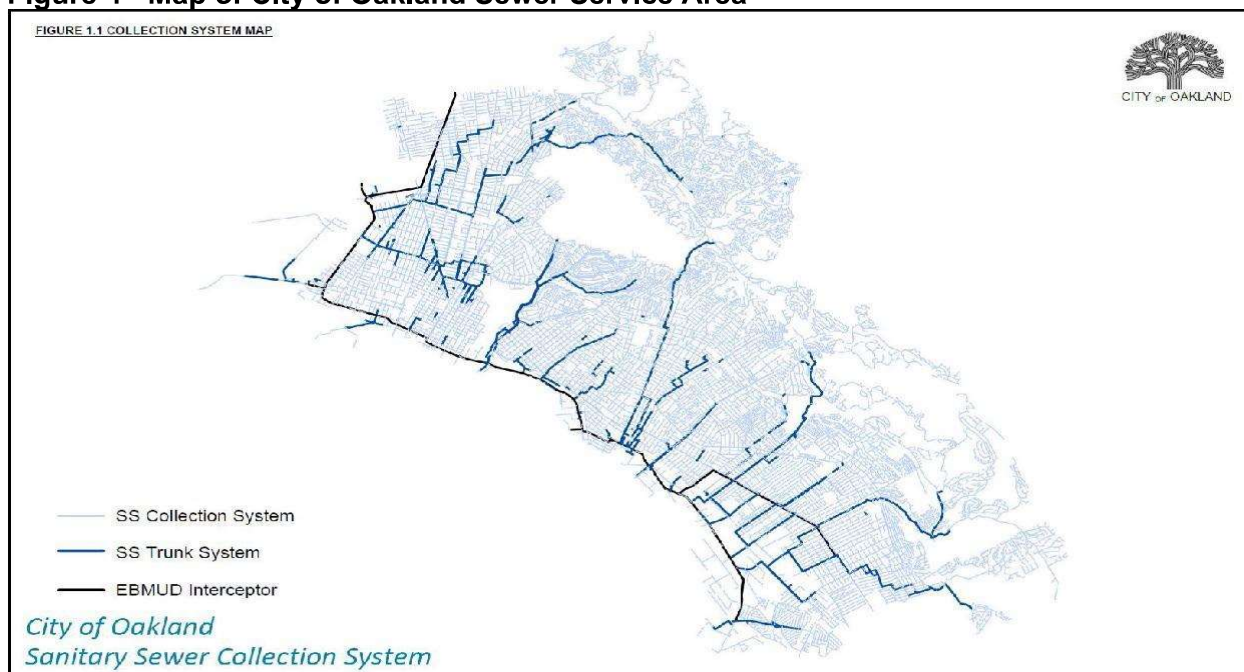
In addition to the work above, the city is working to complete development of a sewer system master plan. The plan will aid in guiding work to reduce the number and magnitude of SSOs, increase the effectiveness of stormwater I&I reduction via capital improvements, and maximize the value on investment associated with achieving regional performance goals mandated through the duration of the CD. The sewer master plan is anticipated for completion and full implementation by January 2023.

Background

City of Oakland Sewer System

The City owns and operates a sanitary sewer collection system that serves approximately four-hundred and thirty thousand (430,000) residents and generates a dry-weather average flow of forty-eight million gallons per day (48 MGD). The sewer system includes approximately nine-hundred and thirty-four (934) miles of gravity pipelines, less than one (1) mile of pressurized sewer pipelines, and eleven (11) pump stations. There are approximately one-hundred and two thousand (102,000) private sewer lateral connections to the sewer system. See **Figure 4**, *Map of City of Oakland Sewer Service Area*.

Figure 4 - Map of City of Oakland Sewer Service Area



Sewer Consent Decree

The CD is the result of several years of negotiations between EBMUD and Satellite Agencies consisting of the city(s) of Alameda, Albany, Berkeley, Emeryville, Oakland, Piedmont; Stege Sanitary District; the EPA and the State/Regional Water Boards; and local environmental non-governmental organizations (NGOs). The CD was finalized on September 22, 2014, and mandates that EBMUD and the seven Satellite Agencies perform appropriate management, operation, and improvements to their respective sewer systems such that the occurrence of SSOs that flow into US Waters (or Waters of the State) are reduced, and discharges of partially treated wastewater into San Francisco Bay from EBMUD's three (3) wet-weather facilities are eliminated by the year 2036. As a condition of compliance, by September 30 of each calendar year, Oakland must submit an annual progress report to the regulatory agencies and the NGOs.

Per the Consent Decree, EBMUD must perform scheduled analyses of the efficacy of its region wide I&I reduction work, coupled with the work prescribed for each of the Satellite Agencies. The flow output ratio test check-ins for each of the three (3) wet-weather facilities are scheduled for 2022 and 2030. They will analyze a three-year average change in flow for each station. If the collective activities of EBMUD and the Satellite Agencies do not achieve mandated flow reduction goals, then a strategic Performance Evaluation Plan (PEP) would need to be developed and

implemented to determine appropriate modifications to the regional inflow/infiltration reduction program. Data collected and analyzed by the PEP would be used to justify the development of a Revised Work Plan to ensure that regional flow reduction goals are met.

The EPA 2014 Consent Decree can be found on the City's website through the following link: [Final Consent Decree \(Consolidated Case Nos. C09-00186-RS and C09-05684-RS\)](#)

Sewer System Management Plan and Asset Management Implementation Plan

Under the WDR, Sanitary sewer collection system entities are required to develop and implement a system-specific Sewer System Management Plan (SSMP). To be effective, SSMPs must include provisions to provide proper and efficient management, operation, and maintenance of sanitary sewer systems, while taking into consideration risk management and cost benefit analysis. Additionally, an SSMP must contain a spill response plan that establishes standard procedures for immediate response to an SSO in a manner designed to minimize water quality impacts and potential nuisance conditions. In addition, the CD requires the city to develop an Asset Management Implementation Plan (AMIP) that is similar to the SSMP.

In response to the above dual requirements, the city revised its SSMP and incorporated to it additional components as required by the CD. The combined document is entitled **The City of Oakland's Asset Management Implementation Plan and Sanitary Sewer Management Plan (AMIP/SSMP)**. The AMIP/SSMP was first developed in 2012 and was revised in October of 2014 after the Sewer Consent Decree's final approval. A subsequent revision was drafted and adopted by Oakland City Council on December 10, 2019. The AMIP/SSMP can be found on the City's website through the following link: [Asset Management Implementation Plan & Sanitary Sewer Management Plan \(2019\)](#)

Analysis

Infiltration and Inflow Reduction

The primary purpose of the CD is to facilitate the City's legal obligation to reduce I&I that contributes to discharges of partially treated wastewater from EBMUD's wet-weather facilities into the San Francisco Bay.

Replacement of sewer pipes and sealing of defective maintenance holes is the primary activity the city has engaged in to reduce I&I. It is estimated that the public-owned portion of the sewer system accounts for thirty-five to forty percent (35-40%) of the source I&I. An additional sixty to sixty-five percent (60-65%) of I&I comes from defective private sewer laterals or roof-leader and sump-pump connections to the sewer system.

Under the Regional Technical Support Program (RTSP) work mandated by the CD, the City completed repairs of one (1) source of non-linear high-priority I&I within twenty-four months (24) of notification by EBMUD. The repair consisted of disconnecting the storm drain inlets to the sewer collection system, eliminating approximately one-million gallons per day (1MGD) of inflow/infiltration contribution.

The CD requires a minimum of two and one-half million dollars (\$2.5M) annual spend for sewer system rehabilitation. The City spent approximately fourteen and one-quarter million dollars (\$14.25M) of an allocated nineteen million six-hundred thousand dollar (\$19,600,000) on sewer rehabilitation and capacity upgrades during the reporting period. Staff anticipates a continued increase in construction costs over the next budget cycle, which will impact the total linear footage of capital work that can be completed per fiscal year. It is unlikely that the city can negotiate a revised work plan that allows for reduced capital repair – thus, additional funding through a rate

increase may be needed by FY2024-25 to maintain compliance with sewer pipeline repair and rehabilitation work mandated by the CD.

The total expenditure for sewer construction work completed during the reporting period was six million, nine-hundred fifty thousand, seven-hundred ninety-three dollars (\$6,950,793). The City budgeted nineteen million, six-hundred forty-seven thousand, six-hundred forty-six (\$19,647,464) dollars for capital improvements projects for FY2020-21 – an increase of three million, one-hundred thirty thousand (\$3.13M) dollars from the previous budget period. However, the impact of COVID-19 on the City’s sanitary sewer rehabilitation design and construction work was significant and resulted in considerable delays and interruptions to multiple phases of project development, contract bid/award, and construction. Consequently, the annual total amount of capital work completed was less than one-third (1/3) of what was planned, and several sewer rehabilitation projects were postponed until FY2021-22. The reduced performance of the capital rehabilitation program did not result in non-compliance with the CD – however, adjustments to the program will be needed to increase capacity and project delivery.

To reduce and/or eliminate the contribution of I&I that is discharged through privately-owned sewer laterals, the City coordinated with EBMUD to finalize three-hundred twenty-seven (327) building permits that met the threshold requiring certification that the private sewer laterals contained no stormwater/urban run-off connections. Of the three-hundred twenty-seven (327) building permits issued, three-hundred twenty-two (322), or ninety-eight and one-half percent (98.5%), received Compliance Certificates issued by EBMUD. The ratio of City-issued permits to EBMUD-issued certificates was well within the twenty-five percent (25%) maximum percent differential for certificated to non-certificated permits issued by the City during the reporting period, as required by the CD.

Completing the sewer system rehabilitation and capital improvement work prescribed to the City and private lateral requirements appears to be effective in moving the City toward meeting the regional flow reduction goals of the decree. The output test used to develop a percent value for the ratio of current flow versus baseline flow for each regional wet-weather facility shows consistent reductions both annually and averaged over a three-year period. The goal is to demonstrate enough regional wet-weather flow reductions by 2022, and again in 2030, to meet the target elimination of wet-weather discharges for select wet-weather facilities in the region. Target reductions for wet-weather facilities specific to Oakland are forty-three percent (43%) for San Antonio Creek and sixty-five percent (65%) for Oakport by September 2022. The current output ratio percentages for San Antonio Creek and Oakport show continued reductions and are anticipated to meet the minimum reduction thresholds required under the CD. See **Table 3, FY 21 Wet Weather Facility Output Ratio and Test Results** and **Table 4, FY 21 Wet Weather Facility Output Ratio Three-Year Average**.

Table 3, FY 21 Wet Weather Facility Output Ratio and Test Results

FY 21 Output Ration and Test Results*					
Facility	FY20 Output Ratio		CD Benchmark		
	<i>Baseline Flow Model Volume (MG)</i>	<i>3-Yr Average Facility Ratio (%)</i>	<i>2022</i>	<i>2030</i>	<i>Final Compliance</i>
San Antonio Creek	13.2	50%	43%	NA**	0% by 2028
Point Ysabel	23.3	63%	53%	18%	0% by 2034
Oakport	53.7	65%	65%	31%	0% by 2036

* Date provided by FY21 Flow Model Calibration Report prepared by EBMUD.
 ** The compliance date for San Antonio Creek preceded 2030.

Table 4, FY 21 Wet Weather Facility Output Ratio Three-Year Average

FY 21 Three-Year-Average			
Facility	Annual Output Ratio		
	FY19	FY20	FY21
San Antonio Creek	74%	39%	35%
Point Ysabel	96%	48%	43%
Oakport	75%	66%	54%

** Data provided by FY21 Flow Model Calibration Report prepared by EBMUD.*

Sewer System Overflows

The secondary objective of the CD is to ensure conformance with the Federal Clean Water Act, and its state equivalent, Porter-Cologne Act, both of which mandate the elimination of SSOs that result in the discharge of untreated wastewater to Waters of the United States and/or Waters of the State of California.

The City’s maintenance and inspection programs are primarily designed to reduce the occurrence of preventable sewer blockages and provide condition assessment of each pipeline in the system. The CD mandates a minimum amount of preventative maintenance and inspection work to be completed annually, to be calculated on a cumulative basis. Maintenance and inspection activity has consistently met the CD cumulative total requirements since its inception.

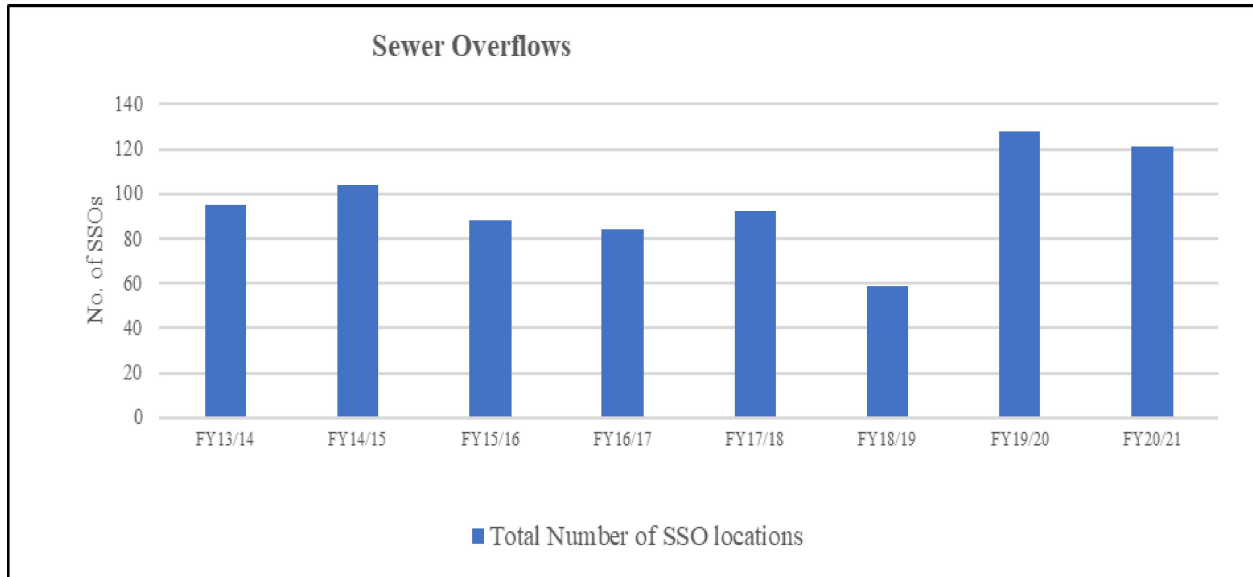
The city utilized an aggressive maintenance strategy in an attempt to reduce the occurrence and frequency of blockages and overflows of the sanitary sewer system. Maintenance was targeted to sewer pipes that had not been cleaned in the previous five fiscal year periods, as well as pipelines with a known history of sewer blockages and overflows.

In addition to consistent performance of maintenance and inspection activity, the city modified its programs to include expansion of its criteria for identifying problem pipelines, and the methodology used for determining the appropriate maintenance and monitoring needed to minimize service interruptions. In specific, pipelines in which operational defects are observed are placed on an accelerated maintenance cycle to prevent blockages and/or other service interruptions until appropriate engineered repairs can be designed and implemented.

Despite a slight increase in targeted pipe cleaning performed during the reporting period, this strategy was less effective than anticipated and did not result in the thirty percent (30%) reduction goal in overflows set prior to the reporting period.

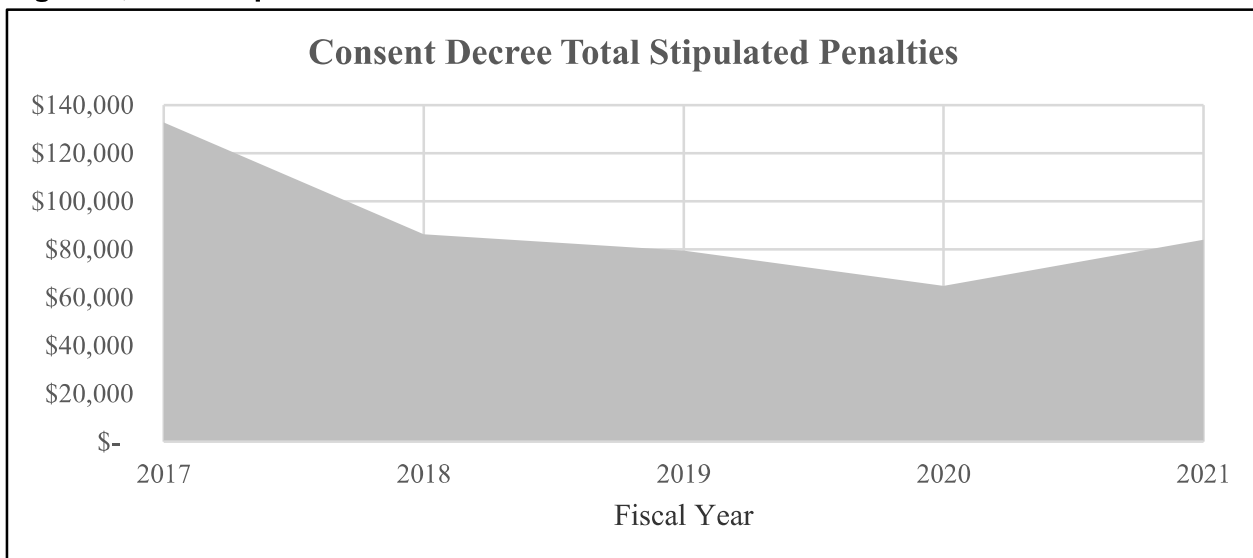
The marginal effectiveness of the maintenance activity performed is believed to have been primarily the result of targeted pipe cleaning to address the increased residential flushing of non-dispersible wipes within the system that has occurred during the extended shelter-in-place order mandated by the state in response to the COVID-19 pandemic. These uncontrollable changes in uses of the system increased the number of sewer overflows that occurred during both wet and dry weather conditions over the past two (2) reporting periods and resulted in damage to one (1) wastewater pump station. Nevertheless, the total number of sewer overflows that occurred was decreased by five and one-half percent (-5.5%) over the reporting period from July 1, 2020, to June 30, 2021. See *Figure 5, Summary of Sewer System Overflows*.

Figure 5, Summary of Sewer System Overflows



The decrease in the number of sewer overflows coincided with a decrease in the total amount of untreated wastewater discharged into regional creeks and waterways. Although discharge reductions were achieved, the City's average number of overflows and volume of discharges per capita, remain well above regional and state averages for comparable sewer systems. Faster notification and response times, and better equipment, allowed staff to mitigate many of these overflows very effectively. Of the total amount spilled during sewer overflows, twenty-one percent (21%) of the untreated wastewater was captured and returned to the system – down from forty-one percent (41%) for the previous reporting period. As a result, the City incurred an additional eighty-four thousand dollars (\$84,000) in monetary penalties imposed by the EPA/Regional Water Board. See **Figure 6, Total Stipulated Penalties** for an account of penalties accrued over time.

Figure 6, Total Stipulated Penalties Accrued from Consent Decree



Funding for Sewer Services

Per the City Charter, the Sewer Service fund (Fund 3100) is used to construct and maintain the City's sanitary sewer infrastructure. This use includes all mandates placed on the city, by the CD to address sewer overflows and to reduce infiltration/inflow of stormwater into the sewer system. The **Table 5** below outlines the FY 2021 Adopted Budget for the appropriation of Fund 3100. It outlines how the Sewer Fund is distributed and for what purpose.

Table 5 – FY21 Adopted Budget for Sewer Service Fund (F3100)

Department	FY21 Adopted Appropriation	Percentage
City Administrator	\$261,783	0.38%
City Attorney	\$886,674	1.29%
Finance Department	\$2,341,433	3.4%
Fire Department	\$442,289	0.64%
Public Works Department	\$32,579,924	47.37%
Department of Transportation	\$1,562,031	2.27%
Information Technology Department	\$231,941	0.34%
Non-Departmental and Port of Oakland	\$10,829,145	15.74%
Capital Improvement Projects	\$19,647,646	28.56%
Total	\$68,782,866	100%

Public Information

Pursuant to Section D.13.XI of the SWRCB Order No. 2006-00003 DWQ, this report will be made available to the public via the City's website. Instructions for submission of comments from the public will be included in the posting of this report and will be logged and made visible for a designated duration and as appropriate.

Respectfully submitted,



G. Harold Duffey
Director, Oakland Public Works

For questions regarding this report, please contact Tyree Jackson, Compliance Officer at (510) 238-3672.

Attachments --None.