Condition Assessment Report
Sanitary Sewer Systems

Prepared for Burbank Sanitary District

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CCTV VIDEO REVIEW AND

MANHOLE CONDITION ASSESSMENT

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BURBANK SANITARY DISTRICT

1.0 EXECUTIVE SUMMARY

1.1 Overview

Mark Thomas and Company, Inc. as the District Manager-Engineer, has completed the Condition Assessment for the Burbank Sanitary District. This report consist a condition assessment of Burbank Sanitary District Sewer System and an implementation schedule based on field observations, data developed and collected from close circuit television (CCTV Contractors) ABLE Underground construction and Presidio System Inc. ABLE Underground Contractor and Presidio System Inc. were retained by Burbank Sanitary District (BSD) to perform a CCTV of approximately twenty nine thousand eight hundred and eighty one (29,881) lineal feet of sanitary sewer mains, thirteen (13) flush inlet and sixty (60) manholes that are part of the trunk sewer which serves the Burbank Sanitary District. ABLE Underground Construction and Presidio System were tasked to review CCTV video tapes of the sanitary sewer mainline at each block of the street. The sanitary sewer mainlines as shown in Figure 1-1.

There were two primary tasks: (1) manhole condition assessment and (2) CCTV to determine pipeline condition. BSD's staffs conducted topside condition assessments of 59 manholes and 8 flush inlets (1 MH and 5 FI were inaccessible). The condition assessments did not involve a confined space entry. Topside assessment of the MH and FI was performed concurrent with the CCTV task. The topside assessments were performed in December 2012 and May 2013.

Burbank Sanitary District (BSD) had conducted condition assessment of assets within its sanitary sewer for the purpose of developing future capital improvement needs and prioritizing the improvements that present a highest "material risk of failure". For the purposes of this document, "failure" means any condition resulting in a sanitary sewer overflow, pipe leakage, or interruption of service to BSD's customers, due to a physical condition defect in the system. The goal of the Condition Assessment Plan is to develop a working plan and schedule for inspecting, assessing, and prioritizing BSD's sanitary sewer system assets, and to develop a recommended Capital Improvement Program (C.I.P) for implementing wastewater collection system projects to meet immediate needs as well as to continue funding the on-going condition assessment and rehabilitation programs. The Condition Assessment Plan will provide standard methods for evaluating the physical condition of BSD's sanitary sewer assets in order to identify assets that present a "material risk of failure".

The condition of the sanitary sewer manholes and sanitary sewer mains was included in the assessment. CCTV results concluded that the sanitary sewer system pipes contained many blockages due to debris, grease, and roots, with several pipe sags, cracks, break and deformation. Much of the sanitary sewer system is composed of vitrified clay pipe, a material

not used in modern sanitary sewer construction. The inspection results are summarized in Table A-1.

Table A-1: Summary of Sanitary Sewer System Condition

Condition	Sanitary Sewer Pipe	Sanitary Sewer Manholes
Excellent	818 feet (2.64%)	(0%)
Good	3742 feet (12.52%)	9 (15.25%)
Fair	12,423 feet (41.57%)	50 (84.75%)
Poor	12,898 feet (43.16%)	(0%)
Total	29,881 feet	59

In summary, manholes are in fair to good conditions. However, over 40% of the sewer mains are in poor condition and will need to be rehabilitated.

The estimated cost for rehabilitation is $2,420,000 which is for pipes in "poor and fair" conditions. Based on above table, the division between poor and fair is about 50-50 split. For implementation, refer to Section 3.9.3.7, "Condition Assessment Results and Recommendation".

2.0 CONDITION ASSESSMENT ACTIVITIES

2.1 Field Investigation Approach

The object of the Condition Assessment Activities is to provide an appropriate level of system information to support sound rehabilitation and or replacement decisions for BDS's sanitary sewer system. The objectives of a standardize field investigation approach is to evaluate sewer assets without expending unnecessary time and resources, and executed investigation and or rehabilitation efforts are utilized where appropriate.

2.2 Procedure for Condition Assessment Activities

The condition of assets in BSD's sanitary sewer system was assessed using data collection methods. Uniform assessment was conducted to aid in the evaluation of data and provided a common basis for assessing rehabilitation needs. Databases system was used by BSD to store and manage asset condition data collected during the assessment activities. Sanitary sewer system was inspected for structural integrity and maintenance issues. These assessment activities included manhole visual inspections, pipeline inspection using close circuit television (CCTV).

3.0 ASSESSMENT STANDARDS FOR GRAVITY SEWER SYSTEM

3.1 Pipeline Assessment and Certification Program (PACP)

The National Association of Sewer Service Companies (NASSCO), along with the assistance of the Water Research Centre (WRC), has developed a national certification program to establish a viable solution to standardize the identification, categorization, evaluation, and prioritization of sanitary sewer or storm sewer infrastructure through CCTV investigations. This standardized certification program was used to ensure consistent record-keeping when compiling CCTV reports into a common database which can then be used for operation and maintenance (O&M) activities as well as pipe rehabilitation and replacement.

NASCCO PACP standards was used to conduct CCTV investigations and document findings. The PACP defect descriptions are organized into the following general categories:

- Structural Defect Coding: This group includes the type of defects where the pipe is considered to be damaged ranging from a minor case defect to a more severe case, depicted as pipe failure. The Structural Defect Coding group includes defects described as: cracks, fractures, broken pipe, holes, deformities, collapsed pipe, joint defects, surface damage defects, weld failures, point repair codes, brickwork defects, and lining failures.

- Operation and Maintenance Coding: This group includes the various codes that involve the spectrum of defects that may impede the operation and maintenance of the sewer piping system. The Operation and Maintenance Coding group includes defects comprised of roots, infiltration, deposits and encrustations, obstacles/obstructions, and vermin.

- Construction Features Coding: This group includes the various codes associated with the typical construction of the sewer piping system. The Construction Features Coding group includes taps, intruding seal material, pipe alignment codes, and access points.

- Miscellaneous Features Coding: This group includes observation codes such as water levels (detection of sags), pipe material changes, and dye testing notes.

PACP Condition Grading System

The tables below describe the grading system for structural and O&M defects, and general guidelines regarding deterioration rates. Each defect can be scored with a grade ranging from 1 to 5, where a grade 5 has the most potential for pipe failure.

Table 3.1 Structural and O&M Defects Grading Table		
Grade	**Grade Description**	**Grade Definition**
5	Immediate Attention	Defects requiring immediate attention
4	Poor	Severe defects that will become Grade 5 defects within the foreseeable future
3	Fair	Moderate defects that will continue to deteriorate
2	Good	Defects that have not begun to deteriorate
1	Excellent	Minor defects

Table 3.2 General Guidelines Regarding Deterioration Rates	
Grade	**Grade Definition**
5	Pipe has failed or will likely fail within the next 5 years
4	Pipe will probably fail in 5 to 10 years
3	Pipe may fail in 10 to 20 years
2	Pipe unlikely to fail for at least 20 years
1	Failure unlikely in the foreseeable future

3.2 Lateral Assessment Certification Program (LACP)

Lateral Assessment was not included in BSD's Condition Assessment Report because majority of the sewer laterals connection from individual customers tying into the BSD gravity sewer main system do not have an access point such as (property line cleanout).

3.3 Manhole Inspections.

Sanitary sewer manhole inspections are an important component of the gravity sewer system assessment due to the susceptibility of manholes to structural defects and/or Inflow/Infiltration which may contribute to SSOs. Manhole inspection not only provides valuable information on the physical condition of the manholes, but also an opportunity to observe pipe diameters, inverts, and surcharging within mainline gravity sewers. Manhole inspection was completed by the certified personnel performing the manhole inspection. Prior to conducting inspections of manhole components, a non-entry (topside) manhole inspection was conducted to determine the overall condition of the manhole as viewed from the ground surface. The surrounding area was observed and noted if manholes or adjacent cleanouts are located in areas that are conducive to flooding or ponding that allows water to enter the sanitary sewer system. The following documentation was collected at each manhole.

- Photographs the above ground location of the manhole
- Photographs the interior of the manhole looking down at the manhole invert and looking into the incoming and outgoing pipelines
- Potential issues

- ❖ Significant defects which are observed during the manhole assessment
- ❖ Photographs will be stored in electronic format.

3.4 CCTV Pipe Inspections

Close Circuit Television (CCTV) video inspection had was performed to assess the condition BSD's sanitary sewer main pipes to confirm the location and magnitude of structural defects, points of inflow and infiltration, lateral locations, undocumented/illegal connections, existing pipe lining, and blockages within the system.

CCTV inspections was conducted in accordance with NASSCO PACP standards. Personnel performing CCTV inspections were PACP-certified and completed all inspections using standard PACP codes for all defects and observations during the inspection. CCTV data will be managed in a PACP-compliant software product. CCTV inspections was recorded in color using a pan-and-tilt, radial-viewing inspection to allow video/image to be sufficiently clear to easily observe sewer line defects and features including the location of service laterals.

Prior to conducting CCTV inspections, the gravity sewer pipes and manholes was cleaned per District's requirement. Cleaning consisted of normal hydraulic jet cleaning to facilitate the internal CCTV inspection. CCTV inspections was not performed in sewer lines with flow depths that do not allow the CCTV equipment to freely pass through the gravity sewer system at the time of inspection.

Gravity main inspections was identified and tracked by recording the upstream and downstream manholes using BSD's manhole identifiers. CCTV inspections was conducted from an upstream manhole to a downstream manhole in the direction of gravity sewer flow to minimize splashing and to allow a smoother pass of the CCTV equipment. The entire length of sewer line undergoing inspection was recorded in this direction unless site conditions make it necessary to stop the CCTV inspection, in which case a reverse-flow set-up was attempted. During the CCTV inspection, the CCTV camera was temporarily stopped at each observed defect or service lateral in order to obtain a clear still picture and video image, as well as a verbal description of the observation.

The camera inspections of pipes commenced on December 10, 2012 and were completed on May 30, 2013 by Presidio System, Inc. Livermore, California and ABLE Underground Construction, San Jose, California. Also on March 19, 2014 Pacific Underground Construction conducted a CCTV for additional three segments of pipe constructed more recently with modern PVC sewer pipes on Olive Street which run between Cleveland Avenue and Wabash Avenue. CCTV data was collected both by District staffs and with CCTV Contractors. CCTV data was collected with fully equipped CCTV vehicles. The CCTV operators coded defects either by structural or maintenance defects. Each defect code was assigned a grade of 1 to 5, with 1 being the least severe and 5 being the most severe defect. These grades only consider the

internal pipe conditions obtained from the televised inspection. District staffs reviewed CCTV videos tape of the sewer main at each block of the street, including the sewer main located in the easement areas. District staffs assessed the condition of the pipeline using the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) to provide standardization and consistency in the evaluation of sewer pipe condition. BSD's staffs conducted condition assessments of assets within its sanitary sewer system for the purpose of locating conditions that present a material risk of failure. "Failures" means any condition resulting in a sanitary sewer overflow, pipe leakage, or interruption of service to BSD's customer, due to physical condition defect in the system.

A pan-and-tilt color camera was used to conduct the camera inspections, allowing the operator to rotate, raise and lower the camera head to provide the optimum view of the interior of the pipes. The camera was stopped at each service connection and lateral, and rotated to allow the inspection of the interior of each connection. All video was recorded in MPEG-1 format and stored directly on labeled DVDs/District hard-drives. The log information for each pipe segment included street location, manhole numbers, pipe size, pipe material, line items for each comment and defect, and a schematic diagram of the manhole-to-manhole observations. The defects that were noted included broken pipe, cracks, offset joints, root intrusions, grease accumulation, infiltration, and pipe obstructions. The goal of the Condition Assessment is two-fold (1) to develop future capital improvement programs and (2) to develop a working plan and schedule for inspecting, assessing, prioritizing BSD's sanitary sewer system assets and prompt repair.

3.5 Prompt Repairs

The Prompt Repairs concept provides a process by which critical system repairs can be made in a more timely and cost effective fashion. Prompt repair methodology employs the concept that when critical failures or deficiencies warranting prompt repair are found during condition assessment activities, actions will be taken to correct the problems by on-call Contractors. Prompt repairs of sanitary sewer infrastructure assets are warranted when critical defects are found that meet these following criteria.

a. Pose an immediate threat to the environment.
b. Pose an imminent threat to the public health and safety
c. Create operational problems that may result in SSOs
d. Contribute substantial inflow to the system.

For BSD, this approach was not implemented, unless District staff determined that the defects to be urgent and critical "in needs of rehabilitation". Rather, the approach of developing a long term capital improvement program was the preferred approach.

3.6 Pipe Inspections

The following streets of the sanitary sewer pipe system were inspected: Pipe run along west east direction from Revey Avenue continues east to Bascom Avenue, pipe run along north south direction between W. San Carlos Avenue and Forest Avenue, and pipe run along north south direction between Scott Avenue and W. San Carlos Avenue, also pipe run along north south direction in an easement areas between Parkmoor Avenue and Scott Avenue.

Segment of pipes between Revey Avenue and Bascom Avenue

1. Bailey Avenue
2. Cecil Street

Segment of pipes between W. San Carlos and Forest Avenue

3. Forest Avenue
4. Olive Avenue
5. Scott Avenue
6. Topeka Avenue
7. Cleveland Avenue
8. Brooklyn Avenue
9. Wabash Avenue

Segment of pipes between Scott Avenue and W. San Carlos Avenue

10. Bascom Avenue
11. Laswell Avenue
12. Vaughn Avenue
13. Arleta Avenue
14. Raymond Avenue
15. Irving Avenue
16. Leland Avenue
17. Ruthland Avenue
18. Cliffton Avenue
19. Leigh Avenue
20. Richmond Avenue

Sanitary sewer main pipes in an easement areas run north south between Parkmoor Avenue and Scott Avenue.

a. Between Bascom Avenue and Laswell Avenue
b. Between Laswell Avenue and Arleta Avenue
c. Between Arleta Avenue and Raymond Avenue
d. Between Raymond Avenue and Irving Avenue
e. Between Irving Avenue and Leland Avenue

The following report is an analysis of the results of the sanitary sewer pipe inspections.

Each segment of the pipe was assigned a condition by Presidio Systems, Inc. and ABLE underground construction using the categories of “excellent,” “good,” “fair,” and “poor.” These

conditions were assigned based on the presence of cracks/breaks, pipe blockages, grease, sags or fine roots. Table 1-1 summarizes how the criteria were applied to the determination of pipe conditions based on the camera inspection data.

Table 1-1: Pipe Condition Determination Criteria

Condition Evaluation	Determination Criteria
Excellent	No cracks or breaks No pipe blockages No grease No Pipe Sags No fine roots
Good	No cracks or breaks May contain pipe blockages up to 5% No grease May contain pipe sags up to 5% May contain fine roots
Fair	No cracks or breaks May contain pipe blockages up to 30% May contain grease up to 10% May contain pipe sags up to 25% May contain fine roots
Poor	May contain cracks or breaks May contain pipe blockages greater than 30% May contain grease greater than 10% May contain pipe sags greater than 25% May contain fine roots

This report represents items developed based on our observations as part of this condition assessment process.

3.7 Visual Inspections

The visual inspections of the manholes were conducted during the CCTV operation by the CCTV Contractors and District's Inspector. The structural condition, amount of sediment, flow volume, flow contents, debris and odor were observed and noted for each manhole. Each manhole was then assigned an overall condition of "excellent," "good," "fair," or "poor" during the visual inspection.

3.8 INSPECTION RESULTS

3.8.1 Pipe Condition

During the inspections, twenty nine thousand eight hundred and eighty one (29,881) lineal feet of sanitary sewer main pipe were inspected. During the inspections, approximately 530 feet of

pipe could not be inspected due to site conditions such as inaccessible or pipe blockages. Approximately one thousand four hundred and fifty (1450) lineal feet of the inspected pipes were 10 inches, two thousand three hundred and fifty four (2,354) lineal feet of the inspected pipes were 8 inches, and the remainder of twenty six thousand seventy seven (26,077) lineal feet of the inspected pipes were 6 inches in diameter. Of the inspected pipes, approximately 95.61% (28,568 feet) were vitrified clay pipe. The remaining approximately 1,313 feet of pipe consisted of PVC and asbestos cement pipe.

Approximately 818 feet of pipe (2.64%) was determined to be in excellent condition, approximately 3,896 feet (12.58%) was determined to be in good condition, approximately 13,538 feet (43.71%) was determined to be in fair condition, and approximately 12,720 feet (41.07%) was determined to be in poor condition. The diameter of the pipes did not correlate closely with the condition of the pipes.

The inspected portion of the sanitary sewer systems, which were rated "poor condition", contained multiple breaks, multiple cracks, holes soil visible and multiple fractures. There were multiple pipe blockages including intruding roots, a pipe misalignment, pipe broken, and an intruding tap. Pipe blockages ranged from 10%-95%. There were also several instances of fine and medium roots. While fine roots do not require immediate attention, those sections of mains will need to inspected and maintained on a regular basis. There were 37 instances of grease ranging from 5%-10%. There were also 97 pipe segments with sagging ranging from 5%-50%. There were also 5 pipe segments that contained issues causing the abandonment of the inspection of the pipe, including water and a siphon. See Appendix A for a summary of pipe issues and Appendix B for a table of all pipe conditions.

3.8.2 Manhole Condition

Fifty nine (59) existing manholes throughout the Burbank Sanitary District were inspected. These manholes were determined to be in good and fair condition. Table 1-2, below contains a summary of how many of the inspected structures were rated in the individual categories, as well as overall condition.

Table 1-2: Condition of Manholes

Structural Condition		Sediment		Hydraulic Condition		Overall Condition	
Good	59	None	10	Good	59	Excellent	0
Damaged Functional		Partial	14	Damaged Functional	0	Good	9
Damaged Non-Functional		Substantial	0	Damaged Non-Functional	0	Fair	50
		Full	0	Blocked	0	Poor	

The individual inspection results for each manhole can be found in the Sanitary Sewer Manholes Table in Appendix B.

3.9 DISCUSSION OF RESULTS

3.9.1 Pipe Conditions Group into Each Street Block Areas

Pipes were grouped into each street block areas, as shown in Figure 1-1. Below are summaries of the pipe conditions in each street block areas. See Appendix C for pipe inspection logs.

3.9.1.1 Bailey Avenue

Two sanitary sewer pipe segments were inspected at Bailey Avenue. They ranged in condition from poor to fair. The segment of pipe between MH201 and MH202, and between MH202 and MH2 consisted several locations of pipe in poor condition which included broken, crack and fracture circumferential, crack and fracture longitudinal, crack and fracture multiple and joint offset with a defect ranging from 2 to 5. The pipe in fair condition at the present time was, in our opinion, approaching in near future (within 3 to 5 years) to be "in poor condition" because of it contained cracks and fracture circumferential at multiple locations throughout the pipe. Also several areas of these pipe segments contained 5% grease, 5% of sags and fine roots. In summary, the average condition of the pipes in this area was fair.

Table 1-3: Bailey Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH201	MH202	LU-101	Circumferential Crack – 171.7 Longitudinal Crack- 227.6, 355.6 Multiple Crack- 215.7, 312.8 Circumferential Fracture– 11.8		5	5		Fair
MH202	MH2	LU-102	Broken– 9.0 Circumferential Crack- 3.1, 77.9, 90.2, 108.5, 111.8, 26.6, 138.9, 168.9, 14.6, 257.3, 266.4, 78.8, 287.8, 363.8 Longitudinal Crack- 153.8, 229.7		5	5	Y	Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Multiple Crack- 21.3, 33.6, 39.5, 84.2,132.6, 166.1, 263.4 Circumferential Fracture- 241.9 Longitudinal Fracture- 80.5 Multiple Fracture- 81.0, 272.5 Joint Offset- 391.3					

3.9.1.2 Cecil Street

Three sanitary sewer pipe segments were inspected at Cecil Street. They ranged in condition from poor to fair. The segment of pipe between MH203 and MH 204, MH204 and MH204A and MH 204A and MH3 consisted several locations of pipe in poor condition which contained broken, crack and fracture circumferential , crack and fracture longitudinal, crack and fracture multiple, joint offset and tap break in and tap factory defective with a defect ranging from 3 to 4. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5% grease and 5% sags. In summary, the average condition of the pipes in this area was fair.

Table 1-4: Cecil Street Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	**End Location**	**Pipe Segment Reference**	**Broken, Cracks, Fracture, and Joint offset (Distance from Start)**	**Blockage (%)**	**Grease (%)**	**Sags (%)**	**Fine Roots**	**Condition**
MH203	MH204	LU-103	Circumferential Crack – 2.0, 9.9, 94.0, 166.3, 320.1, 338.1 Longitudinal Crack-		5	5		Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			19.1, 33.7, 63.8, 75.8, 172.3, 181.3, 229.6, 232.8, 256.9, 322.8 Multiple Crack- 36.8, 60.9, 66.9, 100.2, 106.2, 277.9, 298.9, 346.9, 356.1 Circumferential Fracture– 57.9 Joint Offset- 129.9, 133.2 Tap Break in- 322.2, 366.5 Tap Factory- 52.7					
MH204	MH204A	LU-104	Broken – 51.6, 72.6 Circumferential Crack- 57.6, 183.7, 229.1, 261.9, 295.0 Longitudinal Crack- 48.6, 105.8 Multiple Crack- 3.5, 9.3, 27.4, 45.5, 129.6, 153.8, 156.7, 159.7, 174.7, 256.2, 271.0 280.0 Circumferential Fracture- 192.9 Joint Offset- 241.0 Tap Break in- 223.7 Tap Factory- 142.4, 230.0			5		Fair
MH204A	MH3	LU-104A	Circumferential Crack- 28.8, 37.6, 58.8, 67.8 Longitudinal Crack- 7.9, 25.7, 49.8		5	5		Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Multiple Crack- 4.9, 13.8, 19.7 Longitudinal Fracture- 89.1 Multiple Fracture- 89.4 Joint Offset- 85.7 Tap Factory- 5.7					

3.9.1.3 Topeka Avenue

Two sanitary sewer pipe segments were inspected at Topeka Avenue. They ranged in condition from fair to good. The segment of pipe between MH220 and MH 219, and between MH219 and MH212 consisted of several locations of pipe in fair condition which contained lining failure undercut and overcut, and lining failure defective with a defect ranging from 1 to 2. Also several areas of these pipe segments contained 5% sags. In summary, the average condition of the pipes in this area was good.

Table 1-5: Topeka Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH220	MH219	LU-105	Lining Failure Undercut- 104.6, 140.3, 298.0, 346.6, 383.0, 404.0, 464.1, 479.1, 488.1, 491.1 Lining Failure Overcut- 337.4, 392.0 Lining Failure Defective End –543.0			5		Good
MH219	MH212	LU-106	Lining Failure Undercut-			5		Good

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			66.4, 365.0, 400.8					

3.9.1.4 Cleveland Avenue

Two sanitary sewer pipe segments were inspected at Cleveland Avenue. They ranged in condition from poor to fair. The segment of pipe between MH222 and MH221, and between MH221 and MH213 consisted of several locations of pipe in poor condition which contained broken, crack circumferential , crack longitudinal, crack and fracture multiple, joint offset and tap factory defective with a defect ranging from 1 to 5. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 10% grease, 10% sags and fine roots. In summary, the average condition of the pipes in this area was poor.

Table 1-6: Cleveland Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH222	MH221	LU-107A	Broken- 30.3 Circumferential Crack – 3.0, 78.6, 127.7, 130.5, 161.0, 167.0, 203.6, 238.9, 248.0, 263.3, 275.6, 335.5, 344.7 Longitudinal Crack- 14.6, 36.0, 75.7, 100.2, 109.2, 158.1, 226.6 Multiple Crack- 118.3 Multiple Fracture- 33.1 Joint Offset-					Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			18.1, 21.1, 134.0, 203.6, 351.0 Tap Factory- 160.1					
MH221	MH213	LU-107	Broken- 9.2, 308.6 Circumferential Crack- 208.4, 220.7, 214.9, 226.5, 248.0, 299.7, 351.4, 402.1, 417.4, 420.4, 426.5, 432.5, 438.6, 441.7, 469.2, 475.3, 496.4, 508.7, 537.0 Longitudinal Crack- 189.9, 557.7 Multiple Crack- 174.8, 196.2, 551.8, 554.4, 566.7 Circumferential Fracture- 51.4, 305.9, 314.8, 360.6, 371.8, 374.6, 377.6, 380.9, 393.1, 405.2, 408.2 Multiple Fracture- 1.5, 112.0, 183.7, 186.9, 223.5, 232.6, 366.7, 369.7, 396.0, 399.0, 505.5 Joint Offset- 182.0, 254.1, 383.8, 513.7 Tap Factory- 25.0		10	10	Y	Poor

3.9.1.5 Brooklyn Avenue

Two sanitary sewer pipe segments were inspected at Brooklyn Avenue. They ranged in condition from poor to fair. The segment of pipe between MH224 and MH 223, and between MH223 and MH214 consisted several locations of pipe in poor condition which contained broken soil visible, crack and fracture circumferential , crack longitudinal, crack and fracture multiple, joint offset and tap factory defective with a defect ranging from 3 to 5. The pipe in fair

condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5% grease, 5% sags and fine roots. In summary, the average condition of the pipes in this area was poor.

Table 1-7: Brooklyn Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH224	MH223	LU-108A	Broken Soil Visible- 235 Longitudinal Crack- 21.6, 101.3, 519.9 Multiple Crack- 49.3, 283.5, 319.7, 432.1 Circumferential Fracture- 1.7, 43.1, 98.1,152.8, 155.8, 201.4, 204.3, 292.5 Joint Offset- 16.0, 58.6, 478.0, 523.5 Tap Factory- 512.0		5	5		Poor
MH223	MH214	LU-108	Broken- 383.0 Broken Soil Visible- 239.5, 425.6, 568.8 Circumferential Crack- 197.3, 224.4, 309.9, 28.1, 370.8, 401.3, 419.5, 34.9, 541.6, 563.0 Longitudinal Crack- 14.9 Multiple Crack- 102.5, 190.9, 343.1, 483.4 Circumferential Fracture- 33.7,194.1, 285.4, 303.7, 459.1,502.0 Multiple Fracture- 3.0, 135.5, 236.7, 377.0 Joint Offset-		5	5	Y	Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			126.0 Tap Factory- 216.3, 377.8					

3.9.1.6 Boston Avenue

Two sanitary sewer pipe segments were inspected at Boston Avenue. They ranged in condition from poor to fair. The segment of pipe between MH226 and MH225, and between MH225 and MH215 consisted several locations of pipe in poor condition which contained broken, crack and fracture circumferential, crack and fracture longitudinal, crack and fracture multiple, tap break in and tap factory defective with a defect ranging from 3 to 5. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5% grease and fine roots. In summary, the average condition of the pipes in this area was poor.

Table 1-8: Boston Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH226	MH225	LU-109A	Broken- 26.6 Circumferential Crack – 45.2, 64.7, 91.9, 107.4, 111.5, 152.5, 162.2, 202.1, 205, 216.9, 314.3, 342.0, 369.2, 372.3, 381.2, 412.0, 454.1, 487.9 Longitudinal Crack- 222.9, 256.6, 271.7 Multiple Crack- 67.2, 98.1, 158.6, 168.2,		5		Y	Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			183.5, 232.1, 393.5, 421.1, 445.2 Circumferential Fracture-293.1, 448.3 Multiple Fracture-190.1, 192.9, 442.2 Tap Break in-112.3					
MH225	MH215	LU-109	Broken-171.5 Circumferential Crack-72.6, 84.7, 106.0 Longitudinal Crack-38.8, 228.0 Multiple Crack-164.0, 167.2, 185.6, 394.8, 416.3, 461.7, 474.1, 504.1 Circumferential Fracture-11.3, 81.9, 93.7, 236.9, 328.5 Multiple Fracture-87.8, 91.0 Tap Break in-171.5, 479.3 Tap Factory-91.7, 171.5		5		Y	Poor

3.9.1.7 Wabash Avenue

One sanitary sewer pipe segments were inspected at Wabash Avenue. They ranged in condition from poor to fair. The segment of pipe between MH218 and MH217, consisted several locations of pipe in poor condition which contained broken, crack circumferential , crack and fracture longitudinal, crack and fracture multiple, joint offset and tap break in with a defect ranging from 3 to 4. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5% sags. In summary, the average condition of the pipes in this area was fair.

Table 1-9: Wabash Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH218	MH217	LU-110	Broken- 404.5 Circumferential Crack- 60.7, 94.1, 100.1, 447.0, 538.3t Longitudinal Crack- 81.6, 197.5, 221.9, 285.2, 544.7 Multiple Crack- 228.2, 315.9, 343.5, 450.2, 474.6, 477.3, 531.7 Longitudinal Fracture- 478.0 Multiple Fracture- 361.1 Joint Offset- 97.4, 136.8, 146.0, 282.6, 502.0 Tap Break in- 104.2, 313.8, 452.7			5		Fair

3.9.1.8 Bascom Avenue

Two sanitary sewer pipe segments were inspected at Bascom Avenue. They ranged in condition from poor to fair. The segment of pipe between MH103 and MH102, and between MH102 and MH101 consisted several locations of pipe in poor condition which contained broken soil visible, crack and fracture circumferential, crack longitudinal, with a defect ranging from 1 to 5. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5% sags. In summary, the average condition of the pipes in this area was fair.

Table 1-10: Bascom Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH103	MH102	HU-101	Broken Soil Visible-333.8 Circumferential Crack-2.5, 69.7, 75.5t Longitudinal Crack-26.1, 182.2 Circumferential Fracture-41.5, 134.9, 196.3 Joint Offset-237.3, 273.4, 325.2, 378.2			5		Fair
MH102	MH101	HU-102	Broken-11.6 ft Circumferential Crack-3.5, 58.7,102.6,120.6, 388.3 Longitudinal Crack-154.6 Circumferential Fracture-218.2, 323.5			5		Poor

3.9.1.9 Laswell Avenue

Two sanitary sewer pipe segments were inspected at Laswell Avenue. They ranged in condition from poor to fair. The segment of pipe between MH106 and MH105, and between MH104 and MH01 consisted several locations of pipe in poor condition which contained broken, crack circumferential , crack longitudinal, crack and fracture multiple, hinge and spiral crack, joint offset and tap factory defective with a defect ranging from 1 to 5. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5% grease and 5% sags. In summary, the average condition of the pipes in this area was poor.

Table 1-11: Laswell Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH106	MH105	LU-201	Broken- 203.7 Circumferential Crack - 77.6, 219.4,258.0, 336.7, 348.6, 435.0 Longitudinal Crack- 122.8, 254.3, 281.0 Hinge Crack- 165.6, 254.3 Multiple Crack– 118.5, 148.4, 154.4, 165.6, 187.9, 379.9 Spiral Crack- 271.4 Joint Offset- 118.5, 122.8, 154.4, 156.2, 165.6, 200.6, 219.3, 225.2, 254.3 Tap Factory- 118.1,150.3,155.4, 187.9,199.5, 262.4, 264.6, 281.4, 302.6, 319.4, 349.6, 379.0, 390.0, 400.8, 431.0, 435.4, 437.8					Poor
MH104	MH01	LU-203	Broken– 297.2 Circumferential Crack- 5.8, 383.0 Multiple Fracture- 8.4, 83.4, 159.8, 213.5 Joint Offset- 49.5, 115.1 Tap Factory- 297.8		5	5		Fair

3.9.2.0 Vaughn Avenue

Three sanitary sewer pipe segments were inspected at Vaughn Avenue. They ranged in condition from poor to fair. The segment of pipe between MH109 and MH108, and between MH108 and MH107 and between MH107 and MH3 consisted several locations of pipe in poor condition which contained crack and fracture circumferential, crack longitudinal, crack multiple, joint offset with a defect ranging from 1 to 5. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5% grease and 5% sags. In summary, the average condition of the pipes in this area was fair.

Table 1-12: Vaughn Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH109	MH108	LU-204	Circumferential Crack – 2.0 Longitudinal Crack- 287.2, 350.5 Circumferential Fracture- 63.7, 443.1		5	5		Fair
MH108	MH107	LU-205	Circumferential Crack- 2.0, 9.9, 28.9, 130.6, 140.3, 171.2, 180.3, 213.1, 239.9, 246.2, 255.8, 288.8, 319.8, 328.8, 336.8 Longitudinal Crack- 136.3 Multiple Crack- 360.7 Circumferential Fracture- 4.4, 230.9, 390.7 Joint Offset- 121.4, 282.9, 386.0		5	5		Fair
MH107	MH3	LU-206	Circumferential Crack- 2.8, 36.5, 69.5, 85.3, 122.2, 432.2 Longitudinal Crack- 45.3, 74.2, 82.2, 114.3 Multiple Crack-			5	Y	Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			4.5, 31.4 Circumferential Fracture- 12.5 Longitudinal Fracture- 12.5, 57.4, 383.8 Multiple Fracture- 53.8, 203.4 Joint Offset- 260.5, 432.2					

3.9.2.1 Arleta Avenue

Three sanitary sewer pipe segments were inspected at Arleta Avenue. They ranged in condition from poor to fair. The segment of pipe between MH112 and MH111, and between MH111 and MH110, and between MH110 and MH4 consisted several locations of pipe in poor condition which contained crack and circumferential, crack longitudinal, crack multiple, joint offset and tap break in with a defect ranging from 1 to 5. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5% grease, 5%-10% sags and fine roots. In summary, the average condition of the pipes in this area was fair.

Table 1-13: Arleta Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH112	MH111	LU-207	Circumferential Crack- 2.0, 46.6, 326.7, 337.6, 363.5 Longitudinal Crack- 9.2, 20.4,138.2 Circumferential Fracture- 48.5, 200.5, 286.9, 340.7,			10		Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			392.7 Joint Offset- 14.5, 296.0 Tap Break in- 136.7					
MH111	MH110	LU-208	Circumferential Crack- 67.4, 90.4, 110.4, 212.8, 393.8 Longitudinal Crack-27.2, 293.6 Multiple Crack- 78.6, 168.6, 179.5 Circumferential Fracture- 122.1, 300.0 Joint Offset- 30.0, 54.4		5	5	Y	Good
MH110	MH4	LU-209	Broken- 250.6 Broken Soil Visible-381.9 Circumferential Crack-9.1, 18.1, 26.1, 91.2, 108.2, 151.4, 430.2 Longitudinal Crack- 3.0, 17.6, 57.1, 65.5, 66.2, 71.2, 82.2, 111.2 Circumferential Fracture- 307.6 Longitudinal Fracture- 148.4 Multiple Fracture- 203.5 Joint Offset- 161.3, 406.2 Tap Break in- 110.4		5	5	Y	Fair

3.9.2.2 Raymond Avenue

Three sanitary sewer pipe segments were inspected at Raymond Avenue. They ranged in condition from poor to fair. The segment of pipe between MH115 and MH114, and between MH114 and MH113, and between MH113 and MH05 consisted several locations of pipe in poor condition which contained lining failure bulges, lining failure under service, wrinkle lining, joint offset and tap factory defective with a defect ranging from 2 to 4. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5% grease, 15%-20% sags. In summary, the average condition of the pipes in this area was poor.

Table 1-14: Raymond Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH115	MH114	HU-138	Lining Failure Bulges- 219.0, 235.7 Lining Failure Under Service- 22.9, 167.5 Joint Offset- 106.9, 109.1 Tap Factory- 96.1, 102.5, 117.7, 127.4, 145.7, 154.7, 157.7, 160.8, 167.5, 226.1, 236.1 Wrinkled Lining- 219, 237.1			15-20		Poor
MH114	MH113	HU-139	Lining Failure Bulges – 373.1 Joint Offset- 64.0 Tap Factory- 18.5, 28.0, 58.9, 65.9, 90.0, 111.9, 145.9, 241.7, 254.1, 303.8, 328.5, 378.2, 387.5, 396.9			5		Poor
MH113	MH05	HU-140	Lining Failure Bulges- 223.0		5	5		Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Tap Factory- 26.7, 101.2, 142.4, 144.4, 153.6, 157.2, 194.4, 197.1, 268.3					

3.9.2.3 Irving Avenue

Three sanitary sewer pipe segments were inspected at Irving Avenue. They ranged in condition from poor to fair. The segment of pipe between MH303 and MH302, and between MH302 and MH301, and between MH301 and MH6 consisted several locations of pipe in poor condition which contained broken, crack and fracture circumferential, crack and fracture longitudinal, crack and fracture multiple, joint angular, joint offset and tap factory defective with a defect ranging from 2 to 5. Also several areas of these pipe segments contained 5% grease and fine roots. In summary, the average condition of the pipes in this area was poor.

Table 1-15: Irving Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH303	MH302	LU-210	Broken- 282.6 Circumferential Crack - 123.3, 417.8 Longitudinal Crack- 81.2, 125.8, 169.2, 216.8, 337.2, 347.8, 350.2 Multiple Crack– 43.5 Longitudinal Fracture- 384.5 Joint Angular- 443.7				Y	Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Joint Offset- 300.1, 398.5, 434.6, 440.9, 444.0					
MH302	MH301	LU-211	Broken- 228.8, 233.2 Circumferential Crack- 17.0, 22.1, 98.8, 198.1, 201.0, 247.2, 268.7, 271.5, 398.0 Longitudinal Crack- 51.0, 66.8, 107.8, 113.7, 162.3, 167.9, 238.9, 245.0, 256.1, 268.7 Multiple Crack- 3.0 Circumferential Fracture- 7.1, 145.0, 253.5 Longitudinal Fracture- 125.7, 263.7 Multiple Fracture- 53.9 Tap Factory- 126.6, 228.8		5			Poor
MH301	MH6	LU-212	Circumferential Crack- 54.3, 84.2, 162.5, 177.7, 225.5, 261.1, 321.0 Longitudinal Crack- 13.8, 14.9, 16.3, 30.2, 39.3, 59.3, 69.4, 72.2, 90.1, 104.2, 142.1, 168.4, 211.3, 272.3, 284.3, 303.7, 336.3, 343.2, 358.4 Multiple Crack- 19.3, 45.3, 51.2, 106.3, 153.4, 174.6, 187.6, 198.9, 349.4		5		Y	Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Spiral Crack-196.1 Circumferential Fracture-171.6 Longitudinal Fracture-179.9 Joint Offset-422.5 Tap Factory-26.3, 8.2, 146.2, 178.8, 184.1, 188.9, 224.4, 302.6, 342.2					

3.9.2.4 Leland Avenue

Four sanitary sewer pipe segments were inspected at Leland Avenue. They ranged in condition from poor to fair. The segment of pipe between FI and MH134, and between MH134 and MH133, and between MH133 and MH305, and between MH305 and MH304, and between MH304 and MH7 consisted several locations of pipe in poor condition which contained broken, crack and fracture circumferential, crack and fracture longitudinal, crack and fracture multiple, spiral fracture, joint offset and tap factory defective with a defect ranging from 2 to 5. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5-10% grease, 5%-10% sags and fine roots. In summary, the average condition of the pipes in this area was fair.

Table 1-16: Leland Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
FI	MH134	LU-122	Circumferential Crack – 62.0, 146.1, 176.4, 188.8, 194.0		5	5	Y	Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Longitudinal Crack- 43.7, 83.4, 196.8 Multiple Crack– 240.9 Circumferential Fracture- 143.9 Multiple Fracture– 26.6, 214.0 Tap Factory- 239.7, 241.6					
MH134	MH133	LU-123	Broken– 192.8, 528 Circumferential Crack- 55.4, 64.5, 108.0, 155.6, 178.7, 230.1, 291.8, 335.4, 402.7, 561.1, 597.4, 618.6 Longitudinal Crack- 6.5, 379.5, 410.5, 437.1 Multiple Crack- 43.2, 70.4, 152.3, 163.4, 309.0, 332.3, 407.9, 557.2, 576.5 Circumferential Fracture- 464.4 Multiple Fracture-282.8, 338.5 Joint Offset- 96.1, 341.0 Tap Factory- 86.6, 130.1, 179.4, 221.2, 223.0, 279.7, 281.8, 331.1, 378.6, 383.6, 406.8, 559.9		10	5	Y	Fair
MH133	MH305	LU-213	Circumferential Crack- 443.0 Longitudinal Crack- 135.5, 154.1,196.0, 198.9,		5	10	Y	Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			256.8, 301.9, 344.7, 347.9, 383.1 Multiple Crack- 92.9, 239.7, 287.8, 350.2 Longitudinal Fracture- 77.5, 112.6, 115.6, 382.9 Spiral Fracture- 386.5 Joint Offset- 440.2, 449.4 Tap Factory- 64.9, 217.8, 258.0, 289.3, 352.0					
MH305	MH304	LU-214	Broken- 163.6, 249.7 Circumferential Crack – 45.2, 77.1, 209.2 Longitudinal Crack- 139.9, 266.6, 268.6, 298.7 Multiple Crack– 92.2, 224.0, 241.8, 292.6, 304.5, 386.0 Longitudinal Fracture- 162.6 Multiple Fracture- 56.3 Joint Offset- 390.1 Tap Factory- 4.5, 52.1, 78.2, 89.1, 102.0, 136.9, 248.6, 256.7, 267.7, 326.3, 371.1		5	5		Poor
MH304	MH7	LU-215	Circumferential Crack- 27.8, 56.1, 151.4 Longitudinal Crack- 45.1, 79.1, 118.8, 164.9,		5	5	Y	Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			179.5, 221.6, 266.9, 288.7, 321.0, 341.8 Multiple Crack- 8.6, 13.3, 19.3, 36.3, 42.2, 65.1, 96.0, 130.0, 152.9, 187.7, 210.7, 241.3, 277.3, 295.1, 315.1, 326.8, 333.0, 343.9, 424.3 Longitudinal Fracture- 27.3, 44.6 Multiple Fracture – 252.2, 268.3 Joint Offset- 67.5, 387.3 Tap Factory- 265.1, 347.9 Material Change PVC- 384.4, 394.1					

3.9.2.5 Ruthland Avenue

Six sanitary sewer pipe segments were inspected at Ruthland Avenue. They ranged in condition from poor to fair. The segment of pipe between FI and MH310, and between MH310 and MH309, and between MH309 and MH308, and between MH308 and SS, and between SS and MH307, and between MH307 and MH08A consisted several locations of pipe in poor condition which contained broken soil visible, crack and fracture circumferential, crack and fracture longitudinal, crack and fracture multiple, joint offset and tap break in and tap factory defective with a defect ranging from 1 to 5. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5%-10% grease, 5%-10% sages and fine roots. In summary, the average condition of the pipes in this area was fair.

Table 1-17: Ruthland Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
FI	MH310	LU-216	Circumferential Crack – 10.2, 110.2, 119.0, 152.1, 208.5, 242.6 Longitudinal Crack- 55.7, 116.4, 145.8, 211.5 Longitudinal Fracture-119.0 Joint Offset- 19.5, 116.4,196.5, 258.0			5	Y	Fair
MH310	MH309	LU-217	Broken Soil Visible-556.0 Circumferential Crack- 23.4, 32.6, 69.9, 85.2, 118.7, 187.1, 325.5, 350.6, 395.4, 456.9, 485.0, 509.1, 515.5, 531.5, 573.0 Longitudinal Crack- 38.7, 43.9, 135.8, 468.9 Circumferential Fracture- 45.6, 76.1, 97.5 Multiple Fracture- 512.3 Joint Offset- 275.7, 615.5 Tap Factory- 134.5			5-10	Y	Fair
MH309	MH308	LU-218	Broken Soil Visible- 40.1 Circumferential Crack- 3.5, 106.0, 259.2, 271.7 Longitudinal Crack- 6.6, 114.9, 145.5 Multiple Crack- 9.0, 63.0, 79.9, 99.9, 296.1, 320.1 Circumferential Fracture- 96.7		5	5	Y	Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Multiple Fracture-186.7 Joint Offset-46.2, 350 Tap Break in-220.7 Tap Factory-87.3					
MH308	SS	LU-219	Circumferential Crack – 87.6, 121.7, 238.8 Longitudinal Crack-3.5, 27.5, 249.2 Multiple Crack-38.7, 96.7, 109.6, 147.8, 158.6 Longitudinal Fracture-195.6 Multiple Fracture-7.7		10	5	Y	Fair
SS	MH307	LU-220	Circumferential Crack - 167.3, 184.1, 190.2 Longitudinal Crack-83.8, 124.5 Circumferential Fracture-170.4 Joint Offset-32.7			5	Y	Fair
MH307	MH08A	LU-221	Circumferential Crack - 5.3,18.2, 47.0, 54.4, 88.8, 139.7,149.8, 153.8, 168.7,175.2, 214.0, 420.3 Longitudinal Crack-37.0, 200.7, 342.4 Multiple Crack-109.8, 201.9, 220.1, 236.8, 243.0, 308.5, 329.0, 379.6		5	5	Y	Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Circumferential Fracture- 62.0, 257.0 Longitudinal Fracture- 420.3 Multiple Fracture -227.8 Joint Offset- 131.4, 146.4, 186.7, 275.2, 420.3 Tap Factory- 355.1					

3.9.2.6 Clifton Avenue

Three sanitary sewer pipe segments were inspected at Clifton Avenue. They ranged in condition from poor to fair. The segment of pipe between MH315 and MH314, and between MH314 and MH313, and between MH313 and MH09A consisted several locations of pipe in poor condition which contained crack and fracture circumferential, crack longitudinal, crack and fracture multiple, joint offset and tap break in and tap factory defective with a defect ranging from 1 to 4. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 10% grease, 5% sag and fine roots. In summary, the average condition of the pipes in this area was fair.

Table 1-18: Clifton Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH315	MH314	LU-223	Circumferential Crack - 100.9, 245.5 Longitudinal Crack- 55.1, 106.7, 124.0 ,133.1, 313.2		10	5	Y	Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Circumferential Fracture- 37.1 Joint Offset- 152.6, 304.5					
MH314	MH313	LU-224	Circumferential Crack- 9.8, 11.9, 25.0, 91.2, 100.7, 122.9, 143.8, 160.0, 165.9, 201.8, 220.0, 267.6, 309.8, 317.5, 347.5, 353.3, 376.8, 419.9, 436.9 Longitudinal Crack- 86.1, 148.5, 407.6 Multiple Crack- 19.9, 258.6, 366.9 Circumferential Fracture- 332.0 Multiple Fracture- 426.0 Joint Offset- 335.5 Tap Break in- 315.9 Tap Factory- 90.6, 433		10	5	Y	Fair
MH313	MH09A	LU-225	Circumferential Crack- 15.8, 24.1, 46.8, 59.4, 66.0, 68.1, 85.6, 120.3, 132.4, 192.7, 229.5, 236.1 Longitudinal Crack- 307.1 Multiple Crack- 55.8, 114.4, 126.2, 141.9, 146.3, 288.1 Joint Offset- 189.8, 413.1			5	Y	Fair

3.9.2.7 Leigh Avenue

Three sanitary sewer pipe segments were inspected at Leigh Avenue. They ranged in condition from poor to fair. The segment of pipe between MH318 and MH317, and between MH317 and MH316, and between MH316 and MH10 consisted several locations of pipe in poor condition which contained broken soil visible, crack circumferential , crack and fracture longitudinal, crack and fracture multiple, deformed, joint offset and tap break in and tap factory defective with a defect ranging from 1 to 5. The pipe in fair condition is in similar situation as noted for Bailey Avenue. Also several areas of these pipe segments contained 5% grease, 5% sags and fine roots. In summary, the average condition of the pipes in this area was poor.

Table 1-19: Leigh Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH318	MH317	LU-227	Circumferential Crack – 5.0, 63.7, 134.9, 390.5, 406.9 Longitudinal Crack- 36.3, 275.8, 336.7 Multiple Crack – 13.8, 190.6, 239.1, 412.6 Longitudinal Fracture-343.7 Tap Break in- 413.8		5	5		Poor
MH317	MH316	LU-228	Broken Soil Visible– 2.0, 439.5 Circumferential Crack- 111.5, 418.2 Longitudinal Crack- 200.2, 436.6 Multiple Crack- 5.0, 18.0, 52.2, 183.0, 254.7, 282.1, 313.9, 354.4, 395.0 Deformed- 2.0 Longitudinal Fracture- 58.0, 242.4 Multiple Fracture-		5		Y	Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			401.3 Tap Factory- 331.5					
MH316	MH10	LU-229	Broken– 3.0, 115.6 Circumferential Crack- 17.5, 342.7, 351.6, 370.0, 412.0 Longitudinal Crack- 153.3, 209.9, 315.1 Multiple Crack- 11.3, 22.5, 43.8, 48.7, 51.7, 63.0, 92.5, 101.5, 124.9, 130.5, 138.8, 165.1, 171.3, 188.3, 230.1, 259.2, 293.9, 303.2, 323.2, 376.4 Longitudinal Fracture- 2.0 Multiple Fracture- 300.1 Joint Offset- 308.8, 404.6, 406.8, 410.9 Tap Factory- 332.2, 376.8			5		Poor

3.9.2.8 Richmond Avenue

Three sanitary sewer pipe segments were inspected at Richmond Avenue. They ranged in condition from poor to fair. The segment of pipe between MH321 and MH320, and between MH320 and MH319, and between MH319 and MH11 consisted several locations of pipe in poor condition which contained broken soil visible, crack and fracture circumferential, crack and fracture longitudinal, crack and fracture multiple, joint offset and tap break in and tap factory defective with a defect ranging from 3 to 4. The pipe in fair condition was on the verge of qualifying as being in poor condition because of it contained cracks and fracture circumferential at multiple locations throughout the pipe. Also several areas of these pipe segments contained

5% grease, 5% sags and fine roots. In summary, the average condition of the pipes in this area was fair.

Table 1-20: Richmond Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH321	MH320	LU-230	Circumferential Crack - 357.7 Multiple Crack – 5.7, 332.3 Multiple Fracture – 237.6, 369.9		5	5	Y	Fair
MH320	MH319	LU-231	Broken Soil Visible – 224.6 Circumferential Crack- 45.2, 104.9, 137.6, 171.9, 181.3, 201.3, 207.5, 216.3, 253.1, 322.6, 332.1, 352.4, 358.1, 382.0, 389.8, 405.3, 420.3 Longitudinal Crack- 143.6 Multiple Crack- 57.4, 146.8, 294.3, 306.9, 393.3 Multiple Fracture- 417.3 Joint Offset- 146.8, 175.1 Tap Break in- 356.0		5	5	Y	Fair
MH319	MH11	LU-232	Broken – 177.7,373.2 Circumferential Crack- 137.2, 171.9, 251.1, 260.2 Longitudinal Crack-93.5, 193.4, 317.5, 318.7, 353.0 Multiple Crack- 5.0, 74.4, 103.7, 207.3,		5	5		Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			216.5, 231.7, 297.5, 304.5, 306.7 Longitudinal Fracture-64.9 Multiple Fracture- 177.8, 275.1, 373.5 Joint Offset- 406.3, 411.3 Tap Break in- 375.9 Tap Factory- 322.8					

3.9.2.9 Easement between Bascom – Laswell Avenue

Two sanitary sewer pipe segments were inspected in an easement between Bascom – Laswell Avenue. They ranged in condition from poor to fair. The segment of pipe between FI and MH119, and between MH119 and MH118 consisted several locations of pipe in poor condition which contained broken soil visible, crack circumferential , crack longitudinal, crack multiple, joint offset and tap break in and tap factory defective with a defect ranging from 4 to 5. The pipe in fair condition was on the verge of qualifying as being in poor condition because of it contained cracks and fracture circumferential at multiple locations throughout the pipe. Also several areas of these pipe segments contained 5% sag. In summary, the average condition of the pipes in this area was poor.

Table 1-21: Easement between Bascom-Laswell Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
FI	MH119	LU-112	Circumferential Crack - 48.0, 134.1, 196.7 Longitudinal Crack- 27.5, 81.0			5		Fair

			Multiple Crack – 43.1, 45.6 Joint Offset- 9.1, 15.3, 18.6, 21.4, 24.4, 27.5, 30.6, 33.6, 36.8, 40.0, 43.1, 81.0, 87.1, 96.2, 99.3, 102.3, 111.6, 113.6, 118.8, 121.9, 128.1, 134.1, 137.2, 140.3, 146.5, 149.6, 152.6, 158.7, 164.9, 166.8, 174.8, 177.6, 196.3					
MH119	MH118	HU-141	Broken– 42.8 Circumferential Crack- 42.8, 87.1, 99.5, 102.5, 110.5, 116.7, 143.1, 180.3, 384.7, 512.3, 518.9, 576.8, 601.6 Longitudinal Crack- 64.6, 218.3, 281.4, 331.7, 427.3, 467.0 Multiple Crack- 6.0, 21.4, 119.6, 128.9, 131.0, 131.6,149.4, 161.6, 182.2, 208.9, 221.3, 227.4, 228.3, 229.4, 231.3, 234.2, 243.7, 259.3, 287.4, 299.9, 324.6, 326.5, 347.0, 356.0, 356.1, 368.3, 379.4, 402.9, 406.0, 430.2, 451.6, 463.9, 488.3, 494.3, 497.4, 504.2, 510.6, 516.1, 539.8, 546.4, 549.8, 579.8 Hole 226.4, 227.0, 356.0, 356.1 Hole Soil Visible- 430.2 Joint Offset- 26.8, 30.9, 33.8, 64.6, 80.8, 143.1, 259.3, 265.3, 268.3, 284.5, 421.5 Tap Factory- 230.4, 599.3					Poor

3.9.3.0 Easement between Laswell - Arleta Avenue

Two sanitary sewer pipe segments were inspected in an easement between Laswell – Arleta Avenue. They ranged in condition from poor to worst. The segment of pipe between FI and MH137, and between MH137 and MH117 consisted several locations of pipe in poor condition which contained broken soil visible, crack and fracture circumferential, crack and fracture longitudinal, crack and fracture multiple, hinge and spiral crack, spiral fracture, joint offset and tap factory defective with a defect ranging from 1 to 5. The pipe in poor condition was on the verge of qualifying as being in worst condition because of it contained cracks and fracture circumferential at multiple locations throughout the pipe. Also several areas of these pipe segments contained fine roots. In summary, the average condition of the pipes in this area was poor.

Table 1-22: Easement between Laswell-Arleta Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
FI	MH137	LU-114	Circumferential Crack -65.0 Longitudinal Crack- 14.0, 17.1, 25.9, 35.0, 41.0, 68.1, 77.2, 137.4, 213.6, 223.0 Multiple Crack – 8.0, 11.0, 19.9, 80.1, 95.1, 101.1, 107.1, 109.8, 131.5, 134.3, 151.8, 155.3, 161.4, 180.1, 182.0, 204.5, 207.3, 210.5, 232.1, 235.1 Joint Offset- 8.0, 11.0, 14.0, 17.1, 19.9, 22.9, 25.9, 28.9, 31.9, 35.0, 38.0, 41.0, 50.1, 56.2, 62.2,65, 68.1,71.1, 77.2, 80.1, 89.1,92.2, 95.1, 97.9, 101.1, 107.1, 110.3, 116.3, 122.3, 128.3, 131.5, 134.3, 137.4, 143.3, 143.3, 146.2, 149.2, 155.3, 158.4, 161.4, 164.5, 167.5, 170.7, 173.9, 176.9, 180.1, 186.0, 195.0,					Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			198.2, 198.2, 201.2, 204.5, 207.3, 210.5, 213.6, 223.0, 232.1, 235.1 Tap Factory- 106.3, 148.3, 151.2, 194.0					
MH137	MH117	LU-115	Broken Soil Visible– 120.6, 181.4 Circumferential Crack- 52.0, 62.3, 231.8, 289.8, 317.7 Longitudinal Crack- 21.8,45.7, 175.5, 221.8, 231.1, 283.6, 286.4, 286.6, 299.2, 490.0, 536.2 Hinge Crack- 18.8, 77.2, 265.0, 305.2, 376.6, 397.9, 407.3, 478.0, 485.0, 499.1, 561.1, 582.4 Multiple Crack- 7.0, 30.4, 329.4, 354.9, 357.9, 370.1, 382.9, 385.5, 419.4, 428.7, 456.3, 468.7, 501.2, 524.0, 526.9, 530.0 Spiral Crack- 9.8, 46.0, 80.3, 86.4,105.0, 108.1, 114.3, 147.7, 166.3, 178.3, 197.0, 228.2, 253.0, 296.0, 311.4, 320.6, 342.3, 348.4, 363.9, 391.8, 437.8, 444.1, 450.2, 508.4, 526.9, 533.0, 542.3, 570.1, 588.6 Multiple Fracture- 181.4, 262.0, 502.2 Spiral Fracture- 135.7 Joint Offset- 9.8, 88.2, 116.0,				Y	Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			234.8,255.6, 289.7, 299.2, 333.0, 342.3, 376.6, 420.8, 424.2, 433.8, 434.7, 436.2, 444.1, 479.7, 481.3, 485.0, 499.1, 526.9, 526.9, 582.4 Tap Factory- 87.4, 133.5, 136.5, 176.5, 229.2, 284.5, 287.7, 383.7, 386.6, 488.0, 525.0, 533.9, 568.1, 570.9					

3.9.3.1 Easement between Arleta - Raymond Avenue

Two sanitary sewer pipe segments were inspected in an easement between Arleta – Raymond Avenue. They ranged in condition from poor to fair. The segment of pipe between FI and MH122, and between MH122 and MH116 consisted several locations of pipe in poor condition which contained broken soil visible, crack and fracture circumferential, crack and fracture longitudinal, crack and fracture multiple, deformed, hinge crack, joint offset and tap break in and tap factory defective with a defect ranging from 1 to 5. The pipe in poor condition was on the verge of qualifying as being in worst condition because of it contained cracks and fracture circumferential at multiple locations throughout the pipe. Also several areas of these pipe segments contained 5% sags and fine roots. In summary, the average condition of the pipes in this area was poor.

Table 1-23: Easement between Arleta-Raymond Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	**End Location**	**Pipe Segment Reference**	**Broken, Cracks, Fracture, and Joint offset (Distance from Start)**	**Blockage (%)**	**Grease (%)**	**Sags (%)**	**Fine Roots**	**Condition**
FI	MH122	LU-116	Circumferential Crack - 45.0, 63.2, 93.4, 253.1 Longitudinal Crack- 23.5, 215.4			Y		Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Hinge Crack- 42.1, 93.4, 117.6 Multiple Crack – 32.9, 60, 69.1, 71.3, 85.8, 120.6, 139.3, 159.9, 168.0, 177.2, 195.8, 265.6 Longitudinal Fracture- 69.1 Joint Offset- 8.0, 11.2, 17.4, 17.4, 23.5, 26.6, 32.9, 35.8, 39.0, 45.2, 48.2, 51.2, 54.3, 57.3, 60.3, 66.4, 69.4, 71.3, 74.4, 77.6, 80.6, 85.8, 88.9, 91.9, 97.1, 100.1, 103.4, 106.4, 109.5, 117.6, 120.6, 126.8, 133.0, 136.2, 139.3, 153.8, 159.9, 163.1, 165.0, 168.0, 177.2, 180.4, 186.5, 189.7, 195.8, 199.0, 204.0, 212.2, 215.4, 218.4, 221.6, 224.5, 227.6, 227.6, 230.6, 236.9, 240.0, 243.1, 245.5, 248.0, 253.1, 262.4, 265.6, 271.8, 274.9, 277.9, 281.0, 283.9, 287.1 Tap Factory- 70.3, 93.0, 152.9, 164.1, 199.9, 211.4, 249.1					
MH122	MH116	LU-117	Broken – 20.7, 21.3, 22.3, 331.9, 527.8 Broken Soil Visible- 133.7 Circumferential Crack- 77.6, 84.1, 87.8, 140.0, 140.7, 207.6, 215.2,			5	Y	Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			216.7, 235.7, 240.9, 265.5, 285.4, 300.5, 312.7, 362.1, 369.9, 399.6, 415.1, 437.2, 455.5, 472.5, 475.7, 489.8, 541.2, 546.1, 549.1, 551.9, 558.3, 604.0, 607.2, 613.3 Longitudinal Crack- 50.0, 89.8, 111.4, 126.6, 252.7, 254.5, 376.3, 434.0, 477.9, 480.7, 483.7, 508.0, 514.0 Hinge Crack- 84.5, 156.0, 180.6, 209.1 Multiple Crack- 24.7, 49.7, 74.1, 74.4, 90.7, 112.4, 127.5, 131.5, 133.9, 135.0, 136.8, 137.4, 154.9, 173.3, 176.4, 218.3, 232.6, 234.6, 239.4, 252.6, 253.1, 253.8, 255.4, 256.0, 379.3, 501.8, 536.0, 564.4, 573.6, 588.8, 619.0 Spiral Crack- 115.3, 230.6 Deformed- 566.5 Circumferential Fracture- 18.9,19.3, 25.2, 179.4, 266.2, 268.5, 271.1, 272.9, 381.3, 532.9, 544.2 Longitudinal Fracture- 19.8, 21.8, 133.2, 134.1, 175.5, 237.9 Multiple Fracture- 19.2, 133.9, 174.3, 177.3, 181.3					

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Hole- 21.8, 134.5 Joint Offset- 15.9, 18.9, 24.7, 87.6, 97.0, 103.2, 109.1, 115.3, 124.5, 127.5, 156.0, 161.9, 171.1, 179.4, 180.2, 193.7, 215.2, 232.6, 270.6 Tap Break in- 134.0, 135.0, 253.3 Tap Factory- 81.6, 83.5, 128.3, 178.3, 231.6, 233.6, 365.9, 380.2, 465.4, 526.9 Tap Saddle- 255.4					

3.9.3.2 Easement between Raymond - Irving Avenue

Two sanitary sewer pipe segments were inspected in an easement between Raymond – Irving Avenue. They ranged in condition from poor to fair. The segment of pipe between FI and MH126, and between MH126 and MH125 consisted several locations of pipe in poor condition which contained broken soil visible, crack and fracture circumferential , fracture longitudinal, crack multiple, joint offset and tap break in and tap factory defective with a defect ranging from 1 to 5. The pipe in fair condition was on the verge of qualifying as being in poor condition because of it contained cracks and fracture circumferential at multiple locations throughout the pipe. Also several areas of these pipe segments contained 5% sags. In summary, the average condition of the pipes in this area was poor.

Table 1-24: Easement between Raymond-Irving Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
FI	MH126	LU-118	Longitudinal Crack- 6.8 Joint Offset- 10.3, 28.9, 53.5, 53.6, 56.8, 57.0, 66.1, 68.0, 69.2, 72.3, 80.6, 88.7, 97.0, 105.5, 109.1, 115.5, 131.0, 161.3, 165.9, 172.1, 193.9, 211.3, 213.7, 228.8, 251.5, 270.2, 276.2 Tap Factory- 73.6, 84.8, 90.0, 103.1, 147.9, 165.9, 194.9, 212.9, 247.6			5		Poor
MH126	MH125	LU-119	Broken – 90.8, 607.4 Broken Soil Visible-233.4 Circumferential Crack- 49.9, 82.6, 84.4, 93.7, 133.4, 149.5, 155.8, 164.9, 182.0, 185.1, 254.2, 271.7, 296.3, 305.4, 308.5, 320.8, 326.5, 332.6, 335.7, 371.3, 383.3, 389.2, 418.9, 424.9, 466.8, 469.8, 475.9, 589.5 Longitudinal Crack- 121.3, 227.5, 248.1, 275.1, 392.1, 433.8, 442.7 Multiple Crack- 28.4, 87.6, 127.3, 197.3, 242.2, 314.4, 323.7, 439.7, 454.7, 514.3, 532.9 Circumferential Fracture- 77.4, 598.3, 601.1 Longitudinal Fracture-					Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			395.1, 502.5 Multiple Fracture-224.4, 233.4, 265.8, 317.4, 526.3 Joint Offset-13.1 Tap Break in-180.0, 561.1 Tap Factory-78.5, 134.4, 183.1, 270.3, 285.1, 327.5					

3.9.3.3 Easement between Irving - Leland Avenue

Three sanitary sewer pipe segments were inspected in an easement between Irving – Leland Avenue. These segments of pipe ranged in condition from fair to good. The segment of pipe between FI and MH131, and between MH129A and MH129, and between MH131 and 129 consisted several locations of pipe in fair condition which contained broken soil visible, crack and fracture circumferential, crack and fracture longitudinal, crack and fracture multiple, joint offset and tap break in and tap factory defective with a defect ranging from 2 to 5. The pipe in good condition was on the verge of qualifying as being in fair condition because of it contained cracks and fracture circumferential at multiple locations throughout the pipe. Also several areas of these pipe segments contained 5% grease, 5%-10% sags and fine roots. In summary, the average condition of the pipes in this area was good.

Table 1-25: Easement between Irving-Leland Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
FI	MH131	LU-120	Circumferential Crack -5.6, 6.3, 80.3, 89.4, 100.5, 109.5, 172.6, 249.6, 262.0,			5-10	Y	Good

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			277.2, 285.4 Longitudinal Crack- 27.7, 48.8 74.0, 134.0, 152.2, 181.8, 223.4, 229.4 Multiple Crack – 3.8, 47.9, 74.0, 86.3, 92.4, 121.8, 140.1, 155.4, 208.0, 211.1, 236.2 Longitudinal Fracture-48.8, 200.1t Joint Offset- 18.4,33.6, 48.8, 52.0, 67.3, 77.2 ,80.3, 121.8, 148.7, 169.5, 191.0, 244.8, 271.0 Tap Factory- 248.8					
MH129A	MH129	LU-121A	Circumferential Crack-18.6, 58.5, 90.6, 92.4 Longitudinal Crack-40.2 Multiple Crack- 15.2, 61.4, 70.3, 141.2 Circumferential Fracture- 27.8 Joint Offset- 84.4, 95.9 Tap Factory- 74.5		5	5	Y	Good
MH131	MH129A	LU-121	Broken– 45.4 Broken Soil Visible-113.7 Circumferential Crack-57.6, 469.0 Longitudinal Crack-298.3 Circumferential Fracture- 187.4, 256.5, 281.0 Multiple Fracture-232.4			5	Y	Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Joint Offset- 434.0 Tap Break in- 256.3 Tap Factory- 84.7, 129.3, 183.5, 231.5, 380.1					

3.9.3.4 Forest Avenue

Four sanitary sewer pipe segments were inspected at Forest Avenue. They ranged in condition from fair to good. The segment of pipe between MH216 and MH215, and between MH215 and MH214, and between MH214 and MH213, and between MH213 and MH212 consisted several locations of pipe in fair condition which contained hinge fracture, and tap saddle defective with a defect ranging from 2 to 4. The entire length of these four segments was in good condition throughout. Also several areas of these pipe segments contained 5%-50% sags. In summary, the average condition of the pipes in this area was good.

Table 1-26: Forest Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
MH216	MH215	HU-111	Tap Factory- 97.8, 185.4, 257.1			5		Good
MH215	MH214	HU-110	Tap Factory- 96.3, 133.4, 240.6			5		Good
MH214	MH213	HU-109	Hinge Fracture 7.3 Tap Saddle- 115.7			5		Good
MH213	MH212	HU-108	Tap Saddle- 71.2			5- 50		Good

3.9.3.5 Olive Street

Five sanitary sewer pipe segments were inspected at Olive Street. They ranged in condition from good to excellent. The segment of pipe between FI1 and MH223, and between FI2 and MH223, and between FI3 and MH225, and between FI and MH219, and between FI and MH219A are in excellent condition. The entire length of these five segments was in excellent condition throughout. In summary, the average condition of the pipes in this area was good.

Table 1-27: Olive Avenue Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
FI1	MH223	LU-222						Excellent
FI2	MH223	LU-223						Excellent
FI3	MH225	LU-225						Excellent
FI	MH219	HU-105B						Good
FI	MH219A	HU-106A						Good

3.9.3.6 Scott Street

Eleven sanitary sewer pipe segments were inspected at Scott Street. They ranged in condition from poor to fair. The segment of pipe between FI and MH133, and between MH133 and MH129, and between MH129 and MH303, and between MH303 and 125, and between MH125 and MH115 and between MH118 and MH108, and between MH108 and MH117, and between MH117 and 109, and between MH109 and MH112 and between MH112 and MH116, and between MH116 and MH115 consisted several locations of pipe in poor condition which contained broken soil visible, crack and fracture circumferential , crack and fracture longitudinal, crack and fracture multiple, hinge and spiral crack, joint offset and tap factory defective with a defect ranging from 1 to 5. The pipe in fair condition was on the verge of qualifying as being in poor condition because of it contained cracks and fracture circumferential at multiple locations throughout the pipe. Also several areas of these pipe segments contained 5%-10% sags and fine roots. In summary, the average condition of the pipes in this area was poor.

Table 1-28: Scott Street Sanitary Sewer

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
FI	MH133	HU-137	Multiple Fracture- 77.0, 80.0 Joint Offset 5.8, 15.2 Tap Factory- 92.9			5		Fair
MH133	MH129	HU-136	Longitudinal Crack- 29.2, 32.5, 44.8, 53.8, 60.0, 66.2, 81.4, 87.4, 96.7, 99.6, 111.0, 114.9, 144.2 Hinge Crack- 111.2, 111.7 Multiple Crack- 8.2, 17.2, 20.4, 41.7, 78.3, 84.4, 108.9, 117.1, 124.0, 130.1 Multiple Fracture- 142.2 Joint Offset- 8.2, 11.2, 14.3, 17.2, 20.4, 23.5, 26.5, 29.2, 32.5, 35.6, 38.6, 41.7, 44.8, 47.9, 53.8, 56.9, 60.0, 66.2, 69.2, 75.3, 78.3, 81.4, 84.4, 87.4, 90.5, 93.7, 96.7, 99.6, 102.8, 105.8, 108.9, 111.7, 114.9, 114.9, 117.7, 121.0, 124.0, 127.1, 130.1, 133.3, 136.2, 139.3, 142.2 Tap Factory- 52.8			5		Poor
MH129	MH303	HU-135	Longitudinal Crack- 27.8, 92.5 Multiple Crack- 14.9, 21.8, 34.0, 43.2, 64.7,			5		Fair

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			89.5 Multiple Fracture- 86.4 Joint Offset- 14.9, 89.5					
MH303	MH125	HU-134	Circumferential Crack- 184.6 Longitudinal Crack- 70.5, 94.9, 104.1 Multiple Crack- 8.7, 52.1, 107.1, 110.1, 119.4, 128.3, 143.6, 165.3, 168.0, 171.2, 174.4, 181.1 Spiral Crack- 30.3, 58.2, 79.5, 134.5, 149.8, 162.5, Longitudinal Fracture- 104.1, 169.0 Hinge Fracture- 171.2 Hole- 107.1 Joint Offset- 73.5, 79.5, 162.5 Tap Factory- 107.1			5		Poor
MH125	MH115	HU-133				5		Fair
MH118	MH108	HU-142	Circumferential Crack- 9.7 Hinge Crack- 52.8			5		Good
MH108	MH117	HU-143	Circumferential Crack- 11.7 Longitudinal Crack- 107, 134.8, 160.9, 166.9, 221.9			5		Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			Hinge Crack- 36.0 Multiple Crack- 118.1, 209.6 Spiral Crack- 54.0, 87.5, 227.9 Circumferential Fracture- 160.9 Joint Offset- 23.8, 30.0, 51.0, 54.0, 102.9, 118.1, 127.2, 133.3, 151.7, 166.9, 176.0, 206.6, 209.6, 209.6, 221.9 Tap Factory- 97.8, 161.8					
MH117	MH109	HU-144	Multiple Crack- 10.4 Spiral Crack- 1.1 Joint Offset- 1.1			5		Fair
MH109	MH112	HU-130	Circumferential Crack- 54.8, 88.9 Longitudinal Crack- 42.9, 52.0, 113.2 Multiple Crack- 24.6, 27.7, 33.6, 61.3, 70.5, 86.0, 94.9, 98.1, 101.0, 110.1, 119.4, 131.6, 143.6, 171.1, 173.2, 174.0, 201.7, 210.8, 226.1, 229.3 Spiral Crack- 146.6, 186.4, 192.5 Joint Offset- 91.9, 94.9, 101.0, 110.1, 113.2, 119.4, 122.3, 171.1,			5	Y	Poor

Historic ID		Section ID	Description					
Start Location	End Location	Pipe Segment Reference	Broken, Cracks, Fracture, and Joint offset (Distance from Start)	Blockage (%)	Grease (%)	Sags (%)	Fine Roots	Condition
			180.3 Tap Factory- 83.8, 144.5					
MH112	MH116	HU-131	Multiple Crack- 2.0, 7.9, 13.2 Multiple Fracture- 2.0 Hole Soil Visible- 2.0			5		Fair
MH116	MH115	HU-132	Broken- 180.3 Broken Soil Visible- 183.0 Circumferential Crack- 79.3, 119.0, 155.8, 161.9, 168.2 Longitudinal Crack- 49.1, 146.0 Hinge Crack- 15.7 Multiple Crack- 58.9, 60.9, 64.0 , 88.3, 91.3, 94.4, 137.4, 143.5, 149.7, 186.3, 195.2, 222.7 Spiral Crack- 6.6, 37.0, 46.2, 216.7 Hole- 18.9 Hole Soil Visible- 180.9, 183.0 Joint Offset- 37.0, 70.1, 125.1 Tap Factory- 58.9, 147.5			10	Y	Poor

3.9.3.7 Condition Assessment Results and Recommendations

The goal of the sewer system condition assessment is to create a plan of action for long term, on-going system rehabilitation and maintenance and to develop a recommended Capital Improvement Program (CIP) for implementing wastewater collection system projects to meet immediate needs as well as to continue funding the on-going condition assessment and rehabilitation programs. The following is brief summary of the key points and recommendations in the rehabilitation strategy and Capital Improvement Program.

A sewer condition and criticality rating process was used to assess and prioritize system assets based on existing information. Ratings were developed for various factors that indicate criticality (consequence of failure) and condition (probability of failure). Assets which had indicators of poor condition and whose failure would potentially have the greatest impact on the community and environment were identified as high priority for further investigation or rehabilitation.

Based on this condition assessment, the total capital needs to rehabilitate "pipe in poor and fair condition" is estimated at $2,420,000 (Refer to Appendix D Table for details). Pipes in "poor" condition is approximately $1,300,000. Based on PACP's recommendation, these pipes should be rehabilitated preferably within next 2 years or in budget constraints, could be extended to 5 years. This would require BSD to have an annual capital project budget to $650,000 for a two-year CIP program or $260,000 annual program for a five year CIP program.

Because of the limited available funding, BSD's annual budget for CIP is in the range of $150,000. Based on this budget amount, it would require a 15 year CIP program. Table in Appendix D has prioritized rehabilitation projects in to 15 fiscal year cycle. If the District can increase the CIP budget, 15 fiscal year cycle can be shortened. It is desirable to repair all "poor" condition within next two years, if feasible.

For this reason (15 year CIP cycle), we have included annual CCTV to continue to monitor and repair "emergency" basis, until all pipes in the District can be rehabilitated.

Management, operations, and maintenance related capital improvement projects recommended in phase 1 include:

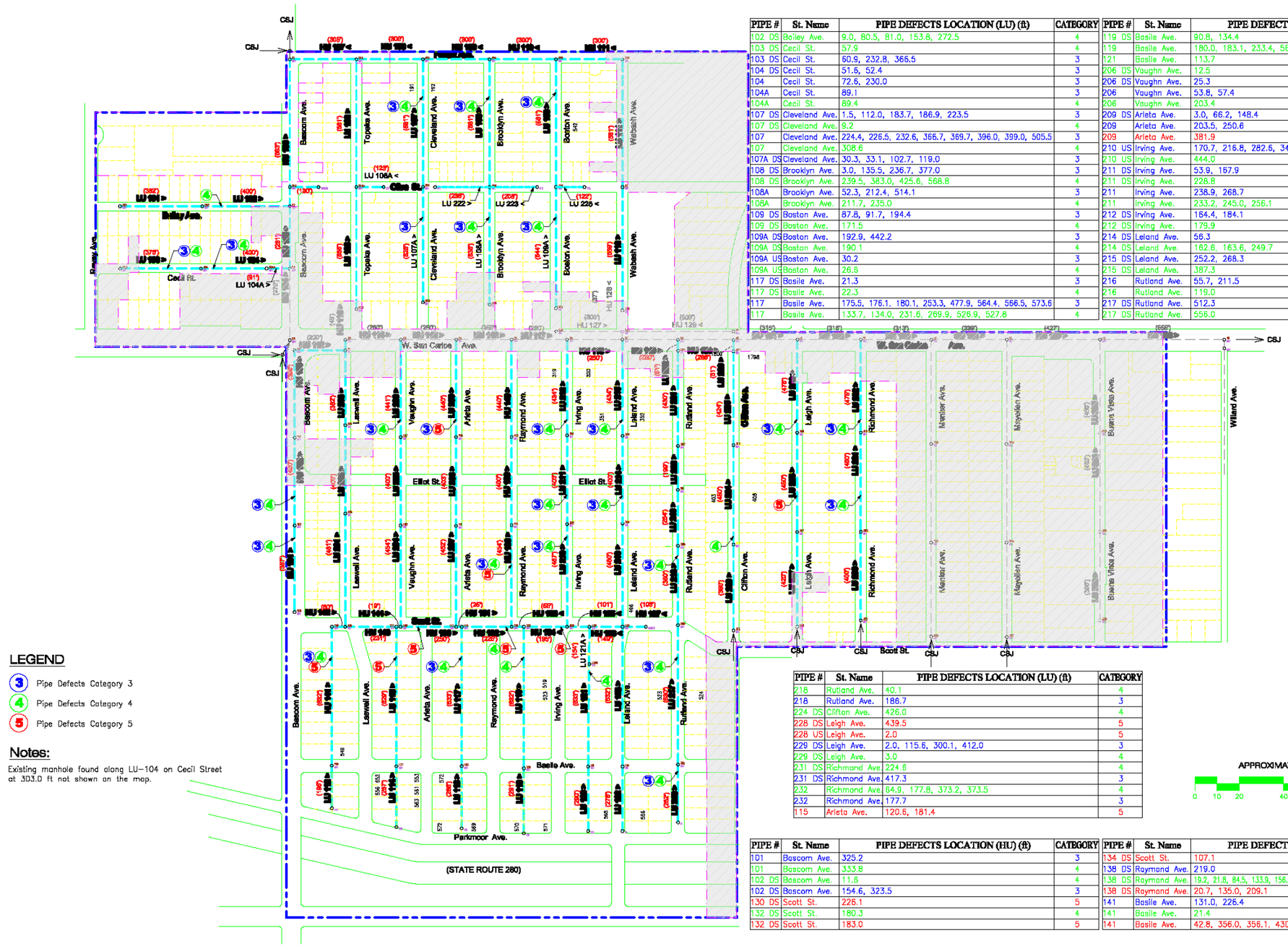
- Prepare plans and profile, and construction details
- Computerized maintenance management system

Specific rehabilitation/improvement projects recommend in Phase 1 include:

- Rehabilitation/Replacement of the collector sewers main segment lists

Continued condition assessment projects recommended in Phase 1 total $32,000 per year with the goal of determining the actual structural condition of all assets within the first 5 years.

Thereafter, condition assessments would be conducted on approximately ten (10) percent of the length of sewer in the Burbank District's collection system per year.



PIPE #	St. Name	PIPE DEFECTS LOCATION (LU) (ft)	CATEGORY
102 DS	Bailey Ave.	9.0, 80.5, 81.0, 153.8, 272.5	4
103 DS	Cecil St.	57.9	4
103 DS	Cecil St.	60.9, 232.8, 366.5	3
104 DS	Cecil St.	51.6, 52.4	3
104	Cecil St.	72.6, 230.0	3
104A	Cecil St.	89.1	3
104A	Cecil St.	89.4	4
107 DS	Cleveland Ave.	1.5, 112.0, 183.7, 186.9, 223.5	3
107 DS	Cleveland Ave.	9.2	4
107	Cleveland Ave.	224.4, 226.5, 232.6, 366.7, 369.7, 396.0, 399.0, 505.5	3
107	Cleveland Ave.	308.6	4
107A DS	Cleveland Ave.	30.3, 33.1, 102.7, 119.0	3
108 DS	Brooklyn Ave.	3.0, 135.5, 236.7, 377.0	3
108 DS	Brooklyn Ave.	239.5, 383.0, 425.6, 568.8	4
108A	Brooklyn Ave.	52.3, 212.4, 514.1	3
108A	Brooklyn Ave.	211.7, 235.0	4
109 DS	Boston Ave.	87.8, 91.7, 194.4	3
109 DS	Boston Ave.	171.5	4
109A DS	Boston Ave.	192.9, 442.2	3
109A DS	Boston Ave.	190.1	4
109A US	Boston Ave.	30.2	3
109A US	Boston Ave.	26.6	4
117 DS	Basile Ave.	21.3	3
117 DS	Basile Ave.	22.3	4
117	Basile Ave.	175.5, 176.1, 180.1, 253.3, 477.9, 564.4, 566.5, 573.6	3
117	Basile Ave.	133.7, 134.0, 231.6, 269.9, 526.9, 527.8	4

PIPE #	St. Name	PIPE DEFECTS LOCATION (LU) (ft)	CATEGORY
119 DS	Basile Ave.	90.8, 134.4	4
119	Basile Ave.	180.0, 183.1, 233.4, 561.1, 607.4	4
121	Basile Ave.	113.7	4
206 DS	Vaughn Ave.	12.5	4
206 DS	Vaughn Ave.	25.3	3
206	Vaughn Ave.	53.8, 57.4	3
206	Vaughn Ave.	203.4	4
209 DS	Arleta Ave.	3.0, 66.2, 148.4	3
209	Arleta Ave.	203.5, 250.6	3
209	Arleta Ave.	381.9	5
210 US	Irving Ave.	170.7, 216.8, 282.6, 347.8, 384.5, 434.6	3
210 US	Irving Ave.	444.0	4
211 DS	Irving Ave.	53.9, 187.9	3
211 DS	Irving Ave.	228.8	4
211	Irving Ave.	238.9, 268.7	3
211	Irving Ave.	233.2, 245.0, 256.1	4
212 DS	Irving Ave.	164.4, 184.1	3
212 DS	Irving Ave.	179.9	4
214 DS	Leland Ave.	56.3	3
214 DS	Leland Ave.	162.6, 163.6, 249.7	4
215 DS	Leland Ave.	252.2, 268.3	3
215 DS	Leland Ave.	387.3	4
216	Rutland Ave.	55.7, 211.5	3
216	Rutland Ave.	119.0	4
217 DS	Rutland Ave.	512.3	3
217 DS	Rutland Ave.	555.0	4

PIPE #	St. Name	PIPE DEFECTS LOCATION (LU) (ft)	CATEGORY
218	Rutland Ave.	40.1	4
218	Rutland Ave.	186.7	3
224 DS	Clifton Ave.	426.0	4
228 DS	Leigh Ave.	439.5	5
228 US	Leigh Ave.	2.0	5
229 DS	Leigh Ave.	2.0, 115.6, 300.1, 412.0	3
229 DS	Leigh Ave.	3.0	4
231 DS	Richmond Ave.	224.6	4
231 DS	Richmond Ave.	417.3	3
232	Richmond Ave.	64.9, 177.8, 373.2, 373.5	4
232	Richmond Ave.	177.7	3
115	Arleta Ave.	120.6, 181.4	5

LEGEND

- 3 Pipe Defects Category 3
- 4 Pipe Defects Category 4
- 5 Pipe Defects Category 5

Notes:

Existing manhole found along LU-104 on Cecil Street at 303.0 ft not shown on the map.

APPROXIMATE SCALE

0 10 20 40 80

N

PIPE #	St. Name	PIPE DEFECTS LOCATION (HU) (ft)	CATEGORY
101	Bascom Ave.	325.2	3
101	Bascom Ave.	333.8	4
102 DS	Bascom Ave.	11.6	4
102 DS	Bascom Ave.	154.6, 323.5	3
130 DS	Scott St.	226.1	5
132 DS	Scott St.	180.3	4
132 DS	Scott St.	183.0	5

PIPE #	St. Name	PIPE DEFECTS LOCATION (HU) (ft)	CATEGORY
134 DS	Scott St.	107.1	5
138 DS	Raymond Ave.	219.0	3
138 DS	Raymond Ave.	19.2, 21.8, 84.5, 133.9, 156.0, 174.3, 177.3, 180.6, 181.3, 270.6	4
138 DS	Raymond Ave.	20.7, 135.0, 209.1	5
141	Basile Ave.	131.0, 226.4	3
141	Basile Ave.	21.4	4
141	Basile Ave.	42.8, 356.0, 356.1, 430.2	5

Figure 1-1: Burbank Sanitary District Defects Map

APPENDIX A: PIPE ISSUE SUMMANRY TABLES

Table A-2: SANITARY SEWER PIPES CONTAINING GREASE

Amount	Start Location (Historic ID)	End Location (Historic ID)	Location of Issue in Pipe (feet from Start)	Segment
5%	MH201	MH202	99.1, 223.0, 375.6	LU-101
5%	MH202	MH2	73.6, 114.6, 391.3	LU-102
5%	MH203	MH204	67.2, 298.9	LU-103
5%	MH204A	MH3	25.7, 73.7	LU-104A
5%	MH221	MH219	76.1	LU-106A
10%	MH221	MH213	410.6, 417.4	LU-107
5%	MH224	MH223	157.4, 161.9	LU-108A
5%	MH223	MH214	5.7, 39.3, 181.1, 279.5	LU-108
5%	MH226	MH225	332.8, 362.7	LU-109A
5%	MH225	MH215	5.5, 167.2, 456.2, 504.1	LU-109
5%	FI1	MH	12.4, 23.80	HU-105B
5%	MH104	MH1	17.8, 383.0	LU-203
5%	MH109	MH108	204.9	LU-204
5%	MH108	MH107	349.0, 358.5	LU-205
5%	MH111	MH110	85.4, 147.2	LU-208
5%	MH110	MH4	122.1	LU-209
5%	MH122	MH116	227.4, 376.3, 514.0, 551.9	LU-117
5%	MH113	MH5	131.1, 200.6	HU-140
5%	MH302	MH301	381.9	LU-211
5%	MH301	MH6	59.3, 70.9, 142.1, 156.3, 239.7	LU-212
5%	MH129A	MH129	149	LU-121A
10%	MH134	MH133	149.6	LU-123
5%	MH133	MH305	60.6, 143.1	LU-213
5%	MH305	MH304	10.4, 168.4, 252.5, 386.9	LU-214
5%	MH304	MH7	217.1, 241.3	LU-215
5%	MH309	MH308	164.0, 352.0	LU-218
10%	MH308	SS	34.4, 81.7	LU-219
5%	MH308	SS	197.5, 253.0	LU-219
5%	MH307	MH08A	299.6	LU-221
10%	MH315	MH314	348.1, 370.8	LU-223
10%	MH314	MH313	27.5, 36.3	LU-224
5%	MH314	MH313	187.8	LU-224
5%	MH318	MH317	70.2, 292.0, 400.4, 418.5	LU-227
5%	MH317	MH316	280.3, 371.4	LU-228
5%	MH321	MH320	332.6, 346.5	LU-230
5%	MH320	MH319	136.5	LU-231
5%	MH319	MH11	5.3, 65.0, 157.6, 402.8	LU-232

Table A-3: SANITARY SEWER PIPES CONTAINING FINE ROOTS, AND MEDIUM ROOTS

Amount	Start Location (Historic ID)	End Location (Historic ID)	Location of Issue in Pipe (feet from Start)	Segment
	MH202	MH2	63.1	LU-102
	MH221	MH219	426.5, 441.7	LU-107
	MH223	MH217	190.9	LU-108
10%	MH223	MH217	135.5	LU-108
	MH226	MH225	190.1	LU-109A
	MH225	MH215	504.1	LU-109
	MH107	MH3	82.2, 125.1	LU-206
	MH111	MH110	371.0, 377.0	LU-208
20%	MH110	MH4	26.1	LU-209
	MH122	MH116	74.1, 84.1, 154.9, 483.7, 564.4, 573.6, 582.6, 598.2, 604.0	LU-117
	MH126	MH125	137.4, 155.8, 179.2, 185.1, 224.4, 227.5, 266.3, 284.2, 296.3, 305.4, 308.5, 317.4, 350.7, 359.5, 460.9, 466.8, 484.7	LU-119
20%	MH303	MH302	205	LU-210
	MH224	MH223	30.6, 77.2, 115.6, 137.0, 203.0, 211.1	LU-120
	MH129A	MH129	61.4	LU-121A
	MH131	MH129A	205.8, 325.8	LU-121
	MH134	MH133	208.2, 222.1, 275.7	LU-123
	MH133	MH305	137.5	LU-213
	MH304	MH7	65.1	LU-215
	FI13	MH310	55.7, 67.2, 130.9, 241.0, 255.1	LU-216
10%	FI13	MH310	152.1	LU-216
	MH310	MH309	216.4	LU-217
	MH309	MH308	79.9 , 86.0, 99.9, 114.9, 121.0, 196.8	LU-218
10%	MH308	SS	140.6 (Lateral)	LU-219
30%	MH308	SS	245.1 (Lateral)	LU-219
	SS	MH307	81.5	LU-220
25%	SS	MH307	82.0 (Lateral)	LU-220
50%	SS	MH307	74.7 (Lateral)	LU-220
	MH307	MH08A	251.9	LU-221
	MH315	MH314	6.1	LU-223
	MH314	MH313	64.6, 100.7, 110.5, 376.8	LU-224
25%	MH314	MH313	362.1	LU-224
	MH314	MH313	90.6, 107.1 (Lateral)	LU-224
	MH313	MH09A	141.9	LU-225
95%	MH317	MH316	331.5 (Lateral)	LU-228
20%	MH317	MH316	323.8	LU-228
30%	MH317	MH316	286.2	LU-228
40%	MH317	MH316	291.3	LU-228
	MH317	MH316	146.0	LU-228

Amount	Start Location (Historic ID)	End Location (Historic ID)	Location of Issue in Pipe (feet from Start)	Segment
	MH317	MH316	200.2, 242.4, 282.1, 323.1	LU-228
	MH321	MH320	329.3, 332.3	LU-230
	MH320	MH319	294.3	LU-231
By ABLE				
	MH109	MH112	229.3	HU-130
	MH122	MH116	156.0	LU-117
	MH137	MH117	J - 147.7, 172.4, 175.5, 178.3, 190.8	LU-115
	MH115	MH114	9.8	HU-138
	MH113	MH05	26.8	HU-140
	MH213	MH212	114.6	HU-108
	MH106	MH105	203.7, 431.0	LU-201
50%	MH119	MH118	109.5, 132.6, 228.3, 428.3	HU-141
10%	MH119	MH118	327.4, 596.1	HU-141
	MH119	MH118	494.3 (J), 501.4 (J), 504.3 (J)	HU-141
80%	MH119	MH118	526.1	HU-141
		MH137	5	LU-114
	MH109	MH112	24.6 (J), 229.3 (J)	HU-130
	MH116	MH115	58.0(J), 59.5 (B), 60.9(J), 88.3 (J), 91.3 (J), 94.4 (J),137.4(J)	HU-132

Table A-4: SANITARY SEWER PIPE SAGS

Amount	Start Location (Historic ID)	End Location (Historic ID)	Location of Issue in Pipe (feet from Start)	Segment
5%	MH201	MH202	380.0	LU-101
5%	MH202	MH2	393.0	LU-102
5%	MH203	MH204	370.0	LU-103
5%	MH204	MH204A	303.0	LU-104
5%	MH204A	MH3	91.0	LU-104A
5%	MH220	MH219	545.0	LU-105
5%	MH221	MH219	124.0	LU-106A
5%	MH219	MH212	570.0	LU-106
10%	MH221	MH213	571.0	LU-107
5%	MH224	MH223	528.0	LU-108A
5%	MH223	MH214	575.0	LU-108
5%	MH218	MH217	552.0	LU-110
5%	FI1	MH	126.0	HU-105B
5%	MH103	MH102	382.0	HU-101
5%	MH102	MH101	393.0	HU-102
5%	MH104	MH1	383.0	LU-203
5%	MH109	MH108	447.0	LU-204
5%	MH108	MH107	395.0	LU-205
5%	MH107	MH3	435.0	LU-206
10%	MH112	MH111	117.6	LU-207
5%	MH112	MH111	445.0	LU-207
5%	MH111	MH110	397.0	LU-208
5%	MH110	MH4	435.0	LU-209
5%	MH122	MH116	623.0	LU-117
20%	MH113	MH5	182.0	HU-140
5%	MH126	MH125	623.0	LU-119
5%	MH302	MH301	398.0	LU-211
30%	MH301	MH6	419.5	LU-212
10%	MH301	MH6	427.0	LU-212
10%	MH224	MH223	124.8	LU-120
5%	MH224	MH223	287.0	LU-120
5%	MH129A	MH129	154.0	LU-121A
5%	MH131	MH129A	469.0	LU-121
5%	FI12	MH134	261.0	LU-122
5%	MH134	MH133	623.0	LU-123
10%	MH133	MH305	445.2	LU-213

Amount	Start Location (Historic ID)	End Location (Historic ID)	Location of Issue in Pipe (feet from Start)	Segment
5%	MH133	MH305	453.0	LU-213
5%	MH305	MH304	393.0	LU-214
5%	MH304	MH7	428.0	LU-215
5%	FI13	MH310	259.0	LU-216
10%	MH310	MH309	291.5	LU-217
5%	MH310	MH309	624.0	LU-217
5%	MH309	MH308	356.0	LU-218
5%	MH308	SS	253.0	LU-219
5%	SS	MH307	194.0	LU-220
5%	MH307	MH08A	423.0	LU-221
5%	MH315	MH314	383.0	LU-223
5%	MH314	MH313	440.0	LU-224
5%	MH313	MH09A	418.0	LU-225
5%	MH318	MH317	422.0	LU-227
5%	MH316	MH10	412.0	LU-229
5%	MH321	MH320	397.0	LU-230
5%	MH320	MH319	444.0	LU-231
5%	MH319	MH11	414.0	LU-232
10%	MH112	MH111	117.6	LU-207
5%	MH112	MH111	445.0	LU-207
5%	MH111	MH110	397.0	LU-208
5%	MH110	MH4	435.0	LU-209
By ABLE				
15%	MH115	MH114	5.0	HU-138
5%	MH122	MH116	5.0	LU-117
5%	MH137	MH117	5.0, 176.5, 275.1, 563.6, 575.3	LU-115
10%	MH137	MH117	568.1, 598.4	LU-115
10%	MH114	MH115	5	HU-138
20%	MH114	MH115	217.8	HU-138
5%	MH114	MH113	5	HU-139
5%	MH113	MH05	287.4	HU-140
20%	MH214	MH213	5	HU-109
15%	MH214	MH213	37.9	HU-109
10%	MH214	MH213	126.8	HU-109
30%	MH214	MH213	186.9	HU-109
40%	MH214	MH213	215.1	HU-109
50%	MH214	MH213	232.1	HU-109
25%	MH214	MH213	238	HU-109

Amount	Start Location (Historic ID)	End Location (Historic ID)	Location of Issue in Pipe (feet from Start)	Segment
10%	MH214	MH213	276.2	HU-109
5%	MH213	MH212	0	HU-108
20%	MH213	MH212	12	HU-108
15%	MH213	MH212	26.3	HU-108
5%	MH213	MH212	55.3	HU-108
50%	MH213	MH212	114.6	HU-108
5%	FI10	MH126	5	LU-118
5%	FI7	MH119	5	LU-112
0%	FI9	MH112	5	LU-116
5%	MH109	MH112	0	HU-130
5%	MH112	MH116	2	HU-131
10%	MH116	MH115	0	HU-132
5%	MH118	MH108	5	HU-142
5%	MH108	MH117	0	HU-143
5%	MH117	MH109	0	HU-144
0%	MH133	MH129	5	HU-136
5%	MH129	MH303	5	HU-135
5%	MH303	MH125	0	HU-134
5%	MH125	MH115	0	HU-133
5%	FI6	MH133	5	HU-137
5%	MH-216	MH215	5	HU-111
5%	MH215	MH214	0	HU-110

Table A-5: SANITARY SEWER OTHER PIPE ISSUES

Description	Start Location (Historic ID)	End Location (Historic ID)	Location of Issue in Pipe (feet from Start)	Segment
ABANDONED SURVEY	MH222	MH221	351.0	LU-107A
ABANDONED SURVEY	MH226	MH225	52.0, 492.0	LU-109A
ABANDONED SURVEY	MH225	MH215	505.0	LU-109
ABANDONED SURVEY	MH113	MH5	182.0, 225.0	HU-140
ABANDONED SURVEY	MH303	MH302	444.0	LU-210

APPENDIX B: MANHOLE SEWER CONDITIONS

Table B-1. Sanitary Sewer Manholes

Rank	Manhole ID	Overall Condition				Structural Condition			Sediment				Hydraulic Condition			
		Excellent	Good	Fair	Poor	Good	Damaged Functional	Damaged Non-Functional	None	Partial	Substantial	Full	Good	Damaged Functional	damaged Non-Functional	Blocked
	201		x			x			x				x			
	202		x			x			x				x			
	E2		x			x			x				x			
	204		x			x			x				x			
	204A		x			x			x				x			
	213		x			x			x				x			
	214		x			x			x				x			
	215		x			x			x				x			
	219		x			x			x				x			
	FI1		x			x			x				x			
	219A		x			x			x				x			
	FI2		x			x			x				x			
	221		x			x			x				x			
	FI3		x			x			x				x			
	223		x			x			x				x			
	FI4		x			x			x				x			
	225		x			x			x				x			
	FI5		x			x			x				x			
	217		x			x			x				x			
	222		x			x			x				x			
	09A		x			x			x				x			
	104		x			x			x				x			
	107		x			x			x				x			
	110		x			x			x				x			
	113		x			x			x				x			
	301		x			x			x				x			
	304		x			x			x				x			
	307		x			x			x				x			
	313		x			x			x				x			
	316		x			x			x				x			
	319		x			x			x				x			
	102		x			x			x				x			
	105		x			x			x				x			

Rank	Manhole ID	Overall Condition				Structural Condition			Sediment				Hydraulic Condition			
		Excellent	Good	Fair	Poor	Good	Damaged Functional	Damaged Non-Functional	None	Partial	Substantial	Full	Good	Damaged Functional	damaged Non-Functional	Blocked
	108		x			x			x				x			
	111		x			x			x				x			
	114		x			x			x				x			
	302		x			x			x				x			
	305		x			x			x				x			
	SS		x			x			x				x			
	308		x			x			x				x			
	314		x			x			x				x			
	317		x			x			x				x			
	320		x			x			x				x			
	103		x			x			x				x			
	118		x			x			x				x			
	106		x			x			x				x			
	117		x			x			x				x			
	109		x			x			x				x			
	112		x			x			x				x			
	116		x			x			x				x			
	115		x			x			x				x			
	125		x			x			x				x			
	303		x			x			x				x			
	129		x			x			x				x			
	133		x			x			x				x			
	FI6		x			x			x				x			
	309		x			x			x				x			
	315		x			x			x				x			
	321		x			x			x				x			
	129A		x			x			x				x			
	119		x			x			x				x			
	137		x			x			x				x			
	122		x			x			x				x			
	126		x			x			x				x			
	131		x			x			x				x			
	134		x			x			x				x			
	310		x			x			x				x			
	FI7		x			x			x				x			
	FI8		x			x			x				x			

Rank	Manhole ID	Overall Condition				Structural Condition			Sediment				Hydraulic Condition			
		Excellent	Good	Fair	Poor	Good	Damaged Functional	Damaged Non-Functional	None	Partial	Substantial	Full	Good	Damaged Functional	damaged Non-Functional	Blocked
	FI9		x			x			x				x			
	FI10		x			x			x				x			
	FI11		x			x			x				x			
	FI12		x			x			x				x			
	FI13		x			x			x				x			

APPENDIX C: PIPE INSPECTION LOGS

Project: ESMT BETWEEN IRVING & RAYMOND(LU-119)

Date: 5/9/2013 12:47:00 PM
Street: BASIL AVE
Length Surveyed: 623
Pacp Quick Overall Rating: 5348
Height (Diameter): 6
Street: BASIL AVE

Pipe Segment Reference: LU-119
Upstream MH: 126
Downstream MH: 125
Direction of Survey: Downstream
Material: Vitrified Clay Pipe

Severity
Light
Moderate
Average
Heavy
Severe

ID Number: 126

(0.0) - Manhole Remark: 126 (Clip)

(0.0) - Water Level (Clip)

(13.1) - Joint Offset Medium Defect: 1 (Clip)

(28.4) - Crack Multiple - Position: 8 To 5 Defect: 3 (Clip)

(49.9) - Crack Circumferential - Position: 8 To 10 Defect: 1 (Clip)

(77.4) - Fracture Circumferential - Position: 7 To 3 Defect: 3 (Clip)

(78.5) - Tap Factory Defective - Position: 10 Size: 4 Defect: 3 Remark: CRACKS (Clip)

(78.5) - General Observation Remark: JOINT OFFSET MEDIUM/CRACKS (Clip)

(82.6) - Crack Circumferential - Position: 7 To 4 Defect: 1 (Clip)

(84.4) - Crack Circumferential - Position: 8 To 4 Defect: 1 (Clip)

(86.7) - Tap Factory - Position: 3 Size: 4 (Clip)

(86.7) - General Observation Remark: JOINT OFFSET MEDIUM (Clip)

(87.6) - Crack Multiple - Position: 9 To 3 Defect: 3 (Clip)

(90.8) - Broken - Position: 7 To 10 Defect: 4 (Clip)

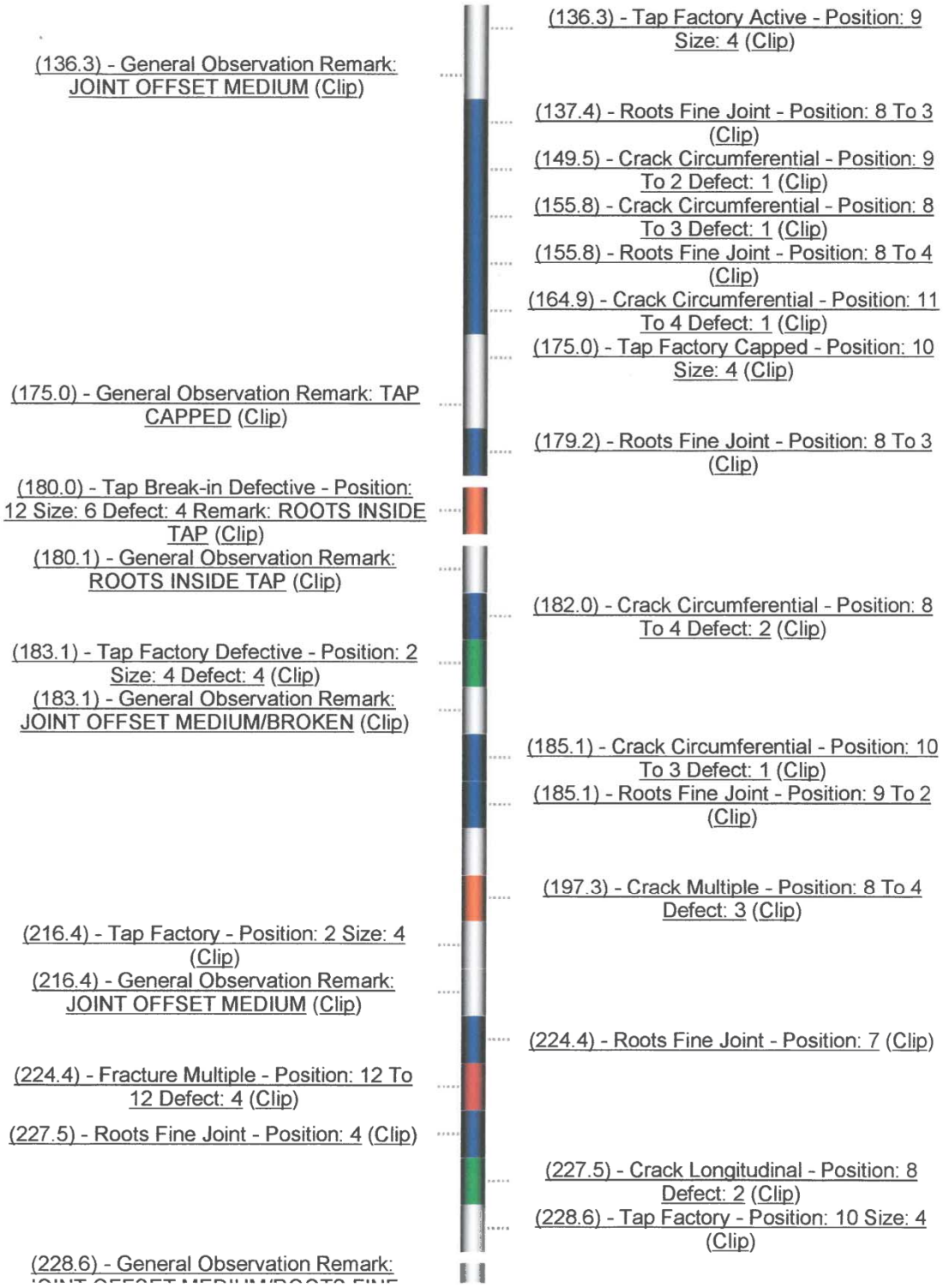
(93.7) - Crack Circumferential - Position: 9 To 3 Defect: 1 (Clip)

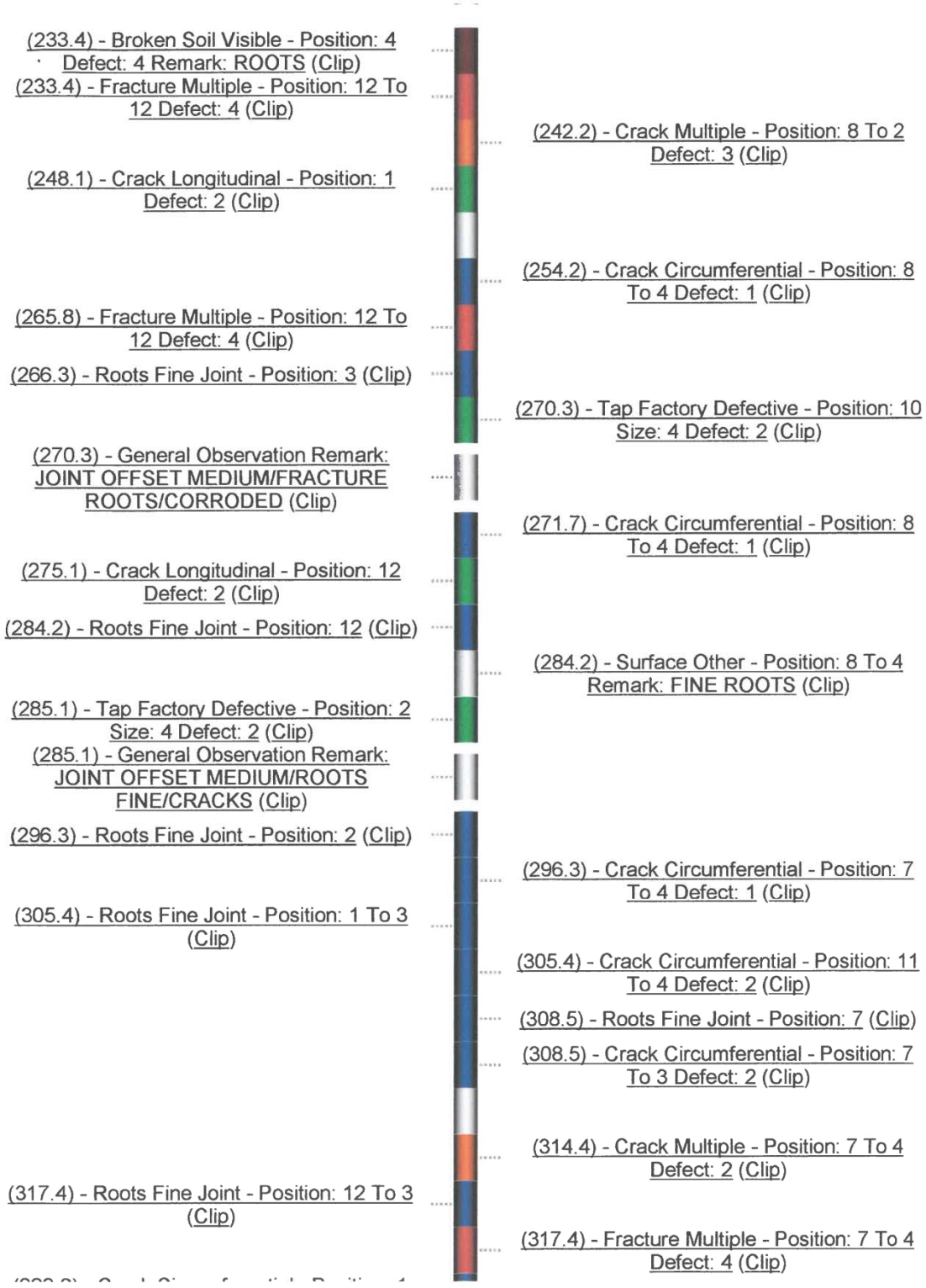
(121.3) - Crack Longitudinal - Position: 2 Defect: 2 (Clip)

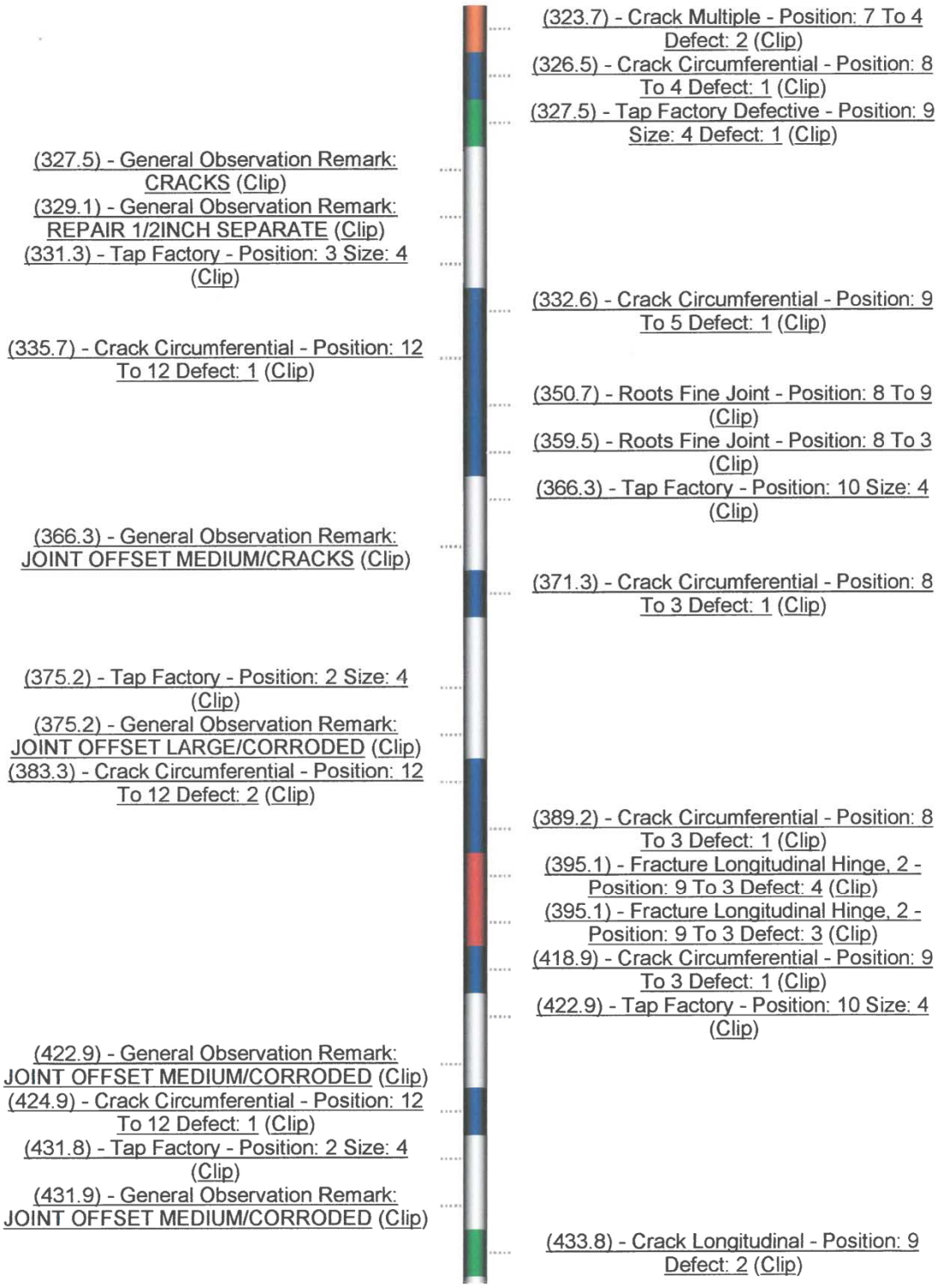
(127.3) - Crack Multiple - Position: 8 To 3 Defect: 3 (Clip)

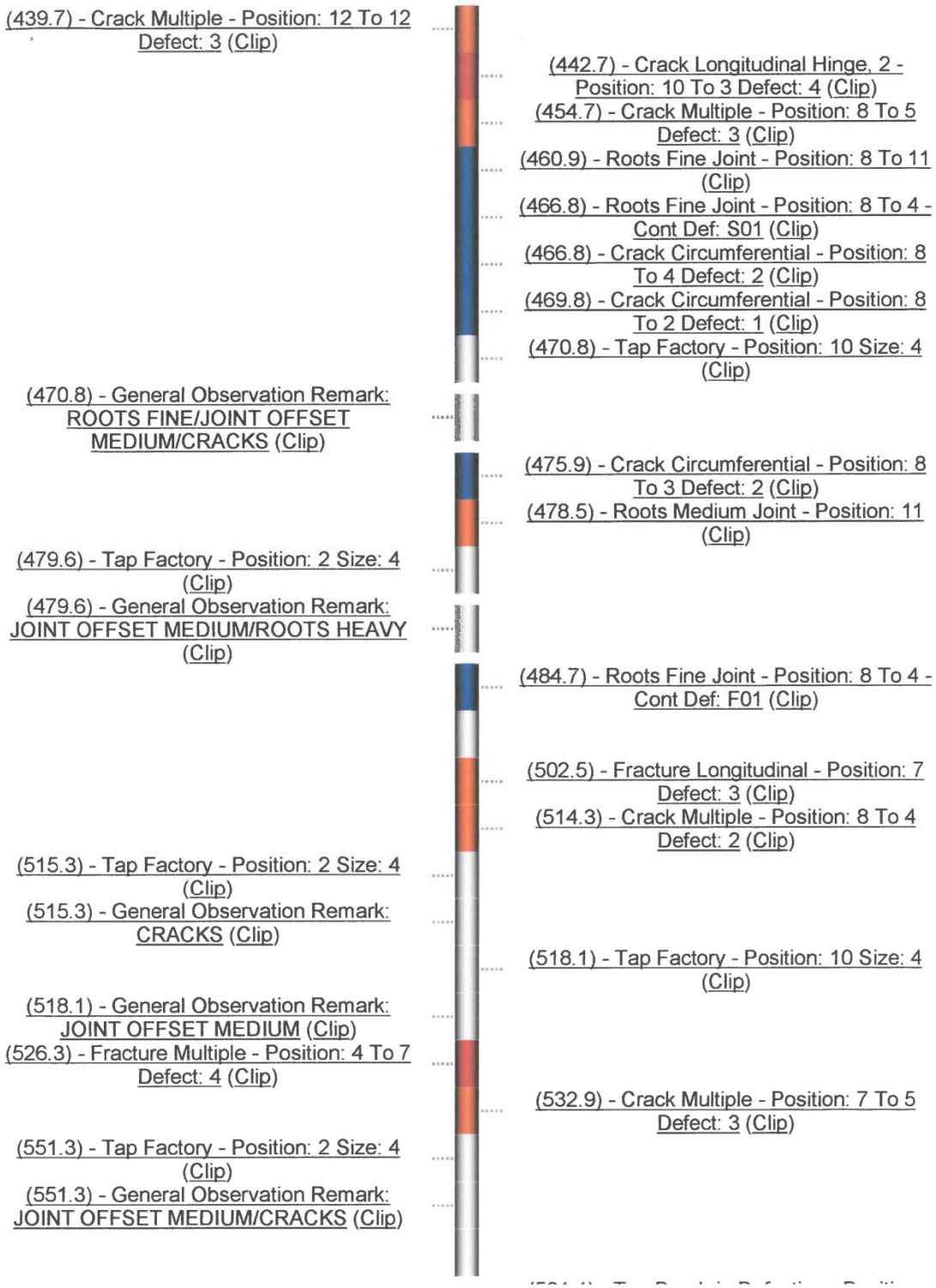
(133.4) - Crack Circumferential - Position: 8 To 4 Defect: 1 (Clip)

(134.4) - Tap Factory Defective - Position: 3 Size: 4 Defect: 4 (Clip)


(136.3) - Tap Factory Active - Position: 9 Size: 4 (Clip)
(136.3) - General Observation Remark: JOINT OFFSET MEDIUM (Clip)
(137.4) - Roots Fine Joint - Position: 8 To 3 (Clip)
(149.5) - Crack Circumferential - Position: 9 To 2 Defect: 1 (Clip)
(155.8) - Crack Circumferential - Position: 8 To 3 Defect: 1 (Clip)
(155.8) - Roots Fine Joint - Position: 8 To 4 (Clip)
(164.9) - Crack Circumferential - Position: 11 To 4 Defect: 1 (Clip)
(175.0) - Tap Factory Capped - Position: 10 Size: 4 (Clip)
(175.0) - General Observation Remark: TAP CAPPED (Clip)
(179.2) - Roots Fine Joint - Position: 8 To 3 (Clip)
(180.0) - Tap Break-in Defective - Position: 12 Size: 6 Defect: 4 Remark: ROOTS INSIDE TAP (Clip)
(180.1) - General Observation Remark: ROOTS INSIDE TAP (Clip)
(182.0) - Crack Circumferential - Position: 8 To 4 Defect: 2 (Clip)
(183.1) - Tap Factory Defective - Position: 2 Size: 4 Defect: 4 (Clip)
(183.1) - General Observation Remark: JOINT OFFSET MEDIUM/BROKEN (Clip)
(185.1) - Crack Circumferential - Position: 10 To 3 Defect: 1 (Clip)
(185.1) - Roots Fine Joint - Position: 9 To 2 (Clip)
(197.3) - Crack Multiple - Position: 8 To 4 Defect: 3 (Clip)
(216.4) - Tap Factory - Position: 2 Size: 4 (Clip)
(216.4) - General Observation Remark: JOINT OFFSET MEDIUM (Clip)
(224.4) - Roots Fine Joint - Position: 7 (Clip)
(224.4) - Fracture Multiple - Position: 12 To 12 Defect: 4 (Clip)
(227.5) - Roots Fine Joint - Position: 4 (Clip)
(227.5) - Crack Longitudinal - Position: 8 Defect: 2 (Clip)
(228.6) - Tap Factory - Position: 10 Size: 4 (Clip)
(228.6) - General Observation Remark:


(233.4) - Broken Soil Visible - Position: 4 Defect: 4 Remark: ROOTS (Clip)
(233.4) - Fracture Multiple - Position: 12 To 12 Defect: 4 (Clip)
(242.2) - Crack Multiple - Position: 8 To 2 Defect: 3 (Clip)
(248.1) - Crack Longitudinal - Position: 1 Defect: 2 (Clip)
(254.2) - Crack Circumferential - Position: 8 To 4 Defect: 1 (Clip)
(265.8) - Fracture Multiple - Position: 12 To 12 Defect: 4 (Clip)
(266.3) - Roots Fine Joint - Position: 3 (Clip)
(270.3) - Tap Factory Defective - Position: 10 Size: 4 Defect: 2 (Clip)
(270.3) - General Observation Remark: JOINT OFFSET MEDIUM/FRACTURE ROOTS/CORRODED (Clip)
(271.7) - Crack Circumferential - Position: 8 To 4 Defect: 1 (Clip)
(275.1) - Crack Longitudinal - Position: 12 Defect: 2 (Clip)
(284.2) - Roots Fine Joint - Position: 12 (Clip)
(284.2) - Surface Other - Position: 8 To 4 Remark: FINE ROOTS (Clip)
(285.1) - Tap Factory Defective - Position: 2 Size: 4 Defect: 2 (Clip)
(285.1) - General Observation Remark: JOINT OFFSET MEDIUM/ROOTS FINE/CRACKS (Clip)
(296.3) - Roots Fine Joint - Position: 2 (Clip)
(296.3) - Crack Circumferential - Position: 7 To 4 Defect: 1 (Clip)
(305.4) - Roots Fine Joint - Position: 1 To 3 (Clip)
(305.4) - Crack Circumferential - Position: 11 To 4 Defect: 2 (Clip)
(308.5) - Roots Fine Joint - Position: 7 (Clip)
(308.5) - Crack Circumferential - Position: 7 To 3 Defect: 2 (Clip)
(314.4) - Crack Multiple - Position: 7 To 4 Defect: 2 (Clip)
(317.4) - Roots Fine Joint - Position: 12 To 3 (Clip)
(317.4) - Fracture Multiple - Position: 7 To 4 Defect: 4 (Clip)


(323.7) - Crack Multiple - Position: 7 To 4 Defect: 2 (Clip)
(326.5) - Crack Circumferential - Position: 8 To 4 Defect: 1 (Clip)
(327.5) - Tap Factory Defective - Position: 9 Size: 4 Defect: 1 (Clip)
(327.5) - General Observation Remark: CRACKS (Clip)
(329.1) - General Observation Remark: REPAIR 1/2INCH SEPARATE (Clip)
(331.3) - Tap Factory - Position: 3 Size: 4 (Clip)
(332.6) - Crack Circumferential - Position: 9 To 5 Defect: 1 (Clip)
(335.7) - Crack Circumferential - Position: 12 To 12 Defect: 1 (Clip)
(350.7) - Roots Fine Joint - Position: 8 To 9 (Clip)
(359.5) - Roots Fine Joint - Position: 8 To 3 (Clip)
(366.3) - Tap Factory - Position: 10 Size: 4 (Clip)
(366.3) - General Observation Remark: JOINT OFFSET MEDIUM/CRACKS (Clip)
(371.3) - Crack Circumferential - Position: 8 To 3 Defect: 1 (Clip)
(375.2) - Tap Factory - Position: 2 Size: 4 (Clip)
(375.2) - General Observation Remark: JOINT OFFSET LARGE/CORRODED (Clip)
(383.3) - Crack Circumferential - Position: 12 To 12 Defect: 2 (Clip)
(389.2) - Crack Circumferential - Position: 8 To 3 Defect: 1 (Clip)
(395.1) - Fracture Longitudinal Hinge, 2 - Position: 9 To 3 Defect: 4 (Clip)
(395.1) - Fracture Longitudinal Hinge, 2 - Position: 9 To 3 Defect: 3 (Clip)
(418.9) - Crack Circumferential - Position: 9 To 3 Defect: 1 (Clip)
(422.9) - Tap Factory - Position: 10 Size: 4 (Clip)
(422.9) - General Observation Remark: JOINT OFFSET MEDIUM/CORRODED (Clip)
(424.9) - Crack Circumferential - Position: 12 To 12 Defect: 1 (Clip)
(431.8) - Tap Factory - Position: 2 Size: 4 (Clip)
(431.9) - General Observation Remark: JOINT OFFSET MEDIUM/CORRODED (Clip)
(433.8) - Crack Longitudinal - Position: 9 Defect: 2 (Clip)


(439.7) - Crack Multiple - Position: 12 To 12 Defect: 3 (Clip)
(442.7) - Crack Longitudinal Hinge, 2 - Position: 10 To 3 Defect: 4 (Clip)
(454.7) - Crack Multiple - Position: 8 To 5 Defect: 3 (Clip)
(460.9) - Roots Fine Joint - Position: 8 To 11 (Clip)
(466.8) - Roots Fine Joint - Position: 8 To 4 - Cont Def: S01 (Clip)
(466.8) - Crack Circumferential - Position: 8 To 4 Defect: 2 (Clip)
(469.8) - Crack Circumferential - Position: 8 To 2 Defect: 1 (Clip)
(470.8) - Tap Factory - Position: 10 Size: 4 (Clip)
(470.8) - General Observation Remark: ROOTS FINE/JOINT OFFSET MEDIUM/CRACKS (Clip)
(475.9) - Crack Circumferential - Position: 8 To 3 Defect: 2 (Clip)
(478.5) - Roots Medium Joint - Position: 11 (Clip)
(479.6) - Tap Factory - Position: 2 Size: 4 (Clip)
(479.6) - General Observation Remark: JOINT OFFSET MEDIUM/ROOTS HEAVY (Clip)
(484.7) - Roots Fine Joint - Position: 8 To 4 - Cont Def: F01 (Clip)
(502.5) - Fracture Longitudinal - Position: 7 Defect: 3 (Clip)
(514.3) - Crack Multiple - Position: 8 To 4 Defect: 2 (Clip)
(515.3) - Tap Factory - Position: 2 Size: 4 (Clip)
(515.3) - General Observation Remark: CRACKS (Clip)
(518.1) - Tap Factory - Position: 10 Size: 4 (Clip)
(518.1) - General Observation Remark: JOINT OFFSET MEDIUM (Clip)
(526.3) - Fracture Multiple - Position: 4 To 7 Defect: 4 (Clip)
(532.9) - Crack Multiple - Position: 7 To 5 Defect: 3 (Clip)
(551.3) - Tap Factory - Position: 2 Size: 4 (Clip)
(551.3) - General Observation Remark: JOINT OFFSET MEDIUM/CRACKS (Clip)

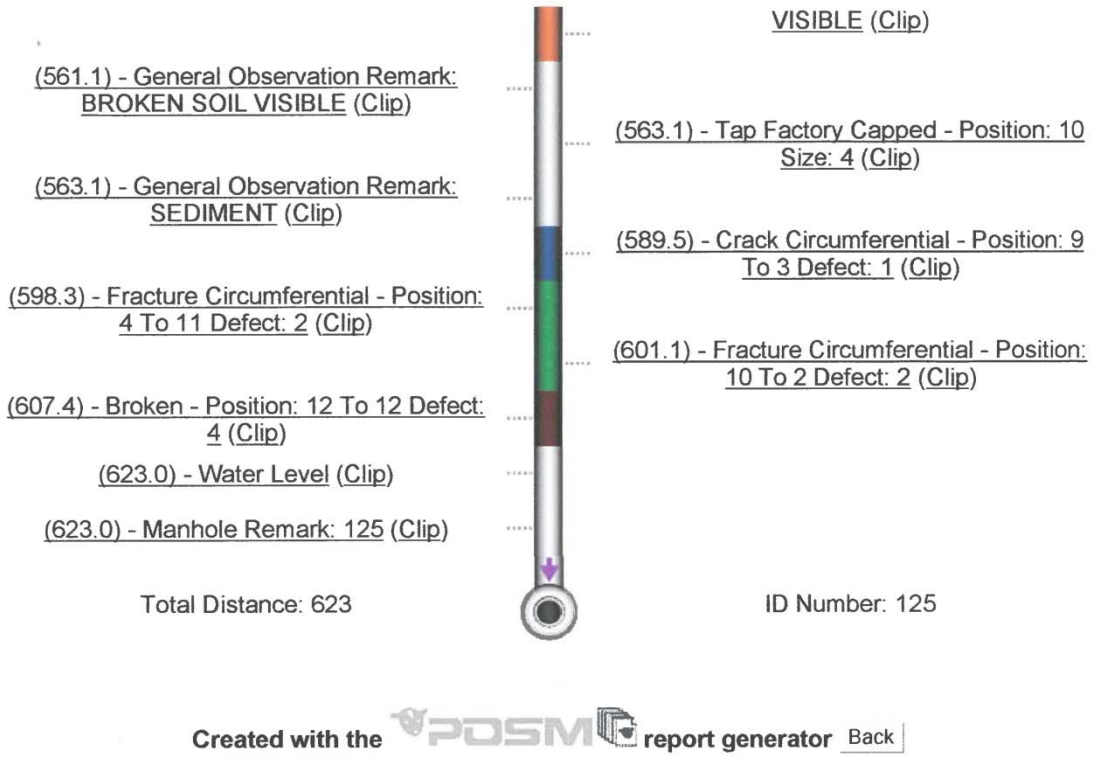


Figure C-1: Simple Report of LU-119 by Presidio System

CD#15

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SAN JOSE,CA 95110

Project Summary

BURBANK DISTRICT PROJECT 2012

Main ID	Date	Address	Start MH	Finish MH	Pipe	Asset length	Surveyed Length
SECTION# LU 115 DOWNSTREA	12/11/2012	BASILE AVE	SECTION#LU 115	DOWNSTREAM SURVEY	VCP	598.4	598.4
SECTION#LU 116 UPSTREAM S	12/11/2012	BASILE AVE	SECTION#LU 116	UPSTREAM SURVEY	VCP	290.1	290.1

Number of inspections: 2

Subtotal	**888.5 ft**	**888.5 ft**
Total	**888.5 ft**	**888.5 ft**

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GraniteXP Observation Report with Still Images

Pipeline Segment Ref:	Project Name:	Start date/time:	Weather:	Surveyed by:
SECTION# LU 115 DOWNSTREA	BURBANK DISTRICT PROJECT 2012	12/11/2012 9:13:43 AM		Lupe Pattison

Upstream manhole No:	Downstream manhole No:	Total length:
SECTION#LU 115	DOWNSTREAM SURVEY	

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
120.6		BSV	No	8 / 4		

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GraniteXP Observation Report with Still Images

Pipeline Segment Ref:	Project Name:	Start date/time:	Weather:	Surveyed by:
SECTION# LU 115 DOWNSTREA	BURBANK DISTRICT PROJECT 2012	12/11/2012 9:13:43 AM		Lupe Pattison

Upstream manhole No:	Downstream manhole No:	Total length:
SECTION#LU 115	DOWNSTREAM SURVEY	

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
120.6		BSV	No	8 / 4		

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GraniteXP Observation Report with Still Images

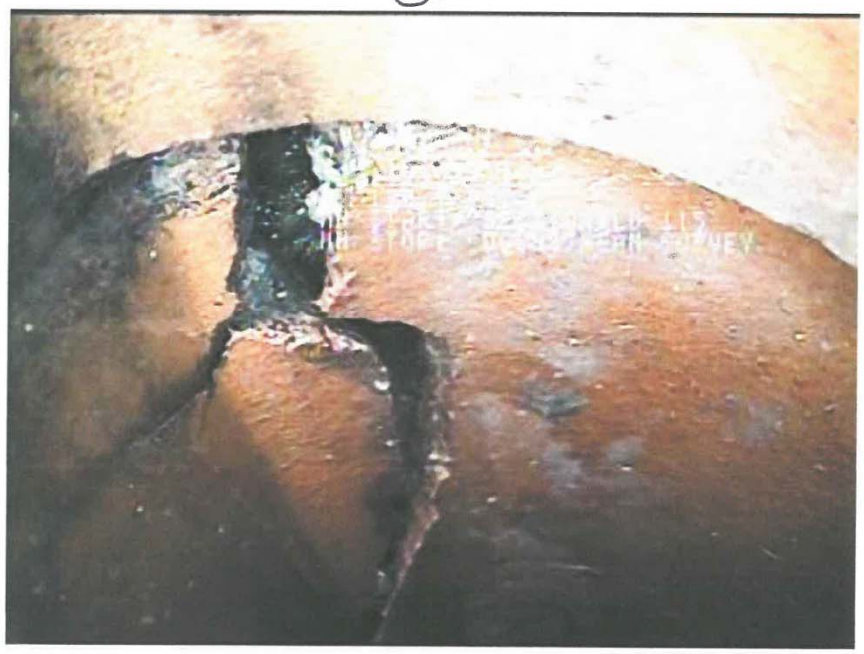
Pipeline Segment Ref:	Project Name:	Start date/time:	Weather:	Surveyed by:
SECTION# LU 115 DOWNSTREA	BURBANK DISTRICT PROJECT 2012	12/11/2012 9:13:43 AM		Lupe Pattison

Upstream manhole No:	Downstream manhole No:	Total length:
SECTION#LU 115	DOWNSTREAM SURVEY	

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
120.6		BSV	No	8 / 4		



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GraniteXP Observation Report with Still Images

Pipeline Segment Ref:	Project Name:	Start date/time:	Weather:	Surveyed by:
SECTION# LU 115 DOWNSTREA	BURBANK DISTRICT PROJECT 2012	12/11/2012 9:13:43 AM		Lupe Pattison

Upstream manhole No:	Downstream manhole No:	Total length:
SECTION#LU 115	DOWNSTREAM SURVEY	

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
120.6		BSV	No	8 / (4)		

ABLE
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SAN JOSE,CA 95110

GraniteXP Observation Report with Still Images

Pipeline Segment Ref:	Project Name:	Start date/time:	Weather:	Surveyed by:
SECTION# LU 115 DOWNSTREA	BURBANK DISTRICT PROJECT 2012	12/11/2012 9:13:43 AM	1	Lupe Pattison

Upstream manhole No:	Downstream manhole No:	Total length:
SECTION#LU 115	DOWNSTREAM SURVEY	598.4

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
181.4		BSV	No	5 /		

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SAN JOSE,CA 95110

PACP Sewer Report

Surveyed by:	Certificate No:	Owner:	Survey Customer	Drainage Area:	Sheet Number:
Lupe Pattison	U-811-13292		BURBANK DISTRICT PROJECT 2012		1

Work order:	Pipeline Segment Ref:	Start date/time:		Street:	City:
	SECTION# LU 115 DOWNSTREA	2012/12/11	09:13	BASILE AVE	SAN JOSE

Location details:	Upstream manhole No:	Rim to invert:	Grade to invert:	Rim to grade:
	SECTION#LU 115			

Downstream manhole No:	Rim to invert:	Grade to invert:	Rim to grade:	Sewer use:	Direction:	Flow Control:	Height:
DOWNSTREAM SURVEY					D		6

Width:	Shape:	Material:	Ln. Method:	Pipe Joint Length:	Total length:	Length surveyed:	Year Laid:	Year renewed:	Media Label:
6	C	VCP			598.4	598.4			

Purpose:	Sewer Category:	Pre-Cleaning	Date Cleaned:	Weather:	Location Code:	Additional Info:
H		J		1		

Grade	Amount of Structural Defects	Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating	Structural Pipe Rating Index	Amount of O&M Defects	O&M Segment Grade	O&M Pipe Rating	O&M Quick Rating	O&M Pipe Rating Index	Overall Pipe Rating	Overall Pipe Rating Index
1	40	40	280	5A4A	2.333333	5	5	5	1500	1	313	2.251799
2	39	78				0	0					
3	16	48				0	0					
4	11	44				0	0					
5	14	70				0	0					

ABLE
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SAN JOSE,CA 95110

Surveyed by: Lupe Pattison

Owner:

Start date/time: 2012/12/11

Upstream manhole No: SECTION#LU 115

Pipeline Segment Ref: SECTION# LU 115 DOWNSTREA

Sheet Number: 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm) 1st	Value Inches (mm) 2nd	%	Joint	Circumferential Location At/From	Circumferential Location to	Image Ref.	Family	Rating	Remarks
5.0	29	AMH											CF		ACCESS POINT
5.0	29	MWL						5							
7.0	101	CM								10	2		S	3	
9.8	179	CS								2	8		S	2	
9.8	216	JSM		M									S	1	
9.8	224	JOM		M									S	1	
18.8	296	CH2								8	10		S	4	
21.8	371	CL								2			S	2	
30.4	447	CM								5	7		S	3	
45.7	572	CL								5			S	2	
46.0	615	CS								1	9		S	2	
52.0	696	CC								3	8		S	1	
62.3	813	CC								4	7		S	1	
77.2	915	CH2								11	7		S	4	
80.3	993	CS								3	8		S	2	
81.2	1030	TF				4				9			CF		
86.4	1119	CS								9	4		S	2	
87.4	1161	TFD				4				3			CF	2	
88.2	1220	JSM		M									S	1	

ABLE
1020 RUFF DR.
SAN JOSE,CA 95110

Surveyed by: Lupe Pattison

Owner:

Start date/time: 2012/12/11

Upstream manhole No: SECTION#LU 115

Pipeline Segment Ref: SECTION# LU 115 DOWNSTREA

Sheet Number: 3

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm) 1st	Value Inches (mm) 2nd	%	Joint	Circumferential Location At/From	Circumferential Location to	Image Ref.	Family	Rating	Remarks
88.2	1229	JOM			M								S	1	
105.0	1362	CS								9	2		S	2	
108.1	1412	CS								3	9		S	2	
114.3	1493	CS								2	9		S	2	
116.0	1563	JSM			M								S	1	
116.0	1571	JOM			M								S	1	
120.6	1679	BSV		S01					J	8	4	BURBANK DISTRICT PROJECT 2012-SECTION #LU 115-DOWNSTREAM SURVEY BSV at 120.6 ft (D).jpg	S	5	
133.5	2040	TFD				4				9			CF	2	
135.7	2100	FS								11	2		S	3	
136.5	14	TFD				4				3			CF	2	
147.7	141	CS								12	2		S	2	
147.7	162	RFJ							J	8			O&M	1	
166.3	328	CS		F01					J	2	8		S	2	
172.4	463	RFJ							J	8	4		O&M	1	
175.5	550	RFJ							J	9	2		O&M	1	
175.5	565	CL								11			S	2	

ABLE
1020 RUFF DR.
SAN JOSE,CA 95110

Surveyed by: Lupe Pattison

Owner:

Start date/time: 2012/12/11

Upstream manhole No: SECTION#LU 115

Pipeline Segment Ref: SECTION# LU 115 DOWNSTREA

Sheet Number: 4

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm) 1st	Value Inches (mm) 2nd	%	Joint	Circumferential Location At/From	Circumferential Location to	Image Ref.	Family	Rating	Remarks
176.5	602	TFD				4				3			CF	2	
176.5	626	MWL						5							
178.3	708	CS								2	11		S	2	
178.3	735	RFJ							J	8	11		O&M	1	
181.4	806	BSV								5		BURBANK DISTRICT PROJECT 2012-SECTION #LU 115-DOWNSTREAM SURVEY BSV at 181.4 ft (D).jpg	S	5	
181.4	844	FM							J	8	5		S	4	
182.4	920	TF				4				9			CF		
190.8	975	RFJ							J	8	5		O&M	1	
197.0	1062	CS		S02					J	8	11		S	2	
221.8	1333	CL								8			S	2	
228.2	1425	CS								2	9		S	2	
229.2	1460	TFD				4				3			CF	2	
231.1	1510	CL								12			S	2	
231.8	1559	CC								8	5		S	1	
234.8	1612	JOM			M								S	1	
235.6	1649	TF				4				9			CF		

ABLE
1020 RUFF DR.
SAN JOSE,CA 95110

Surveyed by: Lupe Pattison | Owner: | Start date/time: 2012/12/11 | Upstream manhole No: SECTION#LU 115 | Pipeline Segment Ref: SECTION# LU 115 DOWNSTREA | Sheet Number: 5

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm) 1st	Value Inches (mm) 2nd	%	Joint	Circumferential Location At/From	Circumferential Location to	Image Ref.	Family	Rating	Remarks
253.0	1781	CS								12	9		S	2	
255.6	1870	JOM			M								S	1	
262.0	1977	FM								7	6		S	4	
265.0	2111	CH2								8	5		S	4	
275.1	34	MWL						5							
283.6	89	CL								11			S	2	
284.5	125	TFD				4				9			CF	2	
286.4	180	CL								8			S	2	
286.6	208	CL								2			S	2	
287.7	241	TFD				4				3			CF	2	
289.7	305	JSM			M								S	1	
289.7	315	JOM			M								S	1	
289.8	377	CC								12	5		S	1	
296.0	431	CS								12	9		S	2	
299.2	517	CL								9			S	2	
299.2	533	JSM			M								S	1	
305.2	597	CH3								8	3		S	5	
311.4	729	CS								9	2		S	2	
317.7	814	CC								8	5		S	1	

ABLE
1020 RUFF DR.
SAN JOSE,CA 95110

Surveyed by: Lupe Pattison

Owner:

Start date/time: 2012/12/11

Upstream manhole No: SECTION#LU 115

Pipeline Segment Ref: SECTION# LU 115 DOWNSTREA

Sheet Number: 6

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm) 1st	Value Inches (mm) 2nd	%	Joint	Circumferential Location At/From	Circumferential Location to	Image Ref.	Family	Rating	Remarks
320.6	895	CS								12	8		S	2	
324.5	945	TF				4				3			CF		
329.4	1014	CM								8	5		S	3	
333.0	1090	JSM			M								S	1	
333.0	1098	JOM			M								S	1	
333.9	1121	TF				4				9			CF		
342.3	1249	CS								12	5		S	2	
342.3	1288	JSM			M								S	1	
342.3	1299	JOM			M								S	1	
348.4	1375	CS								8	3		S	2	
354.9	1499	CM								9	2		S	3	
357.9	1565	CM								11	5		S	3	
363.9	1668	CS								2	9		S	2	
370.1	1762	CM								9	12		S	3	
376.6	1853	CH4								5	8		S	5	
376.6	1893	JSM			M								S	1	
382.9	1986	CM								12	9		S	3	
383.7	2061	TFD				4				9			CF	2	
385.5	2129	CM								8	2		S	3	

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ABLE
1020 RUFF DR.
SAN JOSE,CA 95110

Surveyed by: Lupe Pattison

Owner:

Start date/time: 2012/12/11

Upstream manhole No: SECTION#LU 115

Pipeline Segment Ref: SECTION# LU 115 DOWNSTREA

Sheet Number: 7

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm) 1st	2nd	%	Joint	Circumferential Location At/From	to	Image Ref.	Family	Rating	Remarks
386.6	36	TFD				3				3			CF	2	
391.8	112	CS								12	2		S	2	
397.9	202	CH2								2	4		S	4	
407.3	283	CH2								8	12		S	4	
419.4	397	CM								8	3		S	3	
420.8	472	JSM			M								S	1	
420.8	480	JOM			M								S	1	
423.8	520	TF				4				3			CF		
424.2	577	JSM			M								S	1	
424.2	586	JOM			M								S	1	
428.7	646	CM								8	4		S	3	
433.8	736	JOM			M								S	1	
434.7	779	JSM			M								S	1	
434.7	789	JOM			M								S	1	
435.6	831	TF				4				9			CF		
436.2	892	JSM			M								S	1	
436.2	902	JSM			M								S	1	
437.8	935	CS								12	4		S	2	
444.1	1021	CS								2	7		S	2	

ABLE
1020 RUFF DR.
SAN JOSE,CA 95110

Surveyed by: Lupe Pattison

Owner:

Start date/time: 2012/12/11

Upstream manhole No: SECTION#LU 115

Pipeline Segment Ref: SECTION# LU 115 DOWNSTREA

Sheet Number: 8

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm) 1st	Value Inches (mm) 2nd	%	Joint	Circumferential Location At/From	Circumferential Location to	Image Ref.	Family	Rating	Remarks
444.1	1051	JSM			M								S	1	
450.2	1115	CS								9	5		S	2	
456.3	1224	CM								7	2		S	3	
462.7	1315	CC								7	5		S	1	
468.7	1398	CM								9	12		S	3	
478.0	1499	CH2								8	4		S	4	
479.7	1559	JSM			M								S	1	
479.7	1567	JOM			M								S	1	
481.3	1618	JSM			M								S	1	
481.3	1625	JOM			M								S	1	
481.8	1712	TF				4				9			CF		
485.0	1857	JOM			M								S	1	
485.0	1871	CH2								7	5		S	4	
488.0	1977	TFD				4				3			CF	2	
490.0	2017	CL								12			S	2	
499.1	2132	CH2								10	8		S	4	
499.1	24	JOM			M								S	1	
501.2	87	CM								7	5		S	3	
502.2	135	FM								5	11		S	4	

ABLE
1020 RUFF DR.
SAN JOSE,CA 95110

Surveyed by: Lupe Pattison

Owner:

Start date/time: 2012/12/11

Upstream manhole No: SECTION#LU 115

Pipeline Segment Ref: SECTION# LU 115 DOWNSTREA

Sheet Number: 9

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm) 1st	Value Inches (mm) 2nd	%	Joint	Circumferential Location At/From	Circumferential Location to	Image Ref.	Family	Rating	Remarks
508.4	205	CS								11	2		S	2	
524.0	330	CM								8	12		S	3	
525.0	361	TFD				4				9			CF	2	
526.9	435	CS								12	10		S	2	
526.9	466	JOM			M								S	1	
530.0	534	CM								9	2		S	3	
533.0	603	CS								12	3		S	2	
533.9	644	TFD				4				3			CF	2	
536.2	708	CL								9			S	2	
542.3	772	CS								11	8		S	2	
561.1	878	CH3								10	12		S	5	
563.6	931	MWL						5							
568.1	970	TFD				4				3			CF	2	
568.1	991	MWL						10							
570.1	1044	CS								9	4		S	2	
570.9	1083	TFD				4				9			CF	2	
575.3	1123	MWL						5							
582.4	1192	JSM			M								S	1	
582.4	1203	CH3							J	8	11		S	5	

ABLE
1020 RUFF DR.
SAN JOSE,CA 95110

Surveyed by: Lupe Pattison

Owner:

Start date/time: 2012/12/11

Upstream manhole No: SECTION#LU 115

Pipeline Segment Ref: SECTION# LU 115 DOWNSTREA

Sheet Number: 10

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches (mm) 1st	Value Inches (mm) 2nd	%	Joint	Circumferential Location At/From	Circumferential Location to	Image Ref.	Family	Rating	Remarks
588.6	1290	CS								12	5		S	2	
593.8	1350	MWL						10							
598.4	1402	AEP											CF		

Figure C-2: Simple Report of LU-115 by ABLE Underground Construction

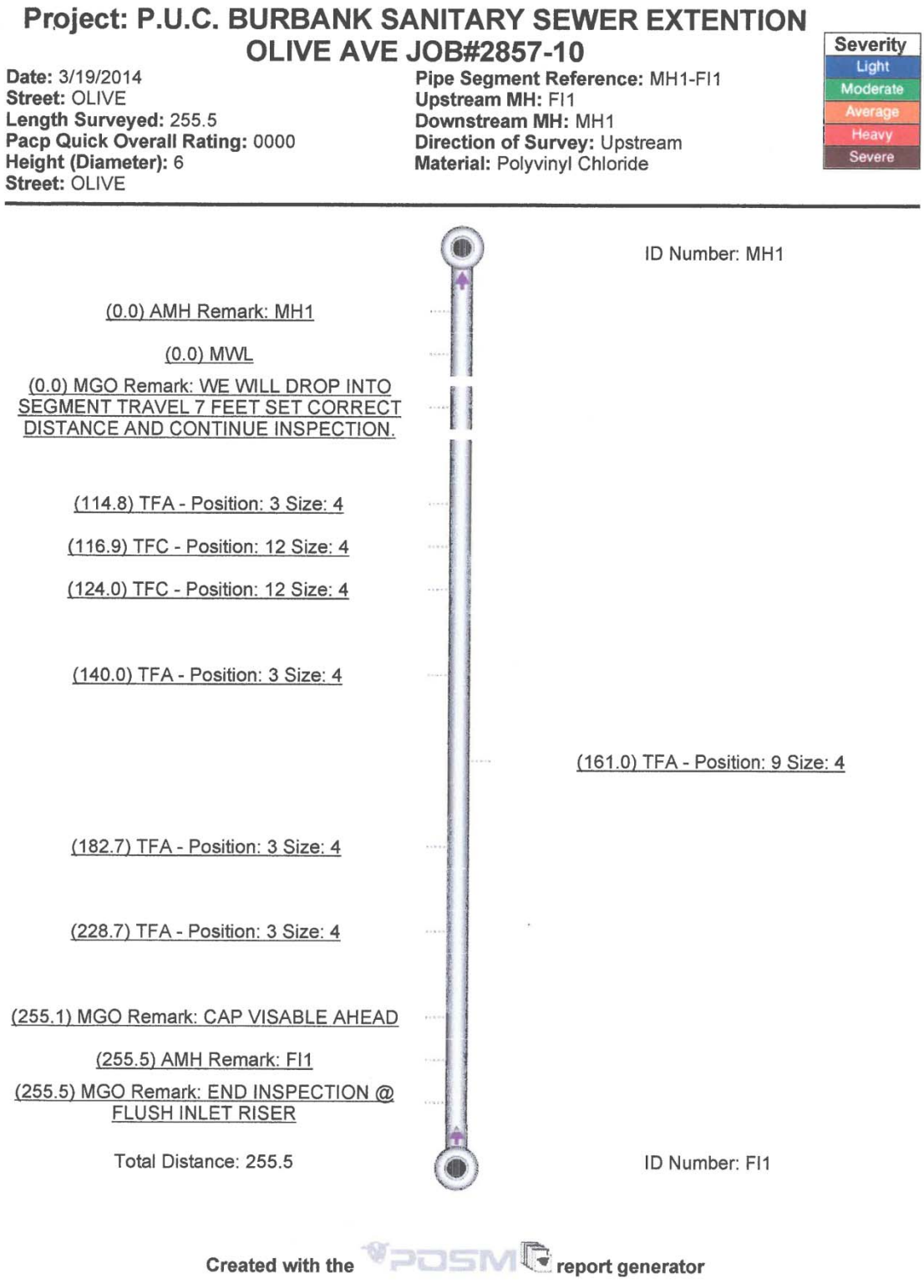

Figure C-3: Simple Report of LU-222 by Pacific Underground Construction

APPENDIX D:

TABLE D-1: SEWER MAIN SEGMENTS RECOMMENDED FOR REHABILITATION OR REPLACEMENT

Rank	Segment	Manhole		Location	Pipeline			Defects (Report)			Conceptual Estimate for Spot Repair (3,4,5)	Adjusted Conceptual Estimate with Combining Spot Repair (3,4,5)	Conceptual Estimate for Spot Repair (4,5)	Adjusted Conceptual Estimate with Combining Spot Repair (4,5)	Conceptual Estimate for Pipe Replacement	Remark		
		Upstream	Downstream		Length (LF)	Diameter (in)	Type	3	4	5						Defect Rating 1	Defect Rating 2	Comment
59	LU-101	201	202	BALIEY AVE	382	6	VCP	2	0	0	$14,000	$14,000	$0	$0	$36,290	1	3	Fair
14	LU-102	202	2	BALIEY AVE	400	6	VCP	0	4	1	$35,000	$28,000	$35,000	$28,000	$38,000	0	0	Poor
38	LU-103	203	204	CECIL ST	375	6	VCP	1	2	0	$21,000	$21,000	$14,000	$14,000	$35,625	0	0	Fair
26	LU-104	204	204A	BASCOM AVE	400	6	VCP	1	0	1	$14,000	$14,000	$7,000	$7,000	$38,000	0	0	Fair
27	HU-101	103	102	BASCOM AVE	387	6	VCP	0	0	1	$7,000	$7,000	$7,000	$7,000	$36,765	1	0	Fair
23	HU-102	102	101	BASCOM AVE	400	6	VCP	0	1	1	$14,000	$14,000	$14,000	$14,000	$38,000	0	1	Fair
63	HU-105B	FI	219	OLIVE ST	130	6	VCP	0	0	0	$0	$0	$0	$0	$0	1	1	Good
45	LU-104A	204A	E3	CECIL ST	91	6	VCP	1	1	0	$14,000	$7,000	$7,000	$7,000	$8,645	0	0	Fair
64	LU-105	220	219	TOPEKA AVE	555	6	VCP	0	0	0	$0	$0	$0	$0	$0	0	1	Good
65	LU-106A	FI	219A	OLIVE ST	123	6	PVC	0	0	0	$0	$0	$0	$0	$0	0	0	Good
66	LU-106	219	212	TOPEKA AVE	581	6	VCP	0	0	0	$0	$0	$0	$0	$0	0	0	Good
19	LU-107A	222	221	CLEVELAND AVE	525	6	VCP	1	2	1	$28,000	$14,000	$21,000	$14,000	$49,875	0	0	Fair
8	LU-107	221	213	CLEVELAND AVE	581	6	PVC	0	11	2	$91,000	$56,000	$91,000	$56,000	$55,195	1	0	Poor
15	LU-108A	224	223	BROOKLYN AVE	535	6	VCP	0	3	1	$28,000	$28,000	$28,000	$28,000	$50,825	0	0	Poor
6	LU-108	223	214	BROOKLYN AVE	581	6	VCP	0	5	3	$56,000	$42,000	$56,000	$42,000	$55,195	0	0	Poor
11	LU-109A	226	225	BOSTON AVE	544	6	VCP	1	2	2	$35,000	$21,000	$28,000	$21,000	$51,680	0	0	Poor
16	LU-109	225	215	BOSTON AVE	581	6	VCP	0	3	1	$28,000	$21,000	$28,000	$21,000	$55,195	0	0	Poor
46	LU-110	218	217	WABASH AVE	559	6	VCP	0	1	0	$7,000	$7,000	$7,000	$7,000	$53,105	0	0	Fair
32	LU-201	106	105	LASWELL AVE	461	6	VCP	7	3	0	$70,000	$35,000	$21,000	$21,000	$43,795	23	7	Poor
18	LU-203	104	1	LASWELL AVE	382	6	VCP	1	2	1	$28,000	$28,000	$21,000	$21,000	$36,290	0	2	Fair
67	LU-204	109	108	VAUGHN AVE	454	6	VCP	0	0	0	$0	$0	$0	$0	$0	4	1	Fair
68	LU-205	108	107	VAUGHN AVE	400	6	VCP	0	0	0	$0	$0	$0	$0	$0	1	1	Good
17	LU-206	107	3	VAUGHN AVE	441	6	VCP	2	2	1	$35,000	$28,000	$21,000	$14,000	$41,895	0	0	Poor
57	LU-207	112	111	ARLETA AVE	452	6	VCP	5	0	0	$35,000	$35,000	$0	$0	$42,940	6	5	Fair
47	LU-208	111	110	ARLETA AVE	403	6	VCP	0	1	0	$7,000	$7,000	$7,000	$7,000	$38,285	0	0	Good
9	LU-209	110	4	ARLETA AVE	440	6	VCP	0	4	2	$42,000	$42,000	$42,000	$42,000	$41,800	0	0	Poor
56	HU-138	115	114	RAYMOND AVE	454	8	VCP	6	0	0	$42,000	$28,000	$0	$0	$56,750	5	12	Poor
60	HU-139	114	113	RAYMOND AVE	400	8	VCP	1	0	0	$7,000	$7,000	$0	$0	$50,000	2	14	Poor

Rank	Segment	Manhole		Location	Pipeline			Defects (Report)			Conceptual Estimate for Spot Repair (3,4,5)	Adjusted Conceptual Estimate with Combining Spot Repair (3,4,5)	Conceptual Estimate for Spot Repair (4,5)	Adjusted Conceptual Estimate with Combining Spot Repair (4,5)	Conceptual Estimate for Pipe Replacement	Remark		
		Upstream	Downstream		Length (LF)	Diameter (in)	Type	3	4	5						Defect Rating 1	Defect Rating 2	Comment
69	HU-140	113	5	RAYMOND AVE	440	8	VCP	0	0	0	$0	$0	$0	$0	$0	2	9	Poor
30	LU-210	303	302	IRVING AVE	457	6	VCP	0	4	0	$28,000	$28,000	$28,000	$28,000	$43,415	0	1	Poor
4	LU-211	302	301	IRVING AVE	403	6	VCP	0	4	4	$56,000	$28,000	$56,000	$28,000	$38,285	0	0	Poor
39	LU-212	301	6	IRVING AVE	434	6	VCP	0	2	0	$14,000	$7,000	$14,000	$7,000	$41,230	0	1	Fair
33	LU-122	FI	134	LELAND AVE	278	6	VCP	0	3	0	$21,000	$21,000	$21,000	$21,000	$26,410	0	0	Fair
12	LU-123	134	133	LELAND AVE	632	6	VCP	0	2	2	$28,000	$28,000	$28,000	$280,000	$60,040	0	0	Fair
36	LU-213	133	305	LELAND AVE	460	6	VCP	3	2	0	$35,000	$28,000	$14,000	$14,000	$43,700	0	1	Fair
7	LU-214	305	304	LELAND AVE	400	6	VCP	0	1	3	$28,000	$21,000	$28,000	$21,000	$38,000	0	0	Poor
37	LU-215	304	7	LELAND AVE	434	6	VCP	0	2	0	$14,000	$7,000	$14,000	$7,000	$41,230	0	1	Fair
34	LU-216	0	310	RUTLAND AVE	262	6	VCP	0	3	0	$21,000	$21,000	$21,000	$21,000	$24,890	0	0	Fair
24	LU-217	310	309	RUTLAND AVE	630	6	VCP	0	1	1	$14,000	$14,000	$14,000	$14,000	$59,850	0	0	Fair
48	LU-218	309	308	RUTLAND AVE	360	6	VCP	0	1	0	$7,000	$7,000	$7,000	$7,000	$34,200	0	0	Fair
49	LU-219	308	SS	RUTLAND AVE	254	6	VCP	0	1	0	$7,000	$7,000	$7,000	$7,000	$24,130	0	0	Fair
70	LU-220	SS	307	RUTLAND AVE	199	6	VCP	0	0	0	$0	$0	$0	$0	$0	6	1	Fair
50	LU-221	307	08A	RUTLAND AVE	430	6	VCP	0	1	0	$7,000	$7,000	$7,000	$7,000	$40,850	0	0	Fair
61	LU-223	315	314	CLIFTON AVE	390	6	VCP	1	0	0	$7,000	$7,000	$0	$0	$37,050	9	0	Fair
51	LU-224	314	313	CLIFTON AVE	450	6	VCP	0	1	0	$7,000	$7,000	$7,000	$7,000	$42,750	0	0	Fair
52	LU-225	313	09A	CLIFTON AVE	424	6	VCP	0	1	0	$7,000	$7,000	$7,000	$7,000	$40,280	0	0	Fair
58	LU-227	318	317	LEIGH AVE	420	6	VCP	3	0	0	$21,000	$14,000	$0	$0	$39,900	9	2	Poor
28	LU-228	317	316	LEIGH AVE	450	6	VCP	0	0	1	$7,000	$7,000	$7,000	$7,000	$42,750	0	0	Fair
21	LU-229	316	10	LEIGH AVE	475	6	VCP	2	1	1	$28,000	$21,000	$14,000	$14,000	$45,125	1	0	Poor
41	LU-230	321	320	RICHMOND AVE	400	6	VCP	0	2	0	$14,000	$14,000	$14,000	$14,000	$38,000	0	0	Fair
22	LU-231	320	319	RICHMOND AVE	450	6	VCP	0	1	1	$14,000	$14,000	$14,000	$14,000	$42,750	0	0	Fair
29	LU-232	319	11	RICHMOND AVE	475	6	VCP	1	5	0	$42,000	$21,000	$35,000	$21,000	$45,125	0	0	Poor
71	LU-112	FI	119	EASEMENT BASCOM - LASWELL	196	6	VCP				$0		$0		$0			no ranking
10	HU-141	119	118	EASEMENT BASCOM - LASWELL	632	6	VCP	0	3	2	$35,000	$35,000	$35,000	$35,000	$60,040			no ranking
72	LU-114	FI	137	EASEMENT LASWELL - ARLETA	257	6	VCP				$0		$0		$0			no ranking
1	LU-115	137	117	EASEMENT LASWELL - ARLETA	629	6	VCP	16	11	5	$224,000	$126,000	$112,000	$84,000	$59,755	45	54	Poor
31	LU-116	FI	122	EASEMENT ARLETA - RAYMOND	286	6	VCP	14	3	0	$119,000	$70,000	$21,000	$21,000	$27,170	85	9	Poor
2	LU-117	122	116	EASEMENT ARLETA - RAYMOND	633	6	VCP	3	4	5	$84,000	$49,000	$63,000	$49,000	$60,135	1	0	Poor

Rank	Segment	Manhole		Location	Pipeline			Defects (Report)			Conceptual Estimate for Spot Repair (3,4,5)	Adjusted Conceptual Estimate with Combining Spot Repair (3,4,5)	Conceptual Estimate for Spot Repair (4,5)	Adjusted Conceptual Estimate with Combining Spot Repair (4,5)	Conceptual Estimate for Pipe Replacement	Remark		
		Upstream	Downstream		Length (LF)	Diameter (in)	Type	3	4	5						Defect Rating 1	Defect Rating 2	Comment
62	LU-118	FI	126	EASEMENT RAYMOND - IRVING	291	6	VCP	1	0	0	$7,000	$7,000	$0	$0	$27,645	27	10	Poor
5	LU-119	126	125	EASEMENT RAYMOND - IRVING	632	6	VCP	1	6	3	$70,000	$63,000	$63,000	$56,000	$60,040	0	2	Poor
53	LU-120	FI	131	EASEMENT IRVING - LELAND	290	6	VCP	0	1	0	$7,000	$7,000	$7,000	$7,000	$27,550	0	0	Good
73	LU-121A	129A	129	EASEMENT IRVING - LELAND	154	6	VCP	0	0	0	$0	$0	$0	$0	$0	0	0	Excellent
13	LU-121	131	129A	EASEMENT IRVING -LELAND	633	6	VCP	0	1	2	$21,000	$21,000	$21,000	$21,000	$60,135	0	1	Fair
74	HU-108	213	212	FOREST AVE	300	10	VCP	0	0	0	$0	$0	$0	$0	$0	0	2	Good
54	HU-109	214	213	FOREST AVE	300	10	VCP	0	1	0	$7,000	$7,000	$7,000	$7,000	$43,500	0	0	Good
75	HU-110	215	214	FOREST AVE	300	10	VCP	0	0	0	$0	$0	$0	$0	$0	0	3	Good
76	HU-111	216	215	FOREST AVE	300	10	VCP	0	0	0	$0	$0	$0	$0	$0	0	3	Good
78	LU-222	FI1	223	OLIVE ST	256	6	PVC	0	0	0	$0	$0	$0	$0	$0	0	0	Excellent
79	LU-223	FI2	223	OLIVE ST	223	6	PVC	0	0	0	$0	$0	$0	$0	$0	0	0	Excellent
80	LU-225	FI3	225	OLIVE ST	130	6	PVC	0	0	0	$0	$0	$0	$0	$0	0	0	Excellent
55	HU-142	118	106	SCOTT ST	60	8	VCP	0	1	0	$7,000	$7,000	$7,000	$7,000	$7,500	1	0	Good
44	HU-143	108	117	SCOTT ST	231	8	VCP	2	1	0	$21,000	$21,000	$7,000	$7,000	$28,875	28	11	Poor
77	HU-144	117	109	SCOTT ST	19	8	VCP	1	0	0	$7,000	$7,000	$0	$0	$2,375	2	1	Fair
25	HU-130	109	112	SCOTT ST	250	10	VCP	20	0	1	$147,000	$63,000	$7,000	$7,000	$36,250	19	8	Poor
20	HU-131	112	116	SCOTT ST	25	8	VCP	3	1	1	$35,000	$7,000	$14,000	$7,000	$3,125	0	0	Fair
3	HU-132	116	115	SCOTT ST	225	8	VCP	13	6	4	$161,000	$56,000	$70,000	$21,000	$28,125	16	9	Poor
78	HU-133	125	115	SCOTT ST	55	8	VCP	0	0	0	$0	$0	$0	$0	$0	0	0	Excellent
42	HU-134	303	125	SCOTT ST	195	8	VCP	15	1	0	$112,000	$49,000	$7,000	$7,000	$24,375	4	12	Poor
43	HU-135	129	303	SCOTT ST	101	8	VCP	6	1	0	$49,000	$28,000	$7,000	$7,000	$12,625	2	2	Poor
35	HU-136	133	128	SCOTT ST	149	8	VCP	10	3	0	$91,000	$42,000	$21,000	$14,000	$18,625	64	14	Poor
40	HU-137	FI	133	SCOTT ST	105	6	VCP	0	2	0	$14,000	$7,000	$14,000	$7,000	$9,975	3	1	Fair

Note: *Excluded Lateral Connection

*Excluded Traffic Control

*Used $95 / lf for 6-inch pipe

*Used $125 / lf for 8-inch pipe

*Used $145 / lf for 10-inch pipe

Pricing does not include Engineering, Design, Administration and Supervision.

Table D-2: Burbank Sanitary District, 5-Year Capital Improvements Program (2014-2019)

Phase 1

Project Name	Description	Total Cost	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19
Rehabilitation							
LU-115	Replacement of 629 ft of 6-inch pipe	$59,755.00	$59,755.00				
LU-117	Replacement of 633 ft of 6-inch pipe	$60,135.00	$60,135.00				
HU-132	Replacement of 225 ft of 8-inch pipe	$28,125.00	$28,125.00				
LU-211	Replacement of 403 ft of 6-inch pipe	$38,285.00		$38,285.00			
LU-119	Replacement of 632 ft of 6-inch pipe	$60,040.00		$60,040.00			
LU-108	Replacement of 581 ft of 6-inch pipe	$55,195.00		$55,195.00			
LU-214	Replacement of 400 ft of 6-inch pipe	$38,000.00			$38,000.00		
LU-107	Replacement of 581 ft of 6-inch pipe	$55,195.00			$55,195.00		
LU-209	Replacement of 440 ft of 6-inch pipe	$41,800.00			$41,800.00		
LU-109A	3 spot repairs	$21,000.00			$21,000.00		
HU-141	5 spot repairs	$35,000.00				$35,000.00	
LU-123	4 spot repairs	$28,000.00				$28,000.00	
LU-121	3 spot repairs	$21,000.00				$21,000.00	
LU-102	Replacement of 400 ft of 6-inch pipe	$38,000.00				$38,000.00	
LU-108A	4 spot repairs	$28,000.00				$28,000.00	
LU-109	3 spot repairs	$21,000.00					$21,000.00
LU-206	Replacement of 441 ft of 6-inch pipe	$41,895.00					$41,895.00

Project Name	Description	Total Cost	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19
LU-203	Replacement of 382 ft of 6-inch pipe	$36,290.00					$36,290.00
LU-107A	2 spot repairs	$14,000.00					$14,000.00
HU-131	Replacement of 25 ft of 8-inch pipe	$3,125.00					$3,125.00
LU-229	3 spot repairs	$21,000.00					$21,000.00
LU-231	2 spot repairs	$14,000.00					$14,000.00
	Subtotal	**$758,840.00**	**$148,015.00**	**$153,520.00**	**$155,995.00**	**$150,000.00**	**$151,310.00**
Continued Assessment Projects							
Burbank Condition Assessment	CCTV inspection of next 5 years	$160,000.00	$32,000.00	$32,000.00	$32,000.00	$32,000.00	$32,000.00
Preventative Maintenance	Annual maintenance	$100,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00
Eng./Maintenance Management	Oversee budget, evaluates the maintenance program	$1,000,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00
	Subtotal	**$1,260,000.00**	**$252,000.00**	**$252,000.00**	**$252,000.00**	**$252,000.00**	**$252,000.00**
	Total	**$2,018,840.00**	**$400,015.00**	**$405,520.00**	**$407,995.00**	**$402,000.00**	**$403,310.00**

Table D-3: Burbank Sanitary District, 5-Year Capital Improvements Program (2019-2024)

Phase 2 (2019-2024)

Project Name	Description	Total Cost	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Rehabilitation							
HU-102	2 spot repairs	$14,000.00	$14,000.00				
LU-217	2 spot repairs	$14,000.00	$14,000.00				
HU-130	Replacement of 250 ft of 10-inch pipe	$36,250.00	$36,250.00				
LU-104	Replacement of 309 ft of 6-inch pipe	$29,355.00	$29,355.00				
HU-101	1 spot repair	$7,000.00	$7,000.00				
LU-228	1 spot repair	$7,000.00	$7,000.00				
LU-210	1 spot repair	$7,000.00	$7,000.00				
LU-116	Replacement of 286 ft of 6-inch pipe	$27,170.00	$27,170.00				
LU-201	Replacement of 461 ft of 6-inch pipe	$43,795.00		$43,795.00			
LU-122	Replacement of 278 ft of 6-inch pipe	$26,410.00		$26,410.00			
LU-216	Replacement of 262 ft of 6-inch pipe	$24,890.00		$24,890.00			
HU-136	Replacement of 149 ft of 6-inch pipe	$18,625.00		$18,625.00			
LU-213	Replacement of 460 ft of 6-inch pipe	$43,700.00		$43,700.00			
LU-215	1 spot repair	$7,000.00			$7,000.00		
LU-103	Replacement of 375 ft of 6-inch pipe	$35,625.00			$35,625.00		
LU-212	1 spot repair	$7,000.00			$7,000.00		
HU-137	Replacement of 105 ft of 6-inch pipe	$9,975.00			$9,975.00		
LU-230	2 spot repairs	$14,000.00			$14,000.00		

Project Name	Description	Total Cost	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19
HU-134	Replacement of 195 ft of 8-inch pipe	$24,375.00			$24,375.00		
HU-135	Replacement of 101 ft of 8-inch pipe	$12,625.00			$12,625.00		
HU-143	Replacement of 231 ft of 8-inch pipe	$28,875.00			$28,875.00		
LU-104A	Replacement of 91 ft of 6-inch pipe	$8,645.00			$8,645.00		
LU-110	1 spot repair	$7,000.00				$7,000.00	
LU-208	1 spot repair	$7,000.00				$7,000.00	
LU-218	1 spot repair	$7,000.00				$7,000.00	
LU-219	1 spot repair	$7,000.00				$7,000.00	
LU-221	1 spot repair	$7,000.00				$7,000.00	
LU-224	1 spot repair	$7,000.00				$7,000.00	
LU-225	1 spot repair	$7,000.00				$7,000.00	
LU-120	1 spot repair	$7,000.00				$7,000.00	
HU-109	1 spot repair	$7,000.00				$7,000.00	
HU-142	1 spot repair	$7,000.00				$7,000.00	
HU-138	4 spot repairs	$28,000.00				$28,000.00	
LU-207	Replacement of 452 ft of 6-inch pipe	$42,940.00				$42,940.00	
HU-139	1 spot repair	$7,000.00				$7,000.00	
LU-227	2 spot repairs	$14,000.00					$14,000.00
LU-101	2 spot repairs	$14,000.00					$14,000.00
LU-223	1 spot repair	$7,000.00					$7,000.00
LU-118	1 spot repair	$7,000.00					$7,000.00
	Subtotal	**$637,255.00**	**$141,775.00**	**$157,420.00**	**$148,120.00**	**$147,940.00**	**$42,000.00**

Project Name	Description	Total Cost	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19
Continued Assessment Projects							
Burbank Condition Assessment	CCTV inspection of next 5 years	$160,000.00	$32,000.00	$32,000.00	$32,000.00	$32,000.00	$32,000.00
Preventative Maintenance	Annual maintenance	$100,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00
Eng./Maintenance Management	Oversee budget, evaluates the maintenance program	$1,000,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00
	Subtotal	**$1,260,000.00**	**$252,000.00**	**$252,000.00**	**$252,000.00**	**$252,000.00**	**$252,000.00**
	Total	**$1,897,255.00**	**$393,775.00**	**$409,420.00**	**$400,120.00**	**$399,940.00**	**$294,000.00**