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CITY OF ONTARIO

OLD MODEL COLONY SEWER MASTER PLAN

Submitted to

City of Ontario
1425 S. Bon View Avenue
Ontario, California 91761

Submitted by

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Section 1

EXECUTIVE SUMMARY

1-1 INTRODUCTION

Background

The City of Ontario's Old Model Colony has a population of nearly 172,000. Its boundaries cover approximately 35.9 square miles of residential, commercial, and industrial areas.

The existing Old Model Colony sewer collection system is made up of a network of gravity sewers, lift stations, and force mains. The gravity system consists of approximately 365.7 miles (1,931,134 ft) of pipe and 7,582 manholes and cleanouts. The system also includes two lift stations and 6,886 feet of associated force mains.

Previous Studies

The City's latest Master Plan was prepared in 1995 by Kennedy/Jenks Consultants. It analyzed the system based upon a City service area that was approximately 70 percent developed. Approximately 102,400 feet of sewers were identified as under capacity to meet future flow conditions. Replacement of these pipelines was recommended at a cost of \$15.5 Million. It was also recommended to video inspect and rehabilitate the existing facilities constructed before 1930 at a cost of \$10.85 Million. Additionally, an ongoing sewer rehabilitation program and video inspection program was recommended. Since the 1995 Master Plan, the City has implemented some flow diversions and the first phase of an improvement project along Holt Boulevard.

AKM Consulting Engineers prepared the "New Model Colony Sewer Master Plan" in 2001, Sewer Pump Station Improvements and Removals" in 2003, and "Sewer Master Plan Alternatives Analysis" in 2005. These documents evaluated the sewer service needs of the New Model Colony, as well as the feasibility of eliminating five existing sewer pump stations that served the southerly portion of Old Model Colony. Based on the results of these studies, it was recommended that the City pursue the construction of the Eastern Trunk Sewer, Western Trunk Sewer, and Haven Avenue Trunk Sewer at increased sizes to accommodate not only the New Model Colony flows, but also the flows that would be added from the Old Model Colony by removal of five of the existing City sewer pump stations. An alternative was proposed to eliminate the Archibald Ranch, Haven, Riverside/Archibald, Turner, and Whispering Lakes Pump Stations from the Old Model Colony sewer system. The flow tributary to these pump stations would be diverted to New Model Colony sewers, which would convey the flow south to the Inland Empire Utilities Agency's Kimball Interceptor.

Objectives

The objective of this Master Plan is to evaluate the City's Old Model Colony sewer collection system to provide a framework for undertaking the construction of new and replacement facilities in an efficient and cost effective manner. As a planning document, it is general in nature and is predicated upon the best information available at this time.

1-2 STUDY AREA

Location

The study area is located approximately 35 miles east of downtown Los Angeles and encompasses approximately 35.9 square miles (23,000 acres) of residential, commercial, and industrial lands.

Topography

Local elevations within the study area range from 1170 feet amsl at the north City boundary near Grove Avenue to 730 feet amsl at the intersection of Archibald Avenue and Schaefer Avenue. The terrain slopes generally from north to south and east to west.

Climate

The climate in the area is Mediterranean-like with generally moderate temperatures and low humidity year-round. The average median temperature is approximately 83° F. The average annual days of sunshine is 312. The historical average annual rainfall is about 16 inches. Most of the rainfall typically occurs between October and April.

Land Use

The City is a well planned urban community with a balance of residential, commercial, and industrial land uses. The primary land use in the City is residential (6,120 Ac or 26.7 %). Industrial use also makes up a significant portion of the total existing land use (4,606 Ac or 20.1%). The total acreage of Old Model Colony is about 23,584 acres or 36.9 square miles. The total acreage of the study area is about 22,954 acres or 35.9 square miles. Approximately 1,766 acres or 7.7 percent of the total is currently undeveloped.

Population

Since its incorporation in 1891, the City of Ontario has grown from a population of 683 to approximately 172,701 in 2007 (*Ref: California Department of Finance*). With the total number of housing units at approximately 46,959 and a 3.66 percent vacancy rate, the population per household is estimated to be 3.793 (*Ref: California Department of Finance*). The ultimate population in Old Model Colony is estimated at 187,865. This is an increase of 9.7 percent from the existing Old Model Colony population of about 171,200.

1-3 CRITERIA

General

Establishing performance standards is an important part of evaluating existing wastewater collection systems, as it forms the basis for system analysis and system improvement recommendations. These standards include methodology for estimating wastewater design flows and minimum design standards for the collection system pipes, pump stations, and force mains.

Flow Monitoring

In order to estimate the residential, commercial, and industrial wastewater flows in the City, a temporary flow monitoring study was conducted by ADS Environmental Services from November 4, 2006 to December 12, 2006 at fifteen locations.

Unit Flow Factors

Unit flow factors utilized in this study were developed based upon the existing land uses obtained from the City's GIS and results of the flow monitoring studies. Water use records, aerial photographs and field reviews supplemented this information.

Peaking Factors

The adequacy of a sewage collection system is based upon its ability to convey the peak dry weather flow (PDWF) and peak wet weather flow.

The temporary flow monitoring data was reviewed to develop peaking relationships at each site. As expected, these relationships varied from site to site depending upon the makeup and size of the tributary land use. Based upon the information from the temporary flow monitoring effort, the following peaking relationships for dry weather and wet weather were selected for this study:

$$Q_{\text{peak}} \text{ (mgd)} = 2.0 \times Q_{\text{ave}} \text{ (mgd)}^{0.92}$$

where Q_{peak} = Peak Dry Weather Flow

Q_{ave} = Average Dry Weather Flow

$$\text{Peak Wet Weather Flow (PWWF)} = 1.34 \times \text{Peak Dry Weather Flow (PDWF)}$$

Sewer Design Criteria

Design criteria are established to ensure that the collection system can operate effectively under all flow conditions. Each pipe segment must convey peak wet weather flows without surcharging the system. Low flows must be conveyed at a velocity that will prevent solids from settling and blocking the system. Details of the criteria recommended for the collection system, the lift stations, and service to Specific Plan and Development sub-areas are included in Section 4 of this report.

1-4 EXISTING WASTEWATER SYSTEM

General Description

The City's existing sewer collection system in Old Model Colony is made up of a network of gravity sewers, pump stations, and force mains. The gravity system consists of approximately 365.7 miles (1,931,134 ft) of pipe and 7,582 manholes and cleanouts. The system also includes two existing pump stations and 6,886 feet of associated forcemains. The total existing and ultimate average load for Old Model Colony is estimated as 13.8 mgd and 30.1 mgd, respectively.

The general direction of flow is from north to south and east to west. The majority of the local sewers tie directly into one of the Inland Empire Utilities Agency (IEUA) trunk sewers crossing through the City. The sewage is then transported to IEUA's Regional Plant No. 1 (RP-1) for treatment.

The sewers are primarily constructed of vitrified clay pipe with sizes ranging from 4-inches to 42-inches in diameter. Approximately 75 percent of the pipes are 8-inches in diameter.

Regional Facilities

Regional wastewater services are provided to the City of Ontario and its neighboring agencies by the Inland Empire Utilities Agency (IEUA). Several regional trunk sewers collect sewage generated in the City and transport it to IEUA's Regional Plant No. 1 (RP-1) for treatment. RP-1, located south of the Pomona Freeway (SR-60) and west of Cucamonga Creek, has been in operation since 1948 and has a current capacity of 44 million gallons per day. RP-1 also serves the Cities of Rancho Cucamonga, Upland, Montclair, Fontana, and portions of unincorporated San Bernardino County.

IEUA began operation of Regional Plant No. 5 (RP-5) in March 2004. RP-5 is located in the City of Chino at the southeast corner of Kimball Avenue and El Prado Road. Sewage generated in New Model Colony, as well as the flow diverted from the Old Model Colony lift station tributary areas will be treated at RP-5. IEUA also plans to bypass an average flow of up to 20 mgd from RP-1 to RP-5 via the NMC sewer system and Kimball Interceptor Sewer in Kimball Avenue. The original design of Kimball Interceptor Sewer did not include the RP-1 bypass flows. RP-5 will ultimately be capable of treating 60 million gallons per day.

Sewersheds

The City's service area has been divided into seven (7) sewersheds, primarily based on the outlet points where the City's system ties into a downstream facility owned by another agency.

Siphons

The City's Old Model Colony sewer collection system includes inverted siphons at five locations. Each was constructed to go under a major flood control channel or a conflicting utility. The primary concern with siphons is the fact that grease and debris can often build up in the depressed section requiring frequent maintenance to prevent sewer spills.

Flow Splits

Multiple flow splits exist within the Old Model Colony sewer collection system. During the Master Plan study, field investigations were conducted at the "major" flow splits. Major flow splits were identified as those flows located on a main trunk sewer where larger tributary areas were identified.

Septic Tanks

There are approximately 206 existing septic tanks in Old Model Colony per City records. Initial recommendations for connecting the parcels with septic tanks to the existing sewer system are provided in Section 5-7. It was beyond the scope of work to conduct a study for each individual site. Future work to determine the feasibility of connecting these parcels to the sewer system may include field investigations, site surveys, and review of existing utility plans.

Pump Stations

Details of the existing Magnolia Pump Station and Haven Pump Station are provided in Section 5-8. Each of the firm capacities of the pump stations was found to be sufficient for pumping the existing and ultimate estimated tributary peak wet weather sewage flows.

1-5 HYDRAULIC SEWER MODEL

Hydraulic Model Software

To perform a detailed analysis of the sewer collection system, it is essential to create a mathematical model that is capable of simulating the operating characteristics of the system. The simulations for this study were performed utilizing software designed for the analysis of sewer systems. The software selected for this study is H2OMap Sewer. It is a GIS based computer program with the ability to perform steady state analyses of the flows in sanitary sewer systems.

Construction of Model Geometry

Information gathered from the City sewer GIS files, atlas sheets, as-built drawings and interviews with City staff was used to create the model geometry of the existing system. Only active sewers owned by the City of Ontario were included in the hydraulic model. Regional sewers were not modeled.

Missing Information

The City's existing sewer GIS data was not 100 percent complete. Approximately 1,175 reaches were found to be missing invert elevations, the length of the pipe, and/or the slope of the pipe. Several steps, described in Section 6-3, were taken to fill in the data gaps with the most accurate data available.

Split Manholes and Flow Patterns

From the existing sewer GIS and sewer atlas sheets, 135 split manholes (more than one pipe exiting the manhole) were identified in the collection system. Many of these split manholes are located at summits in the upstream portions of the system. Thirty-eight (38) split manholes were identified for further investigation due to their potential significance on the hydraulic model results. As-built plans were reviewed and field inspections of the 38 "major" split manhole locations were conducted. The information obtained was used to select flow monitoring locations and to calibrate the hydraulic model.

Tributary Areas

For better accuracy, a polygon was manually created around individual sewer nodes in the model. Approximately 5,630 polygons were created. Most manholes have a tributary area assigned to it unless there are multiple manholes in the same area.

Model Loads

The existing land uses and the calibrated unit flow factors were utilized to apply the average loads (sewage flows) to the existing model. The ultimate land uses and the ultimate unit flow factors were utilized to apply the average loads to the ultimate model.

Schools

The school loads were calculated individually based upon the number of students and a unit flow factor of 25 gpd per student. The calculated flows were then manually input into the model at the appropriate node.

High Water Users

High water users will typically contribute large volumes of sewage to the local sewer system. Irrigation uses are excluded because this water does not contribute to the sewer system. For this study, the City provided water use records for its entire service area over a one year period. The high water users were generally considered to be those customers with an average water use of 10,000 gpd or more. There were a total of 69 high water users identified in the City.

Pump Stations

Since the outflow point from the Haven Pump Station is not a City sewer facility, the data from the pump station will not affect the model of the existing sewer system. The tributary sewers were modeled up to the pump station location; however, the pump station and forcemain are not included in the hydraulic model.

The tributary flows to the Magnolia Pump Station were transferred in the model to the outflow point (MH O11123).

1-6 SYSTEM ANALYSIS

Hydraulic Analysis

The analysis of the Old Model Colony sewer collection system was based upon the calculated existing and ultimate peak dry weather flows. The hydraulic analysis results can be found in the appendix of this report.

Existing pipes that exceed the following criteria are considered hydraulically deficient:

$$\text{Peak Dry Weather } d/D > 0.64$$

The total length of sewer found to be capacity deficient per the developed criteria is 47,236 feet. This is about 2.4 (47,236 / 1,931,134) percent of the total system length.

Condition Assessment

Condition assessment of the Old Model Colony sewer system was not a part of the scope of work for this master plan. Per the General Waste Discharge Requirements, discussed in Sub-section 2-5, the City's Operation and Maintenance Plan must be completed and adopted by November 2, 2008.

'Hot Spots'

Various 'Hot Spots' in the sewer system exist throughout the City. These are areas of the system with reoccurring problems that require maintenance and cleaning on a quarterly basis minimum. Operations staff reports that the causes of the hot spots are primarily grease, roots, sags, and some hydraulic issues where flow in a low flow sewer is restricted from merging properly into sewers carrying flows with high velocities.

Sanitary Sewer Overflows

There were a total of 13 sanitary sewer overflows responded to by the City of Ontario crews between August 2004 and July 2007. The total number of reported spills over the past four years is as follows:

- 2 spills in 2004
- 3 spills in 2005 (1 on private property)
- 1 spills in 2006
- 7 spills in 2007 (3 on private property)

A sewer collection system with less than three (3) spills from the publicly owned system (excludes private property spills that do not result from a blockage in the public system) per 100 miles per year is considered an adequate system. For the Old Model Colony sewer system, this is an average of 11.1 spills per year. Per the provided documentation, the City has an excellent record with minimal spills.

Maintenance Program

A comprehensive maintenance program including regular inspections, preventative maintenance, and good record keeping is an important tool in assuring reliable system operation.

Preventative Maintenance Program (PMP) consists of periodic system cleaning, inspection, condition assessment, and rehabilitation tasks. Currently, the City has a documented preventative maintenance program. The City should review and update the PMP by November 2, 2008 as a part of the City's Operation and Maintenance Program that is required by the Statewide WDR.

Sewer inspection includes CCTV inspection and condition assessment of the collection system, visual inspection of manholes and their flow channels, ground surface inspection of rights of way and easements, and odor and corrosion monitoring. Condition assessment includes, review of the inspection data, and formulation of maintenance, rehabilitation, and replacement projects. Following the completion of the initial CCTV inspection program, the City should develop a continuing inspection plan based upon the knowledge gained from the initial program. Hot spots should be CCTV inspected before and after each cleaning. Each spill site must be CCTV inspected to pinpoint the cause of the spill, and implementation of corrective measures for preventing repeat spills.

The City currently has about 365.7 miles of pipe. In order to comply with the upcoming CMOM requirements, WDR requirements, and the City's regular preventative maintenance program, the City must quantify the number of employees and equipment necessary to perform these tasks.

Minimum staff recommendations are as follows:

1. Two cleaning crews consisting of three employees each is needed to run the hydro-jet machines and clean the sewers on a routine basis.
2. A separate crew consisting of three employees is needed to televise sewers on a routine basis following cleaning, perform hot spot cleaning, conduct flow monitoring, and performing emergency repairs. As an alternative, the City can contract out the CCTV inspection services and flow monitoring services.

3. A lift station maintenance crew consisting of two employees to keep up with the sewer lift station maintenance work.
4. One full time staff member is recommended to ensure that the City can complete all elements of the waste discharge requirements, including the Fats Oil and Grease (FOG) enforcement and source pollution control enforcement.

1-7 CAPITAL IMPROVEMENT PROGRAM

The primary goal of the Capital Improvement Program (CIP) is to provide the City of Ontario with a long-range planning tool for implementing its sewer infrastructure improvements in an orderly manner and a basis for financing of these improvements. To accomplish this goal, the program is phased based upon the implementation cost of the facilities, the quantity of work the City can reasonably administer each year, and the funds available for these projects.

Capital Improvement Project Priorities

The capital improvement projects were selected primarily with consideration of the health and safety of the public and protection of the environment by minimizing the possibility of overflows. The projects that will eliminate the capacity deficiencies in the gravity collection system are prioritized based upon the hydraulic analyses conducted during this study. When the City completes CCTV of its entire system and a full condition assessment, the capital improvement project priorities should be reevaluated.

For this study, the gravity sewer projects were prioritized as follows:

1. Facilities with existing dry weather capacity deficiencies.
2. The facilities that have shown calculated capacity deficiencies but are currently adequate. Flow monitoring is recommended prior to project implementation. When the measured peak flows exceed the pipe capacity ($d/D = 0.64$ during peak dry weather conditions), the projects should be reprioritized.

In some cases, larger sewers are given higher priorities than small sewers because they serve larger areas and a future spill is expected to be larger in quantity. When segments of sewers with lower priorities are located in the same vicinity as a higher priority project, an exception is made to include these lower priority sewers in that project to provide a more economically feasible Capital Improvement Program.

Capital Improvement Program

The Capital Improvement Program is developed based upon the results of the hydraulic analyses and the established priorities. The recommended improvement project locations are illustrated on Figure 1-1. Gravity collection system projects are listed in detail in Table 1-1 by priority, along with cost estimates. These estimates are based upon recent information for similar projects in the Southern California area, and include contingencies for this planning level study. The cost estimates presented in Table 1-1 reflect replacement of the existing facilities. Replacement costs are more conservative and will therefore allow the City more flexibility for each project.

The construction costs are based upon the following:

8-18 inch diameter pipe	\$40 / diameter inch / ft
21 inch diameter pipe and greater	\$35 / diameter inch / ft

Old Model Colony is largely occupied and there are many existing utilities to consider. Therefore, the costs of replacing sewer facilities will be generally higher than in an area that is undeveloped such as New Model Colony. The total costs shown in Table 1-1 include engineering, administration and contingency costs, estimated at 55% of the construction cost per the City's standard. The CCTV inspection cost of the entire system is spread out over four years. The unit cost of \$2 per linear foot includes CCTV inspection and condition assessment evaluation. There are no other contingencies included.

The recommended CIP has been based upon the best information currently available. It should be updated as new information becomes available from sources such as CCTV inspections and from maintenance crew observations. The project priorities may be revised to correspond to changed conditions, such as impending facility failures, or to take advantage of concurrent construction such as street paving projects or adjacent infrastructure work.

Some of the projects recommended are small and it may not be feasible to implement them as a single project. Therefore, several projects should be combined and bid as a package. Some of the projects may be broken down into smaller components to fit the City's budgetary and other obligations.

The CIP shown in Table 1-1 includes about \$45.7 million dollars in gravity collection system projects. Approximately \$3.86 million dollars is allotted for CCTV inspection and condition assessment evaluation.

The pipe ID numbers and upstream and downstream manhole ID numbers given in Table 1-1 correspond to the City's sewer GIS and atlas maps.

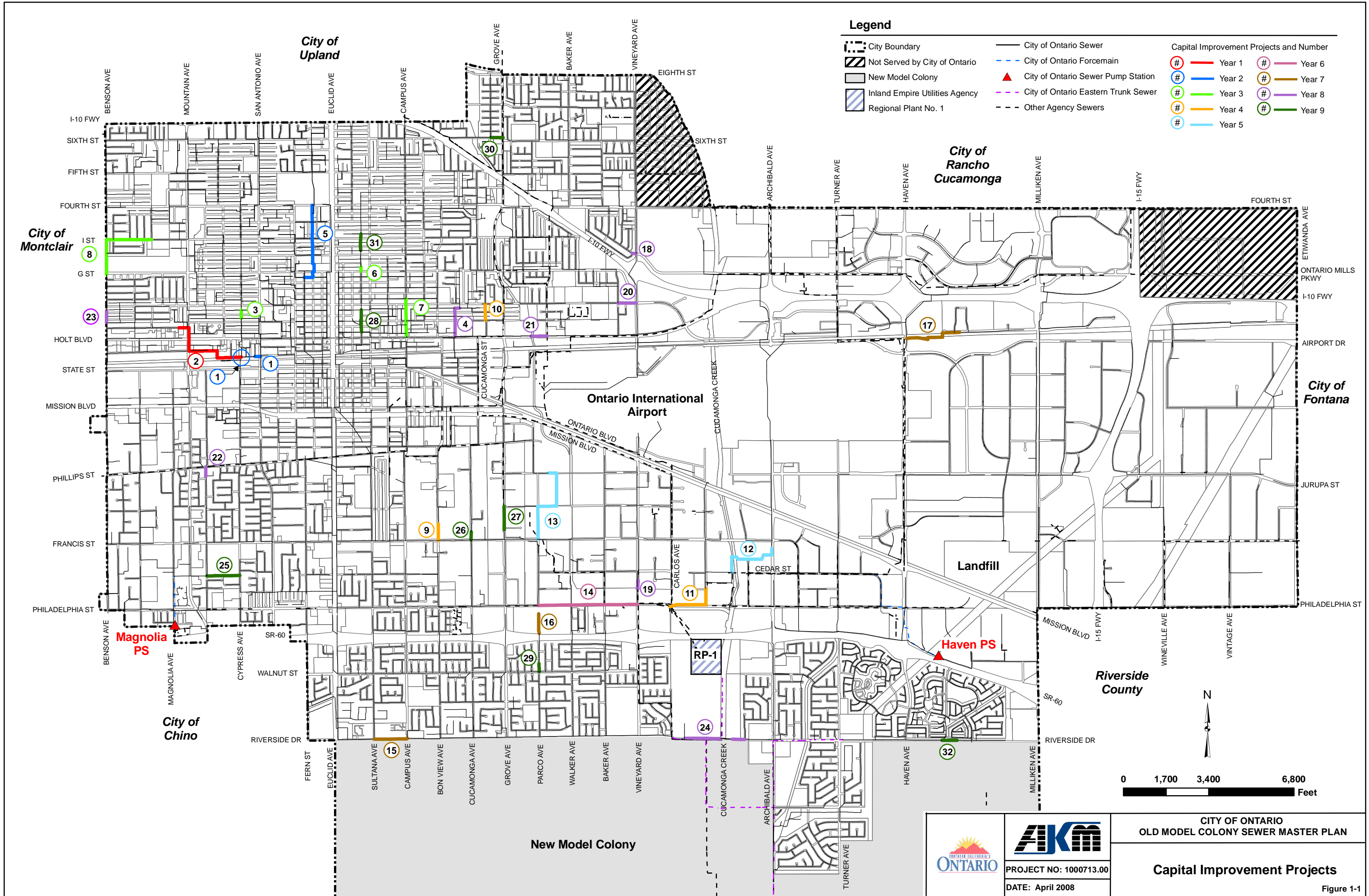


Table 1-1
Capital Improvement Projects

Project No.	Model	Pipe ID	U/S MH ID	D/S MH ID	Street Location	Existing Pipe Size (in)	Replacement Pipe Size (in)	Length (ft)	Slope	Unit Cost (\$/ft)	Cost (\$)	Schedule	Annual Cost (April 2008 Dollars)	
1	West	K121051	K12122	K12121	Easement north of State St and west of San Antonio Ave	8	12	110	0.0080	480	81,840			
	West	K121052	K12121	K12120		8	12	100	0.0080	480	74,400			
	Flow splitting structure at MH K12125					-	-	-	-	-	500,000			
	Subtotal								210	Subtotal		656,240	Year 1	
2	West	J111074	J11155	J11154	Stoneridge Ct, west of Mountain Ave	12	15	318	0.0015	600	295,554			
	West	J111075	J11154	J11153		12	15	35	0.0131	600	32,550			
	West	J111047	J11153	J11152		12	18	21	0.0020	720	22,878			
	West	J111060	J11152	J11163	Mountain Ave, Stoneridge Ct to Brooks St	12	18	236	0.0019	720	262,985			
	West	J111061	J11163	J11164		12	18	165	0.0022	720	184,307			
	West	J111055	J11164	J11173		12	18	279	0.0051	720	311,822			
	West	K111009	J11173	K11114	Brooks St, east of Mountain Ave	12	18	226	0.0027	720	251,770			
	West	K111016	K11114	K11112		12	18	271	0.0014	720	302,425			
	West	K111017	K11112	K11110		12	18	276	0.0015	720	308,016			
	West	K111024	K11110	K11109	Easement east of Mountain Ave, Brooks St to Cypress Ave	12	18	276	0.0015	720	308,016			
	West	K111029	K11109	K11108		12	18	118	0.0015	720	131,721			
	West	K111028	K11108	K11107		12	18	164	0.0015	720	183,024			
	West	K111026	K11107	K11117	Easement east of Mountain Ave, Brooks St to Cypress Ave	12	18	283	0.0016	720	316,330			
	West	K121004	K11117	K12128		12	18	559	0.0015	720	623,308			
	West	K121021	K12128	K12126		12	18	286	0.0015	720	319,176			
	West	K121041	K12126	K12125		12	18	98	0.0015	720	109,814			
Subtotal								3,611	Subtotal		3,963,697	Year 1		
2A	CCTV of Sewers and Condition Assessment Evaluation					Varies		483,000	2.0		966,000			
	Subtotal								483,000	Subtotal		966,000	Year 1	5,585,937
3	West	J121052	J12119	J12123	Esmnt, north of Holowell	8	15	181	0.0079	600	168,051			
	West	J121053	J12123	J12125	Esmnt, south of Holowell	8	15	136	0.0079	600	126,201			
Subtotal								316	Subtotal		294,252	Year 2		
4	North	J151043	J15122	J15123	Easement between Allyn Ave and Virginia Ave, Elma St to Holt Blvd	8	12	180	0.0079	480	133,920			
	North	J151037	J15123	J15134		8	12	327	0.0080	480	243,362			
	North	J151036	J15134	J15141		8	12	340	0.0082	480	252,960			
	North	J151035	J15141	J15145		8	12	337	0.0080	480	250,728			
	North	J151033	J15145	J15155		8	12	130	0.0081	480	96,348			
Subtotal								1,314	Subtotal		977,318	Year 2		
5	West	H131049	H13114	H13126	Easement, Fourth St to J St	8	12	340	0.0050	480	252,960			
	West	H131048	H13126	H13139		8	12	325	0.0030	480	241,800			
	West	H131038	H13139	H13154	Easement, J St to I St	8	12	345	0.0060	480	256,680			
	West	H131039	H13154	H13161		8	12	325	0.0030	480	241,800			
	West	H131075	H13161	I13102	Easement, I St to Granada Ct	8	12	320	0.0030	480	238,080			
	West	I131036	I13102	I13113	Easement, Granada Ct to H St	8	12	320	0.0030	480	238,080			
						8	12	320	0.0020	480	238,080			
	West	I131028	I13120	I13122	Easement, H St to G St	8	12	57	0.0053	480	42,259			
	West	I131027	I13122	I13131		8	12	297	0.0098	480	221,191			
	West	I131033	I13131	I13132	G St at Palm Ave	8	12	62	0.0060	480	45,875			
	West	I131059	I13132	I13137	Palm Ave, south of G St	8	12	190	0.0075	480	141,360			
	West	I131060	I13137	I13FI		8	12	46	0.0075	480	34,514			
	West	I131062	I13FI	I13145	Easement, Palm Ave to Fern Ave	8	12	351	0.0075	480	261,144			
Subtotal								3,298	Subtotal		2,453,824	Year 2		
5A	CCTV of Sewers and Condition Assessment Evaluation					Varies		-	483,000	2.0		966,000		
	Subtotal								483,000	Subtotal		966,000	Year 2	4,691,394
6	North	I131014	I13124	I13129	Cherry Ave, north of G St	8	12	172	0.0033	480	127,968			
	Subtotal								172	Subtotal		127,968	Year 3	
7	North	J141021	J14104	J14117	Campus Ave, D St to Holt Blvd	8	12	400	0.0146	480	297,600			
	North	J141064	J14117	J14139		8	12	476	0.0203	480	354,144			
	North	J141078	J14139	J14143		8	12	163	0.0169	480	121,272			
	North	J141079	J14143	J14163		8	12	311	0.0168	480	231,235			
	North	J141077	J14163	J14170		8	12	28	0.0170	480	20,534			
	North	J141084	J14170	J14186		8	12	85	0.0140	480	63,240			
Subtotal								1,462	Subtotal		1,088,026	Year 3		
8	West	H111001	H11149	H10134	I St, Elderberry Ave to Benson Ave	8	12	292	0.0038	480	217,248			
	West	H101051	H10134	H10136		8	12	50	0.0058	480	37,200			
	West	H101052	H10136	H10138		8	12	241	0.0036	480	179,304			
	West	H101046	H10138	H10137		8	12	100	0.0052	480	74,400			
	West	H101032	H10137	H10139		8	12	181	0.0036	480	134,664			
	West	H101031	H10139	H10140		8	12	149	0.0046	480	110,856			
	West	H101024	H10140	H10141		8	12	243	0.0041	480	180,792			
	West	H101023	H10141	H10142		8	12	252	0.0040	480	187,488			
	West	H101022	H10142	H10135	Benson Ave, I St to G St	8	12	273	0.0048	480	203,112			
	West	I101005	H10135	I10108		8	12	527	0.0183	480	392,014			
	West	I101011	I10108	I10111		8	12	395	0.0184	480	293,880			
	West	I101012	I10111	I10112		8	12	444	0.0184	480	330,187			
Subtotal								3,147	Subtotal		2,341,145	Year 3		

City of Ontario

Table 1-1
Capital Improvement Projects

Project No.	Model	Pipe ID	U/S MH ID	D/S MH ID	Street Location	Existing Pipe Size (in)	Replacement Pipe Size (in)	Length (ft)	Slope	Unit Cost (\$/ft)	Cost (\$)	Schedule	Annual Cost (April 2008 Dollars)
8A	CCTV of Sewers and Condition Assessment Evaluation					Varies	-	483,000	-	2.0	966,000		
							Subtotal	483,000		Subtotal	966,000	Year 3	4,523,138
9	West	N141086	N14135	N14145	Bonview Ave, north of Francis St	8	12	326	0.0060	480	242,544		
	West	N141085	N14145	N14151		8	12	254	0.0060	480	188,976		
	West	N141083	N14151	N14159		8	12	56	0.1086	480	41,292		
							Subtotal	636		Subtotal	472,812	Year 4	
10	North	J151018	J15114	J15125	Virginia Ave, D St to Nocta St	8	12	326	0.0041	480	242,172		
	North	J151045	J15125	J15137		8	12	333	0.0041	480	247,603		
								Subtotal	658		Subtotal	489,775	Year 4
11	East	O181004	O18148	P18101	Hellman Ave, Spruce St to Philadelphia St	18	24	369	0.0022	840	479,787		
	East	P181019	P18101	P18108		18	24	263	0.0022	840	342,765		
	East	P181007	P18108	P18107	Philadelphia St, west of Hellman Ave	18	24	333	0.0014	840	434,087		
	East	P181008	P18107	P18106		18	24	336	0.0014	840	437,472		
	East	P181011	P18106	P18105		18	24	251	0.0014	840	326,151		
	East	P181016	P18105	P18104		18	24	249	0.0014	840	324,328		
	East	P171009	P18104	P17143		18	24	247	0.0014	840	321,464		
							Subtotal	2,048		Subtotal	2,666,053	Year 4	
11A	CCTV of Sewers and Condition Assessment Evaluation					Varies	-	483,000	-	2.0	966,000		
							Subtotal	483,000		Subtotal	966,000	Year 4	4,594,641
12	East	O191028	O19102	O19107	Easement, Archibald Ave to west of Cucamonga Creek	15	18	253	0.0079	720	281,890		
	East	O191016	O19107	O19106		18	24	322	0.0016	840	418,827		
	East	O191017	O19106	O19114		18	24	186	0.0016	840	241,990		
	East	O191018	O19114	O19113		18	24	291	0.0016	840	378,882		
	East	O191006	O19113	O18106		18	24	250	0.0016	840	325,500		
	East	O181079	O18106	O18105		18	24	387	0.0016	840	503,874		
	East	O181025	O18105	O18103		18	24	121	0.0016	840	157,542		
	East	O181012	O18103	O18102		18	24	177	0.0016	840	230,272		
	East	O181016	O18102	O18108		18	24	310	0.0016	840	403,802		
	East	O181015	O18108	O18118		18	24	311	0.0016	840	404,440		
							Subtotal	2,607		Subtotal	3,347,020	Year 5	
13	West	M161010	M16105	M16104	Acacia St, east of Mildred Ave	8	10	322	0.0023	400	199,801		
	West	M161013	M16104	M16108		8	10	296	0.0189	400	183,520		
	West	M161017	M16108	M16109	Easement, Acacia St to Locust St	8	10	296	0.0050	400	183,520		
	West	M161016	M16109	M16110		8	10	296	0.0050	400	183,520		
	West	N161002	M16110	N16100		8	10	296	0.0050	400	183,520		
	West	N161013	N16100	N16103	Locust St, east of Parco Ave	8	10	114	0.0050	400	70,624		
	West	N161016	N16103	N16104		8	12	90	0.0369	480	66,930		
	West	N161012	N16104	N16105		8	12	326	0.0050	480	242,544		
	West	N161011	N16105	N16108	8	12	326	0.0050	480	242,544			
	West	N161017	N16108	N16999	Parco Ave, Locust St to Francis St	8	12	110	0.0101	480	81,881		
	West	N169999	N16999	N16998		8	12	296	0.0050	480	220,224		
	West	N169998	N16998	N16506		8	12	62	0.0050	480	46,128		
	West	N161038	N16506	N16112		8	12	204	0.0050	480	152,022		
	West	N161037	N16112	N16119		8	12	152	0.0050	480	113,088		
							Subtotal	3,187		Subtotal	2,169,866	Year 5	5,516,886
14	West	P161009	P16112	P16111	Philadelphia St, Parco Ave to Vineyard Ave	36	42	323	0.0005	1470	734,816		
	West	P161010	P16111	P16109		36	42	330	0.0005	1470	751,905		
	West	P161011	P16109	P16107		36	42	323	0.0005	1470	735,956		
	West	P161012	P16107	P16105		36	42	312	0.0005	1470	710,892		
	West	P161021	P16105	P16104		36	42	340	0.0005	1470	773,551		
	West	P161022	P16104	P16103		36	42	327	0.0005	1470	743,930		
	West	P161023	P16103	P16102		36	42	327	0.0005	1470	745,070		
	West	P171003	P16102	P17132		36	42	326	0.0005	1470	743,611		
	West	P171015	P17132	P17131		36	42	323	0.0005	1470	736,274		
	West	P171018	P17131	P17130		36	42	325	0.0005	1470	739,373		
	West	P171020	P17130	P17128		36	42	330	0.0005	1470	751,905		
	West	P171021	P17128	P17126		36	42	309	0.0006	1470	703,373		
	West	P171022	P17126	P17115		36	42	5	0.2689	1470	10,253		
							Subtotal	3,898		Subtotal	8,880,909	Year 6	8,880,909
15	South	R141017	R14156	R14155	Riverside Dr, Sultana Ave to Campus Ave	12	15	321	0.0011	600	298,158		
	South	R141018	R14155	R14154		12	15	321	0.0011	600	298,167		
	South	R141019	R14154	R14153		12	15	227	0.0016	600	210,766		
	South	R141016	R14153	R14150		12	15	320	0.0011	600	297,972		
	South	R141060	R14150	R14148		12	15	26	0.0016	600	23,901		
							Subtotal	1,214		Subtotal	1,128,964	Year 7	
16	South	P161042	P16122	P16128	Easement north of SR-60 Fwy (mobile home park)	8	12	326	0.0052	480	242,544		
	South	P161041	P16128	P16134		8	12	326	0.0052	480	242,544		
	South	P161040	P16134	P16139		8	12	117	0.0040	480	86,825		
							Subtotal	769		Subtotal	571,913	Year 7	

**Table 1-1
Capital Improvement Projects**

Project No.	Model	Pipe ID	U/S MH ID	D/S MH ID	Street Location	Existing Pipe Size (in)	Replacement Pipe Size (in)	Length (ft)	Slope	Unit Cost (\$/ft)	Cost (\$)	Schedule	Annual Cost (April 2008 Dollars)
17	East	J211030	J21116	J21117	Guasti Rd, west of Sequoia Ave	8	12	199	0.0018	480	148,190		
	East	J211036	J21117	J21118		8	12	139	0.0055	480	103,282		
	East	J211029	J21118	J21120		8	12	340	0.0032	480	252,960		
	East	J211028	J21120	J21122		8	12	135	0.0032	480	100,440		
	East	J211027	J21122	J21123	Easement east of Haven Ave	8	12	326	0.0032	480	242,544		
	East	J211017	J21123	J21124		8	12	254	0.0032	480	189,236		
	East	J211042	J21124	J21132		8	12	67	0.0027	480	50,123		
	East	J211043	J21132	J21128		8	12	198	0.0027	480	147,416		
	East	J211019	J21128	J21125		8	12	198	0.0027	480	147,416		
	East	J211016	J21125	J21126		8	12	326	0.0033	480	242,544		
East	J211041	J21126	J21127	8	12	158	0.0032	480	117,552				
						Subtotal	2,341	Subtotal	1,741,704	Year 7	3,442,581		
18	North	I171011	I17103	I17104	Plaza Serena St	8	12	153	0.0040	480	114,152		
						Subtotal	153	Subtotal	114,152	Year 8			
19	West	O171057	O17142	O17152	Vineyard Ave, south of	8	10	347	0.0033	400	215,004		
	West	O171047	O17152	O17153	Cedar St	8	10	95	0.0444	400	58,900		
						Subtotal	442	Subtotal	273,904	Year 8			
20	North	J171006	J17103	J17105	D St, Corona Ave to	8	12	361	0.0060	480	268,324		
	North	J171007	J17105	J17104	Vineyard Ave	8	12	361	0.0060	480	268,324		
						Subtotal	721	Subtotal	536,647	Year 8			
21	North	J161027	J16135	J16137	Holt Blvd, west of Imperial	10	15	330	0.0026	600	306,435		
	North	J161047	J16137	J16133	Ave	10	15	303	0.0026	600	281,790		
						Subtotal	633	Subtotal	588,225	Year 8			
22	West	M111010	M11121	M11169	Palmetto Ave, south of	8	10	382	0.0100	400	236,871		
	West	M111092	M11169	M11144	Phillips St	8	10	34	0.0101	400	21,340		
						Subtotal	416	Subtotal	258,211	Year 8			
23	West	J101031	J10122	J10140	Benson Ave, Hollowell St to Vesta St	12	15	478	0.0046	600	444,075		
						Subtotal	478	Subtotal	444,075	Year 8			
24	South	R181059	R18121	R18120	Riverside Dr, Colonial Ave to east of Whispering Lakes Ln	10	12	186	0.0033	480	138,384		
	South	R181040	R18120	R18118		10	12	326	0.0032	480	242,544		
	South	R181038	R18116	R18115		10	12	282	0.0032	480	209,808		
	South	R181036	R18115	R18109		10	12	288	0.0032	480	214,272		
	South	R181014	R18109	R18112		10	12	254	0.0032	480	188,976		
	South	R181015	R18112	R18111		10	12	246	0.0032	480	183,024		
						Subtotal	1,928	Subtotal	1,434,060	Year 8	3,649,274		
25	West	O111052	O11119	O11118	Easement, Palmetto Ave to Cypress Ave	24	27	326	0.0011	945	477,333		
	West	O111001	O11118	O12133		24	27	326	0.0011	945	477,435		
	West	O121005	O12133	O12132		24	27	327	0.0011	945	478,607		
	West	O121010	O12132	O12131		24	27	325	0.0011	945	475,531		
						Subtotal	1,303	Subtotal	1,908,906	Year 9			
26	West	N151027	N15118	N15125	Cucamonga Ave, north of	8	12	264	0.0064	480	196,416		
	West	N151028	N15125	N15142	Francis St	8	12	58	0.1012	480	42,780		
						Subtotal	322	Subtotal	239,196	Year 9			
27	West	N151053	N15102	N15107	Grove Ave, Locust St to	8	10	469	0.0065	400	290,861		
	West	N151051	N15107	N15116	Maple St	8	10	458	0.0064	400	283,681		
						Subtotal	927	Subtotal	574,542	Year 9			
28	North	J131019	J13112	J13124	Cherry Ave, north of Holt Blvd	8	10	441	0.0157	400	273,420		
	North	J131020	J13124	J13136		8	10	261	0.0160	400	161,510		
	North	J131018	J13136	J13138		8	10	181	0.0160	400	111,910		
						Subtotal	882	Subtotal	546,840	Year 9			
29	South	Q161057	Q16132	Q16153	Parco Ave, north of Walnut St	8	12	326	0.0068	480	242,544		
						Subtotal	326	Subtotal	242,544	Year 9			
30	North	F151047	F15143	F15144	Sixth St, Virginia Ave to	8	10	229	0.0041	400	141,670		
	North	F151048	F15144	F15145	Grove Ave	8	10	254	0.0041	400	157,449		
						Subtotal	482	Subtotal	299,119	Year 9			
31	North	H131016	H13155	H13165	Easement west of Sultana Ave, I St to H St	8	10	338	0.0070	400	209,746		
	North	H131002	H13165	I13101		8	10	324	0.0070	400	200,880		
	North	I131017	I13101	I13106		8	10	324	0.0070	400	200,880		
						Subtotal	986	Subtotal	611,506	Year 9			
32	South	R211149	R21220	R21219	Riverside Dr, west of Mill Creek Rd	10	12	296	0.0032	480	220,224		
	South	R211148	R21219	R21218		10	12	294	0.0032	480	218,758		
						Subtotal	590	Subtotal	438,982	Year 9	4,861,635		

Grand Total 45,746,396