

Section 8

SYSTEM ANALYSIS

8-1 Hydraulic Analysis

Gravity System

The analysis of the sewer collection system was based upon the calculated existing and ultimate peak dry weather flows. The hydraulic analysis results can be found in Appendix G of this report. Pipes that exceed the following criteria are considered hydraulically deficient: Peak Dry Weather $d/D > 0.64$.

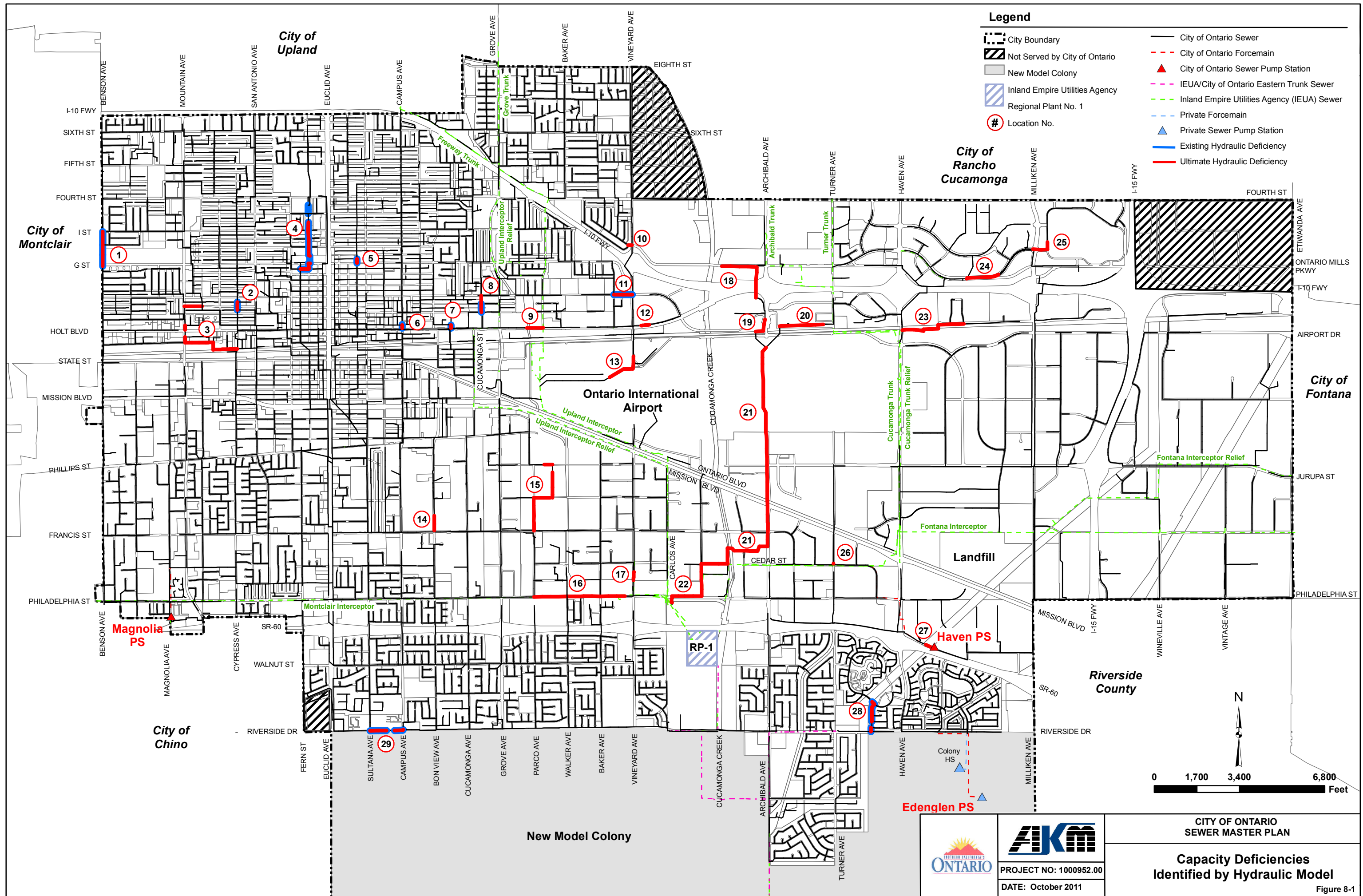
The hydraulic deficiencies, based upon the criteria above, are listed in Table 8-1. The locations of these deficiencies are shown on Figure 8-1. The total length of sewer found to be capacity deficient per the developed criteria discussed in Section 4 is 45,724 feet. This is about 2.4 percent (45,724 / 1,931,134) of the total existing system length.

The Holt Trunk Sewer Project was constructed in two phases from Cucamonga Avenue to San Antonio Avenue. Phase A consists of a sewer on Holt Boulevard from Lemon Avenue to Cucamonga Avenue, intercepting all wastewater flow from north of Holt Boulevard and conveying it east to the existing IEUA Upland Interceptor Relief on Cucamonga Avenue. Phase B is a continuation of Phase A, extending the sewer on Holt Boulevard west from Lemon Avenue to the alley located just west of San Antonio Avenue. Essentially, all flows generated north of Holt Boulevard are intercepted by the new sewer and conveyed east to the existing IEUA Upland Interceptor Relief on Cucamonga Avenue. The area tributary to the Holt Boulevard sewer is shown on Figure 5-1 as Sewershed 2.

Pump Stations

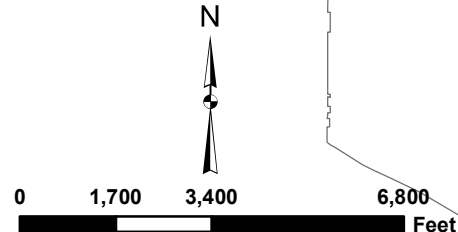
The City currently owns and operates three sewer pump stations, namely Magnolia Pump Station, Haven Pump Station, and Edenglen Pump Station. Detailed descriptions of each pump station can be found in Section 5-7.

The Magnolia Pump Station is a wet well – dry well facility with two pumps, each rated at 400 gpm. The firm capacity of the Magnolia Pump Station is therefore 400 gpm. This is sufficient to pump the existing and ultimate wet weather flows of 115 gpm and 122 gpm, respectively.



Legend

- City Boundary
- Not Served by City of Ontario
- New Model Colony
- Inland Empire Utilities Agency
- Regional Plant No. 1
- Location No.
- City of Ontario Sewer
- City of Ontario Forcemain
- City of Ontario Sewer Pump Station
- IEUA/City of Ontario Eastern Trunk Sewer
- Inland Empire Utilities Agency (IEUA) Sewer
- Private Forcemain
- Private Sewer Pump Station
- Existing Hydraulic Deficiency
- Ultimate Hydraulic Deficiency



PROJECT NO: 1000952.00
 DATE: October 2011

CITY OF ONTARIO
SEWER MASTER PLAN
Capacity Deficiencies
Identified by Hydraulic Model
 Figure 8-1

The Haven Pump Station is a submersible pump station with four pumps rated at 3,400 gpm each. The estimated existing peak wet weather flow from the fully occupied tributary area is 858 gpm. The estimated ultimate peak wet weather flow is 3,532 gpm. Assuming one pump is for stand-by purposes, the firm capacity of the station is 10,200 gpm, which is significantly greater than the ultimate peak wet weather flows.

The Edenglen Pump Station is a submersible pump station with two pumps rated at 132 gpm each. The pump station serves a total of 225 dwelling units with an estimated average flow of 48,000 gpd or 33 gpm (*per City Memorandum "Edenglen Lift Station Capacity" dated May 18, 2010*). The peak wet weather flow is estimated at 164,000 gpd or 114 gpm. During the pump station start-up testing which was conducted on November 9, 2007, the pump station delivered approximately 180 gpm.

8-2 Condition Assessment

Condition assessment of the existing 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 have been completed and certified by November 2, 2008. One of the elements specified as a part of the O&M Program is as follows:

"Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan."

The City has currently completed video inspections of about 1.6 million feet of its existing sewer system. It is planned to have the remaining footage completed in FY 2010-2011. The City plans to budget yearly for sewer condition evaluation and repairs.

8-3 'Hot Spots'

Hot Spots are areas of the system with reoccurring problems that require maintenance and cleaning on a quarterly basis minimum. Currently, there are 102 reaches with a total length of 23,247 feet that are considered to be Hot Spots in the existing system. Operations staff reports that the causes of the hot spots are 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. The 'Hot Spot' locations as reported by City staff are shown on Figure 8-2 and listed in Table 8-2.

City of Upland

Legend

- City Boundary
- Not Served by City of Ontario
- New Model Colony
- Inland Empire Utilities Agency
- Regional Plant No. 1
- Location No.
- City of Ontario Sewer
- City of Ontario Forcemain
- City of Ontario Sewer Pump Station
- IEUA/City of Ontario Eastern Trunk Sewer
- Inland Empire Utilities Agency (IEUA) Sewer
- Private Forcemain
- Private Sewer Pump Station
- Hot Spot Location - 90 Day Cleaning Schedule
- Hot Spot Location - 30 Day Cleaning Schedule

City of Montclair

City of Rancho Cucamonga

City of Fontana

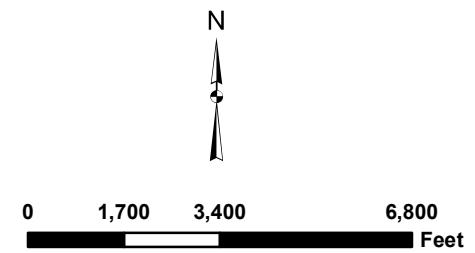
Ontario International Airport

Landfill

Riverside County

City of Chino

New Model Colony

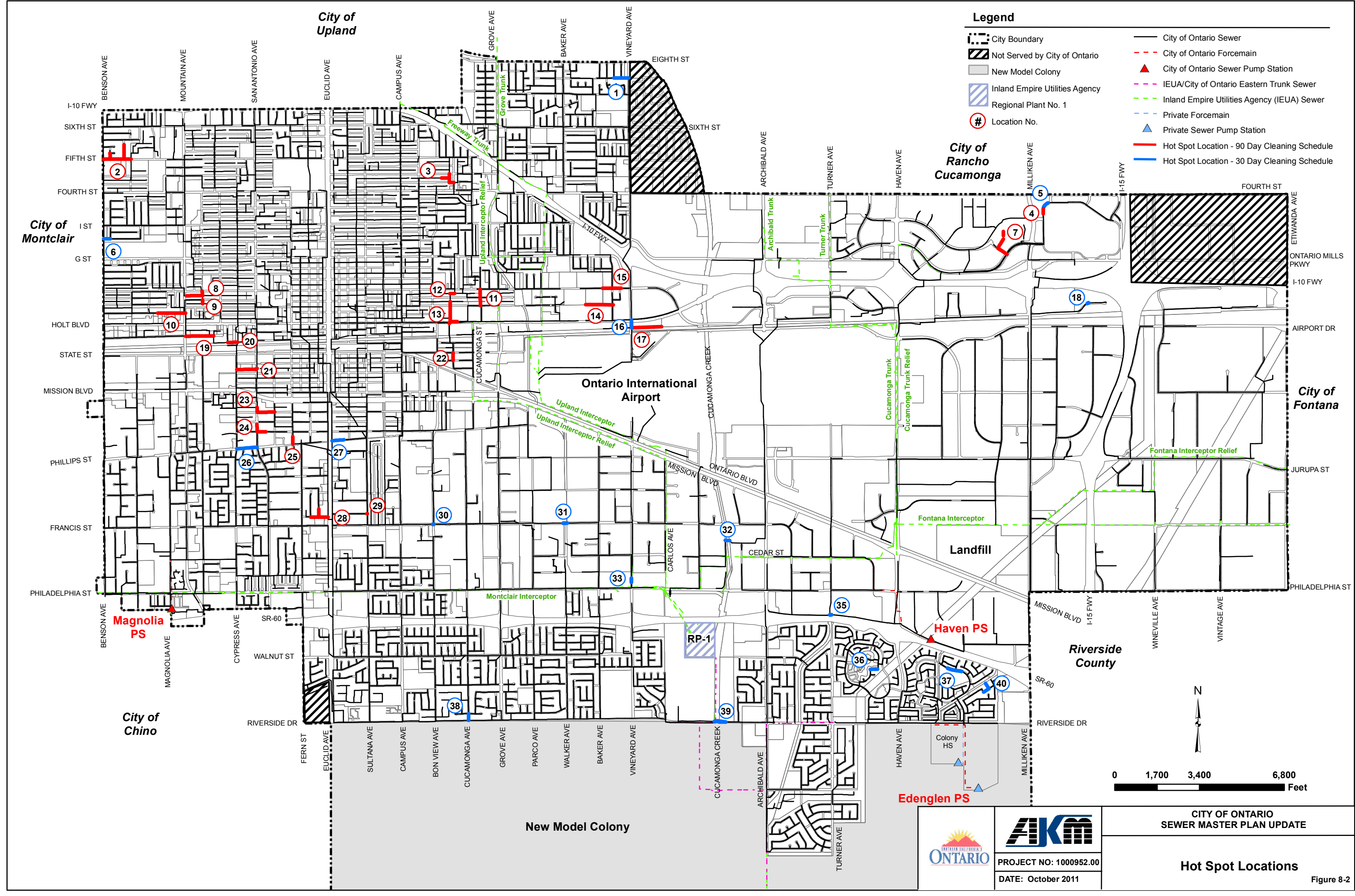


PROJECT NO: 1000952.00
DATE: October 2011

CITY OF ONTARIO
SEWER MASTER PLAN UPDATE

Hot Spot Locations

Figure 8-2



**Table 8-2
Hot Spot Locations**

Location No*	Pipe ID	U/S MH ID	D/S MH ID	Location	Dia (in)	Length (ft)	Material	Slope	Year of Const.	Schedule
1	E17CL1010	E17110	E17108	Olive St, between Sacramento Ave and Vineyard Ave	8	283	VCP	0.0060	1973	30 Day
	E17CL1012	E17108	E17109		8	308	VCP	0.0060	1973	
2	G10CL1021	G10115	G10130	Helen Ave north of Fifth St	8	571	VCP	0.0170	1958	90 Day
	G10CL1019	G10129	G10130	Fifth St east of Helen Ave	8	278	VCP	0.0040	1958	
	G10CL1014	G10130	G10131	Fifth St, between Benson Ave and Helen Ave	8	319	VCP	0.0040	1958	
	G10CL1013	G10131	G10132		8	226	VCP	0.0040	1955	
	G10CL1012	G10132	G10133		8	271	VCP	0.0040	1955	
	G10CL1007	G10124	G10132	Jasmine Ave north of Fifth St	8	236	VCP	0.0116	1955	
3	G15CL1001	G14173	G15181	Easement west of Council Ave, between Princeton St and Harvard Pl	8	317	VCP	0.0400	1950	90 Day
	G15CL1087	G15177	G15181		8	155	VCP	0.0100	1946	
	G15CL1009	G15181	H15108	Harvard Pl west of Council Ave	8	177	VCP	0.0051	1946	
	H15CL1007	H15108	H15107		8	168	VCP	0.0153	1946	
4	H23CL1013	H23113	H23129	Mills Cir north of Concours Dr	10	109	VCP	0.0067	1995	90 Day
	H23CL1012	H23129	H23117		10	83	VCP	0.0067	1995	
5	H23CL1019	H23111	H23126	Mills Cir west of Gurnee Ave	10	111	VCP	0.0032	1995	30 Day
	H23CL1018	H23126	H23128		10	150	VCP	0.0032	1995	
6	I10CL1006	I10110	I10108	H St, Benson Ave to Jasmine Ave	8	273	VCP	0.0040	1955	30 Day
7	I22CL1104	I22100	I22108	Easement north of Ferrari Ln, between Concours St and Inland Empire Blvd	8	296	PVC	0.0080	2000	90 Day
	I22CL1100	I22108	I22122		8	296	PVC	0.0080	2000	
	I22CL1099	I22122	I22124		8	131	VCP	0.0690	2000	
	I22CL1083	I22124	I22129	Ferrari Ln, west of Inland Empire Blvd	8	220	VCP	0.0040	1987	
	I22CL1091	I22129	I22132		8	220	VCP	0.0040	1995	
8	J11CL1078	J11127	J11126	Easement south of D St and east of Mountain Ave	8	320	VCP	0.0040	1952	90 Day
	J11CL1076	J11126	J11124		8	320	VCP	0.0040	1952	
	J11CL1029	J11115	J11124		8	177	VCP	0.0050	1952	
9	J11CL1085	J11132	J11139	Easement south of Hollowell St and east of Mountain Ave	8	158	VCP	0.0072	1952	90 Day
10	J11CL1047	J11153	J11152	Stoneridge Ct west of Mountain Ave	12	21	VCP	0.0015	1954	90 Day
	J11CL1075	J11154	J11153		12	35	VCP	0.0015	1954	
	J11CL1074	J11155	J11154		12	318	VCP	0.0015	1954	
	J11CL1048	J11156	J11155		12	362	VCP	0.0015	1954	
	J11CL1034	J11157	J11156		12	360	VCP	0.0015	1954	
11	J15CL1018	J15114	J15125	Virginia Ave from D St to Nocta St	8	326	VCP	0.0040	1954	90 Day
	J15CL1045	J15125	J15137		8	333	VCP	0.0040	1954	
12	J15CL1043	J15122	J15123	Easement south of D St and east of Allyn Ave	8	176	VCP			90 Day
13	J15CL1036	J15134	J15141	Easement from north of Nocta St to Holt Blvd, east of Allyn Ave	8	336	VCP			90 Day
	J15CL1035	J15141	J15145		8	328	VCP			
	J15CL1033	J15145	J15155		8	131	VCP			
	J15CL1030	J15155	J15157	Holt Blvd east of Bon View Ave	10	76	VCP	0.0170	1987	
	J15CL1031	J15156	J15155	10	286	VCP	0.0025	1954		
14	J17CL1004	J16118	J17154	Easement east of Corona Ave, north of Holt Blvd	8	309	ABS_Tr	0.0060	1986	90 Day
	J16CL1057	J16119	J16118		8	184	VCP	0.0060	1986	
	J17CL1025	J17154	J17117		8	156	ABS_Tr	0.0060	1986	
		J17117	J17155			205				
		J17155	J17156			179				
15	J17CL1006	J17103	J17105	D St west of Corona Ave	8	361	AC	0.0060	1963	90 Day
	J17CL1009	J17106	J17103	D St east of Corona Ave	8	380	ABS_Tr	0.0050	1986	
16	J17CL1063	J17131	J17148	Intersection of Vineyard Ave and Holt Blvd	15	319	VCP	0.0139	1957	30 Day
17	J17CL1074	J17144	J17145	Airport Dr east of Vineyard Ave	8	300	ABS_Tr	0.0039	1985	90 Day
	J17CL1073	J17145	J17146		8	296	ABS_Tr	0.0039	1985	
	J17CL1072	J17146	J17147		8	309	ABS_Tr	0.0039	1985	
	J17CL1071	J17147	J17148		8	283	ABS_Tr	0.0039	1985	
18	J23IS1007	J23103	J23104	New Guasti Rd east of Milliken Ave	6	59	DIP		1986	30 Day
	J23IS1008	J23103	J23104		6	59	DIP		1986	

*Corresponds to Figure 8-2

**Hot Spots Information as of November 2010

**Table 8-2 (continued)
Hot Spot Locations**

Location No*	Pipe ID	U/S MH ID	D/S MH ID	Location	Dia (in)	Length (ft)	Material	Slope	Year of Const.	Schedule
19	K11CL1028	K11108	K11107	Brooks St east of Mountain Ave	12	164	VCP	0.0015	1954	90 Day
	K11CL1029	K11109	K11108		12	118	VCP	0.0015	1954	
	K11CL1024	K11110	K11109		12	276	VCP	0.0015	1954	
	K11CL1017	K11112	K11110		12	276	VCP	0.0015	1954	
	K11CL1016	K11114	K11112		12	271	VCP	0.0015	1954	
20	K12CL1041	K12126	K12125	Easement west of San Antonio Ave, north of State St	12	98	VCP	0.0015	1954	90 Day
	K12CL1021	K12128	K12126		12	286	VCP	0.0015	1954	
21	K12CL1076	K12150	K12149	Easement north of Sunkist St, from Cypress Ave to San Antonio Ave	8	56	VCP	0.0056	1951	90 Day
	K12CL1075	K12151	K12150		8	296	VCP	0.0050	1951	
	K12CL1074	K12152	K12151		8	296	VCP	0.0050	1951	
	K12CL1073	K12153	K12152		8	163	VCP	0.0050	1951	
22	K15CL1024	K15130	K15136	Garfield Ave from State St to Washington St	10	226	VCP		1987	90 Day
23	L12CL1052	L12CL13	L12CL14	San Antonio Ave north of Maitland St	12	191	VCP	0.0050	1934	90 Day
	L12CL1066	L12CL14	L12CL14	Maitland St east of San Antonio Ave	12	351	VCP	0.0050	1934	
	L12CL1051	L12CL14	L12CL14		12	351	VCP	0.0050	1934	
24	L12CL1027	L12CL15	M12100	San Antonio Ave north of Belmont St	8	295	VCP	0.0170	1957	90 Day
	M12CL1070	M12101	M12100	Belmont St east of San Antonio Ave	8	352	VCP	0.0060	1964	
25	M12CL1098	M12112	M12116	Vine Ave north of Phillips St	12	310	VCP	0.0050	1934	90 Day
26	M12CL1062	M12124	M12125	Phillips St from Cypress Ave to San Antonio Ave	8	194	VCP	0.0040	1962	30 Day
	M12CL1060	M12128	M12124		8	316	VCP	0.0040	1962	
	M12CL1059	M12131	M12128		8	299	VCP	0.0040	1966	
27	M13CL1171	M13119	M13122	Phillips St east of Euclid Ave	8	306	VCP	0.0040	1957	30 Day
	M13CL1168	M13122	M13123		8	172	VCP		1957	
28	N13CL1033	N13136	N13152	Laurel Ave north of Maple St	8	326	VCP	0.0100	1957	90 Day
	N13CL1038	N13148	N13150	Maple St west of Euclid Ave	8	167	VCP	0.0040	1957	
	N13CL1039	N13150	N13152		8	327	VCP	0.0040	1957	
	N13CL1040	N13152	N13151		8	373	VCP	0.0040	1957	
29	N13CL1088	N13142	N13141	Maple St west of Sultana Ave	8	15	VCP	0.0366	1991	90 Day
30	N14IS1089	N14160	N14159	Francis St at Bon View Ave	24	21	VCP		1991	30 Day
	N14IS1090	N14160	N14159		24	21	VCP		1991	
31	N16IS1035	N16118	N16117	Francis St west of Cucamonga Channel	15	156	VCP		1991	30 Day
	N16IS1036	N16118	N16117		24	156	VCP		1991	
32	O18CL1012	O18103	O18102	Easement south of Francis St at Cucamonga Creek	18	177	AC	0.0016	1965	30 Day
33	P17IS1011	O17156	P17102	Vineyard Ave north of Philadelphia St	24	176	VCP		1991	30 Day
	P17IS1012	O17156	P17102		18	176	VCP		1991	
34	P18CL1061			Siphon Golf Course		165				90 Day
35	P20CL1038	P20127	P20126	60 Frwy and Turner Ave	10	70	DIP		1988	30 Day
	P20CL1039	P20127	P20126		16	70	DIP		1988	
36	Q20CL1070	Q20166	Q20167	Ashegate Way west of Tahoe Dr	8	290	VCP	0.0050	1985	30 Day
37	Q21CL1015	Q21143	Q21148	Lytile Creek Lp west Silverado Creek PI	8	246	VCP	0.0052	1982	30 Day
	Q21CL1012	Q21148	Q21150	Lytile Creek Lp east Silverado Creek PI	8	337	VCP	0.0052	1982	
38	R15CL1065	R15160	R15173	Cucamonga Ave north of Riverside Dr	8	267	ABS_Tr	0.0072	1977	30 Day
39	R18CL1037	R18117	R18116	Riverside Dr at Cucamonga Creek	10	212	VCP	0.0032	1965	30 Day
	R18CL1039	R18118	R18117		10	254	VCP	0.0032	1965	
	R18CL1055	R18118	R18113		10	216	VCP		1988	
	R18CL1056	R18113	R18109	2400 E Riverside Dr	10	107	VCP		1988	
	R18CL1054	R18109	R18107		10	96	VCP		1988	
40	R22CL1004	R22104	R22107	Boise Creek PI northwest of Yuba River Dr	8	255	VCP	0.0052	1986	30 Day
	R22CL1011	R22107	R22111	Yuba River Dr southwest of Boise Creek PI	8	250	VCP	0.0052	1986	
					Total	23,247				
*Corresponds to Figure 8-2; Location No. 34 is not mapped or shown on Figure 8-2										
**Hot Spots Information as of November 2010										

8-4 Sanitary Sewer Overflow (SSO) History

There were a total of 34 sanitary sewer overflows responded to by the City of Ontario crews between January 2007 and September 2010. The details of these spills are shown in Table 8-3. The total number of reported spills over the past four years is as follows:

10 spills in 2007 (1.64 spills per 100 miles, excluding 4 on private property)

7 spills in 2008 (0.55 spills per 100 miles, excluding 5 on private property)

11 spills in 2009 (1.36 spills per 100 miles, excluding 6 on private property)

6 spills in 2010 (0.82 spills per 100 miles, excluding 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 (365.7 miles), this is an average of eleven (3 x 3.657) spills per year. Per the provided documentation, the City has an excellent record with minimal spills.

Table 8-3
Sanitary Sewer Overflow Summary
Calendar Year 2007 thru September 2010

	Date	Time	Location	Property Type	Reason for Overflow	Overflow from
Calendar Year 2007						
1	02/06/07	10.00 am	1351 N Grove Ave		Grease	City sewer
2	04/03/07	8.00 pm	Cucamonga Ave & I St		Construction Accident	City sewer
3	05/08/07	3.40 am	948 Holt Blvd		Construction Accident	City sewer
4	05/16/07	1.00 am	1112 Cypress Ave		Grease	Private Property
5	05/17/07	11.00 am	700 Holt Blvd	Restaurant	Flood Damage	Private Property
6	05/31/07	3.00 pm	1650 Miliken Av		Debris	Private Property
7	07/16/07	9.30 am	1007 D St		Unknown	City sewer
8	07/31/07	10:00	1007 W "D"		Rocks and debris in sewer main	Manhole
9	10/20/07	11:10	800 N Vineyard		Debris blockage in sewer main	Manhole
10	12/16/07	8:00	1351 N Grove	Apartments	Pipe structural problem/failure and grease	Private cleanout
Calendar Year 2008						
1	01/23/08	7:30	655 E "G"		Root intrusion	Manhole
2	06/09/08	12:30	121 N Fern	Apartments	Blockage in upper lateral	Illegal drain connection
3	07/06/08	22:00	1855 E Riverside	Trailer Park	Grease blockage in private sewer system of trailer park	Private cleanout
4	11/17/08	10:30	1221 E Fourth	Restaurant & store	Failure to maintain septic tank	Private cleanout connected to private septic tank
5	11/18/08	18:30	Nocta St	Apartments	Construction defect in upper lateral	Private cleanout
6	11/29/08	10:45	1855 E Riverside	Trailer Park	Gease blockage in upper lateral	Private cleanout
7	12/16/08	12:00	2425 E Riverside	Westwind Park	Pipe structural problem/failure	Tree planter near restroom

Table 8-3 (Continued)
Sanitary Sewer Overflow Summary
Calendar Year 2007 thru September 2010

	Date	Time	Location	Property Type	Reason for Overflow	Overflow from
Calendar Year 2009						
1	01/23/09	11:40	2665 E Riverside		Grease blockage in sewer main	Manhole
2	04/22/09	11:00	1200 S San Antonio	Apartments	Blockage in upper lateral	Private cleanout
3	05/30/09		1800-2000 Holt		Grease, rags, and debris blockage in sewer main	4 manholes
4	07/11/09	14:10	1351 N Grove	Apartments	Debris blockage in upper lateral	Private cleanout
5	08/14/09	15:00	1220-1228 E Sixth	Strip mall	Debris and grease created blockage; end of lateral was uncapped and paved over	Sewage coming up out of ground along edge of asphalt alleyway behind building
6	09/02/09	11:00	1047-1055 N Mountain	Strip mall	Rags and grease in private lateral. 17 feet of sag in lower lateral	2 private cleanouts in parking lot
7	11/04/09	8:15	4405 E Airport		Rags and grease in upper lateral. Chunks of asphalt in lower lateral	Private cleanout in parking lot
8	12/14/09	10:30	2151 E Philadelphia		Large rock in syphon	Manhole
9	12/14/09	7:50	Olive & San Diego		Stick of lumber in sewer main	Manhole and private cleanout
10	12/23/09	12:01	1216 S Euclid		Gease blockage in upper lateral	Private cleanout
11	12/31/09	9:45	926 E Philadelphia		Debris blockage in upper lateral	Private cleanout
Calendar Year 2010						
1	01/03/10	13:00	1409 E Fourth	Restaurant	Gease blockage in upper lateral	Private cleanout
2	01/05/10	12:00	608 W Emporia		Grease blockage in sewer main	2 Manholes
3	02/20/10	9:00	904 W Rosewood		Root intrusion	Manhole
4	03/18/10	19:00	2400 S Sultana		Contractor failed to remove test plug after making connection to existing sewerline	Manhole
5	08/21/10	9:30	854 & 864 W "B"		Illegal dumping of hauled waste	Side door at 864 West B, front door at 854 West B
6	09/06/10	18:00	1320 N Sultana	Home	Broken pipe	Basement

8-5 Maintenance Program

A comprehensive maintenance program is an important tool in assuring reliable system operation. This not only includes regular inspections and preventative maintenance, but also good record keeping. Accurate records are the backbone of any maintenance operation. They can be used for many purposes including: scheduling regular maintenance activities; allocating manpower; budgeting; pinpointing persistent problems; tracking equipment performance and maintenance history; and the identification of equipment which may be showing signs of failure.

Preventative Maintenance

Preventative maintenance is a crucial element of the maintenance program. The preventative maintenance program (PMP) consists of cleaning, inspection, condition assessment, and rehabilitation tasks. Currently, the City has a documented preventative maintenance program. The City should review and update the PMP annually as a part of the City's Operation and Maintenance Plan 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. Each spill site must be CCTV inspected to pinpoint the cause of the spill, and implementation of corrective measures for preventing repeat spills.

Preventative maintenance activities that the City does currently conduct include the following:

1. The entire sewer system is cleaned once every 14 to 15 months. The City owns 3 hydro-jet machines.
2. All of the system manholes are inspected once every 14 to 15 months.
3. Sewer pump stations are inspected daily
4. Sewer pump station maintenance is conducted monthly
5. The City has a Fats, Oil, and Grease (FOG) program in place that requires the installation of grease interceptors and periodic inspections of the interceptors.

Maintenance activities that are currently planned include the following:

1. The City has recently contracted with a consultant for CCTV inspection of the entire sewer system.
2. Currently, operations staff uses RootX on the laterals on an as-needed basis.

Maintenance Staff Recommendations

The City currently has about 365.7 miles of pipe. In order to comply with the 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.

The City's current staffing for the wastewater collections system includes 7 employees. Each has a California Water Environment Association (CWEA) certification: 4 with Grade 1, 1 with Grade 2, and 2 with Grade 4. Training of these staff members is as follows:

- a. Safety – bi-weekly
- b. Confined space entry – annually

- c. Record keeping – as needed
- d. Pump Station operation and maintenance – annually
- e. Gas sampling – annually
- f. CCTV inspection and/or pipeline assessment – as needed
- g. Lockout-tagout – annually

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 pump station maintenance crew consisting of two employees to keep up with the sewer pump 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.