Chapter 7

CANNERY SEGREGATION LINE EVALUATION

This chapter describes the City of Modesto's (City's) Cannery Segregation Line (CSL), including the trunk sewer's physical characteristics and the industrial customers that discharge into it. This chapter also summarizes the results of flow monitoring data collected from the CSL and the results of the CSL hydraulic capacity analysis.

7.1 BACKGROUND

Figure 7.1 shows the existing CSL alignment. As shown, the CSL conveys industrial wastewater from five different food-processing industries to the Sutter Avenue Primary Treatment Plant (Sutter Plant). These food-processing industries are Stanislaus Foods, Gallo Winery, Seneca Foods, Del Monte, and Frito-Lay.

During the non-canning season, flows from the CSL are combined with domestic wastewater at the Sutter Plant and treated. During the canning season, which generally occurs from July through September, cannery process water discharged into the CSL (Can Seg flows) is diverted directly to the Modesto Ranch irrigation facilities located at the Jennings Road Secondary Treatment Plant (Jennings Plant).

7.2 CAN SEG FLOWS

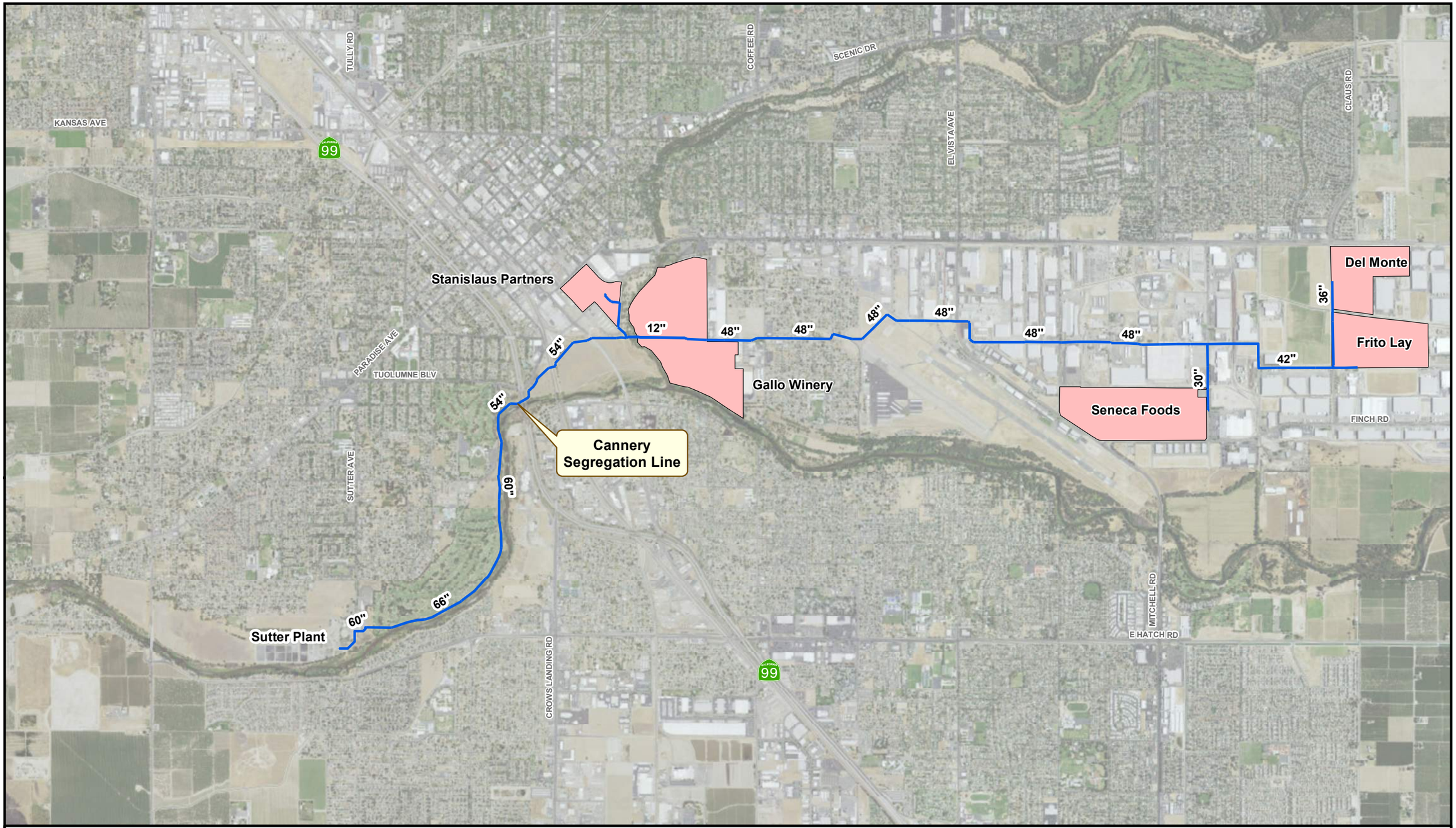
7.2.1 Current Can Seg Flows

The City continuously monitors Can Seg flows during the canning period and does not monitor them during the non-canning period. In addition, individual discharger daily flow data is measured year-round.

Table 7.1 provides the daily average Can-Seg flow for the canning and non-canning seasons. As shown, average flows are nearly ten times higher during the canning season than during the non-canning season.

7.2.2 Projected Can Seg Flows

Concurrent with this Wastewater Collection System Master Plan (CSMP), the City is developing a Wastewater Treatment Master Plan (WTMP). The WTMP includes Can Seg flow projections, which are provided in Table 7.1.



Legend

- Cannery Segregation Line
- Major Dischargers

N

0 2,000 4,000 Feet

EXISTING CSL ALIGNMENT

FIGURE 7.1

CITY OF MODESTO
WASTEWATER COLLECTION SYSTEM MASTER PLAN

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MODESTO CALIFORNIA

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Table 7.1 Current and Projected Can Seg Flows Wastewater Collection System Master Plan City of Modesto, California	
Statistic	**Flow, mgd**
Current Non-Canning Season[1]	
Average	1.60
Max 30-Day	1.77[2]
Current Canning Season[3]	
Average	14.8
Max 30-Day	20.3
Peak Hour	24.4[4]
2035 Non-Canning Season	
Average	1.60[5]
Max 30-Day	1.77[5]
2035 Canning Season	
Average	19.8[6]
Max 30-Day	25.3[6]
Peak Hour	30.5[7]

Notes:
(1) Non-canning season data are based on monthly total flow data from 2012-2014.
(2) Maximum calendar month values from available data, 2012-2014.
(3) Canning season flows are based on individual discharger daily data from 2008-2014.
(4) Based on 2012 hourly flow data provided by the City.
(5) Non-canning season flows were assumed to not increase.
(6) Canning season flows were assumed to increase by 5 mgd, which equates to an increase of roughly 25 percent for the maximum 30-day condition.
(7) A 25 percent increase to 2035 peak hour flow projections is assumed to account for new industries in the future.

7.3 FLOW MONITORING PROGRAM

For this CSMP, two flow monitoring programs were conducted for the collection system, as stated in Chapter 3. The first flow monitoring program was conducted during the dry season from April 30, 2014, to May 27, 2014. The second was conducted during the wet season from December 11, 2014, through March 1, 2015.

This monitoring included two sites in the CSL. During the dry weather flow monitoring period, only one site was monitored. Both sites were monitored during the wet weather flow monitoring period. Table 7.2 summarizes the details of each monitoring site, and Figure 7.2 shows their locations. The “Draft Sanitary Sewer Flow Monitoring and Inflow/Infiltration

Study, July 2015" prepared by V&A summarizes the flow monitoring programs. A copy of the report is included in Appendix C for reference.

Table 7.2 CSL Flow Monitoring Sites
Wastewater Collection System Master Plan
City of Modesto, California

Meter Name	Location	Flow Data Type	Measured Pipe Diameter (in)
7-2	Tioga Dr. and Empire Ave. in Westbound stop lane of Tioga Dr.	Dry & Wet	47.75
G	Dirt road in empty field, south of Tuolumne Boulevard and S. 7th Street.	Wet Only	48

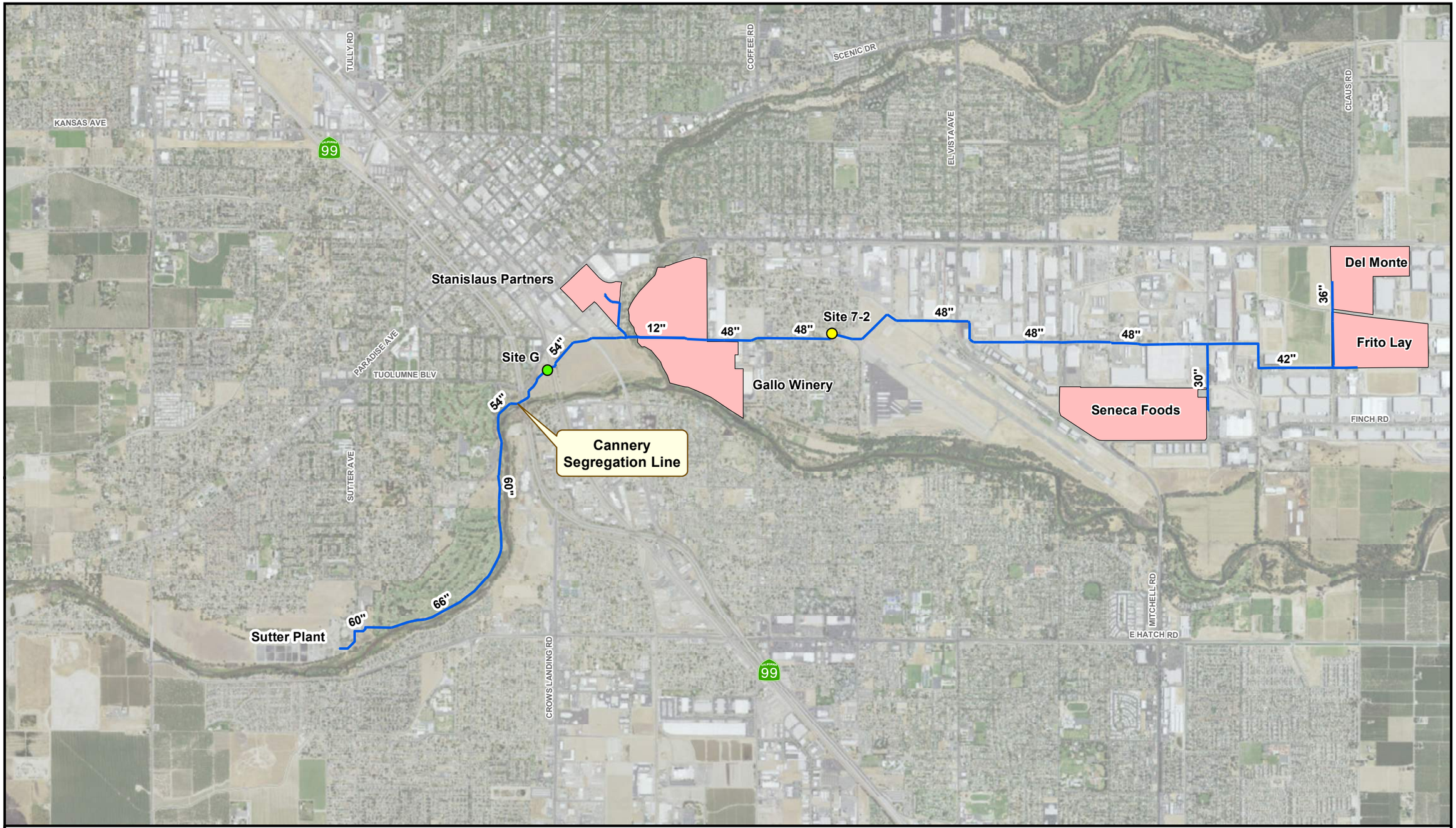
Peaking factors are the ratio of measured peak flow to the ADWF and indicate the quantity of inflow and infiltration (I/I) entering the collection system upstream of a particular flow meter. Wet weather peaking factors for the CSL were developed using the results of the flow monitoring program.

According to the V&A report, the CSL has one of the highest rates of I/I within the City's designated sewer basins. Of the 11 major sewer tributaries in the City, the CSL basin had the second highest rate of inflow and the third highest rate of combined I/I. Because of the excessive I/I, the wet weather peaking factor for each CSL monitoring site exceeds the typical peaking factor threshold of 3. Table 7.3 summarizes the recorded flows and peaking factors per site.

Table 7.3 V&A Monitoring I/I Summary
Wastewater Collection System Master Plan
City of Modesto, California

Monitoring Site	ADWF (mgd)	Peak Measured Flow (mgd)	Peaking Factor
7-2	0.73	5.01	6.9
G	0.68	6.73	9.9

However, these peaking factors do not indicate a serious issue because the flow monitoring data was measured during the non-canning season, and the CSL pipeline was at approximately 40 percent capacity during peak flows. Overall, the measured I/I was between 4.3 to 6 mgd, which corresponds to a peaking factor of approximately 1.3 to 1.4 based on an average canning season flow of 14.8 mgd. Additionally, the canning season generally occurs during the dry season, so peak I/I should not occur at the same time as peak Can Seg flows during the canning season.



Legend

Cannery Segregation Line

Flow Monitors

- Wet Weather Only
- Dry and Wet Weather
- Major Dischargers

N

Feet

0 2,000 4,000

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CSL FLOW MONITORING LOCATIONS

FIGURE 7.2

CITY OF MODESTO

WASTEWATER COLLECTION SYSTEM MASTER PLAN

MODESTO CALIFORNIA

pw://Carollo/Documents/Client/CA/Modesto/9704A00 - WW Collection/Data/MXDs/Fig 7_2.mxd

To reduce the amount of I/I entering the system, the City should investigate where the direct inflow upstream of Meter G is entering the collection system. The best approach would be to conduct a smoke testing study in the specific areas to determine the source of the direct inflows. However, it is beyond the scope of this Master Plan to provide detail beyond this information.

7.4 CAPACITY ANALYSIS

Similar to the domestic collection system, a hydraulic model of the CSL was developed to evaluate its capacity for current and projected 2035 flows. The model estimated the capacity of the CSL based on its current configuration to be 42 mgd, assuming a maximum depth of flow to pipeline diameter (d/D) of 0.85.

According to Table 7.1, the peak flows for current and 2035 conditions are 24.4 mgd and 30.5 mgd, respectively. Therefore, the CSL has sufficient capacity to convey existing and 2035 peak flows.

This CSMP also recommends constructing the River Trunk Realignment Project. (Consult Chapter 6 for more information on this project.) The existing River Trunk, which currently conveys domestic flows, will be dedicated as a redundant pipeline for conveying Can Seg flows. Once this River Trunk Realignment Project is completed, additional capacity will be available to convey peak Can Seg flows.