

## EXECUTIVE SUMMARY

This report documents the development of a schedule of sewer system capacity charges to recover the cost of capacity in the City of Modesto (City) sewer utility system from new applicants for service. This executive summary describes the study objectives; the conceptual approach and methodology used to calculate the recommended capacity charges; and presents the recommended schedule of capacity charges.

### Study Objectives

In May 2006, Brown and Caldwell (BC) entered into an agreement with the City of Modesto to develop a schedule of sewer system capacity charges for its sewer utility. Specifically the study objectives were as follows:

- Recover the cost of capacity in facilities constructed to meet the needs necessitated by growth.
- Meet legal requirements:
  - Demonstrate a **nexus** between development and the need to expand facilities to accommodate growth.
  - Not exceed the development's **proportional share** of the cost of facilities needed to serve that development.
  - **Not be arbitrary or discriminatory** in its application to individual customers or customer classes.
- Be feasible for the City to implement and administer.

### Methodology

There is no single, established method for the calculation of capacity charges that is appropriate for all utilities or eminently fair to all new applicants for service. We reviewed the two options most widely used:

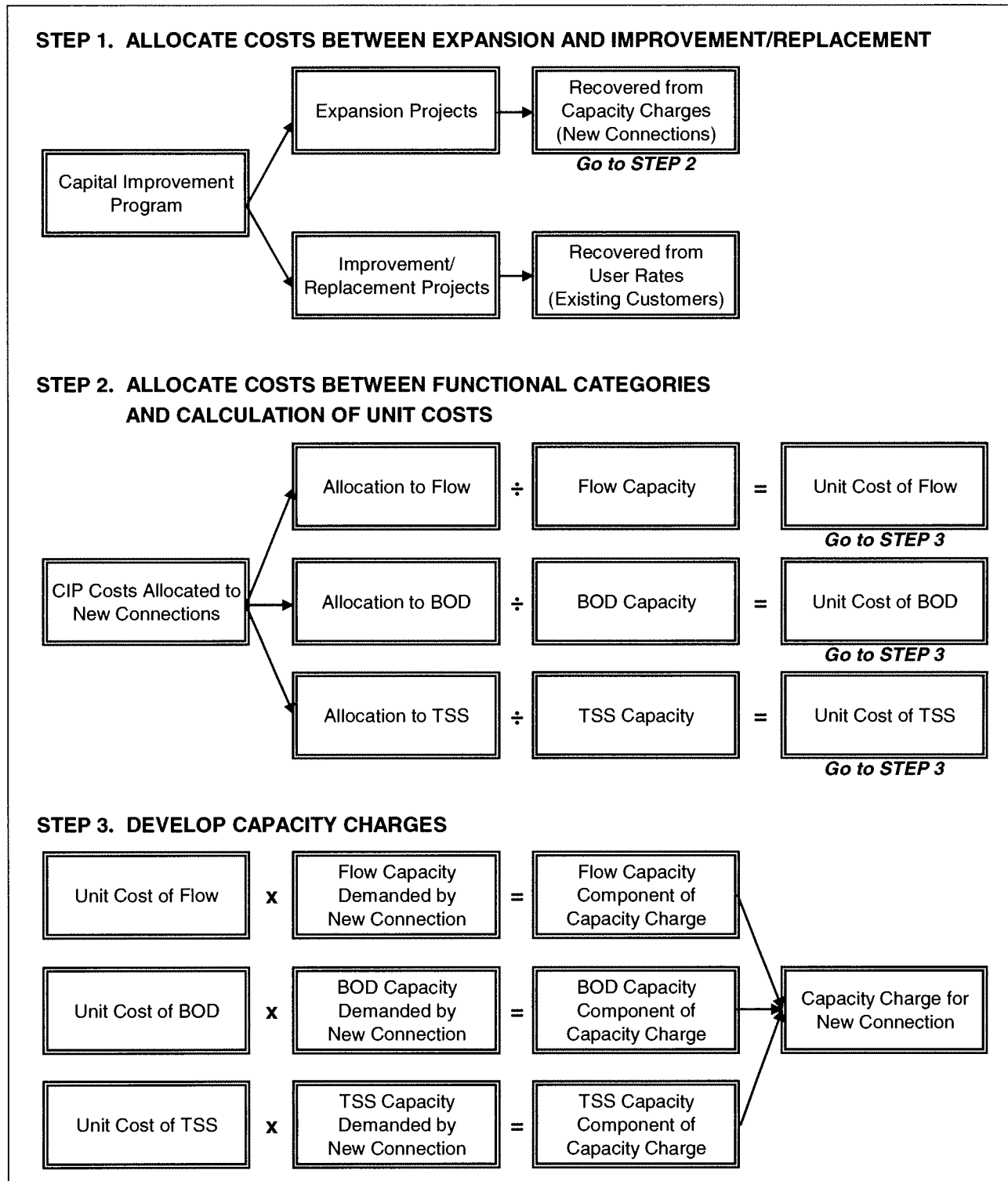
- **Average Method.** Includes recovery of cost of replacement of capacity in existing system plus the portion of the CIP allocable to growth.
- **Marginal Cost Method.** Recovers cost of the portion of the CIP allocable to growth.

The marginal cost method was chosen because it is the most appropriate for the city's wastewater utility because the existing system is at capacity and all new capacity will result from the recommended CIP.

### Capacity Charge Calculation Methodology Using the Marginal Cost Method

Figure ES.1 shows schematically the calculation of the capacity charges using the Marginal Cost Method.

**Figure ES.1 Capacity Charge Calculation Methodology Using the Marginal Cost Method**



## **Information Requirements**

In order to calculate the capacity charges using the marginal cost method it was necessary to have the following information:

- Capital Improvement Program (CIP)
- Portion of CIP Allocable to Growth
- Allocation of Growth Portion of CIP to Functional Cost Categories of Flow, BOD and TSS
- Amount of Capacity Added by Proposed CIP
- Future Cost Escalation
- Method of Financing CIP
- Equivalent Single Family Dwelling Unit Discharge Characteristics

## **Capital Improvement Program Cost Allocation**

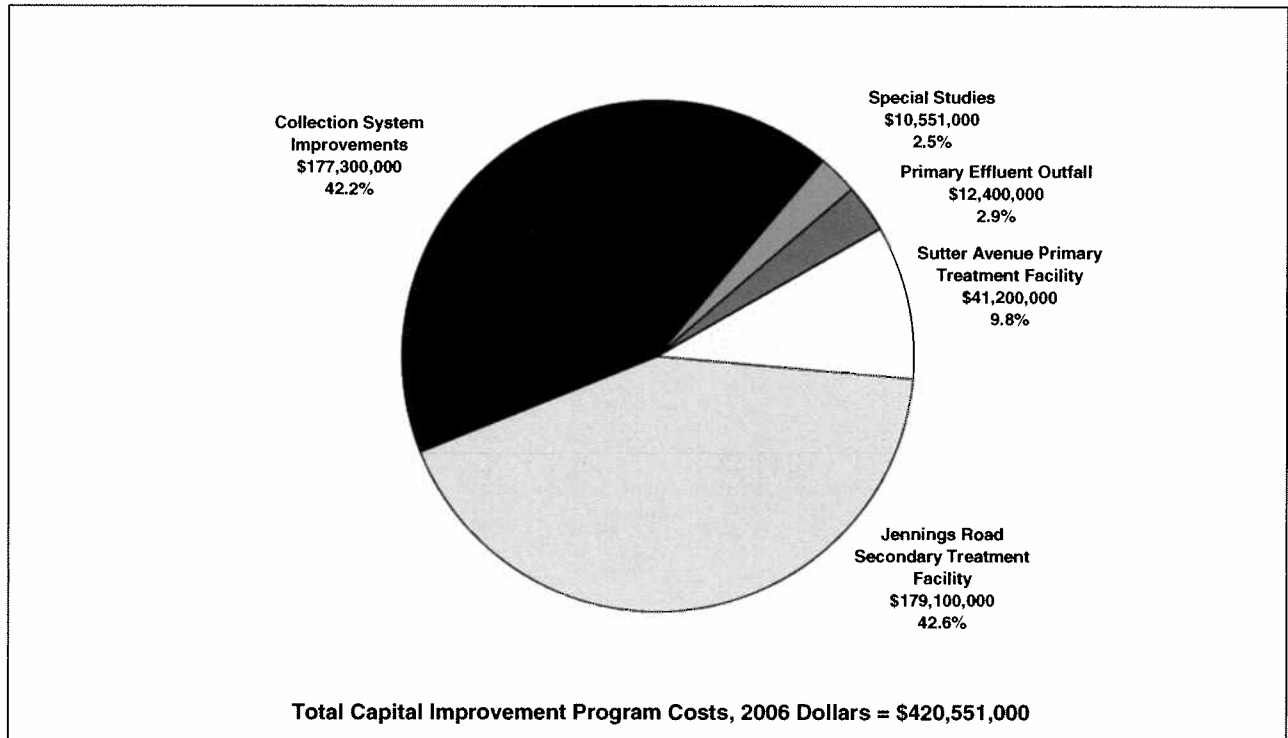
Because the marginal cost method recovers the cost of the proposed CIP, the starting point in the calculation of capacity charges is the CIP. The CIP costs (by phase) were obtained from the Carollo Engineers July 2006 draft report and subsequent updates. The CIP is shown in Figure ES.2. It totals \$420,551,000. This CIP is divided into five categories of costs, collection system costs, Sutter Avenue Primary Treatment Facility costs, primary effluent outfall costs, Jennings Road Secondary Treatment Facility Expansion costs and Special Studies costs.

The details of these costs and their allocation between new customers and existing customers was provided in the Carollo reports. As summarized from the Carollo reports, \$176,575,450 (excluding any financing costs) of the total \$420,551,000 CIP are to be recovered from new customers.

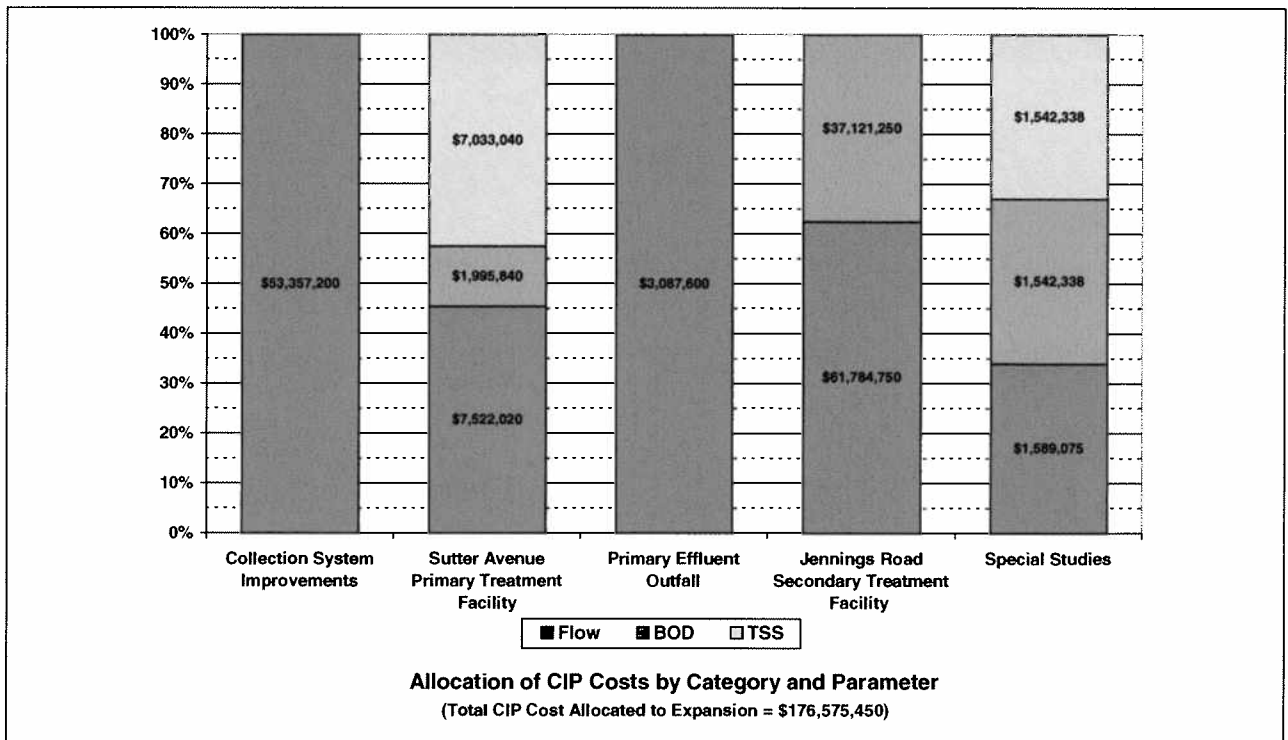
After separating the CIP costs into those that benefit new applicants for service (and are thus recovered via capacity charges) and those that benefit existing customers (and are thus recovered via user charges), the former costs are allocated to the functional cost categories of flow, BOD and TSS as presented in the Carollo Engineers July 2006 draft report and subsequent updates. Figure ES.3 summarizes this allocation for those costs to be recovered from new customers allocated by type (collection, treatment, outfall, etc.) and functional cost category (flow, BOD and TSS).

The costs allocated to the three functional cost categories are then divided by the respective amounts of capacity added (as provided by Carollo Engineers) to determine the unit costs of capacity for flow, BOD and TSS.

**Figure ES.2 Capital Improvement Program Costs by Category**



**Figure ES.3 Allocation of CIP Costs to New Connections by Category and Flow/BOD/TSS**



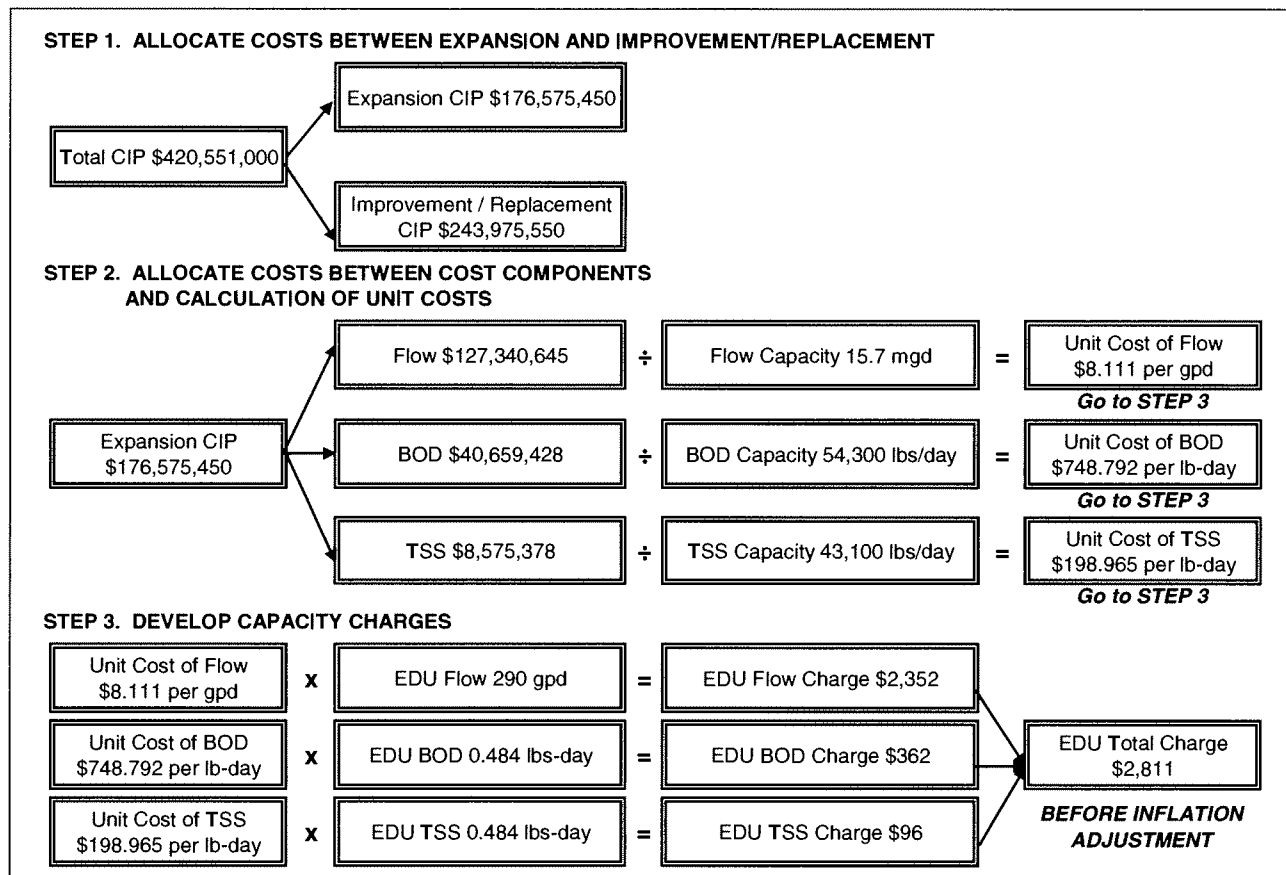
**Capacity of New Facilities**

The capacity available for new customers, provided by the facilities comprising the CIP, was developed from information in Table 4 of the July 2006 Carollo draft report and subsequent updates. The additional capacities provided by the facilities allocable to expansion are 15.7 million gallons per day for flow, 54,300 pounds per day for BOD, and 43,100 pounds per day for TSS.

**Calculation of Unit Costs of Capacity and EDU Capacity Charges**

Using the cost of capacity information shown in Figure ES.3 (which excludes interest), the capacity of new facilities stated above, and the flow, BOD, and TSS discharged by a typical EDU; the methodology shown schematically in Figure ES.1 was used to calculate unit costs of capacity in general and the capacity charge for an EDU, specifically. The results are illustrated in Figure ES. 4 below:

**Table ES.4 Calculation of EDU Capacity Charges for FY 2006**



### **Calculation of Capacity Charges for Subsequent Years with Interest Cost Included**

In order to calculate capacity charges for FY 2007 and beyond that include interest on debt issued to finance the CIP, it is necessary to make the following assumptions:

- The projected cost of the CIP (in June 2006 dollars), as provided by Carollo Engineers, was escalated by 7.9 percent for FY 2007 and by 5.0 percent per year in the remaining years to forecast the cost of each project in the CIP in the year it would be built.
- The CIP is financed by the issuance of debt.
- Five debt issues are assumed in years 2008, 2009, 2010, 2012 and 2020.
- Each debt issue would be for a term of 30 years.
- Debt issuance costs were assumed to be 3 percent of the amount of the CIP funded.
- The interest rates for debt issuance were assumed to be annual rates of 5.0 percent for the first three issues and 5.5 percent for the last two issues.
- Interest was allocated to the portion of CIP allocable to expansion via its percentage of total CIP (\$176,575,450 / \$420,551,000).

Based on the above assumptions, capacity charges were calculated for three interest rate alternatives as follows:

- **Alternative 1: No Interest** - The portion of the CIP (\$176,575,450) allocable to new customers was recovered in proportion to the amount and type (flow, BOD and TSS) of capacity added by the CIP to yield unit costs for flow, BOD and TSS applicable to any new connection. No consideration was given to the recovery of financing costs.
- **Alternative 2: Total Interest** - The same as the first alternative except that the total interest cost allocable to new customers, over the terms of the phased bond issues, was added to the portion of the CIP allocable to new customers.
- **Alternative 3: Present Value of Total Interest** - The same as the first alternative except that the present value of the total interest cost allocable to new customers, over the terms of the phased bond issues, was added to the portion of the CIP allocable to new customers.

These capacity charges for an EDU, for all three alternatives, are shown in Table ES.5.

**Table ES.5 Alternative EDU Capacity Charges**

Fiscal Year	Alternative		
	1	2	3
<b>FY 2007</b>	\$3,033	\$7,200	<b>\$4,876</b>
<b>FY 2008</b>	\$3,185	\$7,352	\$5,028
<b>FY 2009</b>	\$3,344	\$7,511	\$5,187
<b>FY 2010</b>	\$3,511	\$7,678	\$5,355
<b>FY 2011</b>	\$3,687	\$7,854	\$5,530

Alternative 1: No Interest Costs  
Alternative 2: Total Interest Costs  
Alternative 3: Present Value of Total Interest Costs

**Recommendation: Alternative 3**

The unit costs of capacity applicable to all new connections were used to develop capacity charges for a hypothetical new connection for each of the commercial user groups defined in the Modesto Municipal Code (MMC) for wastewater treatment. The discharge strength characteristics (BOD and TSS) for each user group are based on user group definitions in the MMC. Flow for each user group is set at 1,000 million gallons per day (mgd) for groups 1-4 to facilitate comparison of the impact of changes in strength. The capacity charges for Alternative 3 are shown in Table ES.6.

**Table ES.6 Alternative 3 Commercial User Capacity Charges**

City of Modesto Current Commercial User Categories	Discharge Characteristics			FY 2007 Capacity Charges Alt 3
	Flow <sup>1</sup> gpd	BOD <sup>2</sup> mg/l	TSS <sup>2</sup> mg/l	
Group 1 No Food, Just Toilets or Washing Facilities	1,000	200	200	\$16,815
Group 2 Commercial Laundromats, Service Stations, Hotels w/o Food	1,000	450	450	\$20,244
Group 3 Industrial Laundromats, Hotels w/ Food	1,000	700	700	\$23,673
Group 4 Restaurants, Bakeries, Auto Steam, Markets	1,000	1,000	600	\$26,635

1. Flow values were assumed by Brown and Caldwell to facilitate comparison among user categories. Flow values for new applicant's should be based upon determination by the City Engineer.

2. BOD and TSS values were based on commercial user category definitions in the Modesto Municipal Code shown below:

Group 1 Combined BOD and TSS is 400 mg/l or less  
Group 2 Combined BOD and TSS is in the range of 401 mg/l to 900 mg/l  
Group 3 Combined BOD and TSS is in the range of 901 mg/l to 1,400 mg/l  
Group 4 Combined BOD and TSS is over 1,400 mg/l

### Comparison of Capacity Charges

The City of Modesto capacity charge for a single family dwelling for FY 2007 is compared to both the current City capacity charge and those of other near by sewer utilities. The results are summarized in Table ES.7.

**Table ES.7 Comparison of Single Family Dwelling Capacity Charges**

<u>Municipality</u>	<u>Capacity Charge</u>
<i>City of Modesto, Current</i>	\$500
City of Turlock	\$1,839
City of Manteca	\$3,961
<b><i>City of Modesto, FY 2007 (Alt 3)</i></b>	<b>\$4,876</b>
City of Stockton	\$5,700
City of Sacramento	\$7,868
City of Tracy	\$10,095
City of Merced	\$12,500

## Recommendations

Based on the results of this study, Brown and Caldwell makes the following recommendations:

- Capacity charges should be developed based on the marginal cost methodology.
- The interest costs should be included with the CIP construction costs using the present value of future interest payments (Alternative 3).
- The CIP provided by the City's engineers (Carollo Engineers), in June 2006 dollars, should be escalated by 7.9 percent for FY 2007. The costs in subsequent years are escalated by 5.0 percent per year to show likely levels of charges for FY 2008 – 2011.
- The capacity charges for an Equivalent Single Family Dwelling Unit for FY 2007 should be \$4,876.
- The unit cost capacity charges for all users for FY 2007 should be \$14.073 per gallon per day of flow; \$1,299.175 per pound of BOD per day; and \$345.209 per pound of TSS per day.
- If the City elects to adopt the FY 2008 unit costs and associated EDU capacity charge and calculate the unit costs and EDU charges for subsequent years by using the actual changes in the *Engineering New Record Construction Cost Index* for San Francisco, it should use the capacity charge model and do so in the manner described on page 4 of Chapter 4.1.
- After 2011 the capacity charges should be reviewed every four years and updated for the following:
  - Construction costs
  - Timing and amount of bond issues
  - Interest Rates
  - Other Cost Matters as Appropriate
- Revise the Modesto Municipal Code for the following:
  - Update definitions and terminology as necessary
  - Reflect equivalent single family dwelling unit discharge characteristics for Flow (290 gpd), BOD (200 mg/l) and TSS (200 mg/l)
  - Adopt uniform unit costs of capacity for Flow, BOD and TSS

## Peer Review

The City of Modesto retained the firm of HF&H Consultants, LLC, to conduct a peer review of Brown and Caldwell's January 10, 2007 draft report titled *City of Modesto Sewer Capacity Charges*. The results of HF&H's peer review were presented in a Technical Memorandum. HF&H made several useful observations and comments. Items accepted by Brown and Caldwell and the City's Sewer Task Force are incorporated into this final report.