SWEETWATER AUTHORITY

Report on Capacity Charges

July 2006

MWH

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July 25, 2006

Sweetwater Authority
505 Garrett Avenue
Chula Vista, California 91910

Attention: Mr. Hector Martinez
Project Manager

Subject: Report on Capacity Charges

Ladies and Gentlemen:

MWH is pleased to present this Report on Capacity Charges for Sweetwater Authority. The Authority is wise to update its program of capacity charges. This mechanism is used by many water agencies in California to achieve more equitable sharing of financial responsibility for capital costs of utility assets among its customers.

The Authority's Mission is "to provide its current and future customers with a safe, reliable and affordable water supply through the use of the best available technology, sound management practices, public participation and a balanced approach to human and environmental needs in a safe, efficient, and financially responsible manner." We are confident that a change in Authority capacity charges will be consistent with your mission especially with respect to sharing financial responsibility between current and future customers.

Thank you for the opportunity to be of service to Sweetwater Authority.

Respectfully submitted,
MWH AMERICAS, INC.

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Section 1
Introduction and Executive Summary

Sweetwater Authority ("SWA" or "the Authority") provides water service to a population of nearly 180,000 people in National City, the western part of Chula Vista and the unincorporated area of Bonita. The Authority has nearly 34,000 water service connections. Although approximately 96 percent of the land area within the Authority's service area is developed, the Authority expects growth to continue at least through the next twenty-five years.

The Authority's website, http://www.sweetwater.org, contains many interesting and important data about the Authority, including that it has 390 miles of pipeline and produces about 25,000 acre-feet of water per year which is equal to 8,146,000,000 gallons per year or more than 22 million gallons per day.

Management of a water utility is a demanding and complicated business. In addition to meeting the service needs of water customers, the Authority satisfies the demands of a number of other stakeholders as well. These include health, safety and environmental regulators, bankers and governmental lenders and other interested parties. To accomplish competing objectives the Authority has a Mission Statement, a Master Plan, a set of "Rates & Rules," as well as the provisions and limitations of the California codes. Financial responsibility is a key thread in those documents.

Water systems are not inexpensive. SWA's has a net asset book value of more than $140 million. In order to continue to carry out its mission to provide excellent water service to its existing customers and newcomers, the Authority plans to invest an additional amount of about $170 million over the next ten years. Of this amount, $17.8 million is slated to provide additional system capacity. Each year the capital budget is updated by the Authority so the ten year outlook will likely continue to include expansion assets at least through the next two decades. With the continued investment, the Authority will continue to have the reserve capacity in the water system to accommodate new users.

New users provide revenue for operations and debt service. However, at issue for water purveyors is to assure existing customers that the new users are treated fairly and equitably and thus pay for the capital facilities that are necessary for the new users to hook up to the system. There are several ways to share capital cost responsibility for existing and future reserve capacity. A common method is to have capital charges, sometimes called system development charges, facility reserve charges, even connection fees or an element of impact fees.

This report addresses updating the Sweetwater charge structure to include capacity charges.

Sweetwater Authority initiated a capacity charge structure in November of 1978. The charges were called Storage Assessment Fee and were levied on new customers in the amount of $300 per equivalent dwelling unit ("EDU"). Over time the Storage Assessment Fee has increased to

$400 but is now $300. According to the US Bureau of Labor Statistics (keepers of the Consumer Price Index and other indices) $300 in 1978 had the equivalent buying power of $916 in 2005.

State law governs capacity charges. California Government Code Section 66000, *et. seq.*, called the "*Mitigation Fee Act*," provides that the purpose and intended use of a proposed capacity charge must be identified, that there be a reasonable relationship between the use of revenues generated by the fee and the properties paying the fees and that there be a reasonable relationship between the amount of the fee and the cost of the public facility attributable to the properties paying the fees.

MWH is of the opinion that this report satisfies these requirements. In summary, the purpose and intended use of the fees is to generate revenue to pay for capital construction cost, or service debt on capital construction cost, of public water facilities. These facilities will be used to provide water service for the newly connecting accounts. Reasonable care is given in the computation of the fees to assure that only growth-induced portions of new projects, or portions thereof, and unused capacity of existing facilities are to be funded by the fees. The fees are computed on a unit cost basis based on equivalent dwelling unit capacity demand to ensure a reasonable relationship between facility cost and fee paying properties. In administering the fees, MWH assumes that the Authority will comply with other aspects of the *Mitigation Fee Act*, including that fee revenues will not be commingled with other revenue sources.

FEE METHODOLOGY AND COMPUTATION

Section 2 of this report addresses the methodology used to compute capacity charges. A combination of the "buy-in" approach and the "incremental cost" approach is recommended, however if the Authority decides to implement only the buy-in element of the capacity charge this will be acceptable, particularly because the Authority is approaching the holding capacity of the land under current land use practices. Buy-in seeks to ensure equity between new customers and existing customers so that once connected new customers will pay the same rates and charges equivalent to existing customers. Incremental cost seeks to ensure that growth pay for growth in terms of paying for replacement at current cost of the amount of capacity to be used by the new customers.

Section 3 provides details of how the capacity charges are computed based on the methodologies discussed just above. Capacity charges are computed to be $2,306 per equivalent dwelling/residential unit using the buy-in approach and $890 using the incremental cost approach. If the Authority were to implement capacity charges using both buy-in and incremental cost methods, the capacity charges would be $3,196. The *Mitigation Fee Act* would prohibit the Authority from implementing a capacity fee greater than $3,196 at this time, but does not limit entities from implementing capacity charges that are less, provided that the stipulated implementation criteria are met. Thus the Authority might implement capacity charges based on $2,306/EDU (buy-in) or other basis that has a charge less than or equal to $3,196, assuming compliance with the other criteria of the *Mitigation Fee Act*.

The Authority annually assesses its need for capital projects to serve its existing and projected customers. If, for example, growth in the future is more dense, SWA may find that the holding capacity of the land within the Authority's service area is greater and thus may find that additional water system capacity is required. This may result in increases in capacity charge computations, compliant with the *Mitigation Fee Act* if the criteria stipulated in the *Act* are met.

Section 2
Capacity Charge Methodology

This section addresses approaches to develop the capacity charge program for Sweetwater Authority. The approaches recommended for Sweetwater Authority reflect economic and legal precepts for capacity charges and the practices of other water agencies in California.

ECONOMIC AND LEGAL BASIS FOR CAPACITY CHARGES

New customers are allowed to connect to a utility system because the system includes reserve capacity. If there were no capacity available, new connections would not be permitted. For the utility to continue to sustain new development and its corresponding increase in customer demand, the utility must continue to provide reserve capacity in its system.

Capacity that is available to accommodate new customers has been paid for by present and past customers of the system. The manner in which costs incurred to provide that available capacity are recovered from new customers depends on a number of technical, policy, and legal issues. These could include fairness and equity in distributing the costs among customers, the ease or cost of implementation and administration, and legal requirements or constraints.

In the water utility industry, costs for serving new customers can be recovered in a number of different ways. One method for recovering the costs would be to raise utility rates charged to all customers – both existing and new – to pay for the added costs. This has the advantage of being simple to implement and administer. However, it also may create an inequity between existing and future users in which existing customers pay for costs necessary to provide service to new customers. Thus many utilities have policies that support a "growth-pay-for-growth" principle.

Another option for recovering costs associated with serving new customers is to have new customers pay different, higher rates than existing customers. Through the higher rates, new customers directly pay for the facilities required to serve them. While this type of system could be equitable in distributing near-term costs, it could be costly to administer and difficult to implement, especially as with each new year and each new project, "new" customers become "existing" customers.

Yet another option would be to have new customers contribute one-time, up-front charges when they connect to the system. The fee would cover the new customer's share of the cost of facilities required to provide service. This is the precept of capacity charges. Capacity charges can provide equitable cost sharing across different customer classes and over time. In many cases, capacity charges can encompass several managerial and financial objectives including fair and equitable cost sharing and they can readily be implemented and administered.

Economic Basis for Capacity Charges

The basic economic philosophy behind use of capacity charges is that the costs of providing service should be paid for by those customers receiving the benefits of that service so that customer groups do not subsidize other customer groups over the long-run. In establishing any fee or charge, achieving equity among customer types is one of the primary goals. In the case of capacity charges, this goal has been expressed in the form of the "growth pay for growth" principle. As described in the American Water Works Association ("AWWA") Manual M26, *Water Rates and Related Charges*,

> "The purpose of designing customer-contributed-capital system charges is to prevent or reduce the inequity to existing customers that results when these customers must pay the increases in utility rates that are needed to pay for added plant costs for new customers. Contributed capital reduces the need for new outside sources of capital, which ordinarily has been serviced from the revenue stream. Under a system of contributed capital, many utilities are able to finance required facilities by use of a 'growth-pays-for-growth' policy."

Other authorities also point to the added equity in the overall pricing system of requiring new customers to make contributions through capacity charges rather than having the costs added to rates which are paid by all customers. When existing customers contribute to paying the costs to provide service to new customers, they effectively provide a subsidy to the new customers.

Where expansion facilities are effectively under-priced as a result of subsidy from existing customers, economic inefficiencies result. More or larger facilities may be built than would be the case if the full cost of expansion was paid by new customers only. By making "growth-pay-for-growth," economic efficiency closer to what can be achieved in a market oriented industry can result [Nelson, 1995].

Unlike cities or other political entities which may attempt to control the manner in which growth occurs in the community, water system districts such as Sweetwater Authority do not engage in land use planning or other activities geared to controlling or influencing growth. Rather, the Authority must provide water system service to the Authority service area as needed. The goal of capacity charges is to provide the mechanism by which new customers pay for the cost of the facilities necessary to serve them without burdening existing customers.

Legal Framework Governing Capacity Charges

MWH does not practice law, but is aware of certain provisions of the statutes and regulations that are applicable to capacity charges.

In California, the basic statutory standards governing water system capacity charges are embodied in Government Code Sections 66000, *et.seq*., known as the *Mitigation Fee Act* and sometimes called "AB 1600" which was the name of the initial enabling legislation. The

Mitigation Fee Act includes five chapters of the California Government Code, Title 7 Planning and Land Use, Division 1 Planning and Zoning: chapters 5, 6, 7, 8 and 9.

Chapter 5 (commencing with Section 66000) is entitled "Charges for Development Projects." Some of the provisions of Chapter 5 include the following.

> 66000.(b) "Fee" means a monetary exaction other than a tax or special assessment…that is charged…in connection with approval of a development project for the purpose of defraying all or a portion of the cost of public facilities [existing or proposed][1] related to the development project.
>
> 66001.(a) In any action establishing, increasing, or imposing a fee as a condition of approval of a development project…the local agency do all of the following:
>
> (1) Identify the purpose of the fee.
>
> (2) Identify the use to which the fee is to be put. If the use is financing public facilities [existing or proposed][1], the facilities shall be identified.
>
> (3) Determine how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.
>
> (4) Determine how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.
>
> 66001.(b) …Determine how there is a reasonable relationship between the amount of the fee and the cost of the public facility or portion of the public facility attributable to the development on which the fee is imposed.

Chapter 7 (commencing with Section 66012) is entitled "Charges for Specific Purposes." Some of the provisions of Chapter 7 include the following.

> 66013.(a) Notwithstanding any other provisions of law, when a local agency imposes fees for water connections or sewer connections, or imposes capacity charges, those fees or charges shall not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed….
>
> 66013.(b) As used in this section:
>
> (2) "Water connection" means the connection of structure or project to a public water system….
>
> (3) "Capacity charge" means a charge for facilities in existence at the time a charge is imposed or charges for new facilities to be constructed in the future that are of benefit to the person or property being charged.

The statute indicates that a local agency may charge new customers for the utilization of system capacity, existing or proposed, provided that certain procedures are followed.

[1] Parenthesis added by MWH.

Most special districts and joint power authorities, such as Sweetwater Authority, do not have planning or approval authority over development. However, many water utilities take the position that they will comply as fully as possible with the intent of the *Mitigation Fee Act*.

PUBLICATIONS REGARDING CAPACITY CHARGES

Three major publications regarding capacity charges for the utility system were reviewed for this study. A basic publication for the water and wastewater industry regarding water system capacity charges is Manual M26 published by the American Water Works Association. Manual M26, *Water Rates and Related Charges*, covers a number of water system charges, including capacity charges. Other publications reviewed that deal specifically with water system capacity charges include George A. Raftelis, *Comprehensive Guide to Water and Wastewater Finance and Pricing*, and Arthur C. Nelson, *System Development Charges for Water, Wastewater, and Stormwater Facilities*.

AWWA Manual M26, Water Rates and Related Charges

M26 describes two methods for designing development/capacity charges. These techniques are referred to as the System Buy-In method and the Incremental-Cost Pricing method.

System Buy-in Method

The buy-in concept is based on the premise that new customers are entitled to water service at the same price as existing customers. Existing customers, however, have already provided the facilities that will serve the new customers, including any costs of financing those facilities. Under this method, new customers pay an amount equal to the net investment already made by existing customers in the facilities (cost less depreciation less outstanding debt obligations). As described in Manual M26, net investment is based on cost less depreciation. This net equity investment is then divided by the number of customers (or customer equivalents) to determine the amount of payment required from the new customer to buy in to the utility at parity with existing customers.

Once new customers have paid their fee, they become equivalent to existing customers and share the responsibility for existing facilities. When additional costs are incurred for system improvements, replacement, or expansion, all customers share the costs of such improvements.

Incremental-Cost Pricing Method

As described in Manual M26, when new customers connect to the water system, they use either reserve capacity available in existing facilities, which must then be replaced, or they require new capacity which must be added to the system to accommodate their needs. Under this method, new customers would pay for their use of the reserve capacity by paying for new facilities necessary to replace the facilities used to provide service to them. The goal of this method is to minimize or eliminate the need to raise rates in order to provide for system expansion. Consequently, new customers pay fully for the additional facilities without imposing a burden on existing customers.

Since it is likely that the timing of payments received from the development/capacity fee will not exactly match the timing of expenditures to provide facilities, the M26 manual recommends that the fee be adjusted to reflect the time value of money. The intent, according to M26, is that the charge be equal to the required investment as if the construction were to occur at the time of contribution.

Raftelis, Comprehensive Guide to Water and Wastewater Finance and Pricing

According to Raftelis, development/capacity charges improve equity since existing customers would not have to subsidize growth. The charges would usually be developed to recover costs associated only with major capital components of the system. For a water system, these would include source of supply, transmission, treatment, and major pumping components. Raftelis describes three methods for developing charges: (1) growth related cost allocation method; (2) marginal-incremental cost approach; and (3) system buy-in methodology.

Growth Related Cost Allocation

In this method, specific facilities required to serve growth are identified and projected costs established. With a determination of the number of units to be served by the improvements, a cost per unit can be developed that will recover the full cost of the improvements necessary to serve growth. In some cases, the cost of excess capacity in existing facilities is considered in calculating the charges.

Marginal-Incremental Approach

Similar to the M26 incremental-cost pricing method, this method is based on the principle that new users should be responsible for the next increment of capital cost. The development/capacity charge should be set such that existing customer rates would not have to be increased to pay for expansion.

System Buy-in Methodology

Similar to the M26 Buy-in method, this method is based on establishing parity of new customers with existing customers who have paid for facilities that are available to serve the new customers. As described by Raftelis, the value of facilities could be based on either a historical or reproduction cost basis, adjusted for depreciation.

Raftelis also mentions an alternative methodology based on a value of service method. Under this approach, charges are based on the practices of similar communities, tempered by the perceived ability of new users to pay. Raftelis characterizes this approach as, “What the market will bear” and recommends that it be avoided since it has no basis in cost and will likely result in litigation.

Nelson, System Development Charges for Water, Wastewater, and Stormwater Facilities

Nelson identifies eight methods by which development/capacity charges have been calculated. He identifies these as: (1) Market capacity method; (2) Prototypical system method; (3) Growth-related cost allocation method; (4) Recoupment value method (buy-in); (5) Replacement cost method; (6) Marginal cost method; (7) Average cost method; and (8) system wide and growth-related Cost-Attrition method.

Market capacity method

This is based on the "what the market will bear" concept. Like Raftelis, Nelson does not recommend this method. In California it fails the nexus criteria in AB1600 and would likely generate litigation.

Prototypical system method

This method is based on comparison to a comparable community that is fully built-out to determine the charge. By using the costs of another community, for which neither the costs or the pattern of development are likely to be completely identical, the nexus criteria in AB1600 would not be met and litigation would be likely. Nelson recommends against use of this approach.

Growth-related cost allocation method

This is similar to the discussion in Raftelis.

Recoupment Value Method (Buy-in)

Similar to M26 and Raftelis, Nelson describes this method solely in the context of historical cost recovery, with use of asset value net of depreciation. As in the other references, once a customer has bought-in, responsibility for future expansion is jointly shared.

Replacement Cost Method

This method is the same as the Recoupment method, except that the cost basis for the buy-in is the replacement cost rather than historical cost. As with the buy-in method, once the new customer has bought-in, responsibility for future expansion is jointly shared with existing customers.

Marginal Cost Method

This method is defined as consisting of two parts. First is the replacement cost of existing growth-related facilities installed in the recent past. These facilities are valued at replacement cost rather than historical cost. The second part is the cost of future facilities, identified in a CIP or Master Plan, required to serve growth.

Average Cost Method

Under this method, costs of replacing and expanding the entire system are considered in relation to the total capacity of the system. Unlike the replacement cost method, both replacement of existing facilities and planned expansion are included in the cost basis. However, the sum of existing and expanded capacity is used to determine the per unit cost. Replacement costs are used without regard to depreciation.

Total Cost Attrition Method

This method separately determines a value for all system wide assets on a per unit basis and then adds the growth related assets, either put in place in recent years or planned to be put in place in the future. Each component of the cost is developed based on the capacity available for that component. That is, the growth component of asset costs is compared to the growth component of demand, while the existing facility cost is compared to existing demand to determine the per unit charge. Nelson recommends that this method be used based on cost without depreciation since replacement and rehabilitation of facilities over time offset depreciation of the assets.

Summary of Review

As can be seen from the above discussions, the two most commonly discussed methodologies are the system buy-in approach and the incremental cost approach. Use of a fee structure that incorporates both of these two approaches is also common among California water utilities. The two fundamental approaches have many possible variations, most of which represent alternative means of evaluating the numerator (costs or values) to be applied and in some cases how the denominator level of activity (capacity or units of benefit) are determined.

RECOMMENDED METHODOLOGY

MWH recommends that Sweetwater Authority implement a capacity charge program that best reflects its needs for managing capital requirements to provide reserve and expanded capacity in the water system. The Authority might consider a capacity charge program consisting of both the buy-in approach and the incremental cost approach of determining capacity charges. Or it may choose to implement capacity charges determined by only one or the other of these two approaches.

The Buy-in approach is an appropriate application because the Authority is mostly built-out and its assets have capacity available to accommodate near-term growth. The Incremental Cost approach also is an appropriate method because the Authority does plan to provide supplemental capacity in the future, beyond the direct demand requirements to serve its current constituency, according to its adopted Master Plan and its annual ten-year capital improvement plan budgets.

Both the Buy-in and the Incremental Cost approaches are addressed and quantified for application in the next section of this report.

Section 3
Capacity Charge Computation and Implementation

This section discusses the computation of capacity charges based on the methodologies discussed in Section 2. First, equivalent dwelling units ("EDUs") are discussed. EDUs are used to compute capacity charges and are the means that many water and wastewater agencies determine the actual capacity charge for a newly connecting customer. Next, capacity charges are computed using a buy-in approach. Then, capacity charges are computed using an incremental cost approach. Lastly, some aspects of implementation of the computed capacity charges are addressed including whether one or the other of the two approaches is implemented separately or if a fee structure is used that combines the two approaches.

EQUIVALENT DWELLING UNITS

An EDU is the amount of water consumption of a typical single family residential unit. If a business is determined to use about 2.5 times as much water as a single family residential unit, then it would be assigned 2.5 EDUs.

Table 3-1 shows the service and water usage data for SWA's customers in 2004-05[1].

Table 3-1
Services and Water Usage, FY 2004-05

Customer account code and type	EDUs Served	Consumption (HCF/year)	Consumption (gpd)	Unit Cons. (gpd/EDU)
1 Residential	26,013	4,142,723	8,489,745	
17 Resid. with fire prot.	43	8,702	17,833	
Total	26,056	4,151,425	8,507,578	326.5

The number of active services and quantities of water usage (measured in thousands of billing units[2]) data are managed by the Authority in a number of classifications. Only the single family residential ("SFR") accounts are included in Table 3-1 for the purpose of determining the unit consumption associated with EDUs. Unit consumption is expressed on an average daily consumption basis, in gallons per day ("gpd").

The unit consumption data were computed by MWH by dividing SWA water usage data by the numbers of active units serviced by the Authority. The SFR customers used an average of 326.5 gpd per EDU in 2004-05. This figure, 326.5 gpd, defines the unit consumption of an EDU for the purposes of computing capacity charges.

[1] 2004-05 or FY 2004-05 means the accounting fiscal year period of July 1, 2004 through June 30, 2005.
[2] One billing unit is 100 cubic feet, abbreviated "HCF" or "CCF." One gpd is about 2.05 HCF/yr.

Customer Growth

Projected services, water usage and numbers of EDUs are shown in Table 3-2. Growth estimates have been prepared for SWA using actual data of 2004-05 and Authority water system planning and regional demographic forecast data for the future.

Table 3-2
Projected Services, Water Usage and EDUs

	(Base Year) 2004-05	(BY + 5) 2009-10	(BY + 10) 2014-15	(BY + 15) 2019-20	(BY + 20) 2024-25	(BY + 25) 2029-30
Population	179,485	185,864	200,135	214,102	220,420	236,730
Total water demand, mgd	20.5	22.7	24.0	25.4	26.0	27.6
Residential unit consumption, gpcd	114.0	122.1	119.9	118.6	118.0	116.6
EDU consumption, gpd	326.5	350	344	340	338	334
Estimated total no. of EDUs	62,650	64,850	69,760	74,700	76,920	82,630
Number since Base Year		2,200	7,110	12,050	14,270	19,980
Number per 5-year period		2,200	4,910	4,940	2,220	5,710
Number per year,average		440	982	988	444	1,142

In Table 3-2, the population and total water demand (shown in millions gallons per day) data shown on the first two rows were provided by SWA.

Other data included in the table were computed by MWH. Residential unit consumption, expressed in gallons per capita per day, is the total water demand divided by population. Base year EDU consumption is taken from Table 3-1. Subsequent EDU consumption data were computed in direct proportion to the change residential unit consumption shown on the previous row of data. Estimated total number of EDUs for each year shown is the total water demand, expressed in millions of gallons per day ("mgd"), divided by number of EDUs that year. For example, in 2029-30 it is estimated that SWA will be serving a total of 82,630 EDUs (27.6 mgd ÷ 334 gpd per EDU). For master planning purposes the Authority states that the number of EDUs in the Sweetwater Authority service area at build-out land use is represented by the projected number shown for the year 2030, which is equivalent to nearly 83,000 EDUs.

Table 3-2 shows that over the next 25 years the Authority anticipates its customer base will increase by nearly 20,000 EDUs, or nearly a third more the base year total EDUs.

BUY-IN CAPACITY CHARGE DETERMINATION

Capacity charges using the buy-in approach are determined by dividing the net value of water system equity by the quantity of equivalent system users expressed in EDUs. This computation is shown in Table 3-3.

Table 3-3
Buy-In Capacity Charge Computation

Net assets, June 30, 2005	$ 144,457	thousand
Number of EDUs, June 2005	62,650	EDUs
Unit value of existing investment	$ 2,306	per EDU

Net Assets

The numerator, net asset[3] value of the enterprise, is total value of all assets including property, plant and equipment ("PP&E") and all related and financial assets, less allowances for depreciation and less outstanding obligations.

Existing customers have made the investment to provide the net assets and the Authority has the fiduciary responsibility to operate the assets for the benefit of the customers. Some agencies compute water system equity buy-in by including only water operation facilities physical assets. Sweetwater Authority is a special services authority with no government responsibilities or assets unrelated to the water system. Therefore it is reasonable and appropriate that equity buy-in be computed based on net assets of the Authority and not limited to a subset of Authority net assets.

Some agencies compute water system equity buy-in based on replacement value of assets rather than based on original cost less depreciation. Although the Authority maintains assets well, there is no question about whether assets depreciate, whether by physical deterioration, functional/technical obsolescence or economic obsolescence. Use of generally accepted accounting principles ("GAAP") is appropriate and consistent with AWWA Manuals M1 and M26. The American Institute of Certified Public Accountants has recognized the Governmental Accounting Standards Board ("GASB") as the responsible entity to determine and administer GAAP for state and local governments, and particularly GASB's pronouncement no. 34. GASB 34 states that the value of assets should be computed based on original costs if such costs are known. The purpose of a "buy-in" method is for new customers to buy into existing systems and it is appropriate that the buy-in computation reflect the GAAP value of the existing net assets.

The capital equity of $144 million shown in Table 3-3 is the audited and reported value at the close of the 2004-05 fiscal year as reported in Sweetwater Authority's *Financial Report*[4] for the 2004-05 fiscal year.

[3] Prior to GASB 34, many water districts referred to net assets as capital or equity.
[4] See http://www.sweetwater.org/FinancialStatements0605.pdf. The precise value is $144,456,774.

Denominator Value

The denominator is the total number of existing customers using and benefiting from the system, expressed on an EDU basis. In 2005 the average consumption of an equivalent dwelling unit was 326.5 gpd and in that year there were 62,650 EDUs, as shown in Table 3-2.

The total capacity of the system is greater than the total number of EDUs times the EDU unit consumption. This is because the total system includes reserve capacity to accommodate additional users. Financial responsibility for the entire system net assets (not just the portion of the system being used) lies with the existing customers. Therefore it is appropriate to use the number of connected EDUs as the denominator in the capacity charge computation using the buy-in approach so that new customers have equivalent status as existing customers.

INCREMENTAL COST CAPACITY CHARGE DETERMINATION

Capacity charges based on incremental costs usually are determined either using an allocated capacity basis or a specific cost recovery basis.

With the incremental cost (allocated capacity) method, the cost of additional capacity to be provided by expansion projects[5] is divided by the capacity to be provided by those projects. That ratio ($/gpd or $/mgd or $/ac-ft/yr) is converted to a cost per EDU to determine unit capacity charge figures. For example, suppose a complete system is to be provided for a large sub-area including, say, well capacity, storage reservoir, and transmission and distribution pipelines. In this example, it is possible to determine the capacity of that sub-system; say it is 2.0 mgd. The number of EDUs of capacity would be 2.0 mgd divided by the unit demand of an EDU (it was 326.5 gpd/EDU in 2005), or 6,126 EDUs. The capacity charge in dollars per EDU would be the construction cost[6] of the 2.0 mgd facility capacity divided by 6,126 EDUs using the allocated capacity approach.

A benefit of the incremental cost (allocated capacity) method is that the capacity charge does not have a time dimension other than to accommodate carrying costs. If in the example it takes one year to subscribe 2 mgd in customer demand, then the capital revenue associated with the project will be paid in one year. If it takes six years to subscribe 2 mgd of EDUs, then the revenue will arrive over the six year period.

A disadvantage of the incremental cost (allocated capacity) approach is the difficulty to affix a capacity value to many of the necessary assets of a water system. A new laboratory or a new service truck repair garage – these are examples of assets that might serve a wide variance of hydraulic capacity of operating facilities. Because of this, many utilities that favor the

[5] Expansion projects include projects that provide additional capacity to be utilized by future users and also the expansion portion of projects that are for capital replacement and/or improvement and/or upgrade (where "replacement" and "upgrade" do not refer to added capacity). For example, if an 8 inch pipe is worn out and is replaced by a 10 inch pipe, then part of the capital cost is for replacement and part is for expansion.

[6] Construction cost includes capitalized ancillary expenses, as defined in GASB 34, including administrative and legal costs, professional costs of planning, design, construction management, etc.

incremental cost approach (alone or in combination with the buy-in method) prefer the specific cost recovery method of the incremental cost approach.

With the incremental cost (specific recovery) approach, the capital costs of expansion projects[1] to be provided over a specific period of time are summed. This figure is divided by the added water demand (expressed as capacity units, or EDUs) expected to join the system during that period of time. For example, suppose that a district's water system master plan has a twenty year outlook and determines that over the next twenty years a certain amount of capital is needed to construct additional capacity to accommodate the growth over the next twenty years. If everything works out according to plan, the new customers (measured by EDUs) that join the system in twenty years will have paid for the added capacity needed to support their growth and at the end of the twenty year period the amount of reserve capacity will be the same quantity as at the beginning of the period.

Because the projects needed are to accommodate the growth (the additional capacity demanded), then the specific capacity provided by any single project element is not necessary to be determined for the capacity charge determination because the over-all set of expansion projects for the twenty year period is planned to accommodate the increased demand (in EDUs) over the twenty year period. Thus the focus of this approach is the dollar value to be recovered over a specific period of time as opposed to the capacity units to be provided and subscribed.

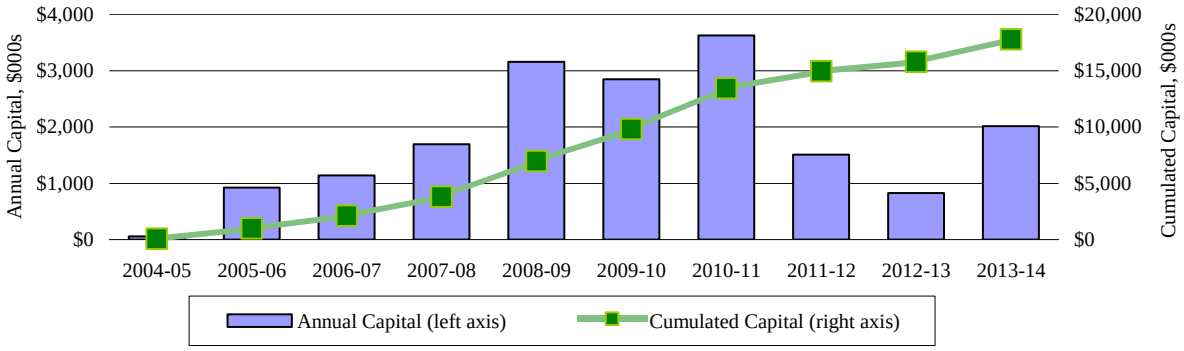
The two methods to determine unit incremental cost yield the same capacity charge value if they are both computed for the long-term planning period (say twenty years as in the above example). They can be different if all of the capital works to accommodate the projected twenty year growth are built during the first ten years if the specific capital recovery target is ten years rather than twenty years. In such case it is important to consider that the ten year capital construction plan (for expansion projects) is to serve twenty years worth of growth, not just the growth that occurs during the first ten years when the projects are being built. To resolve the differentiation, the capital cost of the additional assets to be provided for the longer term increase in demand (twenty years in the example) can be assumed to be fully utilized over that period of time. If growth (in EDUs) over a shorter period of time is estimated, a utilization factor may be applied to the long term value of expansion assets to determine a value of the utilized capacity over the shorter period. This allows appropriate nexus (logical connection) between the better focused shorter term demand forecast with the equivalent value of the long term capital program over the same shorter term period of years.

The following paragraphs show computation of the capacity charge using the incremental cost approach for Sweetwater Authority.

Capital Requirements

Figure 3-1 summarizes the annual and cumulating total amounts of capital required for construction of four projects that will provide expanded system capacity[7]. The time frame shown is ten years. The projects that provide expanded capacity to be built during that time frame are expected by the Authority to meet long term demand requirements for twenty-five years through 2029-30, which is approximately when SWA expects the service area will reach build-out.

Figure 3-1
Capital Improvement Plan for Expansion Projects



The graph indicates that water system investments for the expansion part of the four projects that will provided additional capacity will total about $17.8-million. Annual capital requirements will generally be increasing over the short-term, reaching a high mark of about $3.6 million in 2010-11 and then decreased annual capital activity.

Table 3-4 shows the SWA Ten Year Capital Improvements Program ("CIP"). The four projects that include expansion capacity are indicated in the columns at the left and the costs of those projects in the annual cost columns are the total costs, not just the cost of expansion capacity. All of the costs are shown in constant 2005 dollars.

As shown in Table 3-4 the Authority's ten year CIP is composed of more than 100 projects. Of those projects, four projects will provide additional system capacity, as mentioned above, and so may be included in the computation of capacity charges. Of the total $170-million of capital required, about 10 percent of the total, or about $17.8 million, is the value of the expansion portion of the projects. The expansion portion was determined by SWA by examining the capacity aspect of the projects and making a determination of what portion of the project cost is attributable to the expansion capacity (the remaining project cost being attributable to replacement/improvement/upgrade). The projects that include expansion capacity and the expansion portion of costs are shown in Table 3-4, as well as the apportioned expansion project cost.

[7] The four projects will provide replacement/improvement value as well as increased capacity. Cost of expansion are shown in Figure 3-1, not the total costs of the four projects.

Table 3-4
SWA Ten Year Capital Improvements Program
($000s)

		Expansion 10-years	Percent Expansion	Total 10-years	(BaseYear) 2004-05	(BY + 1) 2005-06	(BY + 2) 2006-07	(BY + 3) 2007-08	(BY + 4) 2008-09	(BY + 5) 2009-10	(BY + 6) 2010-11	(BY + 7) 2011-12	(BY + 8) 2012-13	(BY + 9) 2013-14
45	Desalination fac. II			2,600					1,200	1,400				
46	Runoff phase II			368	368									
47	Boat launch ramps			150					150					
48	Additional wells			7,307	792	1,615	1,100	1,200			1,200	1,400		
49	NC wells - ammonia feeder			20	20									
50	Watershed monitoring			255		55	25	25	25	25	25	25	25	25
51	Storage tanks	1,809	37%	4,850	0	37	703	740	615	615	450	450	620	620
52	Central - Wheeler tank & pipeline			2,490	2	38	1,550	900						
53	Fencing improvement at Sweetwater			175			25		25	25	25	25	25	25
54	Fencing improvement at Loveland			175			25		25	25	25	25	25	25
55	Fencing at Pointe & West SW Res			0										
56	Other			609		9	75	75	75	75	75	75	75	75
57	Pump efficiency			557		77	60	60	60	60	60	60	60	60
58	Wheeler Drain replacement			100				100						
59	Other			0										
60	Treatment plant	2,848	10%	28,000	560	2,240	2,800	11,200	11,200	0	0	0	0	0
61	Desal. plant	2,750	29%	9,625	0	0	825	2,200	2,200	2,200	2,200	0	0	0
62	SCADA replacement program			100			50		50					
63	Caustic and coagulant feed / storage			0										
64	HSP upgrade controls at desal. facility			246		96		50	50	50				
65	Repair/replace/upgrade HVAC at Perdue			100				100						
66	Chemical tank replacements (1 per year)			0										
67	Chemical feed replacements (1 per year)			0										
68	On line instrumentatino improvements			55	25		10	10	10					
69	Electrical power imporvements and upgrades			100			50	50						
70	Perdue Plant upgrades Phase 1													
71	Membranes			4,500			4,500							
72	Construction			24,666	376	1,817	4,000	10,000	8,473					
73	Design work			0										
74	Other			15		15								
75	Perdue Plant upgrades Phase II													
76	Design work			1,000					1,000					
77	Clearwell relplace 12-13 & 13-14			8,090									4,045	4,045
78	Master plan			11,884		984	2,000	2,200	3,300	3,400				

Table 3-4, Continued
SWA Ten Year Capital Improvements Program
($000s)

		Expansion 10-years	Percent Expansion	Total 10-years	(BaseYear) 2004-05	(BY + 1) 2005-06	(BY + 2) 2006-07	(BY + 3) 2007-08	(BY + 4) 2008-09	(BY + 5) 2009-10	(BY + 6) 2010-11	(BY + 7) 2011-12	(BY + 8) 2012-13	(BY + 9) 2013-14
79	Metallic mains			12,796	2,381	4,410	2,000	2,000	1,000	1,005				
80	Pavement			493	44	109	70	80	90	100				
81	Cathodic			340		60	70	70	70	70				
82	Valve replacement program			616	68	148	50	50	50	50	50	50	50	50
83	Design main replacement			1,277	225	232	190	200	210	220				
84	Blow-offs (67) on dead end mains			448	246	202								
85	Other			218		18	50	50	50	50				
86	Meter replacements			1,030	137	93	200	200	200	200				
87	I.S. section			3,507	186	871	450	550	550	500	400			
88	Other			590	18	232	85	85	85	85				
89	Lab equipment			236	2		97	47	63		10	2	5	10
90	Heavy duty equip. replacement program			929	112	230	137	145	154	151				
91	Heavy duty equip.			220			55	55	55	55				
92	Transportation equip.			122		2	30	30	30	30				
93	Vehicle replacement program			1,541	81	180	250	350	330	350				
94	Comm. & field equip.			561	92	69	100	100	100	100				
95	Security upgrades			2,257	12	245	250	250	250	250	250	250	250	250
96	Shop & CV office projects			607	512	95								
97	A/C and heating units at Admin Bldg.			47		47								
98	Garage facilities covering outside area			0										
99	Loveland restrooms			20			20							
100	Loveland trail improvements			40			5	5	5	5	5	5	5	5
101	Residence improvement at Loveland			40			5	5	5	5	5	5	5	5
102	Construct Loveland field office			95	1	94								
103	Pavement Maint. at RAP, WTP and Lake Loveland			159		159								
104	Demolish Loveland cabin and build new cabin			0										
105	Sweetwater & Loveland Res. fishing programs			351	201		50	50	50					
106	Other			72		72								
107	JWANC conservation plan			156	111	45								
108	Sweetwater reservoir URDS optimizatin - grant proj.			601	177	424								
109	Iron and manganese removal plant			1,500					750	750				
110	Master plan main replacements	10,377	63%	16,413	0	1,076	934	0	1,522	2,835	4,168	2,120	939	2,819
111	Desalination facility I – preservation – veg distress			96	16		10	10	10	10	10	10	10	10
112	Desalination facility monitoring & mitigation prog.			22	22									

Table 3-4, Continued
SWA Ten Year Capital Improvements Program
($000s)

		Expansion 10-years	Percent Expansion	Total 10-years	(BaseYear) 2004-05	(BY + 1) 2005-06	(BY + 2) 2006-07	(BY + 3) 2007-08	(BY + 4) 2008-09	(BY + 5) 2009-10	(BY + 6) 2010-11	(BY + 7) 2011-12	(BY + 8) 2012-13	(BY + 9) 2013-14
113	Emergency plan update			0										
114	Air and water quality monitoring SR 125 (USGS)			2,271	496	160	185	190	195	200	205	210	215	215
115	SR 125 management action plan			0										
116	AB 3030 groundwater management plan			13	13									
117	Source water assessment (3 programs)			100				50			50			
118	Source water total organic carbon (USGS)			84	42	42								
119	Urban water managemetn plan 2005/2010			97		27					70			
120	Dam break/inundation			150			150							
121	Design central Wheeler tank and system improv			50						50				
122	Consultant support for garage / fuel dispensing			25			5	10	10					
123	Security			0										
124	San Diego formation aquifer – USGS			3,394	384	410	500	600	700	800				
125	Oversight consultant – Regional WQB			0										
126	Desal facility discharge permit translator study			20	9	11								
127	Recycle water master plan			216	216									
128	Additional water quality studies as needed			400			50	50	50	50	50	50	50	50
129	Feasibility study – admin & ops offices at desal			29	29									
130	Loveland Res intertie			250			250							
131	Lake aeration			50						50				
132	SW Dam south spillway alt. tower			30	1	29								
133	Other			756	6	50	200	250	250					
134	Major dam maintenance			3,046	29	967	800	1,000	125	125				
135	Major tank maint.			30		30								
136	Tank coatings / seismic / maint.			930		245		310		375				
137	Tank improvements – nitrification controls			0										
138	Major reservoir maint. (HMP)			1,301	157	184	120	120	120	120	120	120	120	120
139	URDS II revegetation			111	111									
140	Pond sediment removal			160			20	20	20	20	20	20	20	20
141	URDS II spoil/pond restor'n – watershed mgmt			1,500				1,500						
142	Sweetwater res. vegetation harvest			91	11		10	10	10	10	10	10	10	10
143	Other			15		15								
	Totals	17,785	10%	170,556	8,291	18,266	25,196	37,352	35,567	16,496	9,483	4,912	6,554	8,439
	Totals, expansion only	17,785		17,785	57	922	1,138	1,690	3,156	2,847	3,628	1,508	825	2,013

Incremental Cost Capacity Charge Computation

Computation of the SWA capacity charges using the incremental cost approach is shown in Table 3-5. The computation indicates that $3,007 per EDU would be an appropriate capacity charge figure.

Table 3-5
Incremental Cost Capacity Charge Computation

Expansion project costs to serve 25 year growth	$ 17,785	thousand
Utilization factor	35.6%	over ten years
Cost utilization in first ten years	$ 6,331	
Number of additional accounts	7,110	EDUs in ten years
Incremental capacity charge	$ 890	per EDU

The expansion portion of the CIP is $17.8 million, as shown in Figure 3-1 and Table 3-4. The CIP is based on master plan data and is expected to meet increased capacity requirements over then next twenty-five years. Over the first ten years of the projection, there will be an estimated 7,110 new EDUs as shown in Table 3-2, and over the forthcoming twenty-five year period there will be an estimated 19,980 new EDUs. Therefore over the next ten years approximately 36 percent of the additional capacity provided by the CIP will be utilized (7,110 ÷ 19,980). Applying this ratio to the CIP cost, about $6.3 million of the expansion capacity will be utilized over the next ten years. During this period there will be about 7,110 new EDUs, as stated above, so the average incremental cost per EDU over this period is $890 in present value dollars.

SWA studies its needs for capital assets frequently and comprehensively. The Authority's master plan is updated every five years and its ten year capital budgeting outlook is studied every year as part of the budgeting process. The $17.8 million CIP value is estimated at this time to be a summary of the capital needs to accommodate growth for the twenty-five year period of time. However as time marches on the estimated build-out number of EDUs may change as well as the requirement for and cost of capital to serve that demand. SWA's planning and budgeting process will incorporate such changes over the course of time, and the capacity charge information may change accordingly.

CAPACITY CHARGE IMPLEMENTATION

SWA may choose to implement capacity charges including both the buy-in approach and the incremental cost approach. Table 3-6 shows the combined value would make the capacity charge about $3,200.

Table 3-6
Incremental Cost Capacity Charge Computation

Buy-in approach	$ 2,306
Incremental cost approach	890
Total	$ 3,196

A new customer would pay the buy-in portion of the fee to pay for equity in the existing system that has been provided by the other existing customers. But the system would then have reduced reserve capacity. The incremental cost portion of the capacity charge would ensure that the customer pay for replacement capacity at current cost.

SWA may choose to implement just the buy-in element or the incremental cost element. Because most of the growth is of the infilling type[8], as opposed to large subdivisions at the edges of the service area, MWH would recommend that the Authority implement the buy-in portion if it chooses to implement capacity charges using only one of the two approaches.

Additional implementation features of the capacity charge the Authority may choose to consider include:

- The capacity charge does not include the cost of water meter, box and set, or lateral service from the pipeline to the property line or any construction on customer property, consistent with SWA *Rates & Rules*, page 2, Section I, Paragraph D. – Connection Fees.

- Capacity charges should be recomputed periodically to ensure that the requirements of the *Mitigation Fee Act* continue to be incorporated into the capacity charge program. MWH suggests that the charges be reviewed every year in concert with the master plan update and financial planning that might be included in those updates.

- Capacity charge dollar values should be adjusted annually to reflect changing costs of capital. Many agencies use an index adjustment keyed to the *Engineering News-Record* construction cost index or some other appropriate index.

- Capacity charge income should not be commingled with operating funds, in accordance with the *Mitigation Fee Act*, but should be accounted as operating income (not a balance sheet transaction) in accordance with GASB 33.

- Some agencies allow customers to pay capacity charges over time. The monthly charge is computed to include interest expense at the agency's cost of capital.

- Some agencies allow developers to donate general benefit facilities in lieu of a portion of the capacity charge for the properties in the development. The Authority should have

[8] The Water System Master Plan 2002 states at p.1-4 that the Authority's service area, as indicated by land use maps, is about 96% built-out.

procedures for verifying the value of donated assets so as to comply with procedures suggested by GASB 34.

- SWA should define a schedule of standard EDUs for accounts that are not single family residential using a 5/8 inch meter. Many agencies administer capacity charges by EDUs. The number of EDUs may be in proportion to expect water demand or expected peak water demand in proportion to the EDU water demand or peak water demand. Other agencies administer capacity charges on a meter size basis, using meter capacity ratings as provided by manufacturers or AWWA Manual M6, *Water Meters – Selection, Installation, Testing and Maintenance*. It is noted that current EDU consumption at SWA is 326.5 gpd. AWWA Manual M6, (table 2-2 of that manual) shows that 5/8 inch meters have capacity of 20 gallons per minute, or 28,800 gallons per day on a continuous 24 hour basis, or 88.2 times actual EDU consumption measured on an average annual basis. Larger meters provide larger instantaneous demand hydraulic capacities but their users may not consume water in proportion, on an average annual basis and may not, therefore, be indicative of proportional benefit that accrues to the users of larger meters.

- SWA may desire to add a Capacity Charge provision to its *Rates & Rules* Section V. – Water Service and Billing.