maximum-day demand will be sufficient to transfer treated water in the winter to the individual pressure zones.

4.4 WATER TREATMENT PLANT SLUDGE DISPOSAL

The water treatment sludges produced are primarily calcium carbonate with a high magnesium hydroxide content. The sludges contain much of the original suspended and colloid material contained in the raw water supply plus the chemical added to produce coagulation.

The sludge is essentially composed of relatively inert material. The recent changes in coagulation chemicals to a lesser dosage of lime and higher dosage of ferrous sulfate may slightly alter the quality of sludge produced. However, the relatively inert nature of the sludge should be retained even with these changes in chemicals and dosages. The sludges should continue to be monitored to ensure this inert quality.

Sludge is dewatered at each of the existing water treatment plants by use of centrifuges to produce solid concentrations in the sludge of about 35 to 50 percent. These existing sludges are trucked to the City of Austin Shaw Lane facility in Southeast Travis County. The Shaw Lane disposal facility is an old gravel pit that is being reclaimed for beneficial use by using the inert solids from the water treatment sludge to fill the pit. The City of Austin has a TNRCC permit for this purpose.

The sludge from WTP 4 will be used for the same purpose at a gravel pit located in lower Williamson County near Leander. Sludge is proposed to be transported by use of a slurry pipeline rather than by truck. This is a more efficient method in which the sludge solids are pumped to the site and the carrier water (supernatant) is returned to the water treatment plant for recovery and use. This saves on sludge processing and transportation.

The sludge disposal facilities at each existing water treatment plant have been or are being upgraded by current projects to provide sludge treatment capacities, which match their water treatment capacities. The problems with trucking sludge have been and are primarily due to conditions caused by the truck traffic in residential areas. This problem is being addressed by choice of trucking routes, time of delivery and public education.

By putting the water treatment plant sludges to beneficial use in reclaiming abandoned gravel pits, the City of Austin has solved the issue of disposal in an enlightened manner. The Utility will continue to monitor sludge quality and regulatory trends. This current method of final disposal appears to be the method of choice, and the gravel pits appear to have capacity throughout the planning period.

4.5 COMPLIANCE WITH SAFE DRINKING WATER ACT (SDWA) AMENDMENTS

Among the many regulations governing water system planning, the most significant and rapidly changing are those covered by the Safe Drinking Water Act (SDWA). This section outlines the key features of SDWA requirements now in force and discusses trends and probable new requirements that affect the planning process. The City's record of compliance with these rules is also stated.

The City of Austin's record of SDWA compliance includes:

- The City has complied with all provisions of the Act in effect in January of 1993. This includes compliance with the Lead and Copper Rule.
- Compliance with the Surface Water Treatment Rule was achieved on July 1, 1993. Meeting this rule required major simultaneous construction projects at our three treatment plants.

Based on initial Utility review, the second stage of the Disinfection By-Product Rule may prove challenging. The proposed rule should be available in March of 1994, and the Utility will evaluate its impact in detail at that time.

One important aspect of SDWA regulations is the requirement of public notification when provisions are violated. The mandated notifications vary depending on the severity and potential consequences of the violation. For example, a serious violation of the Total Coliform Rule suggests public health concerns. This violation triggers immediate public notification via the broadcast media, while others require print media public notification. The Utility has never been involved in a violation that incurred the notification requirement.

SDWA History

The Safe Drinking Water Act (SDWA) enacted by Congress in 1974 directed the Environmental Protection Agency (EPA) to establish minimum national drinking water standards. It stipulated that the states be responsible for implementing and enforcing these regulations. Every public water supply serving at least 15 service connections or 25 or more people must ensure that its water meets the minimum standards established by the Act. Drinking water standards, or maximum contaminant levels (MCLs), became effective for 26 parameters which included turbidity, 10 inorganic contaminants, 6 pesticides, and total coliform.

In 1986, Congress passed amendments known as the Safe Drinking Water Act Amendments of 1986, which accelerated EPA's regulations of contaminants, banned all future use of lead pipe and lead solder in public drinking water systems, and streamlined the enforcement procedures to ensure compliance.

The 1986 Amendments gave EPA three years to set standards for 83 contaminants and monitoring requirements for an additional 150 to 200 unregulated parameters in five sets of regulations. These drinking water standards not only establish MCLs but also the best available technologies (BATS) that are capable of meeting the standards.

As part of the SDWA, a number of rules and regulations have been developed to achieve SDWA goals. These rules and regulations include those listed below.

Disinfection/Disinfection By-Products Rule (Phase VI A)

This Rule is currently the one that will pose the most serious challenges to the City's system. The Rule is being negotiated to establish requirements on the use of disinfectants and the permissible levels of disinfection by-products. On September 10, 1992, the Disinfection/Disinfection By-Product (D/DBP) Rule was signed. Concurrently, the EPA created an Advisory Committee to negotiate proposed Rules by March 1994.

To date, three proposed rules have been agreed to: Information Collection Rule (ICR), D/DBP Rule, and Enhanced Surface Water Treatment Rule (ESWTR).

The D/DBP Rule will be divided into two stages. The first stage would establish MCLs for total trihalomethanes (TTHMs) and total haloacetic acids (THAAs) at 80 and 60 parts per billion (ppb) respectively. MCLs would be established for bromate and chlorite. Maximum residual disinfection levels (MRDLs) would be proposed for chlorine at 4 milligrams per liter (mg/l) as free chlorine, for chloramines at 4 mg/l measured as total chlorine, and 0.8 mg/l for chlorine dioxide. Stage 1 will require many large (greater than 100,000 people) systems using conventional treatment to initiate enhanced coagulation for the removal of disinfection by-product precursors.

The second stage of the D/DBP Rule would propose TTHM and THAA levels of 40 and 30 ppb respectively, but would remain open until a second regulatory negotiation in 1998. The second negotiation would be based on data from the ICR rule, health effects, occurrence and exposure data.

With the City's present treatment process we can meet the Stage 1 proposed limits and can demonstrate enhanced coagulation. However, for the Stage 2 proposed regulations various treatment alternatives need to be evaluated with the pilot plant studies to determine further effects on compliance with this rule. This is a major concern at the Green WTP where space for major process changes is at a premium.

Total Coliform Rule

The Total Coliform Rule was finalized on June 29, 1989. Requirements include a written sample siting plan, a monthly maximum contaminant level of no more than 5 percent coliform positive samples per month from the distribution sample sites (221 sample sites for the City of Austin), three specified repeat samples on any positive sample and fecal coliform testing on each total coliform positive sample.

The City of Austin met the compliance date of December 31, 1990 and has had no violations to date.

Surface Water Treatment Rule

This was finalized on June 29, 1989. Regulations became effective in December 1990, with a phased-in implementation period and full compliance required by July 1993. Requirements include turbidity of <0.5 NTU in 95 percent of four-hour measurements of water entering the distribution system; treatment techniques requirements must achieve at least a 4-log reduction (99.99 percent inactivation) of viruses; and continuous monitoring of concentration of disinfectant entering the distribution system from each plant with residual disinfectant in the system not to be undetectable in more than 5 percent of samples taken in a month for any 2 consecutive months. All public water systems using surface water are required to disinfect and may be required to install filtration depending on source quality.

The City of Austin met compliance on July 1, 1993 by the addition of free chlorine at the raw water intakes of each plant to provide the required viral and partial Giardia inactivation. Additional Giardia removal credit is given based on the removal of turbidity provided by the treatment process.

Lead and Copper Rule

This Rule was finalized May 1991, establishing an action level for treatment of 0.015 mg/L for lead and 1.3 mg/L for copper in more than 10 percent of household taps sampled. The 90th percentile of the City of Austin's compliance samples collected and analyzed for both the first and second round of samples were under 5 parts per billion (ppb). Consequently, the Utility has demonstrated effective corrosion control. Water Quality Parameter sample results will continue to be collected and reported quarterly from 10 distribution sample site locations as part of the reduced monitoring program.

Phase II Rule

The National Primary Drinking Water Regulation for 30 synthetic organic chemicals (SOCs) and 8 inorganic chemicals (IOCs) was finalized December 31, 1990. The rule includes monitoring, reporting and public notification requirements for the SOCs and IOCs. Also included are monitoring requirements for approximately 110 additional "unregulated" contaminants.

Compliance sample results of March 1993 for nitrate/nitrite were 0.21-0.23/<0.01-0.01 ppm which is well below the maximum contaminant levels of 10/1 parts per million. Compliance monitoring for Phase II and Phase V contaminants began August, 1993.

In the future annual samples will be required for cadmium, chromium, mercury, selenium, and barium. One sample every 9 years will be required for asbestos and one annual sample for nitrite. For Austin's system four quarterly samples will be required for nitrate initially and then one annual sample thereafter. Quarterly samples for one year will be required for the 18 Volatile Organic Compounds (VOCs) and annual samples after one year of no detection. For the 17 pesticides and PCBs, quarterly samples are needed every three years. After one round of no detection, monitoring requirements will be reduced to two samples per year every three years.

Radionuclide Rule Phase III

The City of Austin Water and Wastewater Utility will not be affected by the MCLs established for naturally occurring radon, radium-226, and radium-228, since they are not a problem for this area. The new MCL of 20 pCi/L for gross alpha and beta particle emitters presents no problem; the levels from our water plants are below that level.

Phase V Rule

This rule, finalized in May 1992, regulates 24 contaminants which include nine pesticides, six inorganic chemicals (IOCs), three volatile organic chemicals (VOCs), and six synthetic organic chemicals (SOCs).

Compliance monitoring for the Phase V contaminants began for large systems in Texas in August 1993.

Information Collection Rule

The ICR is intended to develop information for future regulation of D/DBPs and provide input to the Enhanced Surface Water Treatment Rule. It is also intended to provide data for development of a Stage 2 D/DBP Rule. Systems serving more than 10,000 people will be required to monitor raw water for microbial contaminants and water quality parameters as well as finished water for disinfection by-products and operational parameters. Monitoring for systems serving more than 100,000 people for microbial, Giardia, Cryptosporidium, total coliforms, fecal coliforms or E. Coli and enteroviruses, must be completed by March 1997.

Enhanced Surface Water Treatment Rule

The Enhanced Surface Water Treatment Rule (ESWTR) is intended to insure that the present microbial protection provided by the Surface Water Treatment Rule is adequate, and that microbial protection is not compromised by control of disinfection by-products in the D/DBP rule. The final proposed ESWTR—expected in December 1998—will establish a baseline for systems serving fewer than 10,000 and update the baseline for larger systems if needed.

Phase VI B: Additional SOCs & IOCs

This rule, to be proposed in Spring of 1994, will select contaminants from the Drinking Water Priority List along with those from the D/DBP rule, to make up the 25 contaminants required to be regulated every three years.

(1) In the same manner that it distributes the costs for their actual use, or
(2) Under a system which uses one or any combination of the following factors on a reasonable basis:
   (i) Flow volume of the users;
   (ii) Land area of the users;
   (iii) Number of hookups or discharges of the users;
   (iv) Property valuation of the users, if the grantee has an approved user charge system based on ad valorem taxes."

The foregoing regulatory requirements provide considerable flexibility in how I/I costs may be allocated to users or user classes. The distinction made is that I/I represents a cost category which must be identified and addressed in a user charge study following the criteria specified.

4.0 CONSULTANT'S RECOMMENDATION

The Rate Consultant recommends that the cost associated with infiltration/inflow (I/I) to the wastewater system be allocated to customer classes on a two-thirds (66.7%) customer basis and one-third (33.3%) volume basis. Further, it is recommended that the number of customer accounts approach be used for the customer allocation portion. We conclude that this basis is most appropriate because:

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- Since a significant portion of I/I is not directly related to the wastewater volume contributed by customers, but rather to the number of customer connections and the total length of the sanitary sewage collection system, the allocation of cost responsibility for I/I should recognize that the number of customers served is a predominant factor in the amount of I/I that occurs in the collection system.
- The larger 2/3 customer weighting basis is justified on a cost-causative philosophy recognizing that most I/I enters the sanitary sewer system through defective customer service connections, pipe joints, broken pipe, cracks or openings in manholes, roof leaders, and area drains. The 1/3 volume portion fairly recognizes the greater length and size of services and frontage mains serving larger commercial and industrial customers relative to residential customers.
- The method based on utilizing number of customer accounts, as opposed to equivalent connections, is administratively more simple and easy to understand by rate-payers, and does not require the establishment of wastewater service charge schedules by meter size.
- The 2/3 customer and 1/3 volume method is consistent with Austin's existing allocation procedure on this issue.

5.0 ATTACHMENTS

See Public Involvement Committee (PIC) member comments and Executive Committee decision on this issue paper immediately following.

Executive Team Decision on
Issue Paper #5 Inflows & Infiltration

Consultant Recommendation:

- Allocate 2/3 (66.7%) of identified Infiltration/Inflow costs based on number of customer connection
- Allocate 1/3 (33.3%) of identified Infiltration/Inflow costs based on a customer class volume basis.

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Executive Team Decision: The Executive Team agreed with the consultant's recommendation for Infiltration/Inflow cost allocation. Black & Veatch will proceed with these general methodologies and detail all specific allocation results within the cost of service model to be presented to the PIC in May.

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Executive Team Decision on
Issue Paper #7 Customer Class Wastewater Strengths

The Executive Committee met and reached the decision documented below on March 30, 1999.

Consultant Recommendation: Customer class wastewater strengths should be determined using the "system mass balance" method based on monitored contributions and estimates of normal domestic strength contributions. The associated costs should be recovered through the use of normal-strength volume charges and extra-strength surcharges.

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Executive Team Decision: The Executive Team agreed with the consultant's recommendation for sewage strength cost allocation. Black & Veatch will proceed with these general methodologies and detail all specific allocation results within the cost of service model to be presented to the PIC in May.

Executive Team Decision on Issue Paper #8 Peaking Factors

The Executive Committee met and reached the decision documented below on March 30, 1999.

Consultant Recommendation: The recommendation has three elements

- Customer class peaking factors should be determined using the non-coincident demand or "non-coincident peak" (NCP) method. 2
- The customer class non-coincident peaking factors should be calculated using the billing data estimation approach (Option #2 in the issue paper) in the short term for the current cost of service study. E
- The Utility's demand monitoring program should be re-examined and validated. 2

Executive Team Decision: The Executive Team agreed with the consultant's recommendation for using the non-coincident peak demand basis and the billing data estimation approach. Black & Veatch will proceed with these general methodologies and detail specific allocation results within the cost of service model to be presented to the PIC in May.

The Executive Team also discussed the current hourly demand monitoring program. They recommended further analysis be completed before any final decision is made on whether to terminate the program.

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(16) (29) (2)

(E) (23)

This study is in fulfillment of that requirement. An additional provision of the agreement is that the City **must allow the wholesale customers 6 months to review and comment on the cost-of-service rate study before the study is presented to the Austin City Council for** adoption. (2)

The substantial increases in water and wastewater service costs during the 1980's also focused attention on retail rates. In addition to the principal concern with the overall retail rate levels, questions arose about the equity of the current rate structure. It was recognized that information on the costs to provide service to different types of retail customers is critical for establishment of equitable service rates.

Water conservation also became a significant issue during the course of the 1980's, particularly following mandatory water use restrictions and a moratorium on new service connections in 1984. Although imposed in response to treatment capacity shortages which have since been cured, environmental concerns and the cost of treatment capacity expansions, have prompted interest in the use of rate designs to promote water conservation.

Purpose and Objectives

This cost-of-service water rate study has multiple objectives. These objectives are summarized as follows:

1. The City of Austin, like all municipal utilities, needs to generate revenues adequate to meet revenue requirements (i.e., costs). Determination of rates that meet the Utility's revenue requirements is important to maintain long-term viability and efficiency of service over time.

2. The purpose of a cost-of-service rate study is to promote rate equity by determining the costs of serving user classes and designing rates to recover those costs by class.

3. The City of Austin agreed to perform a cost-of-service rate study as part of the settlement of wholesale rate litigation.

4. **Implementing cost-based rates will make the City of Austin's utility rates defensible. Cost-of-service rates have traditionally been successfully defended when challenged.** (2)

5. An important product of this rate study is a comprehensive computer rate model that will be used by the City in future years to update and maintain cost-of-service rates.

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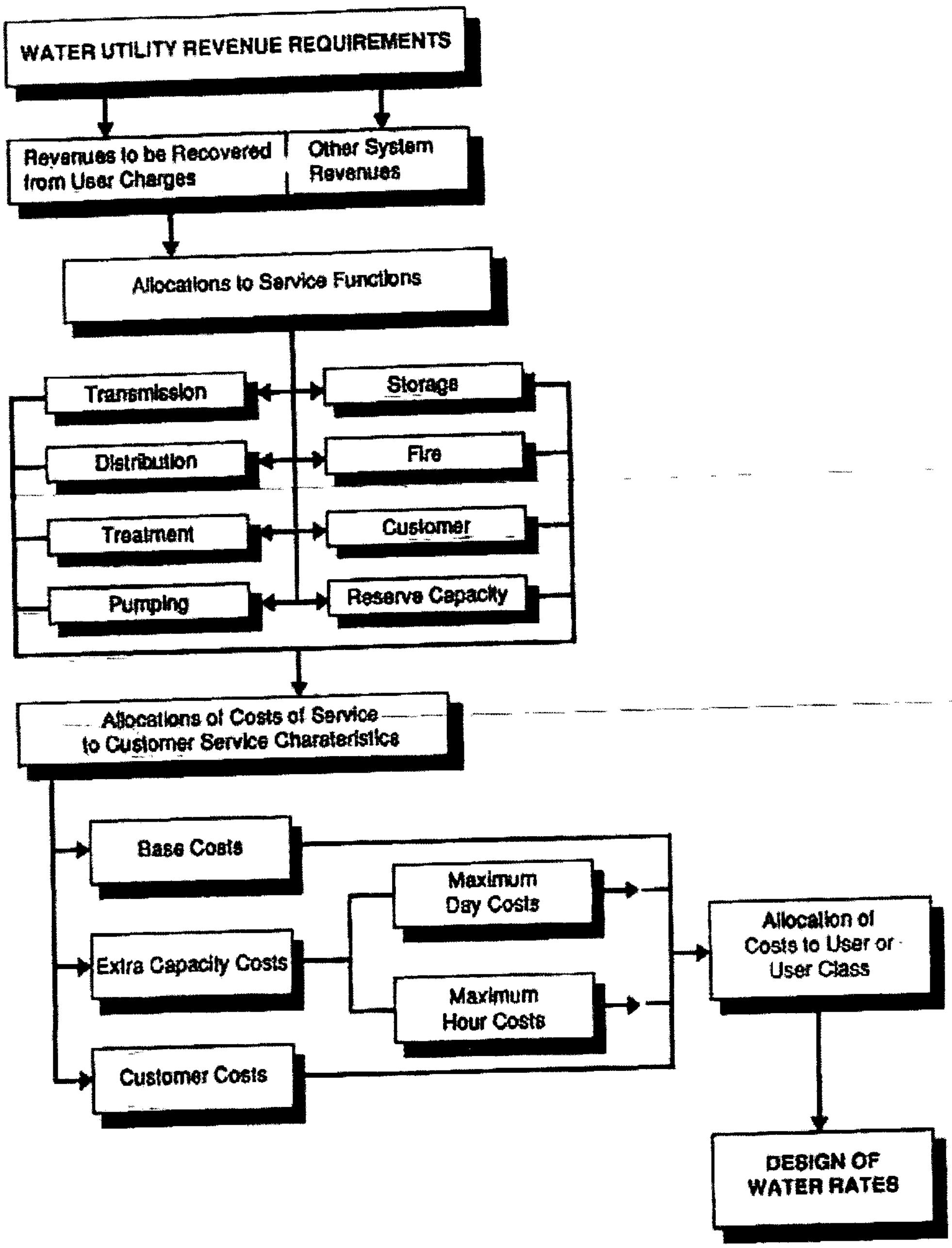

Figure 2-1

Schematic Development of Water Rates

Debt Service Coverage

Debt service coverage is revenue collected in addition to O&M and debt service requirements to provide security on bonded indebtedness, finance certain capital expenditures, and meet equity transfer requirements. **The City's utility revenue bond covenants require minimum debt service coverage ratios of 1.25 times for prior lien bonds and separate lien bonds (contract revenue bonds are separate lien bonds) and 1.10 times for subordinate lien bonds.** The City's financial policies require the Utility to maintain debt service coverage ratios of 1.50 times. The level of debt service coverage is a significant ratemaking issue, because debt service coverage requirements may dictate overall requirements for which rate revenues must be raised. 29

There are virtually always differences between the amount of debt service coverage required by bond covenants and those actually achieved by utilities. Bond covenants specify minimum coverage ratios. In practice, utilities strive to maintain coverage ratios in excess of these minimums, both to ensure continued compliance with the covenants and to assure continued access to new capital on reasonable terms. For example, if a utility operated at or near the minimum required coverages, it would run the risk of failing to achieve the minimum coverage whenever unanticipated events operated to reduce forecasted revenues or increase costs. In addition, operating near the margin would create a risk that the utility's bonds would be downgraded by rating agencies.

In recent years, the City's debt service coverage policies were challenged by outside-City customers. These challenges were based on the view that the City's 1.50 times coverage policy requires collection of revenues for discretionary costs that could be cut without affecting the delivery of utility services. **In the 1989 water rate case, the Texas Water Commission, based on the evidence presented in that case, held that a coverage ratio of 1.39 times was adequate at that time.**

CH2M HILL examined the City's 1.50 times coverage target compared to other communities across Texas and the nation. These surveys indicate that Austin's target is substantially below what other communities achieve. **Additionally, the Utility's revenue-based general fund transfer and capital outlay requirements are currently such that coverage ratios of approximately 1.50 times will be realized** (even if there were no policy directive to do so).

If debt service coverage is treated as a residual calculation in determining revenue requirements (i.e., it only operates to increase revenue requirements if current claims against coverage dollars are insufficient to generate adequate coverage), the City's revenue requirements would not be increased because of the current 1.50 times coverage target. If, on the other hand, debt service coverage is treated as a primary factor in determining revenue requirements, the City's 1.50 times coverage policy will effectively minimize revenue requirements as compared to those that would be established in most other communities. In the rate study, debt service coverage was treated as a residual

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that new development pay impact fees designed to recover a portion of the capital cost of the offsite facilities needed to serve new customers.

Though some customers may have made substantially different capital contributions than others, differences in capital contributions among customer classes are generally not a consideration in development of cost-of-service based rates. Contributions are viewed as part of the historical agreements by which service provision was contracted. Standard ratemaking practice is to design service rates to recover rate year revenue requirements, not revise or remedy previous contractual obligations.

However, through the cost-of-service project's public involvement program, several wholesale customers asserted that the City had required extraordinary capital contributions from certain customers. These customers claimed that they were effectively forced to make these contributions due to the unfair bargaining position the City holds as regional service provider. They asserted that their contributions entitle them to discounted service rates, since, in the absence of their contributions, the facilities they contributed would have been financed by the Utility. (23)

The question of rate credits for capital contributions raised several issues for the development of rates for Austin. Should any rate credits be provided, since to do so would involve retroactive ratemaking and diverge from standard cost-of-service ratemaking principles? And, if rate credits are granted, how should these credits be calculated?

As to the second question, considerable discussion focused on how certain customers' capital contributions could be distinguished as eligible for credit. Retail customers have, as a matter of standard practice, been required to contribute capital as a condition of receiving service. If wholesale contributions were to be recognized in rates, equity would require that credits be provided only to the extent that contributions exceeded the average contributions made by retail customers.

An analysis was performed to determine the relationship between the capital contributions claimed by wholesale customers and what might be termed "normal" or average contributions required of retail customers. **This analysis indicated that in nearly all cases, the facilities for which contribution credits were claimed had not been transferred to City ownership. Because it would be incorrect to grant rate credits for facilities that have not been made part of the City's system, the question of how to calculate a credit was deemed moot.**

Therefore, both because of the inherent problems in developing rate credits for capital contributions at all, and the fact that most of the facilities in question remain owned by wholesale customers, capital contribution credits were not incorporated in rate calculations. This conclusion was supported by the Ad Hoc Cost-of-Service Committee's vote to exclude rate credits from rates.

General Fund Transfer

The City of Austin has a long standing policy of relying on its utility enterprise departments to provide a portion of the funds needed to finance general government operations. For cost-of-service ratemaking, general fund transfers present two important questions largely because of the existence of outside-City Utility customers. These questions are whether general fund transfers are properly included at all in utility revenue requirements based on cost of service, and if so, what is an appropriate transfer level?

The Water and Wastewater Utility's principal general fund transfer is currently set at 8 percent of average annual revenues for the prior 2 years and the current year estimate—approximately $13.6 million at FY92-93 revenue levels. It has variously been described as a payment in lieu of taxes, a payment in lieu of franchise fees, and a return on investment. These descriptions reflect the view that general fund transfers are properly included in revenue requirements in the same way that rate of return or tax and franchise fee payments are included in investor-owned utility revenue requirements.

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Utility transfers are a particularly important method for general government financing in Austin because of the City's unique public financing position. Austin, which is the seat of state government and the site of a large public university, and where there is a substantial federal government presence, has a large fraction of real property exempt from property taxation. Support of general government through utility charges is, therefore, an effective mechanism to recover payments for general government services from institutions that would otherwise be exempt. A survey of similarly situated cities around the country indicates that Austin's practice is not uncommon and, among cities which employ such a transfer, Austin's transfer rate is within the range of these cities' transfer practices. The legality of such a transfer as upheld in various courts around the country, as well as the fact that such transfers are a common public financing mechanism, further support its inclusion in Austin's revenue requirements and suggest that Austin's transfer rate is reasonable.

However, in the 1989 rate case at the Texas Water Commission, the City's wholesale customers took the position that the transfer was an improper exercise of the City's taxing power and that the transfer was unrelated to the cost of providing service. They argued that because they do not live in the City and do not benefit from its municipal services, they should not be asked to share in the cost of providing those services through utility rates.

The subject of the revenue-based transfer was debated at length at a meeting of the Ad Hoc Cost-of-Service Committee. It was the Committee's view, with which CH2M HILL concurs, that the transfer is properly includible in the Utility's revenue requirements, and that all customer classes, wholesale and retail, should share proportionately in the cost.

in the regression equation to estimate water use during 1991 under normal weather conditions. The resulting estimate was 4.7 percent higher than the actual 1991 sales volumes.

Based on the weather normalization analysis, actual water sales during the summer months were increased for each customer class (except in-City single-family, which was already based on a 12-year average use per account). The commercial and multifamily classes' summer volumes were increased 4.7 percent. The wholesale volumes were increased 5.0 percent. Industrial usage was assumed unaffected by weather, so no adjustment was made. Outside-City single-family summer usage was increased 6.0 percent. In-City single-family usage was based on historical billing data which showed the average use per account over the 1979-1991 period. This multi-year average was judged to be a reasonable normalization, so no further weather normalizations were made to this class.

The rate calculations assume a 1.1 percent annual growth in sales volumes from the year for which usage data were available (May 1991 through April 1992) to the year for which the rates would be in effect (FY92-93). This growth estimate was provided by the City based on estimates of short-term customer growth in the service area. The growth estimate is conservative so that revenues will not be overestimated. The 1.1 percent growth assumption was applied to all nonindustrial customer classes, including wholesale customers that may be fully developed. The potential inaccuracies resulting from not specifically analyzing growth rates in each portion of the service area are judged to be insignificant in the overall rate calculations.

Billing Cycle Adjustment for Wholesale Customer Class

For purposes of the cost of service study, the billed water consumption for each of the wholesale customers for the 12-month period May 1, 1991 to April 30, 1992 was adjusted to reflect consumption on a calendar month billing cycle. E

The process followed by Utility staff to make the adjustments included reviewing each wholesale customer's billing read dates and shifting a pro rata share of billed consumption for calendar days that pertained to a different month.

For example, if ABC MUD #1's billed consumption for billing cycles 4/15/91 to 5/14/91 and 5/15/91 to 6/14/91 were 150,000 and 170,000 gallons respectively, the adjusted consumption for the month of May 1991 would be calculated as follows:

1. 4/15/91 to 5/14/91 billing cycle = 30 days

2. 14 days pertained to May = 14/30 or 46.67%

3. Pro rata consumption from 4/15 to 5/14 cycle assigned to the month of May = 150,000 X 0.4667 = 70,005 gallons

PLUS

4. 5/15/91 to 6/14/91 billing cycle = 31 days

5. 17 days pertained to May = 17/31 or 54.83%

6. Pro rata consumption from 5/15 to 6/14 cycle assigned to the month of May = 170,000 X 0.5483 = 93,211 gallons

EQUALS

7. TOTAL ADJUSTED GALLONS FOR THE MONTH OF MAY = 70,005 (14 days) + 93,211 (17 days) = 163,211 GALLONS

Peaking Demands

The cost of providing water to customers depends, not only on how much water they use, but also on how their use occurs over time. The maximum-day and maximum-hour peaking requirements of a water utility's customers are an important influence on the utility's costs. Because water utilities attempt to meet all the water demands of their users, they size their water systems to meet their users' peak requirements. Therefore, during off-peak periods, there are usually costs associated with unused capacity of the system. To develop equitable rates, the analyst must allocate these costs to the users in proportion to each user's contribution to the system peak. Thus, the analyst must determine the peak rate of use relative to the average rate of use for each class. This ratio is called a peaking factor. Peaking factors are developed for maximum-day and maximum-hour rates of use.

If water meters could record both daily and hourly flow rates for each customer, the utility could obtain perfect information on peaking factors. Clearly, this is not feasible, because the enormous costs imposed on the utility could not be justified on the basis of better results. The City's utility has, however, instituted an hourly monitoring program to allow it to collect peaking information from a sample of customers. Currently, complete data from this program is expected to be available for the period June through September 1992.

Hourly Water Demand Monitoring Data

Because of the unavailability of monitored water demand data, **the vast majority of water utilities rely on monthly billing data and system pumpage information to estimate peaking factors (i.e., maximum-day and maximum-hour cost allocators). These estimates, though** usually developed using well established techniques, are subject to important limitations. **For example, an individual wholesale customer may effectively employ storage facilities that mitigate peak day and peak hour demands.** This may not be reflected in the monthly

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billing data used to estimate peaking factors. Similarly, if daily water demand patterns vary significantly over days (and hours) of the billing month, estimated peaking factors may mute customer class responsibility for peak day and peak hour demands.

The City of Austin Water and Wastewater Utility has begun a water demand monitoring effort which, upon full implementation, promises peak demand data collected from continuous monitoring of a statistically representative sampling of customers. Peaking factors based on monitored usage will be available from this monitoring effort. This information will represent a significant advancement in the availability of information on water demand patterns and, correspondingly, will enhance the accuracy of cost allocations made through cost-of-service analysis. (E)

Hourly monitoring of selected wholesale and industrial customers was initiated in FY89-90 and expanded in FY90-91 to include residential and commercial customers. The limited deployment of metering equipment in FY89-90 yielded valuable, though not comprehensive, information. For example, the data collected offered evidence of distinct differences in intra-class water demand patterns among the Utility's wholesale customers. Several implementation problems including mid-summer lightning strikes, meter vault floodings, and installation delays, resulted in the collection of limited data during FY90-91. Notably, meter vault floodings and lightning strikes resulted in the loss of most of the Utility's residential sites. Those remaining constituted a rarified sample from which customer class peaking factors cannot be inferred.

The availability of limited hourly monitoring data presents several options for cost allocation. First, use of monitoring data could be suspended until sufficient data is collected to ensure statistically valid representations of customer class peaking responsibility. The advantage of this option is that a standard methodology–billing data estimation of peaking factors–would be consistently applied to all customer classes. The disadvantage of this option is that it largely ignores data that is available for a limited number of customers. Insofar as the analysis of billing data is an estimation procedure for monitored information, it could be argued that the available monitoring data is the best possible "estimate" of peaking factors.

A second option would be to use available monitoring data and billing data estimates for those customer classes for which monitored data are unavailable. The advantage of this option is that it would use the best available peaking factor data for each customer class. The disadvantage is that it sacrifices the consistent application of a single methodology to all customer classes. Individual customer classes could be disadvantaged or benefitted simply by virtue of whether they happened to be successfully monitored.

A third option for the development of wholesale customer peaking factors is suggested by the possibility that monitoring data on one wholesale customer may be used to represent the water demands of similarly situated wholesale customers. If so, monitored peaking factors of comparable wholesale customers, adjusted for differences in monthly consumption, could be assigned to those customers for which monitoring data is not available. The principle advantages of this option are that it uses all available peaking factor information, preserves the relationships between wholesale customers indicated by billing data, and consistently applies a single methodology. Significant disadvantages of this option are its tenuous assumption of comparability among individual wholesale customers, and its awkward synthesis of billing data and monitoring data.

The peaking factors developed under each option are presented in Table 3-2. The Project Team evaluated each of these options considering the fact that relative, rather than absolute, peaking factor values are most important for cost allocation purposes. This consideration led to the conclusion that preservation of the relationships between customer classes indicated by billing data was of primary importance—a conclusion which secured consensus agreement of the Ad Hoc Cost-of-Service Committee. Peaking factors developed by Option 1 methodology is used for the development of rate options largely due to the inherent problems in assuming comparability among wholesale customers. Sensitivity analysis of the base case rate option was performed using Option 3 peaking factors (see Section 6).

As of the end of July 1992, most of the implementation problems of the Utility's hourly water demand monitoring program had been resolved. This presents an opportunity for update of the cost-of-service analysis using water demand data collected during the summer of 1992. E

Peaking Factor Estimates

For reasons mentioned above, Option 1 peaking factors were used for this study. The following equations show the calculations of these peaking factors for each class.

$$\frac{\textit{(Class i Consump. During System Max Month)}}{\textit{(Av. Month for Class i)}} \times \frac{\textit{(System Peak Day Rate Flow)}}{\textit{(System Max. Month Rate of Flow)}} = \textit{Maximum-Day Peaking Factor}$$

$$\frac{\textit{(Class i Consump. During System Max Month)}}{\textit{(Av. Month for Class i)}} \times \frac{\textit{(System Peak Hour Rate Flow)}}{\textit{(System Max. Month Rate of Flow)}} = \textit{Maximum-Hour Peaking Factor}$$

The estimates of maximum-day and maximum-hour peaking factors for each class calculated under Option 1 are shown in Table 3-2. The maximum-hour peaking factors for the customer class ranged from a high of 3.43 (Hill Country Utilities) to a low of 1.49 (In-City large Volume/Industrial, Outside-City Multifamily, and Village at Western Oaks MUD).

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The peaking factors estimated are for coincidental peaks. This means that the estimates of maximum-day peaking factor measure the probable ratio of each class's use during the system's peak day, to each class's use during that class's average day. Similarly, the maximum-hour peaking factor is based on the customer class's use during the system's maximum-hour. Thus, the peaking factors estimated in this analysis are the expected peaking factors for each customer class during the system's maximum-day and maximum-hour.

Capital Improvement Program expenditures in any given year are financed through existing CIP fund balances, bond proceeds from new money issues, and current revenues. Importantly, a significant portion of projects required in a particular year may not have available bond authority. For example, transmission line relocations in conjunction with state highway projects are typically not debt financed. These projects must be funded through current revenue transfers to the CIP. Funding of remaining projects is guided by coverage requirements, equity financing constraints, and economic considerations of new bond issues. If required current revenue funding of CIP projects does not result in excess coverage, projects for which bond authority is available may be equity financed. However, as has been the case in recent years, the Utility's FY92-93 requirements generate debt service coverage ratios slightly above the 1.50 coverage target, largely as a result of required transfers to CIP funds.

Table 4-2 shows the Utility's actual capital requirements for FY90-91, known and measurable changes in costs, and the FY92-93 requirements.

Revenue Bonds

The largest capital cost item is debt service on utility revenue bonds. The FY92-93 debt service requirement on utility revenue bonds is about $27.3 million. This requirement is net of debt refunding and defeasance savings and application of funds from the Utility's Debt Management Fund. The known and measurable changes for utility revenue bond debt service reflect the effects of defeasances and refundings, as well as the normal annual changes in the scheduled debt service. **About 2.6 million (almost 10 percent) of the total revenue bond debt service requirement is debt service on the system's excess reserve capacity.**

Contract Revenue Bonds

The City's FY92-93 debt service requirement on contract revenue bonds is about $3.9 million. Contract revenue bonds (CRBs) were issued by the City to pay for capital improvements that would serve Municipal Utility Districts (MUDs), but would also have sufficient capacity to accommodate future growth outside of the MUDs. The City entered into agreements with each of the MUDs, which specified how the debt service costs would be shared between the City and the MUD based on the projected use of the facilities. **The CRB debt service included in the Utility's revenue requirement reflects only the City's portion of the debt service on these bonds.** This requirement is also net of savings resulting from debt refundings and defeasance and interest income earned on excess construction and reserve funds.

Municipal Utility Districts with outstanding contract revenue bonds for which the City pays a share of scheduled debt service are as follows:

- North Austin Growth Corridor
- South Austin Growth Corridor

Table 4-2
City of Austin, Texas
Water Utility
Capital Requirements

DESCRIPTION	Actual 1990-91	KNOWN & MEASURABLE CHANGES: O&M Realign. Adjustments	KNOWN & MEASURABLE CHANGES: 1991-92 Adjustments	KNOWN & MEASURABLE CHANGES: Reorganization Adjustment	KNOWN & MEASURABLE CHANGES: 1992-93 Adjustments	1992-93 Revenue Requirements
DEBT SERVICE REQUIREMENTS						
Revenue Bond Debt Service	$23,664,696	$0	$4,985,533	$0	($4,031,233)	$24,628,996
Debt Service on Joint Facilities					2,628,464	2,628,464
Debt Service on Reserve Capacity						
Subtotal Revenue Bond Debt Service	$23,664,696	$0	$4,985,533	$0	($1,402,769)	$27,257,460
Contract Revenue Bond Debt Service						
N. Central Austin Growth Corr. #1	$2,736,681	$0	($2,736,681)	$0	$0	$0
North Austin Growth Corridor #1	90,383	0	(1,096)	0	(878)	88,413
South Austin Growth Corridor #1	89,781	0	(18,769)	0	51,831	118,946
North Austin #1	0	0	0	0	0	0
Circle C #2	982,940	0	(122,210)	0	(139,343)	721,387
Southland Oaks	79,523	0	278,086	0	76,831	434,442
Maple Run	0	0	482,369	0	912,822	1,395,291
Village @ Western Oaks	209,802	0	930,433	0	(239,427)	900,808
Springwoods	0	0	0	0	0	0
Northwest Travis County	0	0	0	0	0	0
Circle C #4	0	0	0	0	0	0
Debt Service on Reserve Capacity	0	0	0	0	282,474	282,474
Subtotal Contract Bond Debt Service	$4,189,010	$0	($1,184,762)	$0	$914,413	$3,911,761
Water District Bond Debt Service	247,983	0	225,902	0	14,472	488,357
Certificates of Participation	537,484	0	50,894	0	(302)	588,076
Subtotal Debt Service Requirements	$28,632,173	$0	$4,077,567	$0	($474,186)	$32,245,654
CIP TRANSFERS						
System Improvements	$0	$0	$0	$0	$0	$0
1976 Authority	0	0	0	0	0	0
1982 Authority						
Prop. 4	0	0	0	0	0	0
Prop. 5	0	0	0	0	0	0
Prop. 6	0	0	0	0	0	0
Prop. 7	0	0	0	0	0	0
Prop. 8	0	0	0	0	3,000,000	3,000,000
Prop. 9	0	0	0	0	0	0
Prop. 10	0	0	0	0	0	0
Prop. 11	0	0	0	0	0	0
Prop. 12	0	0	0	0	0	0
1984 Authority						
Prop. 1	0	0	0	0	0	0
Prop. 2	0	0	0	0	0	0
Prop. 3	0	0	0	0	0	0
Prop. 4	0	0	0	0	0	0
Prop. 5	0	0	0	0	2,500,000	2,668,000
Prop. 6	0	0	0	0	0	0
Prop. 7	0	0	0	0	0	0
Prop. 8	6,000,000	0	(6,000,000)	0	0	0
Prop. 9	0	0	0	0	0	0
Prop. 10	0	0	0	0	0	0
Prop. 11	0	0	0	0	0	0
Prop. 12	0	0	0	0	0	0
1986 Authority						
Prop. 5	0	0	0	0	0	0
Prop. 6	0	0	0	0	0	0
Prop. 7	0	0	0	0	0	0
Prop. 8	0	0	0	0	0	0
Prop. 9	0	0	0	0	0	0
Prop. 10	0	0	0	0	0	0
Prop. 11	0	0	0	0	0	0
Prop. 12	0	0	0	0	0	0
Prop. 13	0	0	0	0	0	0
1988 April Authority	0	0	0	0	0	0
Future Authority	2,400,000	0	(100,000)	0	(2,300,000)	0
New Projects						
City Mainframe	0	0	0	0	190,000	190,000
Davis Lab/Admin Renovation	0	0	0	0	1,760,000	1,760,000
Austin Plaza Rehabilitation	0	0	0	0	188,000	188,000
Water - Computer Purchases	0	0	0	0	485,000	485,000
Relocation of Webberville	0	0	0	0	75,000	75,000
Water Master Plan	0	0	0	0	25,000	25,000
Instrumentation/Electric	0	0	0	0	200,000	200,000
Subtotal CIP Transfers	$8,400,000	$0	($6,100,000)	$0	$9,258,000	$8,659,000

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Table 4-2
City of Austin, Texas
Water Utility
Capital Requirements

DESCRIPTION	Actual 1990-91	KNOWN & MEASURABLE CHANGES: O&M Realign. Adjustments	1991-92 Adjustments	Reorganization Adjustment	1992-93 Adjustments	1992-93 Revenue Requirements
APPROACH MAINS/REFUND CONTRACTS						
Highway 183 / FM 620	$0	$0	$443,810	$0	$84,550	$528,360
Nuckols Crossing	84,606	0	(84,606)	0	0	0
Springfields	0	0	0	0	0	0
Texas Oaks	0	0	0	0	0	0
Travis Country	0	0	0	0	0	0
Zale - Kruger	1,014,829	0	(1,014,829)	0	0	0
North Travis	0	0	0	0	104,667	104,667
Oak Hill	0	0	0	0	0	0
Lake Creek	0	0	0	0	0	0
Our Savior	0	0	40,000	0	(7,308)	32,692
Park 290 E	0	0	0	0	22,000	22,000
Woodland	0	0	0	0	0	0
West Park	0	0	0	0	20,400	20,400
Sites-Shannon	0	0	0	0	0	0
Branch Creek Estates	0	0	0	0	0	0
COA F/P Joint Usage Facility	0	0	0	0	15,200	15,200
Refund Contracts						
Principal and Interest	218,108	0	(23,797)	0	(25,267)	169,042
Non-reimbursable Inspection Charges	37,560	0	(12,500)	0	(25,000)	0
Subtotal Approach Mains/Refund Contracts	$1,355,140	$0	($662,021)	$0	$181,442	$692,561
OTHER CAPITAL REQUIREMENTS						
Vehicle Acquisition Fund	$0	$0	$380,000	$0	$315,583	$695,583
General Fund Transfers	3,942,437	0	3,152,063	0	(215,418)	6,879,582
Non-CIP Capital Outlay	223,788	(24,504)	826,181	0	(545,257)	480,218
Line Rehabilitation	905,726	0	7,274	0	0	913,000
Debt Management Appropriation	0	0	1,355,000	0	(1,355,000)	0
Subtotal Other Capital Requirements	$5,072,451	($24,504)	$5,730,526	$0	($1,800,792)	$8,968,383
TOTAL CAPITAL REQUIREMENTS	$43,477,784	($24,504)	$3,056,074	$0	$4,166,404	$50,078,796

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Table 5-1 shows joint and specific O&M costs for FY92-93. The joint O&M costs of the water system are about $25.1 million, including about $632,000 of revenue-based allocations. Costs allocated to retail customers only are about $11.7 million.

Capital Costs

CH2M HILL analyzed the Utility's plant-in-service and received input from Utility staff to determine joint and specific capital costs. **As with O&M costs, all capital costs associated with water distribution and fire protection are specific to retail customers.** Most of these costs are determined through the functionalization process (see discussion below). Table C-2 in Appendix C shows that Leak Detection costs were immediately identified as retail specific costs because all Leak Detection activities occur within the distribution system. **It is important to note for this analysis, water lines that are 24 inches and larger in diameter are designated as transmission lines, while all lines less than 24 inches in diameter are considered distribution lines.** Table C-3 shows that the FY92-93 requirement for Leak Detection projects is almost $1.0 million.

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Table 5-2 shows the Water Utility's FY92-93 capital costs net of nonrate revenue. In FY92-93, the net capital costs allocated to retail customers only is about $3.6 million, and joint costs are about $40.1 million, including $6.9 million of revenue-based allocations. The allocation of contract revenue bond (CRB) costs to customer classes is discussed later in this section.

Allocation to Service Functions

For this analysis, the revenue requirements were allocated to the following service functions: transmission, distribution, pumping, treatment, storage, customer services, fire protection, and indirect. In addition, some costs were allocated to reserve capacity, and revenue allocation categories. These are special categories that resulted from specific cost allocation issues pertaining to the City. The methods for allocating costs in these categories are described separately below.

Costs are allocated to service functions for two primary reasons. First, as mentioned above, certain functions serve specific customer classes. The costs of these functions must be segregated from other system costs in order to determine specific cost responsibilities. Second, by functionalizing the revenue requirements, the costs can be more accurately allocated to customer service characteristics (see discussion below) and, ultimately, to customer classes.

Table 5-1
City of Austin, Texas
Water Utility
Summary of Net O&M Costs by Customer Service Characteristic

ITEM	CUSTOMER SERVICE CHARACTERISTICS								
	Base	Max Day	Max Hour	Customer	Equivalent Meter	Fire Protection	Revenue Allocations	Direct Assignments	TOTAL
Joint	$14,608,262	$1,919,043	$237,753	$6,116,014	$1,578,043	$0	$0		$24,457,116
Retail Only	8,307,331	2,234,706	764,938	214,483	0	221,110	0		11,742,567
Revenue-Based Allocations							631,676		631,676
Direct Assignments								0	0
NET O&M COSTS	$22,915,593	$4,153,749	$1,002,691	$6,330,496	$1,578,043	$221,110	$631,676	$0	$36,831,359

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D. After all research on these CIP projects was completed, the next task for the Utility was to functionalize all CIP projects to the identified functional parameters. This process was done in two phases:

1. The first phase was directed by the Utility Finance staff and obtained information from the Utility and Public Works Department project managers. The Utility received functionalization criteria from CH2M HILL to assist the project managers in determining the functionalization of each of the projects. The project managers were given workpaper forms for each CIP project they managed to be used to document their response. The Utility used these forms to enter data into the COS CIP Project Database.

2. The second phase was completed by CH2M HILL engineering staff. The Utility provided CH2M HILL with printouts of the COS CIP Project Database showing the project number, project name, and the functional parameters. The functional percentages on projects that had been functionalized in phase one were included for review. The remaining projects that had not been functionalized were also listed. CH2M HILL reviewed the projects to determine the functional percentages. This process took approximately one month. The COS CIP Project Database lists were returned to the Utility staff for data entry.

After the Utility had initiated the CIP project research, it became apparent that the Utility would not be able to identify which specific CIP projects were funded entirely or in part by issued revenue bonds. Records of funding sources on individual CIP projects could not be readily tracked from the City's financial system. Therefore, the Utility and CH2M HILL were faced with a decision on how to best functionalize revenue bond debt service using the available CIP project information. The process by which revenue bond debt service was functionalized is detailed below:

A. Although the Utility staff was unable to determine which specific CIP projects were funded using issued revenue bonds, they could identify the total amount of revenue bonds that were issued for a specific bond authority proposition. **Therefore, it was decided that revenue bond debt service functionalization would be based upon the overall bond authority proposition functionalization.** 23

B. The COS CIP Project Database was then sorted by bond authority proposition. The total expenditures for each CIP project listed within the proposition were distributed to each of the functional parameters based upon that project's functional percentages identified by the project managers or CH2M HILL. For example, if a specific Water CIP project was functionalized as 95 percent transmission and 5 percent fire protection, then the total expenditures for that project were distributed to the respective functional parameters based on the identified percentages. The resulting functional expenditures for each bond authority proposition were totaled for each functional parameter. The overall bond authority proposition functional percentages were then calculated by dividing each functional parameter total expenditures by the total proposition expenditures. Printouts of each bond authority proposition showing a list of CIP projects, total expenditures, functional percentages, and the overall bond authority proposition functional percentages were completed as documentation.

C. CH2M HILL and the Utility decided that excess reserve capacity revenue bond debt service requirements would be functionalized differently than other revenue bond debt service requirements. In the analysis that determined the excess reserve capacity debt service requirements, an allocation of issued revenue bonds pertaining to excess reserve capacity was determined. The Total Issued Revenue Bonds were reduced by the allocation of excess reserve capacity issued bonds to produce the Net Issued Bonds for each of the bond authority propositions.

D. The Net Issued Bonds for each bond authority proposition was distributed to the functional parameters by using the overall bond authority proposition functional percentages calculated in section B. Each functional parameter's Net Issued Bonds were totaled. Revenue bond debt service functionalization percentages were calculated by dividing the Net Issued Bonds for each functional parameter by the total Net Issued Bonds.

E. Revenue bond debt service requirements net of identified excess reserve capacity revenue bond debt service requirements were functionalized according to the percentages calculated in section D.

Table C-4 in Appendix C shows the percentages of each capital requirement item that are distributed to the functional categories. As shown in the table, a portion of revenue bond debt service is allocated to each functional category (except revenue allocations). The functional category that receives the largest allocation of revenue bond debt service cost is treatment; about 40 percent of the revenue bond debt service requirement is associated with treatment facilities.

Table C-5 shows the amount of joint costs allocated to each service function. Treatment is the largest function in terms of cost, representing almost 50 percent ($19.0 million) of total capital requirements. The smallest portion of system capital costs are allocated to fire protection, these costs are about $135,000 in FY92-93. Table C-6 shows the allocation of retail only costs to functions. All of the costs allocated to retail customers in this table are distribution costs. **It is important to note that fire protection costs are also retail only; however,** they are allocated to retail customers following the allocation of costs to customer service characteristics discussed later in this section. 16

Capital Costs by Customer Service Characteristic

Table 5-2 summarizes the results of the allocations of capital costs to customer service characteristics, including joint costs, retail-only costs, revenue-based allocations, and contract revenue bond allocations. The revenue-based capital cost is the general fund transfer, which is calculated from system revenues, and is therefore a revenue-based allocation item. Contract revenue bonds are allocated as a separate category because these costs are allocated to customer classes in a slightly different manner than other costs. The method used to allocate contract revenue bond debt service to customer classes is described later in this section.

Table 5-2 shows that more than $21.8 million of the $47.3 million net capital costs are allocable to base demand and more than $10.9 million are related to maximum-day demand. Maximum-hour costs and contract revenue bonds are each more than $3 million.

Allocations to Customer Classes

The costs by customer service characteristic (Tables 5-1 and 5-2) are allocated to customer classes based on the proportionate usage levels of each characteristic by each class. Joint costs are shared proportionately by all classes. Retail costs are allocated only to the retail classes based on their respective proportions of each characteristic.

Contract revenue bonds are allocated to each class in a slightly different manner. **The contracted debt service for an issuing MUD is considered the entire debt service responsibility for that MUD. The** MUD pays none of the City's share of the debt service on its own issue. However, the MUD does pay its proportionate share of the City's debt service on all other contract revenue bond issues. Retail classes pay their respective shares of all the City's contract revenue bond debt service requirements. This method is used because the City's shares of these debt issues were for facilities providing general system benefits. However, the MUD's contracted shares of their issues were initially set based on the total use (benefit) that the MUD would receive from those facilities. Therefore, allocation of any of the City's share of that issue to the MUD would result in the City overcharging the MUD.

Revenue-based costs are allocated to customer classes in proportion to their share of other costs. The allocation of these costs is the final step in the cost allocation process.

Net Costs by Class

The allocated costs by customer class are summarized in Table 5-3. The in-City single-family class is responsible for more than $39.9 million of net requirements from ratepayers. This amount is about 47.4 percent of the total requirements from rates. Commercial users inside the City are allocated about $17.1 million, and large volume/

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Common Data Limitations

Customer class peaking factors serve as the basis to allocate functionalized costs to each customer class. Customer class peaking factors are based on peak-day and peak-hour demands. These demands are not typically available on a customer class level. In fact, usage data for individual customer classes are typically available only on a monthly basis (or in some cases, less frequently.) Nonetheless, estimates of peaking factors by customer class can serve as a proxy to assign functional cost components in an equitable manner.

Method of Prorating System-Wide Peaking Factors

Considering the limitations on meter reading frequencies, the water industry has developed approaches to estimate peaking factors by customer class. Some utilities maintain meters that record daily and hourly reads for a sample of customers. In fact, during the early 1990s AWU did just that. The costs of these programs are often ~~considerable and the challenges of attaining usable data are significant.~~ For those reasons, AWU abandoned its daily and hourly meter-reading program.

Published data from comprehensive sampling programs may be used to develop estimates of peaking factors by class. However, these data are often specific to the climatic and demographic conditions where the studies are conducted and generally do not provide adequate information for other utilities.

As an alternative, peaking factors are often derived by prorating the system-wide peaking factors to customer classes based on each class's contribution to the system peak-month demands. The derivation of customer class peaking factors uses the following information:

- System average-day demands
- System peak-day demands
- System peak-hour demands
- System peak-month demands
- Customer class average-month and peak-month demands

The following formulas are often used:

$$Class\ Peak\ Day\ Factor = \left(\frac{Class\ Peak\ Month\ Demand}{Class\ Average\ Month\ Demand} X \frac{System\ Peak\ Day\ Demand}{System\ Peak\ Month\ Demand} \right)$$

And:

$$Class\ Peak\ Hour\ Factor = \left(\frac{Class\ Peak\ Month\ Demand}{Class\ Average\ Month\ Demand} X \frac{System\ Peak\ Hour\ Demand}{System\ Peak\ Month\ Demand} \right)$$

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- Number of connections. Under this approach, I/I is attributed to customer classes based on the number of connections each class has within the wastewater system.

- Land Area. Since I/I is often introduced into the collection system, and the ultimate length of pipe in the collection system is based on the total area served, land area is available as a method to allocate and recover I/I costs.

- Property values. For systems that have USEPA approved system of rates based on *ad valorem* property taxes, property values may be used to allocate and recover I/I costs.

Other Observations

The approaches used to allocate and recover I/I costs vary from utility to utility. Some utilities base the allocations of I/I to customer classes based on a combination of the factors listed above. Other utilities use only one of the available methods.

The primary differences in the methods of allocating and recovering I/I costs are based on different philosophies. Some analysts consider I/I cost as another element of the wastewater system that must be managed. And since I/I generally affects the flow-related unit processes the most, the cost associated with I/I are then allocated based on a customer classes' flow. The cost of mitigating I/I are often incurred to augment the hydraulic capacity of the treatment plant and portions of the conveyance system.

Some analyst attempt to allocate the source of I/I back to the customer classes. In some cases, I/I is assumed to occur primarily in the collection system and at the point of connection of customers' ~~services to the sewer laterals. Under this assumption~~, analyst may allocate I/I on a per customer basis.

AWU is unique since much of its major conveyance systems have historically be placed within natural creeks and streams. Although this placement may maximize the use of gravity to convey wastewater, it likely increases the I/I of the major conveyance systems. This unusual circumstance suggests that I/I does not correlate well to the number of connections.

Methodological Options under Review

When considering the issue of wastewater cost allocations, the following methodological options are important to consider:

1. Which is the most appropriate overall method for allocating costs (i.e., design, functional, or hybrid basis)?

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SAVE OUR SPRINGS ALLIANCE

'The Perfect Storm':

Setting priorities at the Austin Water Utility in a time of fiscal crisis

By Scott Henson

June 9, 2010

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'The Perfect Storm': Setting priorities at the Austin Water Utility in a time of fiscal crisis

BY SCOTT HENSON

Executive Summary

Austinites are using less water per capita. Conservation is working. That should be cause for celebration. Saving water saves ratepayer money. It also means lower energy use and lawn-chemical consumption.

But at the Austin Water Utility (AWU) they're calling it a "Perfect Storm" of disaster because if people use less water, AWU won't generate enough revenue to pay for Water Treatment Plant 4 (WTP4), not to mention long-overdue maintenance costs. This analysis by the Save Our Springs Alliance demonstrates that residential water rates could nearly double if the City continues along its present path.

In the book and movie, "The Perfect Storm," a fishing boat captain (played on the big screen by George Clooney) steered his ship directly into the tempest in search of a big catch and everyone died. So city staff's use of the dire term is instructive. Like the sea captain in the story, AWU has recommended that the City Council charge ahead with WTP4 – costing ratepayers $1.2 billion over the life of the project - regardless of the fiscal danger. But this is not a movie. Austin families can't afford large rate hikes during a recession and the City has alternatives to this expensive boondoggle.

Just last month AWU officials informed the City Council of an expected $43.2 million revenue shortfall in FY 2010 due to lower than projected water sales. The water utility's revenue model had somehow failed to predict the "perfect storm" of reduced water use by residences and businesses due to rain and conservation. If current reduced water sales levels persist, Austin could be required to nearly double residential water rates by 2015, mostly to pay for the Water Treatment Plant #4.

Despite years of controversy and debate surrounding the project, residential rate payers have never been given a realistic estimate of WTP4's hit to consumer pocketbooks, particularly when combined with other ongoing debt-funded projects and the City Council's unpublicized decision to shift water-rate burdens from commercial to residential customers. This report attempts to quantify these global residential rate impacts.

Investment in WTP4 has been touted as Austin's "stimulus" for the local business community, albeit one financed by local rate payers instead of the federal government.[1] But Austin could also add jobs – real, long-term jobs - by repairing massive leaks in our existing water system—leaks that allow nearly 10 million gallons of water a day to just seep into the ground. It could and should also invest in "green jobs" in water conservation and efficiency that would pay long-term dividends while drought-proofing our economy.

Recommendations:

- Estimate proposed rate increases based on data that includes implementation of new water conservation goals and the 2008 cost-of-service study, then tell residential rate payers exactly what their overall rate hikes will be through 2015.
- Constructing expensive new infrastructure while simultaneously shifting costs from commercial to residential customers puts too high a burden on residential water customers. Put off new construction until the cost-of-service adjustments are complete to avoid piling onto residential rate payers all at once.
- Before beginning construction on WTP4, evaluate cheaper plant options that would replace the decommissioned "Green Water Treatment plant" with a new plant located in the Desired Development Zone and drawing water from Lady Bird Lake.
- Continue to implement water conservation, including aggressive, summertime lawn watering restrictions, to limit peak-day water use and achieve recently adopted city-wide conservation goals
- Prioritize fixing leaky pipes over a new intake for new revenue bond indebtedness so that millions of gallons of water aren't uselessly seeping into the ground each day

Introduction: The Perfect Storm and Austin Water Rates

At a recent meeting of the Water-Wastewater Commission Budget Subcommittee, Austin Water Utility (AWU) officials told commissioners they were experiencing a "Perfect Storm" of reduced water sales and income because of recent rain, the effects of conservation programs, and the economic downturn Revenues are down more than 10% and AWU expects to take in $43.2 million less this fiscal year than they'd budgeted. If, in that environment, the Austin City Council moves forward with construction of Water Treatment Plant 4, as they are scheduled to do at their meeting on Thursday, June 10, there's every reason to believe they'll be steering residential ratepayers into a hurricane of future water-rate hikes.

Austin homeowners already face large, projected rate hikes to pay for Water Treatment Plant #4, and if this "Perfect Storm" continues, they will be much larger than anyone has so far admitted. In 2009, the City of Austin began a series of multi-year water rate hikes aimed in large part at paying for the WTP4 project – dubbed the Billion Dollar Mistake on the Lake by local environmental groups with its massive, miles-long tunnels under the Balcones Canyonlands Preserve. AWU has suggested raising rates continuously over six years beginning with a 10.1% residential rate increase approved and implemented last fall But public discussions of rate hikes have *largely failed to consider the disparate impact on residential ratepayers*, and they certainly don't take into account AWU's new revenue reality in the short-to-medium term. If the utility sells less water and has the same debts to pay, they must charge consumers more per unit of water.

Projected Homeowner Water Rate Hikes Already Onerous

For residential consumers, proposed increases in the cost of water will rise much faster in the near future than implied by aggregated estimates from the utility

AWU says that combined water-wastewater rates increased 4.5% overall in the FY 2010 budget, but that number is deceiving because residential customers took the brunt of the increase, witnessing a 10.1% boost in single-family residential water rates [2]

The disparate impact on homeowners results from a city-sponsored cost of service study[3] which placed Austin on a multi year path toward shifting rate burdens from commercial and wholesale customers to residential users. AWU plans "to continue to phase out the remainder of the water rate subsidy of the residential customer class over the next 5-7 years,"[4] meaning similar adjustments can be projected going forward.

Table 1 shows the aggregated "combined" water and wastewater rate increases for all classes suggested by AWU recently to the Budget Subcommittee of Austin's Water-Wastewater Commission[5].

Table 1: Projected Combined Water Rate Hikes (2010 – 2015)

	2010	2011	2012	2013	2014	2015	Total
Water	5.70%	6.80%	5.50%	6.60%	5.70%	2.50%	34.19%
Wastewater	3.30%	2%	3.50%	4.30%	3.10%	2.50%	20.20%
Combined	4.50%	4.50%	4.50%	5.50%	4.50%	2.50%	28.96%

On its face, that results in a 28.96% overall increase. However, residential ratepayers took the brunt of the hit in the first year, seeing their water rates increase by 10.1%, not 5.7%. So residential water rates went up 77% more than the averaged amount because of the shift in burden from commercial and wholesale customers. If residential rates increase disproportionately over the next five years at the same rate as in last year's budget, then logically residential increases will be higher than "combined" rate increases. How much higher? Assuming the shift in burden continues at the same pace as in 2010[6], here are the projected residential water-rate increases over the same period:

Table 2: Residential Rate Hikes Including Cost of Service Adjustment (2010 - 2015)

	2010	2011	2012	2013	2014	2015	Total
Residential Water	10.10%	12.05%	9.75%	11.69%	10.10%	4.43%	73.82%

So between overall rate hikes and the shift in burden from industrial to residential ratepayers, Austin homeowners could see a 74% rate increase over this period – a number city staff have scrupulously avoided estimating by projecting forward only "combined" increases instead of including details about the cost-of-service reallocations.

AWU Revenue Models Flawed, Over-Optimistic

No one has told Austin's residential water consumers their rates are scheduled to rise as much as 74% to pay for cost reallocations and Water Treatment Plant 4, but that's already in the works. On top of that, the utility based those rates on the assumption that people would buy more water than has generally turned out to be the case.

The bonded indebtedness to pay for Water Treatment Plant 4 and other AWU projects is secured by revenues from AWU water sales,[7] which are the only available revenue source to pay off the debt. If water sales don't meet projected levels, bondholders can force the City to raise rates through a writ of mandamus,[8] or bond houses might lower the ratings on City of Austin debt. Houston this year increased their combined water-wastewater rates by 30% because of an expanding bond-debt burden. Reported the Houston Chronicle, "Had [Houston] failed to raise rates, many noted, the system likely would face a downgrade in its debt, increasing costs and leading the city to continue running a deficit in the water-sewer utility. This year that shortfall is expected to exceed $100 million."[9]

Austin could easily find itself in the same situation. AWU's assumptions underlying the written solicitation of bond debt for Water Treatment Plant 4 anticipate water sales and revenue rising indefinitely, but this year's revenue decline belies those assumptions. AWU's projected $43.2 million shortfall demonstrates what happens when conservation combines with higher rainfall levels, a development that took AWU budget officials by surprise.

AWU's budget and financial manager Rusty Cobern recently told an industry publication that "Rising conservation has contributed to revenue volatility at AWU" explaining that "We would have expected a revenue windfall during the [recent] drought" but that didn't happen. He concluded that "Aggressive conservation pricing models can eliminate windfall opportunities."[10]

So if AWU's revenue model failed to predict the current shortfall, projecting just one year into the future, how firmly can we rely on their projections several years out? If current, lower usage levels persist into the future, thanks to expanded conservation and/or the alleviation of record drought conditions, rates must increase even more.

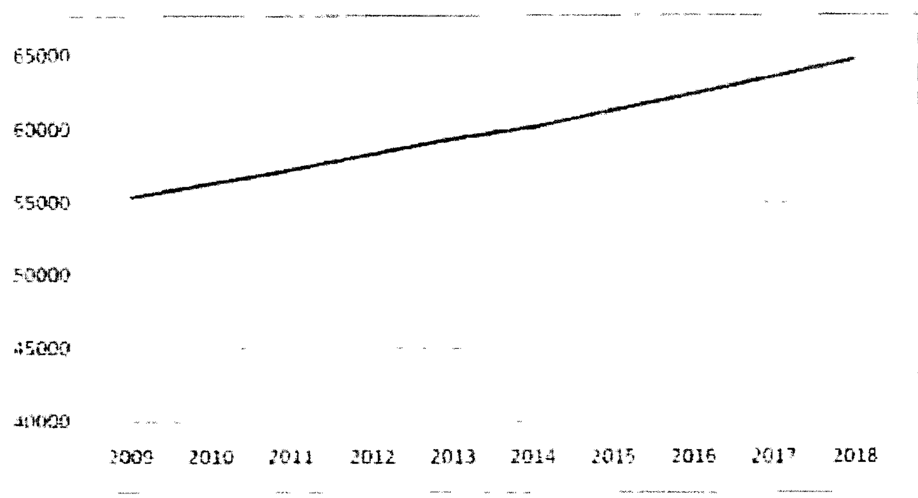
Austin recently adopted aggressive new water conservation goals which, upon implementation, will significantly reduce the total amount of water sold. Water-demand projections presented to the City Council in 2009 showing the need for WTP4 assumed Austinites would use 162 gallons per capita per day (gpcd) in 2020.[11] On May 13, 2010, the Austin City Council approved conservation goals aiming to reduce water use to 140 gpcp by 2020[12], thereby also reducing the volume of water sold and thus the revenue available to pay for Water Treatment Plant 4. What's more, single-family residential water use per account has been declining, from a high of 10,258 gallons per month in 1999-2000 to 6,287 gallons in the 2008-2009 Fiscal Year.[13]

Overestimating Water Sales

These trends create a dilemma if WTP4 is constructed. If water use doesn't increase steadily, then even the already-high projected rate hikes described above probably underestimate the amount AWU needs to cover WTP4-related debt, which will cost ratepayers $1.2 billion including interest. AWU's projected shortfall in the current fiscal year is 10.2% of projected revenue. The utility has sufficient reserves to cover that amount for one year[14], but going forward if the situation continues, rates must increase even higher. In that case, instead of a 74% rate increase by 2015 for homeowners, *93.6% would be required*.[15] Rates could go up even further depending on how badly AWU has overestimated future water use (and/or underestimated the cost of WTP4).

Using data derived from the bond prospectus associated with WTP4[16], Chart 1 depicts the increases in total pumpage AWU told bondholders will occur to generate sufficient revenue to pay its debt:

Chart 1. Projected Total AWU Pumpage: 2009 - 2018



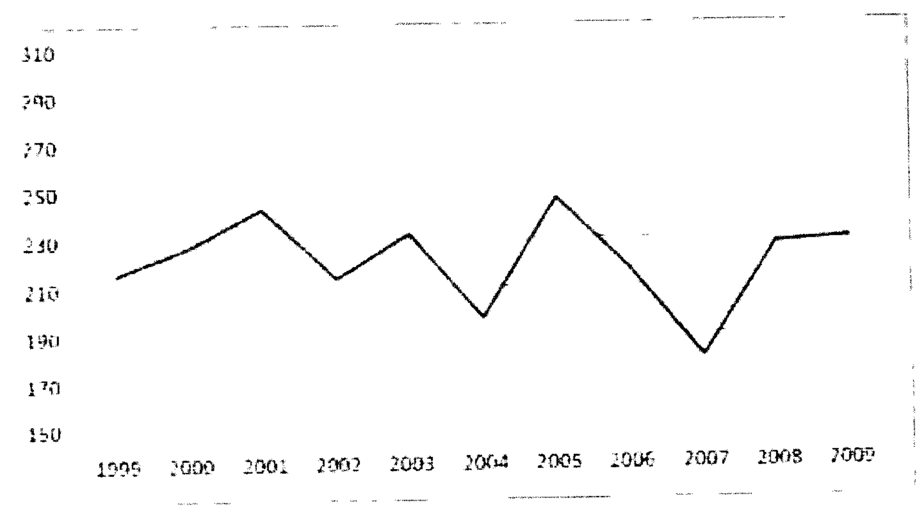
These projections certainly don't jibe with a $43.2 million dip in 2010 water sales, but the trend also seems unrealistic compared to actual total pumpage data from the past decade, as reported by the City in the same source. According to the data depicted in Chart 1, AWU believes total pumpage will increase steadily over time. But that contradicts the City's recent experience, even during a period marked by dramatic economic and population growth, depicted in Chart 2:

Chart 2. Total AWU Annual Pumpage: 1999 – 2008

AWU has consistently overestimated Austinites' water use to project demand for water treatment facilities that never materialized. In 2002, when the Austin City Council first authorized hiring Carollo

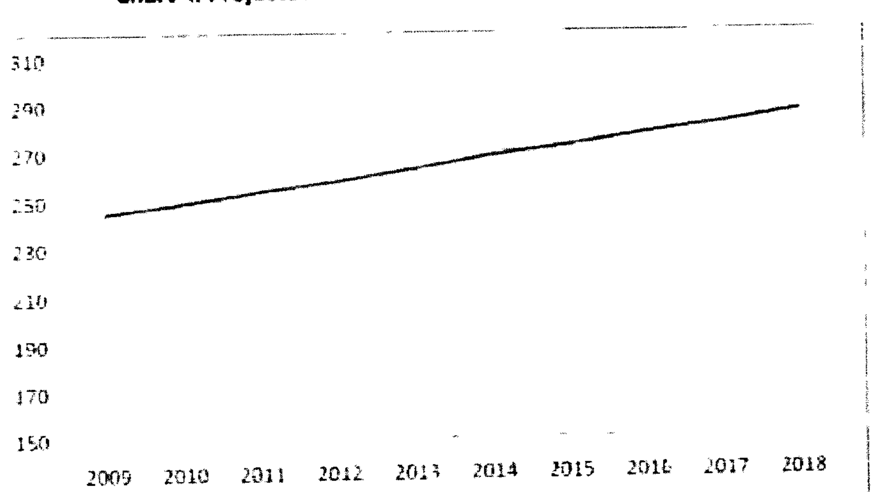
Engineering for the WTP4 project, AWU staff estimated that Austin's peak summer water use would reach 281 million gallons per day (mgd) by 2009.[17] That turned out to be a dramatic overestimate. Chart 3 shows the actual peak use over this period:

Chart 3. Actual Peak Water Use Per Day 1999 - 2009



Even so, similar to its overall pumpage projections, AWU told bondholders that peak use will climb steadily in the near future despite these recent, countervailing trends:

Chart 4. Projected Peak Water Use Per Day: 2009 – 2018



Given the inflated estimates from 2002, there's little reason to believe from recent experience that the steep upward curve depicted to bondholders represents a realistic expectation of real-world events. These exceedingly optimistic "forward looking statements" assume current revenue shortfalls are an anomaly and future water sales will increase at steady, predictable rates. However, AWU's long-term projections have been consistently overstated, while conservation has proven to work

Bottom line: Several situations could conceivably cause water rates to rise much higher than AWU officials have so far projected, including successful conservation efforts, more rain, and a real property glut that has reduced the number of new residential and commercial hookups. By contrast, as AWU's Mr. Cobern noted, summertime conservation measures – particularly restrictions on lawn watering – have eliminated "windfall opportunities" from higher summer water use that AWU previously anticipated. So if water sales aren't as high as AWU optimistically projected, the utility must either increase rates or reduce the General Fund transfer from the utility (which this fiscal year runs about $29 million[28]) and make up the difference with property tax increases

Steering the AWU Away from the Perfect Storm

The Austin environmental community has argued that AWU should wait before launching WTP4 to perform necessary environmental assessments of the transmission lines, save money in the short-term, and to determine before borrowing a half-billion dollars whether conservation measures could forestall new construction even longer. Now, facing unprecedented revenue shortfalls , lower water use through conservation, and this so-called "Perfect Storm," the logic of environmentalists' argument resonates even more strongly.

Any average Austinite whose income is declining would think twice about purchasing an expensive new home that commits the family to high, ongoing debt payments, but that's how AWU suggests Austin respond in the face of its current, unexpected decline in revenue.

The "Perfect Storm" behind lower 2010 water revenues stems primarily from three sources, according to AWU. New conservation measures, the end of the recent record setting drought, and the current economic downturn. Of those, the conservation measures aren't going away, some years will inevitably be rainier than others, and even though Austin's economy remains better than most, few believe the effects of the economic crunch will be over anytime soon. Meanwhile, conservation measures have eliminated opportunities for revenue "windfalls" the utility previously expected during periods of drought

So this isn't necessarily a temporary condition; some or all of these situations may continue for some time, making now the worst possible moment for AWU to take on large amounts of new, rate-secured debt.

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Misplaced Priorities: Fix Leaky Pipes Instead of Building New Intake

In the meantime, AWU continues to put off critical maintenance on older water lines in the central city which are responsible for leaks that drain billions of gallons of water per year from the system. The city parks department recently announced it would stop building new facilities until it could afford to pay for maintenance on the ones it already has[19], but AWU has not yet learned that basic lesson of fiscal prudence in lean economic times.

Some have argued for WTP4 based on the jobs created through a large, debt-financed public works project. AWU Director Greg Meszaros even said he considered WTP4 a "local stimulus" project that would create thousands of short-term jobs[20], though in this case ratepayers, not the Obama Administration, will pick up the tab. But if Austin wants to create jobs through AWU, it's focused on the wrong project.

According to the City Auditor, AWU lost 9.85 million gallons of water per day in 2007 through leaky pipes which have never been fixed.[21] That's 3.5 billion gallons of water per year the City just allows to seep into the ground. It makes little sense to build 50 mgd in new capacity while letting nearly 10 mgd leak out of the system every day.

Responding last summer to questions submitted by Councilmember Bill Spelman, AWU revealed that out of 3,600 miles of pipe that it operates, 900 miles are deteriorated and there are 250 miles of "highly deteriorated" pipe where the majority of leaks are located.[22] During a cold snap in January, reported the Austin Chronicle, those old cast-iron sections of the system accounted for 91% of water main breaks.[23]

No water system is leak-proof, but the City could start by fixing the 250 miles of identifiably deteriorated pipe, a task which would cost $330 million, city staff told Councilmember Spelman. That's a significant amount which would require a nine-figure bond issue, not to mention generating employment lasting many years beyond WTP4's scheduled construction. But that's not where AWU's priorities lie. Instead AWU plans to spend just $81.8 million fixing leaks over the next five years, AWU told Spelman, by which time even more pipe will inevitably deteriorate.

The Water Utility's "Perfect Storm" was easily predicted. Both peak-day and total water use have been flat to slightly declining since 2001. Per-household use is down. Both residents and businesses are saving water and saving money. These trends will likely continue. Rather than increase the damage to ratepayers and the environment, it's time for a midcourse correction and a return to safe harbor.

Recommendations:

The Save Our Springs Alliance offers these common-sense recommendations in the face of AWU's mounting fiscal crisis and misplaced priorities:

- Estimate proposed rate increases based on data that includes implementation of new water conservation goals and the 2008 cost-of-service study, then tell residential rate payers exactly what their overall rate hikes will be through 2015.
- Constructing expensive new infrastructure while simultaneously shifting costs from commercial to residential customers puts too high a burden on residential water customers. Put off new construction until the cost-of-service adjustments are complete to avoid piling onto residential rate payers all at once.
- Before beginning construction on WTP4, evaluate cheaper plant options that would replace the decommissioned "Green Water Treatment plant" with a new plant located in the Desired Development Zone and drawing water from Lady Bird Lake.
- Continue to implement water conservation, including aggressive, summertime lawn watering restrictions, to limit peak-day water use and achieve recently adopted city-wide conservation goals.
- Prioritize fixing leaky pipes over a new intake for new revenue bond indebtedness so that millions of gallons of water aren't uselessly seeping into the ground each day.

Appendix: The following data associated with the charts in this report was taken from the City of Austin Bond Prospectus dated November 5, 2009, p. 21.

Data for Chart 1: Projected total annual pumpage (in millions of gallons):

2009	55,385
2010	56,289
2011	57,270
2012	58,301
2013	59,350
2014	60,155
2015	61,242
2016	62,349
2017	63,477
2018	64,624

Data for Chart 2: Historic Annual Pumpage (in millions of gallons):

1999	46,422
2000	52,194
2001	50,140
2002	50,883
2003	51,111
2004	48,469
2005	51,374
2006	56,603
2007	45,868
2008	53,066

Data for Chart 3: Historial Annual Peak Day Use (in millions of gallons per day)

1999	216
2000	227
2001	243
2002	214
2003	232
2004	197
2005	247
2006	217
2007	180
2008	227
2009	229

Data for Chart 4: Projected Peak Use (in million of gallons per day)

2009	245
2010	249
2011	254
2012	258
2013	263
2014	268
2015	272
2016	277
2017	281
2018	286

Note: This documented was edited June 10 to correct non substantive typographical and editing errors

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ENDNOTES:

[1] Also unlike the federal stimulus, Austin ratepayers will see immediate rate increases to pay for it while debt accrued in Washington can be put off until future generations

[2] "2009-2010 PROPOSED BUDGET RESPONSE TO REQUEST FOR INFORMATION," Response to City Councilmember Chris Riley, Request #30, September 9, 2009

[3] Study Report. Austin Water Utility Cost of Service Rate Study 2008, Red Oak Consulting

[4] Backup material for Water-Wastewater commissioners provided to the author by city staff from the June 3 meeting of the Budget Subcommittee

[5] ibid

[6] All projections are within the 5-7 year period during which AWU says it will shift its cost-of-service allocations.

[7] "Utility bills likely to increase," City and County Beat Blog, Austin American Statesman, April 28, 2010.

[8] Bond Prospectus, "Official Statement," Dated November 5, 2009, p 14.

[9] "Water-sewer rates to climb 30% over next three years," Houston Chronicle, April 22, 2010.

[10] "US Urban Residents Cut Water Usage, Utilities Are Forced to Raise Prices," Circle of Blue WaterNews, April 19, 2010.

[11] Spreadsheet obtained under the Public Information Act from the Austin Water Utility by Bill Bunch, October 2009.

[12] Austin City Council Agenda Item 35, May 13, 2010. The "Fiscal Memo" accompanying the agenda item stated the financial impact to the Austin Water Utility is "unknown" beyond the need to hire more conservation personnel, but the fiscal impact of selling less water is clear from the 2010 revenue shortfall: AWU will receive less revenue than would otherwise be anticipated.

[13] Backup material for Water-Wastewater commissioners provided to the author by city staff from the June 3 meeting of the Budget Subcommittee. "Historical & Projected Accounts (FY Average)"

[14] Backup material for Water-Wastewater commissioners provided to the author by city staff from the June 3 meeting of the Budget Subcommittee.

[15] Assume from the calculation in Table 2 that the amount required to pay off WTP4 debt and other obligations is 1 7382 times the 2009 rate, or a 73.82% increase for residential ratepayers from pre-WTP4 rates at projected levels of use. Now assume water sales continue to underperform compared to AWU projections, currently revenues are at 89.78% of projected amounts. If lower water use and sales continue along these lines, to achieve the same revenue level will require a rate equal to 1 7382/.8978, or a 93.6% overall rate increase from 2009 levels

[16] Bond Prospectus, "Official Statement," Dated November 5, 2009, p 21.

[17] "Recommendation for Council Action," Backup material, Austin City Council, Agenda Item 32, 4/4/02.

[18] Really an extra $ 28,967,464," according to backup material for Water-Wastewater commissioners provided to the author by city staff from the June 3 meeting of the Budget Subcommittee.

[19] "Parks and Rec If you build it," Austin Chronicle, May 28, 2010 Said PARD director Sara Hensley, ""We have to say we can't build it if we can't maintain it."

[20] Comments recorded in author's notes from a public meeting April 20 at Concordia University.

[21] Office of the City Auditor, "Audit Report Austin Water Utility Water Loss," April 28, 2009

[22] Memorandum to Councilmember Bill Spelman from Assistant City Manager Rudy Garza. "Response to WTP4 questions," July 22, 2009, pp. 10-11

[23] "Frozen Assets: AWU and the Busted Pipes," Austin Chronicle, January 22, 2010

1999

Table 28
Austin Water Utility
Wastewater Cost of Service Model - Hybrid Method
Wastewater Concentrations by Customer Class

Customer Class	Contributed Flow (mg/L) BOD	Contributed Flow (mg/L) TSS	Contributed Flow (mg/L) Unused	Inflow & Infiltration (mg/L) BOD	Inflow & Infiltration (mg/L) TSS	Inflow & Infiltration (mg/L) Unused
Residential	200.0	200.0	0.0	40.0	95.0	0.0
Multi-Family	200.0	200.0	0.0	40.0	95.0	0.0
Commercial	200.0	200.0	0.0	40.0	95.0	0.0
Comanche Canyon (WCID#17)	4.0	6.0	0.0	40.0	95.0	0.0
Manor, City of	200.0	200.0	0.0	40.0	95.0	0.0
North Austin MUD #1	200.0	200.0	0.0	40.0	95.0	0.0
Northtown MUD	200.0	200.0	0.0	40.0	95.0	0.0
Rollingwood, City of	200.0	200.0	0.0	40.0	95.0	0.0
Shady Hollow MUD	200.0	200.0	0.0	40.0	95.0	0.0
Sunset Valley, City of	200.0	200.0	0.0	40.0	95.0	0.0
Steiner Ranch (WCID #17)	4.0	6.0	0.0	40.0	95.0	0.0
Wells Branch MUD	200.0	200.0	0.0	40.0	95.0	0.0
Westlake Hills, City of	200.0	200.0	0.0	40.0	95.0	0.0
Hospira	200.0	94.0	0.0	40.0	95.0	0.0
Spansion	11.0	6.0	0.0	40.0	95.0	0.0
Freescale	109.0	97.0	0.0	40.0	95.0	0.0
Samsung	51.0	32.0	0.0	40.0	95.0	0.0
Sematech	88.0	107.0	0.0	40.0	95.0	0.0
University of Texas	182.0	188.0	0.0	40.0	95.0	0.0
Surcharge						

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contributed volume of each class is generally based upon wastewater winter average billing records that exclude estimated water use not reaching the wastewater system, such as that used for lawn sprinkling and car washing.

Based on a historical analysis, it is estimated that the amount of flow entering the sewers through infiltration/inflow will average about 15 percent of the total wastewater flow reaching the treatment plants. Each customer class should bear its proportionate share of the costs associated with infiltration/inflow as the wastewater system must be adequate to convey and process the total flow. Recognizing that the major cost responsibility for infiltration/inflow is allocable on an individual connection basis, two-thirds (66.7%) of the infiltration/inflow volume is allocated to customer classes based on the estimated number of customer connections with the remaining one-third (33.3%) allocated on the basis of contributed volume. The allocation of I/I on this basis to customer classes is shown on Table S-12.

The responsibility for collection system capacity cost varies with the estimated peak flow rates of both contributed wastewater and infiltration attributable to each customer class. Infiltration/inflow is estimated to comprise about 30 percent of the total peak flows.

The BOD and suspended solids responsibility of each customer class is based on estimated average domestic strength concentrations and contributed wastewater volume for each class. Estimated average BOD and suspended solids concentrations of contributed domestic sewage are estimated to be about 144 milligrams per liter (mg/l) and 200 mg/l, respectively, for all customers excluding industrial users. Because of the pretreatment efforts of these customers, their strengths are estimated to be 77 mg/l for BOD and 82 mg/l for suspended solids. An average infiltration/inflow strength allowance of 40 mg/l for BOD and 95 mg/l for suspended solids was also used to balance total wastewater loadings contributed by normal and excess strength users with the total wastewater loadings received at the wastewater treatment plants.

The BOD and suspended solids strengths that are in excess of normal domestic limits of 200 mg/l are assigned to the surcharge customer classification as shown on Line 22 of Table S-11. The estimates of excess strength quantities for surcharge customers are based on a detailed analysis of extra strength data provided by historical surcharge billings of the Utility.

Customer costs are distributed among customer classes on the basis of the number of bills rendered.

8.4.3 Customer Class Cost of Service

Costs of service are distributed among customer classes by application of unit costs of service to respective service requirements. Unit costs of service are based upon the total costs previously allocated to functional components and the total number of applicable units of service.

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WE SAY AUSTIN WATER

Resize text A A A

Questions await coming debate on water rates

Posted 7:00 p.m. Tuesday March 4 2014

By Editorial Board

Our response to last week's American-Statesman story that Austin's successful water conservation efforts might force the city's water utility to significantly raise rates was similar to yours: Shouldn't we be saving money if we're using less water?

As the Statesman's Asher Price and Marty Toohey reported, Austin Water is losing revenue because its customers are using less water. The revenue decline – $27 million below budget projections in 2013 and $10 million below projections in the first quarter of this fiscal year, which began Oct. 1 – comes despite the doubling of rates over the past 12 years.

The utility is working out a rate-increase proposal to present to the City Council this spring. The water utility's director, Greg Meszaros, told Price and Toohey that rates might have to rise by double digits. This was stunning news.

Austin residents are to be commended for taking conservation seriously. Austin's single-day water use peaked in August 2001 at 240.3 million gallons, and has been declining ever since. Meanwhile, Austin's population has grown by 20.5 percent, from about 670,000 residents in 2001 to 843,000 today. To put it another way, as Price and Toohey reported, per-person water use in 2006 averaged 190 gallons a day; last year, daily per-person use was 136 gallons.

This is virtuous behavior to be encouraged and fostered. Yet our readers have told us in letters and online comments they feel as though they are being punished for saving water

The utility says it understands our readers' response, but answers that everybody keeps using water even as they use less of it, and there are costs associated with getting water to every customer The utility saves money on pumping and treatment costs when customers use less water, but other costs in the utility's budget water and sewer line repairs, equipment maintenance, and debt payments - are fixed.

Which brings us to Water Treatment Plant No. 4, the controversial, $508 million facility being built near RM 620 and RM 2222 in Northwest Austin. Some opponents of the plant saw a told-you-so moment in Price and Toohey s report. Critics of the plant had argued that conservation could make Water Treatment Plant No 4 unnecessary. A new treatment plant eventually would be needed, they said, but it could be smaller and built years from now after the utility first focused on replacing leaky pipes and encouraged even more conservation

Critics said Water Treatment Plant No 4 would result in a rate increase substantially larger than city officials were saying would be necessary The Save Our Springs Alliance, for example, put out a report in June 2010 forecasting that residential water rates could nearly double by 2015 to pay for the new water treatment plant.

Supporters of the plant - we were among them - said the plant was needed to ensure a rapidly growing Austin had an adequate future water supply There perhaps was existing treatment capacity for another couple of decades, but it was better to build a new plant now while construction costs were relatively low rather than wait

Plus, it was argued, building a new plant now could stave off crisis should one of the city s two existing plants, built in 1954 and 1969, needed to be shut down for lengthy repairs Once operational, the new treatment plant would allow Austin Water to make life-extending upgrades to its older plants

We have been consistent supporters of the city's conservation efforts, and on a couple of occasions have criticized city officials for not going far enough we favor making the city's lawn-watering restrictions permanent for example. But we and others didn't think conservation ultimately would be enough to meet the city's future water needs.

It is pointless to reargue Water Treatment Plant No. 4. The plant is being built and remains on track to begin operating this year

There is merit, however, in exploring questions surrounding how the plant was sold to the public. We also find merit in asking how utility officials failed to properly and adequately account for conservation's effect on demand. And a key question to get around as we begin to debate a rate increase is, what happens when the utility raises it rates?

For one, people will use less water. As we now are fully aware, when people use less water, the utility's bottom line suffers and the utility has to raise rates. A way has to be found to manage this spiral toward more burdensome rates.

We will be asking these and other questions as Austin Water moves toward a rate-increase proposal and the City Council begins debating it. The answers will be needed as we plan for the region's economic and water future.

Be sure to read Thursday's Viewpoints for our view on Tuesday's local and statewide primary election results, or read us online at www.statesman.com.

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All Comments (3)

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Comment(s) 1-3 of 3

Claire-Standish

Report

Perhaps the City should start giving hefty rebates to those proud Austin homeowners who install a property-wide automatic sprinkler system to keep their lawn full of thirsty, non-indiginous St. Augustine grass beautiful and green all summer long.

7:07 p.m. Mar. 4, 2014

2) 24(E)

Austin American-Statesman

Why drop in water use could cost Austin customers more

Posted: 5:17 p.m. Monday, Feb. 24, 2014

By Asher Price and Marty Toohey - American-Statesman Staff

Austin officials say residents have done such a good job conserving water that the city faces a conundrum: People aren't buying enough water to keep the delivery system in the black.

The Austin Water Utility took a $10 million hit in water sales for the first few months of this fiscal year, on top of the $27 million loss it logged last year. Correcting that shortfall could require new, higher "drought rates" that raise more money even as people use less water, according to the city.

Utility executives told the American-Statesman they are discussing new rate structures that could be proposed this summer. One idea is rates that rise as the lakes that supply Austin's water shrivel, a concept similar to one Dallas has adopted. Asked whether the rate increase would be double-digits, water utility director Greg Meszaros didn't rule the possibility out. To balance its books, the water utility also may deepen internal cuts.

In a sense, Austin has been a victim of its own success: Austinites have been reducing their water consumption — which means the city has collected less money from them — which is leading city officials to conclude rates must rise to bring in the money necessary to fund the 80 percent of costs that utility executives say are "fixed," such as debt payments and some equipment maintenance.

"For a customer it can be counterintuitive" that water conservation causes higher rates, Meszaros said. "But as we reduce water demand we

In this Section

Obama's workout video prompts jokes and security concerns

Texas GOP convention features Cruz vs. Perry presidential poll

UT could get wide latitude on spending tax money for medical school

Study shows 25 percent decline in expulsions in Texas

Judge David Peeples to decide Dietz school-case recusal

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