

**KENT COUNTY WATER AUTHORITY**

**COST OF SERVICE STUDY**

**April 1992**

**Camp Dresser & McKee Inc.**  
**10 Cambridge Center**  
**Cambridge, Massachusetts 02142**

## **1.0 INTRODUCTION**

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### **1.1. Docket Number 1952**

In January of 1992, the Kent County Water Authority filed tariff revisions with the Rhode Island Public Utilities Commissions (PUC) -- Docket Number 1952. As part of this filing, the Authority proposed several changes to the structure of its rates and charges. One such proposed change was to eliminate the five step, declining block metered rates and replace them with a uniform charge per hundred cubic feet. The Authority stated that the intent of the proposed change in rate structure was to encourage water conservation through its pricing structure.

The change in rate structure to a uniform rate for all customers was opposed by several parties in the proceedings, including the Authority's largest customer, the Hoechst Celanese Company and the Division of Public Utilities and Carriers.

The Division's witness "recommended the establishment of a large and a small general water service class."<sup>1</sup> One of the Conservation Law Foundation/Audubon Society of Rhode Island's (CLF/AS) witness recommended "two uniform rates for two (2) classes of customers."<sup>2</sup> A second witness for CLF/AS supported the Authority's proposed uniform rate. Intervener Hoechst's witness opposed the uniform rate proposal in the absence of a cost of service study.

The PUC issued its Report and Order on October 31, 1990. On the issue of rate design, the Commission stated that they were "not satisfied that the continuance of the existing declining block rate design would recover costs appropriately from the retail rate class", but felt there was insufficient data to change the present design. The Commission stated that it "endorses a change from the current rate structure but without concurrence of the parties and appropriate data to analyze any shift in cost, the Commission is compelled to direct that the new rates be determined by an across-the-board increase to the existing rate structure. Based on the absence of data, the Commission determined that a class cost of service study was necessary. "In order to have study results from which all interested parties can work, the Commission directs the Company (Kent County Water Authority) to consult with all the intervenors in this docket in determining the parameters for the study."<sup>3</sup>

### **1.2. Study Parameters**

This study is the class cost of service study ordered by the PUC in Docket Number 1952. During the preparation of this study, two meetings were held with the intervenors to discuss and determine the study parameters. The first meeting was held August 28,

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<sup>1</sup> Report and Order in Docket No. 1952.

<sup>2</sup> Report and Order in Docket No. 1952.

<sup>3</sup> Report and Order in Docket No. 1952.

1991, where general parameters were discussed. At that time, it was agreed that the rates ought to include uniform charges by rate class. A second meeting was held on March 2, 1992. At the second meeting, various customer class breakdowns were discussed based on consumption data provided to the parties in attendance. It was decided that three customer classes should be used, based on water meter size. The small class would include meters up to 2". The medium use class would include 3" and 4" meters, and the large use class would include accounts with meters that are 6" and over.

During the course of the meetings, the Authority filed for new rates with the PUC and requested relief from certain restrictions that resulted from the Order in Docket Number 1952. The new filing was under Docket Number 2034. The PUC issued a final Report and Order under Docket Number 2034<sup>4</sup> on February 28, 1992. That order included an Agreement and Stipulation that resulted in the withdrawing of the Authority's retail rate increase request and the elimination of the restricted debt service and capital account provisions in Docket Number 1952. It was agreed by the parties that the pro forma revenue requirements included in that filing (with the elimination of the restricted accounts) would serve as the basis for the cost of service study since they also formed the basis for the current rates and charges.

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<sup>4</sup> And Docket Number 1952 since it included revisions to the order under that docket.

## 2.0 REVENUE REQUIREMENTS

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Schedule 1, on the following page, presents the rate year revenue requirements used in Docket Number 2034. These revenue requirements include the cost of purchased water under the Providence Water Supply Board's current rates. Providence recently filed for a new rate increase that would substantially increase the wholesale cost of water. Providence's proposed wholesale rate is *not* reflected in the rate year revenue requirements presented on Schedule 1.

The revenues requirements in Schedule 1 reflect rate year debt service expenses without the restrictions that were lifted in Docket Number 2034.

**RATE YEAR EXPENSES**

<b><u>EXPENSE ITEM</u></b>	<b><u>Rate Year Expenses</u></b>
<b><u>SOURCE OF SUPPLY</u></b>	
operations	\$0
purchased water	\$1,634,837
<b><u>PUMPING OPERATIONS</u></b>	
power-pumping	\$321,102
labor-pumping	\$30,562
pumping expense	\$2,834
maint. - pumping	\$16,205
diesel oil	\$905
maint. - structure	\$7,620
<b><u>WATER TREATMENT</u></b>	
chemicals	\$10,417
labor	\$24,296
operating	\$20,105
maint. - water treat	\$5,186
maint. - structure	\$111
<b><u>TRANS &amp; DISTR. EXPENSE</u></b>	
labor	\$10,544
supplies	\$11,412
labor-meter	\$30,301
material-meter	\$4,175
cust. install.	\$0
misc	\$7,465
maint.- res & stdp	\$11,020
maint. - mains	\$243,120
maint. - service	\$56,809
maint. - meters	\$175,866
maint. - hydrants	\$72,453
storage facilities	\$1,218
cust. install. supplies	\$0
<b><u>CUSTOMER ACCOUNT</u></b>	
labor- meter read	\$53,817
office salaries	\$80,458
office expenses	\$45,730
meter read supplies	\$7,202
uncollectable	\$0
<b><u>ADMIN. &amp; GENERAL</u></b>	
salaries	\$129,571
office supplies	\$39,222
insurance	\$134,075
employee benefits	\$221,788
fee & expense	\$25,759
maint. - plant	\$71,917
maint. - trucks	\$72,420
trans. construct	(\$11,581)
vacation, holiday	\$80,533
regul. exp.	\$199,309
fisc. agent fee-dmges	\$2,152
outside service	<u>\$244,925</u>
SUBTOTAL O&M	\$4,095,859
<b><u>FIXED CHARGES</u></b>	
Debt Service	\$644,000
Capital Expenses	\$300,000
Payroll Taxes	\$67,694
PILOT	<u>\$19,149</u>
SUBTOTAL FIXED	\$1,030,843
<b>OPERATING REVENUE</b>	\$76,901
<b>TOTAL EXPENSES</b>	\$5,203,602

### **3.0 UNITS OF SERVICE**

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Schedule 2, on the following page, presents the units of service that were used in the cost of service study. As discussed earlier, three customer classes were used. Based on the billing analysis used in Docket Number 2034, water use by each of the classes was developed. The wholesale use represents the use by the City of Warwick and is charged at the Providence rate by agreement. The number of billings by meter size is based on the billing analysis. These values as well as the number of private fire services and hydrants are the values used in Docket Number 2034.

## PRO FORMA UNITS OF SERVICE

### METERED WATER CONSUMPTION

	<u>Cubic Feet</u>	<u>Gallons</u>
Small (5/8-2" meters)	358,717,641	2,683,207,955
Medium (3&4" meters)	40,087,768	299,856,505
Large (6" & up meters)	66,174,617	494,986,135
Wholesale	10,867,787	81,291,047
<b>TOTAL</b>	<b>475,847,813</b>	<b>3,559,341,641</b>

### FIRE SERVICES

	<u>Number</u>
Public Fire Hydrants	1,997
Private Fire Services	
<u>Size (in)</u>	
4	16
6	136
8	31
10	2
12	1
HYDRANTS	<u>153</u>
	<u>339</u>
<b>SUBTOTAL</b>	<b>2,336</b>

### BILLINGS BY METER SIZE

<u>METER SIZE (IN)</u>	<u>QUARTLY BILLS</u>	<u>MONTHLY BILLS</u>	<u>ALL ACCNTS</u>
5/8 &			
3/4	86,632	12	86,644
1	3,740	0	3,740
1 1/2	956	49	1,005
2	1,760	192	1,952
3	56	48	104
4	68	59	127
6	132	84	216
>8	<u>180</u>	<u>60</u>	<u>240</u>
<b>SUBTOTAL</b>	<b>93,524</b>	<b>504</b>	<b>94,028</b>
 PUBL. FIRE	 40	 0	 40
PRIV. FIRE	<u>339</u>	<u>0</u>	<u>339</u>
<b>TOTALS</b>	<b>93,903</b>	<b>504</b>	<b>94,407</b>

## 4.0 COST ALLOCATIONS

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Schedule 3, on the following page, presents the allocation of the revenue requirements to general water service, fire service and customer service. Schedule 3A, following Schedule 3, presents the allocation of labor costs.

In general, the allocations often follow those used in Docket Number 1952; however, several revisions were made. The Fire Districts that intervened in that docket had objected to pumping costs being allocated based on maximum day demands. During the meetings with the intervenors, it was agreed that pumping costs would be allocated as a base, general water cost -- that is, unrelated to peak demands. Further, items such as source of supply, treatment and pumping that are base related costs were allocated only 0.5% to fire service as a result of the testimony presented by the fire districts in Docket Number 1952.

Payments in lieu of taxes (allocation symbol L) were allocated based on the taxes paid and the use of the property. For example, property associated with wells and pumping stations was allocated in accordance with symbol A: 99.5% to general water and 0.5% to fire service.

The capital expenses (allocation symbol J) are for minor capital improvements and purchases which are of general nature. As a result, they are allocated in proportion to all O&M costs.

The debt service (allocation symbol I) was allocated based on the capital improvement program developed in 1990 (see Docket Number 1952). While all these improvements are yet to be completed, it is the intent of this study to provide a basis for cost based rates for several years. As a result, all debt service costs should be allocated on the basis of the capital improvement program.



**ALLOCATION OF PRO FORMA EXPENSES TO  
GENERAL WATER, FIRE, AND CUSTOMER SERVICE**

EXPENSE ITEM	TOTAL PRO FORMA	ALLOC. SYMBOL	GEN'L WATER %	AMOUNT	FIRE SERVICE %	AMOUNT	CUST. SERVICE %	AMOUNT
<b><u>SOURCE OF SUPPLY</u></b>								
operations	\$0	A	99.5%	\$0	0.5%	\$0	0.0%	\$0
purchased water	\$1,634,837	A	99.5%	\$1,626,663	0.5%	\$8,174	0.0%	\$0
<b><u>PUMPING OPERATIONS</u></b>								
power-pumping	\$321,102	A	99.5%	\$319,496	0.5%	\$1,606	0.0%	\$0
labor-pumping	\$30,562	A	99.5%	\$30,409	0.5%	\$153	0.0%	\$0
pumping expense	\$2,834	A	99.5%	\$2,820	0.5%	\$14	0.0%	\$0
maint. - pumping	\$16,205	A	99.5%	\$16,124	0.5%	\$81	0.0%	\$0
diesel oil	\$905	A	99.5%	\$900	0.5%	\$5	0.0%	\$0
maint. - structure	\$7,620	A	99.5%	\$7,582	0.5%	\$38	0.0%	\$0
<b><u>WATER TREATMENT</u></b>								
chemicals	\$10,417	A	99.5%	\$10,365	0.5%	\$52	0.0%	\$0
labor	\$24,296	A	99.5%	\$24,175	0.5%	\$121	0.0%	\$0
operating	\$20,105	A	99.5%	\$20,004	0.5%	\$101	0.0%	\$0
maint. - water treat	\$5,186	A	99.5%	\$5,160	0.5%	\$26	0.0%	\$0
maint. - structure	\$111	A	99.5%	\$111	0.5%	\$1	0.0%	\$0
<b><u>TRANS &amp; DISTR. EXPENSE</u></b>								
labor	\$10,544	B	80.6%	\$8,499	19.4%	\$2,046	0.0%	\$0
supplies	\$11,412	B	80.6%	\$9,198	19.4%	\$2,214	0.0%	\$0
labor-meter	\$30,301	C	0.0%	\$0	0.0%	\$0	100.0%	\$30,301
material-meter	\$4,175	C	0.0%	\$0	0.0%	\$0	100.0%	\$4,175
cust. install.	\$0	C	0.0%	\$0	0.0%	\$0	100.0%	\$0
misc	\$7,465	F	36.2%	\$2,701	20.5%	\$1,532	43.3%	\$3,233
maint. - res & stdp	\$11,020	D	75.0%	\$8,265	25.0%	\$2,755	0.0%	\$0
maint. - mains	\$243,120	B	80.6%	\$195,955	19.4%	\$47,165	0.0%	\$0
maint. - service	\$56,809	C	0.0%	\$0	0.0%	\$0	100.0%	\$56,809
maint. - meters	\$175,866	C	0.0%	\$0	0.0%	\$0	100.0%	\$175,866
maint. - hydrants	\$72,453	E	0.5%	\$362	99.5%	\$72,090	0.0%	\$0
storage facilities	\$1,218	D	75.0%	\$913	25.0%	\$304	0.0%	\$0
cust. install. supplies	\$0	C	0.0%	\$0	0.0%	\$0	100.0%	\$0
<b><u>CUSTOMER ACCOUNT</u></b>								
labor- meter read	\$53,817	C	0.0%	\$0	0.0%	\$0	100.0%	\$53,817
office salaries	\$80,458	C	0.0%	\$0	0.0%	\$0	100.0%	\$80,458
office expenses	\$45,730	C	0.0%	\$0	0.0%	\$0	100.0%	\$45,730
meter read supplies	\$7,202	C	0.0%	\$0	0.0%	\$0	100.0%	\$7,202
uncollectable	\$0	C	0.0%	\$0	0.0%	\$0	100.0%	\$0
<b><u>ADMIN. &amp; GENERAL</u></b>								
salaries	\$129,571	G	77.1%	\$99,961	5.3%	\$6,918	17.5%	\$22,693
office supplies	\$39,222	G	77.1%	\$30,259	5.3%	\$2,094	17.5%	\$6,869
insurance	\$134,075	G	77.1%	\$103,435	5.3%	\$7,158	17.5%	\$23,482
employee benefits	\$221,788	H	56.2%	\$124,587	10.5%	\$23,277	33.3%	\$73,925
fee & expense	\$25,759	G	77.1%	\$19,872	5.3%	\$1,375	17.5%	\$4,511
maint. - plant	\$71,917	G	77.1%	\$55,482	5.3%	\$3,839	17.5%	\$12,595
maint. - trucks	\$72,420	G	77.1%	\$55,870	5.3%	\$3,866	17.5%	\$12,684
trans. construct	(\$11,581)	G	77.1%	(\$8,935)	5.3%	(\$618)	17.5%	(\$2,028)
vacation, holiday	\$80,533	H	56.2%	\$45,238	10.5%	\$8,452	33.3%	\$26,843
regul. exp.	\$199,309	G	77.1%	\$153,762	5.3%	\$10,641	17.5%	\$34,907
fisc. agent fee-dmges	\$2,152	G	77.1%	\$1,660	5.3%	\$115	17.5%	\$377
outside service	\$244,925	G	77.1%	\$188,953	5.3%	\$13,076	17.5%	\$42,896
SUBTOTAL O&M	\$4,095,859	G	77.1%	\$3,159,847	5.3%	\$218,670	17.5%	\$717,342
<b><u>FIXED CHARGES</u></b>								
Debt Service	\$644,000	I	79.8%	\$514,170	20.2%	\$129,830	0.0%	\$0
Capital Expenses	\$300,000	J	77.1%	\$231,442	5.3%	\$16,016	17.5%	\$52,542
Payroll Taxes	\$67,694	H	56.2%	\$38,026	10.5%	\$7,105	33.3%	\$22,563
PILOT	\$19,149	L	80.1%	\$15,335	14.1%	\$2,700	5.8%	\$1,115
SUBTOTAL FIXED	\$1,030,843			\$798,973	15.1%	\$155,651	7.4%	\$76,219
<b>OPERATING REVENUE</b>	\$76,901	K	77.2%	\$59,382	7.3%	\$5,615	15.5%	\$11,903
<b>TOTAL EXPENSES</b>	\$5,203,602	K	77.2%	\$4,018,202	7.3%	\$379,936	15.5%	\$805,465

**ALLOCATION OF PRO FORMA LABOR EXPENSE TO  
GENERAL WATER, FIRE & CUST. SERVICE**

<b>EXPENSE ITEM</b>	<b>PRO FORMA LABOR</b>	<b>ALLOC. SYMBOL</b>	<b>GEN'L WATER %</b>	<b>AMOUNT</b>	<b>FIRE SERVICE %</b>	<b>AMOUNT</b>	<b>CUST. SERVICE %</b>	<b>AMOUNT</b>
<b><u>SOURCE OF SUPPLY</u></b>								
operations	\$0	A	99.5%	\$0	0.5%	\$0	0.0%	\$0
purchased water	\$0	A	99.5%	\$0	0.5%	\$0	0.0%	\$0
<b><u>PUMPING OPERATIONS</u></b>								
power-pumping	\$0	A	99.5%	\$0	0.5%	\$0	0.0%	\$0
labor-pumping	\$30,562	A	99.5%	\$30,409	0.5%	\$153	0.0%	\$0
pumping expense	\$0	A	99.5%	\$0	0.5%	\$0	0.0%	\$0
maint. - pumping	\$6,834	A	99.5%	\$6,800	0.5%	\$34	0.0%	\$0
diesel oil	\$0	A	99.5%	\$0	0.5%	\$0	0.0%	\$0
maint. - structure	\$6,878	A	99.5%	\$6,844	0.5%	\$34	0.0%	\$0
<b><u>WATER TREATMENT</u></b>								
chemicals	\$0	A	99.5%	\$0	0.5%	\$0	0.0%	\$0
labor	\$22,631	A	99.5%	\$22,518	0.5%	\$113	0.0%	\$0
operating	\$0	A	99.5%	\$0	0.5%	\$0	0.0%	\$0
maint. - water treat	\$1,333	A	99.5%	\$1,326	0.5%	\$7	0.0%	\$0
maint. - structure	\$0	A	99.5%	\$0	0.5%	\$0	0.0%	\$0
<b><u>TRANS &amp; DISTR. EXPENSE</u></b>								
labor	\$10,544	B	80.6%	\$8,498	19.4%	\$2,046	0.0%	\$0
supplies	\$0	B	80.6%	\$0	19.4%	\$0	0.0%	\$0
labor-meter	\$30,301	C	0.0%	\$0	0.0%	\$0	100.0%	\$30,301
material-meter	\$0	C	0.0%	\$0	0.0%	\$0	100.0%	\$0
cust. install.	\$0	C	0.0%	\$0	0.0%	\$0	100.0%	\$0
misc	\$0	F	36.2%	\$0	20.5%	\$0	43.3%	\$0
maint.- res & stdp	\$10,513	D	75.0%	\$7,885	25.0%	\$2,628	0.0%	\$0
maint. - mains	\$173,308	B	80.6%	\$139,686	19.4%	\$33,622	0.0%	\$0
maint. - service	\$39,009	C	0.0%	\$0	0.0%	\$0	100.0%	\$39,009
maint. - meters	\$19,385	C	0.0%	\$0	0.0%	\$0	100.0%	\$19,385
maint. - hydrants	\$32,292	E	0.5%	\$161	99.5%	\$32,131	0.0%	\$0
storage facilities	\$0	D	75.0%	\$0	25.0%	\$0	0.0%	\$0
cust. install. supplies	\$0	C	0.0%	\$0	0.0%	\$0	100.0%	\$0
<b><u>CUSTOMER ACCOUNT</u></b>								
labor- meter read	\$53,817	C	0.0%	\$0	0.0%	\$0	100.0%	\$53,817
office salaries	\$80,458	C	0.0%	\$0	0.0%	\$0	100.0%	\$80,458
office expenses	\$0	C	0.0%	\$0	0.0%	\$0	100.0%	\$0
meter read supplies	\$0	C	0.0%	\$0	0.0%	\$0	100.0%	\$0
uncollectable	\$0	C	0.0%	\$0	0.0%	\$0	100.0%	\$0
<b><u>ADMIN. &amp; GENERAL</u></b>								
salaries	\$129,571	G	77.1%	\$99,961	5.3%	\$6,918	17.5%	\$22,693
office supplies	\$0	G	77.1%	\$0	5.3%	\$0	17.5%	\$0
insurance	\$0	G	77.1%	\$0	5.3%	\$0	17.5%	\$0
employee benefits	\$4,500	G	77.1%	\$3,472	5.3%	\$240	17.5%	\$788
fee & expense	\$0	G	77.1%	\$0	5.3%	\$0	17.5%	\$0
maint. - plant	\$57,283	G	77.1%	\$44,192	5.3%	\$3,058	17.5%	\$10,032
maint. - trucks	\$46,498	G	77.1%	\$35,872	5.3%	\$2,482	17.5%	\$8,144
trans. construct	\$0	G	77.1%	\$0	5.3%	\$0	17.5%	\$0
vacation, holiday	\$80,533	G	77.1%	\$62,129	5.3%	\$4,300	17.5%	\$14,104
regul. exp.	\$0	G	77.1%	\$0	5.3%	\$0	17.5%	\$0
fisc. agent fee-dmges	\$0	G	77.1%	\$0	5.3%	\$0	17.5%	\$0
outside service	\$0	G	77.1%	\$0	5.3%	\$0	17.5%	\$0
<b>SUBTOTAL O&amp;M</b>	<b>\$836,250</b>	<b>H</b>	<b>56.2%</b>	<b>\$469,753</b>	<b>10.5%</b>	<b>\$87,765</b>	<b>33.3%</b>	<b>\$278,731</b>

## 5.0 FIRE SERVICE CHARGES

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Schedule 4, below, presents the fire service charges based on the cost of service study.

<u>Schedule 4</u>	
<u>FIRE SERVICE CHARGES</u>	
<u>PUBLIC FIRE SERVICE</u>	
Quarterly Charge/Hydrant =	\$40.05
Plus Billing Charge =	\$3.78
<u>PRIVATE FIRE SERVICE</u>	
Service Size (inches)	Quarterly Charge
4	\$17.57
6	\$43.84
8	\$89.14
10	\$157.28
12	\$251.73
HYDRANT	\$43.84

Schedule 4A, on the following page, presents the allocation of the fire service expenses from Schedule 3 to public and private fire service. As with the submission in Docket Number 1952, the fire service costs were split between public and private fire service based on the relative demands from each type of service, as measured by the service diameters.

Schedule 4B, on the second following page, presents the calculation of the public and private service charges derived from the allocations.

# **ALLOCATION OF FIRE SERVICE EXPENSES** **TO PUBLIC AND PRIVATE FIRE SERVICE**

	<u>NUMBER</u>	<u>DEMAND NO. OF FACTOR * EQUIVS.</u>	<u>PERCENT OF DEMAND</u>	<u>REVENUE REQUIRED</u>
<u>PUBLIC FIRE SERVICE</u>				
Hydrants	1,997	111.31	222,286.1	84.21% \$319,947
<u>PRIVATE FIRE SERVICE</u>				
	<u>SIZE (IN)</u>			
4	16	38.32	613.1	
6	136	111.31	15,138.2	
8	31	237.21	7,353.5	
10	2	426.58	853.2	
12	1	689.04	689.0	
HYDRANTS	153	111.31	17,030.4	
TOTAL-PRIV.	339		41,677.4	15.79% \$59,988
	=====		=====	=====
GRAND TOTALS	2,336		263,963.5	100.00% \$379,936

\* Note: Based on size to the 2.63 power.

## DETERMINATION OF FIRE SERVICE CHARGES

### PUBLIC FIRE PROTECTION

PUBLIC FIRE ALLOCATION	\$319,947	
----- =	----- =	\$160.21
NUMBER OF PUBLIC HYDRANTS	1,997	
	TOTAL QUARTERLY	\$40.05
	+ BILLING	\$3.78

### PRIVATE FIRE PROTECTION

PRIVATE FIRE ALLOCATION	\$59,988	
----- =	----- =	\$1.44 /EQUIV.
NO.OF EQUIV. 4-IN CONN.	41,677.42	

<u>SIZE (IN)</u>	<u>DEMAND FACTOR</u>	<u>ANNUAL CHARGE</u>	<u>QUARTERLY CHARGE</u>	<u>BILLING CHARGE</u>	<u>TOTAL CHARGE</u>
4	38.32	\$55.16	\$13.79	\$3.78	\$17.57
6	111.31	\$160.21	\$40.05	\$3.78	\$43.84
8	237.21	\$341.43	\$85.36	\$3.78	\$89.14
10	426.58	\$614.00	\$153.50	\$3.78	\$157.28
12	689.04	\$991.77	\$247.94	\$3.78	\$251.73
HYDRANTS	111.31	\$160.21	\$40.05	\$3.78	\$43.84

## 6.0 SERVICE CHARGES

In Docket Number 1952, the PUC approved new service charges for the Kent County Water Authority. Schedule 5 presents the service charges that result from this cost of service study.

Schedule 5		
<u>SERVICE CHARGES</u>		
METER SIZE	QUARTERLY	MONTHLY
(inches)	<u>ACCOUNTS</u>	<u>ACCOUNTS</u>
5/8 & 3/4	\$7.69	\$5.09
1	\$10.81	\$6.13
1 1/2	\$16.66	\$8.08
2	\$21.73	\$9.77
3	\$28.36	\$11.98
4	\$41.23	\$16.27
6	\$69.71	\$25.76
>8	\$119.25	\$42.27

The service charge consists of two components: (1) a metering and service charge component that varies by the size of the meter and service, and (2) a billing component that is the same for all billings. Schedule 5A, on the following page, presents the allocation of the Customer Service requirements from Schedule 3 to the two components. Schedule 5B, on the second following page presents the allocation of labor costs.

In general, those costs associated with meter reading, billing, and customer accounting are allocated to the Customer Billing component. Costs associated with meters, meter testing, and services are allocated to the Customer Meter component. Administrative and general overhead costs that could not be directly allocated are allocated based on all other costs which could be allocated directly.

Schedule 5C presents the determination of equivalent meters. Meter equivalencies were determined in order to calculate meter and service line portion of costs that should be assigned to each meter size. While meter capacities are sometimes used for this equivalency calculation, the costs, and thus the charges, are more closely related to the

## ALLOCATION OF CUSTOMER SERVICE EXPENSES

EXPENSE ITEM	TOTAL CUST. SERV.	ALLOC. SYMBOL	<-CUST. METER-> %	AMOUNT	<-CUST. BILL-> %	AMOUNT
<u>TRANS &amp; DISTR. EXPENSE</u>						
labor	\$0	AA	100.0%	\$0	0.0%	\$0
supplies	\$0	AA	100.0%	\$0	0.0%	\$0
labor-meter	\$30,301	AA	100.0%	\$30,301	0.0%	\$0
material-meter	\$4,175	AA	100.0%	\$4,175	0.0%	\$0
cust. install.	\$0	AA	100.0%	\$0	0.0%	\$0
misc	\$3,233	AA	100.0%	\$3,233	0.0%	\$0
maint.- res & stdp	\$0	AA	100.0%	\$0	0.0%	\$0
maint. - mains	\$0	AA	100.0%	\$0	0.0%	\$0
maint. - service	\$56,809	AA	100.0%	\$56,809	0.0%	\$0
maint. - meters	\$175,866	AA	100.0%	\$175,866	0.0%	\$0
maint. - hydrants	\$0	AA	100.0%	\$0	0.0%	\$0
storage facilities	\$0	AA	100.0%	\$0	0.0%	\$0
cust. install. supplies	\$0	AA	100.0%	\$0	0.0%	\$0
<u>CUSTOMER ACCOUNT</u>						
labor- meter read	\$53,817	BB	0.0%	\$0	100.0%	\$53,817
office salaries	\$80,458	BB	0.0%	\$0	100.0%	\$80,458
office expenses	\$45,730	BB	0.0%	\$0	100.0%	\$45,730
meter read supplies	\$7,202	BB	0.0%	\$0	100.0%	\$7,202
uncollectable	\$0	BB	0.0%	\$0	100.0%	\$0
<u>ADMIN. &amp; GENERAL</u>						
salaries	\$22,693	CC	56.1%	\$12,721	43.9%	\$9,972
office supplies	\$6,869	CC	56.1%	\$3,851	43.9%	\$3,018
insurance	\$23,482	CC	56.1%	\$13,164	43.9%	\$10,318
employee benefits	\$73,925	DD	42.3%	\$31,271	57.7%	\$42,654
fee & expense	\$4,511	CC	56.1%	\$2,529	43.9%	\$1,982
maint. - plant	\$12,595	CC	56.1%	\$7,061	43.9%	\$5,535
maint. - trucks	\$12,684	CC	56.1%	\$7,110	43.9%	\$5,573
trans. construct	(\$2,028)	CC	56.1%	(\$1,137)	43.9%	(\$891)
vacation, holiday	\$26,843	DD	42.3%	\$11,355	57.7%	\$15,488
regul. exp.	\$34,907	CC	56.1%	\$19,568	43.9%	\$15,338
fisc. agent fee-dmges	\$377	CC	56.1%	\$211	43.9%	\$166
outside service	<u>\$42,896</u>	CC	56.1%	<u>\$24,047</u>	43.9%	<u>\$18,849</u>
SUBTOTAL O&M	\$717,342	CC	56.1%	\$402,134	43.9%	\$315,209
<u>FIXED CHARGES</u>						
Debt Service	\$0	EE	55.6%	\$0	44.4%	\$0
Capital Expenses	\$52,542	EE	55.6%	\$29,234	44.4%	\$23,308
Payroll Taxes	\$22,563	DD	42.3%	\$9,544	57.7%	\$13,019
PILOT	<u>\$1,115</u>	EE	55.6%	<u>\$620</u>	44.4%	<u>\$494</u>
SUBTOTAL FIXED	\$76,219			\$39,398		\$36,821
OPERATING REVENUE	\$11,903	EE	55.6%	\$6,623	44.4%	\$5,280
TOTAL EXPENSES	\$805,465	EE	55.6%	\$448,155	44.4%	\$357,310

**ALLOCATION OF CUSTOMER SERVICE LABOR**

<b>EXPENSE ITEM</b>	<b>TOTAL CUST. SERV.</b>	<b>ALLOC. SYMBOL</b>	<b>&lt;-CUST. METER-&gt; %</b>	<b>AMOUNT</b>	<b>&lt;--CUST. BILL--&gt; %</b>	<b>AMOUNT</b>
<b><u>TRANS &amp; DISTR. EXPENSE</u></b>						
labor	\$0	AA	100.0%	\$0	0.0%	\$0
supplies	\$0	AA	100.0%	\$0	0.0%	\$0
labor-meter	\$30,301	AA	100.0%	\$30,301	0.0%	\$0
material-meter	\$0	AA	100.0%	\$0	0.0%	\$0
cust. install.	\$0	AA	100.0%	\$0	0.0%	\$0
misc	\$0	AA	100.0%	\$0	0.0%	\$0
maint.- res & stdp	\$0	AA	100.0%	\$0	0.0%	\$0
maint. - mains	\$0	AA	100.0%	\$0	0.0%	\$0
maint. - service	\$39,009	AA	100.0%	\$39,009	0.0%	\$0
maint. - meters	\$19,385	AA	100.0%	\$19,385	0.0%	\$0
maint. - hydrants	\$0	AA	100.0%	\$0	0.0%	\$0
storage facilities	\$0	AA	100.0%	\$0	0.0%	\$0
cust. install. supplies	\$0	AA	100.0%	\$0	0.0%	\$0
<b><u>CUSTOMER ACCOUNT</u></b>						
labor- meter read	\$53,817	BB	0.0%	\$0	100.0%	\$53,817
office salaries	\$80,458	BB	0.0%	\$0	100.0%	\$80,458
office expenses	\$0	BB	0.0%	\$0	100.0%	\$0
meter read supplies	\$0	BB	0.0%	\$0	100.0%	\$0
uncollectable	\$0	BB	0.0%	\$0	100.0%	\$0
<b><u>ADMIN. &amp; GENERAL</u></b>						
salaries	\$22,693	CC	56.1%	\$12,721	43.9%	\$9,972
office supplies	\$0	CC	56.1%	\$0	43.9%	\$0
insurance	\$0	CC	56.1%	\$0	43.9%	\$0
employee benefits	\$788	DD	42.3%	\$333	57.7%	\$455
fee & expense	\$0	CC	56.1%	\$0	43.9%	\$0
maint. - plant	\$10,032	CC	56.1%	\$5,624	43.9%	\$4,408
maint. - trucks	\$8,144	CC	56.1%	\$4,565	43.9%	\$3,578
trans. construct	\$0	CC	56.1%	\$0	43.9%	\$0
vacation, holiday	\$14,104	DD	42.3%	\$5,966	57.7%	\$8,138
regul. exp.	\$0	CC	56.1%	\$0	43.9%	\$0
fisc. agent fee-dmges	\$0	CC	56.1%	\$0	43.9%	\$0
outside service	\$0	CC	56.1%	\$0	43.9%	\$0
<b>SUBTOTAL O&amp;M</b>	<b>\$278,731</b>	<b>DD</b>	<b>42.3%</b>	<b>\$117,905</b>	<b>57.7%</b>	<b>\$160,826</b>



**DETERMINATION OF EQUIVALENT METERS**

METER SIZE (IN)	NUMBER	EQUIVILENCY FACTOR	EQUIV. 5/8 IN. METERS
5/8 & 3/4	21,659	1.0	21,659
1	935	1.8	1,683
1 1/2	243	3.3	802
2	456	4.6	2,098
3	18	6.3	113
4	22	9.6	210
6	40	16.9	676
>8	50	29.6	1,480
TOTALS	23,423		28,722

cost of installing meters and services<sup>5</sup>. The equivalency factors presented on Schedule 5C are based on typical service and meter installation costs estimated by CDM.

Schedule 5D presents the determination of the service charge components and the calculation of the total service charge for each size meter. As discussed earlier, the total service charge consists of the meter charge<sup>6</sup> plus the billing charge.

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<sup>5</sup> The capacity of meters should be used if demand related or capacity costs are to be recovered within the service charge. In this case, there are no such costs in the service charge.

<sup>6</sup> One fourth the annual charge for quarterly accounts and 1/12 for monthly accounts.

## DETERMINATION OF PROPOSED SERVICE CHARGES

### BILLING CHARGE

CUST. BILLING ALLOC.	=	\$357,310	=		
-----					
NUMBER OF BILLINGS		94,407			\$3.78 PER BILLING

### METER CHARGE

CUST. A ALLOC.	=	\$448,155	=		
-----					
NO. EQUIV. METERS		28,722			\$15.60 / EQ. METER/YR

### TOTAL SERVICE CHARGES

<u>METER SIZE (IN)</u>	<u>QUARTERLY ACCOUNTS</u>			<u>MONTHLY ACCOUNTS</u>		
	<u>METER CHARGE</u>	<u>BILLING CHARGE</u>	<u>TOTAL CHARGE</u>	<u>METER CHARGE</u>	<u>BILLING CHARGE</u>	<u>TOTAL CHARGE</u>
5/8 & 3/4	\$3.90	\$3.78	\$7.69	\$1.30	\$3.78	\$5.09
1	\$7.02	\$3.78	\$10.81	\$2.34	\$3.78	\$6.13
1 1/2	\$12.87	\$3.78	\$16.66	\$4.29	\$3.78	\$8.08
2	\$17.94	\$3.78	\$21.73	\$5.98	\$3.78	\$9.77
3	\$24.58	\$3.78	\$28.36	\$8.19	\$3.78	\$11.98
4	\$37.45	\$3.78	\$41.23	\$12.48	\$3.78	\$16.27
6	\$65.92	\$3.78	\$69.71	\$21.97	\$3.78	\$25.76
>8	\$115.47	\$3.78	\$119.25	\$38.49	\$3.78	\$42.27

## **7.0 ALLOCATION OF GENERAL WATER COSTS**

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Schedule 6 presents the allocation of the General Water Service Expenses from Schedule 3 to Base and Extra Capacity Costs. This part of the cost of service allocation follows the general guidelines in the American Water Works Manual M1 - *Water Rates*<sup>7</sup>. Under this method, costs are classified as being related to base or average demands and to extra capacity or demands in excess of average use.

For those facilities that meet extra capacity requirements, there is typically a component that also is necessary to meet average demands. Piping, for example, must be sized to provide capacity to meet peak period demands, but is also used to meet average demands. In these cases, the portion that is related to meeting average demands is allocated to the base component. The capacity required to meet peak period demands is allocated to the extra capacity component. For the most part, the allocations presented in Schedule 6 follow those used in the development of Schedule 3.

Schedule 6A, on the second following page, presents the allocation of labor costs to the base and extra capacity components.

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<sup>7</sup> The allocations to customer service and fire protection also follow these general guidelines.

**ALLOCATION OF GENERAL WATER EXPENSES TO  
BASE AND EXTRA CAPACITY**

<u>EXPENSE ITEM</u>	<u>TOTAL GEN'L WATER</u>	<u>ALLOC. SYMBOL</u>	<u>BASE %</u>	<u>AMOUNT</u>	<u>EXTRA CAPACITY %</u>	<u>AMOUNT</u>
<u>SOURCE OF SUPPLY</u>						
operations	\$0	aa	100.0%	\$0	0.0%	\$0
purchased water	\$1,626,663	aa	100.0%	\$1,626,663	0.0%	\$0
<u>PUMPING OPERATIONS</u>						
power-pumping	\$319,496	aa	100.0%	\$319,496	0.0%	\$0
labor-pumping	\$30,409	aa	100.0%	\$30,409	0.0%	\$0
pumping expense	\$2,820	aa	100.0%	\$2,820	0.0%	\$0
maint. - pumping	\$16,124	aa	100.0%	\$16,124	0.0%	\$0
diesel oil	\$900	aa	100.0%	\$900	0.0%	\$0
maint. - structure	\$7,582	aa	100.0%	\$7,582	0.0%	\$0
<u>WATER TREATMENT</u>						
chemicals	\$10,365	aa	100.0%	\$10,365	0.0%	\$0
labor	\$24,175	aa	100.0%	\$24,175	0.0%	\$0
operating	\$20,004	aa	100.0%	\$20,004	0.0%	\$0
maint. - water treat	\$5,160	aa	100.0%	\$5,160	0.0%	\$0
maint. - structure	\$111	aa	100.0%	\$111	0.0%	\$0
<u>TRANS &amp; DISTR. EXPENSE</u>						
labor	\$8,499	bb	46.6%	\$3,960	53.4%	\$4,538
supplies	\$9,198	bb	46.6%	\$4,286	53.4%	\$4,912
labor-meter	\$0	cc	0.0%	\$0	0.0%	\$0
material-meter	\$0	cc	0.0%	\$0	0.0%	\$0
cust. install.	\$0	cc	0.0%	\$0	0.0%	\$0
misc	\$2,701	ff	44.8%	\$1,209	55.2%	\$1,492
maint.- res & stdp	\$8,265	dd	0.0%	\$0	100.0%	\$8,265
maint. - mains	\$195,955	bb	46.6%	\$91,315	53.4%	\$104,640
maint. - service	\$0	cc	0.0%	\$0	0.0%	\$0
maint. - meters	\$0	cc	0.0%	\$0	0.0%	\$0
maint. - hydrants	\$362	aa	100.0%	\$362	0.0%	\$0
storage facilities	\$913	dd	0.0%	\$0	100.0%	\$913
cust. install. supplies	\$0	cc	0.0%	\$0	0.0%	\$0
<u>CUSTOMER ACCOUNT</u>						
labor- meter read	\$0	cc	0.0%	\$0	0.0%	\$0
office salaries	\$0	cc	0.0%	\$0	0.0%	\$0
office expenses	\$0	cc	0.0%	\$0	0.0%	\$0
meter read supplies	\$0	cc	0.0%	\$0	0.0%	\$0
uncollectable	\$0	cc	0.0%	\$0	0.0%	\$0
<u>ADMIN. &amp; GENERAL</u>						
salaries	\$99,961	gg	93.2%	\$93,196	6.8%	\$6,765
office supplies	\$30,259	gg	93.2%	\$28,211	6.8%	\$2,048
insurance	\$103,435	gg	93.2%	\$96,435	6.8%	\$7,000
employee benefits	\$124,587	hh	75.5%	\$94,007	24.5%	\$30,580
fee & expense	\$19,872	gg	93.2%	\$18,527	6.8%	\$1,345
maint. - plant	\$55,482	gg	93.2%	\$51,727	6.8%	\$3,755
maint. - trucks	\$55,870	gg	93.2%	\$52,089	6.8%	\$3,781
trans. construct	(\$8,935)	gg	93.2%	(\$8,330)	6.8%	(\$605)
vacation, holiday	\$45,238	hh	75.5%	\$34,135	24.5%	\$11,104
regul. exp.	\$153,762	gg	93.2%	\$143,356	6.8%	\$10,405
fisc. agent fee-dmges	\$1,660	gg	93.2%	\$1,548	6.8%	\$112
outside service	<u>\$188,953</u>	gg	93.2%	<u>\$176,166</u>	6.8%	<u>\$12,787</u>
SUBTOTAL O&M	\$3,159,847	gg	93.2%	\$2,946,012	6.8%	\$213,835
<u>FIXED CHARGES</u>						
Debt Service	\$514,170	ii	24.0%	\$123,401	76.0%	\$390,769
Capital Expenses	\$231,442	jj	93.2%	\$215,780	6.8%	\$15,662
Payroll Taxes	\$38,026	hh	75.5%	\$28,693	24.5%	\$9,333
PILOT	\$15,335	ll	50.3%	\$7,713	49.7%	\$7,621
SUBTOTAL FIXED	\$798,973			\$375,587	53.0%	\$423,386
OPERATING REVENUE	\$59,382	kk	83.9%	\$49,824	16.1%	\$9,558
TOTAL EXPENSES	\$4,018,202	kk	83.9%	\$3,371,422	16.1%	\$646,779

**ALLOCATION OF GENERAL WATER LABOR EXPENSE TO  
BASE AND EXTRA CAPACITY**

<b><u>EXPENSE ITEM</u></b>	<b><u>TOTAL GEN'L WATER</u></b>	<b><u>ALLOC. SYMBOL</u></b>	<b><u>BASE %</u></b>	<b><u>EXTRA CAPACITY AMOUNT</u></b>	<b><u>%</u></b>	<b><u>AMOUNT</u></b>
<b><u>SOURCE OF SUPPLY</u></b>						
operations	\$0	aa	100.0%	\$0	0.0%	\$0
purchased water	\$0	aa	100.0%	\$0	0.0%	\$0
<b><u>PUMPING OPERATIONS</u></b>						
power-pumping	\$0	aa	100.0%	\$0	0.0%	\$0
labor-pumping	\$30,409	aa	100.0%	\$30,409	0.0%	\$0
pumping expense	\$0	aa	100.0%	\$0	0.0%	\$0
maint. - pumping	\$6,800	aa	100.0%	\$6,800	0.0%	\$0
diesel oil	\$0	aa	100.0%	\$0	0.0%	\$0
maint. - structure	\$6,844	aa	100.0%	\$6,844	0.0%	\$0
<b><u>WATER TREATMENT</u></b>						
chemicals	\$0	aa	100.0%	\$0	0.0%	\$0
labor	\$22,518	aa	100.0%	\$22,518	0.0%	\$0
operating	\$0	aa	100.0%	\$0	0.0%	\$0
maint. - water treat	\$1,326	aa	100.0%	\$1,326	0.0%	\$0
maint. - structure	\$0	aa	100.0%	\$0	0.0%	\$0
<b><u>TRANS &amp; DISTR. EXPENSE</u></b>						
labor	\$8,498	bb	46.6%	\$3,960	53.4%	\$4,538
supplies	\$0	bb	46.6%	\$0	53.4%	\$0
labor-meter	\$0	cc	0.0%	\$0	0.0%	\$0
material-meter	\$0	cc	0.0%	\$0	0.0%	\$0
cust. install.	\$0	cc	0.0%	\$0	0.0%	\$0
misc	\$0	ff	44.8%	\$0	55.2%	\$0
maint.- res & stdp	\$7,885	dd	0.0%	\$0	100.0%	\$7,885
maint. - mains	\$139,686	bb	46.6%	\$65,094	53.4%	\$74,592
maint. - service	\$0	cc	0.0%	\$0	0.0%	\$0
maint. - meters	\$0	cc	0.0%	\$0	0.0%	\$0
maint. - hydrants	\$161	aa	100.0%	\$161	0.0%	\$0
storage facilities	\$0	dd	0.0%	\$0	100.0%	\$0
cust. install. supplies	\$0	cc	0.0%	\$0	0.0%	\$0
<b><u>CUSTOMER ACCOUNT</u></b>						
labor- meter read	\$0	cc	0.0%	\$0	0.0%	\$0
office salaries	\$0	cc	0.0%	\$0	0.0%	\$0
office expenses	\$0	cc	0.0%	\$0	0.0%	\$0
meter read supplies	\$0	cc	0.0%	\$0	0.0%	\$0
uncollectable	\$0	cc	0.0%	\$0	0.0%	\$0
<b><u>ADMIN. &amp; GENERAL</u></b>						
salaries	\$99,961	gg	93.2%	\$93,196	6.8%	\$6,765
office supplies	\$0	gg	93.2%	\$0	6.8%	\$0
insurance	\$0	gg	93.2%	\$0	6.8%	\$0
employee benefits	\$3,472	hh	75.5%	\$2,620	24.5%	\$852
fee & expense	\$0	gg	93.2%	\$0	6.8%	\$0
maint. - plant	\$44,192	gg	93.2%	\$41,202	6.8%	\$2,991
maint. - trucks	\$35,872	gg	93.2%	\$33,444	6.8%	\$2,428
trans. construct	\$0	gg	93.2%	\$0	6.8%	\$0
vacation, holiday	\$62,129	hh	75.5%	\$46,880	24.5%	\$15,249
regul. exp.	\$0	gg	93.2%	\$0	6.8%	\$0
fisc. agent fee-dmges	\$0	gg	93.2%	\$0	6.8%	\$0
outside service	\$0	gg	93.2%	\$0	6.8%	\$0
<b>SUBTOTAL O&amp;M</b>	<b>\$469,753</b>	<b>hh</b>	<b>75.5%</b>	<b>\$354,454</b>	<b>24.5%</b>	<b>\$115,300</b>

## 8.0 METERED WATER RATES

The meter water rates that result from the cost of service study are presented below. As discussed earlier, based on the testimony during Docket Number 1952 and the subsequent meetings with intervenors, the rates developed included a uniform rate per hundred cubic feet for each of three customer classes. The customer classes were determined based on the size of the customer's water meter.

<b>METERED WATER RATES</b>	
<u>Customer Class</u>	<u>Rate/100 cu ft</u>
Small: 5/8 through 2 inch meters	\$0.8782
Medium: 3 and 4 inch meters	\$0.8454
Large: 6 inch and up meters	\$0.7994

The rates that result from the cost of service study show that the rates should not vary significantly by customer class. This is an expected result, since the majority of the Authority's expenses are related to base or average use (see Schedule 6). The Authority's largest single expense is purchased water (\$1.6 million out of a total of \$4 million of general water expenses), and this expense is independent of peak demands or extra capacity requirements.

Schedule 7 on the following page, presents the allocation of base and extra capacity costs to customer classes. The average demands presented at the top of this schedule are shown in gallons per day and are derived from the uses by class presented in Schedule 2. No demand data by meter size is available for customers of the Kent County Water Authority. Such data would be very costly to develop<sup>8</sup> and would require several years of monitoring to develop accurate data that showed variations with changes in weather. For this study, we used data developed from other east coast water utilities. The extra capacity factors presented in Schedule 7 are believed to be the best available data for this study.

Using the average and extra capacity demands by each customer class, the base and extra capacity costs can be assigned to each customer class based on each class's percentage of average and extra capacity costs. This is presented in Schedule 7 as well. Based on these calculations, the total costs allocated to each class can be determined. These are:

- Small (5/8" - 2" meters): \$3,150,272
- Medium ( 3" and 4" meters): \$ 338,898
- Large (6" and up meters): \$ 529,032.

<sup>8</sup> The City of Austin, Texas is in the process of developing demand data by class that is estimated to have a cost in the range of \$1 million plus. Salem, Ohio recently installed automatic (telephone line) metering devices at a cost of \$360,000 for only 6,000 customers.

**ALLOCATION OF GENERAL WATER EXPENSES  
TO CUSTOMER CLASSES**

<b>CUSTOMER CLASS</b>	<b>AVERAGE DEMANDS</b>		<b>EXTRA CAPACITY</b>		
	<b>(GALS/DAY)</b>	<b>PERCENT</b>	<b>FACTOR</b>	<b>(GALS/DAY)</b>	<b>PERCENT</b>
Small (5/8-2" meters)	7,351,255	77.15%	3.5	25,729,391	84.93%
Medium (3&4" meters)	821,525	8.62%	2.8	2,259,193	7.46%
Large (6" & up meters)	1,356,126	14.23%	1.7	2,305,415	7.61%
Total	9,528,906	100.00%		30,293,999	100.00%

<b>CUSTOMER CLASS</b>	<b>BASE COSTS</b>		<b>EXTRA CAPACITY</b>		<b>TOTAL</b>
	<b>PERCENT</b>	<b>AMOUNT</b>	<b>PERCENT</b>	<b>AMOUNT</b>	<b>AMOUNT</b>
Small (5/8-2" meters)	77.15%	\$2,600,948	84.93%	\$549,325	\$3,150,272
Medium (3&4" meters)	8.62%	\$290,664	7.46%	\$48,234	\$338,898
Large (6" & up meters)	14.23%	\$479,811	7.61%	\$49,221	\$529,032
Total	100.00%	\$3,371,422	100.00%	\$646,779	\$4,018,202



Schedule 8 presents the calculation of the metered rates presented earlier. For each class of customer, the costs that were allocated to the class are divided by the metered water use of that class.

Schedule 8			
<u>Metered Water Rate Calculation</u>			
<u>Small (5/8-2" meters)</u>			
Total Expense	\$3,150,272		
----- =	----- =		<u>\$0.8782 /HCF</u>
Metered Sales (HCF)	3,587,176		
<u>Medium (3&amp;4" meters)</u>			
Total Expense	\$338,898		
----- =	----- =		<u>\$0.8454 /HCF</u>
Metered Sales (HCF)	400,878		
<u>Large (6" &amp; up meters)</u>			
Total Expense	\$529,032		
----- =	----- =		<u>\$0.7994 /HCF</u>
Metered Sales (HCF)	661,746		

## 9.0 IMPACTS

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### 9.1. Customer Impacts

As with any change in rate structure, there will be various impacts on different customers. The Authority's current declining block rate schedule results in lower overall rates (cost per hundred cubic feet) for larger volume customers that purchase water at the less expensive rate blocks.

The shift to uniform rates by customer class will lower the charges to the residential class because the rates developed from the cost of service study are much closer than the current set of declining block rates -- the cost to serve smaller volume customers is less than those recovered under the current rates. Shifting to uniform rates for each customer class will tend to increase costs for larger volume users within a class and lower costs for smaller volume users within a class.

Under Docket Number 1952, the Authority proposed substantial increases in the public fire protection charges. As discussed earlier, witnesses for the fire districts disagreed with the allocation of certain cost components that were used to derive the rates in that docket. Even with those changes to the allocations, the public fire protection charges increase under the cost of service study.

Schedule 9 presents the impact of the rates developed in this cost service study. The current rates are those approved by the Commission in Dockets No. 1952 and 2034. The charges under the rates listed as "COS" are those developed in this study. Because both sets of rates are based on the same revenue requirements, this schedule presents the impact of the change in rate structure only.

Schedule 10 presents the current and the cost of service based rates. The percent change in the rates is also presented, where applicable. The final page presents a graph showing annual water bills for a residential customer using 10,000 cubic feet of water per year.<sup>9</sup> Even with the recent increases in the Authority's rates, they remain one of the lowest in Rhode Island.

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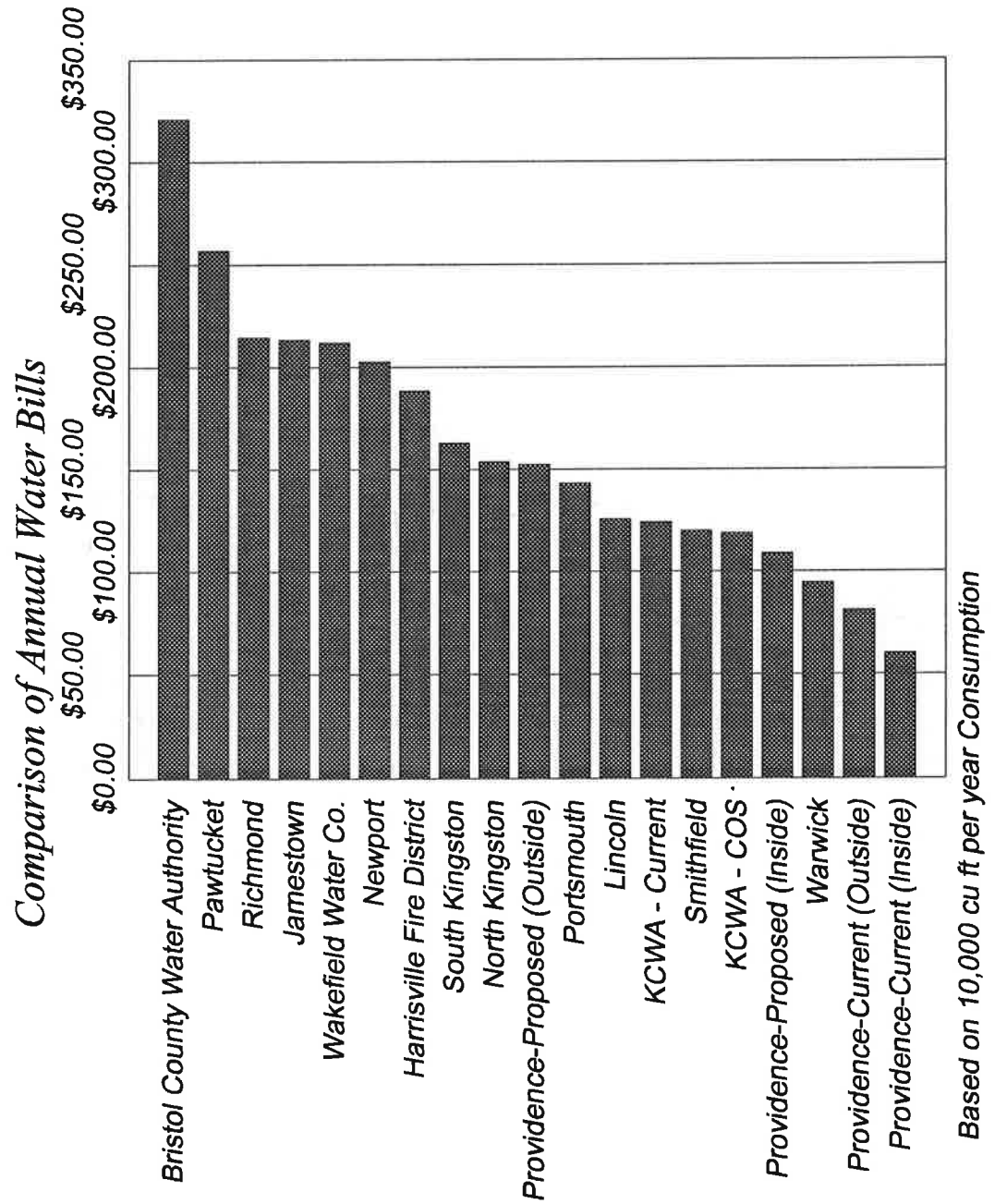
<sup>9</sup> Based on a survey conducted in late 1991. The rates labeled proposed for Providence represent those contained in their April 1992 filing to the PUC.

## IMPACT OF PROPOSED RATES

		<---QUARTERLY BILL--->				
	MTR SIZE	QUARTERLY USE - CU FT	CURRENT RATES	COS RATES	\$ INCREASE	% INCREASE
<u>Small</u>						
	5/8	2,000	\$26.02	\$25.25	(\$0.77)	-2.94%
	5/8	4,000	\$46.08	\$42.82	(\$3.26)	-7.08%
	5/8	6,000	\$66.14	\$60.38	(\$5.76)	-8.71%
	5/8	6,666	\$72.82	\$66.23	(\$6.59)	-9.05%
	5/8	8,000	\$86.20	\$77.95	(\$8.25)	-9.58%
	5/8	10,000	\$106.26	\$95.51	(\$10.75)	-10.12%
	5/8	12,000	\$126.32	\$113.07	(\$13.25)	-10.49%
	5/8	14,000	\$146.38	\$130.64	(\$15.74)	-10.75%
	5/8	15,000	\$156.41	\$139.42	(\$16.99)	-10.86%
	5/8	20,000	\$206.56	\$183.33	(\$23.23)	-11.25%
	5/8	25,000	\$256.71	\$227.24	(\$29.47)	-11.48%
	1	30,000	\$308.76	\$274.27	(\$34.49)	-11.17%
	1	35,000	\$358.91	\$318.18	(\$40.73)	-11.35%
	1	40,000	\$409.06	\$362.09	(\$46.97)	-11.48%
	1	46,666	\$475.92	\$420.63	(\$55.29)	-11.62%
	1	75,000	\$760.11	\$669.46	(\$90.65)	-11.93%
	2	100,000	\$1,018.47	\$899.93	(\$118.54)	-11.64%
	2	200,000	\$1,758.47	\$1,778.14	\$19.67	1.12%
	2	300,000	\$2,498.47	\$2,656.34	\$157.87	6.32%
	2	400,000	\$3,070.47	\$3,534.55	\$464.08	15.11%
	2	600,000	\$4,046.47	\$5,290.95	\$1,244.48	30.75%
<u>Medium</u>						
	3	200,000	\$1,763.09	\$1,719.14	(\$43.95)	-2.49%
	3	400,000	\$3,075.09	\$3,409.92	\$334.83	10.89%
	3	600,000	\$4,051.09	\$5,100.69	\$1,049.61	25.91%
	4	800,000	\$5,036.06	\$6,804.34	\$1,768.28	35.11%
	4	1,000,000	\$6,012.06	\$8,495.12	\$2,483.06	41.30%
	4	1,200,000	\$6,988.06	\$10,185.90	\$3,197.84	45.76%
<u>Large</u>						
	6	400,000	\$3,103.90	\$3,267.50	\$163.60	5.27%
	6	800,000	\$5,055.90	\$6,465.30	\$1,409.40	27.88%
	6	1,200,000	\$7,007.90	\$9,663.09	\$2,655.19	37.89%
	6	1,333,333	\$7,658.56	\$10,729.02	\$3,070.46	40.09%
	8	2,000,000	\$10,946.42	\$16,108.22	\$5,161.80	47.16%
	8	5,000,000	\$25,586.42	\$40,091.67	\$14,505.25	56.69%
	8	10,000,000	\$49,986.42	\$80,064.09	\$30,077.67	60.17%
	8	24,000,000	\$118,306.42	\$191,986.87	\$73,680.45	62.28%
Municipal Fire Service		300 hydrants	\$7,907.97	\$12,018.78	\$4,110.81	51.98%
Private Fire Service		8 Inch Service	\$106.14	\$89.14	(\$17.00)	-16.02%

## COMPARISON OF CURRENT AND COS RATES

<u>Metered Rates</u>		<u>Current</u>	<u>COS</u>	<u>% Change</u>
<u>Metered Rates</u>				
Quarterly	First 100,000	\$1.003	<u>Small</u>	
	Next 233,333	\$0.740	\$0.8782	
	Over 333,333	\$0.488		
Monthly			<u>Medium</u>	
	First 33,333	\$1.003	\$0.8454	
	Next 77,778	\$0.740		
	Over 111,111	\$0.488	<u>Large</u>	
			\$0.7994	
<u>Service Charges</u>				
Quarterly	5/8 & 3/4	\$5.96	\$7.69	29.03%
	1	\$7.86	\$10.81	37.53%
	1 1/2	\$11.94	\$16.66	39.53%
	2	\$15.47	\$21.73	40.47%
	3	\$20.09	\$28.36	41.16%
	4	\$29.06	\$41.23	41.88%
	6	\$48.90	\$69.71	42.56%
	8 & up	\$83.42	\$119.25	42.95%
Monthly	5/8 & 3/4	\$3.97	\$5.09	28.21%
	1	\$4.60	\$6.13	33.26%
	1 1/2	\$5.96	\$8.08	35.57%
	2	\$7.14	\$9.77	36.83%
	3	\$8.68	\$11.98	38.02%
	4	\$11.67	\$16.27	39.42%
	6	\$18.28	\$25.76	40.92%
	8 & up	\$29.79	\$42.27	41.89%
<u>Fire Service</u>				
Public	/hydrant	\$26.35	\$40.05	51.99%
	/bill	\$2.97	\$3.78	27.27%
Private				
	4 in	\$73.21	\$17.57	-75.99%
	6 in	\$92.97	\$43.84	-52.85%
	8 in	\$106.14	\$89.14	-16.02%
	10 in	\$132.50	\$157.28	18.71%
	12 in	\$145.67	\$251.73	72.81%
	hydrant	\$27.09	\$43.84	61.81%



**Allocation Symbols - General Water, Fire & Customer Service**

ALLOCATION SYMBOL	GEN'L WATER %	FIRE SERVICE %	CUST SERVICE %	
A	99.50%	0.50%	0.00%	100.00% Supply, Treatment & Pumping
B	80.60%	19.40%	0.00%	100.00% T&D Mains
C	0.00%	0.00%	100.00%	100.00% Meters
D	75.00%	25.00%	0.00%	100.00% Storage
E	0.50%	99.50%	0.00%	100.00% Hydrants
F	36.18%	20.52%	43.30%	100.00% Misc T&D
G	77.15%	5.34%	17.51%	100.00% All O&M
H	56.17%	10.50%	33.33%	100.00% Labor
I	79.84%	20.16%	0.00%	100.00% Debt
J	77.15%	5.34%	17.51%	100.00% Capital Expense (All O&M)
K	77.22%	7.30%	15.48%	100.00% Total Expense
L	80.08%	14.10%	5.82%	100.00% PILOT

<u>Symbol B</u>	<u>Gal/Min</u>	<u>%</u>
Maximum Day	14,544	80.60%
Fire Demand	3,500	19.40%
Max. Day Plus Fire	18,044	100.00%

Symbol L - PILOT from 1990 study

	Total	Symbol	Gen Water	Fire	Cust A	Cust B
Storage	\$8,334	D	\$6,251	\$2,084	\$0	\$0
Office	\$6,364	G	\$4,910	\$340	\$557	\$557
PS/Wells	\$3,107	A	\$3,091	\$16	\$0	\$0
Mains	\$1,344	B	\$1,083	\$261	\$0	\$0
Total	\$19,149		\$15,335	\$2,700	\$557	\$557
Percent			80.08%	14.10%	2.91%	2.91%

Symbol J - Capital Expenses

Same as G -- for minor capital improvements of general nature.

Symbol I - Debt Service

From 1990 Study of Debt Service

## Allocation Symbols - Customer Service Expenses

<u>ALLOCATION SYMBOL</u>	<u>CUSTOM METER</u>	<u>CUSTOM BILL</u>	<u>TOTAL</u>
AA	100.00%	0.00%	100.00% Meters
BB	0.00%	100.00%	100.00% Billing
CC	56.06%	43.94%	100.00% O&M
DD	42.30%	57.70%	100.00% Labor
EE	55.64%	44.36%	100.00% All Expenses

## Allocation Symbols - General Water Expenses

<u>ALLOCATION SYMBOL</u>	<u>BASE %</u>	<u>EXTRA CAPACITY %</u>	<u>TOTAL</u>
aa	100.00%	0.00%	100.00% Supply, Pumping & Treatment
bb	46.60%	53.40%	100.00% T&D Mains
cc	0.00%	0.00%	0.00% Meters
dd	0.00%	100.00%	100.00% Storage
ee	0.00%	0.00%	0.00% Not Used
ff	44.77%	55.23%	100.00% Misc. T&D
gg	93.23%	6.77%	100.00% All O&M
hh	75.46%	24.54%	100.00% Labor
ii	24.00%	76.00%	100.00% Debt Service
jj	93.23%	6.77%	100.00% Capital Expense (All O&M)
kk	83.90%	16.10%	100.00% All Expenses
ll	50.30%	49.70%	100.00% PILOT

### Symbol bb

	<u>Gal/Min</u>	<u>%</u>
Average Day	6,772	46.56%
Max Day Increment	7,772	53.44%
Maximum Day	14,544	100.00%

### Symbol ii

<u>Item</u>	<u>Amount</u>	<u>Symbol</u>	<u>BASE</u>	<u>EXTRA CAPACITY</u>
Storage	\$6,184	dd	\$0	\$6,184
PS & Wells	\$1,404	aa	\$1,404	\$0
Mains	\$1,855	bb	\$864	\$991
Total	\$9,443		\$2,268	\$7,175
Percent			24.0%	76.0%

### Symbol ll

<u>Item</u>	<u>Amount</u>	<u>Symbol</u>	<u>BASE</u>	<u>EXTRA CAPACITY</u>
Storage	\$6,251	dd	\$0	\$6,251
Office	\$4,910	kk	\$4,119	\$790
PS/Wells	\$3,091	aa	\$3,091	\$0
Mains	\$1,083	bb	\$505	\$578
Total	\$15,335		\$7,716	\$7,619
Percent			50.3%	49.7%