APPENDIX B

SUMMARY OF RESPONSES TO THE PUBLIC SERVICE COMMISSION'S ORDER OF DECEMBER 22, 2000

Question 1. Does the water utility provide fire protection service?	
Yes	72
No	33
To fill trucks only	15

Question 2. For each calendar year since 1995, state the amount of water (in gallons) used for fire protection or fire fighting services and the percentage of the utility's total water production that this use represents.

Question 3. For each calendar year since 1995, state the cost of water used for fire protection or fire fighting services in total dollars.

The following table provides a breakdown of responses received according to the averages of each utility for the 1995 through 1999 period. Several utilities were unable to provide the data.

Gallons		Dollars	
More than 5 Million	2	More than 50,000	1
1,000,001 to 5 Million	10	10,001 to 50,000	1
500,001 to 1 Million	5	5,001 to 10,000	3
300,001 to 500,000	2	3,001 to 5,000	3
200,001 to 300,000	6	2,001 to 3,000	1
100,001 to 200,000	15	1,001 to 2,000	5
50,001 to 100,000	10	501 to 1,000	14
10,001 to 50,000	14	101 to 500	25
Less than 10,000	0	Less than 100	20

Question 4. Describe the types of facilities (e.g., fire hydrants) that are designated for public fire protection.	
Hydrants	78
None	34
Flush hydrants	29
Hydrants, 4" and larger mains, pumping stations, control valves and tanks	3
Outlets	

Question 5.a. How many public fire hydrants are connected to the water utility's distribution mains?	
0	49
1 - 50	26
51 - 100	13
101 - 200	9
201 - 300	9
301 - 400	7
401 - 500	2
615	
1304	
3163	
6090	
7882	

Question 5.b. How many private fire hydrants are connected to the water utility's distribution mains?	
0	98
1 - 10	10
11 - 20	3
21 - 50	4
45	
70	
87	
304	
639	

Question 5.c. How many private sprinkler systems are connected to the water utility's distribution system?	
None	52
1	18
2	5
3	4
4	8
5	5
6 - 10	7
12 - 20	5
25 - 30	5
31 - 50	2
54	
73	
200	
229	
243	
325	
553	
621	
1,138	
Unknown	

Question 6. a. How does the water utility measure the amount of water provided to a private fire hydrant?	
Not applicable	87
Estimated	20
Metered	11
Most metered; a few not metered	2
Question 6. b. How does the water utility measure the amount of water provided to a private sprinkler system?	
Not applicable	63
Metered	29
Estimated	26
Charge by square foot of building	
Metered if installed after 1997	
Question 6. c. How does the water utility measure the amount of water provided to a municipal, county, fire district and volunteer fire departments through public fire hydrants?	
Estimated by fire department	82
Not applicable	38
Metered	4
Hydrant testing equipment	
Not measured - not billed	
Unknown	
Unplanned use is estimated, planned use is metered	
17 of the respondents stated that they are unable to obtain reports from the fire departments.	

Question 7. a. If private sprinkler systems are connected to the water utility's distribution system, is their water usage metered?	
Not applicable	50
No	36
Yes	28
Some are metered	6
Question 7. b. If their water usage is metered, what type of metering device or arrangement is used?	
Not applicable	82
Water meter	33
Fire line meter	4
Meter sized for proper flow of sprinkler system	

Question 8. a. (1) What is the rate that the water utility assesses for water service to public fire hydrants?	
No charge	69
Not applicable	33
Usage in excess of 4 hours billed to property owner	4
$4.17 per month	2
3.33 per month	2
23.96 per month	3
3.00 per month	
10.41 per month	
12.00 per month	
60.00 per month	
0.50 per 1,000 gallons	
0.52 per 1,000 gallons	
1.31 per 1,000 gallons	

Question 8. a. (2) What is the rate that the water utility assesses for water service to private fire hydrants?	
Not applicable	90
Normal rate depending on meter size	10
$4.17 per month	12
12.00 per month	3
15.00 per month	2
7.50 per month	
10.45 per month	
35.96 per month	

Question 8. a. (3) What is the rate the water utility assesses for water service to private sprinkler systems?	
Not applicable	53
Based on meter size	29
No charge	27
$15 per month	2
$25 per month	
$32 per month	
$10.45 per month	
$10 per month	
$5.16 per 1,000 gallons	
.0015 per square foot of building space per month	
3" - $20, 4" - $25, 6" - $30, 8" - $40	
6" - $41, 8" - $58, 10" - $74, 12" - $90	
2" - $4, 4" - $16, 6" - $35.96, 8" - $63.92, 10" - $99.88, 12" - $143.85, 14" - $195.82, 16" - $255.70	
Rates were established as part of a cost of service study. The costs were allocated based on considerations of quantity of water consumed, variability of rate of flow, and costs associated with metering, billing and accounting. The allocation study was based on recognized procedures for allocating the several categories of costs to customer classifications in proportion to each classification's use of the facilities, commodities and services which entail the total cost of providing service. Fire protection costs are associated with providing the facilities to meet the potential peak demand of fire protection service. Fire protection costs are subdivided between public and private. Operating and capital costs for hydrants were allocated directly to the public fire protection classification. The extra capacity costs assigned to fire protection service were allocated to private and public fire protection on the basis of total relative demands of the hydrants and fire service lines.	

Question 8. b. If any of the rates listed in response to Item 8 (a) are the result of special contracts, provide a copy of each special contract.	
Not applicable	118
Reserve the right to enter into special agreements	2

Question 8. c. Explain how each rate listed in response to Item 8 (a) was derived. State all assumptions that were used to derive the rate.	
Not applicable	85
PSC approved the rate	21
Based on meter size	3
Maintenance, inspecting, testing and replacing	2
Cost of service study	4
Unable to determine	2
Wholesale rate	
Special Contract	1
The most significant cost to be recovered for fire protection services are water capacity costs and not the cost of water used. The capacity costs should be recovered by means of an annual ready to serve charge for each public hydrant. A ready to serve charge would be inclusive, so that there would be no additional charge for water usage or for maintenance of public fire hydrants. It would be appropriate to impose some reasonable time limits on the amount of water used for fire hydrant testing and training purposes.	

Question 9. List and describe each incident since 1985 where the utility provided unusually large amounts of water to a fire department for fire fighting purposes. For purposes of this question, "unusually large amounts of water" means that the water utility provided water at fire flow rates (250 gallons of water per minute) for greater than four consecutive hours. For each incident, state the effect that the provision of such service had on the utility's financial condition and on the quality of service provided to its customers.	
None	106
Information not furnished by fire departments	4
Lowered water pressure	2
Occasional low pressure due to fires	
One incident caused tank to drain	
1999 Farm Fire, 484,300 gallons used, received $860.28 for water used, this is the only time we received compensation, no effect on pressure.	
1997 Abandoned apartment building, no money was received for water used, water pressure was lowered for some customers.	
School used 150,000 at a cost of $180, occurred when demand was low so no impact on pressure. Tire dump used 170,000, cabinet shop used 150,000 and Clifford house used 60,000. Not a significant impact on finances but caused low pressure for a few hours.	
None - however, one customer used a private fire system to fill and maintain a large lake. Customer used over 13,000,000 from June to October 2000. Was metered and customer had to pay.	
1994 commercial landfill site, fire department used 15,780,000 gallons then in 1999 2,797,336 was used. Lost revenue was $19,111. City refused to pay and property owner refused since he paid city taxes. District took loss.	
Claudia Sanders dinner house in 1999, 500,000 gallons was used - no major impact on financial condition of utility.	

Question 10. How much water storage capacity, in the water utility's opinion, must be reserved to support the use of fire hydrants?		
Question 11. How much water storage capacity, in the water utility's opinion, must be reserved to support the use of private sprinkler systems?	Capacity for Hydrants	Capacity for Sprinklers
Not applicable or no opinion	57	57
1,000 - 50,000	12	11
51,000 - 150,000	5	3
151,000 - 400,000	2	2
401,000 - 1,000,000	2	2
1,000,000+	2	2
1% - 25%	5	4
26% - 50%	2	1
51% - 75%	1	1
500 gpm		1
Rely on PSC regulations		
3 respondents stated that it depends on contractual arrangements for sprinkler systems.		
Rely on supplier		

4 Respondents stated in part that the volume of water reserved in a storage tank for fire hydrants is related to two factors. Total volume of water needed to suppress a particular fire which varies with the required flow rate and duration. Typical flow rates are 250 gpm in a rural residential area to 2,500 gpm in an industrial park. Depending on location and type of development the volume reserved varies from 30,000 to 300,000 gallons. The second factor relates to the capacity of the tank that must be reserved to maintain a water level which provides acceptable water pressure at the hydrants. The normal operating ranges in our tanks are typically above the levels of 60-80% of capacity so that the appropriate pressure will be available thoughout the duration of the fire.
One utility recommended that the Commission regulation requiring 250 gallons per minute for a period of not less than two hours plus "consumption at the maximum daily rate" be revised to state "consumption at the average daily rate for the utility" which would require adequate storage capacity
Because a large sprinkler system may require more water capacity than a fire hydrant, the regulation setting forth water capacity requirements should also address water capacity requirements for sprinkler systems. The private sprinkler demand requirement would be the gallons per minute rating of the largest sprinkler system, measured for a fixed period of time generally considered appropriate for a sprinkler system to effectively control a fire in most circumstances.
If the system is designed to provide fire service, storage capacity should, at a minimum, provide for the maximum Insurance Services Office requirement for the area served. This varies depending on the type of customer and fire protection available. The ISO requires 8,000 gpm for four hours in parts of Lexington to maintain its "2" rating, so KAWC provides that level of storage in its main service area and 3,500 gpm for three hours in its northern service area, which includes Scott County. Some of KAWC's largest customers provide their own water storage capacity for fire protection privately. The amount of fire protection storage is in addition to storage for "equalization" on peak days and storage to provide at least 50% of the average day demand for emergencies.

In the Matter of:

INVESTIGATION INTO FEES FOR FIRE PROTECTION SERVICES	)	ADMINISTRATIVE Case No. 2000-385

Item 10: How much water storage capacity, in the water utility's opinion, must be reserved to support the use of fire hydrants?

Response: Based on the fire flow and duration requirements set forth in Administrative Regulation 807 KAR 5:066, Section 10 (a) and (b), the minimum storage requirement for fire protection would be 30,000 gallons. The fire chief for the City of Berea feels that 250 gallons per minute is not an acceptable minimum fire flow. He requests a minimum of 500 gallon per minute, which would equate to a minimum storage of 60,000 gallons for fire protection.

AWWA's M31 manual, Distribution System Requirements for fire Protection, page 12, Fire Flow Limits – Nonsprinklered Buildings, (refer to Page 2 of 3 and Page 3 of 3) states 'If the public water supply as to be used for fire suppression and a sprinkler system is not available, the supply available at a given point in the system must be no less than 500 gpm at residual pressure of 20 psi.

Berea is of the opinion that 60,000 gallons (500 gpm for a duration of two (2) hours) is the minimum storage requirements for fire protection. A systems total storage capacity should meet the systems peak daily and hourly demands plus maintain the minimum storage for fire protection.

Respondent: Mike Bethurem

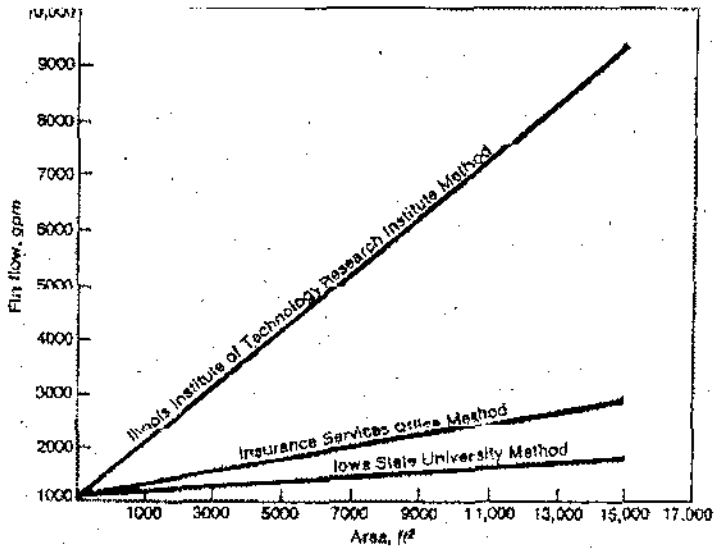

Figure 1-5 Fire flows versus area.

The IITRI method consistently yields the highest fire flow requirement. Generally, the ISO and ISU methods parallel one another, with the ISO method being somewhat, but not significantly, higher. This arises from a number of probable causes. First, the ISO method deals not only with the building presumed to be involved but also considers the need to protect the exposure buildings. In addition, ISO factors into its calculations the status of the fire department equipment and personnel experience, along with other variables. The ISU method is a somewhat stylized approach. This method envisions that the water being supplied to fight a fire is applied in a theoretically ideal manner so as to obtain maximum effectiveness. Clearly this is not always an achievable situation.

PRACTICAL LIMITS ON FIRE FLOW

The suppression of fires using an engine or hose company from a local fire department, which draws large amounts of water from the public water supply system, is not the preferred method of fire suppression. In many cases, an automatic fire suppression system, such as a sprinkler, or a chemical system in combination with an alarm system is more effective. In fact, a building developer who properly designs and installs a fire suppression system can do far more to protect life and property than a fire company can do with any amount of water delivered through the standard hose system. However, water from the public distribution system remains an important part of any fire suppression system.

Fire Flow Limits—Nonsprinklered Buildings

If the public water supply is to be used for fire suppression and a sprinkler system is not available, the supply available at a given point in the system must be no less than 500 gpm at a residual pressure of 20 psi. This represents the amount of water required to provide for two standard hose streams on a given fire. In the judgment of many professionals, this is the minimum amount of water with which any fire can be

controlled and suppressed safely and effectively. Above that minimum, it is recommended that at any given point in the water distribution system the system be able to provide the required design flow, as discussed earlier or by using techniques adopted by responsible authorities. Generally, the ISO method is most likely to yield realistic requirements.

In a nonsprinklered building, a minimum of 500 gpm should be provided in any area of the city. This is a community decision to be made by the community's governing body. If the water distribution system is serviced by a private corporation, some arrangement should be made by the governing body with that supplier to provide the required degree of protection.

Fire Flow Limits—Sprinklered Buildings

The required fire flows determined using the ISO method are for nonsprinklered buildings, not for sprinklered buildings. The governing body of a community, in recognition of the value and effectiveness of automatic sprinklers, may extend a 100 percent (or less) credit* for all buildings within an area that are completely sprinklered. The upper limit that most municipal and private water companies should anticipate providing for fire flow is 3500 gpm; facilities requiring greater than 3500 gpm are individually evaluated. This is the same number that is used by the insurance rating services. In determining the public protection classification for the purpose of setting fire rates in municipalities, the ISO procedure does not consider any major structure having a required fire flow in excess of 3500 gpm.

Exceptions to Fire Flow Limits

There are some exceptions to the required fire flow. For example, if a community has a large concentration of housing units with required fire flows not in excess of 1500 gpm and only one or two properties require an increased level of flow (3500 gpm), it would not make good economic sense to provide 3500 gpm to the one or two isolated properties. The community's governing body would be advised to simply develop ordinances and regulations that would require those isolated properties to provide for their own private fire protection, to reduce the fire flow requirement by going to full sprinkling, or to provide on-site storage and pumping capabilities to meet their own particular fire suppression needs.

There could be circumstances in which a community might arrange to deliver the upper limits of a required fire flow to an isolated building. For example, a single, large, high-hazard mercantile establishment, which provides most of the jobs in the community and produces most of the tax revenue in the community, may receive the required fire flow from the community. By working with the building owner, adequate fire suppression could be provided. This might be achieved through sprinklers or some other means.

NONPOTABLE WATER SOURCES FOR FIRE FIGHTING

There is an abundance of nonpotable water sources that may be used as the primary or backup supply for fire protection. These sources may be divided into two major

*A 100 percent credit exists when no required fire flow is considered, based on building type or configuration. The required fire flow would instead be determined solely from the requirement for the sprinklers plus a hose stream allowance.

In the Matter of:

INVESTIGATION INTO FEES FOR FIRE PROTECTION SERVICES	))	ADMINISTRATIVE Case No. 2000-385

Item 11: How much water storage capacity, in the water utility's opinion, must be reserved to support the use of private sprinkler systems?

Response: AWWA's M31 manual, Distribution System Requirements for fire Protection, page 39, Water Supply Requirements for Sprinkled Properties, (refer to Page 2 of 2) states 'The range of the sprinkler requirements will very from 150 to 1,600 gpm. These flows will be dependent on the classification of hazard, whether the system is hydraulically designed or is pipe scheduled, the type of material being stored and the storage configuration, as well as other factors." Based on this the storage requirements could be less or more than required for a nonsprinkled building.

Berea is of the opinion that 60,000 gallons (500 gpm for a duration of two (2) hours) is the minimum storage requirements for fire protection regardless of whether the system contains building that have sprinkler systems. 60,000 gallons would represent the minimum potential fire flow demand at any giving time, for a system will always have nonsprinked buildings. Berea is also of the opinion that the customer, not the utility, should address sprinkled fire protection requirements above 500 gpm. This may require the customers to build their own standpipe/elevated tank or to contract with the utility to build the additional storage facilities.

Respondent: Mike Bethurem

fire department was rated as class 1, but the water department was rated only as class 3.

The codes and ordinances adopted as part of the new plan included a dangerous building ordinance, which gave the fire marshal authority to condemn property deemed unsafe, unsanitary, or dangerous. Owners of property that was condemned had the choice of selling their buildings to an urban renewal agency or renovating the buildings to code standards, which included mandatory automatic sprinkler systems. All new construction required complete sprinkler systems, under the Federal Urban Renewal Agency Agreement with the city.

In 1955, Fresno covered 21 mi^2, with a population of 115,000. The fire department maintained 68 fire fighters on duty. In 1977, after full implementation of the master plan, the corporate limits of Fresno covered 58 mi^2, with a population of 184,500. In 1977, 95 percent of all buildings in the urban renewal area were completely fitted with sprinklers. This area alone covered about 40 square blocks of non-residential property. As a result of the credits then allowed, the fire department budget was reduced to 7.9 percent of the total municipal budget. Only 68 fire fighters were still maintained on duty in any given 24-h period. Fire losses were reduced by 22 percent, and the fire department maintained a class 1 rating.

The savings realized in fire department operation contributed to more efficient distribution of funds under the total municipal budget, and the water department classification rating was changed from 3 to 1. As a result, Fresno was rerated from class 3 to class 2 municipal rating.

WATER SUPPLY REQUIREMENTS FOR SPRINKLERED PROPERTIES

Under the ISO Fire Suppression Rating Schedule,[3] required fire flow represents a developed flow based on calculations involving only unsprinklered buildings within an area. In recognition of the value and effectiveness of automatic sprinklers, the required fire flow, in effect, extends a 100 percent credit for all buildings within the area that are completely fitted with sprinklers. The same procedure might be applied where the fire flow requirement is developed by a different system. The highest required fire flow for sprinklered or unsprinklered property in an area should be delivered at no less than 20 psi anywhere in the system.

Required fire flow for sprinklered properties consists of the flow required for sprinklers, including a hose-stream allowance of 500 gpm, whichever is greater. The range of the sprinkler requirement will vary from 150 to 1600 gpm. These flows will be dependent on the classification of hazard, whether the system is hydraulically designed or is pipe scheduled, the type of materials being stored, and the storage configuration, as well as other factors.

Design Curves

Figure 5-1 shows the design curves used to determine the density required for various hazard classifications. Density is defined as the flow required, in gallons per minute per square foot, to be discharged over a selected area of operation. For example, if the density required is 0.10 gpm/ft^2 and it is applied to an area of operation of 1500 ft^2, the minimum system demand, excluding hose streams, will be 150 gpm. These design curves indicate a range of basic system demands from 150 gpm for minimum light hazard to 1600 gpm for extra hazard.

The system demands developed from these curves must be increased, however, to allow for two additional factors. To compensate for friction loss in the piping

Question 12. What is the minimum size for a water main to which a fire hydrant should be connected?	
6"	77
No opinion or unknown	13
4"	11
8"	6
Size needed to maintain flow rate and pressure	4
10"	3
PSC regs	3
2"	2
8" unless near dead end then 6"	1

Question 13. What is the minimum size for a water main to which a private sprinkler system should be connected?	
No opinion or unknown	40
6"	38
Case by case basis depending on pressure, flow rating, storage and capacity	13
4"	11
8"	5
Determined by engineer	4
2"	4
3"	3
3/4 to 1"	2

Question 14. A. If the water utility requires or uses a meter to measure the water usage of a private fire protection system, (1) For each meter size that the water utility uses with a private fire protection system, (a) state the average cost of installation of a private fire protection system and (b) provide a breakdown of the average cost of installation by major cost components.	
$250 C&G wet tap, 342 valve, 364 labor, 270 sleeve, 24 box	$1,250
4 respondents stated:	
4" Meter assembly $4,500, vault 3,000, and piping 2,700	10,200
6" Meter assembly $7,500, vault 3,200, and piping 2,900	13,600
8" Meter assembly $9,700, vault 3,400, and piping 3,300	16,400
10" Meter assembly $13,850, vault 3,600, and piping 4,000	21,450
1" Parts $400, overhead 300 (2 respondents)	700
1.5" Parts $800, overhead 400 (2 respondents)	1,200
2" Parts $3,000, overhead 700 (2 respondents)	3,700
3" Parts $4,100, overhead 900 (2 respondents)	5,000
6" Labor $1,412, parts 16,829	18,241
4.5" hydrant, $755, valve 342, labor 700, misc. 200, wet tap 250	2,247
Hydrant 1,100, valve 200, wet tap 1,200	2,500
Average cost to extend fire service line to customer's property $986	
Wet tap sleeve $216, valve 328, equip. and labor 423, misc. 19	

Size Installed	# Installed	Cost Incurred each	
2"	1	$6582	
4"	14	5725	
6"	20	7655	
8"	4	5830	
12"	1	5134	
Contactor Costs vary on the location and the conditions of the installation, for example, 1 installation in downtown Lexington during 2000 for a 6" fire service required a road bore cost of $22,820 in addtion to the cost of the hydrant.			
$1800 Material, $600 Labor & Equipment			$2,400
$1000 Tap on Fee, $475 Meter, $250 Meter Box			$1,725

Question 14. A. (2). State the average monthly usage of private fire protection systems.	
Not applicable	75
Metered with regular water usage	12
5667	
12,300	
118,800	
1,588,878	

Question 14.a.(3). Identify the actions that the water utility must take to operate and maintain a private fire protection system. For each action listed state the annual cost to the water utility to perform.	
Do not maintain	104
Cost is dependent on the potential fire fighting demands ranging from 250 to 2,500 gpm. Backup facilities constitute a larger share of the costs than direct costs such as fire meter assemblies.	3
If private fire protection systems were allowed to connect without meters costs incurred would include the unauthorized use of water, leaks on private lines, no recovery of water costs, no recovery of the cost of construction and financing on the system designated to provide the protection, higher costs for leak detection and all water accountability tasks. Commercial and industrial customers have in the past made improper connections to private fire protection systems in order to fill lakes, water lawns, and other purposes.	3
Check for leaks, replace hydrants (2 respondents0	$100
Inspections and repairs	$1,246
Leak check, lubricate, paint and repair	$25
Larger tanks, and increases in line size	
Inspection, meter reading, pressure testing	$60
The American Water Works Manual M1 recognizes that utilities providing private fire protection incur significant "standby" costs and provides methods for including the costs of operating and maintaining the facilities needed to provide an adequate water supply in the event of a fire. Cost of private fire protection service must include the appropriately allocated share of backup facilities such as transmission and distribution mains, storage facilities, and pumps. According to the AWWA, these backup facilities normally constitute a much larger share of the cost of providing private fire protection service than the direct costs related to private fire protection service such as fire-meter assemblies.	3

If the water district is required to maintain a certain level of water in its storage tanks, then the size of the tanks would need to be large enough to take care of the domestic use, plus an ample amount of reserve. Also, the treatment plant operator could possibly be scheduled for longer days in order to treat the water when needed if there is not enough storage in the clearwell.	
If the customer is required to design his service so that they can accept the pressure and volume that the water district can supply, then there is not a cost to the water district. Maintenance to fire hydrants is another point of disagreement between fire departments and the water district. In our case, the fire hydrants are installed by fire departments, developers, private individuals for use for gravity filling fire trucks only. We do not have he money for the repair and maintenance of these hydrants. We thought that since the fire departments were saving time and money, that the maintenance should be paid by them using money collected from their fire dues. However, if it becomes necessary for he water district to do the repair and maintenance then the district should be able to charge by some means to recover the cost. Most of the repair to hydrants would not be necessary if the hydrants were operated properly.	
No direct Cost to the utility, the KY Motor Speedway assumes all costs related to the operation and maintenance of the installed fire sprinkler system	

Question 14(b) If the water utility does not require or use a meter to measure the water usage of a private fire protection system, (1) For each meter size that the water utility uses with a private fire protection system, (a) State the average cost of installation of a private fire protection system, (b) Provide a breakdown of the average cost of installation by major cost components.	
Installation paid for by applicant	13
Cost of meter	5
2 respondents stated: Valve - $260, equipment - 220, hydrant - 800, labor - 220	1,500
$800 parts, 700 for labor	1,500
$755 hydrant, 300 valve, 160 backhoe, 300 labor, 200 misc.	1,710
$755 hydrant, 342 valve, 250 wet tap, 100 labor, 200 misc.	2,247
$150 saddle, 550 hydrant, valve 175, box 39, engineering 750 and 500 to tap outside service	2,500
Hydrants, joints and valve	3,000
Competitively bid	
Ranges from $22,800 (road bore) to $4,035	
$50 saddle, 20 valve, 10 tubing, 160 labor	
$216 wet tap, 328 valve, 423 equip/labor, 19 misc.	
$900 engineering, 1,900 material, 1,200 labor	4,000
Average costs is $2500	
$216 wet tap, 216 valve, 423 equip/labor, 19 misc material, cost of line extension if any 986	1,860
Hydrant $600, Labor $600	

Question 14.(b)(2). Identify the actions that the water utility must take to operate and maintain a private fire protection system. For each action listed, state the annual cost to the water utility to perform.	
Check for leaks and replace hydrants (2 respondents)	$100
Inspection, meter reading, pressure testing	60
Leak check, lubricate, paint and repair	25
Larger tanks, increased line size	
Inspections and repairs (2 respondents)	1,246
Estimated Annual Costs	78
Usage Reported by school, bypass meter on fire protection system to check for usage.	
3% of O&M estimated to cover costs associated with operation and maintaining the public & private fire protection systems combined.	
Utility incurs no cost as these are the responsibility of the owner.	

Question 14. B. (3). Identify the actions that the water utility must take to operate and maintain a private fire protection system. For each action listed, state the annual cost to the water utility to perform.	
Do not maintain	84
Cost is dependent on the potential fire fighting demands ranging from 250 to 2500 gpm. Backup facilities constitute a larger share of the costs than direct costs such as fire meter assembles.	3
If private fire protection systems were allowed to connect without meters costs incurred would include the unauthorized use of water, leaks on private lines, no recovery of water costs, no recovery of the cost of construction and financing on the system designed to provide the protection, higher costs for leak detection and all water accountability tasks. Commercial and industrial customers have in the past made improper connections to private fire protection systems in order to fill lakes, water lawns and other purposes.	3
Check for leaks, replace hydrants (2 respondents)	$100
Inspections and repairs	$1,246
Leak check, lubricate, paint and repair	$25
Larger tanks and increases in line size	
Inspection, meter reading, pressure testing	$60
The American Water Works Manual M1 recognizes that utilities providing private fire protection incur significant "standby" costs and provides methods for including the costs of operating and maintaining the facilities needed to provide an adequate water supply in the event of a fire. Cost of private fire protection service must include the appropriately allocated share of backup facilities such as transmission and distribution mains, storage facilities, and pumps. According to the AWWA, these backup facilities normally constitute a much larger share of the cost of providing private fire protection service than the direct costs related to private fire protection service such as fire-meter assemblies.	3

If the water district is required to maintain a certain level of water in its storage tanks, then the size of the tanks would need to be large enough to take care of the domestic use, plus an ample amount of reserve. Also the treatment plant operator could possibly be scheduled for longer days in order to treat the water when needed if there is not enough storage in the clearwell.	
If the customer is required to design his service so that they can accept the pressure and volume that the water district can supply, then there is not a cost to the water district. Maintenance to fire hydrants is another point of disagreement between fire departments and the water district. In our case, the fire hydrants are installed by fire departments, developers, private individuals for use for gravity filling fire trucks only. We do not have the money for the repair and maintenance of these hydrants. We thought that since the fire departments were saving time and money, that the maintenance should be paid by them using money collected from their fire dues. However, if it becomes necessary for the water district to do the repair and maintenance then the district should be able to charge by some means to recover the cost. Most of the repair to hydrants would not be necessary if the hydrants were operated properly.	

Question 15 What costs, if any, would your water utility incur with the connection of private fire protection systems to its water distribution system?	
Costs would be paid by individual requesting service	51
Not applicable	35
Don't know	7
Actual cost	6
Would need major upgrades	4
$18,000 for 6" connection plus $40 per month in maintenance	2
Increased labor	2
Maintenance and testing	2
Additional capacity	2
Cost includes maintenance and upkeep of hydrants and unauthorized water use.	
Cost of buffer tank paid by customer	2
Depends on configuration of connnection - approximately $18,000 installation, 250 annual testing, 150 backflow preventers and 40 a month for annual testing and maintenance.	
Must maintain adequate system pressure throughout the water system and maintain adequate quantities to meet peak day and hour requirements in addition to potential fire flow requirement.	
$5,625,334 to upsize mains	
If private fire protection systems were allowed to connect without meters costs incurred would include the unauthorized use of water, leaks on private lines, no recovery of water costs, no recovery of the cost of construction and financing on the system designed to provide the protection, higher costs for leak detection and all water accountability tasks. Commercial and industrial customers have in the past made improper connections to private fire protection systems in order to fill lakes, water lawns and other purposes.	3

Question 16. Should private fire protection service rates be based upon the cost of such service without any subsidization from general customers? Explain.	
Cost should be borne by individual requesting service and not be subsidized.	70
Not applicable	23
No opinion	18
Yes - subsidized by state if necessary	2
Same rate since fire department is a taxable district	
Costs are minimal and benefits outweigh costs	
Yes - commercial and industrial customers are the ones who are interested in private fire protection and utilize the service. The reason most all private fire protection systems are installed is the result of Building Code and insurance company requirements for commercial and industrial property. The general customer base receives no benefit from private fire protection installations and therefore should not be burdened with the cost of providing such service. The purpose of private fire protection facilities is to enhance the protection available to the individual property owner on which the facilities are located. Such facilities do not protect the property of any other customer. The premise of cost of service rates is to allocate expenses of the utility to those customers or groups of customers that benefit or cause the cost. The general customer base should not subsidize private fire protection service because water customers in general do not benefit or cause the costs associated with the service.	3

Private business should be required to pay for the installation of their fire protection system in lieu of a connection fee. Also that the private business should be required to install a pump and holding tank, if necessary to operate their system. We feel there will normally be no water usage. When there is a fire and the system is used the private business should with the assistance of the fire department estimate the amount of water used and pay for that amount according to the regular rate schedule. If a reserve amount of water or a certain pressure is required of the water district, then a monthly fee should be charged accordingly based on actual cost to the district.	
All customers should be charged rates that are cost of service based. The cost of providing fire service, either public or private, is the cost or the ability to provide high demands over a short period, even during maximum water usage. This requires larger mains, larger treatment plant capacity, greater pumping capabilities, and larger storage volumes that may rarely get used. Therefore, an equitable cost of service rate for any fire service must include maintenance costs and support the investment of facilities larger than for general consumption. This can either be through a flat fee for each fire service or hydrant, or can be included in overall customer rates.	

16. Should private fire protection service rates be based upon the cost of such service without any subsidization from general customers? Explain.

RESPONSE

KRS 278.170(3) specifies in part that a utility "may grant free or reduced rate service for the purpose of fighting fires or training firefighters to any city, county, urban-county, charter county, fire protection district, or volunteer fire protection district." KRS 278.172 further provides that "every utility which serves a volunteer fire department or other entity eligible for aid under KRS 95A.262 shall supply such service at the lowest rate available under its tariffs to customers with comparable consumption amounts, including residential or farm rates."

Thus, public policy concerning public fire protection favors the provision of water at the most favorable terms available. These statutes do not expressly extend this policy to matters concerning private fire protection; therefore, the general statutory charge for rate design provides the guidance for private fire service rates.

KRS 278.170(1) mandates the following.

> "No utility shall, as to rates or service, give any unreasonable preference or advantage to any person or subject any person to any unreasonable prejudice or disadvantage, or establish or maintain any unreasonable difference between localities or between classes of service for doing a like and contemporaneous service under the same or substantially the same conditions."

As with any utility rate-design process, the cost of service study is the starting point.[1] KRS 278.170(1) contemplates the application of pragmatism to the rate-design process by permitting the utilization of some preferences or advantages. Consequently, subsidies do exist, and there may be instances wherein the utility may not apply a strict cost of service approach to determine the rates for private fire protection.

The effort of departing from the cost of service must, nonetheless, find a basis in a legitimate rate-making principle such as gradualism or prevention of rate-shock. The deliberate departure from cost of service absent a generally accepted and clearly articulated rate-making principle runs contrary to KRS 278.170 when the departure results in one group of customers subsidizing a material benefit to another group of customers. If the legislature wishes to address this issue, it may. Absent a statutory mandate such as KRS 278.170(3) or KRS 278.172, the utility may not call upon the general customers to indefinitely subsidize a material benefit for the customer group receiving private fire protection service. Without question, the utility should not extract a premium from private fire service customers to provide a material benefit to the "general" customer base. Likewise, the same is true in reverse.

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[1] The Attorney General will point out that there is a subjective nature to cost of service studies. Thus, the same set of facts may support more than one cost of service study that can be found to be reasonable. This response contemplates a situation where there are no issues relating to the proper assignment of costs in the cost of service study.

Question 17. A. What benefits may result to the utility from its installation of public fire hydrants?	
Additional line flushing	62
Not applicable or no benefits	42
Public perception	16
Fire protection	8
Sampling	5
None - liability to the utility	4
Flow tests	3
Lower fire insurance premiums	3
Maintenance on system	2
Benefit only property owners	
Blow off line, clean and find leaks	
By providing fire service and installing public hydrants, the utility is able to design a system that will accommodate higher demands and flows. This allows greater flexibility for the utility during times of growth or peak demand periods. Systems with fire protection generally experience fewer low pressure calls. The utility also has a protected, aboveground point for sampling or flushing. Further, the utility has a constant, visible, public reminder of its service to the community.	
All customers may be unable to benefit from having fire hydrants within a reasonable distance of their property due to the hydraulics of a system. There is a great liability and cost in keeping the water system in condition to always assure flows are available for fire fighting, meeting state and local requirements and the continuous policing to curtail theft of water by farmers, contractors and others. There is a minor benefit in having points to flush the distribution system should a water main failure occur.	

Question 17. B. What benefits may result to the public from the utility's installation of public fire hydrants?	
Lower fire insurance premiums	79
Increased fire protection	48
Not applicable	26
Fresh water as a result of flushing	16
Fire departments would benefit	2
Line maintenance	
Less water usage	
Pressure testing	
Who would pay?	
Public buildings and factories	
The public clearly receives an enormous benefit of public protection, safety in the community, and reduced loss of property owner when fire occurs. The public also receives better water quality if the hydrants are used to routinely flush the system. Finally, the public generally receives the financial benefit of reduced property insurance rates, for slightly higher water rates or property taxes.	
Decrease insurance rate but increase water rates due to more storage required.	
Aside from the obvious fire protection benefits, the availability of public fire hydrants in conjunction with the fire departments meeting other Insurance Service Office rating requirements may reduce property owners insurance premiums.	

17. a. What benefits may result to the utility from its installation of public fire hydrants?

b. What benefits may result to the public from the utility's installation of public fire hydrants?

RESPONSE

17(a) The General Assembly demonstrates a preference favoring the installation of public fire hydrants. Through KRS 74.415(1), the General Assembly grants the commissioners of a water district and the governing body of a water association the discretion to determine questions concerning the installation of fire hydrants on new or extended water lines. The General Assembly expressly fetters the exercise of discretion by requiring that "the commissioners or governing body *shall not* eliminate fire hydrants from new or extended water lines *unless* they determine that hydrants are not feasible (emphasis added)." KRS 74.415(1); also see KRS 96.150(2)(A city may extend water lines which are incapable of supporting fire hydrants only upon a determination that servicing the hydrants is not feasible.); and further see KRS 75.080 (The trustees of any fire protection district may cause the erection of fire hydrants to the water pipes in the public ways.). Thus, public policy in Kentucky favors the installation of fire hydrants, and it should be read to apply to all utilities.

Providing benefits to utilities is not the primary focus of the General Assembly's policy relating to fire hydrants. By requiring a feasibility analysis, the General Assembly affords public utilities subject to KRS 74.415, a means of protection from net impairment or net detriment from the installation of hydrants. Consequently,

compliance with public policy is the primary benefit to the utility that results from the installation of fire hydrants pursuant to a determination of feasibility.

17(b) The potential public benefits resulting from the installation of fire hydrants include the enhancement of fire fighting capabilities and fire protection measures as well as favorable impacts on fire insurance coverage and premiums.

Question 18. A. What benefits result to the public from the installation and use of private sprinkler systems?	
Not applicable or no opinion	41
Benefits private - none to the public	31
Better fire protection	23
Lower insurance premiums	22
Safety	20
Less water used	6
The customers with private sprinkler systems are normally places where the public work. dines and shops. Economic losses to the property owner in the event of the fire are much less and insurance rates for the property are less. These lower costs of business help keep costs to the customer down and keep local businesses viable.	
No direct benefit - the sprinkler system does not increase or reduce the fire protection storage requirements. The system still has to be sized to provide public fire protection. Installation of private sprinkler systems is strictly a business decision for the individual customer. Residents of apartments and college dorms would receive benefits from private sprinkler systems. However the owners of such properties in the past chose not to install sprinklers due to cost or some other business reason. In most cases they will not install a system until a law or regulation is passed requiring them. Is this not the case in Kentucky's public colleges?	
Assists private business in meeting OSHA laws	

Question 18. B. What benefits result to the utility from the installation and use of private sprinkler systems by customers on its water distribution system?	
None	53
Not applicable or no opinion	32
Conserve water	21
Revenue from use	10
Growth	
Problems occur such as leaks, unauthorized usage and potential health hazards	
Safety	5
Liability of utility increased	
Installation and use of private sprinkler systems only benefits the individual property owner and has no direct benefit to the general customer population. Private fire protection provides a measurable benefit to the property being served improving control over fires, decreasing injury to personnel, decreasing property damage, and may reduce annual insurance cost. The cost of private fire protection should be paid by those customers receiving the benefits of private fire protection service. The only benefit to the utility for sprinkler systems is generation of additional revenue to offset the cost of the water mains, tanks, pumps and other apparatus necessary to provide the high flows required.	4
The utility receives benefit because the system is designed to provide fire service, meaning larger mains to accommodate actual fire demands. The larger diameter mains also help minimize low pressure during peak periods.	2

No benefit to the utility due to the installation of private fire protection systems. Sprinkler system does not increase or reduce the fire protection storage requirements. The system still has to be sized to provide public fire protection. Installation of private sprinkler systems is strictly a business decisionof the individual customer. Any private fire protection needs above the capacity that the utility is building into its system for public fire protection is the responsibility of the customer requesting such service, for they are the only ones that have a need for that level of service.	
Lower insurance premiums	2

Question 19. Does the utility currently assess a fee for water service even if the customer has no water usage during the billing period? If yes, describe how this fee was determined.	
Yes - a minimum bill	84
No	19
Not applicable	7
For water but not for fire protection	6
Customer charge	3
Yes - sprinklers are $25	

Question 20. Does the utility charge fire departments operating within its service area for the placement, operation or maintenance of fire hydrants?	
No	92
Placement only	8
Do not install	9
Yes	2
County government authorizes fire department to contribute	4
Yes - fire department pays for the installation and for the $50 fee for maintenance from tax money	
Municipals charged a monthly fee for public hydrants	2
Yes - maintenance paid by fire department	
Fire departments or property owners install at their own expense. We furnish the water and hydrants are only to be used to gravity fill trucks.	

Question 21. A. Does the utility assess a fee or charge to the fire departments operating within its service area for water used for fire fighting or fire training purposes?	
No	107
Yes	6
Fire department does not notify of usage	4
No charge if less than 4 hours usage	3
Question 21. B. (a). State the fee or charge	
$25 per month	
Customer charge plus $1.92 per 1,000 gallons	
$50 per hydrant annually	
Lowest rate increment for water used for training	2
Minimum rate for meter size	2
Question 21. B. (b). Explain how the fee or charge was determined.	
Tariffed rate	2
Standard rate	
Question 21. B. c. State whether the fee or charge is set forth in the utility's filed rate schedule.	
Yes	3

Question 21. C. If no, state whether the utility's filed rate schedules require the fire department to maintain estimates of the amount of water used for fire protection and training, and to report this water usage to the utility on a regular basis.	
No	45
Not in tariff but fire department reports	17
Yes	27
In tariff but fire department will not report	14
Not in tariff and fire department will not report	3
Fire department reports	4
Not applicable	6
Tariff states that water used for extinguishing fires will not be billed provided a certificate of such use from a fire insurance underwriter of the Fire Department submits a list of water used for fire protection and training.	
No means of enforcement	

Question 22. Who should bear the cost of water used for fire protection purposes (e.g., all utility customers, owner of property where fire occurs, the fire department)? Why?	
All customers should pay for public fire protection	43
Customer who receives the benefit should pay	32
Fire dept. if a taxing district	11
No opinion or unsure	12
Everyone unless duration is over 8 hrs. then property owner	4
Everyone unless duration is over 4 hrs. then property owner	3
Minimal usage	3
Not applicable	3
Depends on funding of fire department	
Insurance companies	4
Fire departments charge a fee for services therefore water usage should be paid by the fire department.	3
Fiscal Court should pay if fire department is under them.	
Like insurance, the provision of fire service is generally a benefit to all customers spread equitably in cost among all customers. A single bill for fire protection in the event of the fire may be burdensome to the individual property owner. As the cost of water for fire protection purposes does not represent a significant cost for KAWC we have no position on this question.	

All customers should bear the cost of a utility building, operating and maintaining a water system that has the capacity to provide the desired level of fire protection. If the customer and /or the governing body are paying the utility, based on a fair and reasonable cost allocation, standby fire protection rates, then the utility should assume the cost of the water used for fire protection as long as the water use is properly documented. The amount of water used to extinguish fires in a given year is a minor percent of total production. System line loss represents a far bigger financial and operational burden than does the production cost of water used for extinguishing fires. In Berea's case a 1% reduction in line loss would more than compensate for the cost of water used to extinguish fires	
In our area the fire departments charge membership fees to homeowners. If you are not a member you have to pay the fire department for services rendered, if you have a fire. The fire departments are supported by taxes! Customers should not have to pay to support the fire departments twice!	

22. Who should bear the cost of water used for fire protection purposes (e.g., all utility customers, owner of property where fire occurs, the fire department)? Why?

RESPONSE

The appropriate answer will vary from utility to utility. For example, per KRS 75.180(2), in a fire protection district the owner of property where water is used for firefighting shall be reimbursed in a reasonable amount by the fire protection district board for water used. Clearly, this statute reflects the public policy that individual owners of property in a fire protection district should not have to pay for water used to combat a specific fire.[2] The individual property owners fund the fire protection district through a tax mechanism. Consequently, in such scenarios, the responsibility for bearing the cost of water for a specific fire falls upon the fire protection district. This is a statutory scheme, and the Public Service Commission is without jurisdiction to create a contrary result.[3]

There are, furthermore, a variety of different scenarios where KRS Chapter 75 (Fire Protection Districts) does not resolve the issue of who should bear the cost. Thus, again, the appropriate mechanism for assigning costs will depend upon the unique set of facts and corresponding statutes for each situation. Therefore, at this stage it is not clear that a per se rule for assigning costs is legally possible or wise.

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[2] Compare this statutory mandate to KRS 75.460.

[3] Because the owner of the property may not elect to apply for reimbursement pursuant to KRS 75.180(2), the Attorney General does not take the position that a utility may not bill the individual property owner for water used to fight a fire.

Question 23. What actions does the water utility take on a periodic basis to ensure that all fire hydrants are connected to water distribution mains that are capable of handling fire flows? How often are these actions taken?	
Flushed twice annually	23
Annual flow tests	17
Fire department and utility check	17
Not applicable	16
Hydrants for flushing and testing only	15
Flow tests	11
None	7
Hydraulic analysis	6
Flushed annually	6
As needed	5
No policy	2
Checked and color coded for flow rate	2
Flushed quarterly	1
Flow rate checked every 90 days	

Question 24. A. What are the water utility's policies regarding the placement of fire hydrants?	
Do not install - will not meet PSC requirements	29
No policy	20
Flush hydrants only	16
Engineer must certify	12
Applicant pays	10
PSC regulations	6
6" main and PSC regulations	4
Meet flow requirements, PSC regulations, easily accessible, public place to discourage theft and in a strategic location	4
Discourage	3
Populated areas	3
Within 1,000 feet of structure	2
6" main	2
500' apart in subdivisions, 1,000' apart in rest of system	2
500' apart in subdivisions, placed at clusters of housing in rest of system.	2
Every 2,000 feet if pressure permits	2
Fire department must approve	2
Flow test, 6" main and cost paid by applicant	2
Expansion project, local government provides funding and PSC standards	2
6" main and applicant pays	
Depends on pressure	

End of main lines in subdivisions	
Fire code, city ordinance and PSC regulations No funds to install	
Placement of hydrants is done at the request of the city fire chief. Tariff states that public hydrants shall be installed when required by the governing authority and at the applicant's expense, as part of the distribution or transmission extension, or individual on existing mains of the utility. The cost of such fire hydrants will be considered a part of the cost of the distribution or transmission main extension.	
Public fire hydrants are made at the request of the local governing fire department in each of the counties KAWC serves. Placement is at the discretion of the fire department. For jurisdictions outside Fayette County, the local government must authorize its placement and agree to pay the maintenance fee by either a vote of the Fiscal Court or a letter from the Judge-Executive or Mayor. Private hydrants are also placed at the direction of the local fire department or at the request of the individual property owners who are willing to pay for the installation and monthly fee.	

Question 24 B What studies or analyses does the utility conduct prior to ruling upon requests for fire hydrants?	
Flow and pressure checks	31
Certified by an engineer	27
Not applicable	26
Hydraulic analysis	10
None	6
Follow PSC regulations	6
Population of area	5
Do not install	4
Determine who will pay	2
Flush only	2
Only set during construction	
Minimum flow of 500 gpm at 20 psi	
Do not install on rural water lines	
Within 1,000 feet of the structure	

Question 24. C. Under what circumstances will the water utility install a fire hydrant?	
Not applicable or none	48
Meets engineering specifications, applicant pays cost or utility obtains grants	26
Flush hydrants only	12
Engineer certifies	10
Applicant pays for hydrant and specifications are met	7
Certified by an engineer and applicant pays	6
Requested by fire department	6
Per PSC regulations	4
Installs during main construction	3
All new development required to install hydrants per planning commission	2
No policy	2
No cost to utility, meets specifications, approved by engineer and the district does not incur legal liabilities	2
Within 1,000 feet of structure	
6" mains and PSC regulations	
Easement signing incentive, requested by money lending agency, requested by fire department	
High elevation and large mains	
Pressure adequate and need is determined	
Flow requirement of 500 gpm at 20 psi.	
Government requires, adequate flow and pressure	