Case Nos. 1D98-0713 and 1D98-0727
Florida Water Services Corporation vs. Florida Public Service Commission ("PSC"); Sugarmill Woods Civic Association, Inc. vs. Southern States Utilities, Inc. and the PSC
vs. Joseph J. DeRouin, et al.
PSC Docket No. 920199-WS

SOUTHERN STATES UTILITIES, INC.
DELTONA UTILITIES, INC.

ORIGINAL
FILE COPY

BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 920199-WS

APPLICATION FOR A GENERAL RATE INCREASE

FILED
DEC 12 1996
JON S. W... LER
Clerk District Court of Appeal
First District

VOLUME II
BOOK 11 OF 11

WATER MINIMUM FILING REQUIREMENTS

Containing

SCHEDULE F - ENGINEERING INFORMATION

FOR THE TEST YEAR ENDED
DECEMBER 31, 1991

DOCUMENT NUMBER-DATE
04735 MAY 11 1992
FPSC-RECORDS/REPORTING

TABLE OF CONTENTS
FOR
ENGINEERING "F" SCHEDULES
for
Docket No. 920199-WS

WATER SCHEDULES

TABLE OF CONTENTS
FOR
ENGINEERING "F" SCHEDULES
for
Docket No. 920199-WS

WATER SCHEDULES

(CONTINUED)

TABLE OF CONTENTS
FOR
ENGINEERING "F" SCHEDULES
for
Docket No. 920199-WS

WATER SCHEDULES

(CONTINUED)

TABLE OF CONTENTS
FOR
ENGINEERING "F" SCHEDULES
for
Docket No. 920199-WS

WATER SCHEDULES

(CONTINUED)

APPENDIX FOR FIRE FLOW ORDINANCES:

Introduction To Water Engineering Schedules

Schedule F-1 Unaccounted For Water

The source documentation used to calculate Unaccounted for Water (UFW).

Monthly operating reports (MOR's) files are used to determine water pumped information and water used at the treatment facility, line flushes and line breakage reports are used to calculate other use. Billing information is used in order to ascertain any adjustments to customer usage as a result of under and over reads. Stuck or "O" usage reports are also used to help determine (UFW).

Schedules F-5 Used and Useful Determination For Water Systems

For the water systems included in the instant docket, the used and useful determination is presented on Schedule F-5 and is based upon the sound engineering judgement that recognizes prudent design considerations used throughout the industry. When the Florida Department of Environmental Regulation ("FDER") reviews the plans and specifications for water systems it uses a set of minimum design criteria to determine whether or not to approve said plans. The design standards referred to by the FDER are outlined in FAC 17-555.330 Engineering References for Public Water Systems. The approach to evaluate the used and usefulness of the Company's plants and systems models the same evaluation process used by the FDER and set forth in FAC 17-555. The following is a discussion of the specific design criteria relied upon in evaluating each major component of the water system for the used and useful determination.

Water Supply Wells:

FDER regulations (FAC 17-555.315) require there to be a minimum of two drinking water supply wells for all community water systems that will serve more than 350 persons. We interpret that to translate to 100 equivalent residential connections or ERCs.

With the largest well out of service, the remaining well(s) are required to meet the maximum day demand if there is storage provided. This is referred to as the Firm Reliable Capacity. For systems with multiple wells (10 or more supply wells), the Firm Reliable Capacity is determined with the two largest wells out of service.

For small water systems that do not have storage reservoirs, the wells must be capable of meeting the peak hour demand with the largest well out of service. The peak hour demand is assumed to be twice the maximum day demand as reported by the monthly operating reports and shown on line 5 of the used and useful analysis shown on Schedule F-5. If fire protection is provided, the wells must be capable of meeting the peak hour demand plus the fire flow requirement with the largest well out of service.

Water Treatment Equipment:

For purposes of this case, water treatment equipment is considered to be iron removal filters, reverse osmosis equipment including prefilters, lime softening treatment equipment including solids contact units and gravity filters.

Typically, systems equipped with iron removal filters will be designed with a minimum of two treatment units for reliability purposes. With the largest unit out of service for repair or backwashing, the remaining unit(s) must be capable of meeting the maximum day demand.

In the case of reverse osmosis treatment equipment, the permeators, or filter membranes, are typically assembled in groups called skids. Again, with the largest skid out of service, the remaining units must be capable of meeting the maximum day demand.

The solids contact units used in the typical lime softening process are generally a very reliable piece of equipment and because of their cost they are generally not designed as multiple redundant units for reliability. These units provide for the mixing of raw water and the lime slurry solution, flocculation, solids-water separation and removal of the lime sludge. These units can generally be bypassed in order to blend raw water with finished water if necessary. These units must meet the maximum day demand of the system.

The clarified water leaves the solids contact units and goes to the gravity filters. For operational purposes, a minimum of two units is generally required. With the largest unit out of service, the remaining unit(s) must be capable of meeting the maximum day demand assuming that adequate finished water storage is available.

Finished Water Storage:

Storage is provided to meet the short term peak hour domestic demands placed on the system, provide capacity for required fire flow and to provide emergency storage capacity.

For purposes of the used and useful analysis, the required storage to meet the domestic peak hour demand is based on a 4 hour duration. The peak hour demand is assumed to be two times the maximum day demand. The required fire flow storage is established by the County fire flow ordinance (flow in GPM and duration in hours). The storage needed to meet emergency conditions is especially important when chemical treatment is provided by only one treatment unit. Emergency storage is difficult to define, but should be analyzed based on historical water main breaks and treatment unit failures. Unless otherwise noted, no attempt was made to quantify emergency storage needs.

Depending upon the design of the storage tank and high service pump configuration, "dead storage" may be significant and must be determined. "Dead Storage" is the amount of water in the bottom of the tank that must be maintained above the high service pump suction line in order to keep the pumps from cavitating. This is of particular importance in storage tanks that have floor suction and where the high service pumps centerline elevation is at or above the floor elevation of the storage tank. The vortexing effect is very much a function of the rate of flow rate of the high service pumps. The amount of water necessary to prevent votexing can be estimated from nomograghs as published by the Hydraulic Institute. However, unless otherwise noted, no attempt was made to determine the quantity of water associated with "dead storage".

High Service Pumps:

High service pumping requirements for community water systems are set forth in FAC 17-555.320. These units must meet the peak hourly demand of the customers or the average flow on the maximum day plus fire flow requirement with the largest unit out of service, whichever is greater, while maintaining a distribution system pressure of not less than 20 psi. However, in small systems it is not uncommon to size these pumps to meet the higher peak hour demands placed on the system or even the instantaneous demand on the system.

Auxiliary Power:

FDER requires all community water systems serving more than 350 persons to be equipped with auxiliary standby pumping to meet one-half the maximum day demand and equipped with a automatic start up device. The Company has met this requirement for all large systems and has been actively involved in installing auxiliary generators at its smaller systems to meet the FDER requirement. Therefore, this equipment should be 100% used and useful for rate making purposes.

Chlorination Equipment:

This equipment is required by FDER as set forth in FAC 17-555.320 and as such the equipment is considered 100% used and useful.

Hydropneumatic Tanks:

These tanks typically control the operation of the well pumps or high service pumps by sensing the pressure in the water distribution system. When the system pressure falls below a set point, a pressure sensitive switch sends a signal to start the high service pumps or well pump(s). Typically, these tanks are designed based upon the capacity of the largest high service pump. In order to minimize the cycling of the pumps to between four and six starts per hour, the hydropneumatic tank should have a capacity of between ten and fifteen times the largest high service pump. For the used and useful determination, fifteen times the largest pump size was the criteria used.

Water Transmission and Distribution Systems:

Without the aid of a computerized hydraulic analysis, it is difficult to determine the hydraulic capacity in the different parts of the water system. These analyses can often be expensive to perform and are generally not justified for rate making.

The approach used to evaluate the used and usefulness of the transmission and distribution system was to determine the total number of lots where water mains are installed and service is available. The average number of ERCs is then divided into the total lot count to determine the percentage used and useful. Consideration is given to other factors such as customer density, size of the lines, and layout of the distribution system as shown on the system maps.

Fire Flow Requirements:

These requirements are generally established by the local government of the County or City. Where applicable, a copy of the County Ordinance is included in the Appendix section at the back of this Volume. Many of the systems operated by the Company were built before the adoption and/or the revision of county ordinances relating to fire flow. Therefore, the fire flow standards used in the original design of the systems may have been different. No attempt has been made to determine the standard design criteria which was in effect at the time these systems were designed and constructed. While many of the systems do meet the fire flow standards of today, some do not meet the more stringent standards established primarily for new construction. However, that is not to say that fire flow can not be met at some level of service at or above the minimum 20 PSI system pressure since pumps (well or high service) are capable of producing beyond their design point at reduced system pressures.

Schedule F-8 Margin Reserve Calculations:

Margin reserve calculations, if applicable, are presented on Schedule F-8 and are based on 5 year historical growth rates as presented in Schedule F-9. Where a margin reserve is requested, a 1.5 year period was used for plant while a 1 year period was used for water distribution/wastewater collection systems.

Amelia Island - 1518

Nassau County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Nassau County / Amelia Island
Docket No.: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	20,250		17,218	919	2,113	10.4%
2	February	19,069		16,608	625	1,836	9.6%
3	March	16,162		12,376	1,734	2,052	12.7%
4	April	23,974		20,948	64	2,962	12.4%
5	May	28,638		26,371	21	2,246	7.8%
6	June	32,069		29,349	213	2,507	7.8%
7	July	28,147		34,000	4	(5,857)	-20.8%
8	August	26,347		14,047	659	11,641	44.2%
9	September	31,782		28,984	119	2,679	8.4%
10	October	26,396		22,721	170	3,505	13.3%
11	November	24,334		21,606	174	2,554	10.5%
12	December	22,203		19,827	141	2,235	10.1%
13							
14	Total	299,371	0	264,055	4,843	30,473	10.2%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January		719	200			919
22	February	220	5	150	250		625
23	March	230	696		808		1734
24	April		4			60	64
25	May	17	4				21
26	June	209	4				213
27	July		4				4
28	August	300	4		300	55	659
29	September		4	100		15	119
30	October	101	4			65	170
31	November	120	4			50	174
32	December	97	4			40	141
33	Totals	1294	1456	450	1358	285	4843
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Nassau County / Amelia Island
Docket No.: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 13,1990 thru January 14, 1991
February	January 15 thru February 16
March	February 17 thru March 12
April	March 13 thru April 10
May	April 11 thru May 13
June	May 14 thru June 17
July	June 18 thru July 16
August	July 17 thru August 12
September	August 13 thru September 14
October	September 15 thru October 13
November	October 14 thru November 11
December	November 12 thru December 10

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system was overbilled 8,393,000 gallons in July. The gallons were credited in August. If the sold gallons were adjusted to reflect the error, the unaccounted for water for July equals 9.0 and August equals 12.3 per cent.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Nassau / Amelia Island **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				3,672,000
	Reliable Plant Capacity with Largest Well Out of Service				1,800,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		08/12/91		1,333,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	08/12/91		1,333,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	08/10/91		1,313,000
		(3)	08/23/91		1,287,000
		(4)	08/18/91		1,277,000
		(5)	08/07/91		1,200,000
	(There is no record of any unusual occurances)			AVERAGE	1,282,000
4.	Five-Day Max Year	(1)	08/12/91		1,333,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	08/10/91		1,313,000
		(3)	08/23/91		1,287,000
		(4)	08/18/91		1,277,000
		(5)	07/02/90		1,257,000
	(There is no record of any unusual occurances)			AVERAGE	1,293,400
5.	Average Daily Flow				627,589
6.	Required Fire Flow (1000 GPM for 3 hours)				180,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See NFPA 1231 and NFPA 24 attached hereto)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Nassau / Amelia Island | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Test Year Ending:1991 w/o Margin Reserve

Line No.	Description	Amelia Island	Amelia Island Cont.	Amelia Island Fire Protect
	INPUT DATA SECTION	(a)	(b)	(c)
1	Total Gallons Pumped (000's)	302,070		
2	Annual Average Daily Demand	827,589		
3	Maximum Day Demand - Date	08/12/91		
4	Maximum Day Gallons Pumped	1,333,000		
5	Gallons Per Minute Pumped	926		
6	Fire Flow Requirement (Gallons)	180,000		480,000
7	Fire Flow Requirement (GPM)	1,000		2,000
8	Beginning No. of ERCs	1,602		
9	Ending No. of ERCs	1,865		
10	Average No. of ERCs	1,733		
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)			
11	No. 1 (GPM Capacity)largest	1,400		
12	No. 2 (GPM Capacity)	1,400		
13	No. 3 (GPM Capacity)			
14	Total Well Capacity (GPM)	2,800		
15	Percent Used and Useful	66%		
	Finished Water Storage: (Account No. 330.4)			
16	Tank No. 1	600,000		400,000
17	Total Storage Capacity in Gallons	600,000		400,000
18	Percent Used and Useful	100%		100%
	High Service Pumps: (Account No. 311.2, 325.0_)			
19	No. 1 & 4 (Capacity in GPM)	1,875	500	1,000
20	No. 2 & 5 (Capacity in GPM)	1,270	620	1,000
21	No. 3 & 6 (Capacity in GPM)	625	310	1,000
22	Total High Service Pump Capacity	5,200		3,000
23	Percent Used and Useful	86%		100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)			
24	Tank No. 1	10,000		10,000
25	Total Hydro Tanks (Gallons)	10,000		10,000
26	Percent Used and Useful (Tank No. 1)	100%		100%
27	Auxiliary Power: (Acct. 310.2)	100%		100%
	Distribution System: (Acct No. 331.4 & 335.4)			
28	Average No. of ERCs	1,733		
29	Permitted No. of Lots/ERCs	1,700		
30	Percent Used and Useful	100%		

NOTE (1) Buildings, Land, Aeration, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Nassau / Amelia Island

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Nassau / Amelia Island **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Amelia Island (a)
1	Annual Growth From Schedule F-9	7.0%
2	Average Number Of Test Year ERC's	1,733
3	Number Of ERCs Associated With 1.5 Years Growth	181
4	Projected Number Of ERCs	1,914
5	Test Year Usage Per ERC @ MDD	769
6	MDD 1.5 Years Into Future	1,472,350
	Used and Useful with Margin Reserve:	
7	Supply Wells	73%
8	High Service Pumps	92%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Nassau / Amelia Island

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	1,278.5	1,369.0	1,324.0	176,640,000	133,414	176,640,000	1,324.0	ERR
2	1988	1,369.0	1,451.5	1,410.5	182,876,000	129,653	182,876,000	1,410.5	6.5%
3	1989	1,451.5	1,524.5	1,488.0	206,207,000	138,580	206,207,000	1,488.0	5.5%
4	1990	1,524.5	1,601.5	1,563.0	244,984,600	156,740	244,984,600	1,563.0	5.0%
5	1991	1,601.5	1,865.0	1,733.5	264,056,749	152,326	264,056,749	1,733.5	10.9%
				Average Growth Through 5-Year Period (Col. 8)					7.0%

Apache Shores - 990

Citrus County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Citrus County / Apache Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	432		343	58	31	7.2%
2	February	432		338	58	36	8.3%
3	March	466		299	126	41	8.8%
4	April	426		272	120	34	8.0%
5	May	412		260	112	40	9.7%
6	June	360		221	109	30	8.3%
7	July	332		190	113	29	8.7%
8	August	333		288	12	33	9.9%
9	September	413		263	113	37	9.0%
10	October	312		228	54	30	9.6%
11	November	386		1,168	113	(895)	-231.9%
12	December	382		(713)	135	960	251.3%
13							
14	Total	4,686	0	3,157	1,123	406	8.7%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19							
20							
21	January	6	52				58
22	February	6	52				58
23	March	6	120				126
24	April	10	110				120
25	May	7	105				112
26	June	6	103				109
27	July	8	105				113
28	August	12					12
29	September	10	103				113
30	October	12	42				54
31	November	8	105				113
32	December	12	123				135
33	Totals	103	1020	0	0	0	1123
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Citrus County / Apache Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Sold	Adjusted Pump to Equal Sold Cycle
January	December 22, 1990 thru January 22, 1991
February	January 23 thru February 22
March	February 23 thru March 25
April	March 26 thru April 22
May	April 23 thru May 21
June	May 22 thru June 21
July	June 22 thru July 22
August	July 23 thru August 21
September	August 22 thru September 23
October	September 24 thru October 21
November	October 22 thru November 22
December	November 23 thru December 23

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system was over billed by 941,320 gallons in November and the gallonage was credited back in December. If you adjust the percentages for the overbill, November's unaccounted for water percentage would be 11.9 and December's percentage would equal 5.0 %.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Citrus / Apache Shores **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				432,000
	Reliable Plant Capacity with Largest Well Out of Service				144,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		10/11/91		43,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	04/03/91		26,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	04/30/91		19,000
		(3)	04/16/91		17,000
		(4)	04/02/91		15,000
		(5)	04/05/91		14,000
	(There is no record of any unusual occurances)			AVERAGE	18,200
4.	Five-Day Max Year	(1)	10/11/91		43,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	04/03/91		26,000
		(3)	03/26/91		24,000
		(4)	01/29/91		22,000
		(5)	04/30/91		19,000
	(There is no record of any unusual occurances)			AVERAGE	26,800
5.	Average Daily Flow				12,619
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. **(No fire hydrants on distribution system)**				

USED AND USEFUL CALCULATIONS

Water Treatment Plant

Company: SSU / Citrus / Apache Shores **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Apache Shores
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	4,606
2	Annual Average Daily Demand	12,619
3	Maximum Day Demand - Date	10/11/91
4	Maximum Day Gallons Pumped	43,000
5	Gallons Per Minute Pumped	30
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	160
9	Ending No. of ERCs	160
10	Average No. of ERCs	160
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	200
12	No. 2 (GPM Capacity)	100
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	300
15	Percent Used and Useful	60%
	Iron Removal Filters: (Account No. 320.3)	
16	No. 1 (Capacity in GPM)	200
17	No. 2 (Capacity in GPM)	200
18	Total Filter Capacity in GPM	400
19	Less: Largest unit out of service	200
20	Reliable Filter Capacity	200
21	Percent Used and Useful	30%
	High Service Pumps:(Account No. 311.2, 325.0_)	
22	No. 1 (Capacity in GPM)	0
23	No. 2 (Capacity in GPM)	0
24	No. 3 (Capacity in GPM)	0
25	Total High Service Pump Capacity	0
26	Percent Used and Useful	
	Hydropneumatic Tanks:(Account No. 320.3, or 330.4)	
27	Tank No. 1	3,000
28	Tank No. 2	2,600
29	Tank No. 3	
30	Total Hydro Tanks (Gallons)	5,600
31	Percent Used and Useful (Tank No. 1)	100%
32	Percent Used and Useful (Tank No. 2)	58%
33	Percent Used and Useful (Tank No. 3)	
34	Auxiliary Power/Pumping Equipment(Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
35	Average No. of ERC's	160
36	Permitted No. of Lots/ERC's	293
37	Percent Used and Useful	55%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Citrus / Apache Shores

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Citrus / Apache Shores

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	176.0	158.0	167.0	3,769,000	22,569	3,769,000	167.0	ERR
2	1988	158.0	160.0	159.0	3,608,000	22,692	3,608,000	159.0	-4.8%
3	1989	160.0	163.0	161.5	4,136,000	25,610	4,136,000	161.5	1.6%
4	1990	163.0	160.0	161.5	3,839,600	23,775	3,839,600	161.5	0.0%
5	1991	160.0	160.0	160.0	3,156,912	19,731	3,156,912	160.0	-0.9%
				Average Growth Through 5-Year Period (Col. 8)					-1.1%

Apple Valley - 332

Seminole County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Seminole County / Apple Valley
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	27,598		19,773	4,108	3,717	13.5%
2	February						
3	March	24,418		19,504	3,243	1,671	6.8%
4	April						
5	May	27,049		19,795	3,593	3,661	13.5%
6	June						
7	July	28,788		22,777	3,945	2,066	7.2%
8	August						
9	September	25,215		18,812	4,093	2,310	9.2%
10	October						
11	November	26,890		20,981	3,709	2,200	8.2%
12	December						
13							
14	**Total**	**159,958**		**121,642**	**22,691**	**15,625**	**9.8%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
20							
21	January	201	2527		1380		4108
22	February						
23	March	148	1884		1211		3243
24	April						
25	May	229	2011		1353		3593
26	June						
27	July	306	2200		1439		3945
28	August						
29	September	323	2280	230	1260		4093
30	October						
31	November	255	2109		1345		3709
32	December						
33	Totals	1462	13011	230	7988	0	22691
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Seminole County / Apple Valley
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 3, 1990 thru January 2, 1991
March	January 3 thru March 1
May	March 2 thru May 1
July	May 3 thru July 1
September	July 2 thru September 3
November	September 4 thru November 1

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Seminole / Apple Valley

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				1,440,000
	Reliable Plant Capacity with Largest Well Out of Service				648,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		06/15/91		838,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	05/16/91		820,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	05/01/91		799,000
		(3)	05/15/91		553,000
		(4)	05/18/91		540,000
		(5)	05/02/91		490,000
	(There is no record of any unusual occurances)			AVERAGE	640,400
4.	Five-Day Max Year	(1)	06/15/91		838,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	05/16/91		820,000
		(3)	05/01/91		799,000
		(4)	07/11/91		595,000
		(5)	07/23/91		571,000
	(There is no record of any unusual occurances)			AVERAGE	724,600
5.	Average Daily Flow				441,274
6.	Required Fire Flow (600 GPM for 2 hours)				72,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance attached hereto)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Seminole / Apple Valley — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Apple Valley
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	161,065
2	Annual Average Daily Demand	441,274
3	Maximum Day Demand - Date	06/15/91
4	Maximum Day Gallons Pumped	838,000
5	Gallons Per Minute Pumped	582
6	Fire Flow Requirement (Gallons)	72,000
7	Fire Flow Requirement (GPM)	600
8	Beginning No. of ERCs	928
9	Ending No. of ERCs	949
10	Average No. of ERCs	939
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	550
12	No. 2 (GPM Capacity)	450
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	1,000
15	Percent Used and Useful	100%
	Storage Reservoirs: (Account No. 330.4)	
16	No. 1 (Capacity in Gallons)	100,000
17	No. 2 (Capacity in Gallons)	0
18	Total Storage Capacity	100,000
19	Less: Estimated "Dead Storage"	0
20	Net Available Storage	100,000
21	Percent Used and Useful	100%
	High Service Pumps:(Account No. 311.2. 325.0_)	
22	No. 1 (Capacity in GPM)	1,200
23	No. 2 (Capacity in GPM)	350
24	No. 3 (Capacity in GPM)	0
25	Total High Service Pump Capacity	1,550
26	Percent Used and Useful	100%
	Hydropneumatic Tanks:(Account No. 320.3, or 330.4)	
27	Tank No. 1	8,000
28	Tank No. 2	5,000
29	Tank No. 3	
30	Total Hydro Tanks (Gallons)	13,000
31	Percent Used and Useful (Tank No. 1)	100%
32	Percent Used and Useful (Tank No. 2)	100%
33	Percent Used and Useful (Tank No. 3)	
34	Auxiliary Power/Pumping Equipment(Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
35	Average No. of ERC's	939
36	Permitted No. of Lots/ERC's	1,591
37	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on system layout, pipe size, and customer density. Additionally, the Commission found these plants/systems 100% used and useful in Docket # 890868-WS.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Seminole / Apple Valley | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20

The wastewater collection system is 100% used and useful based on customer density.
See Schedule F-5 for water distribution system used and useful.

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Seminole / Apple Valley

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	800.0	853.0	826.5	124,622,000	150,783	124,622,000	826.5	ERR
2	1988	853.0	880.0	866.5	125,474,000	144,806	125,474,000	866.5	4.8%
3	1989	880.0	902.0	891.0	142,646,000	160,097	142,646,000	891.0	2.8%
4	1990	902.0	928.0	915.0	145,106,661	158,587	145,106,661	915.0	2.7%
5	1991	928.0	949.0	938.5	121,642,389	129,614	121,642,389	938.5	2.6%
					Average Growth Through 5-Year Period (Col. 8)				3.2%

Bay Lake Estates - 784

Osceola County (SSU)

Water

- 1992 FPSC Filing -

Gallons of water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Osceola County / Bay Lake
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	665		623	3	39	5.9%
2	February	524		481	4	39	7.4%
3	March	592		567	0	25	4.2%
4	April	688		636	0	52	7.6%
5	May	588		544	10	34	5.8%
6	June	774		727	2	45	5.8%
7	July	564		507	2	55	9.8%
8	August	566		529	0	37	6.5%
9	September	627		551	47	29	4.6%
10	October	561		483	0	78	13.9%
11	November	574		494	2	78	13.6%
12	December	626		600	2	24	3.8%
13							
14	Total	7,349	0	6,742	72	535	7.3%
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	3					3
22	February	4					4
23	March						0
24	April						0
25	May	10					10
26	June	2					2
27	July	2					2
28	August						0
29	September	2		45			47
30	October						0
31	November	2					2
32	December	2					2
33	Totals	27	0	45	0	0	72
34							

35 Calculations are per monthly operating report file.

Gallons of water Pumped, Sold and Unaccounted For
in Thousands of gallons
Docket No: 920199-WS
Company: SSU / Osceola County / Bay Lake

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

Test Year Ended: December 31, 1991

Unaccounted for water is calculated as follows:

Sold	Adjusted Pump to Equal Sold Cycle
January	December 3, 1990 thru January 2, 1991
February	January 3 thru February 1
March	February 2 thru March 1
April	March 2 thru April 1
May	April 2 thru May 1
June	May 2 thru June 3
July	June 4 thru July 1
August	July 2 thru August 4
September	August 5 thru September 3
October	September 4 thru October 1
November	October 2 thru November 1
December	November 2 thru December 2

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Osceola / Bay Lake Estates

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				396,000
	Reliable Plant Capacity with Largest Well Out of Service				N/A
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		05/13/91		55,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	05/13/91		55,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	05/02/91		33,000
		(3)	05/07/91		32,000
		(4)	05/10/91		32,000
		(5)	05/06/91		31,000
	(There is no record of any unusual occurances)			AVERAGE	36,600
4.	Five-Day Max Year	(1)	05/13/91		55,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	11/09/91		50,000
		(3)	11/15/91		47,000
		(4)	11/22/91		41,000
		(5)	11/29/91		41,000
	(There is no record of any unusual occurances)			AVERAGE	46,800
5.	Average Daily Flow				20,334
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Osceola / Bay Lake Estates

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Bay Lake Estates
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	7,422
2	Annual Average Daily Demand	20,334
3	Maximum Day Demand - Date	05/13/91
4	Maximum Day Gallons Pumped	55,000
5	Gallons Per Minute Pumped	38
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	64
9	Ending No. of ERCs	64
10	Average No. of ERCs	64
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	275
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	275
15	Percent Used and Useful	100%
	Iron Removal Filters: (Account No. 320.3)	
16	No. 1 (Capacity in GPM)	0
17	No. 2 (Capacity in GPM)	0
18	Total Filter Capacity in GPM	0
19	Less: Largest unit out of service	0
20	Reliable Filter Capacity	0
21	Percent Used and Useful	
	High Service Pumps:(Account No. 311.2, 325.0_)	
22	No. 1 (Capacity in GPM)	0
23	No. 2 (Capacity in GPM)	0
24	No. 3 (Capacity in GPM)	0
25	Total High Service Pump Capacity	0
26	Percent Used and Useful	
	Hydropneumatic Tanks:(Account No. 320.3, or 330.4)	
27	Tank No. 1	3,000
28	Tank No. 2	0
29	Tank No. 3	
30	Total Hydro Tanks (Gallons)	3,000
31	Percent Used and Useful (Tank No. 1)	100%
32	Percent Used and Useful (Tank No. 2)	
33	Percent Used and Useful (Tank No. 3)	
34	Auxiliary Power/Pumping Equipment(Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
35	Average No. of ERC's	64
36	Permitted No. of Lots/ERC's	100
37	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on system layout, pipe size, and customer density.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Osceola / Bay Lake Estates

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Osceola / Bay Lake Estates FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3) ERCs	(4)	(5)	(6)	(7)	(8)	(9)
Line No.	Year	Beginning	Ending	Average	Gallons Sold	Gallons/ ERC (5)/(4)	Total Gallons Sold	Total ERCs (7)/(6)	Annual % Incr. in ERCs
1	1987[1]	54.0	54.0	54.0	2,625,000	48,611	2,625,000	54.0	ERR
2	1988	54.0	58.0	56.0	7,199,000	128,554	7,199,000	56.0	3.7%
3	1989	58.0	62.0	60.0	9,368,000	156,133	9,368,000	60.0	7.1%
4	1990	62.0	64.0	63.0	8,775,500	139,294	8,775,500	63.0	5.0%
5	1991	64.0	64.0	64.0	6,743,450	105,366	6,743,450	64.0	1.6%
				Average Growth Through 5-Year Period (Col. 8)					4.3%

[1] Acquired July 1987

Beacon Hills - 886

Duval County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Duval County / Beacon Hills
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	72,521	23	63,077	1,328	8,139	11.2%
2	February					0	
3	March	60,992	109	62,212	1,496	(2,607)	-4.3%
4	April					0	
5	May	80,422	45	75,785	1,497	3,185	4.0%
6	June					0	
7	July	84,977	163	76,878	1,416	6,846	8.0%
8	August					0	
9	September	89,128	56	79,111	1,840	8,233	9.2%
10	October					0	
11	November	85,518	79	81,655	2,732	1,210	1.4%
12	December					0	
13							
14	Total	473,558	475	438,718	10,309	25,006	5.3%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	10	1318				1328
22	February						
23	March	25	1313	158			1496
24	April						
25	May	80	1333	84			1497
26	June						
27	July		1340	76			1416
28	August						
29	September	46	1311	483			1840
30	October						
31	November	733	1999				2732
32	December						
33	Totals	894	8614	801	0	0	10309
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Duval County / Beacon Hills
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the purchase column comes from the Purchased Water Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 20, 1990 thru January 15, 1991
March	January 16 thru March 15
May	March 16 thru May 15
July	May 16 athru July 18
September	July 19 thru September 20
November	September 21 thru November 20

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) A customer's meter was over read and subsequently over billed in March of 1991. The error was corrected in December of 1991 so the increase to sold will appear in January of 1992. If the March sold were adjusted to account for the 3,874,000 gallons, the unaccounted for water percentage would be 1.9 in March and 6.1 annually.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Duval / Beacon Hills

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity (3 Wells at 2 plants)				5,976,000
	Reliable Plant Capacity with Largest Well Out of Service				3,816,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		05/13/91		2,187,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	07/04/91		1,801,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	07/02/91		1,759,000
		(3)	07/01/91		1,696,000
		(4)	07/05/91		1,695,000
		(5)	07/03/91		1,648,000
				AVERAGE	1,719,800
4.	Five-Day Max Year	(1)	05/13/91		2,187,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	03/12/91		2,030,000
		(3)	06/17/91		1,974,000
		(4)	03/24/91		1,846,000
		(5)	07/04/91		1,801,000
				AVERAGE	1,967,600
5.	Average Daily Flow				1,298,236
6.	Required Fire Flow (1,500 GPM for 2 hours)				180,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance attached hereto)				

USED AND USEFUL CALCULATIONS

Water Treatment Plant

Company: SSU / Duval / Beacon Hills

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Beacon Hills
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	473,856
2	Annual Average Daily Demand	1,298,236
3	Maximum Day Demand - Date	05/13/91
4	Maximum Day Gallons Pumped	2,187,000
5	Gallons Per Minute Pumped	1,519
6	Fire Flow Requirement (Gallons)	180,000 [2]
7	Fire Flow Requirement (GPM)	1,500
8	Beginning No. of ERCs	2,508
9	Ending No. of ERCs	2,715
10	Average No. of ERCs	2,612
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	1,500
12	No. 2 (GPM Capacity)	1,200
13	No. 3 (GPM Capacity)	1,150
14	Total Well Capacity (GPM)	3,850
15	Percent Used and Useful	65%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	50,000
17	Tank No. 2	75,000
18	Tank No. 3	121,000
19	Total Storage Capacity in Gallons	246,000
20	Percent Used and Useful	100% [2]
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	1,600
22	No. 2 & 5 (Capacity in GPM)	1,600
23	No. 3 & 6 (Capacity in GPM)	1,600
24	Total High Service Pump Capacity	4,800
25	Percent Used and Useful	95% [2]
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	10,000
27	Tank No. 2	10,000
28	Total Hydro Tanks (Gallons)	20,000
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	100%
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	2,612
33	Permitted No. of Lots/ERCs	3,000
34	Percent Used and Useful	100% (1)

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
(1) Distribution system considered 100% used and useful due to customer distribution and pipe sizes.
(2) Fire flow excluded from used and useful calculation.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Duval / Beacon Hills **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Duval / Beacon Hills | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Beacon Hills & Cobblestone
		(a)
1	Annual Growth From Schedule F-9	12.1%
2	Average Number Of Test Year ERC's	2,612
3	Number Of ERC's Associated With 1.5 Years Growth	472
4	Projected Number Of ERC's	3,084
5	Test Year Usage Per ERC @ MDD	837
6	MDD 1.5 Years Into Future	2,582,686
	Used and Useful With Margin Reserve:	
7	Supply Wells	69%
8	High Service Pumps	100%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Duval / Beacon Hills | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	1,444.0	1,868.0	1,656.0	302,984,000	182,961	302,984,000	1,656.0	
2	1988	1,868.0	2,199.0	2,033.5	392,623,000	193,077	392,623,000	2,033.5	22.8%
3	1989	2,199.0	2,397.0	2,298.0	470,772,000	204,862	470,772,000	2,298.0	13.0%
4	1990	2,397.0	2,508.0	2,452.5	506,741,500	206,622	506,741,500	2,452.5	6.7%
5	1991	2,508.0	2,715.0	2,611.5	438,717,300	167,994	438,717,300	2,611.5	6.5%
				Average Growth Through 5-Year Period (Col. 8)					12.1%

Beecher's Point - 472

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Putnam County / Beechers Point
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	490		264	20	206	42.0%
2	February	535		278	2	255	47.7%
3	March	676		304	27	345	51.0%
4	April	539		378	1	160	29.7%
5	May	622		417	10	195	31.4%
6	June	561		403	2	156	27.8%
7	July	657		376	39	242	36.8%
8	August	597		392	23	182	30.5%
9	September	577		360	31	186	32.2%
10	October	515		474	13	28	5.4%
11	November	520		371	11	138	26.5%
12	December	613		266	17	330	53.8%
13							
14	Total	6,902	0	4,283	196	2,423	35.1%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	18	2				20
22	February		2				2
23	March	18	9				27
24	April		1				1
25	May	6	4				10
26	June		2				2
27	July	26	13				39
28	August	12	1	10			23
29	September	10	1	20			31
30	October	12	1				13
31	November	8	3				11
32	December	4	13				17
33	Totals	114	52	30	0	0	196
34							

35 Calculations are per monthly operating report file.

Gallons of water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Putnam County / Beechers Point
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 20, 1990 thru January 18, 1991
February	January 20 thru February 18
March	February 19 thru March 26
April	March 17 thru April 17
May	April 18 thru May 17
June	May 18 thru June 17
July	June 18 thru July 17
August	July 18 thru August 16
September	August 17 thru September 18
October	September 19 thru October 16
November	October 17 thru November 20
December	November 21 thru December 16

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / Beechers Point

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				122,400
	Reliable Plant Capacity with Largest Well Out of Service				57,600
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		06/21/91		62,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	04/06/91		37,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	04/07/91		37,000
		(3)	04/08/91		37,000
		(4)	04/04/91		34,000
		(5)	04/18/91		28,000
	(There is no record of any unusual occurances)			AVERAGE	34,600
4.	Five-Day Max Year	(1)	06/21/91		62,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	10/24/91		41,000
		(3)	09/04/91		38,000
		(4)	04/06/91		37,000
		(5)	04/07/91		37,000
	(There is no record of any unusual occurances)			AVERAGE	43,000
5.	Average Daily Flow				19,000
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / Beechers Point — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Beachers Point
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	6,935
2	Annual Average Daily Demand	19,000
3	Maximum Day Demand - Date	06/21/91
4	Maximum Day Gallons Pumped	62,000
5	Gallons Per Minute Pumped	43
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	70
9	Ending No. of ERCs	89
10	Average No. of ERCs	80
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	45
12	No. 2 (GPM Capacity)	40
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	85
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	40,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	40,000
20	Percent Used and Useful	52%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	125
22	No. 2 & 5 (Capacity in GPM)	125
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	250
25	Percent Used and Useful	69%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	15,000
28	Total Hydro Tanks (Gallons)	20,000
29	Percent Used and Useful (Tank No. 1)	38%
30	Percent Used and Useful (Tank No. 2)	13%
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	80
33	Permitted No. of Lots/ERCs	85
34	Percent Used and Useful	100% (1)

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
(1) Distribution system considered 100% used and useful due to customer distribution and pipe sizes.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / Beechers Point **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Putnam / Beechers Point — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: *If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.*

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Beechers Point (a)
1	*Annual Growth From Schedule F-9*	9.8%
2	Average Number Of Test Year ERC's	80
3	Number Of ERC's Associated With 1.5 Years Growth	12
4	Projected Number Of ERC's	91
5	Test Year Usage Per ERC @ MDD	780
6	MDD 1.5 Years Into Future	71,069
	Used and Useful With Margin Reserve:	
7	Finished Water Storage	59%
8	High Service Pumps	79%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / Beechers Point | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987								
2	1988 [1]	64.0	64.0	64.0					
3	1989	64.0	68.0	66.0	2,451,000	37,136	2,451,000	66.0	
4	1990	68.0	70.0	69.0	3,466,990	50,246	3,466,990	69.0	4.5%
5	1991	70.0	89.0	79.5	4,282,560	53,869	4,282,560	79.5	15.2%
				Average Growth Through 5-Year Period (Col. 8)					9.8%

[1] Acquired August 1988. No prior data available.

Burnt Store - 2202

Charlotte/Lee County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Charlotte County / Burnt Store
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	6,279		5,688	251	340	5.4%
2	February	3,947		3,441	236	270	6.8%
3	March	5,350		4,441	676	233	4.4%
4	April	5,443		5,106	327	10	0.2%
5	May	4,459		3,891	361	207	4.6%
6	June	3,999		3,552	221	226	5.7%
7	July	3,540		3,120	150	270	7.6%
8	August	2,853		2,329	290	234	8.2%
9	September	2,899		2,420	186	293	10.1%
10	October	3,230		2,700	139	391	12.1%
11	November	3,601		3,254	183	164	4.6%
12	December	4,870		4,226	165	479	9.8%
13							
14	**Total**	**50,470**	**0**	**44,168**	**3,185**	**3,117**	**6.2%**
15							
16							

17 Other use breakdowns are as follows:

18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	11	230		10		251
22	February	20	216				236
23	March	213	404	39	20		676
24	April	69	228	11	19		327
25	May	69	241	36		15	361
26	June	13	179	17		12	221
27	July	26	113	4		7	150
28	August	28	124	123		15	290
29	September	14	106	58		8	186
30	October	7	121	4		7	139
31	November	35	133	1		14	183
32	December	14	132	6		13	165
33	Totals	519	2227	299	49	91	3185
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Charlotte County / Burnt Store
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 6, 1990 thru January 9, 1991
February	January 10 thru February 5
March	February 6 thru March 7
April	March 8 thru April 6
May	April 7 thru May 3
June	May 4 thru June 4
July	June 5 thru July 3
August	July 4 thru August 2
September	August 3 thru September 2
October	September 3 thru October 2
November	October 3 thru November 2
December	November 3 thru December 3

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Charlotte / Burnt Store **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				230,000
	Reliable Plant Capacity with Largest Well Out of Service				50,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		03/26/91		255,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	03/26/91		255,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	03/23/91		237,000
		(3)	03/28/91		232,000
		(4)	03/22/91		223,000
		(5)	03/07/91		204,000
	(There is no record of any unusual occurances)			AVERAGE	230,200
4.	Five-Day Max Year	(1)	03/26/91		255,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/27/91		255,000
		(3)	02/12/91		246,000
		(4)	03/23/91		237,000
		(5)	05/03/91		227,000
	(There is no record of any unusual occurances)			AVERAGE	244,000
5.	Average Daily Flow				139,099
6.	Required Fire Flow (1,250 GPM for 2 hours)				150,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance attached hereto)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Charlotte / Burnt Store

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	BURNT STORE
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	50,771
2	Annual Average Daily Demand	139,099
3	Maximum Day Demand - Date	03/26/91
4	Maximum Day Gallons Pumped	255,000
5	Gallons Per Minute Pumped	177
6	Fire Flow Requirement (Gallons)	150,000
7	Fire Flow Requirement (GPM)	1,250
8	Beginning No. of ERCs	542
9	Ending No. of ERCs	578
10	Average No. of ERCs	560
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	220
12	No. 2 (GPM Capacity)	220
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	440
15	Percent Used and Useful	80%
	Water Treatment Equipment: (Account No. 320.3)	
16	Hollow Fibre Filter Membrane Capacity (GPM)	132
17	Spiral Wound Filter Membrane Capacity (GPM)	35
18	Total R.O. Membrane Capacity	167
19	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
20	Tank No. 1	500,000
21	Total Storage Capacity in Gallons	500,000
22	Percent Used and Useful	47%
	High Service Pumps: (Account No. 311.4, 325.0_)	
23	No. 1 (Capacity in GPM)	1,500
24	No. 2 (Capacity in GPM)	280
25	No. 3 (Capacity in GPM)	280
26	Total High Service Pump Capacity	2,060
27	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
28	Tank No. 1	25,000
29	Percent Used and Useful (Tank No. 1)	90%
30	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
31	Average No. of ERCs	560
32	Permitted No. of Lots/ERCs	4,347
33	Percent Used and Useful	13%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Charlotte / Burnt Store

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Charlotte / Burnt Store

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Burnt Store
		(a)
1	Annual Growth From Schedule F-9	12.2%
2	Average Number Of Test Year ERC's	560
3	Number Of ERC's Associated With 1.5 Years Growth	103
4	Projected Number Of ERC's	663
5	Test Year Usage Per ERC @ MDD	456
6	MDD 1.5 Years Into Future	301,828
	Used and Useful With Margin Reserve:	
7	Supply Wells	95%
8	Finished Water Storage	50%
9	Distribution System	14%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Charlotte / Burnt Store

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987								
2	1988 [1]	430.0	430.0	430.0					
3	1989	430.0	459.0	444.5	42,620,000	95,883	42,620,000	444.5	
4	1990	459.0	542.0	500.5	48,765,300	97,433	48,765,300	500.5	12.6%
5	1991	542.0	577.5	560.0	44,168,500	78,872	44,168,500	560.0	11.9%
				Average Growth Through 2-Year Period (Col. 8)					12.2%

[1] Acquired December 1988. No prior data available.

Carlton Village - 555

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Lake County / Carlton Village
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,656		1,205	337	114	6.9%
2	February						
3	March	1,921		1,089	601	231	12.0%
4	April						
5	May	3,516		1,707	1,466	343	9.8%
6	June						
7	July	1,945		1,425	382	138	7.1%
8	August						
9	September	2,202		1,632	475	95	4.3%
10	October						
11	November	2,032		1,499	420	113	5.6%
12	December						
13							
14	Total	13,272	0	8,557	3,681	1,034	7.8%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	37		212	88		337
22	February						
23	March	19		488	94		601
24	April						
25	May	17		1364	85		1466
26	June						
27	July	56		230	96		382
28	August						
29	September	32		333	110		475
30	October						
31	November	22		288	110		420
32	December						
33	Totals	183	0	2915	583	0	3681
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Lake County / Carlton Village
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 22, 1990 thru January 18, 1991
March	January 19 thru March 18
May	March 19 thru May 17
July	May 18 thru July 17
September	July 18 thru September 17
November	September 18 thru November 19

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Carlton Village

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				244,800 100,800
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)		04/16/91		122,000
3.	Five-Day Max Month The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	05/04/91 05/05/91 05/06/91 05/03/91 05/02/91	AVERAGE	55,700 55,700 55,700 54,000 50,000 54,220
4.	Five-Day Max Year The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	04/16/91 09/13/91 03/29/91 01/29/91 05/04/91	AVERAGE	122,000 75,000 69,000 62,000 55,700 76,740
5.	Average Daily Flow				37,356
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				0

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Carlton Village

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Carlton Village [1]
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	13,635
2	Annual Average Daily Demand	37,356
3	Maximum Day Demand - Date	04/16/91
4	Maximum Day Gallons Pumped	122,000
5	Gallons Per Minute Pumped	85
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	90
9	Ending No. of ERCs	101
10	Average No. of ERCs	96
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	100
12	No. 2 (GPM Capacity)	70
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	170
15	Percent Used and Useful	100%
	Iron Removal Filters: (Account No. 320.3)	
16	No. 1 (Capacity in GPM)	0
17	No. 2 (Capacity in GPM)	0
18	Total Filter Capacity in GPM	0
19	Less: Largest unit out of service	
20	Reliable Filter Capacity	
21	Percent Used and Useful	
	High Service Pumps:(Account No. 311.2, 325.0_)	
22	No. 1 (Capacity in GPM)	0
23	No. 2 (Capacity in GPM)	0
24	No. 3 (Capacity in GPM)	0
25	Total High Service Pump Capacity	0
26	Percent Used and Useful	
	Hydropneumatic Tanks:(Account No. 320.3, or 330.4)	
27	Tank No. 1	3,000
28	Tank No. 2	275
29	Tank No. 3	
30	Total Hydro Tanks (Gallons)	3,275
31	Percent Used and Useful (Tank No. 1)	50%
32	Percent Used and Useful (Tank No. 2)	100%
33	Percent Used and Useful (Tank No. 3)	
34	Auxiliary Power/Pumping Equipment(Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
35	Average No. of ERC's	96
36	Permitted No. of Lots/ERC's	343
37	Percent Used and Useful	28%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] Two plants are interconnected.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Carlton Village

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Lake / Carlton Village

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Carlton Village
		(a)
1	Annual Growth From Schedule F-9	12.3%
2	Average Number Of Test Year ERC's	96
3	Number Of ERC's Associated With 1.5 Years Growth	18
4	Projected Number Of ERC's	113
5	Test Year Usage Per ERC @ MDD	1,277
6	MDD 1.5 Years Into Future	144,548
	Used and Useful With Margin Reserve:	
7	Distribution System	31%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Carlton Village

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3) ERCs	(4)	(5)	(6)	(7)	(8)	(9)
Line No.	Year	Beginning	Ending	Average	Gallons Sold	Gallons/ ERC (5)/(4)	Total Gallons Sold	Total ERCs (7)/(6)	Annual % Incr. in ERCs
1	1987[1]	59.0	61.0	60.0	5,906,000	98,433	5,906,000	60.0	ERR
2	1988	61.0	66.0	63.5	5,845,000	92,047	5,845,000	63.5	5.8%
3	1989	66.0	85.0	75.5	7,210,000	95,497	7,210,000	75.5	18.9%
4	1990	85.0	90.0	87.5	8,029,992	91,771	8,029,992	87.5	15.9%
5	1991	90.0	101.0	95.5	8,556,380	89,596	8,556,380	95.5	9.1%
				Average Growth Through 5-Year Period (Col. 8)					12.3%

[1] Acquired July 1987

Chuluota - 335

Seminole County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Seminole County / Chuluota
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	9,064		9,514	0	(430)	-4.7%
2	February					0	
3	March	10,053		9,553	3	497	4.9%
4	April					0	
5	May	10,012		9,934	5	73	0.7%
6	June					0	
7	July	9,966		9,719	15	232	2.3%
8	August					0	
9	September	13,588		11,542	1,010	1,036	7.6%
10	October					0	
11	November	10,963		8,557	721	1,685	15.4%
12	December					0	
13							
14	**Total**	**63,666**	**0**	**58,819**	**1,754**	**3,093**	**4.9%**
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February						
23	March	3					3
24	April						
25	May	5					5
26	June						
27	July	15					15
28	August						
29	September	160		850			1010
30	October						
31	November	468		253			721
32	December						
33	Totals	651	0	1103	0	0	1754
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Seminole County / Chuluota
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 27, 1990 thru January 22, 1991
March	January 23 thru March 25
May	March 26 thru May 22
July	May 23 thru July 23
September	July 23 thru September 24
November	September 25 thru November 21

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system was overbilled by 641,260 gallons in January and the consumption was credited in November. If the gallons sold were adjusted by 641,000 gallons, the January unaccounted for water percentage equals 4.5 % and the November unaccounted for water pertentage equals 8.3 %.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Seminole / Chuluota

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				1,152,000
	Reliable Plant Capacity with Largest Well Out of Service				432,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		08/05/91		483,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	08/05/91		483,000
		(2)	08/04/91		430,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	08/07/91		410,000
		(4)	08/08/91		386,000
		(5)	08/06/91		353,000
	(There is no record of any unusual occurances)			AVERAGE	412,400
4.	Five-Day Max Year	(1)	08/05/91		483,000
		(2)	11/12/91		434,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	08/04/91		430,000
		(4)	08/07/91		410,000
		(5)	08/08/91		386,000
	(There is no record of any unusual occurances)			AVERAGE	428,600
5.	Average Daily Flow				162,668
6.	Required Fire Flow (600 GPM for 2 hours)				72,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance attached hereto)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Seminole / Chuluota — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Chuluota [1]
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	59,374
2	Annual Average Daily Demand	162,668
3	Maximum Day Demand - Date	08/05/91
4	Maximum Day Gallons Pumped	483,000
5	Gallons Per Minute Pumped	335
6	Fire Flow Requirement (Gallons)	72,000
7	Fire Flow Requirement (GPM)	600
8	Beginning No. of ERCs	642
9	Ending No. of ERCs	665
10	Average No. of ERCs	654
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	500
12	No. 2 (GPM Capacity)	300
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	800
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	100,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	100,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	500
22	No. 2 & 5 (Capacity in GPM)	450
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	950
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	10,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	10,000
29	Percent Used and Useful (Tank No. 1)	100% [1]
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	654
33	Permitted No. of Lots/ERCs	1,055
34	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] The Commission found these plants/systems to be 100% used and useful in Docket # 890868-WS.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Seminole / Chuluota **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Seminole / Chuluota

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	559.0	578.0	568.5	54,783,000	96,364	54,783,000	568.5	ERR
2	1988	578.0	607.0	592.5	62,275,000	105,105	62,275,000	592.5	4.2%
3	1989	607.0	635.0	621.0	64,957,000	104,601	64,957,000	621.0	4.8%
4	1990	635.0	642.0	638.5	60,781,558	95,194	60,781,558	638.5	2.8%
5	1991	642.0	665.0	653.5	58,818,886	90,006	58,818,886	653.5	2.3%
					Average Growth Through 5-Year Period (Col. 8)				3.5%

Citrus Park - 1117

Marion County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

FPSC

In Thousands of gallons

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Marion County / Citrus Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January					0	
2	February	6,102		4,041	1,581	480	7.9%
3	March					0	
4	April	5,868		3,927	1,612	329	5.6%
5	May					0	
6	June	6,334		4,443	1,409	482	7.6%
7	July					0	
8	August	5,848		3,651	1,540	657	11.2%
9	September					0	
10	October	6,126		4,432	1,267	427	7.0%
11	November					0	
12	December	6,205		4,135	1,366	704	11.3%
13							
14	**Total**	**36,483**	**0**	**24,629**	**8,775**	**3,079**	**8.4%**
15							
16							

17 *Other use breakdowns are as follows:*

18					Unmetered &		
19	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	8	1401	172			1581
23	March						
24	April	101	1151	360			1612
25	May						
26	June	9	1200		200		1409
27	July						
28	August	13	1327		200		1540
29	September						
30	October	12	800	405	50		1267
31	November						
32	December	137	1229				1366
33	Totals	280	7108	937	450	0	8775
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Marion County / Citrus Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 15, 1990 thru February 13, 1991
April	February 14 thru April 12
June	April 13 thru June 13
August	June 14 thru August 15
October	August 16 thru October 12
December	October 13 thru December 12

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Marion / Citrus Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				424,800
	Reliable Plant Capacity with Largest Well Out of Service				194,400
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		10/24/91		160,900
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/14/91		143,000
		(2)	09/15/91		143,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	09/16/91		143,000
		(4)	09/11/91		137,000
		(5)	09/18/91		131,000
	(There is no record of any unusual occurances)			AVERAGE	139,400
4.	Five-Day Max Year	(1)	10/24/91		160,900
		(2)	09/14/91		143,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	09/15/91		143,000
		(4)	09/16/91		143,000
		(5)	11/14/91		143,000
	(There is no record of any unusual occurances)			AVERAGE	146,580
5.	Average Daily Flow				100,762
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. NO FIRE HYDRANTS ON DISTRIBUTION SYSTEM				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Marion / Citrus Park — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Citrus Park
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	36,778
2	Annual Average Daily Demand	100,762
3	Maximum Day Demand - Date	10/24/91
4	Maximum Day Gallons Pumped	160,900
5	Gallons Per Minute Pumped	112
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	335
9	Ending No. of ERCs	335
10	Average No. of ERCs	335
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	148
12	No. 2 (GPM Capacity)	137
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	285
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	4,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	4,000
29	Percent Used and Useful (Tank No. 1)	56%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	335
33	Permitted No. of Lots/ERCs	335
34	Percent Used and Useful	100%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Marion / Citrus Park **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Marion / Citrus Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	321.0	325.0	323.0	28,134,000	87,102	28,134,000	323.0	ERR
2	1988	325.0	333.0	329.0	27,280,000	82,918	27,280,000	329.0	1.9%
3	1989	333.0	334.0	333.5	28,470,000	85,367	28,470,000	333.5	1.4%
4	1990	334.0	335.0	334.5	26,323,900	78,696	26,323,900	334.5	0.3%
5	1991	335.0	335.0	335.0	24,629,870	73,522	24,629,870	335.0	0.1%
					Average Growth Through 5-Year Period (Col. 8)				0.9%

Citrus Springs Utilities - 9001

Citrus County (UFU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Citrus County / Citrus Springs
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	13,432		11,035	2,096	301	2.2%
2	February	12,070		9,748	1,216	1,106	9.2%
3	March	11,904		9,614	1,229	1,061	8.9%
4	April	13,758		10,128	1,467	2,163	15.7%
5	May	13,634		10,040	2,051	1,543	11.3%
6	June	13,911		12,115	2,051	(255)	-1.8%
7	July	13,668		10,696	1,345	1,627	11.9%
8	August	12,760		8,334	3,798	628	4.9%
9	September	13,818		9,998	4,292	(472)	-3.4%
10	October	15,878		10,316	1,685	3,877	24.4%
11	November	14,503		12,380	995	1,128	7.8%
12	December	13,277		9,010	848	3,419	25.8%
13							
14	Total	162,613	0	123,414	23,073	16,126	9.9%
15							
16							

Line							
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	969	150	295	672	10	2096
22	February	453	140	20	603		1216
23	March	479	155		595		1229
24	April	350	150	280	687		1467
25	May	1185	155	30	681		2051
26	June	1196	150	10	695		2051
27	July	507	155		683		1345
28	August	1935	155	1070	638		3798
29	September	1657	250	1695	690		4292
30	October	737	155		793		1685
31	November	85	150	35	725		995
32	December	35	150		663		848
33	Totals	9588	1915	3435	8125	10	23073
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Citrus County / Citrus Springs
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Pump to Equal Sold
January	December
February	January
March	February
April	March
May	April
June	May
July	June
August	July
September	August
October	September
November	October
December	November

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The pump figures are not coordinated with the billing cycle due to the numerous billing adjustments which cause the unaccounted for water percentage to fluctuate. The year end percentage is relatively accurate because the meters are read in the last week of the month.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Citrus / Citrus Springs

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				2,160,000
	Reliable Plant Capacity with Largest Well Out of Service				1,440,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		09/10/91		793,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/10/91		793,000
		(2)	09/12/91		671,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	09/09/91		642,000
		(4)	09/06/91		636,000
		(5)	09/04/91		599,000
	(There is no record of any unusual occurances)			AVERAGE	668,200
4.	Five-Day Max Year	(1)	09/10/91		793,000
		(2)	05/03/91		774,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	06/21/91		693,000
		(4)	09/12/91		671,000
		(5)	08/20/91		670,000
	(There is no record of any unusual occurances)			AVERAGE	720,200
5.	Average Daily Flow				452,036
6.	Required Fire Flow (2,250 GPM for 4 hours)				540,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Citrus / Citrus Springs — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Citrus Springs
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	164,993
2	Annual Average Daily Demand	452,036
3	Maximum Day Demand - Date	09/10/91
4	Maximum Day Gallons Pumped	793,000
5	Gallons Per Minute Pumped	551
6	Fire Flow Requirement (Gallons)	540,000
7	Fire Flow Requirement (GPM)	2,250 [1]
8	Beginning No. of ERCs	1,787
9	Ending No. of ERCs	1,863
10	Average No. of ERCs	1,825
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	642
12	No. 2 (GPM Capacity)	548
13	No. 3 (GPM Capacity)	340
14	Total Well Capacity (GPM)	1,530
15	Percent Used and Useful	100% [1]
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	6,000
27	Tank No. 2	5,000
28	Tank No. 3	1,000
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	100%
31	Percent Used and Useful (Tank No. 3)	100%
32	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
33	Average No. of ERCs	1,825
34	Permitted No. of Lots/ERCs	9,000
35	Percent Used and Useful	20%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] Fire flow excluded from used and useful calculation.

Notes: Additional well projected for 1993. See 5-year Capital Requirements Plan.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Citrus / Citrus Springs **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Citrus / Citrus Springs

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Citrus Springs (a)
1	Annual Growth From Schedule F-9	5.6%
2	Average Number Of Test Year ERC's	1,825
3	Number Of ERC's Associated With 1.0 Years Growth	103
4	Projected Number Of ERC's	1,928
5	Test Year Usage Per ERC @ MDD	1,000
6	MDD 1.5 Years Into Future	1,927,725
	Used and Useful With Margin Reserve:	
7	Distribution System	21%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Citrus / Citrus Springs

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	1,420.0	1,512.0	1,466.0	117,524,000	80,166	117,524,000	1,466.0	ERR
2	1988	1,512.0	1,597.0	1,554.5	132,675,000	85,349	132,675,000	1,554.5	6.0%
3	1989	1,597.0	1,682.0	1,639.5	141,580,000	86,356	141,580,000	1,639.5	5.5%
4	1990	1,682.0	1,787.0	1,734.5	143,330,670	82,635	143,330,670	1,734.5	5.8%
5	1991	1,787.0	1,863.0	1,825.0	123,413,068	67,624	123,413,068	1,825.0	5.2%
				Average Growth Through 5-Year Period (Col. 8)					5.6%

Crystal River Highlands - 984

Citrus County (SSU)

Water

- 1992 FPSC Filing -

Gallons of water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Citrus County / Crystal River
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	472		342	104	26	5.5%
2	February	604		374	200	30	5.0%
3	March	578		332	200	46	8.0%
4	April	752		391	298	63	8.4%
5	May	564		354	199	11	2.0%
6	June	713		458	201	54	7.6%
7	July	640		389	199	52	8.1%
8	August	866		406	410	50	5.8%
9	September	1,247		334	850	63	5.1%
10	October	1,478		411	988	79	5.3%
11	November	1,333		452	701	180	13.5%
12	December	1,106		271	554	281	25.4%
13							
14	Total	10,353	0	4,514	4,904	935	9.0%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19							
20							
21	January	4	100				104
22	February	6	194				200
23	March	6	194				200
24	April	4	294				298
25	May	5	194				199
26	June	4	197				201
27	July	5	194				199
28	August	10	300	100			410
29	September	250	600				850
30	October	8	295	685			988
31	November	57	294	350			701
32	December	260	294				554
33	Totals	619	3150	1135	0	0	4904
34							

35 Calculations are per monthly operating report file.

Gallons of water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Citrus County / Crystal River
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 20 1990 thru January 18, 1991
February	January 19 thru February 19
March	Feburary 20 thru March 19
April	March 20 thru April 23
May	April 24 thru May 19
June	May 20 thru June 19
July	June 20 thru July 18
August	July 19 thru August 21
September	August 22 thru September 18
October	September 19 thru October 22
November	October 23 thru November 22
December	November 23 thru December 18

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) *Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The* following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The system was credited 100,000 gallons in December, if the 100,000 gallons were adjusted, the unaccounted for water percentage for December would be 16.4 % and the annual percentage would equal 8.1 %.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Citrus / Crystal River **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				182,880
	Reliable Plant Capacity with Largest Well Out of Service				50,400
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		12/13/91		65,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/24/91		57,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	09/18/91		53,000
		(3)	09/20/91		52,000
		(4)	09/17/91		49,000
		(5)	09/03/91		48,000
				AVERAGE	51,800
4.	Five-Day Max Year	(1)	12/13/91		65,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	09/24/91		57,000
		(3)	10/23/91		54,000
		(4)	09/18/91		53,000
		(5)	09/20/91		52,000
				AVERAGE	56,200
5.	Average Daily Flow				29,422
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (No fire hydrants on distribution system)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Citrus / Crystal River | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Crystal River
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	10,739
2	Annual Average Daily Demand	29,422
3	Maximum Day Demand - Date	12/13/91
4	Maximum Day Gallons Pumped	65,000
5	Gallons Per Minute Pumped	45
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	66
9	Ending No. of ERCs	66
10	Average No. of ERCs	66
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	78
12	No. 2 (GPM Capacity)	75
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	153
15	Percent Used and Useful	100%
	Iron Removal Filters: (Account No. 320.3)	
16	No. 1 (Capacity in GPM)	100
17	No. 2 (Capacity in GPM)	0
18	Total Filter Capacity in GPM	100
19	Less: Largest unit out of service	100
20	Reliable Filter Capacity	0
21	Percent Used and Useful	100%
	High Service Pumps:(Account No. 311.2, 325.0_)	
22	No. 1 (Capacity in GPM)	0
23	No. 2 (Capacity in GPM)	0
24	No. 3 (Capacity in GPM)	0
25	Total High Service Pump Capacity	0
26	Percent Used and Useful	
	Hydropneumatic Tanks:(Account No. 320.3, or 330.4)	
27	Tank No. 1	1,000
28	Tank No. 2	1,000
29	Tank No. 3	
30	Total Hydro Tanks (Gallons)	2,000
31	Percent Used and Useful (Tank No. 1)	100%
32	Percent Used and Useful (Tank No. 2)	100%
33	Percent Used and Useful (Tank No. 3)	
34	Auxiliary Power/Pumping Equipment(Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
35	Average No. of ERC's	66
36	Permitted No. of Lots/ERC's	91
37	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Citrus / Crystal River — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7

Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Citrus / Crystal River FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	45.0	45.0	45.0	2,216,000	49,244	2,216,000	45.0	ERR
2	1988	45.0	65.0	55.0	4,935,000	89,727	4,935,000	55.0	22.2%
3	1989	65.0	65.0	65.0	5,802,000	89,262	5,802,000	65.0	18.2%
4	1990	65.0	66.0	65.5	5,184,200	79,148	5,184,200	65.5	0.8%
5	1991	66.0	66.0	66.0	4,514,050	68,395	4,514,050	66.0	0.8%
					Average Growth Through 5-Year Period (Col. 8)				10.0%

Daetwyler Shores - 105

Orange County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Orange County / Daetwyler
Docket No: 920199-WS
Test Year Ended: December 31, 1990

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	2,446		1,575	10	861	35.2%
2	February						
3	March	2,716		2,582	0	134	4.9%
4	April						
5	May	2,841		2,730	8	103	3.6%
6	June						
7	July	2,558		2,289	13	256	10.0%
8	August						
9	September	838	1,646	2,938	18	(472)	-19.0%
10	October						
11	November		2,520	2,197	0	323	12.8%
12	December						
13							
14	Total	11,399	4,166	14,311	49	1,205	7.7%
15							
16							

17 Other use breakdowns are as follows:

18

19	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January	10					10
22	February						
23	March						0
24	April						
25	May	8					8
26	June						
27	July	13					13
28	August						
29	September		18				18
30	October						
31	November						0
32	December						
33	Totals	31	18	0	0	0	49
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Orange County / Daetwyler
Docket No: 920199-WS
Test Year Ended: December 31, 1990

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the purchase column comes from the Purchased Water Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 29, 1990 thru January 23, 1991
March	January 24 thru March 26
May	March 27 thru May 25
July	May 26 thru July 25
September	July 16 thru September 26
November	September 27 thru November 26

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The water treatment plant was taken off line and interconnected with Orlando Utilities Commission August 14, 1991. The invoices from Orlando Utilities are not coordinated with our billing cycle, therefore causing a fluctuation in the unaccounted for water percentage.

4) This system was overbilled by 598,000 gallons in November of 1990 and the consumption was credited in January of 1991. If the January unaccounted for water percentage is recalculated based on the adjusted gallons, the unaccounted for water percentage equals 10.8 % for January with an annual percentage of 3.9 %.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Orange / Daetwyler Shores

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: *Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.*

			DATE		GPD
	NOTE: ALL WATER PURCHASED FROM OUC AS OF AUGUST 15.				
1.	Plant Capacity				1,440,000
	Reliable Plant Capacity with Largest Well Out of Service				720,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		06/18/91		113,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	05/04/91		78,500
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/05/91		78,500
		(3)	05/03/91		72,000
		(4)	05/06/91		62,000
		(5)	05/02/91		62,000
				AVERAGE	70,600
4.	Five-Day Max Year	(1)	06/18/91		113,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/04/91		78,500
		(3)	05/05/91		78,500
		(4)	05/03/91		72,000
		(5)	05/06/91		62,000
				AVERAGE	80,800
5.	Average Daily Flow				44,071
6.	Required Fire Flow (500 GPM for 2 hours)				60,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance attached hereto)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Orange / Daetwyler Shores — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Daetwyler Shores
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	9,960 [1]
2	Annual Average Daily Demand	44,071 [1]
3	Maximum Day Demand - Date	06/18/91
4	Maximum Day Gallons Pumped	113,000
5	Gallons Per Minute Pumped	78
6	Fire Flow Requirement (Gallons)	60,000
7	Fire Flow Requirement (GPM)	500
8	Beginning No. of ERCs	137
9	Ending No. of ERCs	129
10	Average No. of ERCs	133
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	500
12	No. 2 (GPM Capacity)	500
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	1,000
15	Percent Used and Useful	31%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	12,500
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	12,500
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	450
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	450
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100%
29	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	133
31	Permitted No. of Lots/ERCs	139
32	Percent Used and Useful	100% [2]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] As of August 15th, all water purchased from OUC.
[2] 100% used and useful based on customer density.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Orange / Daetwyler Shores

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Orange / Daetwyler Shores

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	132.0	132.0	132.0	14,627,000	110,811	14,627,000	132.0	ERR
2	1988	132.0	132.0	132.0	15,710,000	119,015	15,710,000	132.0	0.0%
3	1989	132.0	135.0	133.5	18,966,000	142,067	18,966,000	133.5	1.1%
4	1990	135.0	137.0	136.0	19,190,150	141,104	19,190,150	136.0	1.9%
5	1991	137.0	129.0	133.0	14,311,202	107,603	14,311,202	133.0	-2.2%
				Average Growth Through 5-Year Period (Col. 8)					0.2%

Deltona Utilities - 18001

Volusia County (DUI)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: DUI - SSU / Volusia County / Deltona Lakes
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	251,960		219,260	4,258	28,442	11.3%
2	February	232,083		199,596	2,452	30,035	12.9%
3	March	233,994		209,499	3,032	21,463	9.2%
4	April	261,352		209,521	2,935	48,896	18.7%
5	May	245,957		222,443	3,130	20,384	8.3%
6	June	293,081		259,625	4,245	29,211	10.0%
7	July	241,539		213,646	8,700	19,193	7.9%
8	August	215,852		193,859	5,105	16,888	7.8%
9	September	273,440		247,684	7,082	18,674	6.8%
10	October	289,267		241,371	8,228	39,668	13.7%
11	November	242,236		216,144	3,781	22,311	9.2%
12	December	256,671		223,310	3,031	30,330	11.8%
13							
14	**Total**	**3,037,432**	**0**	**2,655,958**	**55,979**	**325,495**	**10.7%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19							
20							
21	January	580	13	37	2,520	1,108	4,258
22	February	52	11	66	2,321	2	2,452
23	March	248	11	378	2,340	55	3,032
24	April	176	16	106	2,614	23	2,935
25	May	83	12	574	2,460	1	3,130
26	June	158	15	1,118	2,931	23	4,245
27	July	6,182	14	87	2,415	2	8,700
28	August	2,864	11	68	2,159	3	5,105
29	September	4,041	11	293	2,734	3	7,082
30	October	5,186	7	140	2,893	2	8,228
31	November	1,297	12	38	2,421	13	3,781
32	December	78	11	264	2,566	112	3,031
33	Totals	20,945	144	3,169	30,374	1,347	55,979
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: DUI - SSU / Volusia County / Deltona Lakes
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 1990
February	January '91
March	February
April	March
May	April
June	May
July	June
August	July
September	August
October	September
November	October
December	November

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) The pumped gallons are not adjusted to coordinate with the sold gallons. Since this system is read and billed throughout the entire month it would be virtually impossible to coordinate sold to pumped gallons.

2) Customer meters are read incorrectly causing over or under billing on the usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

3) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: DUI-SSU / Volusia / Deltona Lakes **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				21,787,200
	Reliable Plant Capacity with 2 Largest Well Out of Service				17,467,200
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		05/12/91		14,460,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	05/12/91		14,460,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/11/91		13,177,000
		(3)	05/05/91		13,036,000
		(4)	05/07/91		12,759,000
		(5)	05/10/91		12,518,000
				AVERAGE	13,190,000
4.	Five-Day Max Year	(1)	05/12/91		14,460,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/11/91		13,177,000
		(3)	05/05/91		13,036,000
		(4)	09/15/91		12,977,000
		(5)	05/07/91		12,759,000
				AVERAGE	13,281,800
5.	Average Daily Flow				8,322,260
6.	Required Fire Flow (2500 GPM for ~~4~~ 2 hours)				~~6~~3 00,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (Per NFPA)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: DUI-SSU / Volusia / Deltona Lakes

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Deltona Lakes
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	3,037,625
2	Annual Average Daily Demand	8,322,260
3	Maximum Day Demand - Date	05/12/91
4	Maximum Day Gallons Pumped	14,460,000
5	Gallons Per Minute Pumped	10,042
6	Fire Flow Requirement (Gallons)	600,000
7	Fire Flow Requirement (GPM)	2,500
8	Beginning No. of ERCs	22,829
9	Ending No. of ERCs	23,359
10	Average No. of ERCs	23,094
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	Total Well Capacity (23 Wells) GPM	15,130
12	Two largest wells out of service	3,000
13	Total Reliable Well Capacity (GPM)	12,130
14	Percent Used and Useful	83%
	Finished Water Storage: (Account No. 330.4)	
15	Total Storage Capacity in Gallons	5,000,000
16	Less "Dead Storage"	0
17	Total Storage Capacity in Gallons	5,000,000
18	Percent Used and Useful	100% [2]
	High Service Pumps: (Account No. 311.2, 325.0_)	
19	Pumps that discharge from reservoirs(10 pumps)	10,950
20	Two largest pumps out of service	4,200
21	Wells that can pump directly to dist. (17 wells)	12,530
22	Two largest wells out of service	3,000
23	Total High Service Pump Capacity	16,280
24	Percent Used and Useful	100% [2]
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
25	Tank No. 1 (Courtland)	7,500
26	Tank No. 2 (Golf Course)	6,000
27	Tank No. 3 (Lombardy)	6,000
28	Tank No. 4 (Wellington)	6,000
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	100%
31	Percent Used and Useful (Tank No. 3)	100%
32	Percent Used and Useful (Tank No. 4)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
33	Average No. of ERCs	23,094
34	Permitted No. of Lots/ERCs	30,000
35	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density and pipe size.
[2] Reference is made to the 10 Year Master Plan prepared by Hartman & Associates. Section 3 of the report compares the capacity vs demand for these facilities.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: DUI-SSU / Volusia / Deltona Lakes

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: DUI-SSU / Volusia / Deltona Lakes

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Deltona Lakes
		(a)
1	Annual Growth From Schedule F-9	10.7%
2	Average Number Of Test Year ERC's	23,094
3	Number Of ERC's Associated With 1.5 Years Growth	3,710
4	Projected Number Of ERC's	26,804
5	Test Year Usage Per ERC @ MDD	626
6	MDD 1.5 Years Into Future	16,782,904
	Used and Useful With Margin Reserve:	
7	Supply Wells	96%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: DUI-SSU / Volusia / Deltona Lakes

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold [1]	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	14,483.5	16,262.0	15,373.0	1,933,389	126	1,933,389	15,373.0	ERR
2	1988	16,262.0	20,048.5	18,155.5	2,359,076	130	2,359,076	18,155.5	18.1%
3	1989	20,048.5	21,704.0	20,876.5	2,715,777	130	2,715,777	20,876.5	15.0%
4	1990	21,704.0	22,828.5	22,266.5	2,856,364	128	2,856,364	22,266.5	6.7%
5	1991	22,828.5	23,359.0	23,094.0	2,655,957	115	2,655,957	23,094.0	3.7%
					Average Growth Through 5-Year Period (Col. 8)				10.7%

[1] Expressed in thousands of gallons.

Dol Ray Manor - 336

Seminole County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted for

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Seminole County / Dol Ray
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	2,075		1,010	18	1,047	50.5%
2	February						
3	March	2,118		1,057	20	1,041	49.2%
4	April						
5	May	2,229		1,169	4	1,056	47.4%
6	June						
7	July	2,249		1,095	5	1,149	51.1%
8	August						
9	September	2,154		2,015	9	130	6.0%
10	October						
11	November	2,621		2,573	2	46	1.8%
12	December						
13							
14	**Total**	**13,446**	**0**	**8,919**	**58**	**4,469**	**33.2%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmeterd & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmeterd & Stuck Meters	Fire Dept.	Totals
20							
21	January	16	2				18
22	February						
23	March	15	5				20
24	April						
25	May	4					4
26	June						
27	July	5					5
28	August						
29	September	9					9
30	October						
31	November	2					2
32	December						
33	Totals	51	7	0	0	0	58
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted for
In Thousands of gallons

FPSC

Company: SSU / Seminole County / Dol Ray
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 19, 1990 thru January 21, 1991
March	January 22 thru March 25
May	March 26 thru May 20
July	May 21 thru July 22
September	July 23 thru September 20
November	September 21 thru November 20

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) According to our billing history, a condominium connected to this system had a signigicant reduction in water usage. Upon investigation it was determined that the turbine meter was not accurately registering consumption. The meter guts were replaced in late July of 1991 and the condominium was back billed for 4,152,496 gallons. If the sold gallons are adjusted by the 4 million gallons, this system would have 2.3 % unaccounted for water.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Seminole / Dol Ray Manor | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				756,000
	Reliable Plant Capacity with Largest Well Out of Service				360,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		06/17/91		76,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	12/02/91		63,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/27/91		58,000
		(3)	12/26/91		57,000
		(4)	12/25/91		54,000
		(5)	12/13/91		53,000
	(There is no record of any unusual occurances)			AVERAGE	57,000
4.	Five-Day Max Year	(1)	06/17/91		76,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/02/91		63,000
		(3)	12/27/91		58,000
		(4)	09/20/91		57,000
		(5)	12/26/91		57,000
	(There is no record of any unusual occurances)			AVERAGE	62,200
5.	Average Daily Flow				38,090
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Seminole / Dol Ray Manor — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Dol Ray Manor
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	13,903
2	Annual Average Daily Demand	38,090
3	Maximum Day Demand - Date	06/17/91
4	Maximum Day Gallons Pumped	76,000
5	Gallons Per Minute Pumped	53
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	77
9	Ending No. of ERCs	77
10	Average No. of ERCs	77
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	275
12	No. 2 (GPM Capacity)	250
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	525
15	Percent Used and Useful	100% [1]
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	8,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	8,000
20	Percent Used and Useful	100% [1]
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	250
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	250
25	Percent Used and Useful	100% [1]
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100% [1]
29	Auxiliary Power: (Acct. 310.2)	100% [1]
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	77
31	Permitted No. of Lots/ERCs	77
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] The Commission found the plant/system to be 100% used and useful in Docket # 890868-WS.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Seminole / Dol Ray Manor **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Seminole / Dol Ray Manor

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3) ERCs	(4)	(5)	(6)	(7)	(8)	(9)
Line No.	Year	Beginning	Ending	Average	Gallons Sold	Gallons/ ERC (5)/(4)	Total Gallons Sold	Total ERCs (7)/(6)	Annual % Incr. in ERCs
1	1987	76.0	76.0	76.0	12,256,000	161,263	12,256,000	76.0	ERR
2	1988	76.0	78.0	77.0	13,512,000	175,481	13,512,000	77.0	1.3%
3	1989	78.0	77.0	77.5	15,262,000	196,929	15,262,000	77.5	0.6%
4	1990	77.0	77.0	77.0	10,314,100	133,949	10,314,100	77.0	-0.6%
5	1991	77.0	77.0	77.0	8,918,940	115,830	8,918,940	77.0	0.0%
				Average Growth Through 5-Year Period (Col. 8)					0.3%

Druid Hills - 334

Seminole County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Seminole County / Druid Hills
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	9,417		8,358	610	449	4.8%
2	February						
3	March	7,506		6,103	742	661	8.8%
4	April						
5	May	8,345		6,412	1,062	871	10.4%
6	June						
7	July	7,670		6,191	1,013	466	6.1%
8	August						
9	September	8,010		6,546	801	663	8.3%
10	October						
11	November	7,764		6,500	649	615	7.9%
12	December						
13							
14	Total	48,712	0	40,110	4,877	3,725	7.6%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19							
20							
21	January	61	149		400		610
22	February						
23	March	107	111	24	400	100	742
24	April						
25	May	109	114	239	400	200	1062
26	June						
27	July	184	114	115	400	200	1013
28	August						
29	September	122	114	115	400	50	801
30	October						
31	November	135	114		400		649
32	December						
33	Totals	718	716	493	2400	550	4877
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Seminole County / Druid Hills
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 20, 1990 thru January 21, 1991
March	January 22 thru March 25
May	March 26 thru May 20
July	May 21 thru July 23
September	July 24 thru September 23
November	September 24 thru November 19

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Seminole / Druid Hills

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				591,840
	Reliable Plant Capacity with Largest Well Out of Service				226,080
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		05/17/91		297,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	12/02/91		205,000
		(2)	12/22/91		205,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	12/23/91		205,000
		(4)	12/21/91		197,000
		(5)	12/26/91		195,000
	(There is no record of any unusual occurances)			AVERAGE	201,400
4.	Five-Day Max Year	(1)	05/17/91		297,000
		(2)	09/07/91		229,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	10/20/91		228,000
		(4)	10/21/91		228,000
		(5)	09/20/91		227,000
	(There is no record of any unusual occurances)			AVERAGE	241,800
5.	Average Daily Flow				132,742
6.	Required Fire Flow (600 GPM for 2 hours)				72,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Seminole / Druid Hills — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Druid Hills
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	48,451
2	Annual Average Daily Demand	132,742
3	Maximum Day Demand - Date	05/17/91
4	Maximum Day Gallons Pumped	297,000
5	Gallons Per Minute Pumped	206
6	Fire Flow Requirement (Gallons)	72,000
7	Fire Flow Requirement (GPM)	600
8	Beginning No. of ERCs	330
9	Ending No. of ERCs	330
10	Average No. of ERCs	330
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	254
12	No. 2 (GPM Capacity)	157
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	411
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	30,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	30,000
20	Percent Used and Useful	100% [2]
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	250
22	No. 2 (Capacity in GPM)	250
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	500
25	Percent Used and Useful	100% [2]
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	7,500
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	7,500
29	Percent Used and Useful (Tank No. 1)	51%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	330
33	Permitted No. of Lots/ERCs	335
34	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size, and system layout.
[2] Fire flow excluded from used and useful calculation.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Seminole / Druid Hills **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Seminole / Druid Hills

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	333.0	335.0	334.0	47,725,000	142,889	47,725,000	334.0	ERR
2	1988	335.0	332.0	333.5	44,921,000	134,696	44,921,000	333.5	-0.1%
3	1989	332.0	331.0	331.5	46,652,000	140,730	46,652,000	331.5	-0.6%
4	1990	331.0	330.0	330.5	49,758,928	150,557	49,758,928	330.5	-0.3%
5	1991	330.0	329.5	330.0	40,110,570	121,547	40,110,570	330.0	-0.2%
				Average Growth Through 5-Year Period (Col. 8)					-0.3%

East Lake Harris Estates - 557

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Lake County / E. Lake Harris
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	998		957	9	32	3.2%
3	March						
4	April	1,172		1,038	29	105	9.0%
5	May						
6	June	886		768	25	93	10.5%
7	July						
8	August	720		600	62	58	8.1%
9	September						
10	October	1,160		1,052	12	96	8.3%
11	November						
12	December	1,018		859	54	105	10.3%
13							
14	Total	5,954	0	5,274	191	489	8.2%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	9					9
23	March						
24	April	21		8			29
25	May						
26	June	10		15			25
27	July						
28	August	4		58			62
29	September						
30	October	12					12
31	November						
32	December	3			51		54
33	Totals	69	0	81	51	0	191
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Lake County / E. Lake Harris
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 13, 1990 thru February 11, 1991
April	February 12 thru April 10
June	April 11 thru June 12
August	June 13 thru August 9
October	August 10 thru October 12
December	October 13 thru December 9

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / East Lake Harris Estates **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				201,600
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		04/04/91		35,500
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/14/91		29,900
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/15/91		29,900
		(3)	09/16/91		29,900
		(4)	09/18/91		29,000
		(5)	09/06/91		27,000
	(There is no record of any unusual occurances)			AVERAGE	29,140
4.	Five-Day Max Year	(1)	04/04/91		35,500
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	11/14/91		34,000
		(3)	09/14/91		29,900
		(4)	09/15/91		29,900
		(5)	09/16/91		29,900
	(There is no record of any unusual occurances)			AVERAGE	31,840
5.	Average Daily Flow				16,543
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / East Lake Harris Estates **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	E. Lake Harris Est.
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	6,038
2	Annual Average Daily Demand	16,543
3	Maximum Day Demand - Date	04/04/91
4	Maximum Day Gallons Pumped	35,500
5	Gallons Per Minute Pumped	25
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	169
9	Ending No. of ERCs	170
10	Average No. of ERCs	170
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	140
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	140
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	70%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	170
31	Permitted No. of Lots/ERCs	214
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on system design, layout, and customer density.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / East Lake Harris Estates | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / East Lake Harris Estates — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	172.0	170.0	171.0	5,199,000	30,404	5,199,000	171.0	ERR
2	1988	170.0	167.0	168.5	5,203,000	30,878	5,203,000	168.5	-1.5%
3	1989	167.0	169.0	168.0	5,184,000	30,857	5,184,000	168.0	-0.3%
4	1990	169.0	169.0	169.0	5,724,230	33,871	5,724,230	169.0	0.6%
5	1991	169.0	170.0	169.5	5,274,190	31,116	5,274,190	169.5	0.3%
					Average Growth Through 5-Year Period (Col. 8)				-0.2%

Fern Park - 324

Seminole County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Seminole County / Fern Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	3,466		2,904	559	3	0.1%
2	February						
3	March	2,814	38	2,044	466	342	12.0%
4	April						
5	May	3,137	165	2,541	367	394	11.9%
6	June						
7	July	3,019		2,451	288	280	9.3%
8	August						
9	September	3,163	47	2,934	245	31	1.0%
10	October						
11	November	2,760	216	2,100	170	706	23.7%
12	December						
13							
14	Total	18,359	466	14,974	2,095	1,756	9.3%
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	30	520		9		559
22	February						
23	March	34	423		9		466
24	April						
25	May	12	346		9		367
26	June						
27	July	15	264		9		288
28	August						
29	September	33	203		9		245
30	October						
31	November	38	123		9		170
32	December						
33	Totals	162	1879	0	54	0	2095
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Seminole County / Fern Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the purchased column comes from the Purchased Water Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 6, 1990 thru January 10, 1991
March	January 11 thru March 7
May	March 8 thru May 7
July	May 8 thru July 8
September	July 9 thru September 9
November	September 10 thru November 7

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The system is interconnected to the City of Altamonte Springs for emergency standby purposes. When water is purchased, the purchased gallons are shown in the month the invoice is received. These gallons are not coordinated with sold gallons.

4) This system was overbilled by 317,000 gallons in September and credited back in November. If the sold gallons were adjusted, the September unaccounted for water percentage equals 10.8 and the November percentage equals 13.1 with the annual percentage remaining the same.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Seminole / Fern Park — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Fern Park
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	18,189
2	Annual Average Daily Demand	49,833
3	Maximum Day Demand - Date	09/20/91
4	Maximum Day Gallons Pumped	71,000
5	Gallons Per Minute Pumped	49
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	180
9	Ending No. of ERCs	179
10	Average No. of ERCs	179
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	259
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	259
15	Percent Used and Useful	100% [1]
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	17,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	17,000
20	Percent Used and Useful	100% [1]
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	250
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	250
25	Percent Used and Useful	100% [1]
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	4,500
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100% [1]
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	179
31	Permitted No. of Lots/ERCs	200
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

[1] The Commission found the plant/system to be 100% used and useful in Docket # 890868-WS.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Seminole / Fern Park | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Seminole / Fern Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3) ERCs	(4)	(5)	(6)	(7)	(8)	(9)
Line No.	Year	Beginning	Ending	Average	Gallons Sold	Gallons/ ERC (5)/(4)	Total Gallons Sold	Total ERCs (7)/(6)	Annual % Incr. in ERCs
1	1987	176.0	170.0	173.0	16,455,000	95,116	16,455,000	173.0	ERR
2	1988	170.0	175.0	172.5	15,756,000	91,339	15,756,000	172.5	-0.3%
3	1989	175.0	179.0	177.0	16,767,000	94,729	16,767,000	177.0	2.6%
4	1990	179.0	180.0	179.5	16,975,340	94,570	16,975,340	179.5	1.4%
5	1991	180.0	178.5	179.5	14,972,700	83,413	14,972,700	179.5	0.0%
				Average Growth Through 5-Year Period (Col. 8)					0.9%

Fern Terrace - 552

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Lake County / Fern Terrace
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	2,365		1,940	281	144	6.1%
2	February						
3	March	1,883		1,449	328	106	5.6%
4	April						
5	May	2,446		1,842	465	139	5.7%
6	June						
7	July	2,743		2,033	534	176	6.4%
8	August						
9	September	2,602		1,881	340	381	14.6%
10	October						
11	November	2,598		2,005	298	295	11.4%
12	December						
13							
14	**Total**	**14,637**	**0**	**11,150**	**2,247**	**1,240**	**8.5%**
15							
16							

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	9	154		118		281
22	February						
23	March	42	144	48	94		328
24	April						
25	May	49	145	149	122		465
26	June						
27	July	50	153	194	137		534
28	August						
29	September	6	154		130	50	340
30	October						
31	November	3	146	9	130	10	298
32	December						
33	Totals	159	896	400	732	60	2247
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Lake County / Fern Terrace
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 2, 1990 thru January 3, 1991
March	January 4 thru March 2
May	March 3 thru April 30
July	May 1 thru July 1
September	July 2 thru September 2
November	September 3 thru November 1

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) It has been determined that the check valve is leaking slowly back into the well at approximately 2 gallons per minute. The consumption was calculated by taking the acutal minutes in the billing cycle minus the minutes the pump ran times 2 gpm and is listed under Utility Use.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Fern Terrace

Docket No. 920199-WS
Test Year Ended: 12/31/91

FPSC

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				142,560
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)		08/17/91		67,000
3.	Five-Day Max Month The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1)	05/11/91		62,000
		(2)	05/09/91		61,000
		(3)	05/05/91		61,000
		(4)	05/06/91		61,000
		(5)	05/10/91		58,000
				AVERAGE	60,600
4.	Five-Day Max Year The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1)	08/17/91		67,000
		(2)	10/12/91		65,000
		(3)	09/14/91		64,000
		(4)	05/11/91		62,000
		(5)	05/09/91		61,000
				AVERAGE	63,800
5.	Average Daily Flow				40,984
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				0

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Fern Terrace **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Fern Terrace
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	14,959
2	Annual Average Daily Demand	40,984
3	Maximum Day Demand - Date	08/17/91
4	Maximum Day Gallons Pumped	67,000
5	Gallons Per Minute Pumped	47
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	121
9	Ending No. of ERCs	121
10	Average No. of ERCs	121
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	99
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	99
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	50%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	121
31	Permitted No. of Lots/ERCs	126
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, system layout and pipe size.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Fern Terrace **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Fern Terrace **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	114.0	112.0	113.0	10,133,000	89,673	10,133,000	113.0	ERR
2	1988	112.0	114.0	113.0	11,252,000	99,575	11,252,000	113.0	0.0%
3	1989	114.0	117.0	115.5	11,026,000	95,463	11,026,000	115.5	2.2%
4	1990	117.0	121.0	119.0	11,446,350	96,188	11,446,350	119.0	3.0%
5	1991	121.0	120.5	121.0	11,150,250	92,151	11,150,250	121.0	1.7%
				Average Growth Through 5-Year Period (Col. 8)					1.7%

Fisherman's Haven - 673

Martin County (SSU)

Water

- 1992 FPSC Filing -

Gallons of water pumped, sold and unaccounted for
In Thousands of gallons

FPSC

Schedule F-1

Preparer: C. Sweat

Company: SSU / Martin County / Fishermans Haven
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	2,218		1,542	354	322	14.5%
2	February						
3	March	1,947		1,446	325	176	9.0%
4	April						
5	May	2,192		1,657	322	213	9.7%
6	June						
7	July	2,089		1,555	333	201	9.6%
8	August						
9	September	1,997		1,497	311	189	9.5%
10	October						
11	November	2,126		1,606	328	192	9.0%
12	December						
13							
14	Total	12,569	0	9,303	1,973	1,293	10.3%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	31	203	20	100		354
22	February						0
23	March	11	214		100		325
24	April						0
25	May	9	213		100		322
26	June						0
27	July	8	200	25	100		333
28	August						0
29	September	11	200		100		311
30	October						0
31	November	3	225		100		328
32	December						0
33	Totals	73	1255	45	600	0	1973
34							

35 Calculations are per monthly operating report file.

Gallons of water pumped, sold and unaccounted for
In Thousands of gallons

Company: SSU / Martin County / Fishermans Haven
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 4, 1990 thru January 1,1991
March	January 2 thru March 2
May	March 3 thru May 2
July	May 3 thru July 3
September	July 4 thru September 1
November	September 2 thru November 3

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Martin / Fishermans Haven

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				144,000
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)		08/10/91		84,000
3.	Five-Day Max Month	(1)	12/02/91		51,000
		(2)	12/22/91		49,800
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	12/06/91		47,100
		(4)	12/04/91		46,600
		(5)	12/14/91		44,800
	(There is no record of any unusual occurances)			AVERAGE	47,860
4.	Five-Day Max Year	(1)	08/10/91		84,000
		(2)	08/20/91		58,900
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	03/30/91		58,100
		(4)	03/04/91		52,600
		(5)	02/20/91		52,000
	(There is no record of any unusual occurances)			AVERAGE	61,120
5.	Average Daily Flow				34,468
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Martin / Fishermans Haven **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Fishermans Haven
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	12,581
2	Annual Average Daily Demand	34,468
3	Maximum Day Demand - Date	08/10/91
4	Maximum Day Gallons Pumped	84,000
5	Gallons Per Minute Pumped	58
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	131
9	Ending No. of ERCs	134
10	Average No. of ERCs	133
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	100
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	100
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	10,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	15%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	133
31	Permitted No. of Lots/ERCs	135
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size and layout.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Martin / Fishermans Haven

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Martin / Fishermans Haven

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	127.0	127.0	127.0	11,324,000	89,165	11,324,000	127.0	ERR
2	1988	127.0	135.0	131.0	9,598,000	73,267	9,598,000	131.0	3.1%
3	1989	135.0	134.0	134.5	11,769,000	87,502	11,769,000	134.5	2.7%
4	1990	134.0	131.0	132.5	11,051,000	83,404	11,051,000	132.5	-1.5%
5	1991	131.0	134.0	132.5	9,304,470	70,222	9,304,470	132.5	0.0%
					Average Growth Through 5-Year Period (Col. 8)				1.1%

Fountains - 772

Osceola County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Osceola County / Fountains
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Line No.	Month/ Year	Total Gallons Pumped	Gallons Purchased	Gallons Sold	Other Uses	Unaccounted For Water (2)+(3)-(4)-(5)	% Unaccounted For Water
1	January						
2	February						
3	March						
4	April	162				162	100.0%
5	May	74				74	100.0%
6	June	86			9	77	89.5%
7	July	72				72	100.0%
8	August	61				61	100.0%
9	September	89				89	100.0%
10	October	72				72	100.0%
11	November	72				72	100.0%
12	December	64				64	100.0%
13							
14	**Total**	**752**	**0**	**0**	**9**	**743**	**98.8%**
15							
16							

Line No.							
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February						
23	March						0
24	April						
25	May						0
26	June	9					
27	July						0
28	August						
29	September						0
30	October						
31	November						0
32	December						
33	Totals	9	0	0	0	0	0
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Osceola County / Fountains
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
	April
	May
	June
	July
	August
	September
	October
	November
	December

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Osceola / Fountains

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
	PLANT BEGAN OPERATION IN APRIL 1991.				
1.	Plant Capacity				734,400
	Reliable Plant Capacity with Largest Well Out of Service				230,400
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		04/25/91		87,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	04/25/91		87,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	04/03/91		40,000
		(3)	04/22/91		24,000
		(4)	04/04/91		3,000
		(5)	04/10/91		3,000
				AVERAGE	31,400
4.	Five-Day Max Year	(1)	04/25/91		87,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	04/03/91		40,000
		(3)	04/22/91		24,000
		(4)	07/22/91		20,000
		(5)	06/20/91		16,300
				AVERAGE	37,460
5.	Average Daily Flow				2,060
6.	Required Fire Flow (250 GPM for 2 hours)				30,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See NFPA Pamplet No. 1)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Osceola / Fountains **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Fountains
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	752
2	Annual Average Daily Demand	2,060
3	Maximum Day Demand - Date	04/25/91
4	Maximum Day Gallons Pumped	87,000
5	Gallons Per Minute Pumped	60
6	Fire Flow Requirement (Gallons)	30,000
7	Fire Flow Requirement (GPM)	250
8	Beginning No. of ERCs	0
9	Ending No. of ERCs	8
10	Average No. of ERCs	4
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	350
12	No. 2 (GPM Capacity)	160
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	510
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	20,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	20,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	500
22	No. 2 & 5 (Capacity in GPM)	500
23	No. 3 & 6 (Capacity in GPM)	500
24	Total High Service Pump Capacity	1,500
25	Percent Used and Useful	37%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	13,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	58%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	4
31	Permitted No. of Lots/ERCs	84
32	Percent Used and Useful	5%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Osceola / Fountains **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Osceola / Fountains

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Fountains
		(a)
1	Annual Growth From Schedule F-9	N/A
2	Average Number Of Test Year ERC's	4
3	Number Of ERC's Associated With 1.5 Years Growth	49
4	Projected Number Of ERC's	53
5	Test Year Usage Per ERC @ MDD	1,584 [2]
6	MDD 1.5 Years Into Future	83,952
	Used and Useful With Margin Reserve:	
7	High Service Pumps	37%
8	Distribution System	40% [1]

[1] Assumes 30 ERCs added per year.
[2] Assumes 1.1 GPM/ERC @ MDD

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Osceola / Fountains

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	0.0	0.0	0.0	0	ERR	0	ERR	ERR
2	1988	0.0	0.0	0.0	0	ERR	0	ERR	ERR
3	1989	0.0	0.0	0.0	0	ERR	0	ERR	ERR
4	1990	0.0	0.0	0.0	0	ERR	0	ERR	ERR
5	1991 [1]	0.0	8.0	4.0	0	0	0	ERR	ERR
				Average Growth Through 5-Year Period (Col. 8)					ERR

[1] Plant began operation in April of 1991.

Fox Run - 679

Martin County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Martin County / Fox Run
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,271		854	279	138	10.9%
2	February	1,175		713	256	206	17.5%
3	March	1,250		864	265	121	9.7%
4	April	1,247		839	281	127	10.2%
5	May	1,320		925	283	112	8.5%
6	June	1,250		911	277	62	5.0%
7	July	1,197		863	312	22	1.8%
8	August	963		637	318	8	0.8%
9	September	1,098		814	250	34	3.1%
10	October	834		632	190	12	1.4%
11	November	952		925	184	(157)	-16.5%
12	December	946		749	172	25	2.6%
13							
14	**Total**	**13,503**	**0**	**9,726**	**3,067**	**710**	**5.3%**
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	15	264				279
22	February	7	249				256
23	March	9	256				265
24	April	21	260				281
25	May	31	251	1			283
26	June	21	256				277
27	July	20	292				312
28	August	16	302				318
29	September	11	239				250
30	October	11	179				190
31	November	5	179				184
32	December	5	167				172
33	Totals	172	2894	1	0	0	3067
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Martin County / Fox Run
Docket No: 920199-WS
Test Year Ended: December 31, 1991

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 4, 1990 thru January 2, 1991
February	January 3 thru February 2
March	February 3 thru March 4
April	March 5 thru April 2
May	April 3 thru May 3
June	May 4 thru June 1
July	June 2 thru July 1
August	July 2 thru August 1
September	August 2 thru September 2
October	September 3 thru October 2
November	October 3 thru November 4
December	November 5 thru December 2

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Martin / Fox Run

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				504,000
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)		07/24/91		74,000
3.	Five-Day Max Month	(1)	05/19/91		64,000
		(2)	05/12/91		60,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	05/07/91		60,000
		(4)	05/08/91		54,000
		(5)	05/13/91		53,000
	(There is no record of any unusual occurances)			AVERAGE	58,200
4.	Five-Day Max Year	(1)	07/24/91		74,000
		(2)	04/19/91		73,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	09/17/91		69,000
		(4)	05/19/91		64,000
		(5)	05/12/91		60,000
	(There is no record of any unusual occurances)			AVERAGE	68,000
5.	Average Daily Flow				0
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (Per letter from Martin County)				60,000

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Martin / Fox Run **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Fox Run
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	14,445
2	Annual Average Daily Demand	39,575
3	Maximum Day Demand - Date	07/24/91
4	Maximum Day Gallons Pumped	74,000
5	Gallons Per Minute Pumped	51
6	Fire Flow Requirement (Gallons)	60,000
7	Fire Flow Requirement (GPM)	500
8	Beginning No. of ERCs	86
9	Ending No. of ERCs	94
10	Average No. of ERCs	90
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	350
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	350
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	20,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	20,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	250
22	No. 2 & 5 (Capacity in GPM)	250
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	500
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	4,400
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	90
31	Permitted No. of Lots/ERCs	109
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size and layout.
[2] Does not include new plant facilities added in 1991 and certified substantially complete on January 30, 1992. These additional facilies are required by consent order.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Martin / Fox Run

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Martin / Fox Run — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	52.0	64.0	58.0	5,546,000	95,621	5,546,000	58.0	ERR
2	1988	64.0	76.0	70.0	8,298,000	118,543	8,298,000	70.0	20.7%
3	1989	76.0	83.0	79.5	9,206,000	115,799	9,206,000	79.5	13.6%
4	1990	83.0	86.0	84.5	10,103,000	119,562	10,103,000	84.5	6.3%
5	1991	86.0	94.0	90.0	9,726,560	108,073	9,726,560	90.0	6.5%
				Average Growth Through 5-Year Period (Col. 8)					11.6%

Friendly Center - 556

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Lake County / Friendly Center
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	284		253	15	16	5.6%
3	March						
4	April	212		189	9	14	6.6%
5	May						
6	June	297		247	22	28	9.4%
7	July						
8	August	330		247	26	57	17.3%
9	September						
10	October	289		237	21	31	10.7%
11	November						
12	December	276		245	15	16	5.8%
13							
14	Total	1,688	0	1,418	108	162	9.6%
15							
16							

Line No.							
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	8	1		6		15
23	March						
24	April	2	1		6		9
25	May						
26	June	10	1		11		22
27	July						
28	August	7	1	7	11		26
29	September						
30	October	4	1	5	11		21
31	November						
32	December	3	1		11		15
33	Totals	34	6	12	56	0	108
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Lake County / Friendly Center
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 13, 1990 thru February 11, 1991
April	February 12 thru April 10
June	April 11 thru June 10
August	June 11 thru August 9
October	August 10 thru October 9
December	October 10 thru December 9

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Friendly Center

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				144,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		08/09/91		10,700
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	07/09/91		10,600
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	07/22/91		10,500
		(3)	07/30/91		10,300
		(4)	07/18/91		6,700
		(5)	07/19/91		6,200
				AVERAGE	8,860
4.	Five-Day Max Year	(1)	08/09/91		10,700
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	07/09/91		10,600
		(3)	07/22/91		10,500
		(4)	07/30/91		10,300
		(5)	06/15/91		9,700
				AVERAGE	10,360
5.	Average Daily Flow				4,615
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Friendly Center — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Friendly Center
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	1,684
2	Annual Average Daily Demand	4,615
3	Maximum Day Demand - Date	08/09/91
4	Maximum Day Gallons Pumped	10,700
5	Gallons Per Minute Pumped	7
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	20
9	Ending No. of ERCs	20
10	Average No. of ERCs	20
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	100
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	100
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	1,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	20
31	Permitted No. of Lots/ERCs	41
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, system layout and pipe size.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Friendly Center **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Friendly Center

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	23.0	21.0	22.0	1,372,000	62,364	1,372,000	22.0	ERR
2	1988	21.0	20.0	20.5	1,310,000	63,902	1,310,000	20.5	-6.8%
3	1989	20.0	21.0	20.5	1,369,000	66,780	1,369,000	20.5	0.0%
4	1990	21.0	20.0	20.5	1,681,450	82,022	1,681,450	20.5	0.0%
5	1991	20.0	20.0	20.0	1,417,610	70,881	1,417,610	20.0	-2.4%
					Average Growth Through 5-Year Period (Col. 8)				-2.4%

Golden Terrace - 992

Citrus County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1

Preparer: C. Sweat

Company: SSU / Citrus County / Golden Terrace
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	457		377	6	74	16.2%
2	February	406		390	2	14	3.4%
3	March	484		383	11	90	18.6%
4	April	464		264	11	189	40.7%
5	May	442		307	12	123	27.8%
6	June	441		347	12	82	18.6%
7	July	402		290	24	88	21.9%
8	August	496		352	13	131	26.4%
9	September	643		499	16	128	19.9%
10	October	428		321	49	58	13.6%
11	November	607		397	7	203	33.4%
12	December	434		367	14	53	12.2%
13							
14	Total	5,704	0	4,294	177	1,233	21.6%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	4	2				6
22	February		2				2
23	March	6	5				11
24	April	9	2				11
25	May	10	2				12
26	June	10	2				12
27	July	22	2				24
28	August	11	2				13
29	September	14	2				16
30	October	47	2				49
31	November	5	2				7
32	December	12	2				14
33	Totals	150	27	0	0	0	177
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Citrus County / Golden Terrace
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 24 1990 thru January 25, 1991
February	January 16 thru February 22
March	February 23 thru March 25
April	March 26 thru April 24
May	April 25 thru May 23
June	May 24 thru June 24
July	June 25 thru July 25
August	July 26 thru August 28
September	August 29 thru Sepatember 25
October	September 26 thru October 23
November	October 24 thru November 27
December	November 28 thru December 23

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the mis-read. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system was overbilled in February and the gallons were credited in April. If the gallons sold are adjusted by the 106,690 gallons, the unaccounted for water percentage would equal 29.8 in February and 17.7 per cent in April.

4) The flow meter at this system is registering approximately 15 per cent fast. If the gallons pumped are adjusted by the 15 per cent, the pumped gallons would equal 4,848,000 and the annual unaccounted for water per cent would equal 7.8. The flow meter is scheduled to be replaced by April 30, 1992

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Citrus / Golden Terrace

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. *All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.*

			DATE		GPD
1.	Plant Capacity				185,760
	Reliable Plant Capacity with Largest Well Out of Service				79,200
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		02/19/91		87,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/19/91		50,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/09/91		44,000
		(3)	09/02/91		43,000
		(4)	09/03/91		43,000
		(5)	09/03/91		43,000
	(There is no record of any unusual occurances)			AVERAGE	44,600
4.	Five-Day Max Year	(1)	02/19/91		87,000
	The five days with the highest pumpage rate from any one month in the test year. *Provide an explanation if fire flow,* line-breaks or other unusual occurances affected the flows on these days.	(2)	09/19/91		50,000
		(3)	09/09/91		44,000
		(4)	09/02/91		43,000
		(5)	09/03/91		43,000
	(There is no record of any unusual occurances)			AVERAGE	53,400
5.	Average Daily Flow				15,696
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Citrus / Golden Terrace **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Golden Terrace
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	5,729
2	Annual Average Daily Demand	15,696
3	Maximum Day Demand - Date	02/19/91
4	Maximum Day Gallons Pumped	87,000
5	Gallons Per Minute Pumped	60
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	116
9	Ending No. of ERCs	116
10	Average No. of ERCs	116
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	74
12	No. 2 (GPM Capacity)	55
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	129
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	2,000
27	Tank No. 2	1,000
28	Percent Used and Useful (Tank No. 1)	56%
29	Percent Used and Useful (Tank No. 1)	83%
30	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
31	Average No. of ERCs	116
32	Permitted No. of Lots/ERCs	120
33	Percent Used and Useful	100%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Citrus / Golden Terrace **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Citrus / Golden Terrace

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	106.0	116.0	111.0	4,206,000	37,892	4,206,000	111.0	ERR
2	1988	116.0	119.0	117.5	4,490,000	38,213	4,490,000	117.5	5.9%
3	1989	119.0	119.0	119.0	4,430,000	37,227	4,430,000	119.0	1.3%
4	1990	119.0	116.0	117.5	4,500,600	38,303	4,500,600	117.5	-1.3%
5	1991	116.0	116.0	116.0	4,293,500	37,013	4,293,500	116.0	-1.3%
				Average Growth Through 5-Year Period (Col. 8)					1.1%

Gospel Island Estates - 986

Citrus County (SSU)

Water

- 1992 FPSC Filing -

Gallons of water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Citrus County / Gospel Island
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	49		60	3	(14)	-28.6%
2	February					0	
3	March	105		70	24	11	10.5%
4	April					0	
5	May	83		82	11	(10)	-12.0%
6	June					0	
7	July	98		103	12	(17)	-17.3%
8	August					0	
9	September	119		108	19	(8)	-6.7%
10	October					0	
11	November	161		150	31	(20)	-12.4%
12	December					0	
13							
14	Total	615	0	573	100	(58)	-9.4%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	3					3
22	February						0
23	March	13	11				24
24	April						0
25	May	9	2				11
26	June						0
27	July	10	2				12
28	August						0
29	September	17	2				19
30	October						0
31	November	14	17				31
32	December						0
33	Totals	66	34	0	0	0	100
34							

35 Calculations are per monthly operating report file.

Gallons of water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Citrus County / Gospel Island
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 25, 1990 thru January 18, 1991
March	January 19 thru March 18
May	March 19 thru May 16
July	May 17 thru July 17
September	July 18 thru September 17
November	September 18 thru November 18

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The flow meter will be replaced by April 30, 1992. When this flow meter is removed it will be tested to determine the accuracy thus allowing an accurate unaccounted for water percentage to be obtained.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Citrus / Gospel Island **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				72,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		12/06/91		28,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	10/10/91		6,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	10/11/91		6,000
		(3)	10/22/91		5,000
		(4)	10/28/91		5,000
		(5)	10/02/91		3,000
	(There is no record of any unusual occurances)			AVERAGE	5,000
4.	Five-Day Max Year	(1)	12/06/91		28,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	02/20/91		20,000
		(3)	03/08/91		8,000
		(4)	10/10/91		6,000
		(5)	10/11/91		6,000
	(There is no record of any unusual occurances)			AVERAGE	13,600
5.	Average Daily Flow				1,945
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Citrus / Gospel Island **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Gospel Island
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	710
2	Annual Average Daily Demand	1,945
3	Maximum Day Demand - Date	12/06/91
4	Maximum Day Gallons Pumped	28,000
5	Gallons Per Minute Pumped	19
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	7
9	Ending No. of ERCs	8
10	Average No. of ERCs	8
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	50
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	50
15	Percent Used and Useful	100%
	Iron Removal Filters: (Account No. 320.3)	
16	No. 1	50
17	No. 2	0
18	No. 3	0
19	Total Storage Capacity in Gallons	50
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	500
27	Tank No. 2	0
28	Percent Used and Useful (Tank No. 1)	100%
29		
30	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
31	Average No. of ERCs	8
32	Permitted No. of Lots/ERCs	25
33	Percent Used and Useful	30%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Citrus / Gospel Island **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Citrus / Gospel Island **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Gospel Island
		(a)
1	Annual Growth From Schedule F-9	10.7%
2	Average Number Of Test Year ERC's	8
3	Number Of ERC's Associated With 1.0 Years Growth	1
4	Projected Number Of ERC's	9
5	Test Year Usage Per ERC @ MDD	3,733
6	MDD 1.5 Years Into Future	32,481
	Used and Useful With Margin Reserve:	
7	Distribution System	35%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Citrus / Gospel Island

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987 [1]	5.0	5.0	5.0	83,000	16,600	83,000	5.0	ERR
2	1988	5.0	5.0	5.0	510,000	102,000	510,000	5.0	0.0%
3	1989	5.0	5.0	5.0	497,000	99,400	497,000	5.0	0.0%
4	1990	5.0	7.0	6.0	522,000	87,000	522,000	6.0	20.0%
5	1991	7.0	8.0	7.5	573,460	76,461	573,460	7.5	25.0%
					Average Growth Through 5-Year Period (Col. 8)				10.7%

[1] Acquired in August 1987.

Grand Terrace - 575

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Lake County / Grand Terrace
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	345		217	17	111	32.2%
2	February	201		180	10	11	5.5%
3	March	308		289	7	12	3.9%
4	April	313		275	21	17	5.4%
5	May	439		431	5	3	0.7%
6	June	341		328	0	13	3.8%
7	July	350		346	1	3	0.9%
8	August	390		363	14	13	3.3%
9	September	486		462	11	13	2.7%
10	October	628		617	4	7	1.1%
11	November	452		16	6	430	95.1%
12	December	548		999	5	(456)	-83.2%
13							
14	Total	4,801	0	4,523	101	177	3.7%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	7			10		17
22	February	10					10
23	March	7					7
24	April	21					21
25	May	5					5
26	June						0
27	July	1					1
28	August	14					14
29	September	11					11
30	October	4					4
31	November	6					6
32	December				5		5
33	Totals	86	0	0	15	0	101
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Lake County / Grand Terrace
Docket No: 920199-WS
Test Year Ended: *December 31, 1991*

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 11,1989 thru January 11, 1990
February	January 12 thru February 6
March	February 7 thru March 12
April	March 13 thru April 5
May	April 6 thru May 7
June	May 8 thru June 5
July	June 6 thru July 5
August	July 6 thru August 8
September	August 9 thru September 6
October	September 7 thru October 8
November	*October 9 thru November 7*
December	November 8 thru December 9

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The October/November read cycle was not billed until December 4 causing November and December percentages to appear inaccurate, however, the annual percentage will remain the same.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Grand Terrace

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				864,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		12/01/91		44,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/19/91		31,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/17/91		30,000
		(3)	09/14/91		29,000
		(4)	09/01/91		27,000
		(5)	09/12/91		27,000
	(There is no record of any unusual occurances)			AVERAGE	28,800
4.	Five-Day Max Year	(1)	12/01/91		44,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/19/91		31,000
		(3)	09/17/91		30,000
		(4)	05/05/91		29,000
		(5)	05/06/91		29,000
	(There is no record of any unusual occurances)			AVERAGE	32,600
5.	Average Daily Flow				13,512
6.	Required Fire Flow (500 GPM for 2 hours)				60,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance attached)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Grand Terrace — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Grand Terrace
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	4,932
2	Annual Average Daily Demand	13,512
3	Maximum Day Demand - Date	12/01/91
4	Maximum Day Gallons Pumped	44,000
5	Gallons Per Minute Pumped	31
6	Fire Flow Requirement (Gallons)	60,000
7	Fire Flow Requirement (GPM)	500
8	Beginning No. of ERCs	48
9	Ending No. of ERCs	84
10	Average No. of ERCs	66
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	600
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	600
15	Percent Used and Useful	100%
	Iron Removal Filters: (Account No. 320.3)	
16	No. 1	0
17	No. 2	0
18	No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	6,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100%
29		
30	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
31	Average No. of ERCs	66
32	Permitted No. of Lots/ERCs	111
33	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, system layout and pipe size.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Grand Terrace **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Grand Terrace **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987								
2	1988								
3	1989 [1]	0.0	28.0	14.0	865,000	61,786	865,000	14.0	
4	1990	28.0	48.0	38.0	3,344,700	88,018	3,344,700	38.0	171.4%
5	1991	48.0	84.0	66.0	4,523,920	68,544	4,523,920	66.0	73.7%
				Average Growth Through 2-Year Period (Col. 8)					117.1%

[1] Acquired in May 1989.

Harmony Homes - 326

Seminole County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Seminole County / Harmony Homes
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,808	24	1,289	180	363	19.8%
2	February						
3	March	1,494	98	1,227	154	211	13.3%
4	April						
5	May	1,800		1,323	183	294	16.3%
6	June						
7	July	1,846		1,347	245	254	13.7%
8	August						
9	September	2,000	50	1,520	211	319	15.6%
10	October						
11	November	1,699	66	1,361	203	201	11.4%
12	December						
13							
14	**Total**	**10,647**	**238**	**8,067**	**1,176**	**1,642**	**15.1%**
15							
16							

Line No.	Other use breakdowns are as follows:						
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	40	50		90		180
22	February						0
23	March	30	49		75		154
24	April						0
25	May	10	56	27	90		183
26	June						0
27	July	56	57	40	92		245
28	August						0
29	September	52	59		100		211
30	October						0
31	November	63	55		85		203
32	December						0
33	Totals	251	326	67	532	0	1176
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Comapny: SSU / Seminole County / Harmony Homes
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the purchase column is from the Purchased Water Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 7, 1990 thru January 7, 1991
March	January 8 thru March 6
May	March 7 thru May 7
July	May 8 thru July 8
September	July 9 thru September 9
November	September 10 thru November 7

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system is interconnected to the City of Altamonte springs for emergency standby purposes. The gallons purchased are not coordinated with the billing cycle.

4) The water for the chlorine booster pump is connected before the flow meter. It is estimated that the pump used 6 gallons per minute while the pump is running. The usage was calculated by taking the minutes the pump ran times 6 gpm and is listed under Utility Use.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Seminole / Harmony Homes

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				432,000 0
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)		09/17/91		45,000
3.	Five-Day Max Month The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	09/17/91 09/04/91 09/07/91 09/06/91 09/14/91	AVERAGE	45,000 44,000 44,000 42,000 42,000 43,400
4.	Five-Day Max Year The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	09/17/91 09/04/91 09/07/91 09/06/91 09/14/91	AVERAGE	45,000 44,000 44,000 42,000 42,000 43,400
5.	Average Daily Flow				29,011
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				0

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Seminole / Harmony Homes | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Harmony Homes
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	10,589
2	Annual Average Daily Demand	29,011
3	Maximum Day Demand - Date	09/17/91
4	Maximum Day Gallons Pumped	45,000
5	Gallons Per Minute Pumped	31
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	63
9	Ending No. of ERCs	62
10	Average No. of ERCs	63
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	300
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	300
15	Percent Used and Useful	100%
	Iron Removal Filters: (Account No. 320.3)	
16	No. 1	0
17	No. 2	0
18	No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	90%
29		
30	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
31	Average No. of ERCs	63
32	Permitted No. of Lots/ERCs	63
33	Percent Used and Useful	100%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Seminole / Harmony Homes **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Seminole / Harmony Homes

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	63.0	62.0	62.5	8,698,000	139,168	8,698,000	62.5	ERR
2	1988	62.0	60.0	61.0	8,670,000	142,131	8,670,000	61.0	-2.4%
3	1989	60.0	63.0	61.5	8,368,000	136,065	8,368,000	61.5	0.8%
4	1990	63.0	63.0	63.0	8,336,580	132,327	8,336,580	63.0	2.4%
5	1991	63.0	62.0	62.5	8,065,200	129,043	8,065,200	62.5	-0.8%
				Average Growth Through 5-Year Period (Col. 8)					0.0%

Hermits Cove - 438

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Putnam County / Hermits Cove
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,138		1,187	4	(53)	-4.7%
2	February					0	
3	March	1,021		991	4	26	2.5%
4	April					0	
5	May	1,119		1,006	18	95	8.5%
6	June					0	
7	July	1,023		1,011	5	7	0.7%
8	August					0	
9	September	1,050		998	15	37	3.5%
10	October					0	
11	November	985		893	5	87	8.8%
12	December					0	
13							
14	Total	6,336	0	6,086	51	199	3.1%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
21	January	4					4
22	February						0
23	March	4					4
24	April						0
25	May	18					18
26	June						0
27	July	5					5
28	August						0
29	September	15					15
30	October						0
31	November	5					5
32	December						0
33	Totals	51	0	0	0	0	51

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

Company: SSU / Putnam County / Hermits Cove
Docket No: 920199-WS
Test Year Ended: December 31, 1991

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Pumped
January	November 13, 1990 thru January 18, 1991
March	January 19 thru March 14
May	March 15 thru May 13
July	May 14 thru July 12
September	July 13 thru September 13
November	September 13 thru November 12

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system was interconnected with our St. John Highlands plant November 12, 1991 while the St. Johns plant was temporarily off line for repairs. Additional consumption does not reflect here as November 12 was the last day of the years billing cycle.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / Hermits Cove

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				158,400
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		11/21/91		66,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	12/05/91		59,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/01/91		55,000
		(3)	12/02/91		52,000
		(4)	12/20/91		51,000
		(5)	12/04/91		45,000
	(There is no record of any unusual occurances)			AVERAGE	52,400
4.	Five-Day Max Year	(1)	11/21/91		66,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/05/91		59,000
		(3)	12/01/91		55,000
		(4)	12/02/91		52,000
		(5)	12/20/91		51,000
	(There is no record of any unusual occurances)			AVERAGE	56,600
5.	Average Daily Flow				20,888
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / Hermits Cove **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Hermits Cove
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	7,624
2	Annual Average Daily Demand	20,888
3	Maximum Day Demand - Date	11/21/91
4	Maximum Day Gallons Pumped	66,000
5	Gallons Per Minute Pumped	46
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	174
9	Ending No. of ERCs	172
10	Average No. of ERCs	173
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	110
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	110
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	No. 1	23,000
17	No. 2	0
18	No. 3	0
19	Total Storage Capacity in Gallons	23,000
20	Percent Used and Useful	96%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	120
22	No. 2 & 5 (Capacity in GPM)	120
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	240
25	Percent Used and Useful	76%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	60%
29		
30	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
31	Average No. of ERCs	173
32	Permitted No. of Lots/ERCs	350
33	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, system layout and pipe size.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / Hermits Cove **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / Hermits Cove — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	169.0	164.0	166.5	4,912,000	29,502	4,912,000	166.5	ERR
2	1988	164.0	171.0	167.5	4,904,000	29,278	4,904,000	167.5	0.6%
3	1989	171.0	171.0	171.0	5,318,000	31,099	5,318,000	171.0	2.1%
4	1990	171.0	174.0	172.5	5,740,612	33,279	5,740,612	172.5	0.9%
5	1991	174.0	172.0	173.0	6,087,220	35,186	6,087,220	173.0	0.3%
				Average Growth Through 5-Year Period (Col. 8)					1.0%

Hobby Hills - 558

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Lake County / Hobby Hills
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	1,366		868	81	417	30.5%
3	March						
4	April	1,412		979	96	337	23.9%
5	May						
6	June	1,280		1,055	86	139	10.9%
7	July						
8	August	1,062		882	60	120	11.3%
9	September						
10	October	1,081		862	66	153	14.1%
11	November						
12	December	1,029		851	70	108	10.5%
13							
14	Total	7,230	0	5,497	460	1,274	17.6%
15							
16							

17 Other use breakdowns are as follows:

18

Line	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	11	2		68		81
23	March						
24	April	15	5	5	71		96
25	May						
26	June	5	2	15	64		86
27	July						
28	August	5	2		53		60
29	September						
30	October	10	2		54		66
31	November						
32	December	5	2	12	51		70
33	Totals	51	15	32	362	0	460
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Lake County / Hobby Hills
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 18, 1990 thru February 15, 1991
April	February 16 thru April 15
June	April 16 thru June 14
August	June 15 thru August 14
October	August 15 thru October 14
December	October 15 thru December 13

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Hobby Hills

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				252,000
	Reliable Plant Capacity with Largest Well Out of Service				144,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		04/24/91		37,300
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	03/14/91		35,300
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	03/28/91		33,300
		(3)	03/15/91		31,900
		(4)	03/21/91		28,000
		(5)	03/09/91		27,300
				AVERAGE	31,160
4.	Five-Day Max Year	(1)	04/24/91		37,300
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	04/25/91		37,300
		(3)	03/14/91		35,300
		(4)	03/28/91		33,300
		(5)	03/15/91		31,900
				AVERAGE	35,020
5.	Average Daily Flow				20,408
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS

Water Treatment Plant

Company: SSU / Lake / Hobby Hills **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Hobby Hills
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	7,449
2	Annual Average Daily Demand	20,408
3	Maximum Day Demand - Date	04/24/91
4	Maximum Day Gallons Pumped	37,300
5	Gallons Per Minute Pumped	26
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	97
9	Ending No. of ERCs	90
10	Average No. of ERCs	94
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	175
12	No. 2 (GPM Capacity)	100
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	275
15	Percent Used and Useful	26%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	88%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	94
31	Permitted No. of Lots/ERCs	125
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on system design, layout, and customer density.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Hobby Hills **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Hobby Hills

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3) ERCs	(4)	(5)	(6)	(7)	(8)	(9)
Line No.	Year	Beginning	Ending	Average	Gallons Sold	Gallons/ ERC (5)/(4)	Total Gallons Sold	Total ERCs (7)/(6)	Annual % Incr. in ERCs
1	1987	90.0	90.0	90.0	5,102,000	56,689	5,102,000	90.0	ERR
2	1988	90.0	93.0	91.5	5,830,000	63,716	5,830,000	91.5	1.7%
3	1989	93.0	97.0	95.0	6,087,000	64,074	6,087,000	95.0	3.8%
4	1990	97.0	97.0	97.0	5,648,630	58,233	5,648,630	97.0	2.1%
5	1991	97.0	90.0	93.5	5,497,313	58,795	5,497,313	93.5	-3.6%
					Average Growth Through 5-Year Period (Col. 8)				1.0%

Holiday Haven - 573

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Lake County / Holiday Haven
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January		326	289	13	24	7.4%
2	February		337	386	1	(50)	-14.8%
3	March		311	309	1	1	0.3%
4	April		349	417	1	(69)	-19.8%
5	May		369	328	1	40	10.8%
6	June		316	328	1	(13)	-4.1%
7	July		311	272	1	38	12.2%
8	August		421	371	1	49	11.6%
9	September		341	329	1	11	3.2%
10	October		347	350	1	(4)	-1.2%
11	November		493	345	1	147	29.8%
12	December		358	337	1	20	5.6%
13							
14	**Total**	**0**	**4,279**	**4,061**	**24**	**194**	**4.5%**
15							
16							

Line No.							
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January		13				13
22	February		1				1
23	March		1				1
24	April		1				1
25	May		1				1
26	June		1				1
27	July		1				1
28	August		1				1
29	September		1				1
30	October		1				1
31	November		1				1
32	December		1				1
33	Totals	0	24	0	0	0	24
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Lake County / Holiday Haven
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the purchase column is from the Purchased Water Report.

Unaccounted for water is calculated as follows:

Usage Sold	Purchase
January	January
February	February
March	March
April	April
May	May
June	June
July	July
August	August
September	September
October	October
November	November
December	December

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) We purchase water from Astor-Astor Park for this system. The billing cycle is not coordinated with the pump cycle, however, the year end percentage should be relatively accurate.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Holiday Haven

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
	ALL WATER IS PURCHASED FROM ASTOR WATER ASSOCIATION, NO PLANTS				
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)		AVERAGE	
4.	Five-Day Max Year The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)		AVERAGE	
5.	Average Daily Flow				
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Holiday Haven **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20

Based on a total of 166 lots and 116 connections, the water distribution system is 70% used and useful.

EQIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Holiday Haven FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Purchased	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Treated	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987 [1]	97.0	108.0	102.5	317,000	3,093	317,000	102.5	ERR
2	1988	108.0	113.0	110.5	6,007,000	54,362	6,007,000	110.5	7.8%
3	1989	113.0	111.0	112.0	4,846,000	43,268	4,846,000	112.0	1.4%
4	1990	111.0	113.0	112.0	4,171,000	37,241	4,171,000	112.0	0.0%
5	1991	113.0	118.0	115.5	4,279,000	37,048	4,279,000	115.5	3.1%
					Average Growth Through 5-Year Period (Col. 8)				3.0%

[1] Acquired December 1987.
All water is purchased from the Astor Water Association.

Holiday Heights - 121

Orange County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Orange County / Holiday Heights
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	588		483	78	27	4.6%
2	February	532		432	87	13	2.4%
3	March	530		444	68	18	3.4%
4	April	623		530	67	26	4.2%
5	May	591		512	75	4	0.7%
6	June	703		592	73	38	5.4%
7	July	728		492	62	174	23.9%
8	August	671		454	92	125	18.6%
9	September	771		537	87	147	19.1%
10	October	638		505	65	68	10.7%
11	November	626		510	65	51	8.1%
12	December	645		529	60	56	8.7%
13							
14	**Total**	**7,646**	**0**	**6,020**	**879**	**747**	**9.8%**

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
21	January	13	65				78
22	February	19	68				87
23	March	14	54				68
24	April	6	61				67
25	May	6	69				75
26	June	9	64				73
27	July	9	53				62
28	August	32	60				92
29	September	23	64				87
30	October	11	54				65
31	November	5	60				65
32	December	0	60				60
33	Totals	147	732	0	0	0	879

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Orange County / Holiday Heights
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 1, 1990 thru January 1, 1991
February	January 3 thru February 1
March	February 2 thru March 1
April	March 2 thru April 1
May	April 2 thru May 2
June	May 3 June 5
July	June 6 thru July 4
August	July 5 thru August 1
September	August 2 thru September 3
October	September 4 thru October 2
November	October 3 thru November 1
December	November 2 thru December 2

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The check valve is slowly leaking back when the pumps are not running at approximately 2.5 gallons per minute. The consumption was calculated by taking the actual hours in the period minus the hours the pump was running times 2.5 gpm and is listed under Utility Use.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Orange / Holiday Heights

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				504,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		06/13/91		38,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	06/10/91		33,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	06/12/91		33,000
		(3)	06/09/91		30,000
		(4)	06/30/91		29,000
		(5)	06/07/91		27,000
	(There is no record of any unusual occurances)			AVERAGE	30,400
4.	Five-Day Max Year	(1)	06/13/91		38,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/04/91		36,000
		(3)	06/10/91		33,000
		(4)	06/12/91		33,000
		(5)	09/03/91		32,000
	(There is no record of any unusual occurances)			AVERAGE	34,400
5.	Average Daily Flow				22,008
6.	Required Fire Flow (500 GPM for 2 hours)				60,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS

Water Treatment Plant

Company: SSU / Orange / Holiday Heights — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Holiday Heights
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	8,033
2	Annual Average Daily Demand	22,008
3	Maximum Day Demand - Date	06/13/91
4	Maximum Day Gallons Pumped	38,000
5	Gallons Per Minute Pumped	26
6	Fire Flow Requirement (Gallons)	60,000
7	Fire Flow Requirement (GPM)	500
8	Beginning No. of ERCs	53
9	Ending No. of ERCs	52
10	Average No. of ERCs	53
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	350
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	350
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	53
31	Permitted No. of Lots/ERCs	53
32	Percent Used and Useful	100%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Orange / Holiday Heights **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Orange / Holiday Heights

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	51.0	51.0	51.0	5,772,000	113,176	5,772,000	51.0	ERR
2	1988	51.0	51.0	51.0	6,570,000	128,824	6,570,000	51.0	0.0%
3	1989	51.0	53.0	52.0	6,953,000	133,712	6,953,000	52.0	2.0%
4	1990	53.0	53.0	53.0	7,102,700	134,013	7,102,700	53.0	1.9%
5	1991	53.0	52.0	52.5	6,020,900	114,684	6,020,900	52.5	-0.9%
				Average Growth Through 5-Year Period (Col. 8)					0.7%

Imperial Mobile Terrace - 570

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Comapny: SSU / Lake County / Imperial Terrace
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	5,861		4,508	1,234	119	2.0%
2	February						
3	March						
4	April	5,346		3,849	1,198	299	5.6%
5	May						
6	June						
7	July	5,407		3,674	1,259	474	8.8%
8	August						
9	September						
10	October	6,159		3,851	1,485	823	13.4%
11	November						
12	December						
13							
14	**Total**	**22,773**	**0**	**15,882**	**5,176**	**1,715**	**7.5%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
20							
21	January	48	1126	60			1234
22	February						
23	March						
24	April	25	1063	60	50		1198
25	May						
26	June						
27	July	8	1151		100		1259
28	August						
29	September						
30	October	46	629	710	100		1485
31	November						
32	December						
33	Totals	127	3969	830	250	0	5176
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Comapny: SSU / Lake County / Imperial Terrace
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a quarterly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	October 2, 1990 thru January 2, 1991
April	January 3 thru April 1
July	April 2 thru July 2
October	July 2 thru October 1

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The check valve at the plant had a slow leak of approximately 10 gallons a minute from up until August 22, 1991. The water loss was calculated by taking the hours in the time period minus the actual hours the pump ran times 600 gallons an hours and is listed under Utility Use.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Imperial Terrace

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				576,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		08/19/91		266,400
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	08/19/91		266,400
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	08/22/91		253,100
		(3)	08/21/91		224,200
		(4)	08/20/91		204,200
		(5)	08/07/91		113,200
				AVERAGE	212,220
4.	Five-Day Max Year	(1)	08/19/91		266,400
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	08/22/91		253,100
		(3)	08/21/91		224,200
		(4)	08/20/91		204,200
		(5)	03/27/91		135,400
				AVERAGE	216,660
5.	Average Daily Flow				62,252
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Imperial Terrace **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Imperial Terrace
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	22,722
2	Annual Average Daily Demand	62,252
3	Maximum Day Demand - Date	08/19/91
4	Maximum Day Gallons Pumped	266,400
5	Gallons Per Minute Pumped	185
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	240
9	Ending No. of ERCs	242
10	Average No. of ERCs	241
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	400
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	400
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	241
31	Permitted No. of Lots/ERCs	241
32	Percent Used and Useful	100%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Imperial Terrace

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Imperial Terrace

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987								
2	1988 [1]	234.0	234.0	234.0	4,260,000	18,205	4,260,000	234.0	
3	1989	234.0	236.0	235.0	18,276,000	77,770	18,276,000	235.0	0.4%
4	1990	236.0	240.0	238.0	19,710,400	82,817	19,710,400	238.0	1.3%
5	1991	240.0	241.5	241.0	15,882,990	65,905	15,882,990	241.0	1.3%
	Average Growth Through 4-Year Period (Col. 8)								1.0%

[1] Acquired October 1988.

Intercession City - 780

Osceola County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Osceola County / Intercession City
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	5,910		1,957	2,366	1,587	26.9%
2	February						
3	March	5,112		2,116	2,047	949	18.6%
4	April						
5	May	4,968		1,998	1,989	981	19.7%
6	June						
7	July	4,763		2,035	1,908	820	17.2%
8	August						
9	September	5,618		2,746	2,252	620	11.0%
10	October						
11	November	4,780		2,392	1,914	474	9.9%
12	December						
13							
14	Total	31,151	0	13,244	12,476	5,431	17.4%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January		2	1477	887		2366
22	February						0
23	March		2	1278	767		2047
24	April						0
25	May		2	1242	745		1989
26	June						0
27	July		2	1191	715		1908
28	August						0
29	September		2	1405	845		2252
30	October						0
31	November		2	1195	717		1914
32	December						0
33	Totals	0	12	7788	4676	0	12476
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Osceola County / Intercession City
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 10, 1990 thru January 10, 1991
March	January 11 thru March 12
May	March 13 thru May 9
July	May 10 thru July 10
September	July 11 thru September 12
November	September 13 thru November 11

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) We are in the process of upgrading the old distribution system. The existing system is undersized (2"mains) and includes several thousand feet of black thin wall PVC tubing. The old PVC and black tubing is deteriorated and continually leaking. We have estimated that 25% of our water pumped is lost due to the leaks and is listed under Main Breaks. In addition, this system has mains that run under buildings, through private property and are sometimes found to be connected direct without meters. We have estimated that approximately 15 % of our pumped water is lost to these situations and is listed under Unmetered & Stuck Meters.

4) Both of the circumstances in #3 above will be eliminated with the distribution system upgrade which has been in process through out 1991. The project should be completed before the first quarter of 1992 ends.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Osceola / Intercession City

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				468,000
	Reliable Plant Capacity with Largest Well Out of Service				106,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		06/26/91		229,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	07/22/91		168,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	07/10/91		154,000
		(3)	07/15/91		148,000
		(4)	07/05/91		143,000
		(5)	07/25/91		143,000
	(There is no record of any unusual occurances)			AVERAGE	151,200
4.	Five-Day Max Year	(1)	06/26/91		229,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	07/22/91		168,000
		(3)	04/29/91		164,000
		(4)	05/06/91		163,000
		(5)	07/10/91		154,000
	(There is no record of any unusual occurances)			AVERAGE	175,600
5.	Average Daily Flow				101,737
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Osceola / Intercession City

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5

Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Intercession City
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	37,134
2	Annual Average Daily Demand	101,737
3	Maximum Day Demand - Date	06/26/91
4	Maximum Day Gallons Pumped	229,000
5	Gallons Per Minute Pumped	159
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	237
9	Ending No. of ERCs	239
10	Average No. of ERCs	238
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	250
12	No. 2 (GPM Capacity)	75
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	325
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	75%
29	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	238
31	Permitted No. of Lots/ERCs	546
32	Percent Used and Useful	44%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Osceola / Intercession City **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Osceola / Intercession City

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	225.0	225.0	225.0	11,922,000	52,987	11,922,000	225.0	ERR
2	1988	225.0	229.0	227.0	10,730,000	47,269	10,730,000	227.0	0.9%
3	1989	229.0	232.0	230.5	12,417,000	53,870	12,417,000	230.5	1.5%
4	1990	232.0	237.0	234.5	12,511,200	53,353	12,511,200	234.5	1.7%
5	1991	237.0	239.0	238.0	13,245,021	55,651	13,245,021	238.0	1.5%
				Average Growth Through 5-Year Period (Col. 8)					1.4%

Interlachen Lake Estates - 470

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Putnam County / Interlachen Estates
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	2,072		1,558	216	298	14.4%
3	March						
4	April	2,201		1,780	11	410	18.6%
5	May						
6	June	1,870		1,642	183	45	2.4%
7	July						
8	August	2,490		1,596	719	175	7.0%
9	September						
10	October	4,466		1,486	1,500	1,480	33.1%
11	November						
12	December	3,181		1,590	201	1,390	43.7%
13							
14	Total	16,280	0	9,652	2,830	3,798	23.3%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February	7	2	207			216
23	March						0
24	April	9	2				11
25	May						0
26	June	8	2	173			183
27	July						0
28	August	8	2	709			719
29	September						0
30	October	10	2	1488			1500
31	November						0
32	December	6	2	193			201
33	Totals	48	12	2770	0	0	2830
34							

35 Calculations are per monthly operating report file.

Gallons of Water pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Putnam County / Interlachen Estates
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 24, 1989 thru February 22, 1990
April	February 23 thru April 24
June	April 25 thru June 24
August	June 25 thru August 23
October	August 24 thru October 23
December	October 24 thru December 22

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / Interlachen Lake Est. **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				489,600
	Reliable Plant Capacity with Largest Well Out of Service				230,400
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		09/18/91		144,000
	The single day with the highest pumpage rate for the test year. *Explain, on a separate page, if fire flow, line-breaks* or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/18/91		144,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/11/91		134,000
		(3)	09/05/91		130,000
		(4)	09/14/91		119,000
		(5)	09/15/91		119,000
	(There is no record of any unusual occurances)			AVERAGE	129,200
4.	Five-Day Max Year	(1)	09/18/91		144,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/11/91		134,000
		(3)	09/05/91		130,000
		(4)	09/14/91		119,000
		(5)	09/15/91		119,000
	(There is no record of any unusual occurances)			AVERAGE	129,200
5.	Average Daily Flow				45,142
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS

Water Treatment Plant

Company: SSU / Putnam / Interlachen Lake Est. **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Interlachen Lk Est.
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	16,477
2	Annual Average Daily Demand	45,142
3	Maximum Day Demand - Date	09/18/91
4	Maximum Day Gallons Pumped	144,000
5	Gallons Per Minute Pumped	100
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	211
9	Ending No. of ERCs	210
10	Average No. of ERCs	211
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	180
12	No. 2 (GPM Capacity)	160
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	340
15	Percent Used and Useful	63%
	Finished Water Storage: (Account No. 330.4)	
16	No. 1	30,500
17	No. 2	0
18	No. 3	0
19	Total Storage Capacity in Gallons	30,500
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	150
22	No. 2 & 5 (Capacity in GPM)	150
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	300
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	45%
29		
30	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
31	Average No. of ERCs	211
32	Permitted No. of Lots/ERCs	355
33	Percent Used and Useful	59%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / Interlachen Lake Est.

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Putnam / Interlachen Lake Est. **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Interlachen Lake Est.
		(a)
1	Annual Growth From Schedule F-9	2.5%
2	Average Number Of Test Year ERC's	211
3	Number Of ERC's Associated With 1.5 Years Growth	8
4	Projected Number Of ERC's	218
5	Test Year Usage Per ERC @ MDD	684
6	MDD 1.5 Years Into Future	149,459
	Used and Useful With Margin Reserve:	
7	Supply Wells	65%
8	Distribution System	61%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / Interlachen Lake Est.

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	185.0	196.0	190.5	9,771,000	51,291	9,771,000	190.5	ERR
2	1988	196.0	200.0	198.0	10,743,000	54,258	10,743,000	198.0	3.9%
3	1989	200.0	209.0	204.5	10,404,000	50,875	10,404,000	204.5	3.3%
4	1990	209.0	211.0	210.0	11,230,000	53,476	11,230,000	210.0	2.7%
5	1991	211.0	210.0	210.5	9,652,651	45,856	9,652,651	210.5	0.2%
				Average Growth Through 5-Year Period (Col. 8)					2.5%

Jungle Den - 1802

Volusia County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Volusia County / Jungle Den
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January		297	243	1	53	17.8%
2	February		380	1,117	1	(738)	-194.2%
3	March		314	(496)	1	809	257.6%
4	April		290	322	1	(33)	-11.4%
5	May		262	218	1	43	16.4%
6	June		200	218	1	(19)	-9.5%
7	July		216	179	1	36	16.7%
8	August		251	228	1	22	8.8%
9	September		229	232	1	(4)	-1.7%
10	October		218	214	1	3	1.4%
11	November		242	203	1	38	15.7%
12	December		248	288	1	(41)	-16.5%
13							
14	Total		3,147	2,966	12	169	5.4%
15							
16							

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January		1				1
22	February		1				1
23	March		1				1
24	April		1				1
25	May		1				1
26	June		1				1
27	July		1				1
28	August		1				1
29	September		1				1
30	October		1				1
31	November		1				1
32	December		1				1
33	Totals	0	12	0	0	0	12
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Volusia County / Jungle Den
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the purchased column comes from the Purchased Water Report.
Unaccounted for water is calculated as follows:

Usage Sold	Purchased Water
January	January
February	February
March	March
April	April
May	May
June	June
July	July
August	August
September	September
October	October
November	November
December	December

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) We purchase water from Astor-Astor Park for this system. The billing cycle is not coordinated with the pump cycle, however, the year end percentage should be relatively accurate.

4) The system was overbilled in February and the gallons were credited in March. If the sold gallons are adjusted by the overbill, the February UFW would equal 7.9 per cent and March would equal 13.1.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Volusia / Jungle Den — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

		DATE	GPD
	ALL WATER IS PURCHASED FROM ASTOR WATER ASSOCITATION, NO PLANTS.		
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.		
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)		
3.	Five-Day Max Month The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	
4.	Five-Day Max Year The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	
5.	Average Daily Flow		
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.		

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Volusia / Jungle Den **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20

Based on a total of 135 lots and 114 connections, the water system is 100% used and useful.
For wastewater collection system, see Schedule F-6

EQIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Volusia / Jungle Den | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Purchased	ERC (5)/(4)	Gallons Treated	ERCs (7)/(6)	% Incr. in ERCs
1	1987 [1]	104.0	108.0	106.0	133,000	1,255	133,000	106.0	ERR
2	1988	108.0	109.0	108.5	3,054,000	28,147	3,054,000	108.5	2.4%
3	1989	109.0	111.0	110.0	3,102,000	28,200	3,102,000	110.0	1.4%
4	1990	111.0	111.0	111.0	3,446,000	31,045	3,446,000	111.0	0.9%
5	1991	111.0	114.0	112.5	3,147,000	27,973	3,147,000	112.5	1.4%
				Average Growth Through 3-Year Period (Col. 8)					1.2%

[1] Acquired December 1987.
All water is purchased from Astor Water Association.

Keystone Heights - 1094

Clay County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Clay & Bradford County / Keystone Club and Keystone Heights
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February						
3	March	31,041		30,854	32	155	0.5%
4	April						
5	May	21,619		17,238	302	4,079	18.9%
6	June						
7	July	23,683		18,286	22	5,375	22.7%
8	August						
9	September	27,047		19,885	209	6,953	25.7%
10	October						
11	November	23,790		20,282	268	3,240	13.6%
12	December						
13							
14	Total	127,180	0	106,545	833	19,802	15.6%
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February						0
23	March	32					32
24	April						0
25	May	144	60	40	58		302
26	June						0
27	July	22					22
28	August						0
29	September	154	55				209
30	October						0
31	November	56	55	67	75	15	268
32	December						0
33	Totals	408	170	107	133	15	833
34							

35 Figures are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Clay & Bradford County / Keystone Club and Keystone Heights
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle	
Keystone Hts & Club	Keystone Heights (Clay County)	Keystone Club (Bradford County)
Jan./Feb/March	November 10, 1990 thru March 4, 1991	December 15, 1990 thru March 4, 1991
April/May	March 5 thru May 1	March 5 thru May 1
June/July	May 2 thru July 3	May 2 thru July 2
August/September	July 4 thru September 9	July 3 thru September 4
October/November	September 10 thru November 5	September 5 thru November 1

Keystone Heights and Keystone Club are interconnected. The customers at Keystone Heights are billed on a bi-monthly basis in January, March, July, September and November. The customers at Keystone Club were billed on a quarterly basis until March, 1991. This situation made it virtually impossible to accurately determine unaccounted for water on a monthly, bi-monthly or quarterly basis.
The billing cycle for these two systems was changed in March of 1991 and they are now billed on a bi-monthly basis. The annual unaccounted for water percentage average should be relatively accurate.

In addition to the problem stated above, the fluctuation in the unaccounted for water per cent occurs for the following reasons:

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Clay / Keystone Heights

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				1,569,600
	Reliable Plant Capacity with Largest Well Out of Service				763,200
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		08/29/91		750,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/17/91		619,000
		(2)	09/25/91		583,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	09/24/91		536,000
		(4)	09/13/91		523,000
		(5)	09/19/91		499,000
	(There is no record of any unusual occurances)			AVERAGE	552,000
4.	Five-Day Max Year	(1)	08/29/91		750,000
		(2)	09/17/91		619,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	09/25/91		583,000
		(4)	09/24/91		536,000
		(5)	09/13/91		523,000
	(There is no record of any unusual occurances)			AVERAGE	602,200
5.	Average Daily Flow				278,044
6.	Required Fire Flow (1000 GPM for 2 hours)				120,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance attached hereto)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Clay / Keystone Heights — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Keystone Heights
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	101,486
2	Annual Average Daily Demand	278,044
3	Maximum Day Demand - Date	08/29/91
4	Maximum Day Gallons Pumped	750,000
5	Gallons Per Minute Pumped	521
6	Fire Flow Requirement (Gallons)	120,000
7	Fire Flow Requirement (GPM)	1,000
8	Beginning No. of ERCs	1,128
9	Ending No. of ERCs	1,136
10	Average No. of ERCs	1,132
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	475
12	No. 2 (GPM Capacity)	370
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	845
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	55,000
17	Total Storage Capacity in Gallons	55,000
18	Percent Used and Useful	100% [1]
	High Service Pumps: (Account No. 311.2, 325.0_)	
19	No. 1 & 4 (Capacity in GPM)	0
20	No. 2 & 5 (Capacity in GPM)	0
21	No. 3 & 6 (Capacity in GPM)	0
22	Total High Service Pump Capacity	0
23	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
24	Tank No. 1	10,000
25	Total Hydro Tanks (Gallons)	10,000
26	Percent Used and Useful (Tank No. 1)	71%
27	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
28	Average No. of ERCs	1,132
29	Permitted No. of Lots/ERCs	1,673
30	Percent Used and Useful	68%

NOTE Buildings, Land, Aeration, and Chlorination Equipment are considered 100% used and useful.

[1] Fire flow excluded from used and useful calculation.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Clay / Keystone Heights

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Clay / Keystone Heights **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	1,076.0	1,052.0	1,064.0	104,395,000	98,116	104,395,000	1,064.0	ERR
2	1988	1,052.0	1,085.0	1,068.5	104,155,000	97,478	104,155,000	1,068.5	0.4%
3	1989	1,085.0	1,088.0	1,086.5	108,422,000	99,790	108,422,000	1,086.5	1.7%
4	1990	1,088.0	1,128.0	1,108.0	137,002,000	123,648	137,002,000	1,108.0	2.0%
5	1991	1,128.0	1,136.0	1,132.0	106,544,843	94,121	106,544,843	1,132.0	2.2%
				Average Growth Through 5-Year Period (Col. 8)					1.6%

Kingswood - 1701

Brevard County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Brevard County / Kingswood
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January		379	299		80	21.1%
2	February		379	186		193	50.9%
3	March		379	250		129	34.0%
4	April		379	291		88	23.2%
5	May		379	276		103	27.2%
6	June		379	277		102	26.9%
7	July		379	248		131	34.6%
8	August		379	490		(111)	-29.3%
9	September		379	278		101	26.6%
10	October		379	261		118	31.1%
11	November		379	310		69	18.2%
12	December		379	249		130	34.3%
13							
14	**Total**	**0**	**4,548**	**3,415**	**0**	**1,133**	**24.9%**
15							
16							

Line No.							
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February						0
23	March						0
24	April						0
25	May						0
26	June						0
27	July						0
28	August						0
29	September						0
30	October						0
31	November						0
32	December						0
33	Totals	0	0	0	0	0	0
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Brevard County / Kingswood
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the purchased column comes from the Purchased Water Report.
Unaccounted for water is calculated as follows:

Usage Sold	Purchased Water
January	January
February	February
March	March
April	April
May	May
June	June
July	July
August	August
September	September
October	October
November	November
December	December

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The water is purchased from Brevard County, the flow meter malfunctioned so the and all gallons purchased are estimated. Due to these circumstances, it is impossible to determine the true unaccounted for water percentage. The Manager responsible for this system is working with Brevard County to correct this situation. Brevard County expects to have the flow meter either repaired or changed out within the next 90 days.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Brevard / Kingswood

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE	GPD
	ALL WATER IS PURCHASED FROM BREVARD COUNTY			
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.			
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)			
3.	Five-Day Max Month The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	AVERAGE	
4.	Five-Day Max Year The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	AVERAGE	
5.	Average Daily Flow			
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.			

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Brevard / Kingswood **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20

Based on customer density, system layout, and pipe size, the water distribution system is 100% used and useful. (See system map)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Brevard / Kingswood

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987 [1]	59.0	59.0	59.0	1,120,000	18,983	1,120,000	59.0	ERR
2	1988	59.0	63.0	61.0	3,257,000	53,393	3,257,000	61.0	3.4%
3	1989	63.0	60.0	61.5	3,071,000	49,935	3,071,000	61.5	0.8%
4	1990	60.0	61.0	60.5	3,478,000	57,488	3,478,000	60.5	-1.6%
5	1991	61.0	59.0	60.0	3,417,020	56,950	3,417,020	60.0	-0.8%
				Average Growth Through 5-Year Period (Col. 8)					0.4%

[1] Acquired in September 1987. All water is purchased from the County.

Lake Ajay Estates - 773

Osceola County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Osceola County / Lake Ajay
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	771		804	12	(45)	-5.8%
3	March						
4	April	808		743	18	47	5.8%
5	May						
6	June	688		613	16	59	8.6%
7	July						
8	August	651		598	5	48	7.4%
9	September						
10	October	644		594	8	42	6.5%
11	November						
12	December	830		810	5	15	1.8%
13							
14	Total	4,392	0	4,162	64	166	3.8%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	12					12
23	March						
24	April	18					18
25	May						
26	June	16					16
27	July						
28	August	5					5
29	September						
30	October	8					8
31	November						
32	December	5					5
33	Totals	64	0	0	0	0	64
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Osceola County / Lake Ajay
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 22, 1990 thru February 18 1991
April	February 19 thru April 15
June	April 16 thru June 19
August	June 20 thru August 19
October	August 20 thru October 18
December	October 19 thru December 20

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Osceola / Lake Ajay

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				417,600
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		04/14/91		37,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	12/29/91		29,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	12/20/91		27,000
		(3)	12/13/91		26,000
		(4)	12/19/91		22,000
		(5)	12/06/91		21,000
				AVERAGE	25,000
4.	Five-Day Max Year	(1)	04/14/91		37,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	11/28/91		35,000
		(3)	02/25/91		31,000
		(4)	12/29/91		29,000
		(5)	11/28/91		28,000
				AVERAGE	32,000
5.	Average Daily Flow				12,197
6.	Required Fire Flow (1500 GPM for 4 hours)				360,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County S/D Design Standards)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Osceola / Lake Ajay | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Lake Ajay
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	4,452
2	Annual Average Daily Demand	12,197
3	Maximum Day Demand - Date	04/14/91
4	Maximum Day Gallons Pumped	37,000
5	Gallons Per Minute Pumped	26
6	Fire Flow Requirement (Gallons)	30,000
7	Fire Flow Requirement (GPM)	250
8	Beginning No. of ERCs	31
9	Ending No. of ERCs	44
10	Average No. of ERCs	38
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	290
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	290
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	15,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	15,000
20	Percent Used and Useful	82% [1]
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	160
22	No. 2 & 5 (Capacity in GPM)	160
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	320
25	Percent Used and Useful	32% [1]
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	38
31	Permitted No. of Lots/ERCs	100
32	Percent Used and Useful	38%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] Fire flow excluded from used and useful calculation.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Osceola / Lake Ajay

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Osceola / Lake Ajay **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Lake Ajay (a)
1	Annual Growth From Schedule F-9	37.3%
2	Average Number Of Test Year ERC's	38
3	Number Of ERC's Associated With 1 Year Growth	14
4	Projected Number Of ERC's	51
5	Test Year Usage Per ERC @ MDD	987
6	MDD 1.5 Years Into Future	50,787
	Used and Useful With Margin Reserve:	
7	Distribution System	51%
8	Finished Water Storage	100%
9	High Service Pumps	44%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Osceola / Lake Ajay

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a subsitute.

	(1)	(2)	(3) ERCs	(4)	(5)	(6) Gallons/ ERC	(7) Total	(8) Total	(9) Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	(5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	0.0	0.0	0.0	0	ERR	0	ERR	ERR
2	1988 [1]	9.0	20.0	14.5	1,325,000	91,379	1,325,000	14.5	ERR
3	1989	20.0	25.0	22.5	2,490,000	110,667	2,490,000	22.5	55.2%
4	1990	25.0	31.0	28.0	3,220,200	115,007	3,220,200	28.0	24.4%
5	1991	31.0	44.0	37.5	4,163,050	111,015	4,163,050	37.5	33.9%
				Average Growth Through 4-Year Period (Col. 8)					37.3%

[1] Acquired April 1988.

Lake Brantley - 325

Seminole County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Seminole County / Lake Brantley
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,357		1,107	115	135	9.9%
2	February						
3	March	1,226		1,010	100	116	9.5%
4	April						
5	May	1,347		1,137	85	125	9.3%
6	June						
7	July	1,483		2,301	74	(892)	-60.1%
8	August						
9	September	1,487		1,270	72	145	9.7%
10	October						
11	November	1,370		1,230	27	114	8.3%
12	December						
13							
14	**Total**	**8,270**	**0**	**8,055**	**473**	**(258)**	**-3.1%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	45			70		115
22	February						
23	March	41			59		100
24	April						
25	May	15			70		85
26	June						
27	July				74		74
28	August						
29	September	28			44		72
30	October						
31	November				27		27
32	December						
33	Totals	129	0	0	344	0	473
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Seminole County / Lake Brantley
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 8,1990 thru January 5, 1991
March	January 6 thru March 6
May	March 7 thru May 4
July	May 5 thru July 6
September	July 7 thru September 7
November	September 8 thru November 7

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) A customer in this systme was overbilled 1,002,510 gallons in July. The customer received a credit for the dollars in September but the gallons were inadvertently credited as 1,000 instead of 1,003,000. This error makes it appear that this system sold 1,003,000 gallons that it did not actually sell. When these gallons are subtracted from the July sold gallons, the unaccounted for percentage for this month equals 7.5 and the annual unaccounted for percentage equals 9.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Seminole / Lake Brantley

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				144,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		05/09/91		40,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/05/91		38,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	09/11/91		36,000
		(3)	09/07/91		32,000
		(4)	09/18/91		31,000
		(5)	09/20/91		29,000
				AVERAGE	33,200
4.	Five-Day Max Year	(1)	05/09/91		40,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	09/05/91		38,000
		(3)	09/11/91		36,000
		(4)	12/26/91		36,000
		(5)	06/14/91		34,000
				AVERAGE	36,800
5.	Average Daily Flow				22,468
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Seminole / Lake Brantley — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Lake Brantley
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	8,201
2	Annual Average Daily Demand	22,468
3	Maximum Day Demand - Date	05/09/91
4	Maximum Day Gallons Pumped	40,000
5	Gallons Per Minute Pumped	28
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	63
9	Ending No. of ERCs	67
10	Average No. of ERCs	65
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	100
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	100
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	9,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	9,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	100
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	100
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	1,500
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	65
31	Permitted No. of Lots/ERCs	77
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, system layout, and pipe size. The Commission found this system/plant to be 100% used and useful in Docket No. 890868-WS.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Seminole / Lake Brantley

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Seminole / Lake Brantley

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	63.0	66.0	64.5	5,859,000	90,837	5,859,000	64.5	ERR
2	1988	66.0	65.0	65.5	6,974,000	106,473	6,974,000	65.5	1.6%
3	1989	65.0	66.0	65.5	7,368,000	112,489	7,368,000	65.5	0.0%
4	1990	66.0	63.0	64.5	7,970,070	123,567	7,970,070	64.5	-1.5%
5	1991	63.0	67.0	65.0	8,055,220	123,926	8,055,220	65.0	0.8%
					Average Growth Through 5-Year Period (Col. 8)				0.2%

Lake Conway Park - 104

Orange County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Orange County / Lake Conway
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,255		1,211	2	42	3.3%
2	February						
3	March	1,442		1,377	6	59	4.1%
4	April						
5	May	1,646		1,567	2	77	4.7%
6	June						
7	July	1,590		1,292	57	241	15.2%
8	August						
9	September	982	532	1,482	12	20	1.3%
10	October						
11	November		2,165	1,447	65	653	30.2%
12	December						
13							
14	**Total**	**6,915**	**2,697**	**8,376**	**144**	**1,092**	**11.4%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January		2				2
22	February						0
23	March	4	2				6
24	April						0
25	May		2				2
26	June						0
27	July	35	2	20			57
28	August						0
29	September	4	8				12
30	October						0
31	November	25	2	38			65
32	December						0
33	Totals	68	18	58	0	0	144
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Orange County / Lake Conway
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 28, 1990 thru January 27, 1991
March	January 28 thru March 27
May	March 28 thru May 27
July	May 28 thru July 24
September	July 25 thru September 26
November	September 27 thru November 26

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The water treatment plant was taken off line and interconnected with Orlando Utilities Commission August 30, 1991. The invoices from Orlando Utilities are not coordinated with our billing cycle, therefore causing a fluctuation in the unaccounted for water percentage. The December percentage is high because the invoice from OUC actually accounts for water used up to December 17, 1991 and our billing cycle stopped November 26.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill sutuation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Orange / Lake Conway

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
	NOTE: ALL WATER PURCHASED FROM ORLANDO UTILITITES COMMISSION AFTER AUGUST 31st.				
1.	Plant Capacity				187,200
	Reliable Plant Capacity with Largest Well Out of Service				57,600
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		07/29/91		50,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	07/29/91		50,000
		(2)	07/09/91		42,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	07/04/91		40,000
		(4)	07/10/91		38,000
		(5)	07/08/91		36,000
	(There is no record of any unusual occurances)			AVERAGE	41,200
4.	Five-Day Max Year	(1)	07/29/91		50,000
		(2)	07/09/91		42,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	07/04/91		40,000
		(4)	06/24/91		39,000
		(5)	07/10/91		38,000
	(There is no record of any unusual occurances)			AVERAGE	41,800
5.	Average Daily Flow				25,669
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Orange / Lake Conway **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Lake Conway
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	6,212 [1]
2	Annual Average Daily Demand	25,669 [1]
3	Maximum Day Demand - Date	07/29/91
4	Maximum Day Gallons Pumped	50,000
5	Gallons Per Minute Pumped	35
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	85
9	Ending No. of ERCs	83
10	Average No. of ERCs	84
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	90
12	No. 2 (GPM Capacity)	40
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	130
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	4,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	4,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	76
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	76
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	2,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	68%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	84
31	Permitted No. of Lots/ERCs	85
32	Percent Used and Useful	100%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

[1] Based on plant operation for 242 days of the year. After August 31st all water is purchased from OUC.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Orange / Lake Conway

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Orange / Lake Conway

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	84.0	84.0	84.0	11,022,000	131,214	11,022,000	84.0	ERR
2	1988	84.0	85.0	84.5	10,526,000	124,568	10,526,000	84.5	0.6%
3	1989	85.0	85.0	85.0	8,827,000	103,847	8,827,000	85.0	0.6%
4	1990	85.0	85.0	85.0	9,144,090	107,578	9,144,090	85.0	0.0%
5	1991	85.0	83.0	84.0	8,374,470	99,696	8,374,470	84.0	-1.2%
				Average Growth Through 5-Year Period (Col. 8)					0.0%

Lake Harriet Estates - 323

Seminole County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Seminole County / Lake Harriet
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	5,944		4,454	502	988	16.6%
2	February						
3	March	5,064	167	4,105	381	745	14.2%
4	April						
5	May	5,886	2,662	5,503	602	2,443	28.6%
6	June						
7	July	6,594	848	4,923	673	1,846	24.8%
8	August						
9	September	6,567		5,261	657	649	9.9%
10	October						
11	November	6,121		5,196	646	279	4.6%
12	December						
13							
14	Total	36,176	3,677	29,442	3,462	6,949	17.4%
15							
16							

Line No.							
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January	146	59		297		502
22	February						
23	March	89	39		253		381
24	April						
25	May	242	66		294		602
26	June						
27	July	274	65	4	330		673
28	August						
29	September	262	67		328		657
30	October						
31	November	281	59		306		646
32	December						
33	Totals	1294	355	4	1809	0	3462
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Seminole County / Lake Harriet
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the purchased column comes from the Purchased Water Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 4, 1990 thru January 8, 1991
March	January 9 thru March 6
May	March 7 thru May 6
July	May 7 thru July 5
September	July 6 thru September 5
November	September 6 thru November 5

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system is interconnected with the City of Altamonte Springs for emergency standby purposes. The gallons purchased are not coordinated with the billing cycle.

4) The water for the chlorine booster pump is connected before the flow meter. It is estimated that the pump uses 6 gallons per minute while the pump is running. The usage was calculated by taking the minutes the pump ran times 6 gpm and is listed under Utility Use.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Seminole / Lake Harriett | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				864,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		09/05/91		152,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	05/16/91		138,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	05/10/91		121,000
		(3)	05/03/91		118,000
		(4)	05/15/91		118,000
		(5)	05/22/91		118,000
	(There is no record of any unusual occurances)			AVERAGE	122,600
4.	Five-Day Max Year	(1)	09/05/91		152,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/11/91		147,000
		(3)	05/16/91		138,000
		(4)	09/18/91		135,000
		(5)	09/07/91		133,000
	(There is no record of any unusual occurances)			AVERAGE	141,000
5.	Average Daily Flow				99,682
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Seminole / Lake Harriett — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Lake Harriett
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	36,384
2	Annual Average Daily Demand	99,682
3	Maximum Day Demand - Date	09/05/91
4	Maximum Day Gallons Pumped	152,000
5	Gallons Per Minute Pumped	106
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	274
9	Ending No. of ERCs	272
10	Average No. of ERCs	273
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	600
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	600
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	25,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	25,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	400
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	400
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	273
31	Permitted No. of Lots/ERCs	293
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

[1] 100% used and useful based on customer density, system layout, and pipe size. The Commission found this system/plant to be 100% used and useful in Docket No. 890868-WS.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Seminole / Lake Harriett

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Seminole / Lake Harriett

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs							
Line No.	Year	Beginning	Ending	Average	Gallons Sold	Gallons/ ERC (5)/(4)	Total Gallons Sold	Total ERCs (7)/(6)	Annual % Incr. in ERCs
1	1987	257.0	255.0	256.0	25,699,000	100,387	25,699,000	256.0	ERR
2	1988	255.0	263.0	259.0	25,971,000	100,274	25,971,000	259.0	1.2%
3	1989	263.0	272.0	267.5	30,023,000	112,236	30,023,000	267.5	3.3%
4	1990	272.0	274.0	273.0	31,312,369	114,697	31,312,369	273.0	2.1%
5	1991	274.0	271.5	273.0	29,441,861	107,846	29,441,861	273.0	0.0%
				Average Growth Through 5-Year Period (Col. 8)					1.6%

Lakeview Villas - 1054

Clay County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Clay County / Lakeview Villa
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	57		44	4	9	15.8%
3	March						
4	April	77		61	10	6	7.8%
5	May						
6	June	114		95	8	11	9.6%
7	July						
8	August	60		57	0	3	5.0%
9	September						
10	October	61		56	0	5	8.2%
11	November						
12	December	63		54	1	8	12.7%
13							
14	Total	432	0	367	23	42	9.7%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	4					4
23	March						
24	April	10					10
25	May						
26	June	8					8
27	July						
28	August						0
29	September						
30	October						0
31	November						
32	December	1					1
33	Totals	23	0	0	0	0	23
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Clay County / Lakeview Villa
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	November 28, 1990 thru January 27, 1991
April	January 28 thru March 30
June	March 31 thru June 3
August	June 4 thru August 5
October	August 6 thru October 1
December	October 2 thru November 28

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Clay / Lakeview Villas

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				28,800
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		11/12/91		4,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	05/15/91		3,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/23/91		3,000
		(3)	05/02/91		2,000
		(4)	05/08/91		2,000
		(5)	05/09/91		2,000
				AVERAGE	2,400
4.	Five-Day Max Year	(1)	11/12/91		4,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/23/91		3,000
		(3)	05/15/91		3,000
		(4)	04/16/91		3,000
		(5)	04/17/91		3,000
				AVERAGE	3,200
5.	Average Daily Flow				1,200
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Clay / Lakeview Villas **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Lakeview Villas
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	438
2	Annual Average Daily Demand	1,200
3	Maximum Day Demand - Date	11/12/91
4	Maximum Day Gallons Pumped	4,000
5	Gallons Per Minute Pumped	3
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	12
9	Ending No. of ERCs	13
10	Average No. of ERCs	13
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	20
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	20
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Total Storage Capacity in Gallons	0
18	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
19	No. 1 & 4 (Capacity in GPM)	0
20	No. 2 & 5 (Capacity in GPM)	0
21	No. 3 & 6 (Capacity in GPM)	0
22	Total High Service Pump Capacity	0
23	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
24	Tank No. 1	1,000
25	Total Hydro Tanks (Gallons)	1,000
26	Percent Used and Useful (Tank No. 1)	30%
27	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
28	Average No. of ERCs	13
29	Permitted No. of Lots/ERCs	23
30	Percent Used and Useful	100% [1]

NOTE Buildings, Land, Aeration, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size, and system layout.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Clay / Lakeview Villas **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Clay / Lakeview Villas

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	15.0	15.0	15.0	681,000	45,400	681,000	15.0	ERR
2	1988	15.0	13.0	14.0	509,000	36,357	509,000	14.0	-6.7%
3	1989	13.0	15.0	14.0	575,000	41,071	575,000	14.0	0.0%
4	1990	15.0	12.0	13.5	604,900	44,807	604,900	13.5	-3.6%
5	1991	12.0	13.0	12.5	367,910	29,433	367,910	12.5	-7.4%
				Average Growth Through 5-Year Period (Col. 8)					-4.5%

Leilani Heights - 675

Martin County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Martin County / Leilani Heights
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	5,484		4,227	353	904	16.5%
2	February	4,605		3,894	286	425	9.2%
3	March	4,471		3,711	287	473	10.6%
4	April	4,321		3,553	369	399	9.2%
5	May	4,511		3,881	289	341	7.6%
6	June	5,608		4,601	464	543	9.7%
7	July	4,383		3,680	322	381	8.7%
8	August	4,691		4,117	327	247	5.3%
9	September	4,934		4,315	357	262	5.3%
10	October	3,935		3,468	298	169	4.3%
11	November	3,825		3,513	288	24	0.6%
12	December	4,334		3,897	398	39	0.9%
13							
14	Total	55,102	0	46,857	4,038	4,207	7.6%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	20	333				353
22	February		286				286
23	March		287				287
24	April		369				369
25	May		289				289
26	June		464				464
27	July		322				322
28	August		327				327
29	September		357				357
30	October		298				298
31	November		288				288
32	December		398				398
33	Totals	20	4018	0	0	0	4038
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Martin County / Leilani Heights
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 1, 1990 thru December 31, 1990
February	January 1, 1991 thru February 1
March	February 2 thru March 4
April	March 5 thru March 31
May	April 1 thru April 30
June	May 1 thru June 2
July	June 3 thru July 3
August	July 4 thru August 2
September	August 3 thru September 2
October	September 3 thru October 2
November	October 3 thru November 4
December	November 5 thru December 5

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Martin / Leilani Heights **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service				676,800 144,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		05/05/91		282,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	05/05/91		282,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	05/08/91		252,000
		(3)	05/12/91		239,000
		(4)	05/13/91		239,000
		(5)	05/03/91		211,000
	(There is no record of any unusual occurances)			AVERAGE	244,600
4.	Five-Day Max Year	(1)	05/05/91		282,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/14/91		278,000
		(3)	05/08/91		252,000
		(4)	05/12/91		239,000
		(5)	05/13/91		239,000
	(There is no record of any unusual occurances)			AVERAGE	258,000
5.	Average Daily Flow				146,085
6.	Required Fire Flow				60,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (Per letter from Martin County)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Martin / Leilani Heights

Docket No. 920199-WS
Test Year Ended: 12/31/91

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Leilani Heights
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	53,321
2	Annual Average Daily Demand	146,085
3	Maximum Day Demand - Date	05/05/91
4	Maximum Day Gallons Pumped	282,000
5	Gallons Per Minute Pumped	196
6	Fire Flow Requirement (Gallons)	60,000
7	Fire Flow Requirement (GPM)	500
8	Beginning No. of ERCs	385
9	Ending No. of ERCs	386
10	Average No. of ERCs	386
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	370
12	No. 2 (GPM Capacity)	100
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	470
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	10,000
27	Tank No. 2	10,000
28	Percent Used and Useful (Tank No. 1)	56%
	Percent Used and Useful (Tank No. 2)	15%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	386
31	Permitted No. of Lots/ERCs	413
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size and layout.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Martin / Leilani Heights **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Martin / Leilani Heights

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	367.0	373.0	370.0	48,834,000	131,984	48,834,000	370.0	ERR
2	1988	373.0	383.0	378.0	54,058,000	143,011	54,058,000	378.0	2.2%
3	1989	383.0	384.0	383.5	56,033,000	146,110	56,033,000	383.5	1.5%
4	1990	384.0	385.0	384.5	55,720,000	144,915	55,720,000	384.5	0.3%
5	1991	385.0	386.0	385.5	46,855,277	121,544	46,855,277	385.5	0.3%
				Average Growth Through 5-Year Period (Col. 8)					1.0%

Leisure Lakes - 2401
(Covered Bridge)

Highlands County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Highlands County / Leisure Lakes
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	540		755	8	(223)	-41.3%
2	February	801		918	8	(125)	-15.6%
3	March	830		897	15	(82)	-9.9%
4	April	1,014		913	10	91	9.0%
5	May	581		764	7	(190)	-32.7%
6	June	431		636	15	(220)	-51.0%
7	July	298		416	8	(126)	-42.3%
8	August	219		487	6	(274)	-125.1%
9	September	385		933	5	(553)	-143.6%
10	October	362		438	14	(90)	-24.9%
11	November	651		495	18	138	21.2%
12	December	607		886	7	(286)	-47.1%
13							
14	Total	6,719	0	8,538	121	(1,940)	-28.9%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	5	3				8
22	February	6	2				8
23	March	13	2				15
24	April	8	2				10
25	May	5	2				7
26	June	4	3	8			15
27	July	3	3	2			8
28	August	2	2	2			6
29	September	3	2				5
30	October	10	2	2			14
31	November	4	4	10			18
32	December	2	2	3			7
33	Totals	65	29	27	0	0	121
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Highlands County / Leisure Lakes
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	January 1, 1991 thru January 25, 1991
February	January 26 thru February 22
March	February 23 thru March 25
April	March 26 thru April 24
May	april 25 thru May 25
June	May 26 thru June 24
July	June 25 thru July 25
August	July 26 thru August 23
September	August 23 thru September 25
October	September 26 thru October 23
November	October 24 thru November 25
December	November 26 thru December 23

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The flow meter at this plant was determined to be defective. It appears to have been slowing down and at times not recording low flows at all. When compared to historical data on the flows at the facility, we believe the meter registered approximately 30 per cent slow for the year. If the 30 % were added to the pumped gallons the year consumption would total 8,735,000 and the unaccounted for water annual percentage would equal 0.8 %. The flow meter was replaced in January, 1992. The old flow meter is being tested. The resluts can be obtained upon request.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Highlands / Covered Bridge(Leisure Lk)

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				504,000
	Reliable Plant Capacity with Largest Well Out of Service				72,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		03/27/91		52,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	04/22/91		33,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	04/09/91		30,000
		(3)	04/02/91		29,000
		(4)	04/03/91		29,000
		(5)	04/04/91		29,000
				AVERAGE	30,000
4.	Five-Day Max Year	(1)	03/27/91		52,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/15/91		40,000
		(3)	11/22/91		39,000
		(4)	11/13/91		35,000
		(5)	04/22/91		33,000
				AVERAGE	39,800
5.	Average Daily Flow				19,518
6.	Required Fire Flow (500 GPM for 2 hours)				60,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (Per NFPA)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Highlands / Covered Bridge(Leisure Lk) — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Covered Bridge [1]
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	7,124
2	Annual Average Daily Demand	19,518
3	Maximum Day Demand - Date	03/27/91
4	Maximum Day Gallons Pumped	52,000
5	Gallons Per Minute Pumped	36
6	Fire Flow Requirement (Gallons)	60,000
7	Fire Flow Requirement (GPM)	500
8	Beginning No. of ERCs	239
9	Ending No. of ERCs	244
10	Average No. of ERCs	242
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	300
12	No. 2 (GPM Capacity)	50
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	350
15	Percent Used and Useful	100% [1]
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	15,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	15,000
20	Percent Used and Useful	100% [1]
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	200
22	No. 2 & 5 (Capacity in GPM)	200
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	400
25	Percent Used and Useful	100% [1]
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	10,000
27	Tank No. 2	
28	Percent Used and Useful (Tank No. 1)	100% [1]
29	Auxiliary Power: (Acct. 310.2)	100% [1]
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	242
31	Permitted No. of Lots/ERCs	385
32	Percent Used and Useful	75% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] In Docket 861073-WS, the Commission determined the water plant to be 100% used and useful and the distribution system 75% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Highlands / Covered Bridge(Leisure Lk) **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Highlands / Covered Bridge(Leisure Lk)

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs							
Line No.	Year	Beginning	Ending	Average	Gallons Sold	Gallons/ ERC (5)/(4)	Total Gallons Sold	Total ERCs (7)/(6)	Annual % Incr. in ERCs
1	1987								
2	1988 [1]	222.0	222.0	222.0	9,016,000	40,613	9,016,000	222.0	
3	1989	222.0	232.0	227.0	8,550,000	37,665	8,550,000	227.0	2.3%
4	1990	232.0	239.0	235.5	8,095,100	34,374	8,095,100	235.5	3.7%
5	1991	239.0	244.0	241.5	8,538,493	35,356	8,538,493	241.5	2.5%
				Average Growth Through 2-Year Period (Col. 8)					3.1%

[1] Acquired January 1989. No Prior Data Available

Marco Shores Utilities - 26002

Collier County (DUI)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: DUI - SSU / Collier County / Marco Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	4,729		4,501	13	215	4.5%
2	February	4,136		3,473	23	640	15.5%
3	March	5,562		7,892		(2,330)	-41.9%
4	April	4,494		4,006		488	10.9%
5	May	3,971		3,066	9	896	22.6%
6	June	2,653		2,442		211	8.0%
7	July	1,593		1,706		(113)	-7.1%
8	August	1,729		2,420		(691)	-40.0%
9	September	1,332		610	5	717	53.8%
10	October	2,228		1,595		633	28.4%
11	November	3,346		2,620		726	21.7%
12	December	4,002		3,257		745	18.6%
13							
14	**Total**	**39,775**	**0**	**37,588**	**50**	**2,137**	**5.4%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	13					13
22	February	23					23
23	March						0
24	April						0
25	May	9					9
26	June						0
27	July						0
28	August						0
29	September	5					5
30	October						0
31	November						0
32	December						0
33	Totals	50	0	0	0	0	50
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: DUI - SSU / Collier County / Marco Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 14, 1990 thru January 15, 1991
February	January 16 thru February 11
March	February 12 thru March 15
April	March 16 thru April 13
May	April 14 thru May 14
June	May 15 thru June 13
July	June 14 thru July 15
August	July 16 thru August 16
September	August 17 thru September 15
October	September 16 thru October 14
November	October 15 thru November 14
December	November 15 thru December 15

Raw water pumped gallons are used in the pumped column because the meter registering pumped gallons is too close to the high service pump thus does not register accurately. The meter is being moved so as to provide for accurate readings in the future.

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: DUI-SSU / Collier / Marco Shores

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity (Limited by capacity of solids contact unit) Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				720,000
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)		05/15/91		334,000
3.	Five-Day Max Month	(1)	12/13/91		201,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/23/91		191,000
		(3)	12/09/91		185,000
		(4)	12/02/91		184,000
		(5)	12/06/91		178,000
	(There is no record of any unusual occurances)			AVERAGE	187,800
4.	Five-Day Max Year	(1)	05/15/91		334,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	01/31/91		239,000
		(3)	11/18/91		234,000
		(4)	02/25/91		227,000
		(5)	02/01/91		213,000
	(There is no record of any unusual occurances)			AVERAGE	249,400
5.	Average Daily Flow				102,690
6.	Required Fire Flow (750 GPM for 4 hours) The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				180,000

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: DUI-SSU / Collier / Marco Shores **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Marco Shores
1	Total Gallons Pumped (000's)	37,482
2	Annual Average Daily Demand	102,690
3	Maximum Day Demand - Date	05/15/91
4	Maximum Day Gallons Pumped	334,000
5	Gallons Per Minute Pumped	232
6	Fire Flow Requirement (Gallons)	180,000
7	Fire Flow Requirement (GPM)	750
8	Beginning No. of ERCs	411
9	Ending No. of ERCs	409
10	Average No. of ERCs	410
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	0
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	No. 4 (GPM Capacity)	0
15	Total Well Capacity (GPM)	0 [1]
16	Percent Used and Useful	
	Water Treatment Equipment	
17	General Filter Solids Contact Unit in GPM	500
18	General Gravity Filters in GPM	500
	(rated capacity with one filter out of service)	
19	Total Water Treatment Equipment Capacity in GPM	500
20	Percent Used and Useful	46%
	Finished Water Storage: (Account No. 330.4)	
21	Tank No. 1 (Net of Dead Storage)	416,666
22	Total Storage Capacity in Gallons	416,666
23	Percent Used and Useful	70%
	High Service Pumps: (Account No. 311.2, 325.0_)	
24	No. 1 (Capacity in GPM)	1,200
25	No. 2 (Capacity in GPM)	1,200
26	No. 3 (Capacity in GPM)	300
27	Total High Service Pump Capacity	2,700
28	Percent Used and Useful	81%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
29	Tank No. 1	10,000
30	Percent Used and Useful (Tank No. 1)	100%
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	410
33	Permitted No. of Lots/ERCs	600
34	Percent Used and Useful	100% [2]

NOTE Buildings, Land, Aeration, and Chlorination Equipment are considered 100% used and useful.
[1] Raw water supplied by Marco Island System.
[2] 100% used and useful based on system layout, customer density, and pipe size.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: DUI-SSU / Collier / Marco Shores

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: DUI-SSU / Collier / Marco Shores **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Marco Shores
		(a)
1	Annual Growth From Schedule F-9	1.7%
2	Number Of ERC's Associated With 1.5 Years Growth	10
3	Average Number Of Test Year ERC's	410
4	Projected Number Of ERC's	420
5	Test Year Usage Per ERC @ MDD	815
6	Projected MDD for Margin Reserve	342,439
	Used and Useful With Margin Reserve:	
7	Finished Water Storage	71%
8	Water Treatment Equipment	48%
9	High Service Pumps	82%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: DUI-SSU / Collier / Marco Shores — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	403.0	364.0	383.5	15,227,000	39,705	15,227,000	383.5	ERR
2	1988	364.0	393.0	378.5	15,679,000	41,424	15,679,000	378.5	-1.3%
3	1989	393.0	416.0	404.5	19,487,000	48,176	19,487,000	404.5	6.9%
4	1990	416.0	411.0	413.5	32,094,954	77,618	32,094,954	413.5	2.2%
5	1991	411.0	408.5	410.0	37,587,996	91,678	37,587,996	410.0	-0.8%
					Average Growth Through 5-Year Period (Col. 8)				1.7%

Marion Oaks Utilities - 11001

Marion County (UFU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Marion County / Marion Oaks
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	11,555		9,224	1,313	1,018	8.8%
2	February	12,590		11,131	1,230	229	1.8%
3	March	11,912		10,047	803	1,062	8.9%
4	April	13,181		11,722	592	867	6.6%
5	May	16,050		12,522	1,926	1,602	10.0%
6	June	13,189		12,450	548	191	1.4%
7	July	14,956		10,474	2,951	1,531	10.2%
8	August	12,761		10,574	934	1,253	9.8%
9	September	12,255		10,127	1,532	596	4.9%
10	October	14,916		12,409	1,156	1,351	9.1%
11	November	13,482		10,696	1,383	1,403	10.4%
12	December	13,239		10,033	1,796	1,410	10.7%
13							
14	**Total**	**160,086**	**0**	**131,409**	**16,164**	**12,513**	**7.8%**
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18–20							
21	January	263	290	750		10	1313
22	February	717	310	193		10	1230
23	March	741	52			10	803
24	April	530	52			10	592
25	May	1514	102	300		10	1926
26	June	438	100			10	548
27	July	939	100	1862		50	2951
28	August	374	100	450		10	934
29	September	1081	50	391		10	1532
30	October	76	50	1020		10	1156
31	November	1323	50			10	1383
32	December	786	50	950		10	1796
33	Totals	8782	1306	5916	0	160	16164
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Marion County / Marion Oaks
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 28, 1990 thru December 27, 1990
February	December 28, 1990 thru January 28, 1991
March	January 29 thru February 27
April	February 28 thru March 27
May	March 28 thru April 29
June	April 30 thru May 27
July	May 28 thru June 28
August	June 29 thru July 29
September	July 30 thru August 28
October	August 29 thru September 25
November	Septemver 26 thru October 25
December	October 26 thru November 25

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significanty different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Marion / Marion Oaks — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				1,440,000
	Reliable Plant Capacity with Largest Well Out of Service				720,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		05/14/91		1,885,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	08/03/91		967,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	08/10/91		949,000
		(3)	08/09/91		703,000
		(4)	08/12/91		700,000
		(5)	08/13/91		652,000
	(There is no record of any unusual occurances)			AVERAGE	794,200
4.	Five-Day Max Year	(1)	05/14/91		1,885,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	06/16/91		1,032,000
		(3)	08/03/91		967,000
		(4)	08/10/91		949,000
		(5)	03/05/91		805,360
	(There is no record of any unusual occurances)			AVERAGE	1,127,672
5.	Average Daily Flow				503,332
6.	Required Fire Flow (2500 GPM for 5 hours)				750,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance attached)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Marion / Marion Oaks **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Marion Oaks
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	183,716
2	Annual Average Daily Demand	503,332
3	Maximum Day Demand - Date	~~08/14/91~~ 6/16/92
4	Maximum Day Gallons Pumped	~~1,885,000~~ 1,032,000
5	Gallons Per Minute Pumped	~~1,309~~ 717
6	Fire Flow Requirement (Gallons)	750,000
7	Fire Flow Requirement (GPM)	2,500
8	Beginning No. of ERCs	2,265
9	Ending No. of ERCs	2,358
10	Average No. of ERCs	2,312
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	1,000
12	No. 2 (GPM Capacity)	500
13	No. 3 (GPM Capacity)	500
14	Total Well Capacity (GPM)	2,000
15	Percent Used and Useful	~~100%~~ 72%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	1,000,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	1,000,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	600
22	No. 2 & 5 (Capacity in GPM)	600
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	1,200
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	12,000
27	Tank No. 2	8,500
28	Tank No. 3	8,500
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	88%
31	Percent Used and Useful (Tank No. 3)	88%
32	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
33	Average No. of ERCs	2,312
34	Permitted No. of Lots/ERCs	7,457
35	Percent Used and Useful	31%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Marion / Marion Oaks **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Marion / Marion Oaks | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Marion Oaks
		(a)
1	Annual Growth From Schedule F-9	11.6%
2	Average Number Of Test Year ERC's	2,312
3	Number Of ERC's Associated With 1 Years Growth	269
4	Projected Number Of ERC's	2,580
5	Test Year Usage Per ERC @ MDD	~~815~~ 446
6	MDD 1.5 Years Into Future	~~2,104,075~~ 1,212,409
	Used and Useful With Margin Reserve:	
7	Distribution System	35%
8	Water Treatment Equipment	84%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Marion / Marion Oaks

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	1,409.5	1,568.5	1,489.0	111,784,000	75,073	111,784,000	1,489.0	ERR
2	1988	1,568.5	1,881.0	1,725.0	141,023,000	81,752	141,023,000	1,725.0	15.8%
3	1989	1,881.0	2,088.0	1,984.5	124,929,000	62,952	124,929,000	1,984.5	15.0%
4	1990	2,088.0	2,265.0	2,176.5	138,312,155	63,548	138,312,155	2,176.5	9.7%
5	1991	2,265.0	2,358.0	2,311.5	131,409,215	56,850	131,409,215	2,311.5	6.2%
					Average Growth Through 5-Year Period (Col. 8)				11.6%

Meredith Manor - 330

Seminole County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Seminole County / Meredith Manor
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	14,625	45	11,741	1,393	1,536	10.5%
3	March						
4	April	14,120	39	11,462	1,374	1,323	9.3%
5	May						
6	June	15,551	44	13,156	1,844	595	3.8%
7	July						
8	August	15,111	41	11,573	1,792	1,787	11.8%
9	September						
10	October	17,109	33	13,729	1,745	1,668	9.7%
11	November						
12	December	15,618	36	10,773	1,815	3,066	19.6%
13							
14	Total	92,134	238	72,434	9,963	9,975	10.8%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	47	615		731		1393
23	March						
24	April	202	477		695		1374
25	May						
26	June	179	875		790		1844
27	July						
28	August	366	671		755		1792
29	September						
30	October	200	690		855		1745
31	November						
32	December	211	724		780	100	1815
33	Totals	1205	4052	0	4606	100	9963
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Seminole County / Meredith Manor
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the purchase column comes from the Purchased Water Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 6, 1990 thru February 6, 1991
April	February 7 thru April 5
June	April 6 thru June 4
August	June 5 thru August 6
October	August 7 thru October 7
December	October 8 thru December 4

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) We purchase water from Sanlando Utilities. Their read dates do not correspond to our billing cycle and may cause a fluctuation in the UFW % during the year.

4) This system was overbilled 938,110 gallons in June and the consumption was credited in December. If the gallons sold were adjusted by the error, the unaccounted for water would equal 9.8 per cent in June and 13.6 per cent in December.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Seminole / Meridith Manor — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				1,296,000
	Reliable Plant Capacity with Largest Well Out of Service				432,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		08/10/91		463,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/18/91		373,000
		(2)	09/07/91		367,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	09/05/91		365,000
		(4)	09/21/91		318,000
		(5)	09/17/91		317,000
	(There is no record of any unusual occurances)			AVERAGE	348,000
4.	Five-Day Max Year	(1)	08/10/91		463,000
		(2)	12/02/91		397,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	09/18/91		373,000
		(4)	09/07/91		367,000
		(5)	09/05/91		365,000
	(There is no record of any unusual occurances)			AVERAGE	393,000
5.	Average Daily Flow				255,359
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Seminole / Meridith Manor — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Meridith Manor
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	93,206
2	Annual Average Daily Demand	255,359
3	Maximum Day Demand - Date	08/10/91
4	Maximum Day Gallons Pumped	463,000
5	Gallons Per Minute Pumped	322
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	741
9	Ending No. of ERCs	737
10	Average No. of ERCs	739
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	600
12	No. 2 (GPM Capacity)	300
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	900
15	Percent Used and Useful	100%
	Storage Reservoirs: (Account No. 330.4)	
16	No. 1 (Capacity in Gallons)	50,000
17	No. 2 (Capacity in Gallons)	0
18	Total Storage Capacity	50,000
19	Less: Estimated "Dead Storage"	0
20	Net Available Storage	50,000
21	Percent Used and Useful	100%
	High Service Pumps:(Account No. 311.2, 325.0_)	
22	No. 1 (Capacity in GPM)	800
23	No. 2 (Capacity in GPM)	350
24	No. 3 (Capacity in GPM)	0
25	Total High Service Pump Capacity	1,150
26	Percent Used and Useful	92%
	Hydropneumatic Tanks:(Account No. 320.3, or 330.4)	
27	Tank No. 1	10,000
28	Tank No. 2	0
29	Tank No. 3	
30	Total Hydro Tanks (Gallons)	10,000
31	Percent Used and Useful (Tank No. 1)	100%
32	Percent Used and Useful (Tank No. 2)	
33	Percent Used and Useful (Tank No. 3)	
34	Auxiliary Power/Pumping Equipment(Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
35	Average No. of ERC's	739
36	Permitted No. of Lots/ERC's	867
37	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, system layout, and pipe size.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Seminole / Meridith Manor **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 for water. The wastewater collection system is 100% used and useful.)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Seminole / Meridith Manor

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3) ERCs	(4)	(5)	(6)	(7)	(8)	(9)
Line No.	Year	Beginning	Ending	Average	Gallons Sold	Gallons/ ERC (5)/(4)	Total Gallons Sold	Total ERCs (7)/(6)	Annual % Incr. in ERCs
1	1987	759.0	718.0	738.5	70,588,000	95,583	70,588,000	738.5	ERR
2	1988	718.0	710.0	714.0	72,885,000	102,080	72,885,000	714.0	-3.3%
3	1989	710.0	726.0	718.0	82,127,000	114,383	82,127,000	718.0	0.6%
4	1990	726.0	741.0	733.5	83,799,876	114,247	83,799,876	733.5	2.2%
5	1991	741.0	736.5	739.0	72,433,256	98,015	72,433,256	739.0	0.7%
				Average Growth Through 5-Year Period (Col. 8)					0.0%

Morningview - 562

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Lake County / Morningview
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. *Provide all calculations to substantiate the other uses.* If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	700		951	72	(323)	-46.1%
3	March						
4	April	749		635	79	35	4.7%
5	May						
6	June	720		621	53	46	6.4%
7	July						
8	August	702		578	64	60	8.5%
9	September						
10	October	668		548	63	57	8.5%
11	November						
12	December	765		584	98	83	10.8%
13							
14	Total	4,304	0	3,917	429	(42)	-1.0%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	35	9		28		72
23	March						
24	April	46	3		30		79
25	May						
26	June	27	4		22		53
27	July						
28	August	34	2		28		64
29	September						
30	October	16	2	12	33		63
31	November						
32	December	22	2	36	38		98
33	Totals	180	22	48	179	0	429
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Lake County / Morningview
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 3, 1990 thru January 31, 1991
April	February 1 thru April 4
June	April 5 thru June 1
August	June 2 thru August 4
October	August 5 thru September 31
December	October 1 thru December 2

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) A sewer only customer was billed for 377,500 gallons in February. Since there were no dollars involved, the gallons were not credited back to the system. Due to the gallonage error it appears that we sold 377,500 gallons than we actually did. If the sold gallons were adjusted to reflect this error the unaccounted for water percentage would equal 7.9 for February and 7.8 annually.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Morningview | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				612,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		03/30/91		26,600
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	12/21/91		18,400
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/16/91		17,900
		(3)	12/18/91		16,100
		(4)	12/20/91		14,700
		(5)	12/11/91		14,600
	(There is no record of any unusual occurances)			AVERAGE	16,340
4.	Five-Day Max Year	(1)	03/30/91		26,600
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	04/03/91		22,600
		(3)	07/18/91		22,600
		(4)	11/14/91		19,700
		(5)	09/22/91		19,400
	(There is no record of any unusual occurances)			AVERAGE	22,180
5.	Average Daily Flow				11,860
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Morningview

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Morningview
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	4,329
2	Annual Average Daily Demand	11,860
3	Maximum Day Demand - Date	03/30/91
4	Maximum Day Gallons Pumped	26,600
5	Gallons Per Minute Pumped	18
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	45
9	Ending No. of ERCs	46
10	Average No. of ERCs	45
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	425
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	425
15	Percent Used and Useful	100%
	Storage Reservoirs: (Account No. 330.4)	
16	No. 1 (Capacity in Gallons)	0
17	No. 2 (Capacity in Gallons)	0
18	Total Storage Capacity	0
19	Less: Estimated "Dead Storage"	0
20	Net Available Storage	0
21	Percent Used and Useful	
	High Service Pumps:(Account No. 311.2, 325.0_)	
22	No. 1 (Capacity in GPM)	0
23	No. 2 (Capacity in GPM)	0
24	No. 3 (Capacity in GPM)	0
25	Total High Service Pump Capacity	0
26	Percent Used and Useful	
	Hydropneumatic Tanks:(Account No. 320.3, or 330.4)	
27	Tank No. 1	4,500
28	Tank No. 2	0
29	Tank No. 3	
30	Total Hydro Tanks (Gallons)	4,500
31	Percent Used and Useful (Tank No. 1)	100%
32	Percent Used and Useful (Tank No. 2)	
33	Percent Used and Useful (Tank No. 3)	
34	Auxiliary Power/Pumping Equipment(Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
35	Average No. of ERC's	45
36	Permitted No. of Lots/ERC's	48
37	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Morningview **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Morningview FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	48.0	48.0	48.0	3,786,000	78,875	3,786,000	48.0	ERR
2	1988	48.0	49.0	48.5	4,529,000	93,381	4,529,000	48.5	1.0%
3	1989	49.0	47.0	48.0	4,798,000	99,958	4,798,000	48.0	-1.0%
4	1990	47.0	45.0	46.0	4,135,400	89,900	4,135,400	46.0	-4.2%
5	1991	45.0	45.5	45.5	3,916,870	86,085	3,916,870	45.5	-1.1%
				Average Growth Through 5-Year Period (Col. 8)					-1.3%

Oak Forest - 993

Citrus County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Citrus County / Oak Forest
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January					0	
2	February	2,764		2,017	238	509	18.4%
3	March					0	
4	April	2,289		2,168	64	57	2.5%
5	May					0	
6	June	2,522		2,266	109	147	5.8%
7	July					0	
8	August	2,130		1,869	66	195	9.2%
9	September					0	
10	October	2,709		2,380	125	204	7.5%
11	November					0	
12	December	2,471		2,104	113	254	10.3%
13							
14	Total	14,885	0	12,804	715	1,366	9.2%
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February	89		80	69		238
23	March						0
24	April	7			57		64
25	May						0
26	June	46			63		109
27	July						0
28	August	13			53		66
29	September						0
30	October	59			66		125
31	November						0
32	December	50			63		113
33	Totals	264	0	80	371	0	715
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Citrus County / Oak Forest
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 12, 1990 thru February 11, 1991
April	February 12 thru April 9
June	April 10 thru June 10
August	June 11 thru August 9
October	August 10 thru October 10
December	October 9 thru December 9

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Citrus / Oak Forest

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				322,560
	Reliable Plant Capacity with Largest Well Out of Service				115,200
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		01/02/91		80,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/03/91		68,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/24/91		65,000
		(3)	09/25/91		65,000
		(4)	09/05/91		60,000
		(5)	09/13/91		60,000
	(There is no record of any unusual occurances)			AVERAGE	63,600
4.	Five-Day Max Year	(1)	01/02/91		80,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	01/04/91		70,000
		(3)	09/03/91		68,000
		(4)	09/24/91		65,000
		(5)	09/25/91		65,000
	(There is no record of any unusual occurances)			AVERAGE	69,600
5.	Average Daily Flow				40,460
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Citrus / Oak Forest — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Oak Forest
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	14,768
2	Annual Average Daily Demand	40,460
3	Maximum Day Demand - Date	01/02/91
4	Maximum Day Gallons Pumped	80,000
5	Gallons Per Minute Pumped	56
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	134
9	Ending No. of ERCs	142
10	Average No. of ERCs	138
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	144
12	No. 2 (GPM Capacity)	80
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	224
15	Percent Used and Useful	100%
	Iron Removal Filters: (Account No. 320.3)	
16	No. 1	0
17	No. 2	0
18	No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	0
28	Percent Used and Useful (Tank No. 1)	43%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	138
31	Permitted No. of Lots/ERCs	287
32	Percent Used and Useful	48%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Citrus / Oak Forest

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Citrus / Oak Forest

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Oak Forest
		(a)
1	Annual Growth From Schedule F-9	4.4%
2	Average Number Of Test Year ERC's	138
3	Number Of ERC's Associated With 1 Years Growth	6
4	Projected Number Of ERC's	144
5	Test Year Usage Per ERC @ MDD	581
6	MDD 1.5 Years Into Future	83,550
	Used and Useful with a Margin Reserve	
7	Distribution System	50%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Citrus / Oak Forest

Docket No. 920199-WS
Test Year Ended: 12/31/91

FPSC

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	106.0	126.0	116.0	13,280,000	114,483	13,280,000	116.0	ERR
2	1988	126.0	134.0	130.0	14,616,000	112,431	14,616,000	130.0	12.1%
3	1989	134.0	136.0	135.0	16,856,000	124,859	16,856,000	135.0	3.8%
4	1990	136.0	134.0	135.0	17,322,000	128,311	17,322,000	135.0	0.0%
5	1991	134.0	141.5	138.0	12,803,513	92,779	12,803,513	138.0	2.2%
					Average Growth Through 5-Year Period (Col. 8)				4.4%

Oakwood - 1702

Brevard County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Preparer: C. Sweat

Company: SSU / Brevard County / Oakwood
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January		1,271	830	184	257	20.2%
2	February		1,093	735	175	183	16.7%
3	March		1,143	817	177	149	13.0%
4	April		1,097	835	175	86	7.8%
5	May		1,265	814	183	268	21.2%
6	June		1,108	3	175	930	83.9%
7	July		1,351	1,577	188	(414)	-30.6%
8	August		1,025	875	172	(22)	-2.1%
9	September		1,320	949	186	185	14.0%
10	October		1,015	676	171	168	16.6%
11	November		722	1,145	156	(579)	-80.2%
12	December		886	299	164	423	47.7%
13							
14	**Total**	**0**	**13,296**	**9,556**	**2,106**	**1,634**	**12.3%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January			120	64		184
22	February			120	55		175
23	March			120	57		177
24	April			120	55		175
25	May			120	63		183
26	June			120	55		175
27	July			120	68		188
28	August			120	52		172
29	September			120	66		186
30	October			120	51		171
31	November			120	36		156
32	December			120	44		164
33	Totals	0	0	1440	666	0	2106
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Brevard County / Oakwood
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Purchased Water
January	January
February	February
March	March
April	April
May	May
June	June
July	July
August	August
September	September
October	October
November	November
December	December

This system has a combination of black iron, galvanized and PVC pipe. The galvanized and black iron pipes are deteriorating whcih causes slow leaks especially in the joints. These leaks are not large enough to show on the surface thus we are unable to detect the leak until we go out to change a meter or make repairs. We estimate that there are approximately 120,000 gallons lost per month due to this problem.

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The water is purchased from Brevard County which makes it virtually impossible to coordinate the purchased gallons with the sold gallons. In addition, June usage was billed in July.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Brevard / Oakwood | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

		DATE	GPD
	ALL WATER IS PURCHASED FROM BREVARD COUNTY		
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.		
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)		
3.	Five-Day Max Month The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	
4.	Five-Day Max Year The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	
5.	Average Daily Flow		
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.		

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Brevard / Oakwood

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7

Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20

Based on customer density, system layout, and pipe size, the water distribution system is 100% used and useful. (See system map)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Brevard / Oakwood **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987 [1]	185.0	185.0	185.0	3,679,000	19,886	3,679,000	185.0	ERR
2	1988	185.0	191.0	188.0	9,136,000	48,596	9,136,000	188.0	1.6%
3	1989	191.0	190.0	190.5	9,458,000	49,648	9,458,000	190.5	1.3%
4	1990	190.0	191.0	190.5	9,942,000	52,189	9,942,000	190.5	0.0%
5	1991	191.0	191.0	191.0	9,557,117	50,037	9,557,117	191.0	0.3%
					Average Growth Through 5-Year Period (Col. 8)				0.8%

[1] Aquired in September 1987. All water is purchased from the County.

Palisades Country Club - 579

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Lake County / Palisades
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. *The gallons pumped should match the flows shown on the monthly operating reports sent to DER.* The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February						
3	March						
4	April						
5	May						
6	June						
7	July	176				176	100.0%
8	August	390				390	100.0%
9	September	264			225	39	14.8%
10	October	571			537	34	6.0%
11	November	371			370	1	0.3%
12	December	478		57	447	(26)	-5.4%
13							
14	Total	2,250	0	57	1,579	614	27.3%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February						0
23	March						
24	April						0
25	May						
26	June						0
27	July						
28	August						0
29	September	225					225
30	October	537					537
31	November	370					370
32	December	447					447
33	Totals	1579	0	0	0	0	1579
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Lake County / Palisades
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Pump
	July
	August
	September
	October
	November
December	December

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) December is the first billing for this system. The 57,000 gallons sold is for consumption from August 7 through December 2, 1991 for Palisades Country Club. The flushing was necessary to keep the lines active in order to provide quality water to the customer.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Palisades — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
	NOTE: PLANT BEGAN OPERATION MAY 1, 1991.				
1.	Plant Capacity				576,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		10/15/91		116,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	10/15/91		116,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	10/14/91		48,000
		(3)	10/08/91		43,000
		(4)	10/31/91		40,000
		(5)	10/03/91		35,000
	(There is no record of any unusual occurances)			AVERAGE	56,400
4.	Five-Day Max Year	(1)	10/15/91		116,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	10/14/91		48,000
		(3)	11/27/91		48,000
		(4)	12/18/91		46,000
		(5)	12/27/91		45,000
	(There is no record of any unusual occurances)			AVERAGE	60,600
5.	Average Daily Flow				11,101
6.	Required Fire Flow (500 GPM for 2 hours)				60,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Palisades — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 3
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Palisades
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	2,409
2	Annual Average Daily Demand	11,101 [1]
3	Maximum Day Demand - Date	10/15/91
4	Maximum Day Gallons Pumped	116,000
5	Gallons Per Minute Pumped	81
6	Fire Flow Requirement (Gallons)	60,000
7	Fire Flow Requirement (GPM)	500
8	Beginning No. of ERCs	0
9	Ending No. of ERCs	6
10	Average No. of ERCs	3
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	800
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	800
15	Percent Used and Useful	83%
	Iron Removal Filters: (Account No. 320.3)	
16	No. 1	0
17	No. 2	0
18	No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	15,000
27	Tank No. 2	0
28	Percent Used and Useful (Tank No. 1)	80%
29		
30	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
31	Average No. of ERCs	3
32	Permitted No. of Lots/ERCs	95
33	Percent Used and Useful	3%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] Plant operated for 217 days.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Palisades **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Lake / Palisades | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Palisades
		(a)
1	Annual Growth From Schedule F-9	N/A
2	Average Number Of Test Year ERC's	3
3	Number Of ERC's Associated With 1.5 Years Growth	38
4	Projected Number Of ERC's	40
5	Test Year Usage Per ERC @ MDD	42,182
6	MDD 1.5 Years Into Future	1,697,818
	Used and Useful with a Margin Reserve	
7	Supply Wells	100%
8	Distribution System	29% [1]

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Palisades

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/ ERC	Total	Total ERCs	Annual % Incr.
Line No.	Year	Beginning	Ending	Average	Gallons Sold	(5)/(4)	Gallons Sold	(7)/(6)	in ERCs
1	1987	0.0	0.0	0.0	0	ERR	0	ERR	ERR
2	1988	0.0	0.0	0.0	0	ERR	0	ERR	ERR
3	1989	0.0	0.0	0.0	0	ERR	0	ERR	ERR
4	1990	0.0	0.0	0.0	0	ERR	0	ERR	ERR
5	1991	0.0	5.5	3.0	57,240	19,080	57,240	3.0	ERR
				Average Growth Through 5-Year Period (Col. 9)					ERR

Palm Port - 440

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1

Preparer: C. Sweat

Company: SSU / Putnam County / Palm Port
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	615		700	1	(86)	-14.0%
3	March						
4	April	353		669	4	(320)	-90.7%
5	May						
6	June	284		724	10	(450)	-158.5%
7	July						
8	August	475		767	7	(299)	-62.9%
9	September						
10	October	515		665	6	(156)	-30.3%
11	November						
12	December	578		635	6	(63)	-10.9%
13							
14	Total	2,820	0	4,160	34	(1,374)	-48.7%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February	1					1
23	March						0
24	April	4					4
25	May						0
26	June	10					10
27	July						0
28	August	7					7
29	September						0
30	October	6					6
31	November						0
32	December	6					6
33	Totals	34	0	0	0	0	34
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Putnam County / Palm Port
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 2,1990 thru February 1, 1991
April	February 2 thru April 1
June	April 2 thru June 3
August	June 4 thru August 1
October	August 2 thru October 1
December	October 2 thru December 2

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The flow meter for this system is not registering accurately if at all during some periods. In comparison with past history flows, the meter has registered approximately 50 % slow for the years total. If the years end percentage was recalculated adding 50 % pumped gallons the unaccounted for water percentage would be 0.9 %. The flow meter is scheduled to be replaced by May 15, 1992.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / Palm Port

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				144,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		12/07/91		35,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/04/91		14,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/14/91		12,000
		(3)	09/15/91		12,000
		(4)	09/16/91		12,000
		(5)	09/10/91		9,000
	(There is no record of any unusual occurances)			AVERAGE	11,800
4.	Five-Day Max Year	(1)	12/07/91		35,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	01/23/91		17,000
		(3)	01/24/91		17,000
		(4)	09/04/91		14,000
		(5)	09/14/91		12,000
	(There is no record of any unusual occurances)			AVERAGE	19,000
5.	Average Daily Flow				7,962
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / Palm Port **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Palm Port
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	2,906
2	Annual Average Daily Demand	7,962
3	Maximum Day Demand - Date	12/07/91
4	Maximum Day Gallons Pumped	35,000
5	Gallons Per Minute Pumped	24
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	85
9	Ending No. of ERCs	90
10	Average No. of ERCs	88
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	100
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	100
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	18,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	18,000
20	Percent Used and Useful	65%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	60
22	No. 2 (Capacity in GPM)	60
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	120
25	Percent Used and Useful	81%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	5,000
29	Percent Used and Useful (Tank No. 1)	30%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	88
33	Permitted No. of Lots/ERCs	137
34	Percent Used and Useful	64%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / Palm Port

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Putnam / Palm Port **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Palm Port
		(a)
1	Annual Growth From Schedule F-9	5.4%
2	Average Number Of Test Year ERC's	88
3	Number Of ERC's Associated With 1.5 Years Growth	7
4	Projected Number Of ERC's	95
5	Test Year Usage Per ERC @ MDD	400
6	MDD 1.5 Years Into Future	37,815
	Used and Useful with a Margin Reserve	
7	Finished Water Storage	70%
8	High Service Pumps	88%
9	Distribution System	67%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / Palm Port — FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	69.0	73.0	71.0	3,983,000	56,099	3,983,000	71.0	ERR
2	1988	73.0	78.0	75.5	4,293,000	56,861	4,293,000	75.5	6.3%
3	1989	78.0	84.0	81.0	4,372,000	53,975	4,372,000	81.0	7.3%
4	1990	84.0	85.0	84.5	4,562,830	53,998	4,562,830	84.5	4.3%
5	1991	85.0	90.0	87.5	4,158,890	47,530	4,158,890	87.5	3.6%
				Average Growth Through 5-Year Period (Col. 8)					5.4%

Palm Terrace - 1429

Pasco County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Pasco County / Palm Terrace
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	2,756	5,582	5,911	574	1,853	22.2%
2	February	2,270	3,967	7,260	600	(1,623)	-26.0%
3	March	2,086	4,988	3,769	466	2,839	40.1%
4	April	2,199	4,787	8,076	377	(1,467)	-21.0%
5	May	2,403	3,169	3,754	351	1,467	26.3%
6	June	2,403	4,527	8,223	181	(1,474)	-21.3%
7	July	1,417	5,379	3,647	356	2,793	41.1%
8	August	677	6,113	8,072	281	(1,563)	-23.0%
9	September	2,204	4,133	3,493	158	2,686	42.4%
10	October	2,278	3,804	6,942	168	(1,028)	-16.9%
11	November	2,671	4,763	3,701	189	3,544	47.7%
12	December	2,480	4,174	8,109	1,787	(3,242)	-48.7%
13							
14	**Total**	**25,844**	**55,386**	**70,957**	**5,488**	**4,785**	**5.9%**
15							
16							

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January		364	2	208		574
22	February	5	440		155		600
23	March		288	2	176		466
24	April		203		174		377
25	May	7	205		139		351
26	June		8		173		181
27	July		187		169		356
28	August	4	104	4	169		281
29	September				158		158
30	October	16			152		168
31	November		4		185		189
32	December		91		1696		1787
33	Totals	32	1894	8	3554	0	5488
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Pasco County / Palm Terrace
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the purchase column comes from the Purchased Water Report.

Unaccounted for water is calculated as follows:

Usage Sold	Purchased plus Pumped From MORs
January	December
February	January
March	February
April	March
May	April
June	May
July	June
August	July
September	August
October	September
November	October
December	November

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or underbilling on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) We purchase water from Pasco County for this system. The invoices we receive from the county do not coordinate with our customer billing cycle making it difficult to compare the time frame accurately.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Pasco / Palm Terrace

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				230,400
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		08/05/91		181,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	10/22/91		135,000
		(2)	10/29/91		119,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	10/28/91		117,000
		(4)	10/21/91		113,000
		(5)	10/14/91		113,000
	(There is no record of any unusual occurances)			AVERAGE	119,400
4.	Five-Day Max Year	(1)	08/05/91		181,000
		(2)	08/13/91		142,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	05/14/91		141,000
		(4)	10/22/91		135,000
		(5)	06/14/91		134,000
	(There is no record of any unusual occurances)			AVERAGE	146,600
5.	Average Daily Flow				69,759
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Pasco / Palm Terrace | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Mors

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Palm Terrace [1]
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	25,462
2	Annual Average Daily Demand	69,759
3	Maximum Day Demand - Date	08/05/91
4	Maximum Day Gallons Pumped	181,000
5	Gallons Per Minute Pumped	126
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	1,200
9	Ending No. of ERCs	1,186
10	Average No. of ERCs	1,193
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	160
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	160
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	3,000
29	Percent Used and Useful (Tank No. 1)	80%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	1,193
33	Permitted No. of Lots/ERCs	1,213
34	Percent Used and Useful	100% [2]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] System interconnected with Pasco County. For 1991, 55.386 MG was purchased from the County.
[2] 100% used and useful based on customer density.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Pasco / Palm Terrace — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Pasco / Palm Terrace — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3) ERCs	(4)	(5)	(6)	(7)	(8)	(9)
Line No.	Year	Beginning	Ending	Average	Gallons Sold	Gallons/ ERC (5)/(4)	Total Gallons Sold	Total ERCs (7)/(6)	Annual % Incr. in ERCs
1	1987 [1]	1,213.0	1,205.0	1,209.0	40,937,000	33,860	40,937,000	1,209.0	ERR
2	1988	1,205.0	1,207.0	1,206.0	79,848,000	66,209	79,848,000	1,206.0	-0.2%
3	1989	1,207.0	1,201.0	1,204.0	86,901,000	72,177	86,901,000	1,204.0	-0.2%
4	1990	1,201.0	1,200.0	1,200.5	79,598,600	66,305	79,598,600	1,200.5	-0.3%
5	1991	1,200.0	1,185.5	1,193.0	70,959,014	59,479	70,959,014	1,193.0	-0.6%
				Average Growth Through 5-Year Period (Col. 8)					-0.3%

[1] Acquired June 1987.

Palms Mobile Home Park - 559

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Lake County / Palms Mobile Home
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	403		331	38	34	8.4%
3	March						
4	April	458		507	38	(87)	-19.0%
5	May						
6	June	481		294	34	153	31.8%
7	July						
8	August	319		243	41	35	11.0%
9	September						
10	October	418		344	43	31	7.5%
11	November						
12	December	501		388	81	32	6.4%
13							
14	Total	2,580	0	2,107	275	198	7.7%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	18			20		38
23	March						
24	April	15			23		38
25	May						
26	June	10			24		34
27	July						
28	August	9		16	16		41
29	September						
30	October	13		17	13		43
31	November						
32	December	13		58	10		81
33	Totals	78	0	91	106	0	275
34							

35 Calculations are per monthly operating report file.

Gallons of water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Lake County / Palms Mobile Home
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 4, 1990 thru February 1, 1991
April	February 2 thru April 1
June	April 2 thru June 3
August	June 4 thru August 1
October	August 2 thru October 1
December	October 2 thru December 2

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system was overbilled 116,000 gallons in April and the consumption was credited in June. If the gallons sold are adjusted by the 116,000 gallons, the unaccounted for water percentage for April equals 6.4 % and June equals 7.7 %.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Palms Mobile Home Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				187,200
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		10/05/91		44,300
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	10/05/91		44,300
		(2)	10/22/91		23,500
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	10/04/91		22,300
		(4)	10/28/91		17,400
		(5)	10/23/91		17,000
	(There is no record of any unusual occurances)			AVERAGE	24,900
4.	Five-Day Max Year	(1)	10/05/91		44,300
		(2)	10/22/91		23,500
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	10/04/91		22,300
		(4)	09/11/91		19,300
		(5)	10/28/91		17,400
	(There is no record of any unusual occurances)			AVERAGE	25,360
5.	Average Daily Flow				11,908
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Palms Mobile Home Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Palm M.H. Park
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	2,584
2	Annual Average Daily Demand	11,908
3	Maximum Day Demand - Date	10/05/91
4	Maximum Day Gallons Pumped	44,300
5	Gallons Per Minute Pumped	31
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	59
9	Ending No. of ERCs	60
10	Average No. of ERCs	60
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	130
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	
14	Total Well Capacity (GPM)	130
15	Percent Used and Useful	47%
	Iron Removal Filters: (Account No. 320.3)	
16	No. 1	0
17	No. 2	0
18	No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 & 4 (Capacity in GPM)	0
22	No. 2 & 5 (Capacity in GPM)	0
23	No. 3 & 6 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	1,500
27	Tank No. 2	0
28	Percent Used and Useful (Tank No. 1)	100%
29	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
30	Average No. of ERCs	60
31	Permitted No. of Lots/ERCs	87
32	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size, and system layout.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Palms Mobile Home Park **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Palms Mobile Home Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	60.0	61.0	60.5	3,012,000	49,785	3,012,000	60.5	ERR
2	1988	61.0	61.0	61.0	2,624,000	43,016	2,624,000	61.0	0.8%
3	1989	61.0	61.0	61.0	2,293,000	37,590	2,293,000	61.0	0.0%
4	1990	61.0	59.0	60.0	2,360,910	39,349	2,360,910	60.0	-1.6%
5	1991	59.0	60.0	59.5	2,107,010	35,412	2,107,010	59.5	-0.8%
					Average Growth Through 5-Year Period (Col. 8)				-0.4%

Park Manor - 444

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Putnam County / Park Manor
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1

Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	236		222	8	6	2.5%
3	March						
4	April	214		196	3	15	7.0%
5	May						
6	June	274		250	3	21	7.7%
7	July						
8	August	264		232	8	24	9.1%
9	September						
10	October	257		204	6	47	18.3%
11	November						
12	December	366		351	6	9	2.5%
13							
14	Total	1,611	0	1,455	34	122	7.6%
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	8					8
23	March						
24	April	3					3
25	May						
26	June	3					3
27	July						
28	August	8					8
29	September						
30	October	6					6
31	November						
32	December	6					6
33	Totals	34	0	0	0	0	34
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Putnam County / Park Manor
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 4, 1990 thru February 1, 1991
April	February 2 thru April 1
June	April 2 thru June 3
August	June 4 thru August 1
Ocotober	August 2 thru September 29
December	September 30 thru December 2

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / Park Manor

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				106,560
	Reliable Plant Capacity with Largest Well Out of Service				34,560
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		12/17/91		10,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	12/17/91		10,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/12/91		10,000
		(3)	12/01/91		9,000
		(4)	12/31/91		9,000
		(5)	12/24/91		8,000
	(There is no record of any unusual occurances)			AVERAGE	9,200
4.	Five-Day Max Year	(1)	12/17/91		10,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/12/91		10,000
		(3)	11/30/91		10,000
		(4)	12/01/91		9,000
		(5)	12/31/91		9,000
	(There is no record of any unusual occurances)			AVERAGE	9,600
5.	Average Daily Flow				4,608
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / Park Manor

Docket No. 920199-WS
Test Year Ended: 12/31/91

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

FPSC

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Recap Schedules: A-9,B-19

Line No.	Description	Park Manor
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	1,682
2	Annual Average Daily Demand	4,608
3	Maximum Day Demand - Date	12/17/91
4	Maximum Day Gallons Pumped	10,000
5	Gallons Per Minute Pumped	7
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	26
9	Ending No. of ERCs	36
10	Average No. of ERCs	31
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	50
12	No. 2 (GPM Capacity)	24
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	74
15	Percent Used and Useful	58%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	500
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	500
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	31
33	Permitted No. of Lots/ERCs	32
34	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / Park Manor

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / Park Manor

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3) ERCs	(4)	(5)	(6)	(7)	(8)	(9)
Line No.	Year	Beginning	Ending	Average	Gallons Sold	Gallons/ ERC (5)/(4)	Total Gallons Sold	Total ERCs (7)/(6)	Annual % Incr. in ERCs
1	1987	32.0	25.0	28.5	2,080,000	72,982	2,080,000	28.5	ERR
2	1988	25.0	26.0	25.5	1,194,000	46,824	1,194,000	25.5	-10.5%
3	1989	26.0	24.0	25.0	2,541,000	101,640	2,541,000	25.0	-2.0%
4	1990	24.0	26.0	25.0	1,737,000	69,480	1,737,000	25.0	0.0%
5	1991	26.0	36.0	31.0	1,455,230	46,943	1,455,230	31.0	24.0%
				Average Growth Through 5-Year Period (Col. 8)					2.1%

Picciola Island - 564

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Lake County / Picciola Island
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	2,137		1,719	141	277	13.0%
3	March						
4	April	1,934		1,626	131	177	9.2%
5	May						
6	June	2,675		2,321	127	227	8.5%
7	July						
8	August	1,973		1,656	135	182	9.2%
9	September						
10	October	3,034		2,611	119	304	10.0%
11	November						
12	December	2,431		1,955	127	349	14.4%
13							
14	Total	14,184	0	11,888	780	1,516	10.7%
15							
16							

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	33		8	100		141
23	March						
24	April	23		8	100		131
25	May						
26	June	19		8	100		127
27	July						
28	August	27		8	100		135
29	September						
30	October	11		8	100		119
31	November						
32	December	19		8	100		127
33	Totals	132	0	48	600	0	780
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Lake County / Picciola Island
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 2,1990 thru February 1,1991
April	February 2 thru April 1
June	April 2 thru June 3
August	June 4 thru August 1
October	August 2 thru October 1
December	October 2 thru December 2

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Picciola island

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				396,000
	Reliable Plant Capacity with Largest Well Out of Service				144,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		08/17/91		85,200
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/15/91		79,000
		(2)	09/16/91		79,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	09/07/91		78,600
		(4)	09/03/91		73,800
		(5)	09/06/91		71,800
	(There is no record of any unusual occurances)			AVERAGE	76,440
4.	Five-Day Max Year	(1)	08/17/91		85,200
		(2)	09/15/91		79,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	09/16/91		79,000
		(4)	09/07/91		78,600
		(5)	09/03/91		73,800
	(There is no record of any unusual occurances)			AVERAGE	79,120
5.	Average Daily Flow				39,036
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Picciola Island

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Picciola Island
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	14,248
2	Annual Average Daily Demand	39,036
3	Maximum Day Demand - Date	08/17/91
4	Maximum Day Gallons Pumped	85,200
5	Gallons Per Minute Pumped	59
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	126
9	Ending No. of ERCs	129
10	Average No. of ERCs	128
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	175
12	No. 2 (GPM Capacity)	100
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	275
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	5,000
29	Percent Used and Useful (Tank No. 1)	53%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	128
33	Permitted No. of Lots/ERCs	213
34	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size, and system layout.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Picciola Island

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Picciola Island

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	105.0	112.0	108.5	12,075,000	111,290	12,075,000	108.5	ERR
2	1988	112.0	120.0	116.0	11,685,000	100,733	11,685,000	116.0	6.9%
3	1989	120.0	123.0	121.5	13,180,000	108,477	13,180,000	121.5	4.7%
4	1990	123.0	126.0	124.5	12,460,338	100,083	12,460,338	124.5	2.5%
5	1991	126.0	129.0	127.5	11,888,170	93,241	11,888,170	127.5	2.4%
					Average Growth Through 5-Year Period (Col. 8)				4.1%

Pine Ridge Estates - 782

Osceola County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Osceola County / Pine Ridge Estates
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,339		2,104		(765)	-57.1%
2	February						
3	March	1,201		2,203		(1,002)	-83.4%
4	April						
5	May	1,353		2,230		(877)	-64.8%
6	June						
7	July	1,806		2,373	48	(615)	-34.1%
8	August						
9	September	2,086		2,102	6	(22)	-1.1%
10	October						
11	November	2,240		2,085		155	6.9%
12	December						
13							
14	**Total**	**10,025**	**0**	**13,097**	**54**	**(3,126)**	**-31.2%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February						0
23	March						0
24	April						0
25	May						0
26	June						0
27	July	48					48
28	August						0
29	September	6					6
30	October						0
31	November						0
32	December						0
33	Totals	54	0	0	0	0	54
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Osceola County / Pine Ridge Estates
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 10, 1990 thru January 10, 1991
March	January 11 thru March 11
May	March 12 thru May 9
July	May 10 thru July 9
September	July 10 thru September 10
November	September 11 thru November 8

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The master meter registering pumped gallons was tested and found to be approximately 75% slow. This meter was changed out June 30, 1991 so accurate pumped gallons will now be available. If the pumped gallons were increased by approximately 75% for November 1990 thru June 1991 the unaccounted for water per cent would be about 8%.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Osceola / Pine Ridge Estates

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: *Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.*

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service				648,000 180,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		06/04/91		70,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/16/91		52,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/23/91		47,000
		(3)	09/30/91		45,000
		(4)	09/18/91		43,000
		(5)	09/03/91		42,000
	(There is no record of any unusual occurances)			AVERAGE	45,800
4.	Five-Day Max Year	(1)	06/04/91		70,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	06/17/91		61,000
		(3)	11/15/91		59,000
		(4)	11/22/91		59,000
		(5)	11/28/91		54,000
	(There is no record of any unusual occurances)			AVERAGE	60,600
5.	Average Daily Flow				29,370
6.	Required Fire Flow (250 GPM for 2 hours)				30,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Osceola / Pine Ridge Estates

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Pine Ridge Estates
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	10,720
2	Annual Average Daily Demand	29,370
3	Maximum Day Demand - Date	06/04/91
4	Maximum Day Gallons Pumped	70,000
5	Gallons Per Minute Pumped	49
6	Fire Flow Requirement (Gallons)	30,000
7	Fire Flow Requirement (GPM)	250
8	Beginning No. of ERCs	172
9	Ending No. of ERCs	171
10	Average No. of ERCs	172
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	325
12	No. 2 (GPM Capacity)	125
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	450
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	15,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	15,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	250
22	No. 2 (Capacity in GPM)	250
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	500
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,500
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	3,500
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	172
33	Permitted No. of Lots/ERCs	172
34	Percent Used and Useful	100%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Osceola / Pine Ridge Estates

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Osceola / Pine Ridge Estates

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	39.0	100.0	69.5	6,526,000	93,899	6,526,000	69.5	ERR
2	1988	100.0	144.0	122.0	10,108,000	82,852	10,108,000	122.0	75.5%
3	1989	144.0	167.0	155.5	14,289,000	91,891	14,289,000	155.5	27.5%
4	1990	167.0	172.0	169.5	13,956,700	82,340	13,956,700	169.5	9.0%
5	1991	172.0	171.0	171.5	13,096,370	76,364	13,096,370	171.5	1.2%
				Average Growth Through 5-Year Period (Col. 8)					25.3%

Pine Ridge Utilities - 9002

Citrus County (UFU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Citrus County / Pine Ridge
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	5,483		4,303	515	665	12.1%
2	February	5,743		4,923	288	532	9.3%
3	March	4,981		4,294	185	502	10.1%
4	April	5,882		4,587	935	360	6.1%
5	May	5,914		5,117	292	505	8.5%
6	June	7,213		6,522	409	282	3.9%
7	July	6,462		5,307	444	711	11.0%
8	August	5,612		4,738	312	562	10.0%
9	September	6,546		5,073	852	621	9.5%
10	October	7,434		6,121	819	494	6.6%
11	November	7,292		6,601	203	488	6.7%
12	December	6,407		5,566	294	547	8.5%
13							
14	**Total**	**74,969**	**0**	**63,152**	**5,548**	**6,269**	**8.4%**
15							
16							

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	290	225				515
22	February	88	200				288
23	March	101	84				185
24	April	430	155	350			935
25	May	142	150				292
26	June	254	155				409
27	July	284	150	10			444
28	August	92	155	65			312
29	September	607	155	90			852
30	October	669	150				819
31	November	53	150				203
32	December	144	150				294
33	Totals	3154	1879	515	0	0	5548
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Citrus County / Pine Ridge
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 26, 1990 thru December 23, 1990
February	December 24, 1990 thru January 26, 1991
March	January 27 thru February 24
April	February 25 thru March 25
May	March 26 thru April 25
June	April 26 thru May 29
July	May 30 thru June 28
August	June 29 thru July 25
September	July 26 thru August 29
October	August 30 thru September 26
November	September 27 thru October 28
December	October 29 thru November 27

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Citrus / Pine Ridge **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				835,200
	Reliable Plant Capacity with Largest Well Out of Service				216,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		10/10/91		465,000
	The single day with the highest pumpage rate for the test year. *Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day.* (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/10/91		465,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/03/91		331,000
		(3)	09/23/91		323,000
		(4)	09/09/91		320,000
		(5)	09/12/91		316,000
	(There is no record of any unusual occurances)			AVERAGE	351,000
4.	Five-Day Max Year	(1)	10/10/91		465,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/10/91		465,000
		(3)	09/03/91		331,000
		(4)	09/23/91		323,000
		(5)	09/09/91		320,000
	(There is no record of any unusual occurances)			AVERAGE	380,800
5.	Average Daily Flow				205,422
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Citrus / Pine Ridge — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Pine Ridge
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	74,979
2	Annual Average Daily Demand	205,422
3	Maximum Day Demand - Date	10/10/91
4	Maximum Day Gallons Pumped	465,000
5	Gallons Per Minute Pumped	323
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	860
9	Ending No. of ERCs	1,032
10	Average No. of ERCs	946
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	430
12	No. 2 (GPM Capacity)	150
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	580
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	7,500
27	Tank No. 2	1,000
28	Total Hydro Tanks (Gallons)	8,500
29	Percent Used and Useful (Tank No. 1)	86%
30	Percent Used and Useful (Tank No. 2)	100%
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	946
33	Permitted No. of Lots/ERCs	5,080
34	Percent Used and Useful	19%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Citrus / Pine Ridge

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Citrus / Pine Ridge

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 3
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Pine Ridge (a)
1	Annual Growth From Schedule F-9	20.5%
2	Number Of ERC's Associated With 1.0 Years Growth	194
3	Average Number Of Test Year ERC's	946
4	Projected Number Of ERC's	1,140
	Used and Useful With Margin Reserve:	
5	Distribution System	22%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Citrus / Pine Ridge

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	410.0	486.0	448.0	35,251,000	78,685	35,251,000	448.0	ERR
2	1988	486.0	556.0	521.0	39,258,000	75,351	39,258,000	521.0	16.3%
3	1989	556.0	688.0	622.0	47,068,000	75,672	47,068,000	622.0	19.4%
4	1990	688.0	860.0	774.0	60,708,950	78,435	60,708,950	774.0	24.4%
5	1991	860.0	1,032.0	946.0	63,152,195	66,757	63,152,195	946.0	22.2%
					Average Growth Through 5-Year Period (Col. 8)				20.5%

Piney Woods - 553

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Lake County / Piney Woods
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	3,010		2,675	9	326	10.8%
2	February						
3	March	2,549		2,374	52	123	4.8%
4	April						
5	May	2,838		3,447	28	(637)	-22.4%
6	June						
7	July	3,345		2,465	89	791	23.6%
8	August						
9	September	3,078		2,908	51	119	3.9%
10	October						
11	November	3,524		3,203	24	297	8.4%
12	December						
13							
14	Total	18,344	0	17,072	253	1,019	5.6%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	9					9
22	February						
23	March	52					52
24	April						
25	May	28					28
26	June						
27	July	89					89
28	August						
29	September	35		16			51
30	October						
31	November	24					24
32	December						
33	Totals	237	0	16	0	0	253
34							

35 Calculations are per monthly operating report file.

Gallons of water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Lake County / Piney Woods
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 2, 1990 thru December 31, 1990
March	January 1, 1991 thru February 28
May	March 1 thru May 4
July	May 5 thru July 5
September	July 6 thru September 4
November	September 5 thru November 4

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system was overbilled 643,000 gallons in May and they were credited in July. If the sold numbers are adjusted to reflect the overbill, May's unaccounted for water equals .2% and July equals 4.4 %.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Piney Woods & Spring Lake Manor **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service				633,600 201,600
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		08/13/91		95,600
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/03/91		94,400
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/13/91		92,500
		(3)	09/12/91		89,900
		(4)	09/25/91		82,500
		(5)	09/24/91		82,100
	(There is no record of any unusual occurances)			AVERAGE	88,280
4.	Five-Day Max Year	(1)	08/13/91		95,600
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/03/91		94,400
		(3)	08/17/91		93,600
		(4)	09/13/91		92,500
		(5)	09/12/91		89,900
	(There is no record of any unusual occurances)			AVERAGE	93,200
5.	Average Daily Flow				50,890
6.	Required Fire Flow (250 GPM for 2 hours)				30,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Piney Woods & Spring Lake Manor — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Piney Woods Spring Lk Manor
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	18,575
2	Annual Average Daily Demand	50,890
3	Maximum Day Demand - Date	08/13/91
4	Maximum Day Gallons Pumped	95,600
5	Gallons Per Minute Pumped	66
6	Fire Flow Requirement (Gallons)	60,000
7	Fire Flow Requirement (GPM)	500
8	Beginning No. of ERCs	163
9	Ending No. of ERCs	166
10	Average No. of ERCs	165
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	300
12	No. 2 (GPM Capacity)	140
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	440
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	50,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	50,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	200
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	200
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	2,000
28	Total Hydro Tanks (Gallons)	7,000
29	Percent Used and Useful (Tank No. 1)	90%
30	Percent Used and Useful (Tank No. 2)	100%
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	165
33	Permitted No. of Lots/ERCs	215
34	Percent Used and Useful	77%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Piney Woods & Spring Lake Manor

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Piney Woods & Spring Lake Manor

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	158.0	158.0	158.0	16,926,000	107,127	16,926,000	158.0	ERR
2	1988	158.0	159.0	158.5	16,723,000	105,508	16,723,000	158.5	0.3%
3	1989	159.0	160.0	159.5	16,772,000	105,154	16,772,000	159.5	0.6%
4	1990	160.0	163.0	161.5	17,562,500	108,746	17,562,500	161.5	1.3%
5	1991	163.0	166.0	164.5	17,072,650	103,785	17,072,650	164.5	1.9%
					Average Growth Through 5-Year Period (Col. 8)				1.0%

Point O' Woods - 987

Citrus County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Citrus County / Point O Woods
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,795		1,612	25	158	8.8%
2	February	1,449		1,303	15	131	9.0%
3	March	1,656		1,336	230	90	5.4%
4	April	1,658		1,453	60	145	8.7%
5	May	1,911		1,641	167	103	5.4%
6	June	1,525		993	362	170	11.1%
7	July	1,770		1,708	35	27	1.5%
8	August	1,520		976	452	92	6.1%
9	September	1,917		1,492	260	165	8.6%
10	October	2,135		1,393	201	541	25.3%
11	November	2,258		1,708	394	156	6.9%
12	December	1,999		1,537	302	160	8.0%
13							
14	Total	21,593	0	17,152	2,503	1,938	9.0%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
20							
21	January	25					25
22	February	10	5				15
23	March	200	20	10			230
24	April	60					60
25	May	165	2				167
26	June	358	4				362
27	July	35					35
28	August	402	50				452
29	September	210	50				260
30	October	201					201
31	November	304	90				394
32	December	302					302
33	Totals	2272	221	10	0	0	2503
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Citrus County / Point O Woods
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 15,1990 thru January 14,1991
February	January 15 thru February 12
March	February 13 thru March 14
April	March 15 thru April 12
May	April 13 thru May 14
June	May 15 thru June 11
July	June 12 thru July 15
August	July 16 thru August 11
September	August 12 thru September 10
October	September 11 thru October 10
November	October 11 thru November 12
December	November 13 thru December 9

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Citrus / Point O Woods **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				1,144,800
	Reliable Plant Capacity with Largest Well Out of Service				424,800
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		10/29/91		124,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	12/05/91		88,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	12/12/91		84,000
		(3)	12/14/91		82,000
		(4)	12/15/91		82,000
		(5)	12/16/91		82,000
				AVERAGE	83,600
4.	Five-Day Max Year	(1)	10/29/91		124,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	11/19/91		113,000
		(3)	08/08/91		106,000
		(4)	09/24/91		105,000
		(5)	09/25/91		103,000
				AVERAGE	110,200
5.	Average Daily Flow				51,148
6.	Required Fire Flow				40,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Citrus / Point O Woods — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Point O Woods
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	22,319
2	Annual Average Daily Demand	61,148
3	Maximum Day Demand - Date	10/29/91
4	Maximum Day Gallons Pumped	124,000
5	Gallons Per Minute Pumped	86
6	Fire Flow Requirement (Gallons)	40,000
7	Fire Flow Requirement (GPM)	750
8	Beginning No. of ERCs	316
9	Ending No. of ERCs	342
10	Average No. of ERCs	329
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	500
12	No. 2 (GPM Capacity)	154
13	No. 3 (GPM Capacity)	141
14	Total Well Capacity (GPM)	795
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	2,000
28	Total Hydro Tanks (Gallons)	7,000
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	100%
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	329
33	Permitted No. of Lots/ERCs	415
34	Percent Used and Useful	79%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Citrus / Point O Woods **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Citrus / Point O Woods

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Point O Woods (a)
1	Annual Growth From Schedule F-9	9.2%
2	Number Of ERC's Associated With 1.0 Years Growth	30
3	Average Number Of Test Year ERC's	329
4	Projected Number Of ERC's	359
	Used and Useful With Margin Reserve:	
5	Distribution System	87%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Citrus / Point O Woods | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987								
2	1988 [1]	246.0	260.0	253.0	7,588,000	29,992	7,588,000	253.0	
3	1989	260.0	291.0	275.5	20,564,000	74,642	20,564,000	275.5	8.9%
4	1990	291.0	316.0	303.5	20,461,800	67,419	20,461,800	303.5	10.2%
5	1991	316.0	342.0	329.0	17,152,488	52,135	17,152,488	329.0	8.4%
				Average Growth Through 3-Year Period (Col. 8)					9.2%

[1] Acquired July 1988.

Pomona Park - 443

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Putnam County / Pomona Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	2,424		3,766	7	(1,349)	-55.7%
3	March						
4	April	2,004		3,360	7	(1,363)	-68.0%
5	May						
6	June	2,087		3,194	6	(1,113)	-53.3%
7	July						
8	August	1,882		2,960	5	(1,083)	-57.5%
9	September						
10	October	1,940		2,055	6	(121)	-6.2%
11	November						
12	December	2,140		1,278	8	854	39.9%
13							
14	Total	12,477	0	15,613	39	(4,175)	-33.5%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February	7					7
23	March						0
24	April	7					7
25	May						0
26	June	6					6
27	July						0
28	August	5					5
29	September						0
30	October	6					6
31	November						0
32	December	8					8
33	Totals	39	0	0	0	0	39
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Putnam County / Pomona Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 20,1990 thru February 19, 1991
April	February 20 thru April 19
June	April 20 thru June 20
August	June 21 thru August 20
October	August 21 thru October 22
December	October 23 thru December 24

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The flow meter stopped registering August 28, 1991. The flows were calculated by using the killowatt hours used. The meter will be replaced by May 30, 1992.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / Pomona Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				136,800
	Reliable Plant Capacity with Largest Well Out of Service				50,400
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		01/01/91		64,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	01/01/91		64,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	01/02/91		45,000
		(3)	01/04/91		40,000
		(4)	01/16/91		40,000
		(5)	01/17/91		39,000
				AVERAGE	45,600
4.	Five-Day Max Year	(1)	01/01/91		64,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	03/19/91		60,000
		(3)	12/17/91		60,000
		(4)	01/02/91		45,000
		(5)	01/04/91		40,000
				AVERAGE	53,800
5.	Average Daily Flow				33,290
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / Pomona Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Pomona Park
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	12,151
2	Annual Average Daily Demand	33,290
3	Maximum Day Demand - Date	01/01/91
4	Maximum Day Gallons Pumped	64,000
5	Gallons Per Minute Pumped	44
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	175
9	Ending No. of ERCs	171
10	Average No. of ERCs	173
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	60
12	No. 2 (GPM Capacity)	35
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	95
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	5,000
29	Percent Used and Useful (Tank No. 1)	18%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	173
33	Permitted No. of Lots/ERCs	535
34	Percent Used and Useful	32%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / Pomona Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / Pomona Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3) ERCs	(4)	(5)	(6) Gallons/ ERC	(7) Total	(8) Total	(9) Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	(5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	167.0	173.0	170.0	17,920,000	105,412	17,920,000	170.0	ERR
2	1988	173.0	173.0	173.0	19,311,000	111,624	19,311,000	173.0	1.8%
3	1989	173.0	173.0	173.0	17,510,000	101,214	17,510,000	173.0	0.0%
4	1990	173.0	175.0	174.0	19,397,563	111,480	19,397,563	174.0	0.6%
5	1991	175.0	171.0	173.0	16,613,661	96,033	16,613,661	173.0	-0.6%
				Average Growth Through 5-Year Period (Col. 8)					0.4%

Postmaster Village - 1095

Clay County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Clay County / Postmaster Village
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	5,603		4,266	386	951	17.0%
2	February						
3	March						
4	April	3,358		2,874	248	236	7.0%
5	May						
6	June						
7	July	3,990		3,277	266	447	11.2%
8	August						
9	September						
10	October	4,891		4,241	473	177	3.6%
11	November						
12	December						
13							
14	Total	17,842	0	14,658	1,373	1,811	10.2%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19							
20							
21	January	98	3		285		386
22	February						0
23	March						0
24	April	60	3	20	165		248
25	May						0
26	June						0
27	July	63	3		200		266
28	August						0
29	September						0
30	October	9	3	211	250		473
31	November						0
32	December						0
33	Totals	230	12	231	900	0	1373
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Clay County / Postmaster Village
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a quarterly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	October 1, 1990 thru January 1, 1991
April	January 2 thru April 1
July	April 2 thru July 1
October	July 2 thru October 4

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Clay / Postmaster Village

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				136,800
	Reliable Plant Capacity with Largest Well Out of Service				50,400
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		12/19/91		91,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	12/19/91		91,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	12/25/91		85,000
		(3)	12/31/91		82,000
		(4)	12/23/91		75,000
		(5)	12/13/91		75,000
				AVERAGE	81,600
4.	Five-Day Max Year	(1)	12/19/91		91,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	12/25/91		85,000
		(3)	12/31/91		82,000
		(4)	12/23/91		75,000
		(5)	12/13/91		75,000
				AVERAGE	81,600
5.	Average Daily Flow				46,170
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Clay / Postmaster Village — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Postmaster Village
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	16,852
2	Annual Average Daily Demand	46,170
3	Maximum Day Demand - Date	12/19/91
4	Maximum Day Gallons Pumped	91,000
5	Gallons Per Minute Pumped	63
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	144
9	Ending No. of ERCs	148
10	Average No. of ERCs	146
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	110
12	No. 2 (GPM Capacity)	110
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	220
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	3,000
28	Total Hydro Tanks (Gallons)	8,000
29	Percent Used and Useful (Tank No. 1)	33%
30	Percent Used and Useful (Tank No. 2)	55%
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	146
33	Permitted No. of Lots/ERCs	345
34	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, system layout and pipe size.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Clay / Postmaster Village

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Clay / Postmaster Village

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	112.0	125.0	118.5	9,950,000	83,966	9,950,000	118.5	ERR
2	1988	125.0	130.0	127.5	12,419,000	97,404	12,419,000	127.5	7.6%
3	1989	130.0	139.0	134.5	14,749,000	109,658	14,749,000	134.5	5.5%
4	1990	139.0	144.0	141.5	14,968,100	105,782	14,968,100	141.5	5.2%
5	1991	144.0	148.0	146.0	14,608,220	100,056	14,608,220	146.0	3.2%
					Average Growth Through 5-Year Period (Col. 8)				5.4%

Quail Ridge - 578

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Lake County / Quail Ridge
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	357			1	356	99.7%
2	February	307			1	306	99.7%
3	March	387			1	386	99.7%
4	April	625			1	624	99.8%
5	May	762			1	761	99.9%
6	June	343			1	342	99.7%
7	July	422			1	421	99.8%
8	August	689			1	688	99.9%
9	September	855			1	854	99.9%
10	October	508			4	504	99.2%
11	November	451			1	450	99.8%
12	December	466		492	1	(27)	-5.8%
13							
14	**Total**	**6,172**	**0**	**492**	**15**	**5,665**	**91.8%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	1					1
22	February	1					1
23	March	1					1
24	April	1					1
25	May	1					1
26	June	1					1
27	July	1					1
28	August	1					1
29	September	1					1
30	October	4					4
31	November	1					1
32	December	1					1
33	Totals	15	0	0	0	0	15
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Lake County / Quail Ridge
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Pump
January	January
February	February
March	March
April	April
May	May
June	June
July	July
August	August
September	September
October	October
November	November
December	December

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) December is the first billing for this system. The sold gallons account for all gallons used on meters since their installation. At year end 1991, there were a total of eleven meters set.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: *SSU / Lake / Quail Ridge*

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				936,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		05/10/91		64,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/15/91		45,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	09/16/91		45,000
		(3)	09/11/91		42,000
		(4)	09/13/91		42,000
		(5)	09/07/91		37,000
				AVERAGE	42,200
4.	Five-Day Max Year	(1)	05/10/91		64,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/06/91		56,000
		(3)	08/06/91		53,000
		(4)	05/02/91		50,000
		(5)	05/07/91		50,000
				AVERAGE	54,600
5.	Average Daily Flow				16,912
6.	Required Fire Flow (500 GPM for 2 hours)				60,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Quail Ridge

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Quail Ridge
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	6,173
2	Annual Average Daily Demand	16,912
3	Maximum Day Demand - Date	05/10/91
4	Maximum Day Gallons Pumped	64,000
5	Gallons Per Minute Pumped	44
6	Fire Flow Requirement (Gallons)	60,000
7	Fire Flow Requirement (GPM)	500
8	Beginning No. of ERCs	0
9	Ending No. of ERCs	12
10	Average No. of ERCs	6
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	650
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	650
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	6,500
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	6,500
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	6
33	Permitted No. of Lots/ERCs	114
34	Percent Used and Useful	5%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Quail Ridge

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Lake / Quail Ridge

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Quail Ridge (a)
1	Annual Growth From Schedule F-9	N/A
2	Number Of ERC's Associated With 1.0 Years Growth (Estimated)	19
3	Average Number Of Test Year ERC's	6
4	Projected Number Of ERC's	25
	Used and Useful With Margin Reserve:	
5	Distribution System	22%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Quail Ridge

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	0.0	0.0	0.0					
2	1988	0.0	0.0	0.0					
3	1989	0.0	0.0	0.0					
4	1990	0.0	0.0	0.0					
5	1991 [1]	0.0	12.0	6.0	492,460	82,077	492,460	6.0	ERR
				Average Growth Through 5-Year Period (Col. 8)					ERR

[1] New Acquisition and new plant.

River Grove - 442

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

FPSC

In Thousands of gallons

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Putnam County / River Grove
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,794		1,021	5	768	42.8%
2	February					0	
3	March	1,400		1,690	1	(291)	-20.8%
4	April					0	
5	May	1,616		(339)	7	1,948	120.5%
6	June					0	
7	July	1,893		1,153	9	731	38.6%
8	August					0	
9	September	1,487		1,082	9	396	26.6%
10	October					0	
11	November	1,480		958	9	513	34.7%
12	December					0	
13							
14	Total	9,670	0	5,565	40	4,065	42.0%
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	5					5
22	February						0
23	March	1					1
24	April						0
25	May	7					7
26	June						0
27	July	9					9
28	August						0
29	September	9					9
30	October						0
31	November	9					9
32	December						0
33	Totals	40	0	0	0	0	40
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Putnam County / River Grove
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 5, 1990 thru January 8, 1991
March	January 9 thru March 4
May	March 5 thru May 3
July	May 4 thru July 3
September	July 4 thru September 3
November	September 4 thru November 5

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) There are billing adjustments in the March and May billing cycle causing a major fluctuation in the unaccounted for water percentage. In addition, the flow meter at the plant was not registering low flow and finally quit working in July. The flows were calculated at 650 gallons per kilowatt hour for the remainder of the year. The flow meter will be replaced by May 15, 1992.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / River Grove

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				194,400
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		07/18/91		70,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	06/14/91		50,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	06/03/91		44,000
		(3)	06/13/91		43,000
		(4)	06/01/91		36,000
		(5)	06/25/91		34,000
				AVERAGE	41,400
4.	Five-Day Max Year	(1)	07/18/91		70,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	06/14/91		50,000
		(3)	06/03/91		44,000
		(4)	06/13/91		43,000
		(5)	08/28/91		41,000
				AVERAGE	49,600
5.	Average Daily Flow				25,688
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / River Grove — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	River Grove
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	9,376
2	Annual Average Daily Demand	25,688
3	Maximum Day Demand - Date	07/18/91
4	Maximum Day Gallons Pumped	70,000
5	Gallons Per Minute Pumped	49
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	105
9	Ending No. of ERCs	103
10	Average No. of ERCs	104
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	135
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	135
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	15,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	15,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	160
22	No. 2 (Capacity in GPM)	160
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	320
25	Percent Used and Useful	61%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	3,000
29	Percent Used and Useful (Tank No. 1)	80%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	104
33	Permitted No. of Lots/ERCs	119
34	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size, and system layout.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / River Grove

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / River Grove | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	105.0	102.0	103.5	8,867,000	85,671	8,867,000	103.5	ERR
2	1988	102.0	103.0	102.5	7,647,000	74,605	7,647,000	102.5	-1.0%
3	1989	103.0	104.0	103.5	7,561,000	73,053	7,561,000	103.5	1.0%
4	1990	104.0	105.0	104.5	7,601,100	72,738	7,601,100	104.5	1.0%
5	1991	105.0	103.0	104.0	5,564,991	53,510	5,564,991	104.0	-0.5%
					Average Growth Through 5-Year Period (Col. 8)				0.1%

River Park - 439

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
in Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Putnam County / River Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	2,135		2,029	50	56	2.6%
2	February						
3	March	2,597		2,197	360	40	1.5%
4	April						
5	May	1,881		1,747	33	101	5.4%
6	June						
7	July	1,387		1,522	30	(165)	-11.9%
8	August						
9	September	1,457		1,073	37	347	23.8%
10	October						
11	November	1,818		1,353	29	436	24.0%
12	December						
13							
14	Total	11,275	0	9,921	539	815	7.2%
15							
16							
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	36	14				50
22	February						0
23	March	14	211	135			360
24	April						0
25	May	32	1				33
26	June						0
27	July	28	1	1			30
28	August						0
29	September	36	1				37
30	October						0
31	November	25	4				29
32	December						0
33	Totals	171	232	136	0	0	539
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Putnam County / River Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 11, 1990 thru January 21, 1991
March	January 22 thru March 14
May	March 15 thru May 13
July	May 14 thru July 12
September	July 13 thru September 13
November	September 14 thru November 11

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The system was overbilled by 192,480 in July and credited that amount in September. If unaccounted for water percentage is adjusted by 192,000 gallons, July equals 1.9 % and September equals 11.9 % with the year end percentage remaining the same.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / River Park **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the *Department of Environmental Regulation*.

			DATE		GPD
1.	Plant Capacity *Reliable Plant Capacity with Largest Well Out of Service* The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				417,600 187,200
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)		01/15/91		70,000
3.	Five-Day Max Month The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	01/14/91 01/30/91 01/31/91 01/29/91 01/04/91	AVERAGE	53,000 50,000 49,000 47,000 47,000 49,200
4.	Five-Day Max Year The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)	01/15/91 07/17/91 01/14/91 01/30/91 01/31/91	AVERAGE	70,000 56,000 53,000 50,000 49,000 55,600
5.	Average Daily Flow				31,392
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / River Park

Docket No. 920199-WS
Test Year Ended: 12/31/91

FPSC

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	River Park
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	11,458
2	Annual Average Daily Demand	31,392
3	Maximum Day Demand - Date	01/15/91
4	Maximum Day Gallons Pumped	70,000
5	Gallons Per Minute Pumped	49
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	333
9	Ending No. of ERCs	342
10	Average No. of ERCs	338
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	122
12	No. 2 (GPM Capacity)	59
13	No. 3 (GPM Capacity)	34
14	Total Well Capacity (GPM)	215
15	Percent Used and Useful	52%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	5,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	5,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	90
22	No. 2 (Capacity in GPM)	90
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	180
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	1,500
28	Total Hydro Tanks (Gallons)	4,500
29	Percent Used and Useful (Tank No. 1)	45%
30	Percent Used and Useful (Tank No. 2)	59%
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	338
33	Permitted No. of Lots/ERCs	754
34	Percent Used and Useful	45%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / River Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / River Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	332.0	326.0	329.0	10,107,000	30,720	10,107,000	329.0	ERR
2	1988	326.0	334.0	330.0	10,347,000	31,355	10,347,000	330.0	0.3%
3	1989	334.0	335.0	334.5	14,024,000	41,925	14,024,000	334.5	1.4%
4	1990	335.0	333.0	334.0	12,625,000	37,799	12,625,000	334.0	-0.1%
5	1991	333.0	342.0	337.5	9,920,777	29,395	9,920,777	337.5	1.0%
				Average Growth Through 5-Year Period (Col. 8)					0.6%

Rolling Green - 985

Citrus County (SSU)

Water

- 1992 FPSC Filing -

Gallons of water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Schedule F-1

Preparer: C. Sweat

Company: SSU / Citrus County / Rolling Green
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"19910 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	2,072		1,885	7	180	8.7%
3	March						
4	April	2,167		1,949	4	214	9.9%
5	May						
6	June	2,269		2,087	6	176	7.8%
7	July						
8	August	1,973		1,816	11	146	7.4%
9	September						
10	October	2,309		2,119	7	183	7.9%
11	November						
12	December	2,584		2,325	9	250	9.7%
13							
14	Total	13,374	0	12,181	44	1,149	8.6%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February	7					7
23	March						0
24	April	4					4
25	May						0
26	June	6					6
27	July						0
28	August	11					11
29	September						0
30	October	2		5			7
31	November						0
32	December	9					9
33	Totals	39	0	5	0	0	44
34							

35 Calculations are per monthly operating report file.

Gallons of water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Citrus County / Rolling Green
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 4,1990 thru February 1, 1991
April	February 2 thru April 2
June	April 3 thru May 31
August	June 1 thru August 1
October	August 2 thru October 2
December	October 3 thru December 2

The fluctuation in the unaccounted for water per cent occurs for the following reasons

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Citrus / Rolling Green **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				142,560
	Reliable Plant Capacity with Largest Well Out of Service				70,560
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		11/22/91		86,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/25/91		65,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/19/91		61,000
		(3)	09/04/91		52,000
		(4)	09/03/91		51,000
		(5)	09/24/91		51,000
	(There is no record of any unusual occurances)			AVERAGE	56,000
4.	Five-Day Max Year	(1)	11/22/91		86,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	05/15/91		84,000
		(3)	04/03/91		72,000
		(4)	05/27/91		71,000
		(5)	11/20/91		70,000
	(There is no record of any unusual occurances)			AVERAGE	76,600
5.	Average Daily Flow				36,959
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Citrus / Rolling Green **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Rolling Green [1]
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	13,490
2	Annual Average Daily Demand	36,959
3	Maximum Day Demand - Date	11/22/91
4	Maximum Day Gallons Pumped	86,000
5	Gallons Per Minute Pumped	60
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	68
9	Ending No. of ERCs	77
10	Average No. of ERCs	73
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	50
12	No. 2 (GPM Capacity)	49
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	99
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	1,000
27	Tank No. 2	10,000
28	Total Hydro Tanks (Gallons)	11,000
29	Percent Used and Useful (Tank No. 1)	75%
30	Percent Used and Useful (Tank No. 2)	7%
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	73
33	Permitted No. of Lots/ERCs	91
34	Percent Used and Useful	80%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] This system underwent major improvements and was interconnected with Rosemont

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Citrus / Rolling Green **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Citrus / Rolling Green | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Rolling Green
		(a)
1	Annual Growth From Schedule F-9	14.2% [1]
2	Number Of ERC's Associated With 1.0 Years Growth	10
3	Average Number Of Test Year ERC's	73
4	Projected Number Of ERC's	83
	Used and Useful With Margin Reserve:	
5	Distribution System	100% [2]

[1] Assumes growth will remain at same level that occured in 1990.
[2] 100% used and useful based on customer density and system layout.

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Citrus / Rolling Green

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987 [1]	0.0	45.0	22.5	2,390,000	106,222	2,390,000	22.5	ERR
2	1988	45.0	53.0	49.0	8,378,000	170,980	8,378,000	49.0	117.8%
3	1989	53.0	59.0	56.0	10,379,000	185,339	10,379,000	56.0	14.3%
4	1990	59.0	68.0	63.5	12,238,300	192,729	12,238,300	63.5	13.4%
5	1991	68.0	77.0	72.5	12,180,800	168,011	12,180,800	72.5	14.2%
					Average Growth Through 5-Year Period (Col. 8)				34.0%

[1] Acquired August 1987.

Rosemont - 988

Citrus County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Citrus County / Rosemont
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	317		305	5	7	2.2%
2	February	207		203	0	4	1.9%
3	March	237		233	3	1	0.4%
4	April	257		246	2	9	3.5%
5	May	350		331	5	14	4.0%
6	June	350		345	0	5	1.4%
7	July	232		248	0	(16)	-6.9%
8	August	216		216	0	0	0.0%
9	September	272		266	0	6	2.2%
10	October	386		380	0	6	1.6%
11	November	437		427	0	10	2.3%
12	December	339		328	0	11	3.2%
13							
14	Total	3,600	0	3,528	15	57	1.6%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	5					5
22	February						0
23	March	3					3
24	April	2					2
25	May	5					5
26	June						0
27	July						0
28	August						0
29	September						0
30	October						0
31	November						0
32	December						0
33	Totals	15	0	0	0	0	15
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Citrus County / Rosemont
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 15,1990 thru January 16,1991
February	January 17 thru February 13
March	February 14 thru March 17
April	March 18 thru April 13
May	April 14 thru May 11
June	May 12 thru June 13
July	June 14 thru July 16
August	July 17 thru August 15
September	August 16 thru September 13
October	September 14 thru October 13
November	October 14 thru November 15
December	November 16 thru December 15

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Citrus / Rosemont

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				67,680
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		05/15/91		29,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/04/91		24,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/19/91		22,000
		(3)	09/04/91		20,000
		(4)	09/03/91		20,000
		(5)	09/24/91		20,000
	(There is no record of any unusual occurances)			AVERAGE	21,200
4.	Five-Day Max Year	(1)	05/15/91		29,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	11/07/91		25,000
		(3)	09/04/91		24,000
		(4)	09/19/91		22,000
		(5)	05/14/91		22,000
	(There is no record of any unusual occurances)			AVERAGE	24,400
5.	Average Daily Flow				9,844
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Citrus / Rosemont

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Rosemont [1]
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	3,593
2	Annual Average Daily Demand	9,844
3	Maximum Day Demand - Date	05/15/91
4	Maximum Day Gallons Pumped	29,000
5	Gallons Per Minute Pumped	20
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	46
9	Ending No. of ERCs	46
10	Average No. of ERCs	46
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	47
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	47
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	2,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	2,000
29	Percent Used and Useful (Tank No. 1)	35%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	46
33	Permitted No. of Lots/ERCs	59
34	Percent Used and Useful	78%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

[1] This system underwent major improvements and was interconnected with Rolling Green in December of 1991.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Citrus / Rosemont

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7

Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Citrus / Rosemont FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987								
2	1988 [1] Acq	48.0	48.0	48.0	0	0	0	48.0	
3	1989	48.0	46.0	47.0	5,157,000	109,723	5,157,000	47.0	-2.1%
4	1990	46.0	46.0	46.0	4,510,700	98,059	4,510,700	46.0	-2.1%
5	1991	46.0	46.0	46.0	3,526,870	76,671	3,526,870	46.0	0.0%
				Average Growth Through 3-Year Period (Col. 8)					-1.4%

[1] Acquired August 1987.

Salt Springs - 1115

Marion County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1

Preparer: C. Sweat

Company: SSU / Marion County / Salt Springs
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	3,216		(3,285)	715	5,786	179.9%
3	March						
4	April	3,829		2,062	1,524	243	6.3%
5	May						
6	June	3,455		1,753	1,444	258	7.5%
7	July						
8	August	2,073		1,795	92	186	9.0%
9	September						
10	October	1,977		1,374	429	174	8.8%
11	November						
12	December	2,625		1,954	487	184	7.0%
13							
14	Total	17,175	0	5,653	4,691	6,831	39.8%
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	18		697			715
23	March						
24	April	14		1510			1524
25	May						
26	June	19		1425			1444
27	July						
28	August	17			75		92
29	September						
30	October	79		300	50		429
31	November						
32	December	26		441		20	487
33	Totals	173	0	4373	125	20	4691
34							

35 Calculations are per monthly operating report file.

In Thousands of gallons

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 4, 1990 thru February 1, 1991
April	February 2 thru April 1
June	April 2 thru June 3
August	June 4 thru August 1
October	August 2 thru October 1
December	October 2 thru December 3

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The system was overbilled by 4,101,000 gallons in December, 1990 and it was credited in February 1991. In addition, the Adventrure Resorts Campground meter was stuck during the December to February time frame.. The campground typically uses about 1,312,000 gallons. If the 4,101,000 and 1,312,000 gallons are added to the sold gallons in February, the unaccounted for water equals 11.6 per cent in February and an annual percentage of 8.3.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

FPSC

Company: SSU / Marion / Salt Springs

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. *All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.*

			DATE		GPD
1.	Plant Capacity				767,520
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		02/16/91		132,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	03/30/91		123,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	03/23/91		111,000
		(3)	03/02/91		105,000
		(4)	03/07/91		102,000
		(5)	03/14/91		102,000
				AVERAGE	108,600
4.	Five-Day Max Year	(1)	02/16/91		132,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	03/30/91		123,000
		(3)	03/23/91		111,000
		(4)	02/28/91		106,000
		(5)	02/21/91		106,000
				AVERAGE	115,600
5.	Average Daily Flow				46,477
6.	Required Fire Flow (750 GPM for 1.5 hours)				40,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Marion / Salt Springs | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Salt Springs
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	16,964
2	Annual Average Daily Demand	46,477
3	Maximum Day Demand - Date	02/16/91
4	Maximum Day Gallons Pumped	132,000
5	Gallons Per Minute Pumped	92
6	Fire Flow Requirement (Gallons)	40,000
7	Fire Flow Requirement (GPM)	750
8	Beginning No. of ERCs	157
9	Ending No. of ERCs	162
10	Average No. of ERCs	159
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	533
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	533
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	15,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	15,000
29	Percent Used and Useful (Tank No. 1)	53%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	159
33	Permitted No. of Lots/ERCs	160
34	Percent Used and Useful	100%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Marion / Salt Springs **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Marion / Salt Springs

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	114.0	117.0	115.5	5,411,000	46,848	5,411,000	115.5	ERR
2	1988	117.0	150.0	133.5	10,464,000	78,382	10,464,000	133.5	15.6%
3	1989	150.0	157.0	153.5	16,027,000	104,410	16,027,000	153.5	15.0%
4	1990	157.0	157.0	157.0	22,833,400	145,436	22,833,400	157.0	2.3%
5	1991	157.0	161.5	159.5	5,653,870	35,447	5,653,870	159.5	1.6%
				Average Growth Through 5-Year Period (Col. 8)					6.1%

Samira Villas - 1118

Marion County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Marion County / Samira Villas
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	284		276	4	4	1.4%
3	March						
4	April	178		174	3	1	0.6%
5	May						
6	June	228		216	6	6	2.6%
7	July						
8	August	169		160	5	4	2.4%
9	September						
10	October	168		163	3	2	1.2%
11	November						
12	December	165		162	2	1	0.6%
13							
14	Total	1,192	0	1,151	23	18	1.5%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February	4					4
23	March						0
24	April	3					3
25	May						0
26	June	6					6
27	July						0
28	August	5					5
29	September						0
30	October	3					3
31	November						0
32	December	2					2
33	Totals	23	0	0	0	0	23
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Marion County / Samira Villas
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 12, 1990 thru February 4, 1991
April	February 5 thru April 4
June	April 5 thru June 5
August	June 6 thru August 5
October	August 6 thru October 3
December	October 4 thru December 4

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Marion / Samira Villas

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				122,400
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		05/10/91		9,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	05/10/91		9,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/09/91		9,000
		(3)	05/02/91		6,000
		(4)	05/03/91		6,000
		(5)	05/16/91		6,000
				AVERAGE	7,200
4.	Five-Day Max Year	(1)	05/10/91		9,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/09/91		9,000
		(3)	01/01/91		7,000
		(4)	01/02/91		7,000
		(5)	01/03/91		7,000
				AVERAGE	7,800
5.	Average Daily Flow				3,052
6	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Marion / Samira Villas **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Samira Villas
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	1,114
2	Annual Average Daily Demand	3,052
3	Maximum Day Demand - Date	05/10/91
4	Maximum Day Gallons Pumped	9,000
5	Gallons Per Minute Pumped	6
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	13
9	Ending No. of ERCs	13
10	Average No. of ERCs	13
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	85
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	85
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	1,500
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	1,500
29	Percent Used and Useful (Tank No. 1)	85%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	13
33	Permitted No. of Lots/ERCs	13
34	Percent Used and Useful	100%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Marion / Samira Villas

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Marion / Samira Villas

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987 [1]	0.0	0.0	0.0	0	ERR	0	ERR	ERR
2	1988	13.0	13.0	13.0	2,469,000	189,923	2,469,000	13.0	ERR
3	1989	13.0	13.0	13.0	1,805,000	138,846	1,805,000	13.0	0.0%
4	1990	13.0	13.0	13.0	2,257,300	173,638	2,257,300	13.0	0.0%
5	1991	13.0	13.0	13.0	1,151,220	88,555	1,151,220	13.0	0.0%
					Average Growth Through 5-Year Period (Col. 8)				0.0%

[1] Acquired December 1987.

Saratoga Harbour - 448

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Putnam County / Saratoga Harbour & Welaka Mobile Home Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,769		879	207	683	38.6%
2	February					0	
3	March	1,100		719	197	184	16.7%
4	April					0	
5	May	1,163		889	206	68	5.8%
6	June					0	
7	July	1,024		781	198	45	4.4%
8	August					0	
9	September	1,045		690	323	32	3.1%
10	October					0	
11	November	1,019		685	286	48	4.7%
12	December					0	
13							
14	Total	7,120	0	4,643	1,417	1,060	14.9%
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	103	4		100		207
22	February						0
23	March	93	4		100		197
24	April						0
25	May	102	4		100		206
26	June						0
27	July	94	4		100		198
28	August						0
29	September	87	4	132	100		323
30	October						0
31	November	88	4	94	100		286
32	December						0
33	Totals	567	24	226	600	0	1417
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Putnam County / Saratoga Harbour & Welaka Mobile Home Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
Saratoga Harbor and Welaka are interconnected and are on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 15, 1990 thru January 14, 1991
March	January 15 thru March 14
May	March 15 thru May 13
July	May 14 thru July 12
September	July 13 thru September 13
November	September 14 thru November 11

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) Saratoga Harbour and Welaka Mobile Home Park are interconnected together. It is impossible to determine the pump for each plant individually. In order to determine the unaccounted for water percentage, the systems' sold and pumped are combined.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / Saratoga Harbor & Welaka

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				267,840 109,440
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)		01/01/91		55,000
3.	Five-Day Max Month	(1)	01/01/91		55,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	01/02/91		29,500
		(3)	01/03/91		29,000
		(4)	01/08/91		28,500
		(5)	01/10/91		25,000
	(There is no record of any unusual occurances)			AVERAGE	33,400
4.	Five-Day Max Year	(1)	01/01/91		55,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	02/20/91		38,000
		(3)	04/18/91		36,000
		(4)	06/06/91		33,000
		(5)	03/01/91		31,000
	(There is no record of any unusual occurances)			AVERAGE	38,600
5.	Average Daily Flow				17,688
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				0

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / Saratoga Harbor & Welaka — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Saratoga Harbor Welaka MHP
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	6,456
2	Annual Average Daily Demand	17,688
3	Maximum Day Demand - Date	01/01/91
4	Maximum Day Gallons Pumped	55,000
5	Gallons Per Minute Pumped	38
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	130
9	Ending No. of ERCs	131
10	Average No. of ERCs	130
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	110
12	No. 2 (GPM Capacity)	76
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	186
15	Percent Used and Useful	50%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	40,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	40,000
20	Percent Used and Useful	46%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	150
22	No. 2 (Capacity in GPM)	150
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	300
25	Percent Used and Useful	51%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	1,500
28	Total Hydro Tanks (Gallons)	6,500
29	Percent Used and Useful (Tank No. 1)	45%
30	Percent Used and Useful (Tank No. 2)	100%
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	130
33	Permitted No. of Lots/ERCs	249
34	Percent Used and Useful	52%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / Saratoga Harbor & Welaka

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Putnam / Saratoga Harbor & Welaka **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 3
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	(a)
1	Annual Growth From Schedule F-9	3.6%
2	Number Of ERC's Associated With 1.5 Years Growth	7
3	Average Number Of Test Year ERC's	130
4	Projected Number Of ERC's	137
5	Test Year Usage Per ERC @ MDD	422
6	Projected MDD for Margin Reserve	57,929
	Used and Useful With Margin Reserve:	
7	Supply Wells	53%
8	Finshed Water Storage	48%
9	High Service Pumps	54%
10	Distribution System	54%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / Saratoga Harbor & Welaka

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	109.0	118.0	113.5	5,781,000	50,934	5,781,000	113.5	ERR
2	1988	118.0	118.0	118.0	5,964,000	50,542	5,964,000	118.0	4.0%
3	1989	118.0	124.0	121.0	5,447,000	45,017	5,447,000	121.0	2.5%
4	1990	124.0	130.0	127.0	5,553,595	43,729	5,553,595	127.0	5.0%
5	1991	130.0	130.5	130.5	4,642,938	35,578	4,642,938	130.5	2.8%
					Average Growth Through 5-Year Period (Col. 8)				3.6%

Silver Lake Estates - 574

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Lake County / Silver Lake/Western Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	18,751		16,511	548	1,692	9.0%
2	February	19,522		17,868	544	1,110	5.7%
3	March	22,333		18,176	970	3,187	14.3%
4	April	23,042		21,272	616	1,154	5.0%
5	May	29,842		24,302	775	4,765	16.0%
6	June	23,471		27,943	616	(5,088)	-21.7%
7	July	27,192		22,692	1,507	2,993	11.0%
8	August	28,508		22,925	878	4,705	16.5%
9	September	35,417		30,555	921	3,941	11.1%
10	October	29,918		21,487	795	7,636	25.5%
11	November	29,641		24,191	785	4,665	15.7%
12	December	28,940		22,453	821	5,666	19.6%
13							
14	**Total**	**316,577**	**0**	**270,375**	**9,776**	**36,426**	**11.5%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	36	32	15	465		548
22	February	28	12	16	488		544
23	March	120	4	288	558		970
24	April	19	2	1	576	18	616
25	May	26	1	2	746		775
26	June	1	1	26	587	1	616
27	July	133		694	680		1507
28	August	57		108	713		878
29	September	20	3	13	885		921
30	October	10	1	36	748		795
31	November	18	1	25	741		785
32	December	42	1	54	724		821
33	Totals	510	58	1278	7911	19	9776
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Lake County / Silver Lake/Western Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Pumped Gallons
January	January
February	February
March	March
April	April
May	May
June	June
July	July
August	August
September	September
October	October
November	November
December	December

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) Western Shores and Silver Lake are interconnected. Western Shores is on a bi-monthly billing cycle and the meters are read on or about the 1st of the month. Silver Lakes is on a monthly billing cycle and the meters are read on or about the 3rd week of each month. Due to the billing cycle differences we could not coordinate the sold to the pump gallons.

4) This system received a credit for 9,965.000 gallons in March for gallons that were overbilled in January and February. If these thre months were added together and unaccounted for water determined on the total, the unaccounted for water percentage for the three month period would equal 9.9 per cent.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Silver Lakes & Western Shores

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				3,189,600
	Reliable Plant Capacity with Largest Well Out of Service				1,749,600
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		09/10/91		1,437,500
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/10/91		1,437,500
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/12/91		1,372,000
		(3)	09/14/91		1,332,000
		(4)	09/19/91		1,301,000
		(5)	09/17/91		1,235,000
	(There is no record of any unusual occurances)			AVERAGE	1,335,500
4.	Five-Day Max Year	(1)	09/10/91		1,437,500
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/12/91		1,372,000
		(3)	09/14/91		1,332,000
		(4)	09/19/91		1,301,000
		(5)	08/17/91		1,297,000
	(There is no record of any unusual occurances)			AVERAGE	1,347,900
5.	Average Daily Flow				867,334
6.	Required Fire Flow (750 GPM for 2 hours)				90,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Silver Lakes & Western Shores **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Silver Lakes Western Shores
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	316,577
2	Annual Average Daily Demand	867,334
3	Maximum Day Demand - Date	09/10/91
4	Maximum Day Gallons Pumped	1,437,500
5	Gallons Per Minute Pumped	998
6	Fire Flow Requirement (Gallons)	90,000
7	Fire Flow Requirement (GPM)	750
8	Beginning No. of ERCs	1,448
9	Ending No. of ERCs	1,557
10	Average No. of ERCs	1,502
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	1,000
12	No. 2 (GPM Capacity)	1,000
13	No. 3 (GPM Capacity)	215
14	Total Well Capacity (GPM)	2,215
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	10,000
27	Tank No. 2	5,000
28	Total Hydro Tanks (Gallons)	15,000
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	65%
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	1,502
33	Permitted No. of Lots/ERCs	1,617
34	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size, and system layout.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Silver Lakes & Western Shores **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Silver Lakes & Western Shores

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	159.0	166.0	162.5	7,216,000	44,406	7,216,000	162.5	ERR
2	1988 [1]	932.0	1,110.0	1,021.0	174,517,000	170,928	174,517,000	1,021.0	528.3%
3	1989	1,110.0	1,287.0	1,198.5	234,263,000	195,463	234,263,000	1,198.5	17.4%
4	1990	1,287.0	1,448.0	1,367.5	262,544,500	191,989	262,544,500	1,367.5	14.1%
5	1991	1,448.0	1,556.5	1,502.5	270,375,423	179,950	270,375,423	1,502.5	9.9%
				Average Growth Through 4-Year Period (Col. 8)					13.7%

[1] Siver Lakes system acquired in March 1988. The 1987 data is for Western Shores only.
[2] Growth for the combined systems is calculated for 1988 to 1991.

Silver Lake Oaks - 473

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Putnam County / Silver Lake Oaks
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	348		174	127	48	13.8%
2	February						
3	March	396		168	153	75	18.9%
4	April						
5	May	359		168	127	64	17.8%
6	June						
7	July	354		212	133	9	2.5%
8	August						
9	September	423		236	154	33	7.8%
10	October						
11	November	369		212	142	15	4.1%
12	December						
13							
14	**Total**	**2,250**	**0**	**1,170**	**836**	**244**	**10.8%**
15							
16							

17 Other use breakdowns are as follows:

Line	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	25	102				127
22	February						0
23	March	54	99				153
24	April						0
25	May	23	104				127
26	June						0
27	July	28	105				133
28	August						0
29	September	43	111				154
30	October						0
31	November	42	95	5			142
32	December						0
33	Totals	215	616	5	0	0	836
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Putnam County / Silver Lake Oaks
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 8, 1990 thru January 7, 1991
March	January 8 thru March 7
May	March 8 thru May 7
July	May 8 thru July 8
September	July 9 thru September 12
November	September 13 thru November 8

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / Silver Lake Oaks

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				57,600
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		08/04/91		18,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/17/91		12,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	09/10/91		10,000
		(3)	09/25/91		9,000
		(4)	09/04/91		8,000
		(5)	09/18/91		8,000
				AVERAGE	9,400
4.	Five-Day Max Year	(1)	08/04/91		18,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	01/17/91		17,000
		(3)	01/24/91		12,000
		(4)	09/17/91		12,000
		(5)	09/10/91		10,000
				AVERAGE	13,800
5.	Average Daily Flow				6,079
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / Silver Lake Oaks — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Silver Lake Oaks
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	2,219
2	Annual Average Daily Demand	6,079
3	Maximum Day Demand - Date	08/04/91
4	Maximum Day Gallons Pumped	18,000
5	Gallons Per Minute Pumped	13
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	29
9	Ending No. of ERCs	25
10	Average No. of ERCs	27
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	40
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	40
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	1,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	1,000
29	Percent Used and Useful (Tank No. 1)	60%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	27
33	Permitted No. of Lots/ERCs	53
34	Percent Used and Useful	51%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / Silver Lake Oaks **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / Silver Lake Oaks **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987								
2	1988								
3	1989 [1]	28.0	28.0	28.0	138,000	4,929	138,000	28.0	
4	1990	28.0	29.0	28.5	1,074,383	37,698	1,074,383	28.5	1.8%
5	1991	29.0	25.0	27.0	1,169,580	43,318	1,169,580	27.0	-5.3%
				Average Growth Through 2-Year Period (Col. 8)					-1.8%

[1] Siver Lakes system acquired in October 1989.

Skycrest - 551

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Lake County / Skycrest
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,185		834	139	112	9.4%
2	February						
3	March	1,125		809	212	104	9.2%
4	April						
5	May	1,179		915	158	106	9.0%
6	June						
7	July	1,251		827	297	127	10.1%
8	August						
9	September	1,194		935	144	115	9.6%
10	October						
11	November	1,167		909	143	115	9.9%
12	December						
13							
14	Total	7,101	0	5,329	1,094	678	9.6%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	3	10	2	124		139
22	February						
23	March	26	10	58	118		212
24	April						
25	May	24	10		124		158
26	June						
27	July	26	10	130	131		297
28	August						
29	September	9	10		125		144
30	October						
31	November	10	10		123		143
32	December						
33	Totals	98	60	190	746	0	1094
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Lake County / Skycrest
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 2, 1990 thru January 3, 1991
March	January 4 thru March 2
May	March 3 thru May 4
July	May 5 thru July 1
September	July 2 thru September 1
November	September 2 thru November 4

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Skycrest

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				972,000
	Reliable Plant Capacity with Largest Well Out of Service				252,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		05/14/91		57,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	05/14/91		57,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/12/91		35,000
		(3)	05/13/91		35,000
		(4)	05/19/91		33,000
		(5)	05/20/91		33,000
				AVERAGE	38,600
4.	Five-Day Max Year	(1)	05/14/91		57,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/12/91		35,000
		(3)	05/13/91		35,000
		(4)	05/19/91		33,000
		(5)	05/20/91		33,000
				AVERAGE	38,600
5.	Average Daily Flow				19,104
6.	Required Fire Flow (500 GPM for 2 hours)				60,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Skycrest **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Skycrest
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	6,973
2	Annual Average Daily Demand	19,104
3	Maximum Day Demand - Date	05/14/91
4	Maximum Day Gallons Pumped	57,000
5	Gallons Per Minute Pumped	40
6	Fire Flow Requirement (Gallons)	60,000
7	Fire Flow Requirement (GPM)	500
8	Beginning No. of ERCs	111
9	Ending No. of ERCs	111
10	Average No. of ERCs	111
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	500
12	No. 2 (GPM Capacity)	175
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	675
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	3,000
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	111
33	Permitted No. of Lots/ERCs	123
34	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size, and system layout.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Skycrest **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Skycrest

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	86.0	88.0	87.0	3,771,000	43,345	3,771,000	87.0	ERR
2	1988	88.0	95.0	91.5	4,157,000	45,432	4,157,000	91.5	5.2%
3	1989	95.0	106.0	100.5	5,189,000	51,632	5,189,000	100.5	9.8%
4	1990	106.0	111.0	108.5	6,827,910	62,930	6,827,910	108.5	8.0%
5	1991	111.0	111.0	111.0	5,330,050	48,018	5,330,050	111.0	2.3%
					Average Growth Through 5-Year Period (Col. 8)				6.3%

Spring Hill Utilities - 27001

Hernando County (DUI)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: DUI - SSU /Hernando County / Spring Hill
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	221,174		230,435	3,422	(12,683)	-5.7%
2	February	222,465		210,429	2,735	9,301	4.2%
3	March	245,005		200,188	4,140	40,677	16.6%
4	April	266,606		222,894	3,616	40,096	15.0%
5	May	294,762		239,080	4,318	51,364	17.4%
6	June	271,515		252,419	3,715	15,381	5.7%
7	July	249,139		216,391	3,576	29,172	11.7%
8	August	245,872		223,299	3,154	19,419	7.9%
9	September	297,130		230,953	3,641	62,536	21.0%
10	October	296,786		243,968	3,588	49,230	16.6%
11	November	288,210		246,558	3,432	38,220	13.3%
12	December	265,470		284,052	3,405	(21,987)	-8.3%
13							
14	Total	3,164,134	0	2,800,666	42,741	320,727	10.1%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	450		350	2,212	410	3,422
22	February	150		200	2,225	160	2,735
23	March	650		825	2,450	215	4,140
24	April	300		500	2,666	150	3,616
25	May	370		200	2,948	800	4,318
26	June	200		100	2,715	700	3,715
27	July	310		300	2,491	475	3,576
28	August	425			2,459	270	3,154
29	September	335		100	2,971	235	3,641
30	October	400			2,968	220	3,588
31	November	350			2,882	200	3,432
32	December	500		50	2,655	200	3,405
33	Totals	4440	0	2625	31,641	4035	42,741
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: DUI - SSU /Hernando County / Spring Hill
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Pumped From the MORs
January	January
February	February
March	March
April	April
May	May
June	June
July	July
August	August
September	September
October	October
November	November
December	December

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on the usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The pumped gallons are not adjusted to coordinate with the sold gallons. Since this system is read and billed throughout the entire month it would be virtually impossible to coordinate the sold gallons to the pumped gallons.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: DUI-SSU / Hernando / Spring Hill

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				19,512,000
	Reliable Plant Capacity with Two Largest Well Out of Service				14,616,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		06/15/91		15,903,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	05/14/91		14,516,000
		(2)	05/04/91		14,384,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	05/15/91		13,898,000
		(4)	05/07/91		13,403,000
		(5)	05/11/91		13,386,000
	(There is no record of any unusual occurances)			AVERAGE	13,917,400
4.	Five-Day Max Year	(1)	06/15/91		15,903,000
		(2)	05/14/91		14,516,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	05/04/91		14,384,000
		(4)	05/15/91		13,898,000
		(5)	06/11/91		13,894,000
	(There is no record of any unusual occurances)			AVERAGE	14,519,000
5.	Average Daily Flow				8,668,860
6.	Required Fire Flow (1000 GPM for 4 hours)				240,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See ISO Guideline)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: DUI-SSU / Hernando / Spring Hill **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Spring Hill
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	3,164,134
2	Annual Average Daily Demand	8,668,860
3	Maximum Day Demand - Date	06/15/91
4	Maximum Day Gallons Pumped	15,903,000
5	Gallons Per Minute Pumped	11,044
6	Fire Flow Requirement (Gallons)	240,000
7	Fire Flow Requirement (GPM)	1,000
8	Beginning No. of ERCs	24,451
9	Ending No. of ERCs	25,356
10	Average No. of ERCs	24,903
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	2,000
12	No. 2 (GPM Capacity) Second Largest	1,750
13	No. 3 (GPM Capacity)	13,475
14	Total 21 Wells Capacity (GPM)	17,225
15	Percent Used and Useful	82%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	2,000,000
17	Tank No. 2	1,000,000
18	Tank No. 3	500,000
19	Total Storage Capacity in Gallons	3,500,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0)	
21	No. 1 (Capacity in GPM)Largest	3,500
22	No. 2 (Capacity in GPM)Second Largest	2,500
23	No. 3 (Capacity in GPM)All Others Combined	3,950
24	Total High Service Pump Capacity	9,950
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1 located at Unit 1 site. Largest high service pump is 1200 GPM	8,000
27	Tank No. 2 located at Unit 2 site. Largest well pump is 400 GPM	8,000
28	Tank No. 3 located at Unit 13 site. Largest well pump is 2000 GPM	8,000
29	Tank No. 4 located at Unit 19 site. Largest well pump is 1050 GPM	7,500
30	Tank No. 5 located at Unit 25 site. Largest high service pump is 500 GPM	8,000
31	Percent Used and Useful Tank No. 1	100%
32	Percent Used and Useful Tank No. 2	75%
33	Percent Used and Useful Tank No. 3	100%
34	Percent Used and Useful Tank No. 4	100%
35	Percent Used and Useful Tank No. 5	94%
36	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
37	Average No. of ERCs	24,903
38	Permitted No. of Lots/ERCs	31,931
39	Percent Used and Useful	78%

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: DUI-SSU / Hernando / Spring Hill **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: DUI-SSU / Hernando / Spring Hill

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Spring Hill (a)
1	Annual Growth From Schedule F-9	8.7%
2	Number Of ERC's Associated With 1.5 Years Growth	3,244
3	Average Number Of Test Year ERC's	24,903
4	Projected Number Of ERC's	28,148
5	Test Year Usage Per ERC @ MDD	639
6	Projected MDD for Margin Reserve	17,974,831
	Used and Useful With Margin Reserve:	
7	Supply Wells	93%
8	Distribution System	85%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: DUI-SSU / Hernando / Spring Hill

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold [1]	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	17,790.0	17,905.0	17,847.5	1,835,740	102,857	1,835,740	17,847.5	ERR
2	1988	17,905.0	21,369.0	19,637.0	2,544,433	129,573	2,544,433	19,637.0	10.0%
3	1989	21,369.0	23,440.0	22,404.5	2,938,057	131,137	2,938,057	22,404.5	14.1%
4	1990	23,440.0	24,451.0	23,945.5	3,057,571	127,689	3,057,571	23,945.5	6.9%
5	1991	24,451.0	25,355.5	24,903.5	2,800,666	112,461	2,800,666	24,903.5	4.0%
				Average Growth Through 5-Year Period (Col. 8)					8.7%

[1] Expressed in thousands of gallons.

St. John's Highlands - 471

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Putnam County / St. Johns Highlands
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January					0	
2	February	1,178		565	259	354	30.1%
3	March					0	
4	April	973		599	4	370	38.0%
5	May					0	
6	June	635		717	7	(89)	-14.0%
7	July					0	
8	August	838		395	9	434	51.8%
9	September					0	
10	October	986		390	352	244	24.7%
11	November					0	
12	December	363		490	92	(219)	-60.3%
13							
14	Total	4,973	0	3,156	723	1,094	22.0%
15							
16	0						
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February	1	2	256			259
23	March						0
24	April	2	2				4
25	May						0
26	June	5	2				7
27	July						0
28	August	7	2				9
29	September						0
30	October	350	2				352
31	November						0
32	December	90	2				92
33	Totals	455	12	256	0	0	723
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Putnam County / St. Johns Highlands
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 25, 1990 thru February 22, 1991
April	February 23 thru April 22
June	April 23 thru June 24
August	June 25 thru August 23
October	August 24 thru October 23
December	October 24 thru December 23

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The water treatment facility was down for repairs from November 12, to December 30, 1991 (48 days). Water was provided to the area through an interconnect with the Hermits Cove plant during this period. Since there was no flow through this plant for the 48 days, December appears to be a negative percentage. If you were to take the average daily consumption for the 317 days the plant was on line minus the other uses and times it by the 48 days the plant was off line then the consumption for the December period would be approximately 832,000 and the UFW percentage would equal 30.8 for December with an average of 38.7 % annually

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / St. Johns Highlands

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				141,120
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		01/26/91		98,600
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	01/26/91		98,600
		(2)	01/27/91		98,600
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	01/28/91		98,600
		(4)	01/25/91		39,000
		(5)	01/18/91		25,000
	(There is no record of any unusual occurances)			AVERAGE	71,960
4.	Five-Day Max Year	(1)	01/26/91		98,600
		(2)	01/27/91		98,600
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	01/28/91		98,600
		(4)	04/04/91		44,000
		(5)	01/25/91		39,000
	(There is no record of any unusual occurances)			AVERAGE	75,760
5.	Average Daily Flow				13,542
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / St. Johns Highlands

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	St. Johns Highlands
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	4,943
2	Annual Average Daily Demand	13,542
3	Maximum Day Demand - Date	01/26/91
4	Maximum Day Gallons Pumped	98,600
5	Gallons Per Minute Pumped	68
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	79
9	Ending No. of ERCs	78
10	Average No. of ERCs	79
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	98
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	98
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	16,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	16,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	60
22	No. 2 (Capacity in GPM)	60
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	120
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	3,000
29	Percent Used and Useful (Tank No. 1)	49%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	79
33	Permitted No. of Lots/ERCs	118
34	Percent Used and Useful	67%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / St. Johns Highlands **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Putnam / St. Johns Highlands

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	ST. Johns Highlands (a)
1	Annual Growth From Schedule F-9	2.5%
2	Number Of ERC's Associated With 1.0 Years Growth	2
3	Average Number Of Test Year ERC's	79
4	Projected Number Of ERC's	80
	Used and Useful With Margin Reserve:	
5	Distribution System	68%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / St. Johns Highlands

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	71.0	71.0	71.0	2,889,000	40,690	2,889,000	71.0	ERR
2	1988	71.0	76.0	73.5	3,307,000	44,993	3,307,000	73.5	3.5%
3	1989	76.0	80.0	78.0	3,522,000	45,154	3,522,000	78.0	6.1%
4	1990	80.0	79.0	79.5	3,529,480	44,396	3,529,480	79.5	1.9%
5	1991	79.0	78.0	78.5	3,156,240	40,207	3,156,240	78.5	-1.3%
					Average Growth Through 5-Year Period (Col. 8)				2.5%

Stone Mountain - 565

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Lake County / Stone Mountain
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January					0	
2	February	305		155	1	149	48.9%
3	March					0	
4	April	330		195	3	132	40.0%
5	May					0	
6	June	520		201	2	317	61.0%
7	July					0	
8	August	703		220	2	481	68.4%
9	September					0	
10	October	791		254	183	354	44.8%
11	November					0	
12	December	440		245	1	194	44.1%
13							
14	Total	3,089	0	1,270	192	1,627	52.7%
15							
16							

Line No.	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February	1					1
23	March						0
24	April	3					3
25	May						0
26	June	2					2
27	July						0
28	August	2					2
29	September						0
30	October	3		180			183
31	November						0
32	December	1					1
33	Totals	12	0	180	0	0	192
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Lake County / Stone Mountain
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Management Report Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 6,1990 thru February 5,1991
April	February 6 thru April 5
June	April 6 thru June 4
August	June 5 thru August 5
October	August 6 thru October 5
December	October 6 thru December 4

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) We have not been able to determine the exact cause for the unaccounted for water percentage being 52.7. We at one point thought we had a fernery nearby illegally connected to the mian somewhere. Our crews trenched around the entire plant property to locate an illegal line with no results. We now believe the configuration of the piping at the flow meter could be causing the meter to register inaccurately when the well turns on. A meter will be placed on the finished water side of the flow meter so that we can compare the readings to determine how much, if any, the flow meter is registering fast. Our findings will be submitted after the test is completed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Stone Mountain

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				144,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		06/07/91		27,200
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/11/91		19,200
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/06/91		18,800
		(3)	09/13/91		16,100
		(4)	09/17/91		15,900
		(5)	09/05/91		15,200
	(There is no record of any unusual occurances)			AVERAGE	17,040
4.	Five-Day Max Year	(1)	06/07/91		27,200
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	04/30/91		21,200
		(3)	07/23/91		20,800
		(4)	09/11/91		19,200
		(5)	09/06/91		18,800
	(There is no record of any unusual occurances)			AVERAGE	21,440
5.	Average Daily Flow				8,353
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Stone Mountain — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Stone Mountain
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	3,049
2	Annual Average Daily Demand	8,353
3	Maximum Day Demand - Date	06/07/91
4	Maximum Day Gallons Pumped	27,200
5	Gallons Per Minute Pumped	19
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	6
9	Ending No. of ERCs	6
10	Average No. of ERCs	6
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	100
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	100
15	Percent Used and Useful	38%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	1,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	1,000
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	6
33	Permitted No. of Lots/ERCs	24
34	Percent Used and Useful	25%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Stone Mountain

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Stone Mountain **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	7.0	8.0	7.5	1,121,000	149,467	1,121,000	7.5	ERR
2	1988	8.0	9.0	8.5	863,000	101,529	863,000	8.5	13.3%
3	1989	9.0	6.0	7.5	1,590,000	212,000	1,590,000	7.5	-11.8%
4	1990	6.0	6.0	6.0	1,417,000	236,167	1,417,000	6.0	-20.0%
5	1991	6.0	6.0	6.0	1,269,150	211,525	1,269,150	6.0	0.0%
					Average Growth Through 5-Year Period (Col. 8)				-5.4%

Sugar Mill - 1801

Volusia County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Volusia County / Sugar Mill Country Club
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
January	3,240		2,459	552	229	7.1%
February	3,220		2,105	838	277	8.6%
March	3,650		2,874	661	115	3.2%
April	3,150		2,290	539	321	10.2%
May	3,050		2,093	589	368	12.1%
June	2,700		1,765	608	327	12.1%
July	2,760		1,888	575	297	10.8%
August	2,450		1,359	808	283	11.6%
September	2,633		1,789	575	269	10.2%
October	2,590		1,656	710	224	8.6%
November	3,550		2,574	549	427	12.0%
December	3,080		2,261	621	198	6.4%
Total	**36,073**	**0**	**25,113**	**7,625**	**3,335**	**9.2%**

Other use breakdowns are as follows:

Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
January	60	383	30	79		552
February	315	413	25	85		838
March	175	365	50	71		661
April	110	320	50	59		539
May	139	342	51	57		589
June	166	360	35	47		608
July	100	339	56	80		575
August	200	458	25	125		808
September	100	335	50	90		575
October	150	425	40	95		710
November	200	231	24	94		549
December	240	291	30	60		621
Totals	1955	4262	466	942	0	7625

Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Volusia County / Sugar Mill Country Club
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

(Plant No. 1801)

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 15, 1990 thru January 16, 1991
February	January 17 thru February 15
March	February 16 thru March 19
April	March 20 thru April 13
May	April 14 thru May 11
June	May 12 thru June 10
July	June 11 thru July 14
August	July 15 thru August 13
September	August 14 thru September 16
October	September 17 thru October 14
November	October 15 thru November 15
December	November 16 thru December 15

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Volusia / Sugar Mill

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				371,520
	Reliable Plant Capacity with Largest Well Out of Service				240,480
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		03/06/91		200,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	03/06/91		200,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	03/15/91		190,000
		(3)	03/22/91		190,000
		(4)	03/24/91		180,000
		(5)	03/30/91		160,000
				AVERAGE	184,000
4.	Five-Day Max Year	(1)	03/06/91		200,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	03/15/91		190,000
		(3)	03/22/91		190,000
		(4)	03/24/91		180,000
		(5)	04/03/91		170,000
				AVERAGE	186,000
5.	Average Daily Flow				98,666
6.	Required Fire Flow (2500 GPM for 2 hours)				300,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Volusia / Sugar Mill **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Sugar Mill C.C.
1	Total Gallons Pumped (000's)	36,013
2	Annual Average Daily Demand	98,666
3	Maximum Day Demand - Date	03/06/91
4	Maximum Day Gallons Pumped	200,000
5	Gallons Per Minute Pumped	139
6	Fire Flow Requirement (Gallons)	300,000
7	Fire Flow Requirement (GPM)	2,500
8	Beginning No. of ERCs	621
9	Ending No. of ERCs	640
10	Average No. of ERCs	630
	Supply Wells: (Acct No.304.2. 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	91
12	No. 2 (GPM Capacity)	84
13	No. 3 (GPM Capacity)	83
14	No. 4 (GPM Capacity)	76
15	Total Well Capacity (GPM)	258
16	Percent Used and Useful	87%
	Water Treatment Equipment	
17	Infilco Solids Contact Unit in GPM	350
18	Infilco Gravity Filters in GPM (2 ea. @ 96 sq ft) (rated capacity with one filter out of service)	288
19	Total Water Treatment Equipment Capacity in GPM	288
20	Percent Used and Useful	48%
	Finished Water Storage: (Account No. 330.4)	
21	Tank No. 1	500,000
22	Total Storage Capacity in Gallons	500,000
23	Percent Used and Useful	73%
	High Service Pumps: (Account No. 311.2, 325.0_)	
24	No. 1 (Capacity in GPM)	1,050
25	No. 2 (Capacity in GPM)	650
26	No. 3 (Capacity in GPM)	650
27	Total High Service Pump Capacity	2,350
28	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3. or 330.4)	
29	Tank No. 1	15,000
30	Percent Used and Useful (Tank No. 1)	100%
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	630
33	Permitted No. of Lots/ERCs	767 ~~1,500~~
34	Percent Used and Useful	100% [1]

NOTE Buildings, Land, Aeration, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size and system layout.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Volusia / Sugar Mill **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Volusia / Sugar Mill

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Sugar Mill
		(a)
1	Annual Growth From Schedule F-9	5.9%
2	Number Of ERC's Associated With 1.5 Years Growth	56
3	Average Number Of Test Year ERC's	630
4	Projected Number Of ERC's	686
5	Test Year Usage Per ERC @ MDD	317
6	Projected MDD for Margin Reserve	217,669
	Used and Useful With Margin Reserve:	
7	Supply Wells	95%
8	Finished Water Storage	75%
9	Water Treatment Equipment	52%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Volusia / Sugar Mill

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold [1]	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987 [1]	483.0	520.0	501.5	7,799,000	15,551	7,799,000	501,500.0	ERR
2	1988	520.0	554.0	537.0	22,412,000	41,736	22,412,000	537,000.0	7.1%
3	1989	554.0	587.0	570.5	26,980,000	47,292	26,980,000	570,500.0	6.2%
4	1990	587.0	621.0	604.0	26,361,000	43,644	26,361,000	604,000.0	5.9%
5	1991	621.0	639.5	630.5	25,112,883	39,830	25,112,883	630,500.0	4.4%
					Average Growth Through 5-Year Period (Col. 8)				5.9%

[1] Acquired in August 1987.

Sugar Mill Woods - 989

Citrus County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Citrus County / Sugar Mill Woods
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

FPSC

Schedule F-1

Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
January	37,466		25,818	2,090	9,558	25.5%
February	32,115		23,663	4,075	4,377	13.6%
March	30,679		25,128	4,652	899	2.9%
April	34,127		23,619	7,707	2,801	8.2%
May	36,587		28,116	4,839	3,632	9.9%
June	38,153		30,690	7,227	236	0.6%
July	34,095		27,783	2,229	4,083	12.0%
August	30,950		23,801	1,729	5,420	17.5%
September	32,209		27,788	4,239	182	0.6%
October	39,338		28,459	10,637	242	0.6%
November	42,398		37,668	6,033	(1,303)	-3.1%
December	41,193		34,270	2,474	4,449	10.8%
Total	429,310	0	336,903	57,931	34,576	8.1%

Other use breakdowns are as follows:

Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
January	20	691	1379			2090
February	1041	114	2920			4075
March	1751	114	2787			4652
April	1892	114	5701			7707
May	2096	114	2629			4839
June	1921	114	5192			7227
July	114	114	2001			2229
August	613	114	1002			1729
September	837	114	3288			4239
October	2568	114	7955			10637
November	3467	114	2452			6033
December	120	114	2240			2474
Totals	16440	1945	38546	0	0	57931

Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Citrus County / Sugar Mill Woods
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Water Sold	Adjusted Pump to Equal Sold Cycle
January	December 1, 1990 thru December 30, 1990
February	January 1, 1991 thru January 31
March	February 1 thru February 28
April	March 1 thru March 31
May	April 1 thru April 30
June	May 1 thru June 1
July	June 2 thru June 30
August	July 1 thru July 31
September	August 1 thru September 2
October	September 3 thru September 30
November	October 1 thru October 31
December	November 1 thru November 30

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Citrus / Sugarmill Woods

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				6,912,000
	Reliable Plant Capacity with Two Largest Well Out of Service				5,184,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		09/25/91		1,869,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	10/16/91		1,863,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	10/23/91		1,857,000
		(3)	10/15/91		1,847,000
		(4)	10/30/91		1,833,000
		(5)	10/21/91		1,659,000
				AVERAGE	1,811,800
4.	Five-Day Max Year	(1)	09/25/91		1,869,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	10/16/91		1,863,000
		(3)	10/23/91		1,857,000
		(4)	10/15/91		1,847,000
		(5)	10/30/91		1,833,000
				AVERAGE	1,853,800
5.	Average Daily Flow				1,180,107
6.	Required Fire Flow (2500 GPM for 4 hours)				600,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Citrus / Sugarmill Woods — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Sugarmill Woods
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	430,739
2	Annual Average Daily Demand	1,180,107
3	Maximum Day Demand - Date	09/25/91
4	Maximum Day Gallons Pumped	1,869,000
5	Gallons Per Minute Pumped	1,298
6	Fire Flow Requirement (Gallons)	600,000
7	Fire Flow Requirement (GPM)	2,500
8	Beginning No. of ERCs	4,125
9	Ending No. of ERCs	4,457
10	Average No. of ERCs	4,291
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	Plant No. 1 - 2 @ 300 GPM each	600
12	Plant No. 2 - 5 @ 600 GPM each	3,000
13	Plant No. 3 - 2 @ 600 GPM each	1,200
14	Total Well Capacity (GPM)	4,800
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Total Storage Capacity in Gallons	0
19	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
20	No. 1 (Capacity in GPM)	0
21	No. 2 (Capacity in GPM)	0
22	Total High Service Pump Capacity	0
23	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
24	Tank No. 1 at Plant No. 1	6,000
25	Tank No. 2 at Plant No. 2	12,000
26	Tank No. 3 at Plant No. 2	15,000
27	Tank No. 4 at Plant No. 2	15,000
28	Tank No. 5 at Plant No. 3	12,000
29	Percent Used and Useful (Tank No. 1)	75%
30	Percent Used and Useful (Tank No. 2)	75%
31	Percent Used and Useful (Tank No. 3)	60%
32	Percent Used and Useful (Tank No. 4)	60%
33	Percent Used and Useful (Tank No. 5)	75%
34	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
35	Average No. of ERCs	4,291
36	Permitted No. of Lots/ERCs	9,054
37	Percent Used and Useful	47%

Note: Buildings, Land, and Chlorination Equipment are

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Citrus / Sugarmill Woods | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Citrus / Sugarmill Woods

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Sugarmill Woods (a)
1	Annual Growth From Schedule F-9	6.3%
2	Number Of ERC's Associated With 1.0 Years Growth	271
3	Average Number Of Test Year ERC's	4,291
4	Projected Number Of ERC's	4,562
	Used and Useful With Margin Reserve:	
5	Distribution System	50%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Citrus / Sugarmill Woods | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987								
2	1988 [1]								
3	1989	3,703.0	3,890.0	3,796.5	360,806,000	95,036	360,806,000	3,796.5	
4	1990	3,890.0	4,125.0	4,007.5	379,338,600	94,657	379,338,600	4,007.5	5.6%
5	1991	4,125.0	4,457.0	4,291.0	336,802,604	78,490	336,802,604	4,291.0	7.1%
					Average Growth Through 2-Year Period (Col. 8)				6.3%

[1] Acquired July 1988.

Sunny Hills Utilities - 28001

Washington County (UFU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU /Washington County / Sunny Hills
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	4,098		1,740	2,087	271	6.6%
2	February	5,090		1,675	3,230	185	3.6%
3	March	3,939		2,365	2,122	(548)	-13.9%
4	April	4,199		2,278	1,384	537	12.8%
5	May	5,544		3,043	2,199	302	5.4%
6	June	5,624		2,233	2,948	443	7.9%
7	July	5,889		3,169	2,476	244	4.1%
8	August	5,494		4,006	2,316	(828)	-15.1%
9	September	7,016		2,181	4,831	4	0.1%
10	October	8,126		2,577	4,872	677	8.3%
11	November	6,104		3,069	3,017	18	0.3%
12	December	5,305		1,740	3,481	84	1.6%
13							
14	**Total**	**66,428**	**0**	**30,076**	**34,963**	**1,389**	**2.1%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	50	11	2016		10	2087
22	February	147	36	3037		10	3230
23	March	159		1943		20	2122
24	April	164		1210		10	1384
25	May	115	58	2016		10	2199
26	June	90	72	2736		50	2948
27	July	50	58	2318		50	2476
28	August	143	14	2109		50	2316
29	September	58	14	4709		50	4831
30	October	58	36	4738		40	4872
31	November	58		2909		50	3017
32	December	205		3226		50	3481
33	Totals	1297	299	32967	0	400	34963
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU /Washington County / Sunny Hills
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 2, 1989 thru January 2 1990
February	January 3 thru February 4
March	February 5 thru March 4
April	March 5 thru April 1
May	April 2 thru May 1
June	May 2 thru June 3
July	June 4 thru July 1
August	July 2 thru August 1
September	August 2 thru September 3
October	September 4 thru October 1
November	October 2 thru November 4
December	November 5 thru December 2

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system was debited 690,000 gallons in March and 878,000 gallons in August. If sold gallons were adjusted, the unaccounted for water percentage would equal 3.9 for March and .09 for August.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Washington / Sunny Hills

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				1,172,160
	Reliable Plant Capacity with Largest Well Out of Service				668,160
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		09/07/91		437,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/07/91		437,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	09/10/91		375,000
		(3)	09/23/91		374,000
		(4)	09/16/91		356,000
		(5)	09/24/91		354,000
				AVERAGE	379,200
4.	Five-Day Max Year	(1)	09/07/91		437,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	10/25/91		424,000
		(3)	09/10/91		375,000
		(4)	09/23/91		374,000
		(5)	09/16/91		356,000
				AVERAGE	393,200
5.	Average Daily Flow				181,545
6.	Required Fire Flow (500 GPM for 2 hours)				60,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Washington / Sunny Hills

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Sunny Hills
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	66,264
2	Annual Average Daily Demand	181,545
3	Maximum Day Demand - Date	09/07/91
4	Maximum Day Gallons Pumped	437,000
5	Gallons Per Minute Pumped	303
6	Fire Flow Requirement (Gallons)	60,000
7	Fire Flow Requirement (GPM)	500
8	Beginning No. of ERCs	603
9	Ending No. of ERCs	603
10	Average No. of ERCs	603
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest at Unit 8 site	350
12	No. 2 (GPM Capacity) Second Largest at Unit 19 site	300
13	No. 3 (GPM Capacity) at Unit 10 site	164
14	Total Wells Capacity (GPM)	814
15	Percent Used and Useful	65%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1 located at Unit 19 site	60,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	60,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0)	
21	No. 1 (Capacity in GPM)Largest located at Unit 19	200
22	No. 2 (Capacity in GPM)Second Largest located at Unit 19 site	200
23	No. 3 (Capacity in GPM) located at Unit 19 site	100
24	Total High Service Pump Capacity	500
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1 located at Unit 19 site	10,000
27	Tank No. 2 located at Unit 8 site	7,500
28	Tank No. 3 located at Unit 10 site	7,500
29	Percent Used and Useful Tank No. 1	45%
30	Percent Used and Useful Tank No. 2	70%
31	Percent Used and Useful Tank No. 3	33%
32	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
33	Average No. of ERCs	603
34	Permitted No. of Lots/ERCs	5,581
35	Percent Used and Useful	11%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Washington / Sunny Hills **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Washington / Sunny Hills **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Sunny Hills
		(a)
1	Annual Growth From Schedule F-9	5.3%
2	Number Of ERC's Associated With 1.5 Years Growth	48
3	Average Number Of Test Year ERC's	603
4	Projected Number Of ERC's	650
5	Test Year Usage Per ERC @ MDD	725
6	Projected MDD for Margin Reserve	471,552
	Used and Useful With Margin Reserve:	
7	Supply Wells	71%
8	Distribution System	11%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Washington / Sunny Hills

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	486.0	496.0	491.0	34,172,000	69,597	34,172,000	491.0	ERR
2	1988	496.0	580.0	538.0	39,858,000	74,086	39,858,000	538.0	9.6%
3	1989	580.0	635.0	607.5	32,638,000	53,725	32,638,000	607.5	12.9%
4	1990	635.0	603.0	619.0	46,267,800	74,746	46,267,800	619.0	1.9%
5	1991	603.0	602.5	603.0	30,075,393	49,876	30,075,393	603.0	-2.6%
				Average Growth Through 5-Year Period (Col. 8)					5.3%

Sunshine Parkway - 560

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Lake County / Sunshine Parkway
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,015		483	147	385	37.9%
2	February	1,133		634	129	370	32.7%
3	March	1,303		931	136	236	18.1%
4	April	1,292		989	126	177	13.7%
5	May	1,282		1,024	123	135	10.5%
6	June	1,258		1,018	127	113	9.0%
7	July	1,474		1,253	128	93	6.3%
8	August	1,709		1,543	132	34	2.0%
9	September	1,411		1,268	130	13	0.9%
10	October	1,431		1,243	131	57	4.0%
11	November	1,708		1,552	131	25	1.5%
12	December	1,318		1,085	131	102	7.7%
13							
14	Total	16,334	0	13,023	1,571	1,740	10.7%
15							
16							

17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	24	123				147
22	February	21	108				129
23	March	16	120				136
24	April	16	110				126
25	May	5	118				123
26	June	8	119				127
27	July	5	123				128
28	August	5	127				132
29	September	11	119				130
30	October	13	118				131
31	November	11	120				131
32	December	11	120				131
33	Totals	146	1425	0	0	0	1571
34							
35	*Calculations are per monthly operating report file.*						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Lake County / Sunshine Parkway
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 25,1990 thru January 23, 1991
February	January 24 thru February 21
March	February 22 thru March 24
April	March 25 thru April 21
May	April 22 thru May 23
June	May 24 thru June 23
July	June 24 thru July 24
August	July 25 thru August 26
September	August 27 thru September 25
October	September 26 thru October 25
November	October 26 thru November 27
December	November 28 thru December 26

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Sunshine Parkway

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				3,116,160
	Reliable Plant Capacity with Largest Well Out of Service				1,535,040
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		08/06/91		83,600
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	08/06/91		83,600
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	08/10/91		83,700
		(3)	08/19/91		72,500
		(4)	08/16/91		69,500
		(5)	08/27/91		63,100
				AVERAGE	74,520
4.	Five-Day Max Year	(1)	08/06/91		83,800
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	08/10/91		83,700
		(3)	12/29/91		83,700
		(4)	10/27/91		82,400
		(5)	08/19/91		72,500
				AVERAGE	81,220
5.	Average Daily Flow				44,945
6.	Required Fire Flow (1500 GPM for 3 hours)				270,000
	The standards will be those as set by the Insurance Service Organization or by a govemmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Sunshine Parkway — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Sunshine Parkway
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	16,405
2	Annual Average Daily Demand	44,945
3	Maximum Day Demand - Date	08/06/91
4	Maximum Day Gallons Pumped	83,800
5	Gallons Per Minute Pumped	58
6	Fire Flow Requirement (Gallons)	270,000
7	Fire Flow Requirement (GPM)	1,500
8	Beginning No. of ERCs	39
9	Ending No. of ERCs	40
10	Average No. of ERCs	40
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)	1,098
12	No. 2 (GPM Capacity)	1,066
13	No. 3 (GPM Capacity)	0
14	Total Wells Capacity (GPM)	2,164
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	108,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	108,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0)	
21	No. 1 (Capacity in GPM)	600
22	No. 2 (Capacity in GPM)	600
23	No. 3 (Capacity in GPM)	600
24	Total High Service Pump Capacity	1,800
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	10,000
27	Tank No. 2	
28	Tank No. 3	
29	Percent Used and Useful Tank No. 1	100%
30	Percent Used and Useful Tank No. 2	
31	Percent Used and Useful Tank No. 3	
32	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
33	Average No. of ERCs	40
34	Permitted No. of Lots/ERCs	40
35	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density and system layout.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Sunshine Parkway | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Sunshine Parkway **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	117.0	59.0	88.0	50,241,000	570,920	50,241,000	88.0	ERR
2	1988	59.0	38.0	48.5	25,711,000	530,124	25,711,000	48.5	-44.9%
3	1989	38.0	38.0	38.0	14,827,000	390,184	14,827,000	38.0	-21.6%
4	1990	38.0	39.0	38.5	11,022,750	286,305	11,022,750	38.5	1.3%
5	1991	39.0	40.0	39.5	13,023,880	329,718	13,023,880	39.5	2.6%
					Average Growth Through 5-Year Period (Col. 8)				-18.1%

Tropical Park - 781

Osceola County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Osceola County / Tropical Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	6,174		5,410	224	540	8.7%
3	March						
4	April	6,053		5,353	184	516	8.5%
5	May						
6	June	5,953		5,226	180	547	9.2%
7	July						
8	August	5,621		5,985	166	(530)	-9.4%
9	September						
10	October	5,717		4,089	67	1,561	27.3%
11	November						
12	December	5,588		5,047	54	487	8.7%
13							
14	Total	35,106	0	31,110	875	3,121	8.9%
15							
16							

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						
22	February	224					224
23	March						
24	April	184					184
25	May						
26	June	180					180
27	July						
28	August	166					166
29	September						
30	October	67					67
31	November						
32	December	54					54
33	Totals	875	0	0	0	0	875
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Osceola County / Tropical Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 18, 1990 thru February 21, 1991
April	February 22 thru April 21
June	April 22 thru June 22
August	June 23 thru August 21
October	August 22 thru October 23
December	October 24 thru December 19

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system was over billed by 1,080,000 gallons in August and it was credited back in October. When the sold gallons are adjusted to reflect the over bill, August's unaccounted for water equals 9.8 % and October equals 8.4%.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Osceola / Tropical Park **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service				648,000 144,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		11/29/91		180,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	04/22/91		132,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	04/15/91		121,000
		(3)	04/10/91		120,000
		(4)	04/29/91		117,000
		(5)	04/16/91		115,000
	(There is no record of any unusual occurances)			AVERAGE	121,000
4.	Five-Day Max Year	(1)	11/29/91		180,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	11/22/91		179,000
		(3)	11/06/91		169,000
		(4)	07/30/91		168,000
		(5)	03/25/91		147,000
	(There is no record of any unusual occurances)			AVERAGE	168,600
5.	Average Daily Flow				96,419
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Osceola / Tropical Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Tropical Park
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	35,193
2	Annual Average Daily Demand	96,419
3	Maximum Day Demand - Date	11/29/91
4	Maximum Day Gallons Pumped	180,000
5	Gallons Per Minute Pumped	125
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	548
9	Ending No. of ERCs	544
10	Average No. of ERCs	546
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	350
12	No. 2 (GPM Capacity)	100
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	450
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	3,000
27	Tank No. 2	1,000
28	Total Hydro Tanks (Gallons)	4,000
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	100%
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	546
33	Permitted No. of Lots/ERCs	671
34	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size, and system layout.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Osceola / Tropical Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Osceola / Tropical Park

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	540.0	541.0	540.5	29,775,000	55,088	29,775,000	540.5	ERR
2	1988	541.0	543.0	542.0	29,294,000	54,048	29,294,000	542.0	0.3%
3	1989	543.0	543.0	543.0	31,379,000	57,788	31,379,000	543.0	0.2%
4	1990	543.0	548.0	545.5	31,848,200	58,384	31,848,200	545.5	0.5%
5	1991	548.0	544.0	546.0	31,108,098	56,975	31,108,098	546.0	0.1%
					Average Growth Through 5-Year Period (Col. 8)				0.3%

University Shores - 106

Orange County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Orange County / University Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	26,184	4,888	28,436	81	2,555	8.2%
2	February	24,209	4,643	26,499	1,350	1,003	3.5%
3	March	30,726	4,491	32,344	1,454	1,419	4.0%
4	April	19,876	4,854	18,279	2,191	4,260	17.2%
5	May	26,639	4,872	32,573	1,428	(2,490)	-7.9%
6	June	27,639	5,532	30,360	1,372	1,439	4.3%
7	July	23,155	5,721	27,195	1,067	614	2.1%
8	August	25,950	4,718	28,246	896	1,526	5.0%
9	September	26,989	5,463	28,311	1,223	2,918	9.0%
10	October	25,268	7,476	28,635	1,327	2,782	8.5%
11	November	26,704	5,645	28,455	1,363	2,531	7.8%
12	December	26,978	5,644	28,408	1,237	2,977	9.1%
13							
14	Total	310,317	63,947	337,741	14,989	21,534	5.8%
15							
16							
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January	35	46				81
22	February	69	1281				1350
23	March		1454				1454
24	April		1491	700			2191
25	May	5	1423				1428
26	June	9	1363				1372
27	July		1067				1067
28	August		896				896
29	September		1223				1223
30	October	30	1297				1327
31	November		1363				1363
32	December		1237				1237
33	Totals	148	14141	700	0	0	14989
34							
35	Calculations are per monthly operating report file.						

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Orange County / University Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the Purchase column is from the Purchased Water Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 14, 1990 thru January 13, 1991
February	January 14 thru February 12
March	February 13 thru March 20
April	March 21 thru April 11
May	April 12 thru May 12
June	May 13 thru June 14
July	June 15 thru July 15
August	July 16 thru August 17
September	August 18 thru September 16
October	September 17 thru October 14
November	October 15 thru November 14
December	November 15 thru December 13

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the mis-read. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) We purchase water from the City of Winter Park. The read dates provided by the City do not correspond to our billing cycle dates thus creating a fluctuation in the UFW % during the year.

4) There are numerous billing adjustments throughout the year which cause a fluctuation in unaccounted for water percentages but the year end percentage is accurate.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Orange / University Shores & Suncrest

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				6,912,000
	Reliable Plant Capacity with Largest Well Out of Service				4,752,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		09/18/91		1,726,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	05/12/91		1,332,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	05/06/91		1,131,000
		(3)	05/01/91		1,088,000
		(4)	05/13/91		1,085,000
		(5)	05/05/91		1,070,000
				AVERAGE	1,141,200
4.	Five-Day Max Year	(1)	09/18/91		1,726,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(2)	09/19/91		1,491,000
		(3)	05/12/91		1,332,000
		(4)	07/23/91		1,181,000
		(5)	05/06/91		1,131,000
				AVERAGE	1,372,200
5.	Average Daily Flow				854,408
6.	Required Fire Flow (2000 GPM for 2 hours)				240,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See Orange County Subdivision Regulation)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Orange / University Shores & Suncrest **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Univ Shores & Suncrest
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	311,859
2	Annual Average Daily Demand	854,408
3	Maximum Day Demand - Date	09/18/91
4	Maximum Day Gallons Pumped	1,726,000
5	Gallons Per Minute Pumped	1,199
6	Fire Flow Requirement (Gallons)	240,000
7	Fire Flow Requirement (GPM)	2,000
8	Beginning No. of ERCs	2,847
9	Ending No. of ERCs	3,020
10	Average No. of ERCs	2,934
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)	1,500
12	No. 2 (GPM Capacity)	1,500
13	No. 3 (GPM Capacity)	1,800
14	Total Wells Capacity (GPM)	4,800
15	Percent Used and Useful	97%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	412,000
17	Tank No. 2	200,000
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	612,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0)	
21	No. 1 (Capacity in GPM)	2,250
22	No. 2 (Capacity in GPM)	4,000
23	No. 3 (Capacity in GPM)	1,730
24	Total High Service Pump Capacity	7,980
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1 Suncrest Plant	10,000
27	Tank No. 2 University Plant	10,000
28	Percent Used and Useful Tank No. 1	100%
29	Percent Used and Useful Tank No. 2	100%
30	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
31	Average No. of ERCs	2,934
32	Permitted No. of Lots/ERCs	3,042
33	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size, and system layout.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Orange / University Shores & Suncrest **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Orange / University Shores & Suncrest | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	University Shores
		(a)
1	Annual Growth From Schedule F-9	8.2%
2	Number Of ERC's Associated With 1.5 Years Growth	361
3	Average Number Of Test Year ERC's	2,934
4	Projected Number Of ERC's	3,295
5	Test Year Usage Per ERC @ MDD	588
6	Projected MDD for Margin Reserve	1,938,564
	Used and Useful With Margin Reserve:	
7	Supply Wells	100%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Orange / University Shores & Suncrest — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	2,101.0	2,178.0	2,139.5	214,478,000	100,247	214,478,000	2,139.5	ERR
2	1988	2,178.0	2,386.0	2,282.0	245,679,000	107,660	245,679,000	2,282.0	6.7%
3	1989	2,386.0	2,675.0	2,530.5	345,911,000	136,697	345,911,000	2,530.5	10.9%
4	1990	2,675.0	2,847.0	2,761.0	356,593,250	129,154	356,593,250	2,761.0	9.1%
5	1991	2,847.0	3,020.0	2,933.5	337,741,660	115,133	337,741,660	2,933.5	6.2%
					Average Growth Through 5-Year Period (Col. 8)				8.2%

Venetian Village - 567

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Lake County / Venetian Village
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,530		1,181	37	312	20.4%
2	February						
3	March	1,506		1,397	27	82	5.4%
4	April						
5	May	1,583		1,447	36	100	6.3%
6	June						
7	July	1,521		1,467	18	36	2.4%
8	August						
9	September	1,452		1,414	16	22	1.5%
10	October						
11	November	1,504		1,427	3	74	4.9%
12	December						
13							
14	**Total**	**9,096**	**0**	**8,333**	**137**	**626**	**6.9%**
15							
16							

17 Other use breakdowns are as follows:

18

Line No.	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
19	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January	34	3				37
22	February						
23	March	13	14				27
24	April						
25	May	32	4				36
26	June						
27	July	13	5				18
28	August						
29	September	12	4				16
30	October						
31	November	3					3
32	December						
33	Totals	107	30	0	0	0	137
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Lake County / Venetian Village
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1

Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 3,1990 thru January 2,1991
March	January 3 thru March 1
May	March 2 thru May 1
July	May 2 thru July 1
September	July 02 thru September 3
November	September 4 thru November 5

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system was overbilled in November of 1990 and the consumption was credited back in January of 1991 which is why the January unaccounted for water percentage is high.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Venetian Village

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				397,440
	Reliable Plant Capacity with Largest Well Out of Service				144,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		04/15/91		40,200
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	12/21/91		30,700
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/25/91		30,000
		(3)	12/26/91		30,000
		(4)	12/02/91		28,300
		(5)	12/18/91		28,200
	(There is no record of any unusual occurances)			AVERAGE	29,440
4.	Five-Day Max Year	(1)	04/15/91		40,200
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	05/03/91		39,300
		(3)	03/07/91		38,000
		(4)	80/15/91		37,500
		(5)	10/20/91		35,900
	(There is no record of any unusual occurances)			AVERAGE	38,180
5.	Average Daily Flow				24,726
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Venetian Village — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Venetian Village
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	9,025
2	Annual Average Daily Demand	24,726
3	Maximum Day Demand - Date	04/15/91
4	Maximum Day Gallons Pumped	40,200
5	Gallons Per Minute Pumped	28
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	129
9	Ending No. of ERCs	131
10	Average No. of ERCs	130
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)	176
12	No. 2 (GPM Capacity)	100
13	No. 3 (GPM Capacity)	0
14	Total Wells Capacity (GPM)	276
15	Percent Used and Useful	56%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	4,000
27	Tank No. 2	
28	Tank No. 3	
29	Percent Used and Useful Tank No. 1	66%
30	Percent Used and Useful Tank No. 2	
31	Percent Used and Useful Tank No. 3	
32	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
33	Average No. of ERCs	130
34	Permitted No. of Lots/ERCs	223
35	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density and system layout.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Venetian Village **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Lake / Venetian Village **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Venetian Village (a)
1	Annual Growth From Schedule F-9	6.3%
2	Number Of ERC's Associated With 1.5 Years Growth	12
3	Average Number Of Test Year ERC's	130
4	Projected Number Of ERC's	142
5	Test Year Usage Per ERC @ MDD	309
6	Projected MDD for Margin Reserve	43,970
	Used and Useful With Margin Reserve:	
7	Supply Wells	61%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Venetian Village

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	98.0	106.0	102.0	5,222,000	51,196	5,222,000	102.0	ERR
2	1988	106.0	116.0	111.0	5,881,000	52,982	5,881,000	111.0	8.8%
3	1989	116.0	119.0	117.5	7,652,000	65,123	7,652,000	117.5	5.9%
4	1990	119.0	129.0	124.0	8,982,000	72,435	8,982,000	124.0	5.5%
5	1991	129.0	131.0	130.0	8,333,404	64,103	8,333,404	130.0	4.8%
				Average Growth Through 5-Year Period (Col. 8)					6.3%

Welaka - 447

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Company: SSU / Putnam County / Saratoga Harbour & Welaka Mobile Home Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,769		879	207	683	38.6%
2	February					0	
3	March	1,100		719	197	184	16.7%
4	April					0	
5	May	1,163		889	206	68	5.8%
6	June					0	
7	July	1,024		781	198	45	4.4%
8	August					0	
9	September	1,045		690	323	32	3.1%
10	October					0	
11	November	1,019		685	286	48	4.7%
12	December					0	
13							
14	Total	7,120	0	4,643	1,417	1,060	14.9%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January	103	4		100		207
22	February						0
23	March	93	4		100		197
24	April						0
25	May	102	4		100		206
26	June						0
27	July	94	4		100		198
28	August						0
29	September	87	4	132	100		323
30	October						0
31	November	88	4	94	100		286
32	December						0
33	Totals	567	24	226	600	0	1417
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Putnam County / Saratoga Harbour & Welaka Mobile Home Park
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
Saratoga Harbor and Welaka are interconnected and are on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 15, 1990 thru January 14, 1991
March	January 15 thru March 14
May	March 15 thru May 13
July	May 14 thru July 12
September	July 13 thru September 13
November	September 14 thru November 11

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) Saratoga Harbour and Welaka Mobile Home Park are interconnected together. It is impossible to determine the pump for each plant individually. In order to determine the unaccounted for water percentage, the systems' sold and pumped are combined.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / Saratoga Harbor & Welaka **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				267,840
	Reliable Plant Capacity with Largest Well Out of Service				109,440
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		01/01/91		55,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	01/01/91		55,000
		(2)	01/02/91		29,500
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	01/03/91		29,000
		(4)	01/08/91		28,500
		(5)	01/10/91		25,000
	(There is no record of any unusual occurances)			AVERAGE	33,400
4.	Five-Day Max Year	(1)	01/01/91		55,000
		(2)	02/20/91		38,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(3)	04/18/91		36,000
		(4)	06/06/91		33,000
		(5)	03/01/91		31,000
	(There is no record of any unusual occurances)			AVERAGE	38,600
5.	Average Daily Flow				17,688
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / Saratoga Harbor & Welaka — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Saratoga Harbor Welaka MHP
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	6,456
2	Annual Average Daily Demand	17,688
3	Maximum Day Demand - Date	01/01/91
4	Maximum Day Gallons Pumped	55,000
5	Gallons Per Minute Pumped	38
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	130
9	Ending No. of ERCs	131
10	Average No. of ERCs	130
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	110
12	No. 2 (GPM Capacity)	76
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	186
15	Percent Used and Useful	50%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	40,000
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	40,000
20	Percent Used and Useful	46%
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	150
22	No. 2 (Capacity in GPM)	150
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	300
25	Percent Used and Useful	51%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	5,000
27	Tank No. 2	1,500
28	Total Hydro Tanks (Gallons)	6,500
29	Percent Used and Useful (Tank No. 1)	45%
30	Percent Used and Useful (Tank No. 2)	100%
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	130
33	Permitted No. of Lots/ERCs	249
34	Percent Used and Useful	52%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS

Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / Saratoga Harbor & Welaka **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Putnam / Saratoga Harbor & Welaka

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 3
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	(a)
1	Annual Growth From Schedule F-9	3.6%
2	Number Of ERC's Associated With 1.5 Years Growth	7
3	Average Number Of Test Year ERC's	130
4	Projected Number Of ERC's	137
5	Test Year Usage Per ERC @ MDD	422
6	Projected MDD for Margin Reserve	57,929
	Used and Useful With Margin Reserve:	
7	Supply Wells	53%
8	Finshed Water Storage	48%
9	High Service Pumps	54%
10	Distribution System	54%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / Saratoga Harbor & Welaka

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	109.0	118.0	113.5	5,781,000	50,934	5,781,000	113.5	ERR
2	1988	118.0	118.0	118.0	5,964,000	50,542	5,964,000	118.0	4.0%
3	1989	118.0	124.0	121.0	5,447,000	45,017	5,447,000	121.0	2.5%
4	1990	124.0	130.0	127.0	5,553,595	43,729	5,553,595	127.0	5.0%
5	1991	130.0	130.5	130.5	4,642,938	35,578	4,642,938	130.5	2.8%
				Average Growth Through 5-Year Period (Col. 8)					3.6%

Western Shores - 566

Lake County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Lake County / Silver Lake/Western Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	18,751		16,511	548	1,692	9.0%
2	February	19,522		17,868	544	1,110	5.7%
3	March	22,333		18,176	970	3,187	14.3%
4	April	23,042		21,272	616	1,154	5.0%
5	May	29,842		24,302	775	4,765	16.0%
6	June	23,471		27,943	616	(5,088)	-21.7%
7	July	27,192		22,692	1,507	2,993	11.0%
8	August	28,508		22,925	878	4,705	16.5%
9	September	35,417		30,555	921	3,941	11.1%
10	October	29,918		21,487	795	7,636	25.5%
11	November	29,641		24,191	785	4,665	15.7%
12	December	28,940		22,453	821	5,666	19.6%
13							
14	Total	316,577	0	270,375	9,776	36,426	11.5%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19							
20							
21	January	36	32	15	465		548
22	February	28	12	16	488		544
23	March	120	4	288	558		970
24	April	19	2	1	576	18	616
25	May	26	1	2	746		775
26	June	1	1	26	587	1	616
27	July	133		694	680		1507
28	August	57		108	713		878
29	September	20	3	13	885		921
30	October	10	1	36	748		795
31	November	18	1	25	741		785
32	December	42	1	54	724		821
33	Totals	510	56	1276	7911	19	9776
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Lake County / Silver Lake/Western Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.

Unaccounted for water is calculated as follows:

Usage Sold	Pumped Gallons
January	January
February	February
March	March
April	April
May	May
June	June
July	July
August	August
September	September
October	October
November	November
December	December

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) Western Shores and Silver Lake are interconnected. Western Shores is on a bi-monthly billing cycle and the meters are read on or about the 1st of the month. Silver Lakes is on a monthly billing cycle and the meters are read on or about the 3rd week of each month. Due to the billing cycle differences we could not coordinate the sold to the pump gallons.

4) This system received a credit for 9,985,000 gallons in March for gallons that were overbilled in January and February. If these thre months were added together and unaccounted for water determined on the total, the unaccounted for water percentage for the three month period would equal 9.9 per cent.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Lake / Silver Lakes & Western Shores

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service				3,189,600 1,749,600
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		09/10/91		1,437,500
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	09/10/91		1,437,500
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/12/91		1,372,000
		(3)	09/14/91		1,332,000
		(4)	09/19/91		1,301,000
		(5)	09/17/91		1,235,000
	(There is no record of any unusual occurances)			AVERAGE	1,335,500
4.	Five-Day Max Year	(1)	09/10/91		1,437,500
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	09/12/91		1,372,000
		(3)	09/14/91		1,332,000
		(4)	09/19/91		1,301,000
		(5)	08/17/91		1,297,000
	(There is no record of any unusual occurances)			AVERAGE	1,347,900
5.	Average Daily Flow				867,334
6.	Required Fire Flow (750 GPM for 2 hours)				90,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation. (See County Ordinance)				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Lake / Silver Lakes & Western Shores **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Silver Lakes Western Shores
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	316,577
2	Annual Average Daily Demand	867,334
3	Maximum Day Demand - Date	09/10/91
4	Maximum Day Gallons Pumped	1,437,500
5	Gallons Per Minute Pumped	998
6	Fire Flow Requirement (Gallons)	90,000
7	Fire Flow Requirement (GPM)	750
8	Beginning No. of ERCs	1,448
9	Ending No. of ERCs	1,557
10	Average No. of ERCs	1,502
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	1,000
12	No. 2 (GPM Capacity)	1,000
13	No. 3 (GPM Capacity)	215
14	Total Well Capacity (GPM)	2,215
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	10,000
27	Tank No. 2	5,000
28	Total Hydro Tanks (Gallons)	15,000
29	Percent Used and Useful (Tank No. 1)	100%
30	Percent Used and Useful (Tank No. 2)	65%
31	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	1,502
33	Permitted No. of Lots/ERCs	1,617
34	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density, pipe size, and system layout.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Lake / Silver Lakes & Western Shores **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Lake / Silver Lakes & Western Shores — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	159.0	166.0	162.5	7,216,000	44,406	7,216,000	162.5	ERR
2	1988 [1]	932.0	1,110.0	1,021.0	174,517,000	170,928	174,517,000	1,021.0	528.3%
3	1989	1,110.0	1,287.0	1,198.5	234,263,000	195,463	234,263,000	1,198.5	17.4%
4	1990	1,287.0	1,448.0	1,367.5	262,544,500	191,989	262,544,500	1,367.5	14.1%
5	1991	1,448.0	1,556.5	1,502.5	270,375,423	179,950	270,375,423	1,502.5	9.9%
				Average Growth Through 4-Year Period (Col. 8)					13.7%

[1] Siver Lakes system acquired in March 1988. The 1987 data is for Western Shores only.
[2] Growth for the combined systems is calculated for 1988 to 1991.

Westmont - 122

Orange County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Orange County / Westmont
Docket No: 920199-WS
Test Year Ended: December 31, 1991

"1991 UFW"

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January		950	940		10	1.1%
2	February		774	810		(36)	-4.7%
3	March		949	1,076		(127)	-13.4%
4	April		925	890		35	3.8%
5	May		761	981		(220)	-28.9%
6	June		908	1,210		(302)	-33.3%
7	July		1,276	824		452	35.4%
8	August		1,222	926		296	24.2%
9	September		1,139	1,136		3	0.3%
10	October		1,115	760		355	31.8%
11	November		901	1,014		(113)	-12.5%
12	December		1,249	815		434	34.7%
13							
14	**Total**	**0**	**12,169**	**11,382**	**0**	**787**	**6.5%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February						0
23	March						0
24	April						0
25	May						0
26	June						0
27	July						0
28	August						0
29	September						0
30	October						0
31	November						0
32	December						0
33	Totals	0	0	0	0	0	0
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Company: SSU / Orange County / Westmont
Docket No: 920199-WS
Test Year Ended: December 31, 1991

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
The usage in the Purchase column is from the Purchased Water Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Purchased
January	January
February	February
March	March
April	April
May	May
June	June
July	July
August	August
September	September
October	October
November	November
December	December

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) We purchase water from Orange County Public Utilities. The gallons are reflected in the month invoiced and are not coordinated to the billing cycle.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Orange / Westmont

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE	GPD
	ALL WATER IS PURCHASED FROM ORANGE COUNTY, NO PLANTS.			
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.			
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)			
3.	Five-Day Max Month The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)		
4.	Five-Day Max Year The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days. (There is no record of any unusual occurances)	(1) (2) (3) (4) (5)		
5.	Average Daily Flow			
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.			

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Orange / Westmont **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20

The water distribution system is 100% used and useful based on customer density pipe size, and system layout.

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Orange / Westmont | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3) ERCs	(4)	(5)	(6) Gallons/ ERC	(7) Total	(8) Total	(9) Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	(5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987 [1]	108.0	108.0	108.0	3,902,000	36,130	3,902,000	108.0	ERR
2	1988	108.0	111.0	109.5	8,543,000	78,018	8,543,000	109.5	1.4%
3	1989	111.0	116.0	113.5	11,786,000	103,841	11,786,000	113.5	3.7%
4	1990	116.0	118.0	117.0	12,832,000	109,675	12,832,000	117.0	3.1%
5	1991	118.0	124.0	121.0	11,382,900	94,074	11,382,900	121.0	3.4%
				Average Growth Through 5-Year Period (Col. 8)					2.9%

[1] Acquired August 1987.

Windsong - 783

Osceola County (SSU)

Water

- 1992 FPSC Filing -

Gallons of water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Osceola County / Windsong
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	1,292		1,281	0	11	0.9%
2	February						
3	March	1,262		1,239	5	18	1.4%
4	April						
5	May	1,356		1,287	0	69	5.1%
6	June						
7	July	1,309		1,307	0	2	0.2%
8	August						
9	September	1,248		1,246	0	2	0.2%
10	October						
11	November	1,200		1,200	0	0	0.0%
12	December						
13							
14	Total	7,667	0	7,560	5	102	1.3%
15							
16							

Line No.							
17	Other use breakdowns are as follows:						
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February						0
23	March	5					5
24	April						0
25	May						0
26	June						0
27	July						0
28	August						0
29	September						0
30	October						0
31	November						0
32	December						0
33	Totals	5	0	0	0	0	5
34							
35	Calculations are per monthly operating report file.						

Gallons of water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

Company: SSU / Osceola County / Windsong
Docket No: 920199-WS
Test Year Ended: December 31, 1991

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 13, 1990 thru January 9, 1991
March	January 10 thru March 10
May	March 11 thru May 8
July	May 9 thru July 10
September	July 11 thru September 10
November	September 11 thru November 11

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Osceola / Windsong **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity Reliable Plant Capacity with Largest Well Out of Service The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				216,000
2.	Maximum Day The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)		12/02/91		39,000
3.	Five-Day Max Month	(1)	12/16/91		33,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/17/91		31,000
		(3)	12/12/91		29,000
		(4)	12/08/91		28,000
		(5)	12/29/91		28,000
	(There is no record of any unusual occurances)			AVERAGE	29,800
4.	Five-Day Max Year	(1)	12/02/91		39,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days	(2)	01/07/91		36,000
		(3)	07/09/91		34,000
		(4)	12/16/91		33,000
		(5)	12/17/91		31,000
	(There is no record of any unusual occurances)			AVERAGE	34,600
5.	Average Daily Flow				20,751
6.	Required Fire Flow The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Osceola / Windsong — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Windsong
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	7,574
2	Annual Average Daily Demand	20,751
3	Maximum Day Demand - Date	12/02/91
4	Maximum Day Gallons Pumped	39,000
5	Gallons Per Minute Pumped	27
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	105
9	Ending No. of ERCs	106
10	Average No. of ERCs	105
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	150
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	150
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	4,000
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	4,000
29	Percent Used and Useful (Tank No. 1)	56%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	105
33	Permitted No. of Lots/ERCs	106
34	Percent Used and Useful	100%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Osceola / Windsong **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7

Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Osceola / Windsong | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	56.0	88.0	72.0	5,130,000	71,250	5,130,000	72.0	ERR
2	1988	88.0	96.0	92.0	6,779,000	73,685	6,779,000	92.0	27.8%
3	1989	96.0	98.0	97.0	8,310,000	85,670	8,310,000	97.0	5.4%
4	1990	98.0	105.0	101.5	8,889,600	87,582	8,889,600	101.5	4.6%
5	1991	105.0	105.5	105.5	7,559,440	71,653	7,559,440	105.5	3.9%
					Average Growth Through 5-Year Period (Col. 8)				10.0%

Woodmere - 888

Duval County (SSU)

Water

- 1992 FPSC Filing -

Gallons of water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Duval County / Woodmere
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January						
2	February	29,650		39,729	394	(10,473)	-35.3%
3	March						
4	April	28,435		17,440	378	10,617	37.3%
5	May						
6	June	31,373		29,756	567	1,050	3.3%
7	July						
8	August	27,881		27,229	514	138	0.5%
9	September						
10	October	31,008		30,386	353	269	0.9%
11	November						
12	December	31,356		30,507	369	480	1.5%
13							
14	Total	179,703	0	175,047	2,575	2,081	1.2%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January						0
22	February	9	372	13			394
23	March						0
24	April	12	366				378
25	May						0
26	June	25	395	147			567
27	July						0
28	August		362	152			514
29	September						0
30	October		353				353
31	November						0
32	December		369				369
33	Totals	46	2217	312	0	0	2575
34							

35 Calculations are per monthly operating report file.

Gallons of water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Duval County / Woodmere
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
February	December 20, 1990 thru February 24, 1991
April	February 25 thru April 22
June	April 23 thru June 24
August	June 25 thru August 23
October	August 24 thru October 24
December	October 25 thru December 21

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) This system was overbilled 10,700,000 gallons in February. 10,152,000 gallons were credited in April and 548,000 in June. If the sold gallons are adjusted to reflect the overbill and credits, the unaccounted for water percentage would equal .8 in February, 1.6 in April and 1.6 in June with the annual percentage remaining the same.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Duval / Woodmere

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				4,320,000
	Reliable Plant Capacity with Largest Well Out of Service				1,440,000
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		07/07/91		849,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	12/01/91		817,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/25/91		652,000
		(3)	12/22/91		614,000
		(4)	12/08/91		590,000
		(5)	12/23/91		581,000
	(There is no record of any unusual occurances)			AVERAGE	650,800
4.	Five-Day Max Year	(1)	07/07/91		849,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/01/91		817,000
		(3)	05/06/91		793,000
		(4)	06/24/91		772,000
		(5)	05/12/91		747,000
	(There is no record of any unusual occurances)			AVERAGE	795,600
5.	Average Daily Flow				486,181
6.	Required Fire Flow (1500 GPM for 3 hours)				270,000
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation (See County Ordinance)				

USED AND USEFUL CALCULATIONS

Water Treatment Plant

Company: SSU / Duval / Woodmere | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Woodmere
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	177,456
2	Annual Average Daily Demand	486,181
3	Maximum Day Demand - Date	07/07/91
4	Maximum Day Gallons Pumped	849,000
5	Gallons Per Minute Pumped	590
6	Fire Flow Requirement (Gallons)	270,000
7	Fire Flow Requirement (GPM)	1,500
8	Beginning No. of ERCs	1,488
9	Ending No. of ERCs	1,503
10	Average No. of ERCs	1,495
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)	2,000
12	No. 2 (GPM Capacity)	1,000
13	No. 3 (GPM Capacity)	0
14	Total Wells Capacity (GPM)	3,000
15	Percent Used and Useful	59%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	400.000
17	Tank No. 2	55,000
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	455,000
20	Percent Used and Useful	100%
	High Service Pumps: (Account No. 311.2, 325.0)	
21	No. 1 (Capacity in GPM)	1,100
22	No. 2 (Capacity in GPM)	1,000
23	No. 3 (Capacity in GPM)	1,000
24	Total High Service Pump Capacity	3,100
25	Percent Used and Useful	100%
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	10,000
27	Tank No. 2	
28	Tank No. 3	
29	Percent Used and Useful Tank No. 1	100%
30	Percent Used and Useful Tank No. 2	
31	Percent Used and Useful Tank No. 3	
32	Auxiliary Power: (Acct. 310.2)	100%
	Distribution System: (Acct No. 331.4 & 335.4)	
33	Average No. of ERCs	1,495
34	Permitted No. of Lots/ERCs	1,600
35	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density and system layout.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Duval / Woodmere

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Duval / Woodmere **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8

Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Woodmere (a)
1	Annual Growth From Schedule F-9	3.9%
2	Number Of ERC's Associated With 1.5 Years Growth	87
3	Average Number Of Test Year ERC's	1,495
4	Projected Number Of ERC's	1,583
5	Test Year Usage Per ERC @ MDD	568
6	Projected MDD for Margin Reserve	898,612
	Used and Useful With Margin Reserve:	
7	Supply Wells	62%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Duval / Woodmere | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	1,105.0	1,462.0	1,283.5	205,222,000	159,892	205,222,000	1,283.5	ERR
2	1988	1,462.0	1,481.0	1,471.5	255,713,000	173,777	255,713,000	1,471.5	14.6%
3	1989	1,481.0	1,485.0	1,483.0	198,611,000	133,925	198,611,000	1,483.0	0.8%
4	1990	1,485.0	1,488.0	1,486.5	195,685,100	131,642	195,685,100	1,486.5	0.2%
5	1991	1,488.0	1,502.5	1,495.5	175,047,255	117,049	175,047,255	1,495.5	0.6%
					Average Growth Through 5-Year Period (Col. 8)				3.9%

Wootens - 446

Putnam County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

Company: SSU / Putnam County / Wooten
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	95		62	6	27	28.4%
2	February						
3	March	95		49	6	40	42.1%
4	April						
5	May	166		78	2	86	51.8%
6	June						
7	July	180		83	2	95	52.8%
8	August						
9	September	179		84	2	93	52.0%
10	October						
11	November	98		56	12	30	30.6%
12	December						
13							
14	Total	813	0	412	30	371	45.6%
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Stuck Meters	Fire Dept.	Totals
20							
21	January	4	2				6
22	February						0
23	March	4	2				6
24	April						0
25	May		2				2
26	June						0
27	July		2				2
28	August						0
29	September		2				2
30	October						0
31	November	10	2				12
32	December						0
33	Totals	18	12	0	0	0	30
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

Company: SSU / Putnam County / Wooten
Docket No: 920199-WS
Test Year Ended: December 31, 1991

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

The usage in the sold column comes from the Water Consumption Report.
This system is on a bimonthly billing cycle.

Unaccounted for water is calculated as follows:

Management Report Usage Sold	Adjusted Pump to Equal Sold Cycle
January	November 10, 1990 thru January 21, 1991
March	January 22 thru March 14
May	March 15 thru May 13
July	May 14 thru July 12
September	July 13 thru September 17
November	September 18 thru November 11

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) The flow meter here is suspected to be inaccurate. The meter will be replaced by April 15, 1992 and tested to determine accuracy of past flows.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Putnam / Wooten **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				36,000
	Reliable Plant Capacity with Largest Well Out of Service				0
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		07/23/91		15,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	06/03/91		6,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	06/18/91		5,000
		(3)	06/25/91		4,000
		(4)	06/27/91		4,000
		(5)	06/04/91		3,000
	(There is no record of any unusual occurances)			AVERAGE	4,400
4.	Five-Day Max Year	(1)	07/23/91		15,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	12/03/91		9,000
		(3)	06/03/91		6,000
		(4)	06/18/91		5,000
		(5)	04/16/91		5,000
	(There is no record of any unusual occurances)			AVERAGE	8,000
5.	Average Daily Flow				2,312
6.	Required Fire Flow				0
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Putnam / Wooten — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Wooten
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	844
2	Annual Average Daily Demand	2,312
3	Maximum Day Demand - Date	07/23/91
4	Maximum Day Gallons Pumped	15,000
5	Gallons Per Minute Pumped	10
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	15
9	Ending No. of ERCs	19
10	Average No. of ERCs	17
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)largest	25
12	No. 2 (GPM Capacity)	0
13	No. 3 (GPM Capacity)	0
14	Total Well Capacity (GPM)	25
15	Percent Used and Useful	83%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0_)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	500
27	Tank No. 2	0
28	Total Hydro Tanks (Gallons)	500
29	Percent Used and Useful (Tank No. 1)	75%
30	Percent Used and Useful (Tank No. 2)	
31	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
32	Average No. of ERCs	17
33	Permitted No. of Lots/ERCs	61
34	Percent Used and Useful	28%

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Putnam / Wooten

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

MARGIN RESERVE CALCULATIONS - WATER

Company: SSU / Putnam / Wooten | **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-8
Page 1 of 1
Preparer: G. Morse

Explanation: If a margin reserve is requested, provide all calculations and analyses used to determine the amount of margin reserve for each portion of used and useful plant.

Recap Schedules: F-5,F-6,F-7

Line No.	Description	Wooten (a)
1	Annual Growth From Schedule F-9	5.0%
2	Number Of ERC's Associated With 1.5 Years Growth	1
3	Average Number Of Test Year ERC's	17
4	Projected Number Of ERC's	18
5	Usage Per ERC @ MDD	882
6	MDD With Margin Reserve ERCs	16,119
	Used and Useful With Margin Reserve:	
7	Supply Wells	90%
8	Distribution System	30%

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Putnam / Wooten

FPSC

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ERCs				Gallons/	Total	Total	Annual
Line No.	Year	Beginning	Ending	Average	Gallons Sold	ERC (5)/(4)	Gallons Sold	ERCs (7)/(6)	% Incr. in ERCs
1	1987	18.0	10.0	14.0	372,000	26,571	372,000	14.0	ERR
2	1988	10.0	15.0	12.5	302,000	24,160	302,000	12.5	-10.7%
3	1989	15.0	16.0	15.5	679,000	43,806	679,000	15.5	24.0%
4	1990	16.0	15.0	15.5	525,150	33,881	525,150	15.5	-0.0%
5	1991	15.0	19.0	17.0	413,480	24,322	413,480	17.0	9.7%
				Average Growth Through 5-Year Period (Col. 8)					5.0%

Zephyr Shores - 1427

Pasco County (SSU)

Water

- 1992 FPSC Filing -

Gallons of Water Pumped, Sold and Unaccounted For

In Thousands of gallons

FPSC

Schedule F-1
Page 1 of 2
Preparer: C. Sweat

Company: SSU / Pasco County / Zephyr Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991 "1991 UFW"

Explanation: Provide a schedule of gallons of water pumped, sold and unaccounted for each month of the test year. The gallons pumped should match the flows shown on the monthly operating reports sent to DER. The other uses may include plant use, flushing of hydrants and water and sewer lines, line breakages and fire flows. Provide all calculations to substantiate the other uses. If unaccounted for water is greater than 10%, provide an explanation as to the reasons why.

Line No.	(1) Month/ Year	(2) Total Gallons Pumped	(3) Gallons Purchased	(4) Gallons Sold	(5) Other Uses	(6) Unaccounted For Water (2)+(3)-(4)-(5)	(7) % Unaccounted For Water
1	January	2,414	471	2,446	167	272	9.4%
2	February	1,647	533	1,827	155	198	9.1%
3	March	2,098	449	2,221	128	198	7.8%
4	April	2,148	456	2,398	137	69	2.6%
5	May	1,298	332	1,458	85	87	5.3%
6	June	1,059	263	1,106	87	129	9.8%
7	July	1,289	181	2,891	108	(1,529)	-104.0%
8	August	1,085	224	726	93	490	37.4%
9	September	1,424	326	495	76	1,179	67.4%
10	October	1,637	365	1,747	95	160	8.0%
11	November	1,984	400	2,209	84	91	3.8%
12	December	1,891	457	2,191	90	67	2.9%
13							
14	**Total**	**19,974**	**4,457**	**21,715**	**1,305**	**1,411**	**5.8%**
15							
16							

17 Other use breakdowns are as follows:

Line No.	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
18							
19	Month	Flushing	Utility Use	Water Breaks	Unmetered & Stuck Meters	Fire Dept.	Totals
20							
21	January		167				167
22	February		155				155
23	March		128				128
24	April		137				137
25	May		85				85
26	June		87				87
27	July		108				108
28	August		93				93
29	September		76				76
30	October		95				95
31	November		84				84
32	December		90				90
33	Totals	0	1305	0	0	0	1305
34							

35 Calculations are per monthly operating report file.

Gallons of Water Pumped, Sold and Unaccounted For
In Thousands of gallons

FPSC

Schedule F-1
Page 2 of 2
Preparer: C. Sweat

Company: SSU / Pasco County / Zephyr Shores
Docket No: 920199-WS
Test Year Ended: December 31, 1991

The usage in the sold column comes from the Water Consumption Report.
The usage in the purchase column comes from the Purchased water Report.

Unaccounted for water is calculated as follows:

Usage Sold	Adjusted Pump to Equal Sold Cycle
January	December 16, 1990 thru January 18, 1991
February	January 19 thru February 16
March	Februaru 17 thru March 19
April	March 20 thru April 22
May	April 23 thru May 19
June	May 20 thru June 17
July	June 18 thru July 24
August	July 25 thru August 23
September	August 24 thru September 20
October	September 21 thru October 18
November	October 19 thru November 18
December	November 19 thru December 17

The fluctuation in the unaccounted for water per cent occurs for the following reasons.

1) Customer meters are read incorrectly causing over or under billing on usage in the month of the misread. The following month the customer is debited or credited for the incorrect usage billed the previous month.

2) The customer receives an estimated bill because the meter couldn't be read. The following month a true reading is obtained. The actual reading is significantly different than the estimated reading, thus the usage was over or under billed.

3) We purchase water form Pasco County for this system. The invoices are not coordinated with our customer billing cycle.

4) This system was overbilled in July and the gallons were credited in August and September. If August sold is adjusted by the 379,000 gallons overbilled, the unaccounted for water for August equals 6.5 per cent. If the September sold is adjusted by the 1,010,140 gallons, the unaccounted for water percentage equals 9.7 and the annual total remains the same at 5.8 per cent.

In an overbill situation, unaccounted for water could appear as a negative that month and a high number the following month. In an underbill situation, unaccounted for water could appear as a high number that month and a negative the following month.

WATER TREATMENT PLANT DATA

Company: SSU / Pasco / Zephyr Shores **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-3
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information for each water treatment plant. If the system has water plants that are interconnected, the data for these plants may be combined. All flow data must be obtained from the monthly operating reports (MORs) sent to the Department of Environmental Regulation.

			DATE		GPD
1.	Plant Capacity				172,800
	Reliable Plant Capacity with Largest Well Out of Service				57,600
	The hydraulic rated capacity. If different from that shown on the DER operating or construction permit, provide an explanation.				
2.	Maximum Day		02/11/91		121,000
	The single day with the highest pumpage rate for the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flow this day. (There is no record of any unusual occurances)				
3.	Five-Day Max Month	(1)	11/17/91		99,000
	The five days with the highest pumpage rate from the month with the highest pumpage rate during the test year. Explain, on a separate page, if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	11/30/91		92,000
		(3)	11/18/91		91,000
		(4)	11/20/91		84,000
		(5)	11/16/91		82,000
	(There is no record of any unusual occurances)			AVERAGE	89,600
4.	Five-Day Max Year	(1)	02/11/91		121,000
	The five days with the highest pumpage rate from any one month in the test year. Provide an explanation if fire flow, line-breaks or other unusual occurances affected the flows on these days.	(2)	02/09/91		120,000
		(3)	02/10/91		120,000
		(4)	03/28/91		113,000
		(5)	11/17/91		99,000
	(There is no record of any unusual occurances)			AVERAGE	114,600
5.	Average Daily Flow				54,025
6.	Required Fire Flow				
	The standards will be those as set by the Insurance Service Organization or by a governmental agency ordinance. Provide documents to support this calculation.				

USED AND USEFUL CALCULATIONS
Water Treatment Plant

Company: SSU / Pasco / Zephyr Shores — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-5
Page 1 of 1
Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water treatment plant(s).

Recap Schedules: A-9,B-19

Line No.	Description	Zephyr Shores
	INPUT DATA SECTION	(a)
1	Total Gallons Pumped (000's)	19,719
2	Annual Average Daily Demand	54,025
3	Maximum Day Demand - Date	02/11/91
4	Maximum Day Gallons Pumped	121,000
5	Gallons Per Minute Pumped	84
6	Fire Flow Requirement (Gallons)	N/A
7	Fire Flow Requirement (GPM)	N/A
8	Beginning No. of ERCs	476
9	Ending No. of ERCs	535
10	Average No. of ERCs	506
	Supply Wells: (Acct No.304.2, 307.2, 308.2, 309.2)	
11	No. 1 (GPM Capacity)	80
12	No. 2 (GPM Capacity)	40
13	No. 3 (GPM Capacity)	0
14	Total Wells Capacity (GPM)	120
15	Percent Used and Useful	100%
	Finished Water Storage: (Account No. 330.4)	
16	Tank No. 1	0
17	Tank No. 2	0
18	Tank No. 3	0
19	Total Storage Capacity in Gallons	0
20	Percent Used and Useful	
	High Service Pumps: (Account No. 311.2, 325.0)	
21	No. 1 (Capacity in GPM)	0
22	No. 2 (Capacity in GPM)	0
23	No. 3 (Capacity in GPM)	0
24	Total High Service Pump Capacity	0
25	Percent Used and Useful	
	Hydropneumatic Tanks: (Account No. 320.3, or 330.4)	
26	Tank No. 1	7,000
27	Tank No. 2	
28	Tank No. 3	
29	Percent Used and Useful Tank No. 1	17%
30	Percent Used and Useful Tank No. 2	
31	Percent Used and Useful Tank No. 3	
32	Auxiliary Power: (Acct. 310.2)	N/A
	Distribution System: (Acct No. 331.4 & 335.4)	
33	Average No. of ERCs	506
34	Permitted No. of Lots/ERCs	647
35	Percent Used and Useful	100% [1]

Note: Buildings, Land, and Chlorination Equipment are considered 100% used and useful.
[1] 100% used and useful based on customer density and system layout.

USED AND USEFUL CALCULATIONS
Water Distribution and Wastewater Collection Systems

Company: SSU / Pasco / Zephyr Shores **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-7

Preparer: G. Morse

Explanation: Provide all calculations, analyses and governmental requirements used to determine the used and useful percentages for the water distribution and wastewater collection systems. The capacity should be in terms of ability to serve a designated number of connections. It should then be related to actual connected density during the test year. If the distribution and collection systems are entirely contributed or built-out, this schedule is not required.

Recap Schedules: A-9,A-10,B-19,B-20
(See Schedules F-5 and F-6)

EQUIVALENT RESIDENTIAL CONNECTIONS - WATER

Company: SSU / Pasco / Zephyr Shores — **FPSC**

Docket No. 920199-WS
Test Year Ended: 12/31/91

Schedule F-9
Page 1 of 1
Preparer: G. Morse

Explanation: Provide the following information in order to calculate the average growth in ERCs for the last five years, including the test year. If the utility does not have single-family residential (SFR) customers, the largest customer class should be used as a substitute.

Line No.	(1) Year	(2) ERCs Beginning	(3) ERCs Ending	(4) ERCs Average	(5) Gallons Sold	(6) Gallons/ ERC (5)/(4)	(7) Total Gallons Sold	(8) Total ERCs (7)/(6)	(9) Annual % Incr. in ERCs
1	1987	296.0	330.0	313.0	10,452,000	33,393	10,452,000	313.0	ERR
2	1988	330.0	367.0	348.5	14,725,000	42,253	14,725,000	348.5	11.3%
3	1989	367.0	434.0	400.5	19,217,000	47,983	19,217,000	400.5	14.9%
4	1990	434.0	476.0	455.0	21,561,800	47,389	21,561,800	455.0	13.6%
5	1991	476.0	535.0	505.5	21,714,145	42,956	21,714,145	505.5	11.1%
	Average Growth Through 5-Year Period (Col. 8)								12.7%

CHARLOTTE/LEE COUNTY

- 1992 FPSC Filing -

Charlotte

MAR 2 3 1990
EFF. DATE
3-14-85

ORDINANCE
NUMBER 85-9

AN ORDINANCE RESCINDING SUBSECTION 3 OF THE AMENDED SECTION 14 OF ORDINANCE 81-04; AMENDING SECTION 1 OF ORDINANCE 82-32, AS AMENDED BY ORDINANCE 82-59, TO PROVIDE STANDARDS FOR THE DESIGN AND INSTALLATION OF FIRE HYDRANTS, FIRE HYDRANT SPACING, FIRE FLOWS, AND DURATION OF FLOW; TO SPECIFY THE CIRCUMSTANCES UNDER WHICH VARIOUS METHODS OF COMPLIANCE WOULD APPLY; AND TO PROVIDE THAT, EXCLUSIVE OF INCORPORATED MUNICIPALITIES, NEW WATER MAIN CONSTRUCTION SHALL BE CAPABLE OF CARRYING THE REQUIRED FLOWS WHETHER OR NOT SUCH FLOWS ARE CURRENTLY AVAILABLE; PROVIDING ALTERNATIVE METHODS OF COMPLIANCE; REQUIRING NOTIFICATION OF EXPANSION OR EXTENSION OF WATER LINES AND SUBMISSION OF PLANS FOR EXAMINATION; REQUIRING THAT NO PERMITS BE ISSUED WITHOUT APPROVAL BY DIRECTOR OF FIRE PREVENTION; REQUIRING THE FILING OF REPORTS OF HYDRANT TESTING; CREATING SECTION 16 OF ORDINANCE 82-32 TO PROVIDE A PENALTY FOR UNAUTHORIZED USE OF FIRE HYDRANTS; AMENDING SECTION 2 OF ORDINANCE 82-32 TO PROVIDE FOR ENFORCEMENT OF THE FIRE ORDINANCE; AND PROVIDING AN EFFECTIVE DATE.

BE IT ORDAINED by the Board of County Commissioners of Charlotte County, Florida:

Section 1. That Subsection 3 of the Amended Section 14 of Ordinance 81-04 be rescinded and that Section 1 of Ordinance 82-32, as amended by Ordinance 82-59, be further amended to read as follows:

"Section 1. This Ordinance shall be known as the Charlotte County Fire Prevention Ordinance. This Ordinance adopts the Fire Prevention Code of the National Fire Protection Association, NFPA No. 1, and its incorporated standards and codes as published in the National Fire Codes of the National Fire Protection Association and being particularly the most currently published edition thereof, except for the following exclusions and amendments:

1. [illegible] to concur with the amended version as adopted in current Charlotte County Building Code.

2. NFPA Standard 220 which is deleted because of the inclusion of similar provisions in Chapter 4 of the Standard Building Code within local amendments.

3. *In case of conflict of Life Safety Code 101 with the*

4-3.7.1 have two 2-½" and one 4-½" nozzles with N.S.T. threads.

4-3.7.2. have a pentagonal operating nut and hydrant caps.

4-3.7.3. have a hydrant valve opening sufficient to provide required fire flows.

4-3.7.4. have an operating nut which opens when turned counter-clockwise.

4-3.8 All fire hydrants must be provided with an independent gate valve.

4-3.9 Hydrants set in paved areas shall be protected as necessary by four inch (4") pipes three feet (3') above and below grade and filled with and set in concrete.

4-3.10 Hydrants must be rotated so that the pumper connections face the main route of access.

4-3.11 All hydrants, public and private, when required, shall be painted:

a. Barrell - Chrome Yellow

b. Bonnet and Caps - Chrome Yellow

6. Hydrants shall be maintained as necessary by the utility. Fire Districts shall be responsible for inspecting hydrants at least annually and for the removal of any vegetation obstructing hydrants. Fire districts shall provide and install blue reflective markers. The markers shall be installed in roadway to show location of hydrant.

The Fire Chiefs from any fire district shall file a monthly report with the County Water and Sewer Advisory Committee, by the tenth of the month following the end of the previous month, on fire hydrants from which water was drawn during the previous month. If, during any month, the Fire Marshal draws water from any hydrant, he shall so note in his records by the tenth of the month following the end of the month during which the water was drawn. The County Fire Chiefs' reports, and the Fire Marshal's notations, shall include the following data:

A. Location of the hydrant;

illustration and not limitation, as defined in NFPA 1231, 3-2.4, 3-2.5 and 3-2.6. See Appendix B. Fire hydrants shall be installed as may be necessary so that the distance betwen hydrants does not exceed 600 feet. Minimum flow from any hydrant shall be designed to deliver 1250 G.P.M. at 20 P.S.I. residual pressure for a minimum of 2 hours.

9-1.4 Heavy Manufacturing and Heavy Industrial Areas: Examples, by way of illustration and not limitation, as defined in NFPA 1231, 3-2.3. Fire hydrants shall be installed so that the distance between hydrants does not exceed 600 feet. Hydrants and flow shall be designed for a minimum flow of 1250 G.P.M. at 20 P.S.I. residual pressure for a minimum of two hours from each of two hydrants at the same time.

9. Sprinkler systems designed and installed in accordance with NFPA 13 may be used to reduce required fire flow as in accordance with Insurance Services Office Grading Schedule. See Appendix C.

Section 2. Section 16 of Ordinance 82-32 is hereby created to read:

"Section 16. Unauthorized use of fire hydrants shall be a violation of this Ordinance and punished as provided by general law."

Section 3. Section 2 of Ordinance 82-32 is hereby amended to read:

Section 2. It shall be unlawful for any person to violate this Ordinance or any code adopted hereunder, or maintain such a violation, to refuse to obey any provision thereof, or to fail or refuse to comply with any such provisions or regulations except as authorized by variance as may be allowed in writing, by the Director of the Charlotte County Fire Prevention Bureau. Proof of such unlawful act or failure to comply shall be deemed prima facie evidence that such act is that of the owner and other person in control of the premises. Prosecution, or lack thereof, 4-2.3 Hydrants shall not be placed near retaining walls where there is danger of frost through the walls.

4-3 INSTALLATION AND MAINTENANCE.

4-3.1 Hydrants shall be set on flat stones or concrete slabs and, if necessary, shall be provided with sufficient small stones (or equivalent) placed about the drain to ensure quick drainage.

4-3.2 Where soil is of such a nature that the hydrants will not drain properly with the arrangement specified in 4-3.1 or ground water stands at levels above that of the drain, the hydrant drain shall be plugged at the time of installation. If drain is plugged, hydrants in service in cold climates shall be pumped out after usage. Such hydrants shall be marked to indicate the need for pumping out after usage.

4-3.3 In setting hydrants, due regard should be given to final grade line. The center of a hose outlet shall be not less than 12 in. (305 mm) above the floor of a hose house or above grade.

4-3.4 Hydrants shall be fastened to piping by standard clamps or be properly anchored. (See fig. A-8-6.2(g).)

4-3.5 Hydrants shall be protected if subject to mechanical damage. The means of protection shall be arranged in a manner which will not interfere with the connection to or operation of hydrants.

4-3.6 Hydrants shall be tested at least annually for proper functioning in accordance with the requirements of the authority having jurisdiction.

4-3.7 --

Restaurants
Rope and Twine Manufacturing
Shoe Manufacturing
Sugar Refining
Tanneries
Textile Manufacturing
Tobacco Barns
Wood Product Assembly

3-2.6 Occupancy Hazard Classification Number 6.

3-2.6.1 Occupancies in this classification are considered LOW HAZARD OCCUPANCIES, where quantity and combustibility of contents are moderate and stockpiles of combustibles do not exceed 8 feet in height. Fires in these occupancies can be expected to develop at a moderate rate and have moderate rates of heat release.

3-2.6.2 Occupancy Hazard Classification Number 6 examples include:

Automobile Parking Garages
Bakeries
Beverage Manufacturing
Boiler Houses
Breweries
Brick, Tile, and Clay Products
Canneries
Cement Plants
Churches
Dairy Products Manufacturing and Processing
Electric Generating Stations
Electronics Plants
Foundries
Fur Processing
Glass and Glass-products Manufacturing
Laundries
Slaughterhouses
Steel Mills
Theaters and Auditoriums
Watch and Jewelry Manufacturing
Waterworks Manufacturing
Wineries

construction requirements contained in the Charlotte County Building Code, the provisions of the Charlotte County Building Code shall prevail.

4. NFPA Standard 24 shall be applicable only in the unincorporated areas of the county where:

A. Water is being supplied through a system of lines above or below ground level which is capable of providing the flows required by Chapter 9 of NFPA 24, 9-1 through 9-1.4 as appropriate to the area served.

B. Water is being supplied by a system of lines which does not have the flow volume to meet the criteria in subparagraph 4A above in all circumstances, but which can meet such criteria in some portion of the system. Such systems are required to meet the standards of NFPA 24 wherever they are capable of being met. In instances where those criteria cannot be met through the supply of water produced by the system, the supply shall be supplemented by the requirements of NFPA 1231.

C. Water is being supplied through a system of lines large enough from a volumetric standpoint in some parts of the system to meet the criteria discussed in subparagraph 4A above were it uniform throughout, but which does not have the capacity to meet such criteria currently. Such a system must meet the same criteria as shown in subparagraph 4B above.

D. In those areas where new systems are extended or built, they shall meet the standards of NFPA 24.

5. NFPA Standard 1231 shall be applicable in the following areas:

A. Where no water lines are available to provide fire flow to a customer as long as:

(1) The area for which fire flow is required is not within the certificated area of any utility, or is within such certificated area, but the extension of water lines has been found not economically feasible by the Board; and

3-2.4 Occupancy Hazard Classification Number 4.

3-2.4.1 Occupancies in this classification are considered HIGH HAZARD OCCUPANCIES, where quantity and combustibility of contents are high. Fires in these occupancies can be expected to develop rapidly and have high rates of heat release.

3-2.4.2 Occupancy Hazard Classification Number 4 examples include:

- Department Stores
- Exhibition Halls
- Feed Mills
- Flour Mills
- Paper and Pulp Mills
- Paper Process Plants
- Piers and Wharves
- Repair Garages
- Tire Manufacturing and Storage
- Warehouses, such as:
  - paper
  - furniture
  - paint
  - department store
  - general storage
  - whiskey
- Wood Machining

3-2.5 Occupancy Hazard Classification Number 5.

3-2.5.1 Occupancies in this classification are considered MODERATE HAZARD OCCUPANCIES, where quanitity and combustibility of contents are moderate and stockpiles of combustibles do not exceed 12 feet in height. Fires in these occupancies can be expected to develop quickly and have moderately high rates of heat release.

3-2.5.2 Occupancy Hazard Classification Number 5 examples include:

- Cereal Mills
- Clothing Manufacturing
- Cold Storage Warehouses
- Confectionery Products Warehouses
- Farm Storage Buildings, such as:
  - hay barns
  - dairy barns
  - equipment sheds
  - corn cribs
- Grain Elevators and Warehouses
- Leather Goods Manufacturing
- Libraries (with large stock room areas)
- Lithographing
- Machine Shops
- Mercantiles
- Metal Working
- Pharmaceutical Manufacturing
- Printing and Publishing

of either the owner, occupant or the person in charge shall not be deemed to relieve any of the others.

This ordinance shall be deemed a technical code for purposes of enforcement, and violations will be subject to the penalties and procedures provided in Chapter 162, Florida Statutes. Such enforcement procedures will not, however, be deemed to stand in place of, or be followed prior to, any other proceedings or court actions provided by general law."

Section 4. This Ordinance shall take effect on receipt of acknowledgement of its filing in the Office of the Secretary of State, State of Florida.

PASSED AND DULY ADOPTED this 5th. day of March, 1985.

BOARD OF COUNTY COMMISSIONERS
OF CHARLOTTE COUNTY, FLORIDA

By
Paul E. Monroe, Jr., Chairman

ATTEST:
Barbara T. Scott, Clerk of Circuit Court and Ex-Officio Clerk to the Board of County Commissioners

APPROVED AS TO FORM:

George L. Dorsett
Assistant County Attorney

B. The date on which water was drawn from the hydrant.

C. The test results, which results shall include static and residual pressures; and

D. The actual or estimated amount of water consumed.

7. Section 4-3.3, as shown in Appendix A, shall be amended to read as follows:

4-3.3 Hydrants shall be set so that the distance from finished grade to the center of the lowest opening will not be less than eighteen inches (18").

8. NFPA 24 shall be amended by the addition thereto of Chapter 9 to read as follows:

CHAPTER 9. FIRE HYDRANT SPACING, FIRE FLOWS, DURATION OF FLOW.

9-1 Fire hydrants shall be installed in accordance with the following minimum requirements. Distances shall be measured by "hose lay" as defined in the NFPA text "Fire Terms" (NFPA No. SPP-60) along the path of vehicular travel.

9-1.1 Mobile Home Parks, Mobile Home Subdivisions and Recreational Vehicle Parks: Fire hydrants shall be installed as may be necessary so that the distance between hydrants does not exceed 1,000 feet. All hydrants shall be designed to deliver minimum flow of 500 G.P.M. at 20 P.S.I. residual pressure for a minimum of one hour.

9-1.2 Single Family Residences, Except as Defined in 9-1.1, Single Family, Duplex and Triplex Family Units: Fire hydrants shall be installed as may be necessary so that the distance between hydrants does not exceed 1,000 feet. All hydrants shall be designed to deliver minimum flow of 750 G.P.M. at 20 P.S.I. residual pressure for a minimum of one hour.

9-1.3 Industrial, Commercial, Apartment Areas and Other High Value Areas: Examples, by way of

(2) The user of fire flow has attempted to obtain extension of service outside a certificated utility's service area and has been refused.

B. Where water lines exist which are inadequate to provide the flows required as shown in 4A above. In that case, NFPA Standard 1231 will be used for purposes of supplementing those lines in order to achieve an acceptable level of fire protection. See subsection 4B above.

Any person, firm, corporation, limited to general partnership, joint stock company, business trust, or joint venture constructing, installing or extending any new water main or mains shall notify the Director of Fire Prevention in writing and submit any new plans for such additions for his inspection and determination that the same shall be capable of carrying the flows required by Chapter 9 of NFPA 24, 9-1 through 9-4, as appropriate to the area served, whether or not the water system, to which the new water main or mains will connect, is capable of supplying the flows required by Chapter 9 of NFPA 24, 9-1 through 9-1.4. Such plans shall be certified by a professional engineer. However, this paragraph shall not be construed to take precedence over, or in any way vitiate, any existing agreement or agreements entered into pursuant to Article 7, Section 9 of the Charlotte County Subdivision Regulations or any development order issued by Charlotte County, the State of Florida, or any agency of the government of the United States.

No building permit shall be issued by the Director of the Building Department, and no right-of-way permit for water lines shall be issued by the Director of the Department of Public Works unless the Director of Fire Prevention has approved such permits under the provisions of this ordinance.

The current edition of NFPA Standard 24, as shown in Appendix A, shall be amended by the addition of the following requirements.

4-3.7 In addition to meeting American Water Works Association specifications, all new installations of hydrants shall:

(2) The user of fire flow has attempted to obtain extension of service outside a certificated utility's service area and has been refused.

B. Where water lines exist which are inadequate to provide the flows required as shown in 4A above. In that case, NFPA Standard 1231 will be used for purposes of supplementing those lines in order to achieve an acceptable level of fire protection. See subsection 4B above.

Any person, firm, corporation, limited to general partnership, joint stock company, business trust, or joint venture constructing, installing or extending any new water main or mains shall notify the Director of Fire Prevention in writing and submit any new plans for such additions for his inspection and determination that the same shall be capable of carrying the flows required by Chapter 9 of NFPA 24, 9-1 through 9-4, as appropriate to the area served, whether or not the water system, to which the new water main or mains will connect, is capable of supplying the flows required by Chapter 9 of NFPA 24, 9-1 through 9-1.4. Such plans shall be certified by a professional engineer. However, this paragraph shall not be construed to take precedence over, or in any way vitiate, any existing agreement or agreements entered into pursuant to Article 7, Section 9 of the Charlotte County Subdivision Regulations or any development order issued by Charlotte County, the State of Florida, or any agency of the government of the United States.

No building permit shall be issued by the Director of the Building Department, and no right-of-way permit for water lines shall be issued by the Director of the Department of Public Works unless the Director of Fire Prevention has approved such permits under the provisions of this ordinance.

The current edition of NFPA Standard 24, as shown in Appendix A, shall be amended by the addition of the following requirements.

4-3.7 In addition to meeting American Water Works Association specifications, all new installations of hydrants shall:

4-3.7.1 have two 2-½" and one 4-½" nozzles with N.S.T. threads.

4-3.7.2. have a pentagonal operating nut and hydrant caps.

4-3.7.3. have a hydrant valve opening sufficient to provide required fire flows.

4-3.7.4. have an operating nut which opens when turned counter-clockwise.

4-3.8 All fire hydrants must be provided with an independent gate valve.

4-3.9 Hydrants set in paved areas shall be protected as necessary by four inch (4") pipes three feet (3') above and below grade and filled with and set in concrete.

4-3.10 Hydrants must be rotated so that the pumper connections face the main route of access.

4-3.11 All hydrants, public and private, when required, shall be painted:

a. Barrell - Chrome Yellow

b. Bonnet and Caps - Chrome Yellow

6. Hydrants shall be maintained as necessary by the utility. Fire Districts shall be responsible for inspecting hydrants at least annually and for the removal of any vegetation obstructing hydrants. Fire districts shall provide and install blue reflective markers. The markers shall be installed in roadway to show location of hydrant.

The Fire Chiefs from any fire district shall file a monthly report with the County Water and Sewer Advisory Committee, by the tenth of the month following the end of the previous month, on fire hydrants from which water was drawn during the previous month. If, during any month, the Fire Marshal draws water from any hydrant, he shall so note in his records by the tenth of the month following the end of the month during which the water was drawn. The County Fire Chiefs' reports, and the Fire Marshal's notations, shall include the following data:

A. Location of the hydrant;

B. The date on which water was drawn from the hydrant.

C. The test results, which results shall include static and residual pressures; and

D. The actual or estimated amount of water consumed.

7. Section 4-3.3, as shown in Appendix A, shall be amended to read as follows:

4-3.3 Hydrants shall be set so that the distance from finished grade to the center of the lowest opening will not be less than eighteen inches (18").

8. NFPA 24 shall be amended by the addition thereto of Chapter 9 to read as follows:

CHAPTER 9. FIRE HYDRANT SPACING, FIRE FLOWS, DURATION OF FLOW.

9-1 Fire hydrants shall be installed in accordance with the following minimum requirements. Distances shall be measured by "hose lay" as defined in the NFPA text "Fire Terms" (NFPA No. SPP-60) along the path of vehicular travel.

9-1.1 Mobile Home Parks, Mobile Home Subdivisions and Recreational Vehicle Parks: Fire hydrants shall be installed as may be necessary so that the distance between hydrants does not exceed 1,000 feet. All hydrants shall be designed to deliver minimum flow of 500 G.P.M. at 20 P.S.I. residual pressure for a minimum of one hour.

9-1.2 Single Family Residences, Except as Defined in 9-1.1, Single Family, Duplex and Triplex Family Units: Fire hydrants shall be installed as may be necessary so that the distance between hydrants does not exceed 1,000 feet. All hydrants shall be designed to deliver minimum flow of 750 G.P.M. at 20 P.S.I. residual pressure for a minimum of one hour.

9-1.3 Industrial, Commercial, Apartment Areas

Restaurants
Rope and Twine Manufacturing
Shoe Manufacturing
Sugar Refining
Tanneries
Textile Manufacturing
Tobacco Barns
Wood Product Assembly

3-2.6 Occupancy Hazard Classification Number 6.

3-2.6.1 Occupancies in this classification are considered LOW HAZARD OCCUPANCIES, where quantity and combustibility of contents are moderate and stockpiles of combustibles do not exceed 8 feet in height. Fires in these occupancies can be expected to develop at a moderate rate and have moderate rates of heat release.

3-2.6.2 Occupancy Hazard Classification Number 6 examples include:

Automobile Parking Garages
Bakeries
Beverage Manufacturing
Boiler Houses
Breweries
Brick, Tile, and Clay Products
Canneries
Cement Plants
Churches
Dairy Products Manufacturing and Processing
Electric Generating Stations
Electronics Plants
Foundries
Fur Processing
Glass and Glass-products Manufacturing
Laundries
Slaughterhouses
Steel Mills
Theaters and Auditoriums
Watch and Jewelry Manufacturing
Waterworks Manufacturing
Wineries

3-2.4 Occupancy Hazard Classification Number 4.

3-2.4.1 Occupancies in this classification are considered HIGH HAZARD OCCUPANCIES, where quantity and combustibility of contents are high. Fires in these occupancies can be expected to develop rapidly and have high rates of heat release.

3-2.4.2 Occupancy Hazard Classification Number 4 examples include:

- Department Stores
- Exhibition Halls
- Feed Mills
- Flour Mills
- Paper and Pulp Mills
- Paper Process Plants
- Piers and Wharves
- Repair Garages
- Tire Manufacturing and Storage
- Warehouses, such as:
  - paper
  - furniture
  - paint
  - department store
  - general storage
  - whiskey
- Wood Machining

3-2.5 Occupancy Hazard Classification Number 5.

3-2.5.1 Occupancies in this classification are considered MODERATE HAZARD OCCUPANCIES, where quanitity and combustibility of contents are moderate and stockpiles of combustibles do not exceed 12 feet in height. Fires in these occupancies can be expected to develop quickly and have moderately high rates of heat release.

3-2.5.2 Occupancy Hazard Classification Number 5 examples include:

- Cereal Mills
- Clothing Manufacturing
- Cold Storage Warehouses
- Confectionery Products Warehouses
- Farm Storage Buildings, such as:
  - hay barns
  - dairy barns
  - equipment sheds
  - corn cribs
- Grain Elevators and Warehouses
- Leather Goods Manufacturing
- Libraries (with large stock room areas)
- Lithographing
- Machine Shops
- Mercantiles
- Metal Working
- Pharmaceutical Manufacturing
- Printing and Publishing

4-2.3 Hydrants shall not be placed near retaining walls where there is danger of frost through the walls.

4-3 INSTALLATION AND MAINTENANCE.

4-3.1 Hydrants shall be set on flat stones or concrete slabs and, if necessary, shall be provided with sufficient small stones (or equivalent) placed about the drain to ensure quick drainage.

4-3.2 Where soil is of such a nature that the hydrants will not drain properly with the arrangement specified in 4-3.1 or ground water stands at levels above that of the drain, the hydrant drain shall be plugged at the time of installation. If drain is plugged, hydrants in service in cold climates shall be pumped out after usage. Such hydrants shall be marked to indicate the need for pumping out after usage.

4-3.3 In setting hydrants, due regard should be given to final grade line. The center of a hose outlet shall be not less than 12 in. (305 mm) above the floor of a hose house or above grade.

4-3.4 Hydrants shall be fastened to piping by standard clamps or be properly anchored. (See fig. A-8-6.2(g).)

4-3.5 Hydrants shall be protected if subject to mechanical damage. The means of protection shall be arranged in a manner which will not interfere with the connection to or operation of hydrants.

4-3.6 Hydrants shall be tested at least annually for proper functioning in accordance with the requirements of the authority having jurisdiction.

4-3.7 --

of either the owner, occupant or the person in charge shall not be deemed to relieve any of the others.

This ordinance shall be deemed a technical code for purposes of enforcement, and violations will be subject to the penalties and procedures provided in Chapter 162, Florida Statutes. Such enforcement procedures will not, however, be deemed to stand in place of, or be followed prior to, any other proceedings or court actions provided by general law."

Section 4. This Ordinance shall take effect on receipt of acknowledgement of its filing in the Office of the Secretary of State, State of Florida.

PASSED AND DULY ADOPTED this 5th. day of March, 1985.

BOARD OF COUNTY COMMISSIONERS
OF CHARLOTTE COUNTY, FLORIDA

By ______________________
Paul E. Monroe, Jr., Chairman

ATTEST:
Barbara T. Scott, Clerk of
Circuit Court and Ex-Officio
Clerk to the Board of County
Commissioners

____

APPROVED AS TO FORM:

____
George L. Dorsett
Assistant County Attorney

illustration and not limitation, as defined in NFPA 1231, 3-2.4, 3-2.5 and 3-2.6. See Appendix B. Fire hydrants shall be installed as may be necessary so that the distance betwen hydrants does not exceed 600 feet. Minimum flow from any hydrant shall be designed to deliver 1250 G.P.M. at 20 P.S.I. residual pressure for a minimum of 2 hours.

9-1.4 Heavy Manufacturing and Heavy Industrial Areas: Examples, by way of illustration and not limitation, as defined in NFPA 1231, 3-2.3. Fire hydrants shall be installed so that the distance between hydrants does not exceed 600 feet. Hydrants and flow shall be designed for a minimum flow of 1250 G.P.M. at 20 P.S.I. residual pressure for a minimum of two hours from each of two hydrants at the same time.

9. Sprinkler systems designed and installed in accordance with NFPA 13 may be used to reduce required fire flow as in accordance with Insurance Services Office Grading Schedule. See Appendix C.

Section 2. Section 16 of Ordinance 82-32 is hereby created to read:

"Section 16. Unauthorized use of fire hydrants shall be a violation of this Ordinance and punished as provided by general law."

Section 3. Section 2 of Ordinance 82-32 is hereby amended to read:

Section 2. It shall be unlawful for any person to violate this Ordinance or any code adopted hereunder, or maintain such a violation, to refuse to obey any provision thereof, or to fail or refuse to comply with any such provisions or regulations except as authorized by variance as may be allowed in writing, by the Director of the Charlotte County Fire Prevention Bureau. Proof of such unlawful act or failure to comply shall be deemed prima facie evidence that such act is that of the owner and other person in control of the premises. Prosecution, or lack thereof,

CITRUS COUNTY

- 1992 FPSC Filing -

Fire Prevention Officer
Mike Connel
904-746-1335
Citrus County

ORDINANCE NO. 86 - 10

AN ORDINANCE OF CITRUS COUNTY, FLORIDA, READOPTING, AS AMENDED, ORDINANCE NO. 84-12 KNOWN AS THE CITRUS COUNTY DESIGN FOR WATER DISTRIBUTION SYSTEMS AND TREATMENT PLANTS ORDINANCE; PROVIDING FOR DEFINITIONS INCLUDING A NEW DEFINITION OF "DEVELOPMENT"; PROVIDING FOR DESIGN CRITERIA INCLUDING CRITERIA FOR ALTERNATE SYSTEMS; PROVIDING FOR ENFORCEMENT; PROVIDING FOR EXEMPTIONS; ELIMINATING THE PROPORTIONATE SHARE CHARGE FOR FIRE HYDRANT INSTALLATION; PROVIDING A VARIANCE PROCEDURE; PROVIDING SEVERABILITY; PROVIDING FOR THE REPEAL OF INCONSISTENT ORDINANCES; AND, PROVIDING AN EFFECTIVE DATE.

BE IT ORDAINED by the Board of County Commissioners of Citrus County, Florida:

SECTION 1. SHORT TITLE

This Ordinance shall be known and may be cited as the Citrus County Design for Water Distribution Systems and Treatment Plants Ordinance.

SECTION 2. DECLARATION OF LEGISLATIVE INTENT

The Board of Citrus County Commissioners finds and declares that the reasonable control of activities which are causing or may cause pollution or contamination of the environment is necessary for the protection and preservation of the public health, safety, and general welfare.

The Board also finds that the provision of minimum standards for water supply and treatment plants will aid in protecting the public from potentially harmful environmental and safety problems, including sub-standard water treatment and supply and inadequate fire protection.

Chapter 125.01, Florida Statutes, authorizes the County to provide environmental health services, rules and regulations governing water treatment and supply and other acts not inconsistent with general or special law and which are of common interests to the public health, safety and welfare of the citizens of Citrus County, Florida.

SECTION 3. DEFINITIONS

The following words as used in this Ordinance shall have the following meaning:

A. AVERAGE DAILY DOMESTIC FLOW -- shall be defined as 125 gallons per day per capita with 3.5 persons per single - family residence or 2.5 persons per multi - family or mobile home dwelling unit.

B. DEVELOPMENT -- shall be defined as residental subdivisions and including, but not limited to, buildings in commercial or industrial parks, complexes or centers.

C. DIRECTOR -- County Administrator or the appropriate Department and/or Departments designated by him to carry out the provisions of this Ordinance.

D. FIRE FLOW RATE -- is the amount of water at a minimum pressure which is needed, over and above the daily minimum consumption, to provide sufficient volume to extinguish fire in given types of occupancies or hazard areas. Minimum residual pressure at a fire hydrant discharging required fire flow shall be 20 psi.

E. PEAK HOURLY DOMESTIC DEMAND RATE -- FOR PURPOSES OF DESIGN shall be defined as 0.9 gallons per minute(gpm) per single-family residence, and 0.7 gpm per dwelling unit for multi-family housing or mobile homes.

For commercial Institutional and Industrial units the PEAK HOURLY DOMESTIC DEMAND RATE shall be defined as 0.7 gallons per minute for each EQUIVALENT RESIDENTIAL UNIT(ERU) or fraction thereof. One ERU is defined as 312.5 GPD (Average Daily Flow).

The following table shall be used to establish Design ERU's in connection with this Ordinance:

ESTABLISHMENT	AVERAGE DAILY FLOW(DESIGN)
1. Bars (No Food Service)	10 GPD per Seat
2. Banquet Rooms	5 GPD per Seat
3. Bowling Alley(No Food Service - No Bar)	40 GPD per Lane
4. Barber Shops	55 GPD per Chair
5. Beauty Salons	270 GPD per Chair
6. Boarding Schools	75 GPD per Pupil
7. Car Washes:	
(a) Customer Stall Type	1.5 GPD per Square Foot Floor Space
(b) Automatic & Drive-Thru	2.5 GPD per Square Foot Floor Space
8. Churches, Assembly Halls, Theatre, Arena, Auditoriums	
(a) No Food Service	3 GPD per Seat
(b) With Food Service	5 GPD per Seat
9. Clubs:	
(a) Country or Golf Clubs	65 GPD per Member
(b) Swimming Club or Pools	15 GPD per Member
(c) Boating Club	10 GPD per Member
(d) Lodges & Fraternal Organizations	10 GPD per Member
10. Cocktail Lounges	10 GPD per Seat
11. Coffee Shop(12 hour or less Operations)	20 GPD per Seat
12. Drive-In Theatre	5 GPD per Car Space
13. Factories:	
(a) No Showers-No Industrial Waste	25 GPD per Employee per Shift
(b) Showers-No Industrial Waste	35 GPD per Employee per Shift
(c) With Cafeteria - Add	5 GPD per Employee per Shift
14. Hospitals	
(a) No Resident Personnel	200 GPD per Bed
(b) With Resident Personnel	250 GPD per Bed
15. Hotels - Motels	100 GPD per Unit
(a) Add for Coffee/Shop/Restaurant/Lounge	PER INDIVIDUAL ELEMENT
16. Mobile Unit Parks(Tourist or Recreation Vehicles)	
(a) With Central Toilet Facilities	80 GPD per Space
(b) With Individual Sewer Connection	100 GPD per Space
17. Laundromats	200 GPD per Machine
18. Institutions(Nursing,Rest, Boarding Homes)	100 GPD per Person
19. Offices:	
(a) General Offices	0.14 GPD per Square Foot Floor Space
(b) Medical/Dental Offices	0.30 GPD per Square Foot Floor Space
20. Parks	
(a) Recreational	100 GPD per Water Closet

(b) Stadiums, Frontons, Ball Parks, etc.	3 GPD per Seat
21. Restaurants	1.0 GPD per Square Foot Floor Space
22. Schools:	
(a) Elementary	15 GPD per Pupil
(b) Jr. High and High Schools	25 GPD per Pupil
(c) With Cafeteria	5 GPD per Pupil
23. Shopping Centers & Department Stores	
(a) Without Food Service or Laundries	0.16 GPD per Square Foot of Building
(b) Add for Restaurant, Coffee Shop, Lounge, etc.	PER INDIVIDUAL UNIT
24. Service Station	500 GPD per Island or Set of Pumps
25. Swimming Pools(Public)	10 GPD per Swimmer
26. Warehouses & Industrial Sites	
(a) Warehouses(No Showers, No Volatile Storage)	100 GPD per Water Closet
(b) Warehouses(Showers, No Volatile Storage)	200 GPD per Water Closet
(c) Warehouses(Volatile Storage)	Per County Fire Prevention Requirements
(d) Light Industrial Parks or Buildings	15 GPD per Employee
27. Miscellaneous	
(a) Youth & Recreation Camps	50 GPD per Camper
(b) Labor Camps	50 GPD per Occupant

"Floor Space", as used herein, is defined as the total area inside the exterior walls of a building, measured at the intersection of the exterior wall and the floor being measured. The Total "Floor Space" considered shall be the sum of the area of all floors, for multi-storied buildings.

F. PERSONS -- shall be construed to include any natural person, individual, public or private corporation, firm, association, joint venture, partnership, municipality, governmental agency, political subdivision, public officer or any other entity whatsoever or any combination of such, jointly or severally.

G. PUBLIC WATER SYSTEM -- Any water plant with the capacity of five or more living units to be connected to it.

H. COMMUNITY WATER SYSTEM -- means a public water system which serves at least 15 service connections used by year-round residents or 15 Equivalent Residential Units.

SECTION 4. DESIGN FOR SINGLE-FAMILY AND LOW DENSITY

For single - family and low density(less than nine (9) dwelling units per gross acre), multi - family or mobile home residential areas, fire flow times and storage shall be based on the following:

PEAK HOURLY DOMESTIC DEMAND RATE (gpm)	MINIMUM REQUIRED FIRE FLOW (gpm)	MINIMUM TIME FOR TOTAL FLOW	MINIMUM STORAGE* (GALLONS)
0-50	500	30 min**	10,000**
51-100	500	1 hour	20,000**
101-200	750	1 hr 30min**	40,000**
201-300	1,000	2 hours **	75,000**
301-400	1,250	2hrs 30 min**	120,000**
401-500	1,500	3 hours	175,000**
501-600	1,500	3 hrs 15 min	200,000
601-750	1,750	3 hrs 30 min	250,000

751-1,000	2,000	4 hours	350,000
1,001-1,250	2,250	4 hrs 30 min	450,000
1,251-1,500	2,500	5 hours	600,000
over 1,500	compute on basis of not less than five(5) hours flow time at 50% of combined peak hourly demand rate and required fire flow rate, based on population and density, as may be required by the Citrus County Public Works Manual.		

* Not including hydropneumatic tank storage capacity.

** Where at least two wells are provided and total well pump capacity equals or exceeds 100% of combined peak hourly domestic demand rate and required fire flow, storage is not required.

SECTION 5. DESIGN FOR MULTI-FAMILY AND COMMERCIAL

For high density(nine (9) or more dwelling units per gross acres) multi-family residential areas and commercial, institutional or industrial areas(EXCEPT FOR THOSE BUILDINGS SPECIFICALLY EXEMPTED HEREIN) fire flow times and storage shall be based on the table below.

PEAK HOURLY DOMESTIC(OR OTHER) DEMAND RATE (gpm)	MINIMUM REQUIRED FIRE FLOW (gpm)	MINIMUM TIME FOR TOTAL FLOW	MINIMUM STORAGE * (GALLONS)
0-50	1,000	1 hr. **	50,000**
51-100	1,500	2 hrs **	100,000**
101-200	1,500	2 hrs 30 min **	125,000**
201-300	1,500	3 hours **	160,000**
301-400	1,500	3 hrs 30 min **	200,000**
401-500	1,500	3 hrs 45 min **	225,000**
501-600	1,500	4 hours	250,000
601-750	1,750	4 hours	300,000
751-1,000	2,000	4 hours	350,000
1001,1,250	2,250	4 hrs 30 min	450,000
1,251-1,500	2,500	5 hours	600,000
over 1,500	Compute on basis of not less than five(5) flow time at 50% of combined peak hourly domestic (or other) demand rate and required flow rate, based on population, density, and/or other hazardous features of proposed construction, as may be required by Citrus County Utilities Division and the Citrus County Public Works Manual.		

* Not including hydropneumatic tank storage capacity.

** Where at least two wells are provided and total well pump capacity equals or exceeds 100% of peak hourly domestic demand rate and required fire flow, storage is not required.

An alternate system, providing for the minimum fire flows shown above and approved by the Citrus County Fire Prevention Division Chief may be substituted for the fire flow requirements of SECTION 5. The Citrus County Fire Prevention Division Chief shall use the criteria contained in the N.F.P.A. Code, Volume 1231, Section B-4-1, in determining whether the alternate system is acceptable to Citrus County.

SECTION 6. SYSTEM REQUIREMENTS AND PLACEMENTS OF FIRE HYDRANTS

All public water plants and distribution systems shall meet the requirements as set forth in Part B, Section XVI (WATER

[redacted]

SECTION 7. MINIMUM TOTAL SUPPLY WELL AND WELL PUMP CAPACITY

Minimum total supply well and well pump capacity shall be 50% of the combined peak hourly domestic demand rate and required fire flow rate for the minimum total flow duration time specified above. This minimum supply capacity may be reduced if usable water storage capacity is increased proportionately.

SECTION 8. REQUIREMENTS FOR WELL AND HIGH SERVICE PUMPS

Wells for Community Water Systems shall be four inches(4") or larger dependent on the requirements for fire flow and peak hourly domestic demand rate and at least two(2) wells are required. A minimum of two(2) high service pumps shall be provided in all Community Water Systems utilizing ground storage, with total capacity to produce at least 100% of combined peak hourly domestic demand rate and required fire flow.

SECTION 9. REQUIREMENTS FOR STANDBY POWER

Standby power with automatic start capability shall be provided on site with capacity to operate sufficient pumps and controls to maintain at least average daily domestic flow plus required fire flow rate for all plants providing service to 100 or more dwelling units. Smaller plants shall be provided with a standard receptacle for plug-in of external engine-generator set, which shall be compatible with voltage and phase arrangement of equipment within the plant.

SECTION 10. REQUIREMENTS FOR CHLORINATION

Chlorination systems shall be provided as required by Citrus County Ordinance 83-02 or its successors.

SECTION 11. HYDROPNEUMATIC TANKS

For systems not exceeding peak hourly domestic demand rate of 500 gpm, a hydropneumatic system without any storage facilities is acceptable where the total of at least two supply well pumps provide 100% of the peak hourly domestic demand rate and required fire flow. Where peak hourly domestic demand rate exceeds 500 gpm, elevated storage facilities and/or ground storage facilities with high service pump capabilities shall be provided.

SECTION 12. FLOW METERS

An indicating and totalizing flow meter shall be provided on the main plant discharge pipe. If a large hydropneumatic tank is used, the meter shall be located ahead(upstream) of the tank inlet. If variable speed pumps or "jockey" pumps with PRV bypass recirculation are used, flow meter shall be sized and located so that it is capable of measuring low flows to within 5% of average daily domestic rate of flow, as well as total combined high service pump capacity. Flow meters shall be provided with chart recorder for plants having more than 750 gpm peak hourly domestic demand rate.

SECTION 13. APPLICATION OF ORDINANCE TO EXISTING SYSTEMS AND DEVELOPMENTS

The provisions of this Ordinance shall also apply to all new developments or additions to existing developments served by existing public water systems where the capacity of the existing well system is increased to over 25% of the original design capacity of the existing well system. The 125% of design capacity "cutoff" shall be a cumulative figure from the original design capacity existing at the effective date of Ordinance 83-05

CLAY COUNTY

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Clay

ORDINANCE NO. 88-67

AN ORDINANCE AMENDING CLAY COUNTY ORDINANCE 85-68, KNOWN AS THE SUBDIVISION ORDINANCE OF CLAY COUNTY, AS AMENDED FROM TIME TO TIME AND AS MOST RECENTLY AMENDED BY CLAY COUNTY ORDINANCE 88-30, TO REQUIRE THE LOCATION OF A FIRE HYDRANT AT THE ENTRANCE TO EACH SUBDIVISION; REQUIRING SIDEWALKS AND BUS TURN-AROUNDS UNDER CERTAIN CIRCUMSTANCES IN TYPE I, II AND III SUBDIVISIONS; PROVIDING AN EFFECTIVE DATE.

FILED
88 SEP 16 PM 1:17
DEPARTMENT OF STATE
TALLAHASSEE, FLORIDA

NOW THEREFORE BE IT ORDAINED, BY THE BOARD OF COUNTY COMMISSIONERS, CLAY COUNTY, FLORIDA, that:

Section 1.

Subsection (10) of Section 26 of Clay County Ordinance 85-68, as most recently amended by Clay County Ordinance 88-30, is hereby amended in its entirety to read:

(10) Water Supply and Sanitary Sewerage Facilities: Where the public or franchised water and sanitary sewerage facilities are available to a subdivision, said facilities shall be provided within the subdivision in accordance with the regulations and requirements of the Clay County Health Department and the Department of Public Safety.

The fire main system shall be designed, as a minimum, to meet National Fire Protection Association (NFPA) Fire Protection Handbook, 16th Edition or the latest edition and other applicable NFPA standards except that SDR21 Class PR 200 piping is acceptable. The fire main shall also be designed in conjunction with the water facility capability, present and future, to provide 1000 GPM fire flow rate at each hydrant at a minimum residual pressure of 20 psi.

No hydrants are required to be located outside of the platted area. One hydrant shall be located at the entrance of each subdivision platted hereunder, unless a hydrant conforming to the specifications of this Ordinance exists within 500 feet of said location along the public right-of-way to which said entrance connects, or unless said entrance connects with an existing platted subdivision with fire hydrants therein located in conformity with this Ordinance. The hydrants shall be no farther apart than 500 feet measured along the center of the adjacent roadway; provided that, should this result in a hydrant being located in front of any lot having less than 120 feet of frontage on the right-of-way, then said hydrant may be relocated farther than 500 feet from the next nearest hydrant to a point along the far side line or prolongation thereof into the right-of-way of said lot, if said point of relocation is no farther than 600 feet from the nearest hydrant, else the hydrant shall be relocated to a point along the near side line or the prolongation thereof into the right-of-way of said lot. Further, should the placement of hydrants using the foregoing formula result in a spacing between the end of any cul-de-sac and the next nearest hydrant, as measured along the centerline of the roadway of more than 500 feet, then another hydrant shall be located between said points as designated by the Department of Public Safety and the DRC. All hydrants shall be positioned no farther than 20 feet from the edge of the paved roadway.

Where public or franchised water facilities must be constructed in conjunction with a subdivision development the fire flow rate at each hydrant shall be 1000 GPM and at minimum residual pressure of 20 psi. Any expansion of water supply facilities will be constructed to meet this fire flow rate and 20 psi minimum residual pressure.

Section 2.

Section 15 of Clay County Ordinance 85-68, as amended, is hereby amended by the creation of subsection (7) and (8) to read as follows:

(7) Sidewalks:

A sidewalk shall be constructed within the right of way or easement way along both sides of the entire length of any major arterial roadway and along one side of the entire length of any collector street. In the absence of major arterial roadways or collector streets, the sidewalk shall be constructed to extend continuously along one side of the shortest roadway route from one point of entry to the subdivision to all other roadway connections to other existing or planned subdivisions or phases thereof, unless no such other roadway connections exist or are planned and the subdivision contains fewer than six (6) homesite lots. If no such other roadway connections exist or are planned, but the subdivision contains six (6) or more homesite lots, then the sidewalks shall be constructed from the point of entry to the subdivision along one side of the entire length of the entry roadway and along one side of the primary loop road, if any. A sidewalk shall be constructed along state and county paved roads upon which the subdivision fronts, extending the entire width of said frontage, and only along the subdivision side of said road. All sidewalks shall be constructed so that the edge furthest from the centerline of said right-of-way lies coextensive with the edge of said right-of-way and the opposite edge thereof lies no closer than two and one-half (2 1/2) feet from the back of the curb or five (5) feet in the case of rural road sections from the nearest edge of the travelled way. In the event that inadequate right-of-way width exists for such location, then sufficient additional right-of-way or easement shall be dedicated or reserved in the plat for such purpose. Sidewalks shall be five (5) feet in width along major arterial roadways, and four (4) feet in width along all other streets and roadways. With respect to any sidewalk interior to the subdivision and required hereunder, no portion thereof abutting or crossing any particular lot or parcel shall be required to be constructed until a dwelling or other approved permanent building or structure, as the case may be, is constructed upon said lot or parcel; further, final building inspection approval for any dwelling, building or structure constructed upon said lot or parcel shall be withheld by the Clay County Building Department until said portion has been constructed in accordance herewith. Accordingly, final plat approval, acceptance and maintenance, if applicable, by the Board shall not be contingent upon satisfactory construction of all portions of the interior sidewalk system of the subdivision nor shall sidewalk construction and maintenance be any responsibility of the developer within the purview of any developer warranty bond required under Section 27(4) hereof, except that the developer shall be required to construct prior to maintenance acceptance, in the case of Type I Subdivisions, and prior to issuance of the first building permit in the case of Type II Subdivisions, all portions of such sidewalk system not abutting or crossing homesite lots, and such portions shall be within the purview of said warranty bond in the case of the Type I Subdivision. The developer may, at his sole option, submit a master sidewalk plan in the case of a multi-phased subdivision or portion thereof to which the foregoing specifications shall be applied in lieu of a phase by phase application. The requirements of this subsection shall apply to all subdivisions for which application is initially made subsequent to September 13, 1988.

(8) Bus Turn-Arounds.

(a) At least one bus turn-around having a minimum outside diameter of 118 feet shall be provided in all new subdivisions consisting of 50 or more lots/dwelling units, unless such new subdivision provides a looping or through road system.

(b) Within any new subdivision any dead-end road that serves 50 or more lots/dwelling units shall terminate in a bus turn-around having a minimum outside diameter of 118 feet.

(c) Any road extension from an existing subdivision into a new subdivision which new subdivision serves more than 50 or more lots/dwelling units shall have a bus turn-around having a minimum outside diameter of 118 feet, unless such new subdivision provides a looping or through road system.

Section 3.

Section 36 of Clay County Ordinance 85-68, as amended, is hereby amended by the creation of subsection (7) to read as follows:

(7) Bus Turn-Arounds.

(a) At least one bus turn-around having a minimum outside diameter of 118 feet shall be provided in all new subdivisions consisting of 50 or more lots/dwelling units, unless such new subdivision provides a looping or through road system.

(b) Within any new subdivision any dead-end road that serves 50 or more lots/dwelling units shall terminate in a bus turn-around having a minimum outside diameter of 118 feet.

(c) Any road extension from an existing subdivision into a new subdivision which new subdivision serves more than 50 or more lots/dwelling units shall have a bus turn-around having a minimum outside diameter of 118 feet, unless such new subdivision provides a looping or through road system.

Section 4. Effective Date. This Ordinance shall become effective as prescribed by general Florida law.

DULY ADOPTED, by the Board of County Commissioners, Clay County, Florida, this 13th day of September, 1988.

BOARD OF COUNTY COMMISSIONERS
CLAY COUNTY, FLORIDA

BY: Dale S. Wilson
Chairman

ATTEST:

George L. Carlisle
Clerk of the Courts
Ex-officio Clerk to the
Board of County Commissioners

APPROVED AS TO FORM:

Mark H. Scruby
County Attorney

INTENTIONALLY LEFT BLANK

COLLIER COUNTY

- 1992 FPSC Filing -

COLLIER COUNTY
DEVELOPMENT SERVICES DEPARTMENT
Community Development Division
2800 North Horseshoe Drive
Naples, Florida 33942

FAX (813) 643-3266

Date: 5-13-91

Time: 445 PM

Total Pages including cover sheet 3

TO: Chuck Bliss

Fax Number: 407- - 880-1061

Firm/Department:

City, State:

Comments:

****

FROM: Robert Salvaggio
Fire Plans Review
Collier County Development Services
Project Review Services
(813) 643-8471

ARTICLE XI (Cont.)

SECTION 8 (Cont.)

Hydrants shall be set in a manner complying with no less than the requirements set forth in the latest edition of Section 43 of Chapter 4 of N.F.P.A. No. 24, entitled STANDARDS FOR OUTSIDE PROTECTION, SETTING FOR HYDRANTS.

A. Residential Land Development - In one and two story land developments with not more than ten (10) dwelling units per acre, fire hydrants shall be spaced no greater than five hundred (500') feet apart and not more than two hundred fifty (250') feet to the center of any lot in the development and shall be connected to mains no less than six (6") inches in diameter. The system shall provide capacity for fire flows of at least five hundred (500) gallons per minute or greater, as required, in addition to maximum day domestic requirements at residual pressures of not less than twenty (20) pounds per square inch.

B. Commercial, Industrial, Multi-Story & Multi-Family Developments - Fire hydrants located in these areas shall be connected to water mains no less than eight (8") inches in diameter. Hydrants shall be spaced at such intervals as to require no greater than two hundred fifty (250) lineal feet of fire hose to reach the farthest and highest point on any structure proposed for the development. In no case shall the spacing of hydrants be greater than five hundred (500) feet apart. Hydrant spacing and size shall be capable of

ARTICLE XI (Cont.)

SECTION 8 (Cont.)

providing water flows adequate to meet the requirements for the Occupancy Classification as defined in the latest edition of the National Fire Code, Volume No. 6, published by the National Fire Protection Association. In no case shall the flow be less than seven hundred fifty (750) GPM with the residual pressure of twenty (20) P.W.I. at the remotest point of discharge.

SECTION 9

MEDIAN STRIPS AND ENTRANCEWAYS

A. Median Strips - Median strips which are part of the dedicated or deeded right-of-way may not be utilized for any purpose other than by the County or a public utility. If a developer desires to beautify a median strip in a subdivision or land development he may do so by placing grass, shrubs and trees of small root structure within the median strip under permit issued by the County Engineer after submission and approval of landscaping plans.

B. Subdivision or Land Development Entranceways - Subdivision or land development entranceways consisting of walls, fences, gates, rock piles or the like are not permitted within the median strip or other areas in a dedicated or deeded right-of-way. Decorative entranceways must be constructed upon plots of land adjacent to a right-of-way in compliance with the Zoning, building and Sign Codes and placed so as not to constitute a traffic hazard.

DUVAL COUNTY

- 1992 FPSC Filing -

LAND DEVELOPMENT PROCEDURES
regarding
ENGINEERING REQUIREMENTS
of the
DEPARTMENT OF PUBLIC WORKS
CITY OF JACKSONVILLE, FLA.

. C 057

Second Printing

February 1980

Prepared by

ENGINEERING DIVISION

Approved and Adopted in
Accordance With Provisions of
Chapter 712.130
Code of Subdivision Regulations

SECTION 4
POTABLE ~~PORTABLE~~ WATER
TABLE OF CONTENTS

SECTION 4
POTABLE WATER

4.1 GENERAL

4.1.1 Developer's Responsibility

The developer shall be responsible for the design of an adequate water production, transmission, and distribution facilities as necessary. The method of design and construction shall be according to the City Ordinance Code, the City of Jacksonville Standard Specifications and Details, this manual, and accepted engineering standards.

A public water system shall be provided in each new development; however, the Department of Public Works may find that conditions are such that a private water system is acceptable. It is the developer's responsibility to contact the Utilities Programs Controller of the City's Water Services Division for this determination. Said Controller or his representative shall advise the developer as to the proper procedures for permission to connect to the City-owned system. If it is determined that the developer may utilize a private water system, it shall be the developer's responsibility to coordinate with the private utility company for approval of the connection. Plans, specifications, and design calculations must be submitted to the City for approval, whether the system is public or private.

4.2 DESIGN FLOWS

All systems shall be sized to provide peak domestic requirements at residual pressures of not less than 30 psi at all points in the system plus fire flow.

4.2.1 Average Flows

A. Residential - In the absence of data to the contrary, the following may be used:

1. 150 gpcd
2. 600 gpd/connection (single-family)

Data sources include the Jacksonville Area Planning Board (JAPB) for population predictions and the Water Services Division for water consumption data. Basis for design flows must be clearly stated in the developer's submittal to the City.

B. Commercial and Industrial - These must be estimated on an individual case; basis for estimate must be clearly stated in the developer's submittal to the City.

4.2.2 Fire Flow

A. Residential - Fire flows of at least 500 gpm in single-family residential developments and at least 1,500 gpm from at least two fire hydrants in multi-family residential developments at a residual pressure of at least 20 psi at the hydrant shall be provided.

B. Commercial and Industrial - Fire flow minimum requirements are the same as multi-family residential requirements.

4.3 DESIGN PERIOD

All transmission and distribution lines shall be sized for the ultimate population density (50 years); pumping stations and storage facilities may be designed on a 20 year population prediction, with expansion by modules considered.

4.4 HYDRAULIC DESIGN

4.4.1 Major transmission lines sizes shall conform to the City's Master Plan for Water and Sewer Utility Development, as defined in Chapter 612 of the City Ordinance Code, where applicable. Distribution mains in non-residential areas shall be a minimum of 12" in diameter, unless they are in a closely interconnected gridiron, in which case they shall be a minimum of 8" in diameter. Water lines serving hydrants in residential developments shall be a minimum of 6" in diameter arranged so that they form a good gridiron of looped distribution. Single main extensions supplying a looped gridiron or long lengths of dead end main (greater than 1000 feet) serving more than one hydrant shall not be less than 8" in diameter.

4.4.2 Velocities

Velocities shall normally be less than 5 f.p.s.

4.4.3 "C" Factors

The following Hazen-Williams roughness coefficients shall be used for new construction:

16" dia. and larger cement-lined cast iron and ductile iron	140
Less than 16" dia. cement-lined cast iron and ductile iron	130
P.V.C. (all sizes)	140

4.5 LOCATION CRITERIA

4.5.1 Mains

Water mains within City rights-of-way and private road easements shall be located as specified in Section 7 of this manual. Mains shall not be located in utility easements.

Mains shall have a minimum cover of 30" under unpaved areas and 36" under paved areas. In D.O.T. and railroad rights-of-way, minimum cover shall be established by the D.O.T. and individual railroad, respectively.

4.5.2 Water and Sewer Separation

Horizontal separation shall be a minimum of 10'. If this is not possible, a water main may be laid closer than 10' to, or in the same trench, or on an undisturbed earth shelf located to one side of the sewer and at such an elevation that the bottom of the water main is at least 18" above the top of the sewer.

Vertical separation shall be a minimum of 18" where a water main crosses a sewer. This vertical separation shall be maintained for that portion of the water main located within 10', horizontally, of any sewer to be crossed. If this vertical separation [illegible]

4.5.3 Fire Hydrants

Fire hydrants in single-family residential areas shall be not more than 600' apart when measured along streets or acceptable accessways, except in a cul-de-sac or dead-end street where a fire hydrant shall be located not more than 600' from the center of the turnaround. Fire hydrants in commercial, industrial, and multi-family residential areas shall be not more than 300' apart when measured along streets or acceptable accessways, and shall be within 250' of each structure. All fire hydrants and independent valves shall be located within the street right-of-way or easement.

4.5.4 Meters

All water meters shall be located in accordance with Section 612.403 of the City Ordinance Code.

4.5.5 Valves

Valves shall be installed at a maximum of 1,000' intervals on long extensions, 500' in industrial and commercial areas. There shall be a sufficient number of valves so that single lines in the network may be isolated from the remainder of the system. Valves shall be installed in two directions on a tee; three directions on a cross.

4.5.6 Flushing Hydrants

Flushing hydrants shall be installed at the dead-end of all non-circulating mains.

4.6 SERVICES

A separate service connection shall be provided for each lot. The minimum site service allowable for new single-family residences shall be 3/4 inch.

4.7 WATER TREATMENT PLANTS

Water treatment plants to be dedicated to the City will be considered on an individual basis. It is the developer's responsibility to contact the Utilities Programs Controller of the City's Water Services Division early in the planning stage for direction.

4.8 SHOP DRAWINGS

Shop drawing submittals shall be required as per Section 20.28 of the City Standard Specifications for all systems to be dedicated to the City.

4.9 AS-BUILT DRAWINGS

"As-Built" drawings shall be submitted for all systems, whether public or private for review and approval. Please refer to Section 20.66 "AS-BUILT DRAWINGS" of the City Standard Specifications. All water "As-Built" shall be on Mylar; Sepia paper is no longer acceptable.

August 31, 1989

Mr. Frank L. Novak, P.E.
Vice President
Deltona Utilities Consultants, Inc.
Post Office Box 5309
Deltona, Florida 32728-5309

Re: **Fire Department Rating of the Existing Beacon Hills and Woodmere Fire Protection Systems**

Dear Mr. Novak:

I have reviewed our files concerning Southern States Utilities, Inc. (SSU), Beacon Hills and Woodmere fire protection systems, and have determined that as of the date of this letter, these systems provide adequate fire protection. The criteria for this review was:

1. The reports concerning the most current inspections performed by the local fire company;

2. The compliance with all Duval County fire protection ordinances;

3. Meeting or exceeding minimum fire flow requirements for that particular location;

4. Maintenance of the fire protection system in an above average condition; and

5. Cooperation of the utility in notifying the fire department concerning any temporary water outages and any fire protection equipment out of service.

The Beacon Hills and Woodmere systems meet all the above criteria including the minimum fire flow requirements of: a) 500 gallons per minute for two hours in residential areas; and b) 1,500 gallons per minute for two hours in commercial areas.

Our local companies have noted excellent maintenance and cooperation of SSU concerning its fire protection systems. If you have any questions or comments, please do not hesitate to call.

Sincerely,

Lt. T. W. Copeland

Lt. Ted Copeland
Duval County Fire Marshall

TC/cal

cc: Gerald C. Hartman, P.E., DRMP

89-352.00
Corresp. 2'89/cal

LAKE COUNTY

- 1992 FPSC Filing -

Lake County

PROTECTION DEPARTMENT
ST MAIN STREET
TAVARES, FLORIDA 32778

BOARD OF COUNTY COMMISSIONERS · LAKE COUNTY, FLORIDA · 1887 · 1987

PHONE: 904-343-9458
SUNCOM: 869-1458

Office Phone: (904) 343-9458 FAX Number: (904) 343-3883

DATE: 3-18-91

SENT TO: Phillip Story
Southern States Utilities

FAX NUMBER: 407-884-9116

ONE COVER SHEET - PLUS 11 PAGES = 12 TOTAL PAGES

SPECIAL INSTRUCTIONS:
Please call me (904) 343 9477, in reference to fire Prevention Ordinance, and Land use comp plans

Thanks
Catherine L Davis

FOR LAND COMP PLAN CONTACT MELONE HICKS
904-343-9652

DISTRICT ONE DISTRICT TWO DISTRICT THREE DISTRICT FOUR DISTRICT FIVE

Sec. 85. Public site design standards.

The following shall be the required standards to be observed for the design and provision of public sites and related elements.

85.10. Public park. Where a site for a public park is within the scope of a comprehensive plan and deemed suitable by the planning and zoning commission and the proper authorities in a proposed subdivision, such site shall be reserved for public usage. The subdivider shall allow a period of forty-five (45) days from the date of submittal of the preliminary plat, during which time the proper park authorities are required to make known the intention of acquiring said site. If such notification be affirmative, the planning and zoning commission shall then set a period of time upon consulting the subdivider and the park authorities for such acquisition.

85.100. Dedication or reservation. Parks and playgrounds shall be dedicated to the public, deeded to Lake County, or reserved for private use under private ownership. If deeded to Lake County, the land shall be used exclusively by Lake County for recreational purposes, and the subdivider may stipulate a reasonable limit of time within which Lake County is required to make physical improvements to the site, otherwise the title of the site will revert to the subdivider.

85.101. Size and location. The size and location of such parks and playgrounds are subject to the approval of the planning and zoning commission.

85.102. Inadequate size. Where the proposed subdivision is too small to provide space of suitable size for public open space use intended, the open space provided may be combined with that provided or to be provided in adjoining area. Thus, in the aggregate, there will be provided an open space of suitable size for the purpose intended.

85.11. Public schools. Where a site for public school buildings is within the scope of a comprehensive plan and deemed suitable by the planning and zoning commission and the proper school authority in a subdivision, such site shall be reserved for public usage. The subdivider shall allow a period of ninety (90) days from the date of submittal of the preliminary plat, during which time the proper school authority is required to make known the intention of acquiring the said site. If such notification be affirmative, the planning and zoning commission shall then set the period of time upon consulting the subdivider and the school authority for such acquisition.

Sec. 86. Public and other improvements.

Every subdivider shall be required to install the following public and other improvements in accordance with the conditions and specifications as follows:

86.10. Water supply.

A. *Fire protection standards.* In all new subdivisions or expansion of existing subdivisions where nineteen (19) or more lots whose average lot size is thirty thousand (30,000) square feet or less are or may be created, or where a central water system will be used for drinking water, an adequate water supply system and an adequate water delivery system for fire protection as defined in this section must be provided.

(1) *Water supply system.* The water supply system shall provide five hundred (500) gallons per minute at twenty (20) pounds per square inch residual pressure on the entire system with each hydrant delivering not less than five hundred (500) gallons per minute. Sufficient pressure shall be provided within the system to maintain twenty (20) pounds per square inch residual pressure while providing required fire flows. The system shall be capable of providing the required fire flows for a duration of at least two (2) hours.

(2) *Water delivery system.*

(a) *Main sizes.* The minor distribution branches or systems shall consist of mains at least six (6) inches in size arranged so that they form a closed loop in all areas of the distribution system. Where long unsupported lengths of pipe are necessary, eight-inch or larger mains shall be used. In new construction, eight-inch or larger pipes shall be used where dead ends and a poor system pattern are likely to exist for a considerable period as where the layout of the streets is not well suited to producing a close-loop system. The use of dead-ended six-inch and smaller mains to provide fire protection shall not be permitted.

(b) *Hydrants.* Hydrants shall be so located that the maximum hose travel distance, as measured in streets rights-of-way, will not exceed five hundred (500) feet to the center of the lot and no more than five hundred (500) feet apart. Actual spacing and location of the hydrants shall be determined by the Lake County Fire Coordinator. Hydrants shall have two and one-half-inch hose connections with a four and one-half-inch diameter pumper connection. Threads shall be American National Standard. The operating nut shall be National Standard one and one-half-inch point to flat. Hydrants shall not be located within three (3) feet of any obstruction nor in front of entry ways, and the pumper discharge shall face the nearest roadway. The center of the lowest outlet shall be not less than eighteen (18) inches above the surrounding grade and the operating nut shall not be more than four (4) feet above the surrounding grade. Hydrant branches (from main to hydrant) shall not be less than six (6) inches in diameter and as short as possible with a maximum permissible length of fifty (50) feet. Each branch will be individually gate valved.

B. *Potable water systems.* In all new subdivisions or expansion of existing subdivisions where fifty (50) or more lots whose average lot size is thirty thousand (30,000) square feet or less are created, a public water system for drinking and other household uses shall be provided which meets the requirements of the fire protection standards in "A" above, and all applicable state statutes and regulations governing public water systems. In such divisions, individual wells shall not be permitted except for irrigation.

C. *Ownership of and access to water systems.*

(1) For any water system created pursuant to subsection "A", fire protection standards, or "B", potable water systems, an agreement shall be entered into between Lake County, the subdivider and any involved homeowners association prior to platting, which agreement shall provide that at the time a public water system operated by a governmental agency (i.e. municipality, county or other public agency) is adjacent to the subdivision, that the water system in the subdivision shall be conveyed without consideration to such governmental agency which shall then operate such public water system. Said agreement shall additionally provide that should any adjacent land be subdivided by the same or another subdivider, and if it is practical, that the system may be enlarged solely at the cost of the subsequent subdivider, and that the system be operated jointly from that time on.

(2) For any water system created pursuant to subsection "A" fire protection standards, or "B", potable water systems, necessary easements, dedications or rights-of-way shall be dedicated, conveyed or deeded to Lake County so that Lake County or its authorized agents shall have the right to access for maintenance and use for fire protection purposes all parts of the water system. Such dedications or easements shall also provide for unlimited use of water when necessary for fire fighting purposes.

D. *Existing public water systems.* In any case where a new subdivision or an extension of an existing subdivision will be connecting to an existing public water supply system, the rules of this section 86.10 shall apply and the existing public water supply system shall be upgraded to meet all the requirements of this ordinance.

E. For purposes of subsection "A", fire protection standards, or "B", potable water systems, to determine the number of lots which are or may be created, all property owned by an applicant adjacent to the property in the proposed subdivision shall be considered as included in the proposed subdivision and multiple phases of a subdivision shall be considered as one (1) subdivision. It is the intent of this paragraph to encourage the construction of public water systems for fire protection and potable water and to discourage property owners from attempting to avoid these regulations by platting less than nineteen (19) or fifty (50) lots at a time.

86.11. *Sanitary sewers.* When a subdivision is located within or adjacent to the service area of a public sewerage system, sanitary sewers and other required appurtenances thereto shall be installed in such a manner as to serve adequately all lots with connections to the public sewer system. In a proposed subdivision which cannot feasibly connect with an existing public sewer system, a subdivision sewer system may be required for the subdivision if feasible in the judgement of the planning and zoning commission with the advice of the county engineer, and in accordance with the policies and requirements of the Lake County Health Department and the state board of health. Where it is determined in the judgement of the planning and zoning

C. *Ownership of and access to water systems.*

(1) For any water system created pursuant to subsection "A", fire protection standards, or "B", potable water systems, an agreement shall be entered into between Lake County, the subdivider and any involved homeowners association prior to platting, which agreement shall provide that at the time a public water system operated by a governmental agency (i.e. municipality, county or other public agency) is adjacent to the subdivision, that the water system in the subdivision shall be conveyed without consideration to such governmental agency which shall then operate such public water system. Said agreement shall additionally provide that should any adjacent land be subdivided by the same or another subdivider, and if it is practical, that the system may be enlarged solely at the cost of the subsequent subdivider, and that the system be operated jointly from that time on.

(2) For any water system created pursuant to subsection "A" fire protection standards, or "B", potable water systems, necessary easements, dedications, or rights-of-way shall be dedicated, conveyed or deeded to Lake County so that Lake County or its authorized agents shall have the right to access for maintenance and use for fire protection purposes all parts of the water system. Such dedications or easements shall also provide for unlimited use of water when necessary for fire fighting purposes.

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86.12. *Installation of improvements.* After the sub grade for a street has been completed, the remainder of the street right of way has been graded and before any base materials is applied, all the underground work for water mains, sanitary sewers, gas mains, electric power conduits, and any other utility including all service connections, shall be installed completely and approved through the length of the road to a point at least two (2) feet outside of the back of the curb. All underground improvements so installed for the purpose of future service connections shall be properly capped and back-filled. All driveway openings in curbs shall be of a width specified by the Lake County Engineer and shall be cut and drained by the subdivider.

86.13. *Storm drains.* An adequate storm drainage system, including necessary storm sewers, drain inlets, manholes, culverts, bridges and other appurtenances, shall be required in all subdivisions to the extent that the foregoing elements are required and approved by the county engineer and the Director of the Lake County Pollution Control Department and installed in accordance with the plans and specifications of the Lake County Engineer. All natural drainage ways shall be preserved at their natural gradient and shall not be filled or interfered with in any way, except as approved by the county engineer and the Director of the Lake County Pollution Control Department. If, in the judgement of the county engineer and the Director of the Lake County Pollution Control Department, a natural drainage way needs to be reserved in the public interest, a storm drainage easement of a width or to an elevation specified by the county engineer and the Director of the Lake County Pollution Control Department, shall be required and reserved as a public storm drainage easement with the dead rights to these natural drainage easements dedicated to the public.

86.14. *Canals and Waterways.* All canals or waterways located within subdivisions shall conform to the requirements of the county engineer with regards to maximum length, water circulation, and the provision of adjacent areas for maintenance.

86.15. *Other improvements.*

a. *Buffer areas.* It is desirable for the protection of residential properties to have green belts or landscape screen planting located between a residential development and adjacent express highways and other major arterial streets and railroad right-of-way. Where a subdivider desires to protect his development in this respect, a proposed subdivision plat shall show the location of said green belts.

b. *Street trees.* Street trees, of a variety and size in accordance with the standards adopted by the planning and zoning commission, may be planted between the street curb and gutter and sidewalk. The location of street trees shall be approved by the Lake County Engineer.

LAKE COUNTY FIRE PROTECTION
STANDARDS FOR
ONSTRUCTION, SUBDIVISIONS AND OTHER DEVELOPMENT

I REQUIRED FIRE FLOW: CODE JUSTIFICATION

Fire Flow requirements are listed under Section 603.1.3 of the Standard Fire Prevention Code as follows:

"All premises where buildings or portions of buildings, other than one or two family dwellings are located more than 150 ft. from a public fire hydrant system shall be provided with approved fire hydrants connected to a water system capable of supplying the fire flow required by the Fire Official. The location and number of such on-site hydrants shall be as designated by the Fire Official with the minimum arrangement being so as to have a hydrant available for distribution of hose to any portion of any building on the premises at distances not exceeding 500 feet."

Lake County Fire Protection has amended this section as listed in the following pages.

REQUIRED FIRE FLOW: DEFINITION

The required fire flow is the rate of flow needed for firefighting purposes to confine a major fire to the building(s) within a block or other contiguous group or property. The determination of this flow depends upon the size, construction, occupancy and exposure of buildings within and surrounding the block or group of buildings, and upon the existence of automatic sprinkler protection. The minimum required fire flow in the various land use zone classifications shall be as listed in Table I.

All new buildings, new developments, and all existing buildings being altered to increase the area or height; existing buildings being changed to a more hazardous occupancy class; or properties with existing building(s) that new construction will increase the square footage on the property exceeding the requirements, with the exception of residential buildings which contain two or less units, shall have available fire hydrants connected to a water supply or to an on-site private system that will supply the required fire flow.

Prior to the issuance of any building permit, or development permit, approval shall be obtained from the Fire Coordinator. Inspection and testing of fire suppression systems shall be required by the Fire Coordinator prior to the granting of the Certificate of Occupancy.

All new construction where central water supply is not available shall meet the minimum fire flow requirements with on-site private fire protection. All on-site installations shall conform to specifications for well construction and/or water storage as required by the Fire Coordinator.

Approval or disapproval of fire suppression systems and fire flow requirements for the purpose of obtaining a Certificate of Occupancy shall be accomplished by the Fire Coordinator within two (2) weeks after receiving a written request for same by the applicant for a Certificate.

In the event that the minimum fire flow requirements set out in this section cannot be met by the water supply utility servicing said property, then the applicant for a building permit shall be required to supplement those flows through an on-site or readily available system meeting the minimum fire flow requirements of this section and meeting with the approval of the Fire Coordinator.

TABLE I

REQUIRED FLOWS BY ZONING CLASSIFICATION

ER	19 units & over)	
R-1-15	19 units & over)	
R-1-10	19 units & over)	500 GPM at 20 psi residual on the system/each hydrant shall deliver not less than 500 gpm
R-1-7	19 units & over)	
R-1-6	19 units & over)	
R-1-5	19 units & over)	
RMRP		
RM		
RECREATIONAL VEHICLE PARKS)		
RP- ONE AND TWO STORY		750 GPM at 20 psi residual on the system/each hydrant shall deliver not less than 500 GPM
RP- THREE STORIES & ABOVE		1,000 GPM at 20 psi residual on the system/each hydrant shall deliver not less than 500 GPM

****

C-1, C-2, CP 3,500* to 15,000 Square Feet	750 GPM at 20 psi residual on the system/each hydrant shall deliver not less than 500 GPM.

* Water storage MAY be allowed in commercial between 3,500 and 10,000 square feet dependent upon occupancy type, hazards, and approval of Fire Coordinator.

C-1, C-2, CP 15,000 to 20,000 Square Feet	1,000 GPM at 20 psi residual on the system/each hydrant shall deliver not less than 500 GPM.
C-1, C-2, CP Over 20,000 Square Feet	1,500 GPM at 20 psi residual on the system/each hydrant shall deliver not less than 750 GPM.

Shopping Centers under one roof exceeding 50,000 square feet shall be evaluated by the insurance services office guide for determination of required fire flow.

****

LM, M-1, MP 3,500* to 15,000 Square Feet	750 GPM at 20 psi residual on the system/each hydrant shall deliver not less than 500 GPM.
LM, M-1, MP 15,000 to 20,000 Square Feet	1,000 GPM at 20 psi residual on the system/each hydrant shall deliver not less than 750 GPM.

LM, M-1, MP Over 20,000 Square Feet	1,500 GPM at 20 psi residual on the system/each hydrant shall deliver not less than 750 GPM.
MP-PLANNED INDUSTRIAL PARKS	2,000 GPM at 20 psi residual on the system/each hydrant shall deliver not less than 750 GPM.

Planned Unit Developments and Conditional Use Permits will be required to provide fire hydrants based on planned development.

Fire Flow requirements may be reduced up to 50% for automatic sprinkler protection, with the approval of the Fire Coordinator.

* Water Storage MAY be allowed in Industrial/Manufacturing between 3,500 and 10,000 square feet dependent upon degree of hazard and approval of the Fire Coordinator.

****

ALL PROPERTIES regardless of size shall be required to provide the minimum on-site water requirements, to be determined by the Fire Coordinator, if there is on-site storage of flammable liquids and/or LP Gas.

****

REQUIRED DURATION OF FIRE FLOW

Required Fire Flow-GPM	Required Duration-Hours
2,500 or Less	2
2,501 or More	3

****

MAIN SIZES:

The minor distribution branches or systems supplying water supply systems shall consist of mains at least six (6) inches in diameter arranged so that they form a closed loop in all areas of the distribution system. Where long unsupported lengths of pipe are necessary, eight (8) inch or larger mains shall be used. In new construction, eight (8) inch or larger pipe shall be used where dead ends and a poor system pattern are likely to exist for a considerable period or where the layout of the streets is not well suited to producing a closed-loop system. The use of dead-ended six (6) inch and smaller mains to provide fire protection shall not be permitted.

PRESSURE:

ficient pressures shall be provided within the system to aintain 20 psi residual pressures while providing required fire flow.

HYDRANT SPACING:

1. Single Story Residential: Hydrants shall be so located that the maximum hose travel distance, as measured in streets, rights-of-way, will not exceed 500' to the center of the lot or to the edge of the structure being protected, and no more than 500 feet apart.

2. Multi-Story Residential: Hydrant spacing along a main shall not exceed 300 feet, nor shall a hydrant be more than 300 feet from the structure being protected.

3. Commercial and Industrial: Hydrant spacing along a main shall not exceed 300 feet, nor shall a hydrant be more than 300 feet from the structure being protected.

4. Schools, Hospitals, Institutions, Prisons and Nursing Homes: Two (2) hydrants, not more than 300 feet apart, must be provided to protect each structure.

SECTION II

MAINTENANCE/TAMPERING:

1. Unobstructed legal access to fire hydrants or on-site private systems shall be provided and maintained to accommodate firefighting apparatus.

2. No person shall place or keep any post, fence, vegetation growth, trash or other material near any fire hydrant that would prevent such hydrant from being immediately seen or in any manner deter or hinder the fire department from gaining immediate access to a fire hydrant.

3. No person shall use or operate any fire hydrant or other valve or any fire system intended for use by the fire department for fire suppression purposes except

4. No person shall remove, tamper with or otherwise disturb any fire hydrant or firefighting appliances except for the purpose of extinguishing fires, firefighting training, or making necessary repairs without first obtaining written approval by the fire department.

SECTION III- AMENDED SUBDIVISION ORDINANCE

Section 86.10 of the Lake County Subdivision Ordinance was amended September 3, 1985 to read as follows:

A. Fire Protection Standards:

In all new subdivision or expansion of existing subdivisions, where nineteen (19) or more lots, whose average lot size is thirty thousand (30,000) square feet or less are or may be created, or where a central water system and an adequate water delivery system for fire protection must be provided, as defined in this section.

1. Water Supply System:

The water supply system shall provide 500 gpm at 20 psi residual pressure on the entire system with each hydrant delivering not less than 500 gpm. Sufficient pressure shall be provided within the system to maintain 20 psi residual pressure while providing required fire flows. The system shall be capable of providing the required fire flows for duration of at least two hours.

2. Water Delivery System:

A. Main Sizes: The minor distribution branches or systems shall consist of mains at least six (6) inches in size arranged so that they form a closed loop in all areas of the distribution system. Where long unsupported lengths of pipe are necessary, eight (8) inch or larger mains shall be used. In new construction, eight (8) inch or larger pipe shall be used where dead ends and a poor system pattern are likely to exist for a considerable period and where the layout of the streets are not well suited to producing a closed-loop system. The use of dead ended six (6) inch and smaller mains to provide fire protection shall not be permitted.

B. Hydrants: Hydrants shall be so located that the maximum hose travel distance, as measured in feet, shall be determined by the Lake County Fire Coordinator. Hydrants shall have two (2) - 2 1/2" hose connections with a 4 1/2" diameter pumper connection. Threads shall be American National Standard. The operating nut shall be National Standard 1 1/2" point-to-flat. Hydrants shall not be located within three (3) feet of any obstruction which would prevent its use, nor in front of entry ways, and the pumper discharge shall face the nearest roadway. The center of the lowest outlet shall be not less than eighteen (18) inches above the surrounding grade and the operating nut shall not be more than four (4) feet above the surrounding grade. Hydrant branches (from main to hydrant) shall not be less than six (6) inches in diameter and as short as possible with a maximum permissible length of fifty (50) feet. Each branch will be individually gate valved.

B. Potable Water Systems:

where fifty (50) or more lots whose average lot size is thirty thousand (30,000) square feet or less are created, a public water system for drinking and other household uses shall be provided which meets the requirements of the fire protection standards in "A" above, and all applicable state statutes and regulations governing public water systems. In such subdivisions, individual wells shall not be permitted except for irrigation.

C. Ownership of and Access to Water Systems:

1. For any water system created pursuant to subsection "A. Fire Protection Standards", or "B. Potable Water Systems", an agreement shall be entered into between Lake County, the subdivider and any involved Homeowners Association prior to platting, which shall provided that at the time a public water system operated by a governmental agency (i.e. municipality, county or other public agency) is adjacent to the subdivision, that the water system in the subdivision shall be conveyed without consideration to such governmental agency which shall then operate such public water system. Said agreement shall additionally provide that should any adjacent land be subdivided by the same or another that the system may be enlarged solely at the cost of the subsequent subdivider, and that the systems be operated jointly from that time on.

2. For any water system created pursuant to subsection "A. Fire Protection Standards", or "B. Potable Water Systems", necessary easements, dedications, or right-of-ways shall be dedicated, conveyed or deeded to Lake County, so that Lake County or its authorized agents shall have the right to access for maintenance and use for fire protection purposes, all parts of the water system. Such dedications or easements shall also provide for unlimited use of water when necessary for firefighting purposes.

D. Existing Public Water Systems:

In any case where a new subdivision or an expansion of an existing public water supply system, the rules of Section 86.10 shall apply and the existing public water supply system shall be upgraded to meet all requirements of this Standard.

E. Additional Lots:

For purposes of subsection "A. Fire Protection Standards", or "B. Potable Water Systems", to determine the number of lots which are or may be created, all property owned by an applicant adjacent to the property in the proposed subdivision shall be considered as included in the proposed subdivision and multiple phases of a subdivision shall be considered as one subdivision. It is the intent of this paragraph to encourage the construction of public water systems for fire protections and potable water and to discourage property owners from attempting to avoid these regulations by platting less than nineteen (19) or fifty (50) lots at a time.

MARION COUNTY

- 1992 FPSC Filing -

MAR 26 1990

Marion County Commission

412 S.E. 25th Avenue • Ocala, Florida 32671

FIRE SERVICES
(904) 622-0403

COMMISSIONERS
GAIL CROSS DIST. 1
DON GREENE DIST. 2
FARNELL TOWNLEY DIST. 3
T.W. "TOMMY" NEEDHAM DIST. 4
GLEN CHARLES FIORELLO DIST. 5
AREA CODE 904 622-0305

March 21, 1990

Dyer, Riddle, Mills and Precourt
1505 E Colonial Drive
Orlando, Florida 32853

Attention: Gary Morse

Dear Gary:

In reference to the questions you had on fire flow rates; in Marion County we use NFPA #24 for water systems, NFPA #20 for fire pump installation and NFPA #13 for sprinkler installations.

If you have any further questions, feel free to contact this office.

Sincerely,

James Swanger, Captain
Marion County Fire Service

JS/jt

Engineering

MARION COUNTY ORDINANCE NUMBER 86-17

AN ORDINANCE PROVIDING FOR THE ADOPTION OF THE MARION COUNTY WATER SUPPLY SYSTEMS CONSTRUCTION MANUAL; PROVIDING FOR THE PURPOSE OF THIS ORDINANCE; PROVIDING FOR THE ADOPTION OF THE MARION COUNTY WATER SUPPLY SYSTEMS CONSTRUCTION MANUAL; PROVIDING FOR A SEVERABILITY CLAUSE; AND PROVIDING FOR AN EFFECTIVE DATE.

BE IT ORDAINED by the Board of County Commissioners of Marion County, Florida as follows:

SECTION I: PURPOSE

The purpose of this Ordinance is to establish regulations for the construction of water supply systems including the types of materials used in said construction in order to provide standardization of construction materials to protect customers of water supply systems, and to protect Marion County's valuable water supply.

SECTION II: AREA EMBRACED

This ordinance shall be in full force and effect throughout the unincorporated areas of Marion County.

SECTION III: ADOPTION OF MARION COUNTY WATER SUPPLY SYSTEMS CONSTRUCTION MANUAL

The Marion County Water Supply Systems Construction Manual as attached hereto and made a part hereof shall be in full force and effect at the time of adoption of this Ordinance, except as hereinafter provided. The requirement of the Marion County Water Supply Systems Construction Manual shall apply to all construction of water supply systems hereinafter taking place except those water supply systems approved for construction at the time of the effective date of this ordinance.

SECTION IV: SEVERABILITY CLAUSE

It is declared to be the intent of the Board of County Commissioners of Marion County, Florida that if any section, subsection, sentence, clause, phrase or provision of this ordinance is held invalid or unconstitutional, such invalidity or unconstitutionality shall not be so construed as to render invalid or unconstitutional the remaining provisions of this ordinance.

SECTION V: EFFECTIVE DATE

A certified copy of this ordinance as enacted shall be filed by the Clerk of the Board with the Office of the Secretary of State of Florida within ten (10) days after enactment and this within ordinance shall take effect upon official acknowledgement from the Secretary of State that this ordinance has been filed with such office.

DULY ADOPTED this 1st day of July, 1986.

BOARD OF COUNTY COMMISSIONERS
MARION COUNTY, FLORIDA

Steve H. Gilman MD

STEVE H. GILMAN, M.D., CHAIRMAN

ATTEST:

Frances E. Thigpin

FRANCES E. THIGPIN, CLERK

ADOPTED BY THE BOARD OF COUNTY COMMISSIONERS ON JULY 1, 1986. RECEIVED NOTICE FROM SECRETARY OF STATE ON JULY 10, 1986, THAT ORDINANCE WAS FILED ON JULY 8, 1986.

MARION COUNTY'S

WATER SUPPLY SYSTEMS

CONSTRUCTION MANUAL

Prepared July 1, 1986

0719

WATER SUPPLY SYSTEMS CONSTRUCTION MANUAL

A. DEFINITIONS - As used herein, the following words and terms shall have the following meanings:

1. PUBLIC WATER SUPPLY SYSTEMS shall mean pipes, lines, valves, meters, water main laterals, or reservoirs, used or having the present capacity for future use in connection with the obtaining and supplying water for domestic consumption, fire protection, irrigation, consumption by business, or consumption by industry, and without limiting the generality of the foregoing definition shall embrace all necessary appurtenance and equipment and shall include all property, rights, easements and franchises relative to any such system and deemed necessary or convenient for the operation thereof.

2. WATER MAINS - A water supply pipe or system of pipes, installed and maintained by a Government entity or private utility company, on public property, in the street or approved dedicated easement for public or community use.

3. WATER SERVICE LINE - The pipe from the water main to the meter.

4. FIRE LINE - Piping installed to provide private fire protection from the water main to point of delivery.

B. SYSTEM DESIGN CRITERIA

1. Maximum system working pressure shall not exceed 80 P.S.I., minimum operational pressure shall be 20 P.S.I. dynamic and 30 P.S.I. static. The utility company shall notify the consumer that the pressure may exceed 60 P.S.I. upon application. The notice will suggest pressure reducing valves should be installed on individual service to protect washing machines, dishwashers, ice makers, etc. If the static or dynamic pressures exceeds 70 P.S.I., the utility will be required to install a pressure reducing valve at the meter.

2. All water supply mains shall be designed and sized so as to provide needed fire flows, as determined from the Fire Suppression Rating Schedule of the Insurance Service Offices (ISO).

3. Water Plants shall be sized as to meet average daily flow and peek domestic demand requirements. (See Appendix A)

4. All water mains shall be AWWA C900 PVC pipe or Ductile Iron Pipe four (4) inches or larger.

5. Water Supply Mains shall be a minimum of 36 inches deep to top of pipe.

6. Service lines shall be a minimum of 24 inches deep within Right-of-Way.

7. Distribution mains shall be looped whenever possible.

8. Thrust blocks of the appropriate size shall be installed wherever water flow changes directions or dead ends, unless "Restrained Joint" pipe is used.

9. Fire lines shall utilitze a backflow prevention device commensurate with the degree of hazard.

10. Water mains shall be installed in public Right-Of-Way at all times. When easements must be utilized, permission must be obtained from the County Commission.

11. When required, fire hydrants shall be spaced so that all property may be accessed with the use of 500 feet of fire hose.

12. Valves shall be located so as to be readily accessible at all times.

13. PVC water main shall be laid with a copper wire (14-1 UF) or detector tape so its location can be determined at a later date with a locating device.

14. Gate valves shall be used with all water mains up to ten (10) inch diameter; butterfly valves shall be used for all larger sizes.

C. MATERIAL SPECIFICATIONS

1. PVC PIPE

All PVC (Polyvinyl Chloride) pipe used for water mains 4 inches or larger shall conform to AWWA C900 (See Sec. D for Titles of Standards). Outside diameters shall be the same as Ductile Iron Pipe. Dimension Ratio (DR) shall be a minimum of 25 with a minimum Pressure Class (PC) of 100.

All Polyvinyl Choloride (PVC) water mains shall be installed with a solid copper locating wire. The locating wire shall be (14-1 UF) solid copper wire or Detector Tape. All lines shall be installed according to manufacturer's recommendations.

2. DUCTILE IRON PIPE

All Ductile Iron pipe used for water mains shall conform to AWWA C150 and C151. Thickness Class 50 may be used. Push-on joints shall conform to AWWA C111. Mechanical joints shall conform to AWWA C111. Lock type joints shall be "unlockable". Cement lined pipe shall be required in all instances and shall conform to AWWA C104. Polyethylene encasement, when used, shall conform to AWWA C105. Fittings shall have mechanical joint ends, be cement lined and conform to AWWA C110 or AWWA C153. All lines shall be installed according to manufacturer's recommendations.

3. WATER MAIN VALVES

a. GATE VALVES - All gate valves shall conform to AWWA C509. End connection shall be mechanical joints conforming to AWWA C111. Operating nut shall be two (2) inches square and open to the left.

b. BUTTERFLY VALVES - Butterfly valves shall be rubber seated, tight closing, epoxy lined and shall conform to AWWA C504. End connections shall be mechanical joint conforming to AWWA C111. Operating nut shall be two (2) inches square and open to the left. Epoxy lining shall conform to AWWA C-550.

c. FLUSHING VALVES (Blow Offs) - Flushing valves shall be as shown in Detail W-1.

4. CORPORATION STOPS

Corporation stops used when direct tapping shall have "Mueller CC" inlet threads or equivalent, conforming to AWWA C800. Corporation stops used in saddles shall be "Mueller CC" threads or equivalent or national pipe thread.

5. SERVICE LINES

All water service lines shall be made of Polybutylene with copper equivalent outside diameter (CTS-00), SDR of 13.5 or polyethylene with copper equivalent outside diameter SDR 9.

6. Meters shall be in accordance with AWWA C-700, C-701, C-702 or C-708.

7. METER STOPS

Meter stops shall be operable with a standard operating key and have a means of locking in the closed position and installed in meter boxes for protection and future location purposes.

8. VALVE BOXES

Valve boxes shall be designed for use with two (2) inch square nut operated valves installed underground. Covers shall be easily removed for access to the valve operating nut. Cover shall say "Water" on top.

9. TAPPING SLEEVES AND CROSSES

Tapping sleeves and crosses shall be made of cast iron or fabricated stainless steel.

10. TAPPING VALVES

Tapping valves shall meet AWWA 509.

11. FIRE HYDRANTS

Fire Hydrants, when used, shall conform to AWWA C-502 and shall contain two and one half inch (2-1/2") hose connections and one four and one half inch (4-1/2") steamer connection with National Standard Fire Hose coupling screw threads, five and one quarter inch (5-1/4") valve opening, six inch (6") diameter mechanical joint inlet, one and one half inch (1-1/2") pentagon operating nut; shall open counter clockwise, shall be painted fire hydrant red in an approved manner with the primer paint being Kopper's "Glamortex" No. 622 rust primer and the finish paint being Kopper's "Glamortex" No 314, safety red and shall be either Mueller Centurion (Traffic Model A-423) or American-Darling B-84B fire hydrant.

E. TESTING

To prevent floatng of the pipe, sufficient backfill should be placed prior to filling pipe with water and subsequent field testing. Where local conditions require that the trenches be backfilled immediately after the pipe has been laid, the testing may be carried out after backfilling has been completed, but before placement of permanent surface. Water used for testing purposes shall be potable water brought to the site in a tank truck or tapped from a nearby distribution system or well.

The distribution system shall be pressurized by means of a pump connected to the system. Test pressure shall be 150 P.S.I. Length of test shall be two (2) hours. Allowable leakage shall be determined by the following formula:

$$L = \frac{(ND)\sqrt{P}}{7400} \quad \text{WHERE}$$

L = allowable leakage in gal./hr.
N = number of joints in the system under test
D = diameter of pipe in inches
P = average test pressure during the leakage test in P.S.I..

Actual leakage shall be determined by measuring the amount of water that must be pumped back into the system to bring it back to 150 P.S.I..

G. DISINFECTION

Disinfection shall be in accordance with AWWA C601 and the requirements of the State Environmental Health Department.

H. MATERIAL AND INSTALLATION STANDARDS

DESCRIPTION		TITLE
AWWA C104	-	Cement-Mortar Lining for Gray-Iron and Ductile Iron Pipe and Fittings for Water.
AWWA C105	-	Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids
AWWA C110	-	Gray-Iron and Ductile Iron Fittings, 3 inches thru 48 inches, for Water and Other Liquids

AWWA C111	-	Rubber-Gasket Joints for Gray-Iron and Ductile Iron Pressure Pipe and Fittings
AWWA C115	-	Flanged Gray-Iron and Ductile Iron Pipe with Threaded Flanges
AWWA C150	-	Thickness Design or Ductile Iron Pipe
AWWA C151	-	Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
AWWA C504	-	Rubber Seated Butterfly Valves
AWWA C508	-	Swing Check Valves for Ordinary Waterworks Service
AWWA C509	-	Resilient Seated Gate Valves, 3 inch thru 12 inch NPS, for Water Systems
AWWA C600	-	Installation of Ductile Iron Water Mains and their Appurtenances
AWWA C700	-	Standard for Cold-Water Meters - Displacement Types.
AWWA C701	-	Standard for Cold-Water Meters - Turbine Type for Customer Service
AWWA C702	-	Standard for Cold-Water Meters - Compound Type
AWWA C800	-	Standard for Threads for Underground Service Line Fittings
AWWA C900	-	Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch thru 12 inch, for Water
AWWA C901	-	Polyethylene (PE) Pressure Pipe, Tubing and fittings, 1/2 inch through 3 inch, for water (same as ASTM D2666)

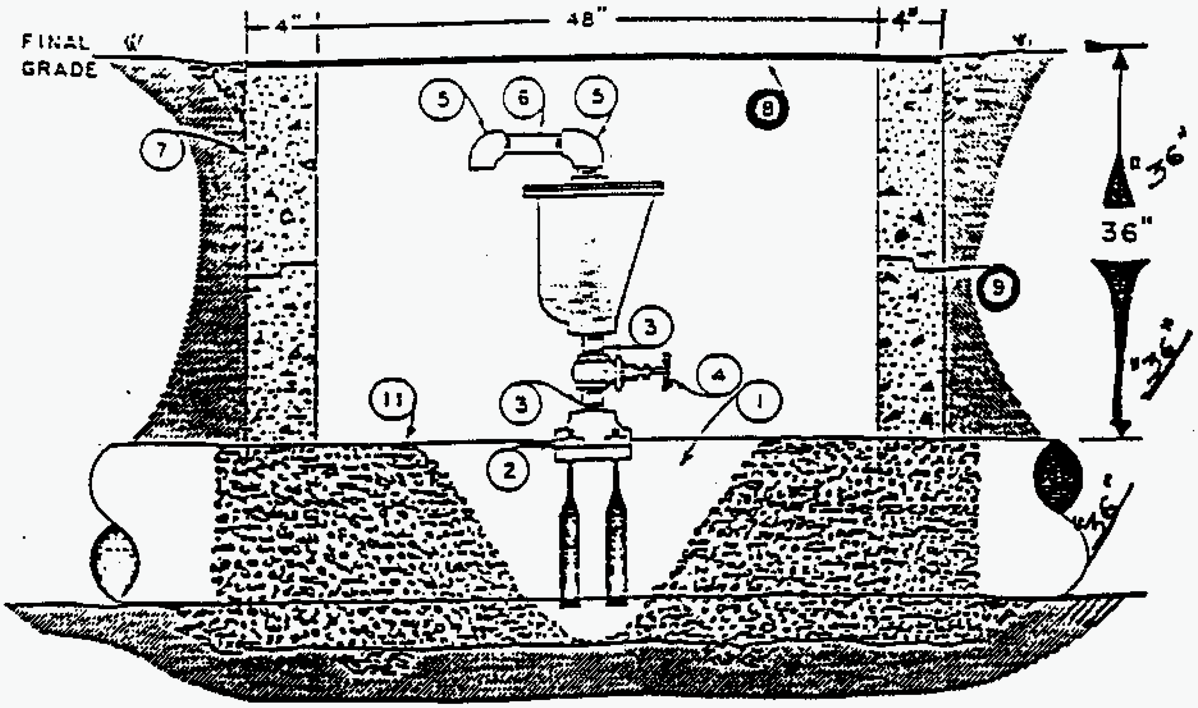
DESCRIPTION		TITLE
AWWA C902	-	Standard for Polybutylene (PB) Pressure Pipe, Tubing, and Fittings, 1/2 inch thru 3 inch for Water
ASTM D2666	-	Standard for Polybutylene (PB) Plastic Tubing
ASTM D3139	-	Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals
ASTM F477	-	Elastomeric Seals (Gaskets) for Jointing Plastic Pipe
ANSI B16.1	-	Standard Specification for Mechanical Joint Bolt Hole Spacing
AWWA PUBLICATION No. M23		PVC Pipe - Design and Installation

The latest revision of any standard referred to herein shall be substituted for the former.

It is to be understood that the above referenced standards, are to include all revisions that may have occurred from the time of this writing up to the time of application of the standard. The latest revision of any standard shall be used at the time of construction.

When ANSI and AWWA standards are the same, only the AWWA designation has been used (AWWA C110 INSTEAD OF ANSI/AWWA-C110/A21.10).

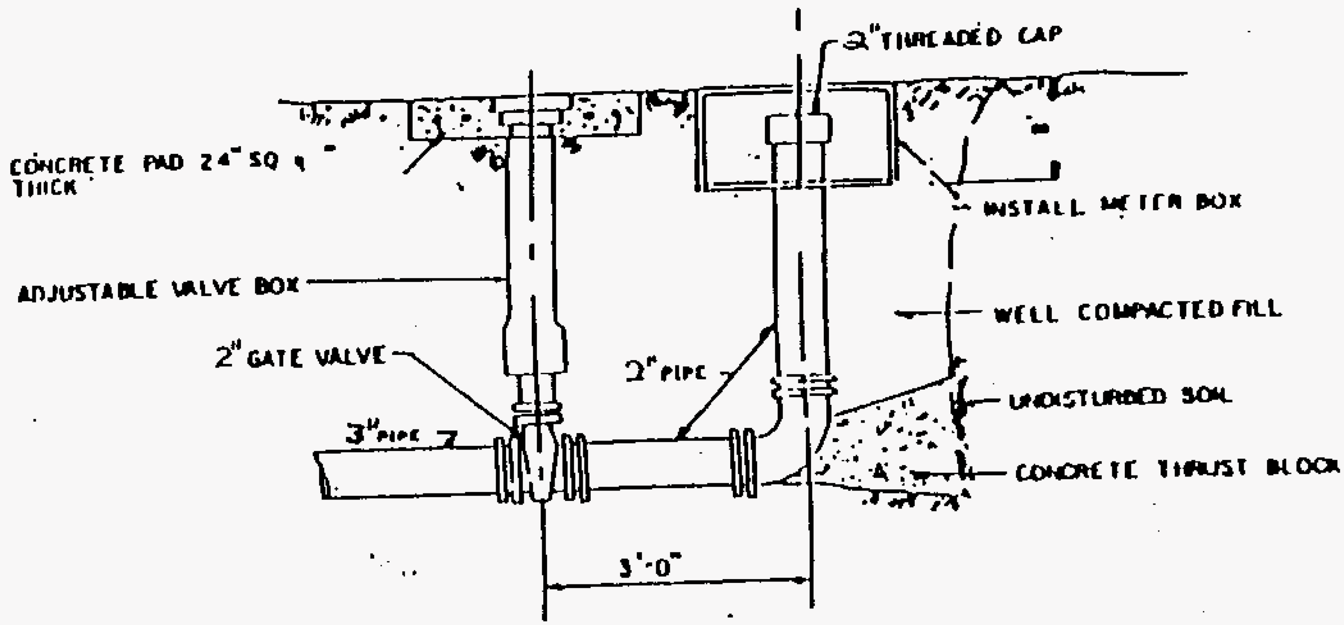
INDEX OF DETAILS



M A T E R I A L S			
ITEM	QUANT.	DESCRIPTION	
1	*	6" - 24"	PIPE, D.I. or PVC (DR-18)
2	1	1" (TAP)	SADDLE, SERVICE (I.D. THREAD)
3	2	1" x 2"	NIPPLE, BRASS
4	1	1"	VALVE, GATE
5	2	1/2" x 90°	ELBOW, GALVANIZED
6	1	1/2" x 6"	NIPPLE, GALVANIZED
7	*	4' x 4'	VAULT, SECTIONAL
8	1	4' x 4'	COVER, STEEL PLATE
9	*		SEALER, (RAM-NEK)
10	1		VALVE, AIR RELEASE
11	*		GRAVEL

AIR RELEASE VALVE

MARION COUNTY PUBLIC WORKS DIVISION	STANDARD DETAIL	W 1
WATER SUPPLY SYSTEMS		SHEET ___ OF ___



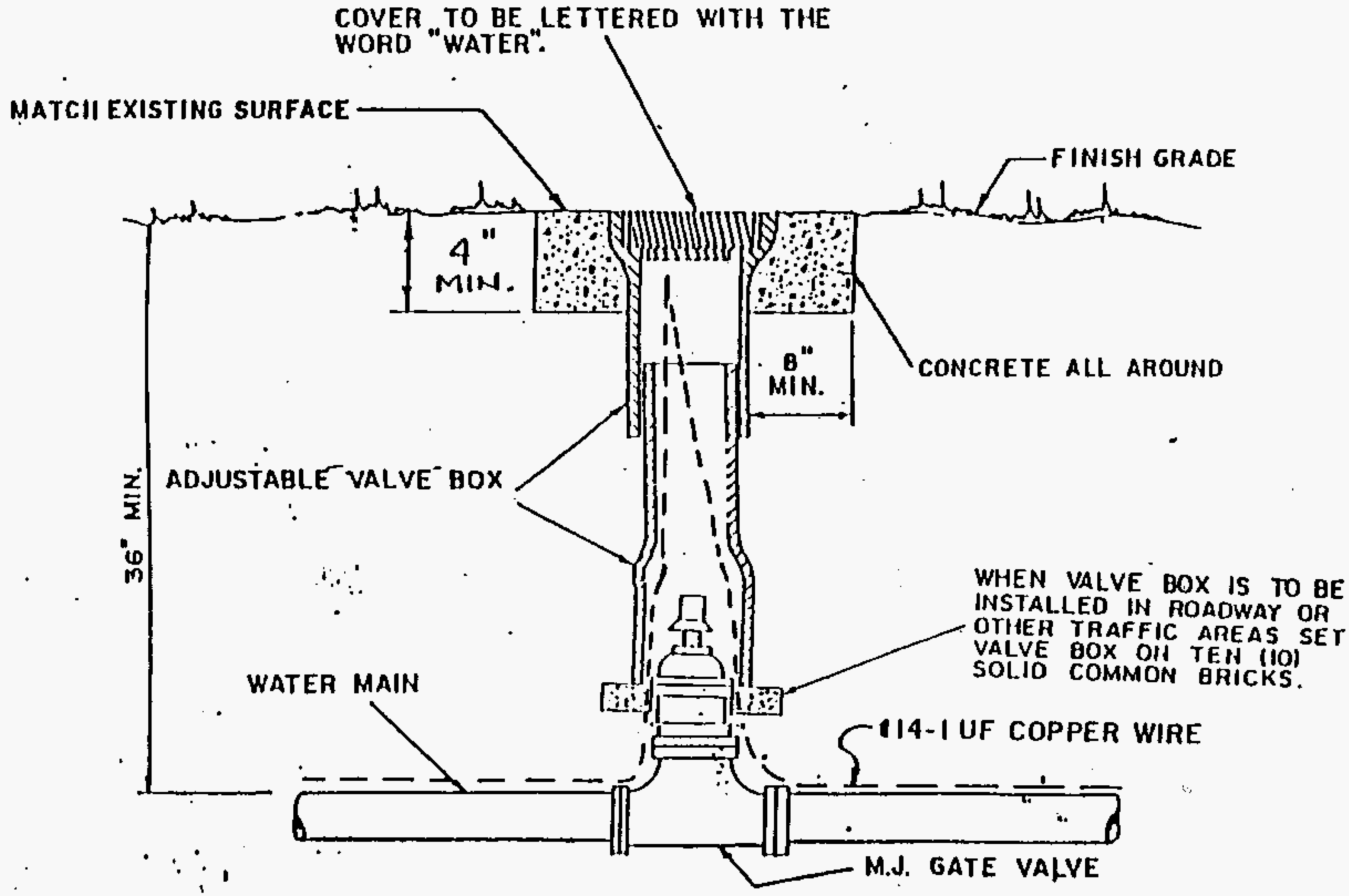
FLUSHING VALVE DETAIL

MARION COUNTY
PUBLIC WORKS DIVISION
WATER SUPPLY SYSTEMS
0729

STANDARD DETAIL

W2

GATE VALVE & BOX



NOTE: DETECTOR TAPE OR WIRE MAY BE USED FOR LOCATION PURPOSES.

PUBLIC WORKS DIVISION

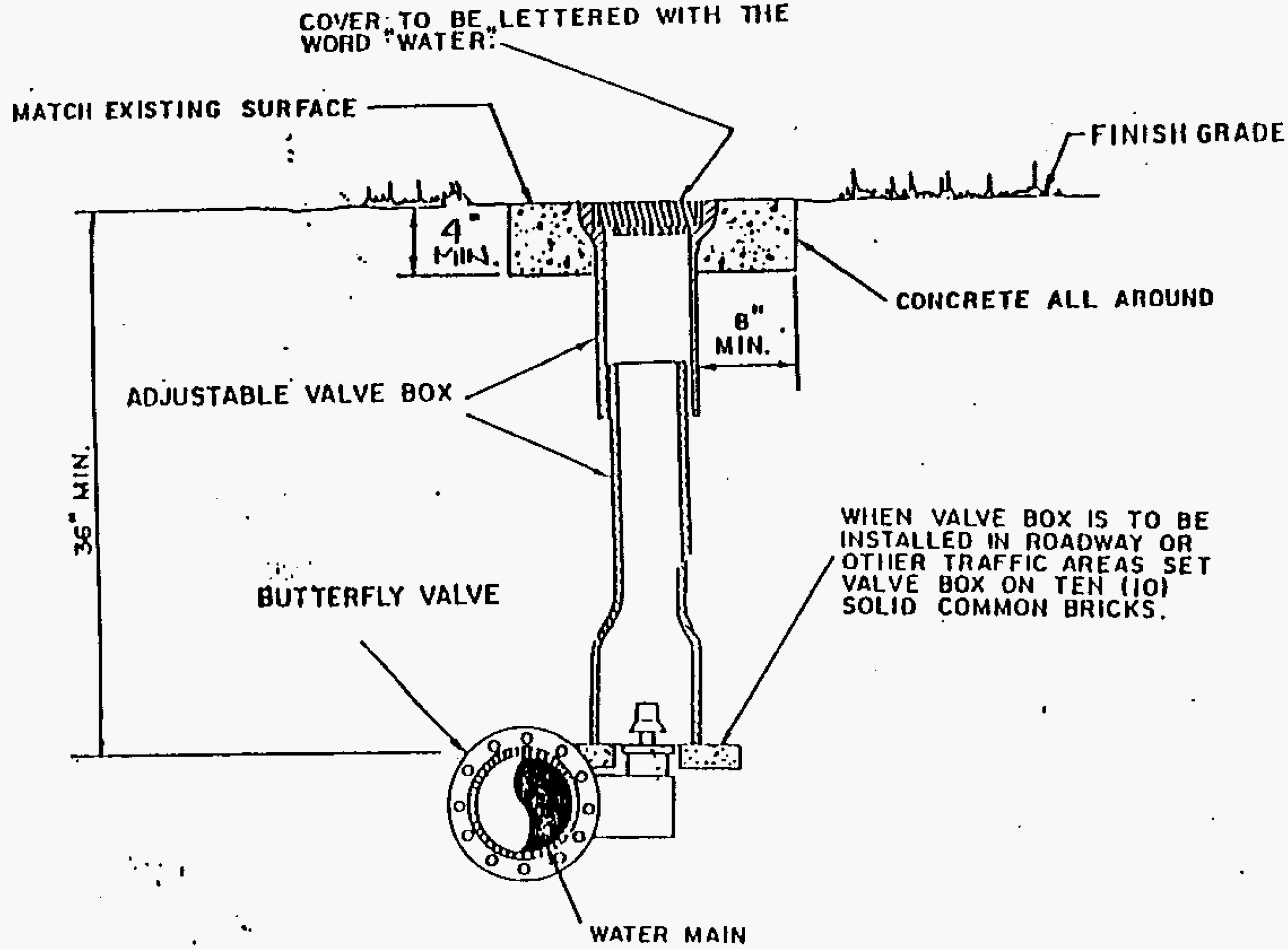
MARION COUNTY

STANDARD DETAIL

W3

0730

BUTTERFLY VALVE & BOX



MARION COUNTY
PUBLIC WORKS DIVISION
WATER SUPPLY SYSTEMS

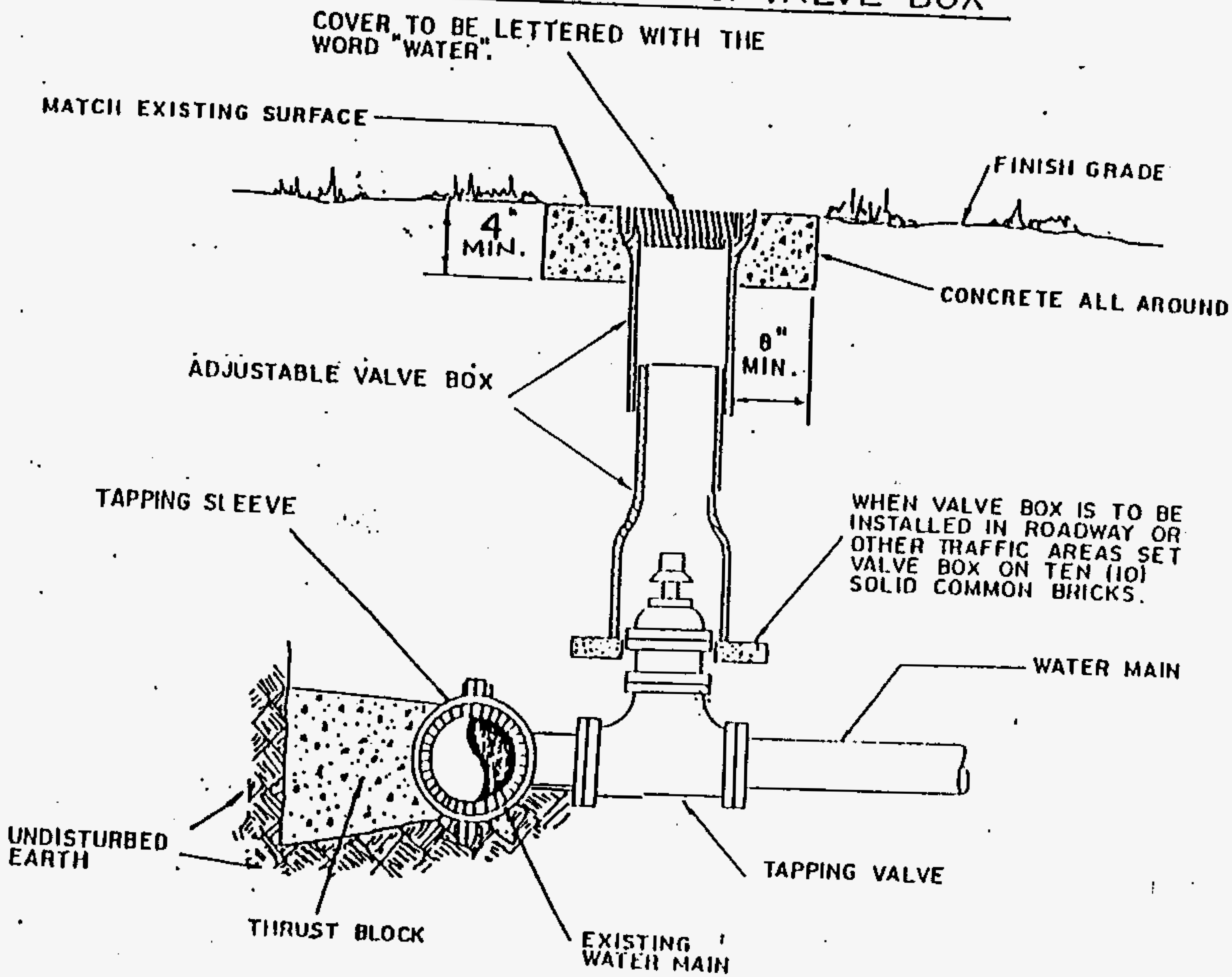
STANDARD DETAIL

W4

SHEET 1 OF 1

0731

TAPPING SLEEVE & VALVE BOX

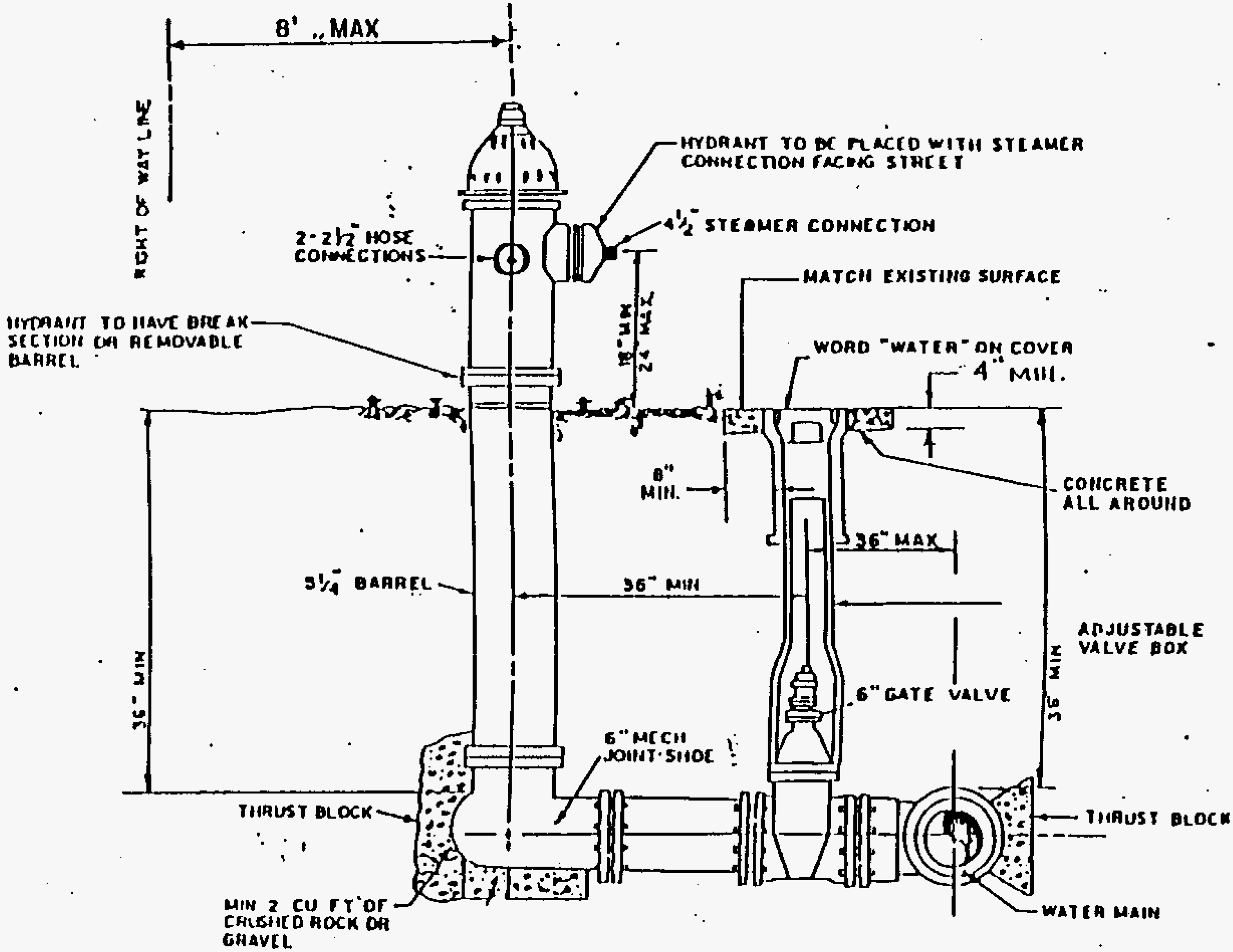


MARION COUNTY
PUBLIC WORKS DIVISION

STANDARD DETAIL

W5

0762



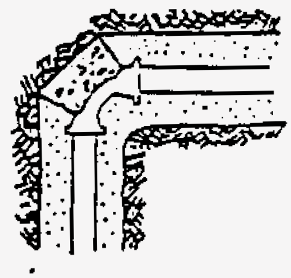
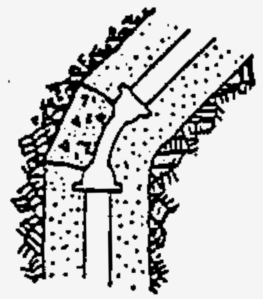
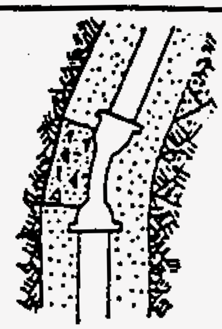
PROFILE VIEW

FIRE HYDRANT ASSEMBLY

MARION COUNTY
PUBLIC WORKS DIVISION
0733

STANDARD DETAIL

W6

SIZE of PIPE	SQUARE FEET OF CONCRETE BEARING SURFACE NEEDED		
			
	90° ELL	45° ELL	22 1/2° ELL
4"	1.5	1	1
6"	3	1.5	1
8"	5	3	1.5
10"	8	4	2
12"	10	6	3

THRUST BLOCKS

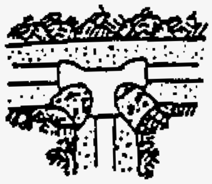
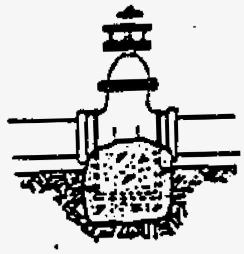
NOTES

1. THRUST BLOCK SIZE FOR PIPE LARGER THAN 12" SHALL BE DETERMINED IN EACH CASE BY ENGINEER. ABOVE BEARING AREAS ARE BASED ON AN ALLOWABLE SOIL-BEARING PRESSURE OF 2000 lbs./ft^2 AND MAY BE VARIED BY THE ENGINEER IF OTHER SOIL CONDITIONS ARE ENCOUNTERED IN THE FIELD.

2. POLYETHYLENE SHEET SHALL BE USED TO PREVENT CONCRETE FROM CONTACTING BOLTS.

3. 2000 P.S.I. CONCRETE SHALL BE USED FOR ALL THRUST BLOCKS.

MARION COUNTY PUBLIC WORKS DIVISION	STANDARD DETAIL	W7
WATER SUPPLY SYSTEMS		SHEET 1 OF 2

SIZE of PIPE	SQUARE FEET OF CONCRETE BEARING SURFACE NEEDED			
				
	DEADEND TEE	SIDE TEE	DEADEND LINE	VALVE ANCHOR (each side)
4"	1	1	1	1
6"	2	2	2	2
8"	4	4	4	4
10"	6	6	6	6
12"	8	8	8	8

THRUST BLOCKS

NOTES

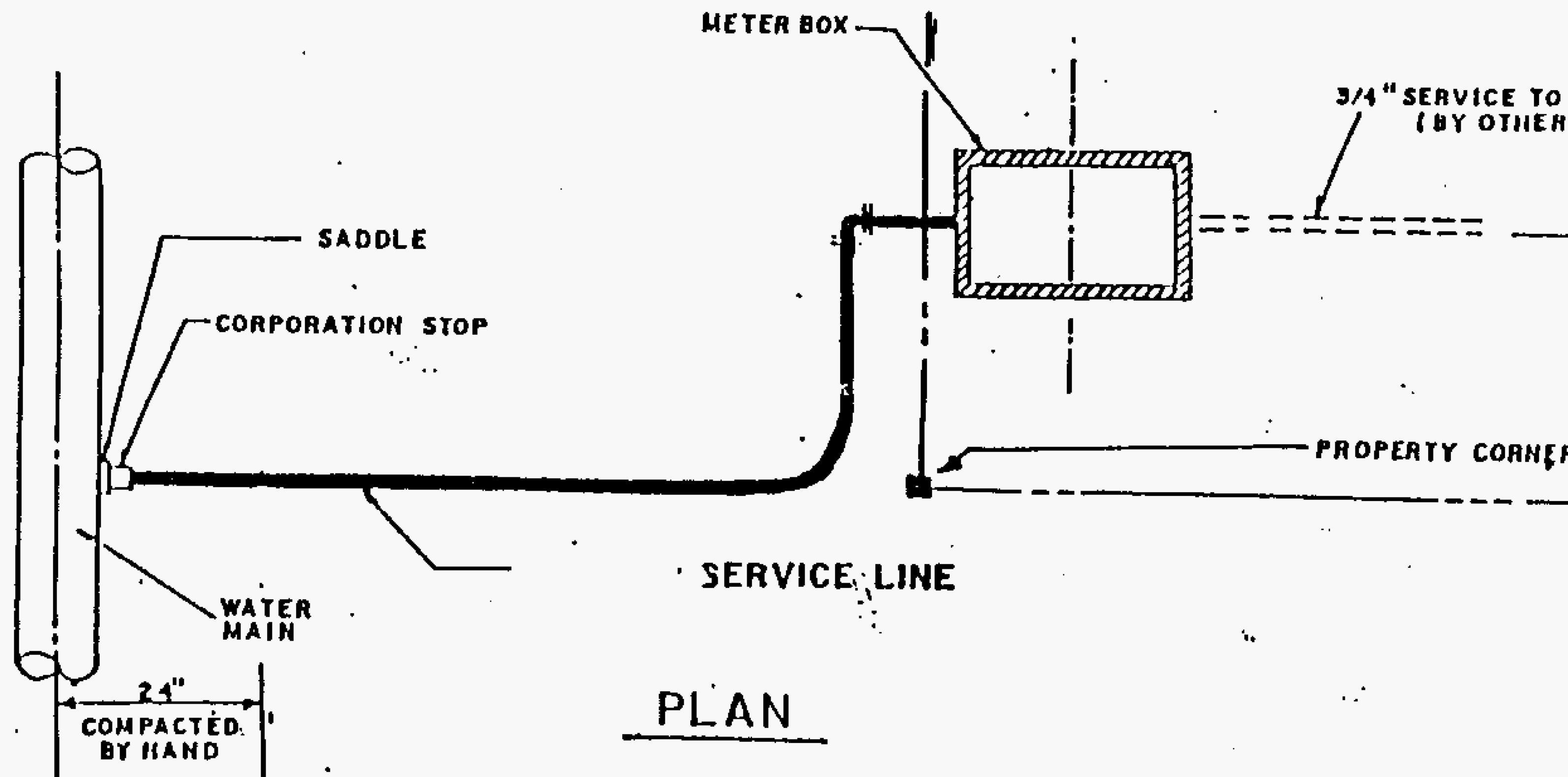
1. THRUST BLOCK SIZE FOR PIPE LARGER THAN 12" SHALL BE DETERMINED IN EACH CASE BY ENGINEER. ABOVE BEARING AREAS ARE BASED ON AN ALLOWABLE SOIL-BEARING PRESSURE OF 2000 $lbs./ft^2$ AND MAY BE VARIED BY THE ENGINEER IF OTHER SOIL CONDITIONS ARE ENCOUNTERED IN THE FIELD.

2. POLYETHYLENE SHEET SHALL BE USED TO PREVENT CONCRETE FROM CONTACTING BOLTS.

3. 2000 P.S.I. CONCRETE SHALL BE USED FOR ALL THRUST BLOCKS.

MARION COUNTY PUBLIC WORKS DIVISION	STANDARD DETAIL	W7
WATER SUPPLY SYSTEMS		SHEET 2 OF 2

RESIDENTIAL WATER SERVICE



PLAN

NOTE: USE CTS COMPRESSION FITTINGS

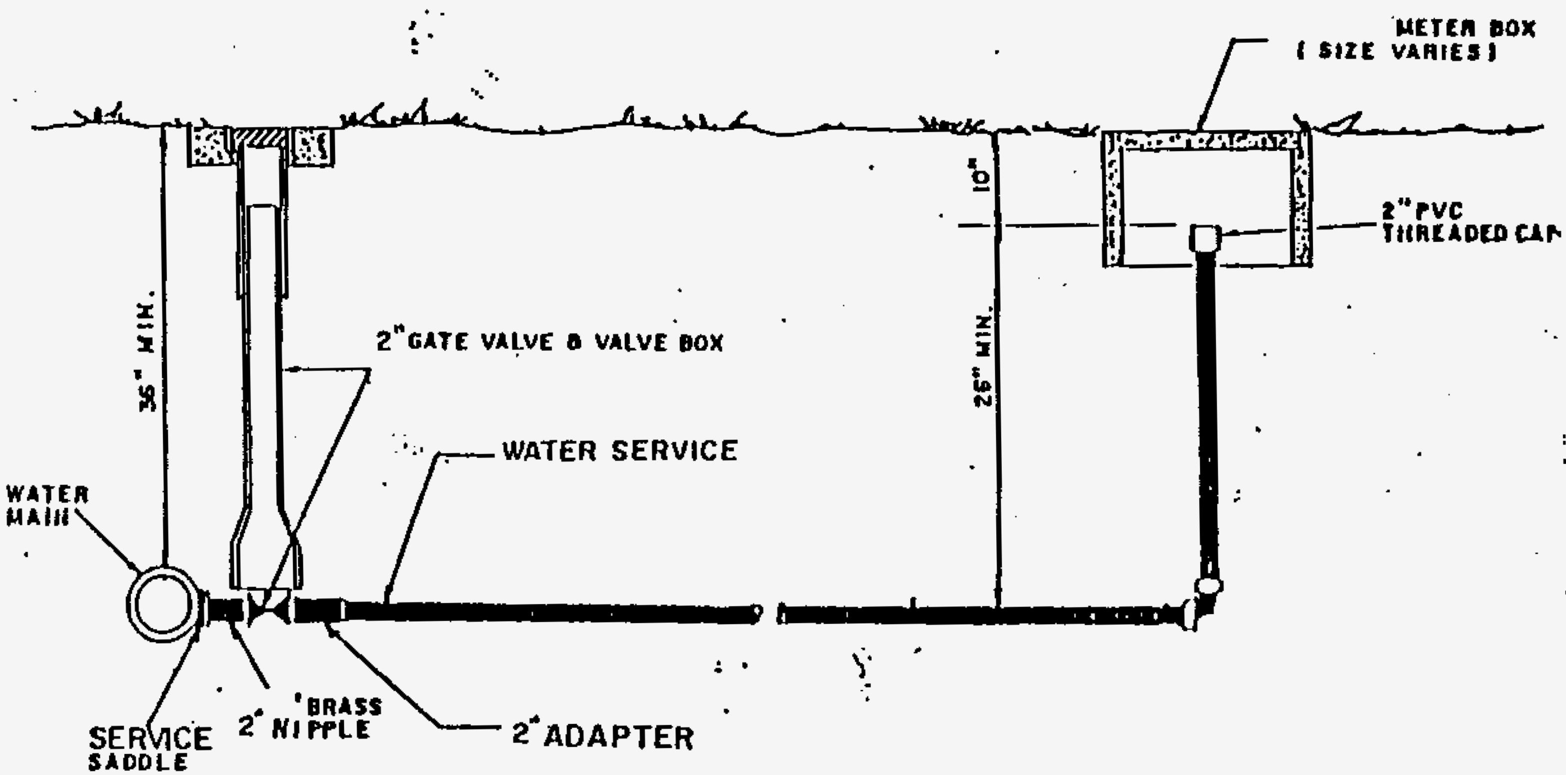
MARION COUNTY
PUBLIC WORKS DIVISION

STANDARD DETAIL

W8

0736

MULTI-FAMILY WATER SERVICE



SECTION

NOTE: WATER SERVICE MANIFOLD TO
BE DESIGN BY PROJECT ENGINEER

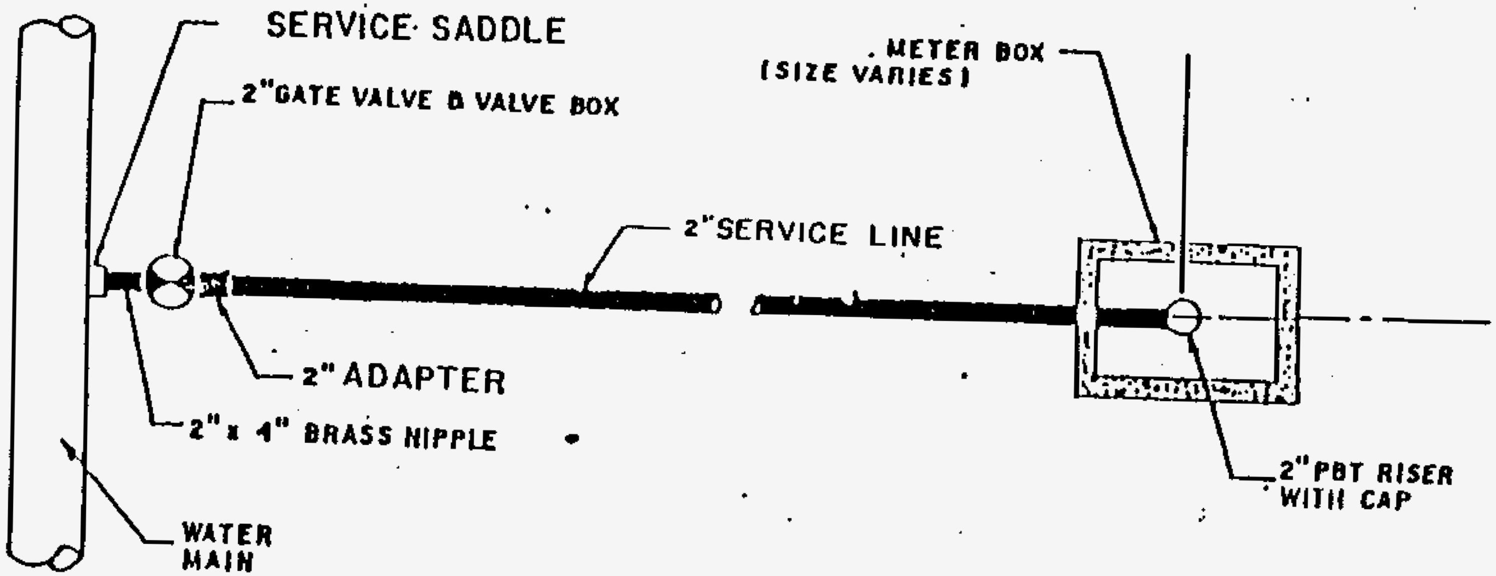
MARION COUNTY
PUBLIC WORKS DIVISION

STANDARD
DETAIL

W 9

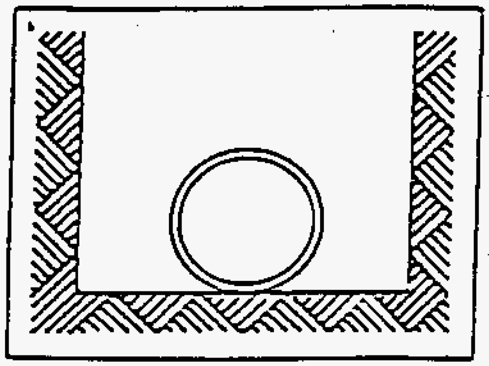
0737

MULTI-FAMILY WATER SERVICE



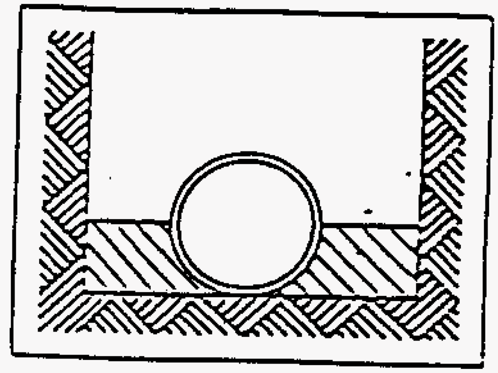
PLAN

MARION COUNTY
PUBLIC WORKS DIVISION
STANDARD DETAIL
W9
2 of 2
0738



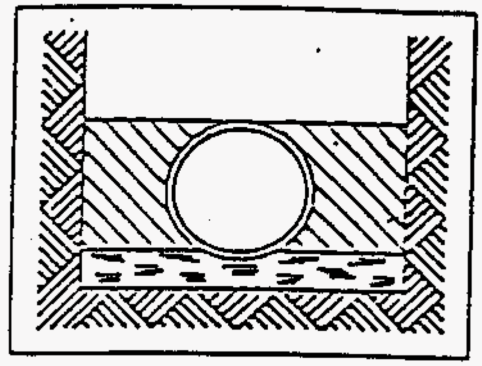
Type 1 *

Flat-bottom trench.† Loose backfill.



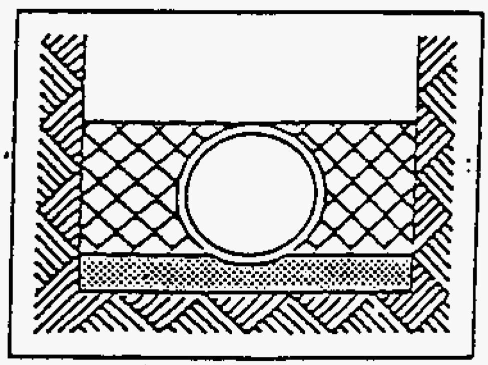
Type 2

Flat-bottom trench.† Backfill lightly consolidated to centerline of pipe.



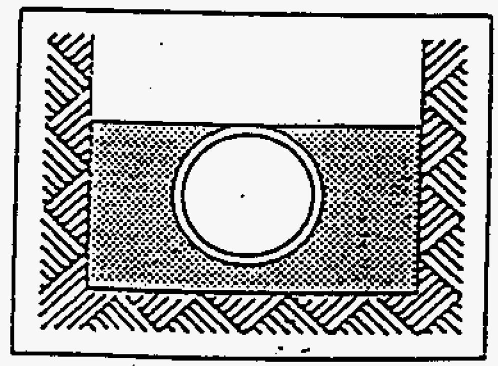
Type 3.

Pipe bedded in 4-in. minimum loose soil.‡ Backfill lightly consolidated to top of pipe.



Type 4

Pipe bedded in sand, gravel, or crushed stone to depth of 1/8 pipe diameter, 4-in. minimum. Backfill compacted to top of pipe. (Approximately 80 per cent Standard Proctor, AASHTO T-99.)



Type 5

Pipe bedded in compacted granular material to centerline of pipe. Compacted granular or select‡ material to top of pipe. (Approximately 90 per cent Standard Proctor, AASHTO T-99.)

* For 30-in. and larger pipe, consideration should be given to the use of laying conditions other than Type 1.
† "Flat-bottom" is defined as undisturbed earth.
‡ "Loose soil" or "select material" is defined as native soil excavated from the trench, free of rocks, foreign materials, and frozen earth.

Laying Conditions for Ductile-Cast-Iron Pipe

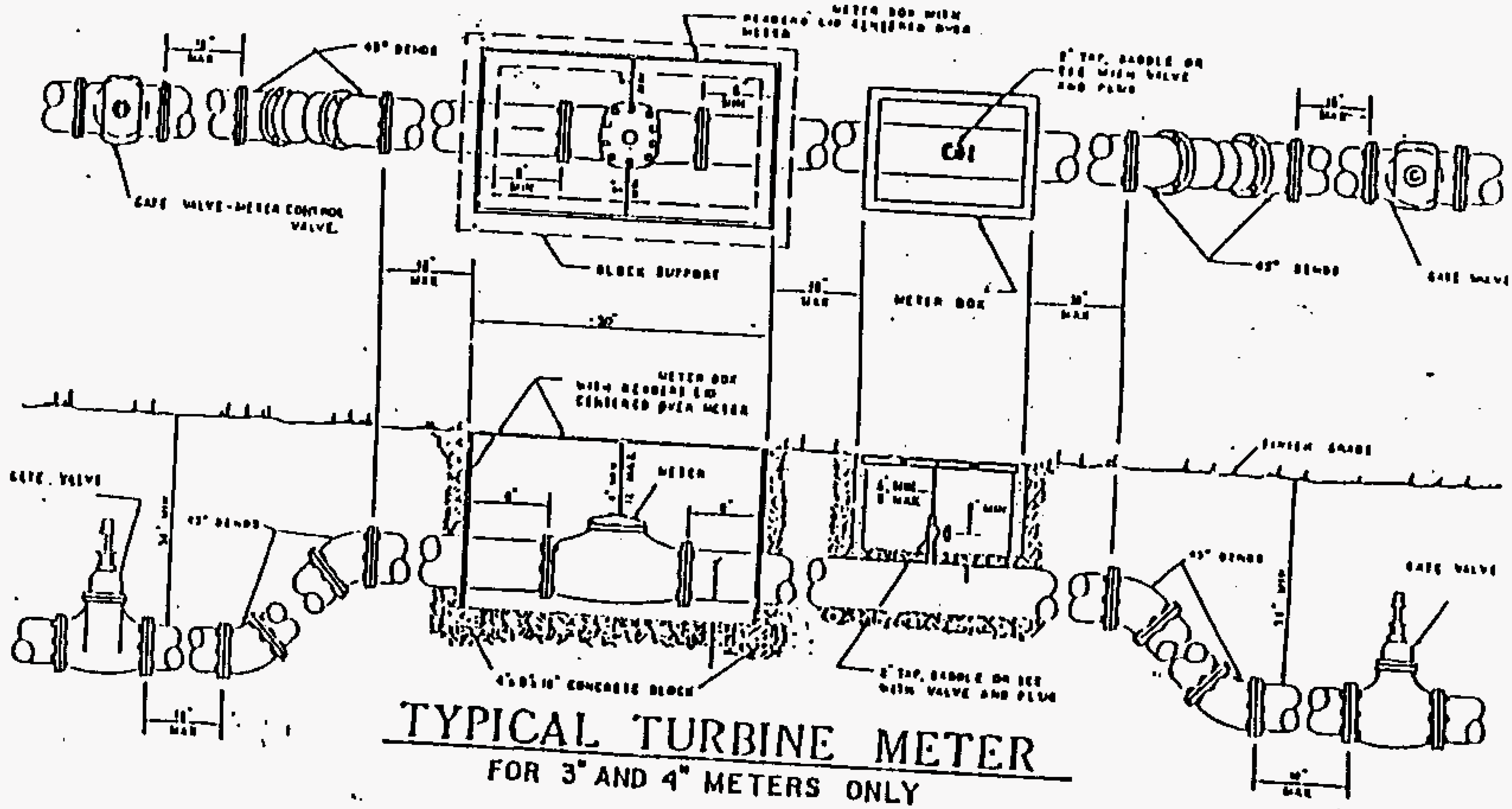
MARION COUNTY PUBLIC WORKS DIVISION	STANDARD DETAIL	W10
WATER SUPPLY SYSTEMS		

MARION COUNTY
PUBLIC WORKS DIVISION
WATER SUPPLY SYSTEMS

STANDARD DETAIL

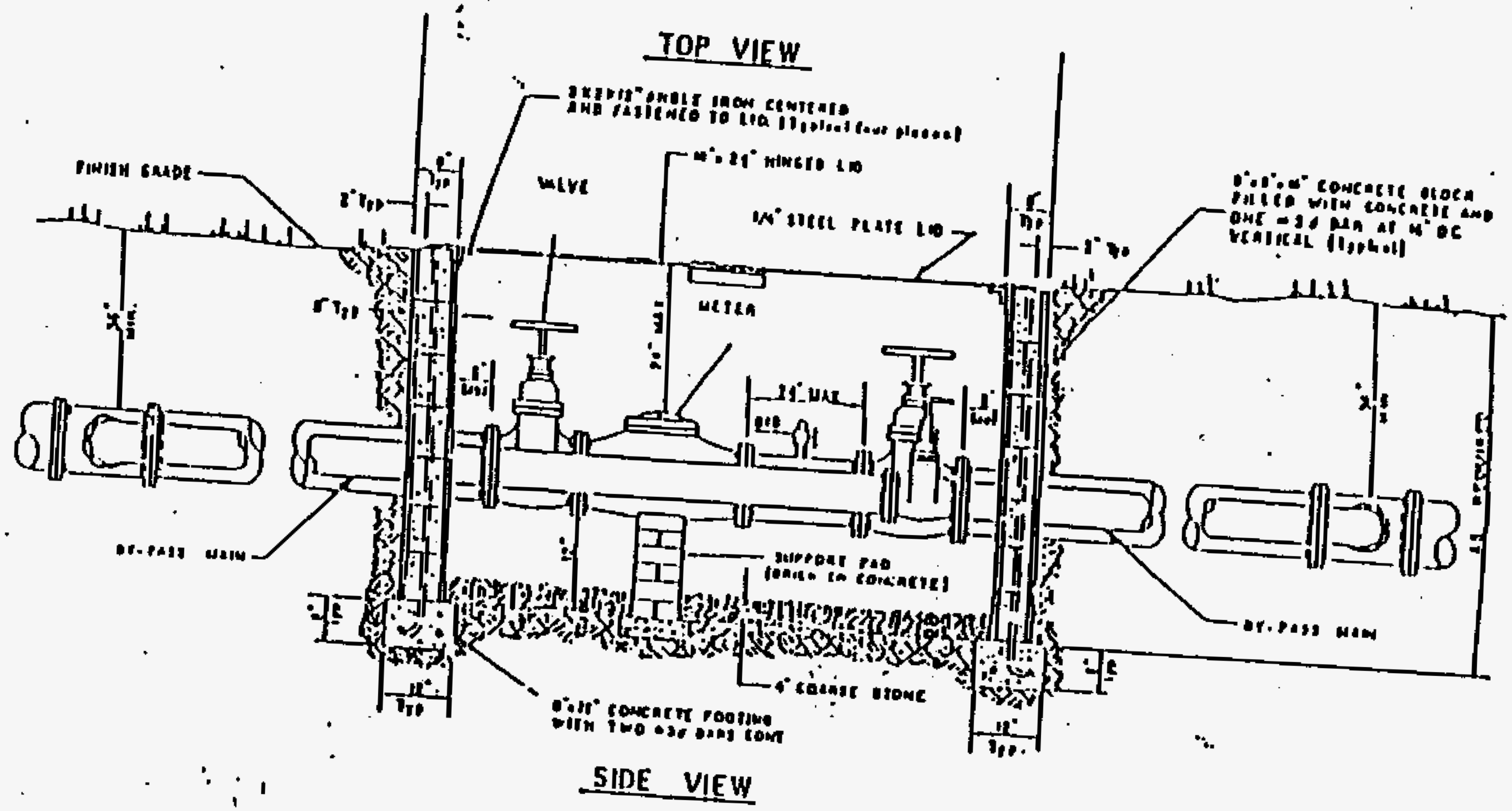
W11

0740



TYPICAL TURBINE METER

FOR 3" AND 4" METERS ONLY



TYPICAL TURBINE METER

FOR WATER METERS 6" OR LARGER

NOTE: JOINTS WITHIN METER BOX TO BE FLANGE TYPE

MARION COUNTY
PUBLIC WORKS DIVISION
WATER SUPPLY SYSTEMS

STANDARD DETAIL

W 12

SHEET 1 OF 2

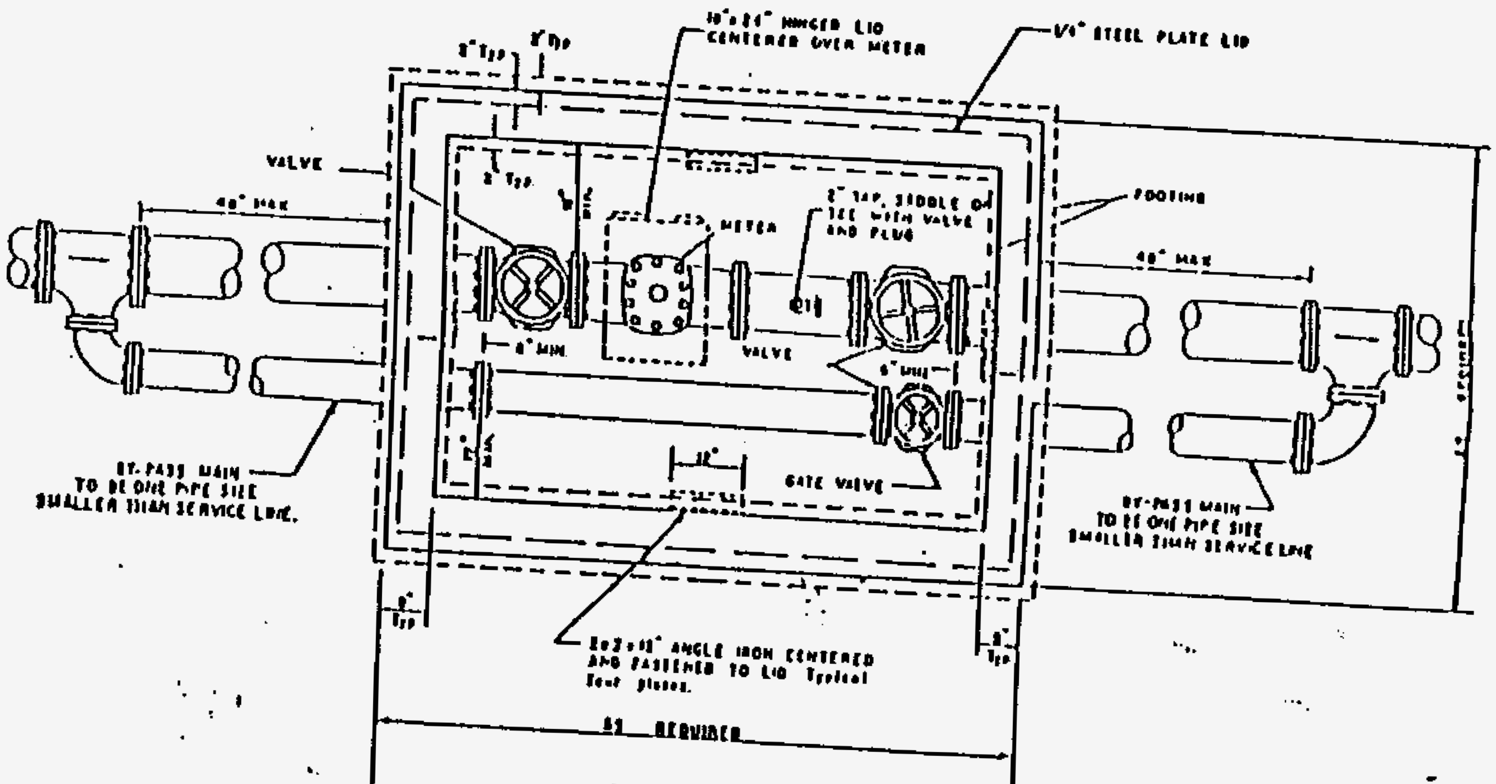
0741

MARION COUNTY
PUBLIC WORKS DIVISION
WATER SUPPLY SYSTEMS

STANDARD DETAIL

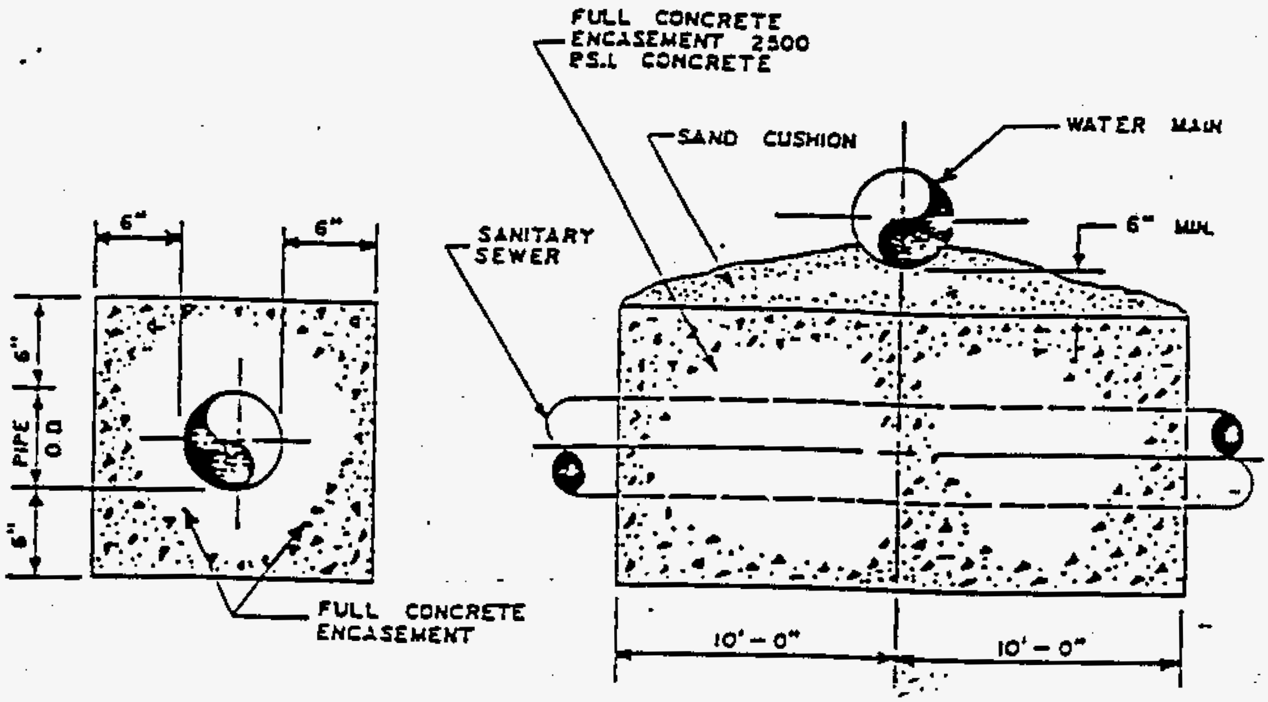
W 12

SHEET 2 OF 2



TOP VIEW

0742



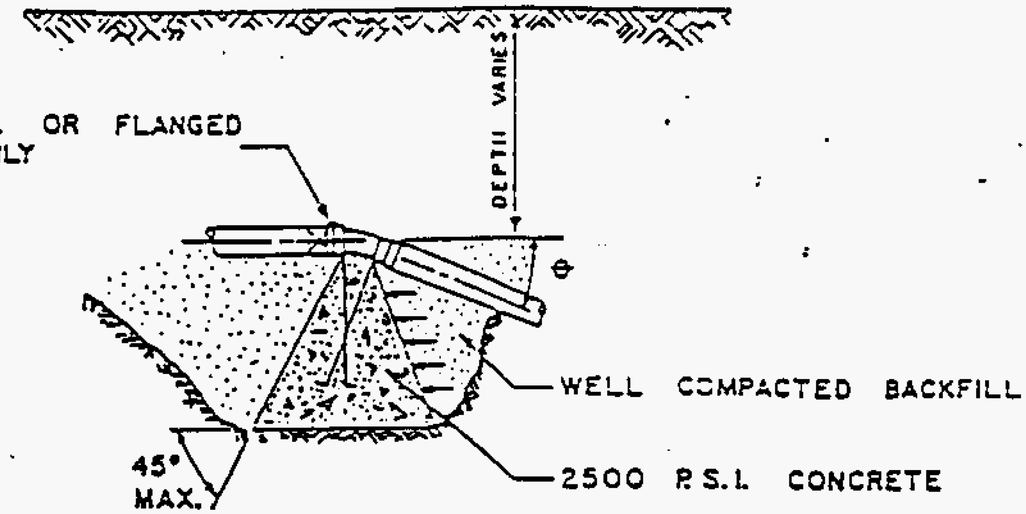
CONCRETE ENCASEMENT

NOTES

1. USE ENCASEMENT WHERE VERTICAL CLEARANCE BETWEEN WATER MAIN AND SEWER IS 18" OR LESS.

2. WHEN CROSSING SEWER MAIN, ONE FULL JOINT OF WATER PIPE SHALL BE CENTERED OVER THE SEWER MAIN.

MARION COUNTY PUBLIC WORKS DIVISION	STANDARD DETAIL	W13
WATER SUPPLY SYSTEMS		SHEET 1 OF 1



MINIMUM CONCRETE ANCHORS FOR BENDS TURNED DOWN. QUANTITIES IN CUBIC YARDS.			
PIPE SIZE	ANGLE θ		
	45° BEND	22.5° BEND	11.25° BEND
6"	0.7	0.4	0.2
8"	1.1	0.6	0.3
10"	1.5	1.0	0.5
12"	2.4	1.3	0.7

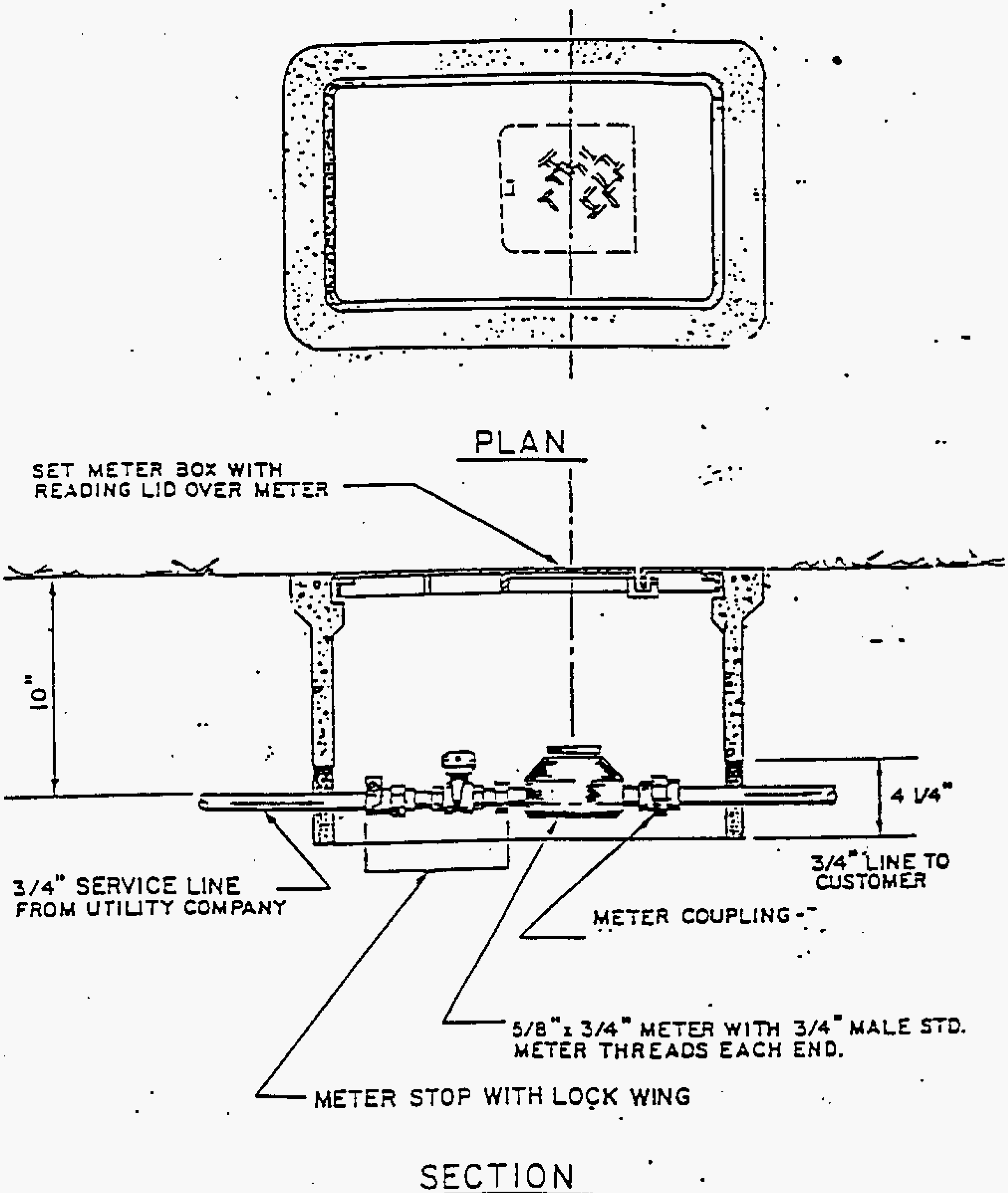
CONCRETE ANCHOR FOR TURNED-DOWN BENDS

NOTES

1. QUANTITIES ARE GIVEN FOR CONCRETE ANCHORS IN DRY SOIL. QUANTITIES OF CONCRETE ANCHORS TO BE USED BELOW THE GROUND WATER TABLE SHALL BE CALCULATED BY MULTIPLYING ABOVE VALUES BY 1.76.
2. VERTICAL BENDS TURNED UP SHALL BE ANCHORED WITH THE SAME SIZE ANCHORS AS SPECIFIED FOR HORIZONTAL BENDS. (SEE THRUST BLOCK DETAIL)
3. ANCHORS FOR PIPE LARGER THAN 12" SHALL BE DERIVED AT IN EACH CASE BY ENGINEER.

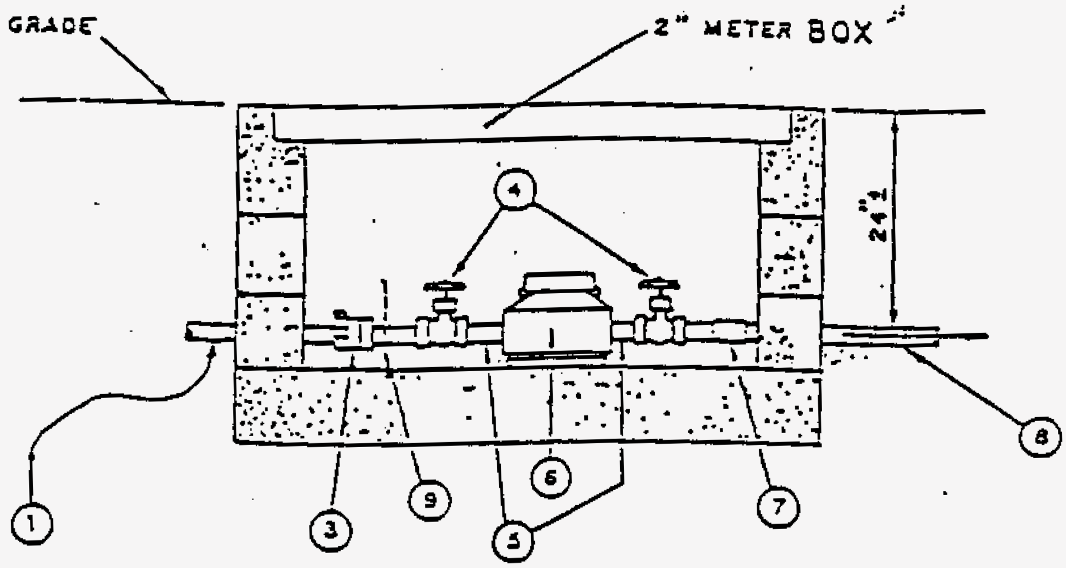
MARION COUNTY PUBLIC WORKS DIVISION	STANDARD DETAIL	W14
WATER SUPPLY SYSTEMS		SHEET 1 OF 1

SINGLE METER BOX



MARION COUNTY PUBLIC WORKS DIVISION WATER SUPPLY SYSTEMS	STANDARD DETAIL	W15 SHEET 1 OF 2

1 1/2" & 2" WATER METER CONNECTIONS



1. 2" SERVICE LINE FROM UTILITY COMPANY.

3. 2" MALE ADAPTER
4. 2" GATE VALVE FIP BOTH ENDS.
5. 2" METER COUPLING, MIP ONE END.
6. 2" METER.
7. 2" COUPLING, MIP ONE END, OTHER END COMPATIBLE WITH CUSTOMERS' PLUMBING.
8. 2" LINE TO CUSTOMER.
9. FOR 1 1/2" METER, PROVIDE REDUCER AT THIS POINT; ADJUST SIZES ACCORDINGLY.

MARION COUNTY PUBLIC WORKS DIVISION	STANDARD DETAIL	W 15
WATER SUPPLY SYSTEMS		2 of 2

APPENDIX A

TO DETERMINE AVERAGE DAILY FLOW:

ASSUME: CONSUMPTION RATE OF 100 GALLONS PER CAPITA PER DAY
2.5 PERSONS PER MULTI-FAMILY UNIT OR MOBILE HOME
3.5 PERSONS PER SINGLE FAMILY RESIDENCE
OTHER CONSUMPTION RATES AS GIVEN IN APPENDIX C

THEN AVERAGE DAILY FLOW IS THEN:

FOR SINGLE FAMILY RESIDENCE:	350 GALLONS PER DAY
FOR MULTI-FAMILY UNIT:	250 GALLONS PER DAY
FOR OTHERS:	AS DETERMINED FROM APPENDIX C

TO DETERMINE PEAK HOURLY DOMESTIC DEMAND RATE:
USE ATTACHED CHART FOR 400 OR LESS RESIDENCES, FOR MORE THAN 400
0.9 GALLONS PER MINUTE PER SINGLE FAMILY RESIDENCE
0.7 GALLONS PER MINUTE PER MULTI-FAMILY UNIT OR MOBILE HOME
0.7 GALLONS PER MINUTE PER ERU

(ERU = EQUIVALENT RESIDENTIAL UNIT = 312.5 GALLONS PER DAY. DIVIDE QUANITITY OBTAINED IN APPENDIX C BY 312.5 TO OBTAIN TOTAL ERU'S)

USE PEAK HOURLY DOMESTIC DEMAND RATE TO SIZE WATER PLANT WELLS, HYDROPNEUMATIC TANK, AND PUMPS.

TO DETERMINE THE SIZE OF PIPES, NUMBER OF HYDRANTS, ETC. IN THE WATER DISTRIBUTION SYSTEM IN ORDER TO ALLOW FOR FUTURE EXPANSION OF WATER PLANT AND/OR CONNECTION TO REGIONAL SYSTEMS:

DETERMINE PEAK HOURLY DOMESTIC DEMAND RATE AS SHOWN ABOVE. ENTER TABLE IN APPENDIX B WITH SAME TO DETERMINE FIRE FLOW REQUIREMENT FOR PROPERTIES BEING SERVED. USING HARDY-CROSS ANALYSIS DESIGN PIPE NETWORK SO THAT WATER DISTRIBUTION SYSTEM IS LARGE ENOUGH TO HANDLE BOTH DOMESTIC AND FIRE FLOWS JUST AS IF ADEQUATE FIRE FLOW STORAGE AND/OR PUMPING CAPACITY WERE PRESENT AT WATER PLANT SITE.

IT IS EMPHASIZED THAT WATER PLANTS TO BE CONSTRUCTED UNDER THIS ORDINANCE SHALL MEET THE REQUIREMENTS FOR DOMESTIC FLOWS ONLY WHILE WATER DISTRIBUTION SYSTEMS SHALL BE DESIGNED TO HANDLE BOTH DOMESTIC FLOWS AND FIRE FLOWS, EXCLUDING ANY REQUIRED FIRE FLOW STORAGE TANKS.

WHEN THE SYSTEM SERVES A POPULATION OF THREE HUNDRED OR MORE ADDITIONAL 100% BACKUP IN WATER SUPPLY WILL BE REQUIRED.

PEAK DOMESTIC DEMANDS

NO. CUST.	FLOW GPM	NO. CUST.	FLOW GPM	NO. CUST.	FLOW GPM
1	12.2	55	112.2	305	212.5
2	15.0	60	115.6	310	214.2
3	17.7	65	119.0	315	215.9
4	20.4	70	122.4	320	217.6
5	23.1	75	125.8	325	219.3
6	25.8	80	129.2	330	221.0
7	27.2	85	132.6	335	222.7
8	29.2	90	136.0	340	224.4
9	31.3	95	138.0	345	226.1
10	33.3	100	140.1	350	227.8
11	35.4	105	142.1	355	229.5
12	37.4	110	144.2	360	231.2
13	38.8	115	146.2	365	232.9
14	40.8	120	148.9	370	234.6
15	42.8	125	151.0	375	236.3
16	44.9	130	153.0	380	238.0
17	46.9	135	155.0	385	239.7
18	49.0	140	157.1	390	241.4
19	51.0	145	159.8	395	243.1
20	52.4	150	161.8	400	244.8
21	54.6	155	163.9		
22	56.8	160	165.9		
23	59.1	165	168.0		
24	61.3	170	170.7		
25	63.6	175	172.7		
26	65.8	180	174.8		
27	68.1	185	176.8		
28	70.3	190	179.5		
29	72.6	195	181.6		
30	74.8	200	183.6		
31	76.8	205	185.0		
32	78.9	210	186.3		
33	80.9	215	187.7		
34	83.0	220	189.0		
35	85.0	225	190.4		
36	87.0	230	191.8		
37	89.1	235	193.1		
38	91.1	240	194.5		
39	93.2	245	195.8		
40	95.2	250	197.2		
41	96.6	255	198.6		
42	97.9	260	199.9		
43	99.3	265	201.3		
44	100.6	270	202.6		
45	102.0	275	204.0		
46	103.4	280	205.4		
47	104.7	285	206.7		
48	106.1	290	208.1		
49	107.4	295	209.4		
50	108.8	300	210.8		

APPENDIX B

USING THE PEAK HOURLY DOMESTIC DEMAND RATE DETERMINED FROM APPENDIX A, DETERMINE FROM THESE TABLES THE MINIMUM REQUIRED FIRE FLOW RATES IN GALLONS PER MINUTE(TO BE USED IN DESIGNING WATER DISTRIBUTION SYSTEM)

FOR SINGLE FAMILY,MULTI-FAMILY AND MOBILE HOME DEVELOPMENTS IN LOW DENSITY AREAS (LESS THAN 9 UNITS PER ACRE) FIRE FLOW RATES,TIMES AND STORAGE SHALL BE BASED ON THE TABLE BELOW:

PEAK HOURLY DOMESTIC DEMAND RATE IN GPM	MINIMUM REQUIRED FIRE FLOW IN GPM	TOTAL FLOW TIME IN HRS	STORAGE TANK SIZE GALLONS (1)
0 TO 50	500	0.5	10,000 (2)
51 TO 100	500	1.0	20,000 (2)
101 TO 200	750	1.5	40,000 (2)
201 TO 300	1000	2.0	75,000 (2)
301 TO 400	1250	2.5	120,000 (2)
401 TO 500	1500	3.0	175,000 (2)
501 TO 600	1500	3.25	200,000
601 TO 750	1750	3.5	250,000
751 TO 1000	2000	4.0	350,000
1001 TO 1250	2250	4.5	450,000
1251 TO 1500	2500	5.0	600,000
OVER 1500	(3)	(3)	(3)

NOTES:

(1) THIS DOES NOT INCLUDE HYDROPNEUMATIC TANK STORAGE CAPACITY.

(2) WHERE TWO WELLS ARE PROVIDED AND TOTAL PUMP CAPACITY EXCEEDS 100% OF COMBINED PEAK HOURLY DOMESTIC DEMAND RATE AND REQUIRED FIRE FLOW DEMAND RATE,FIRE FLOW STORAGE TANKS ARE NOT REQUIRED.

(3) TO BE CALCULATED BY PROJECT ENGINEER

FOR HIGH DENSITY (9 OR MORE UNITS PER ACRE) MULTI-FAMILY RESIDENTIAL AREAS AND COMMERCIAL,INSTITUTIONAL OR INDUSTRIAL AREAS FIRE FLOW RATES,TIMES AND STORAGE SHALL BE BASED ON THE TABLE BELOW.

PEAK HOURLY DEMAND RATE IN GPM	MINIMUM REQUIRED FIRE FLOW IN GPM	MINIMUM TIME FOR TOTAL FLOW IN HOURS	MINIMUM STORAGE IN GALLONS (1)
0 TO 50	1000	1.0	50,000 (2)
51 TO 100	1500	2.0	100,000 (2)
101 TO 200	1500	2.5	125,000 (2)
201 TO 300	1500	3.0	160,000 (2)
301 TO 400	1500	3.5	200,000 (2)
401 TO 500	1500	3.75	225,000 (2)
501 TO 600	1500	4.0	250,000
601 TO 750	1750	4.0	300,000
751 TO 1000	2000	4.0	350,000
1001 TO 1250	2250	4.5	450,000
1251 TO 1500	2500	5.0	600,000
OVER 1500	(3)	(3)	(3)

SEE NOTES ON PREVIOUS PAGE

APPENDIX C

The following table shall be used to establish Design ERU's in connection with this ordinance:

ESTABLISHMENT	AVERAGE DAILY FLOW (DESIGN)
1. Bars (No Food Service)	30 GPD per Seat
2. Banquet Rooms	5 GPD per Seat
3. Bowling Alley (No Food Service - No Bar)	100 GPD per Lane
4. Barber Shops	100 GPD per Chair
5. Beauty Salons	270 GPD per Chair
6. Boarding Schools	75 GPD per Pupil
7. Car Washes:	
(a) Customer Stall Type	1.5 GPD per Square Foot Floor Space
(b) Automatic & Drive Thru	2.5 GPD per Square Foot Floor Space
8. Churches, Assembly Halls, Theatre, Arena, Auditoriums	
(a) No Food Service	3 GPD per Seat
(b) With Food Service	5 GPD per Seat
9. Clubs:	
(a) County or Golf Clubs	65 GPD per Member
(b) Swimming Club or Pools	25 GPD per Member
(c) Boating Club	10 GPD per Member
(d) Lodges & Fraternal Organizations	10 GPD per Member
10. Cocktail Lounges	30 GPD per Seat
11. Coffee Shops (12 hour or less Operations)	25 GPD per Seat
12. Drive-In Theatre	5 GPD per Car Space
13. Factories:	
(a) No Showers-No Industrial Waste	25 GPD per Employee per Shift
(b) Showers - No Industrial Waste	35 GPD per Employee per Shift
(c) With Cafeteria - Add	5 GPD per Employee per Shift
14. Hospitals	
(a) No Resident Personnel	200 GPD per Bed
(b) With Resident Personnel	250 GPD per Bed
15. Hotels - Motels	150 GPD per Unit
(a) Add for Coffee/Shop/ Restaurant/Lounge	PER INDIVIDUAL ELEMENT
16. Mobile Unit Parks (Tourist or Recreation Vehicles)	
(a) With Central Toilet Facilities	100 GPD per Space
(B) With Individual Sewer Connection	200 GPD per Space
17. Laundromats	200 GPD per Machine

ESTABLISHMENT	AVERAGE DAILY FLOW (DESIGN)
18. Institutions (Nursing, Rest, Boarding Homes)	100 GPD per person
19. Offices:	
(a) General Offices	0.14 GPD per Square Foot Floor Space
(b) Medical/Dental Offices	0.30 GPD per Square Foot Floor Space
20. Parks	
(a) Recreational	100 GPD per Water Closet
(b) Stadiums, Frontons, Ball Parks, etc.	3 GPD per Seat
21. Restaurants	1.0 GPD per Square Foot Floor Space
22. Schools	
(a) Elementary	15 GPD per Pupil
(b) Jr. High and High Schools	25 GPD per Pupil
(c) With Cafeteria	5 GPD per Pupil
23. Shopping Centers & Department Stores	
(a) Without Food Service or Laundries	0.16 GPD per Square Foot of Building
(b) Add for Restaurant, Coffee Shop, Lounge, etc.	PER INDIVIDUAL UNIT
24. Service Station	500 GPD per Island or Set of Pumps
25. Swimming Pools (Public)	10 GPD per Swimmer
26. Warehouses & Industrial Sites	
(a) Warehouses (No Showers, No Volatile Storage)	100 GPD per Water Closet
(b) Warehouses (Showers, No Volatile Storage)	200 GPD per Water Closet
(c) Warehouses (Volatile Storage)	Per County Fire Prevention Requirements
(d) Light Industrial Parks or Buildings	15 GPD per Employee
27. Miscellaneous	
(a) Youth & Recreation Camps	50 GPD per Camper
(b) Labor Camps	50 GPD per Occupant

"Floor Space", as used herein, is defined as the total area inside the exterior walls of a building, measured at the intersection of the exterior wall and the floor being measured. The Total "Floor Space" considered shall be the sum of the area of all floors, for multistoried buildings.

MARTIN COUNTY

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APR - 5 1990

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

COUNTY OF MARTIN COUNTY OF MARTIN STATE OF FLORIDA **STATE OF FLORIDA**

DEPARTMENT OF PUBLIC SAFETY
6000 S.E. Tower Drive
Stuart, Florida 34997-7699
WILLIAM F. O'BRIEN, III • Director

PHONE (407) 287-1652

SUNCOM 239-5693

Dial Direct:
288-5633/34

File
To: Gary Morse

April 2, 1990

PS-FC-90-778

Dyer, Riddle & Precourt, Inc.
1505 E. Colonial Drive
Orlando, Florida 32853

Dear Mr. Fox:

This letter should serve as verification that the Martin County Fire Marshal's Office utilizes I.S.O. Fire Flow Guidelines wherever practicable.

If we can be of any further assistance, please contact this office.

Respectfully

Bart Stuart

Bartley D. Stuart,
Deputy Chief - Fire Prevention

FTS/BDS/ejh

NASSAU COUNTY

- 1992 FPSC Filing -

NASSAU COUNTY BOARD OF COUNTY COMMISSIONERS
DEPARTMENT OF EMERGENCY SERVICES
NASSAU COUNTY OFFICE ANNEX
11 North 14th Street, Box 12
Fernandina Beach, Florida 32034-0494

ARMON C. SUMMERALL
Director

DIVISIONS
- Civil Defense
- Communications
- Emergency Medical Services
- Fire
- Fuel Allocation
- Water Safety

(904) 261-6612
(904) 879-3300
Suncom 821-5227
Emergency Dial 911
(904) 261-5962

December 10, 1990

Southern States Utilities
ATTN: Phillip Story
1000 Color Place
Apopka, Florida 32703

Dear Mr. Story:

Per your request please find enclosed copies of NFPA 1231 and NFPA 24 in reference to water supply for fire fighting purposes. There are additional codes, however, that apply to commercial buildings with fire pumps, alternative water supplies that may not be fully addressed in these publications.

Another source of reference material would be to contact the local State Fire Marshal's office in your area.

Sincerely,

Scott R. Westgate
Fire Marshal
Nassau County

SW/swt

NFPA 1231

Standard on Water Supplies for

Suburban and Rural Fire Fighting

1989 Edition

This edition of NFPA 1231, *Standard on Water Supplies for Suburban and Rural Fire Fighting*, was prepared by the Technical Committee on Forest and Rural Fire Protection and acted on by the National Fire Protection Association, Inc. at its Annual Meeting held May 15-18, 1989 in Washington, DC. It was issued by the Standards Council on July 14, 1989, with an effective date of August 7, 1989, and supersedes all previous editions.

The 1989 edition of this standard has been approved by the American National Standards Institute.

Origin and Development of NFPA 1231

This text originally was NFPA 25, *Recommended Practices for Water Supply Systems for Rural Fire Protection*, and originally was developed by the Subcommittee on Water Supply Systems for Rural Fire Protection of the Committee on Rural Fire Protection and Prevention. It received tentative adoption in 1969 and was further amended and adopted in May 1969 as NFPA 25.

The 1975 edition represented a complete revision of the previous document. This edition underwent a title change to *Water Supplies for Suburban and Rural Fire Fighting* and was renumbered NFPA 1231.

The 1984 edition represented a complete revision to include both mandatory and advisory material.

This 1989 edition is the fourth revision and incorporates some significant changes and additions.

Technical Committee on Forest and Rural Fire Protection

R. L. Bjornsen, *Chairman*
Fire Management Associates

Donald G. Perry, *Vice Chairman*
Santa Barbara County Fire Dept., CA

James T. Wooters, *Vice Chairman*
DeKalb County Fire Services

Mary D. Chambers, *Secretary*
Bernalillo County Fire District 10

Fred G. Allinson, Natl Volunteer Fire Council
Lynn R. Biddison, Chemonics, Fire Tral
John E. Bunting, New Boston Fire Dept., NH
George R. Cowan, Wormald CDN Inc.
Richard J. Day, California Division of Forestry and Fire Protection
Dennis Dube, Canadian Forestry Service
J. A. Foster, ISO Commercial Risk Services Inc.
Donald C. Freyer, Georgia Forestry Commission
William Goldfeder, Loudon County Dept. of Fire & Rescue
Salvatore M. Grasso, Fred S. James & Co. of NY Inc.
Edward T. Grohe, Western Fire Equipment Co.
Roy G. Hatcher, Iowa Conservation Commission
Louis G. Jekel, Rural/Metro Corp.
Ralph R. Lafferty, MacMillan Bloedel Ltd
John F. Marker, Forest Service USDA
Paul G. Mason, M&M Protection Consultants
Richard E. Montague, Incident Management Concepts
Frederick S. Richards, Office of Fire Prev. & Control, NYS Dept. of State
James C. Sorenson, USDA Forest Service
Howard L. Vandersall, Lawdon Fire Services, Inc.
David D. Walizer, State Fire Marshal's Office, CA
Louis A. Witzeman, Scottsdale Fire Dept., AZ

Alternates

Charles E. Lundfelt, North Star Serv. Area
(Alternate to W. Goldfeder)
Edward G. Mazurkiewicz, M&M Protection Consultants
(Alternate to Paul Mason)
John Vieweger, Ansul Fire Protection, Wormald US Inc.
(Alternate to George Cowan)

Bill Baden, NFPA Staff Liaison

This list represents the membership at the time the Committee was balloted on the text of this edition. Since that time, changes in the membership may have occurred.

NOTE: Membership on a Committee shall not in and of itself constitute an endorsement of the Association or any document developed by the Committee on which the member serves.

Contents

NFPA 1231

Standard on Water Supplies for

Suburban and Rural Fire Fighting

1989 Edition

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates explanatory material on that paragraph in Appendix A.

Information on referenced publications can be found in Chapter 6 and Appendix H.

Chapter 1 Administration

1-1* Scope. This standard identifies minimum requirements for water supplies for fire fighting purposes in rural and suburban areas in which adequate and reliable water supply systems for fire fighting purposes do not exist.

1-2 Purpose. This standard specifies minimum requirements for water supply for fire fighting purposes to protect property from fire in areas where water must be transported from a river, lake, canal, bay, stream, pond, well, cistern, or other similar source of water that is available as a suction supply for fire department use. Water obtained by methods outlined in this standard may be used to supplement water for fire fighting available from hydrants on a traditional municipal-type distribution system. Likewise, a hydrant served by a water distribution system may be the source of supply for water that is transported to the rural fire area.

It is the intent of this standard to provide and maintain minimum water supplies for fire fighting purposes through the establishment of a cooperative working arrangement among the authority having jurisdiction, the fire department having jurisdiction, and the property owners in the jurisdiction.

This standard provides minimum requirements and nothing herein shall be interpreted to mean that the authority having jurisdiction cannot exceed any or all of these requirements where, in the judgment of such authority having jurisdiction, additional protection is warranted.

This standard is restricted to identifying minimum requirements for water supplies for fire fighting purposes. Much information has been added to the appendix of this standard concerning rural water supplies, hauling of water, transporting water through large diameter hose, portable pumping equipment, and automatic sprinkler protection, any or all of which may comprise a rural "water system."

1-3 General.

1-3.1 The requirements of Chapters 5 and 6 of this standard are performance oriented and allow the authority having jurisdiction the option to specify how these water supplies are made available, thereby giving consideration to local conditions and need.

1-3.2 Although the water requirements developed by this standard are performance oriented, it must be emphasized that they are minimum in scope. The water available to the fire department, which may come from single or multiple water points, must be delivered to the fire scene. The authority having jurisdiction may determine that additional water supplies are warranted. Appendix G contains secondary water supply requirements useful when the authority having jurisdiction determines additional water supplies are desirable.

1-3.3 Fire apparatus and associated equipment are important components of the water transport process. Many alternative approaches to fulfilling this process are provided in Appendices C, D, and E.

Apparatus shall meet the requirements outlined in NFPA 1901, *Standard on Automotive Fire Apparatus*, and other applicable NFPA standards.

1-3.4 Fire control and extinguishment is probable only when a prompt alarm notification initiates an immediate response, which in return results in effective agent application confining the fire to the area or origin.

1-3.5 The effectiveness and reliability of fixed fire protection systems is a documented fact. Strong consideration shall be given to installation of sprinkler systems as outlined in NFPA 13, *Standard for the Installation of Sprinkler Systems*, and NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Mobile Homes*.

1-4 Definitions.

Adequate and Reliable Water Supply. A supply that is sufficient every day of the year to control and extinguish anticipated fires in the municipality, particular building, or building group served by the water supply.

Approved. Acceptable to the "authority having jurisdiction."

NOTE: The National Fire Protection Association does not approve, inspect or certify any installations, procedures, equipment, or materials nor does it approve or evaluate testing laboratories. In determining the acceptability of installations or procedures, equipment or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization concerned with product evaluations which is in a position to determine compliance with appropriate standards for the current production of listed items.

Authority Having Jurisdiction. The "authority having jurisdiction" is the organization, office or individual responsible for "approving" equipment, an installation or a procedure.

NOTE: The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner since jurisdictions and "approval" agencies vary as do their responsibilities. Where public safety is primary, the "authority having jurisdiction" may be a federal, state, local or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department, health department, building official, electrical inspector, or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the "authority having jurisdiction." In many circumstances the property owner or his designated agent assumes the role of the "authority having jurisdiction"; at government installations, the commanding officer or departmental official may be the "authority having jurisdiction."

Automatic Aid. A plan developed between two or more fire departments for immediate joint response on first alarms.

Building. Any structure erected for the support, shelter, or enclosure of persons, animals, or property of any kind.

Construction Classification Number. A series of numbers from 0.50 through 1.50 that are mathematical factors used in a formula to determine total water supply requirements of this standard only.

Exposure Hazard. A structure within 50 ft (15.2 m) of another building and 100 sq ft (9.3 m²) or larger in area. If a structure is of occupancy hazard classification number 3 or 4, it is considered an exposure hazard if within 50 ft (15.2 m) of another building, regardless of size.

Fire Department Having Jurisdiction. The fire department serving the municipality, or any portion of the municipality, governed by the authority having jurisdiction. The authority having jurisdiction and the fire department having jurisdiction may be the same agency.

Labeled. Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Large Diameter Hose. Fire department hose having an inside diameter of 3½ in. (89 mm) or larger.

Listed. Equipment or materials included in a list published by an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

NOTE: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The "authority having jurisdiction" should utilize the system employed by the listing organization to identify a listed product.

Minimum Requirements for Water Supply. The smallest quantity of water supply suggested for any degree of fire control. In some fires this supply may be suitable for protecting exposures only.

Municipality. A town, city, county, fire district, or community having powers of local self-government.

Municipal-Type Water System. A system having water pipe serving hydrants and designed to furnish, over and above domestic consumption, a minimum flow of 250 gpm (946 L/min) and 20 psi (139 kPa) residual pressure for a two-hour duration.

Mutual Aid. A plan developed between two or more departments to render assistance to the parties of the agreement. Often the request for such aid to be rendered comes only after an initial response has been made and the fire scene status has been determined.

Normal Living Area — Dwelling. This area shall include typical rooms, such as living room, dining area, parlor, kitchen, bath, bedroom, halls, library, music room, family room, laundry room, etc., and includes any other areas that are normally heated or cooled plus attic-basement provisions, enclosed parking (garage), and storage areas.

Occupancy Hazard Classification Number. A series of numbers from 3 through 7 that are mathematical factors used in a formula to determine total water supply requirements of this standard only.

Protected Property. Property protected by a water supply that is minimally adequate in volume and duration and by a fire department capable of using the water supply to suppress a possible fire within the property.

Secondary (Design) Water Supply. The estimated rate of flow (expressed in gpm for a prescribed time period) that is considered necessary to control a major fire in a building or structure.

Shall. Indicates a mandatory requirement.

Should. Indicates a recommendation or that which is advised but not required.

Single Water Point. The point or site at which water supply, such as a pumper with portable folding tank or dry hydrant, etc., may be located to protect a cluster of buildings, such as a subdivision or an estate.

Water Supply Officer. The fire department officer responsible for providing water for fire fighting purposes.

Chapter 2 Structure Surveys

2-1 General.

2-1.1* The fire department having jurisdiction shall perform an on-site survey of all buildings, including type of construction, occupancies, and exposures, within the applicable jurisdiction to obtain the information needed to compute the minimum water supplies required. At the time of the on-site survey, a record shall be prepared of available water supplies. This information is to be utilized for prefire planning purposes as well as by the water supply officer.

2-1.2 Areas specified in 5-2.1, 5-3.1, and 5-4.1 may be surveyed as an area to determine square footage or cubic footage and square meters or cubic meters of each struc-

—re and distance to structural exposure hazards, but without a survey of contents.

2-1.3 These surveys may be combined with fire prevention or prefire planning inspections.

Chapter 3 Classification of Occupancy Hazard

3-1 General.

3-1.1 The fire department having jurisdiction, upon completing the survey specified in Chapter 2, shall determine the occupancy hazard classification number from the sections of this chapter.

3-1.2 Occupancy hazard classification numbers shall not be assigned to any structure not surveyed as specified in Chapter 2.

3-1.3 An occupancy hazard classification number shall not be assigned to any building when such building is protected by an automatic sprinkler system installed in accordance with applicable NFPA standards.

3-1.4* Storage of products potentially hazardous from the standpoint of increased fire volume or of those having an explosive nature exists at many *rural locations*, and such products may be in sufficient quantities to increase the occupancy hazard classification number of the building.

3-2* Occupancy Hazard Classification Number.

3-2.1 The occupancies listed in each section are only examples of types of occupancies for the particular classification, and these lists of examples shall not be interpreted as being exclusive. Similar occupancies shall be assigned the same occupancy hazard classification number.

3-2.2 Where more than one occupancy is present in a structure, the occupancy hazard classification number for the most hazardous occupancy shall be used for the entire structure.

3-2.3 Occupancy Hazard Classification Number 3.

3-2.3.1 Occupancies in this classification are considered SEVERE HAZARD OCCUPANCIES, where quantity and combustibility of contents are very high. Fires in these occupancies can be expected to develop very rapidly and have high rates of heat release. (*See 5-5.1.*)

3-2.3.2 When an exposing structure is of occupany hazard classification number 3, it is considered an exposure hazard if within 50 ft (15.2 m), regardless of size.

3-2.3.3 Occupancy hazard classification number 3 examples include:

Aircraft Hangars
Cereal or Flour Mills
Chemical Works and Plants
Cotton Picker and Opening Operations
Distilleries
Explosives and Pyrotechnics Manufacturing and Storage
Feed and Grist Mills
Grain Elevators and Warehouses
Linseed Oil Mills
Lumberyards
Oil Refineries
Plastics Manufacturing and Storage
Saw Mills
Solvent Extracting
Straw or Hay in Bales
Varnish and Paint Manufacturing

3-2.4 Occupancy Hazard Classification Number 4.

3-2.4.1 Occupancies in this classification are considered HIGH HAZARD OCCUPANCIES, where quantity and combustibility of contents are high. Fires in these occupancies can be expected to develop rapidly and have high rates of heat release.

3-2.4.2 When an exposing structure is of occupancy hazard classification number 4, it is considered an exposure hazard if within 50 ft (15.2 m), regardless of size.

3-2.4.3 Occupancy hazard classification number 4 examples include:

Barns and Stables (commercial)
Building Materials
Department Stores
Exhibition Halls, Auditoriums, and Theaters
Feed Stores (without processing)
Freight Terminals
Mercantiles
Paper and Pulp Mills
Paper Processing Plants
Piers and Wharves
Repair Garages
Rubber Products — Manufacturing and Storage
Warehouses, such as:
- paper
- furniture
- paint
- department store
- general storage
- whiskey

Woodworking Industries

3-2.5 Occupancy Hazard Classification Number 5.

3-2.5.1 Occupancies in this classification are considered MODERATE HAZARD OCCUPANCIES, where quantity and combustibility of contents are moderate and stockpiles of combustibles do not exceed 12 ft (3.7 m) in height. Fires in these occupancies can be expected to develop quickly and have moderately high rates of heat release.

3-2.5.2 Occupancy hazard classification number 5 examples include:

Amusement Occupancies
Clothing Manufacturing Plants
Cold Storage Warehouses
Confectionery Product Warehouses
Farm Storage Buildings, such as:
  dairy barns
  equipment sheds
  corn cribs
Hatcheries
Laundries
Leather Goods Manufacturing Plants
Libraries (with large stock room areas)
Lithography Shops
Machine Shops
Metalworking Shops
Nurseries (plant)
Pharmaceutical Manufacturing Plants
Printing and Publishing Plants
Restaurants
Rope and Twine Manufacturing Plants
Sugar Refineries
Tanneries
Textile Manufacturing Plants
Tobacco Barns
Unoccupied Buildings

3-2.6 Occupancy Hazard Classification Number 6.

3-2.6.1 Occupancies in this classification are considered LOW HAZARD OCCUPANCIES, where quantity and combustibility of contents are moderate and stockpiles of combustibles do not exceed 8 ft (2.44 m) in height. Fires in these occupancies can be expected to develop at a moderate rate and have moderate rates of heat release.

3-2.6.2 Occupancy hazard classification number 6 examples include:

Armories
Automobile Parking Garages
Bakeries
Barber or Beauty Shops
Beverage Manufacturing Plants
Boiler Houses
Breweries
Brick, Tile, and Clay Product Manufacturing Plants
Canneries
Cement Plants
Churches
Dairy Products Manufacturing and Processing
Doctors' Offices
Electronics Plants
Foundries
Fur Processing Plants
Gasoline Service Stations
Glass and Glass Products Manufacturing Plants
Municipal Buildings
Post Offices
Slaughterhouses
Telephone Exchanges
Undertaking Establishments
Watch and Jewelry Manufacturing Plants
Wineries

3-2.7 Occupancy Hazard Classification Number 7.

3-2.7.1 Occupancies in this classification are considered LIGHT HAZARD OCCUPANCIES, where quantity and combustibility of contents are low. Fires in these occupancies can be expected to develop at a relatively low rate and have relatively low rates of heat release.

3-2.7.2 Occupancy hazard classification number 7 examples include:

Apartments
Colleges and Universities
Dormitories
Dwellings
Fire Stations
Fraternity or Sorority Houses
Hospitals
Hotels and Motels
Libraries (except large stock room areas)
Museums
Nursing and Convalescent Homes
Offices (including data processing)
Police Stations
Prisons
Schools

Chapter 4 Classification of Construction

4-1 General.

4-1.1 The fire department having jurisdiction, upon completing the survey specified in Chapter 2, shall determine the construction classification number from the sections of this chapter.

4-1.2 For the purpose of this standard, each building surveyed shall be classified as to type of construction and shall be assigned a construction classification number. However, no dwelling shall be assigned a construction classification number higher than 1.0.

4-1.3 Construction classification numbers shall not be assigned to any structure not surveyed as specified in Chapter 2.

4-1.4 Where more than one type of construction is pres- in a structure, the higher construction classification .iber shall be used for the entire structure.

4-1.5 When a building is located within 50 ft (15.2 m) of the surveyed building and is 100 sq ft (9.3 m^2) or greater in total area, the building is treated as an exposure with the water requirement calculated by the standard multiplied by 1.5.

4-2* Construction Classification Number.

4-2.1 The construction classifications listed in this standard have been simplified for quick use. When a more complete definition is needed, refer to NFPA 220, *Standard on Types of Building Construction*, or the local building code.

4-2.2 Type I (Fire-Resistive) Construction — Construction Classification Number 0.5. A building constructed of noncombustible materials (reinforced concrete, brick, stone, etc., and having any metal members properly "fireproofed") with major structural members designed to withstand collapse and to prevent the spread of fire.

4-2.3 Types II and IV (Noncombustible) and Heavy Timber Construction — Construction Classification Number 0.75. A building having all structural members (including walls, floors, and roofs) of noncombustible materials and not qualifying as fire-resistive construction.

Also, heavy timber construction in which walls are ·sonry, columns are 8-in. wood supports, floors are 3-in. .ue and grooved plank, and roof decks are 2-in. tongue ... grooved plank. All wood beams and girders are 6 in. wide and 10 in. deep.

4-2.4* Type III (Ordinary) Construction — Construction Classification Number 1.0. Any structure having exterior walls of masonry or other noncombustible material, in which the other structural members are wholly or partly of wood or other combustible material.

4-2.5* Type V (Wood Frame) Construction — Construction Classification Number 1.50. Any structure in which the structural members are wholly or partly of wood or other combustible material and the construction does not qualify as ordinary construction.

When a dwelling is classified as wood frame construction (that is, having structural members wholly or partly of wood or other combustible material), assign a construction classification number of 1.0.

Chapter 5 Determining Minimum Water Supplies

5-1 General.

5-1.1 The fire department having jurisdiction for structural surveys specified in Chapter 2, after completing the vey and determining the construction classification .ber and the occupancy hazard classification number, ..all compute the minimum water supply, in gallons (liters), needed for the structure in its authority. As the water supplies developed by this standard are minimum and in many cases may be suitable for exposure protection only, the authority having jurisdiction shall review the calculations to see that the flows are available to meet the needs indicated by the preplans.

5-2 Single Structures without Exposure Hazards.

5-2.1* For single structures with no portion of any unattached structural exposure hazard within 50 ft (15.2 m), unless it is smaller than 100 sq ft (9.3 m^2), the minimum water supply, in gallons, shall be determined by the total cubic footage of the structure including any attached structures, divided by the occupancy hazard classification number, determined from Chapter 3, and multiplied by the construction classification number, as determined from Chapter 4, or see Table 5-9.1(a).

$$\text{MINIMUM WATER SUPPLY} = \frac{\text{Total Cu Ft of Structure}}{\text{Occupancy Hazard Classification}} \times \text{Construction Classification No.}$$

5-2.1.1 The minimum water supply required for any structure, without exposure hazards, shall not be less than 2,000 gal (7570 L). [*See Table 5-9.1(b).*]

5-2.1.2 The minimum water supply, as determined for any structure specified in 5-2.1 and 5-2.1.1, shall be available on the fireground at, and the fire department shall be capable of utilizing the total water supply at, the rates specified in Table 5-9.1(c).

5-3 Single Structures with Exposure Hazards.

5-3.1* For all single structures with unattached structural exposure hazard closer than 50 ft (15.2 m) to any portion of the dwelling and larger than 100 sq ft (9.3 m^2), the minimum water supply, in gallons, shall be determined by the total cubic footage of the structure, including any attached structures, divided by the occupancy hazard classification number determined from Chapter 3, multiplied by the construction classification number as determined by Chapter 4 and multiplied by 1.5. [*See Table 5-9.1(a).*]

$$\text{MINIMUM WATER SUPPLY} = \frac{\text{Total Cu Ft of Structure}}{\text{Occupancy Hazard Classification}} \times \text{Construction Classification No.} \times 1.5$$

5-3.1.1 The minimum water supply required for a single structure with exposure hazards specified in 5-3.1 shall not be less than 3,000 gal (11 355 L). [*See Table 5-9.1(b).*]

5-3.1.2 The minimum water supply, as determined for any structure specified in 5-3.1 and 5-3.1.1, shall be available on the fireground at, and the fire department shall be capable of utilizing the minimum water supply at, the rates specified in Table 5-9.1(c).

5-4 Multiple Structures — Single Water Point without Exposure Hazards.

5-4.1* For all multiple structures with no portion of any unattached structural exposure hazard within 50 ft (15.2 m) unless it is smaller than 100 sq ft (9.3 m^2), the minimum water supply, in gallons, shall be determined by the total cubic footage of the structure, including any attached structures, divided by the occupancy hazard classification number as determined from Chapter 4, or see Table 5-9.1(a).

Where structures are close enough together that they may be served from a single water point, the water supply shall be computed from the structure having the largest minimum water supply requirement.

5-4.1.1 The minimum water supply required for multiple structures specified in 5-4.1 shall not be less than 3,000 gal (11 355 L). [*See Table 5-9.1(b).*]

5-4.1.2 The minimum water supply as determined for any structure specified in 5-4.1 and 5-4.1.1 shall be available on the fireground at, and the fire department shall be capable of utilizing the minimum water supply at, the rate specified in Table 5-9.1(c).

$$\text{MINIMUM WATER SUPPLY} = \frac{\text{Total Cu Ft of Structure}}{\text{Occupancy Hazard Classification}} \times \text{Construction Classification No.}$$

5-5 Multiple Structures — Single Water Point with Exposure Hazards.

5-5.1* For all multiple structures with unattached structural exposure hazards within 50 ft (15.2 m) to any portion of the structure and larger than 100 sq ft (9.3 m^2), the total water supply, in gallons, shall be determined by the cubic footage of the structure, including any attached structures, divided by the occupancy hazard classification number, as determined from Chapter 3, multiplied by the construction classification number, as determined from Chapter 4, and multiplied by 1.5, or see Table 5-9.1(a).

$$\text{MINIMUM WATER SUPPLY} = \frac{\text{Total Cu Ft of Structure}}{\text{Occupancy Hazard Classification}} \times \text{Construction Classification No.} \times 1.5$$

5-5.1.1 The minimum water supply required for multiple structures specified in 5-5.1 shall not be less than 3,000 gal (11 355 L). [*See Table 5-9.1(b).*]

5-5.1.2 The minimum water supply, as determined for any structure specified in 5-5.1 and 5-5.1.1 shall be available on the fireground at, and the fire department shall be capable of utilizing the minimum water supply at, the rate specified in Table 5-9.1(c).

5-6 Special Fire Protection Problems.

5-6.1* This standard is not intended to provide details for calculating an adequate amount of water for large special fire protection problems such as bulk flammable liquid storage, bulk flammable gas storage, large varnish and paint factories, some plastics manufacturing and storage, aircraft hangars, distilleries, refineries, lumberyards, grain elevators, large chemical plants, coal mines, tunnels, subterranean structures, and warehouses using high pack storage for flammables or pressurized aerosols. For suggested protection, consult appropriate NFPA standards.

5-7 Structures with Automatic Sprinkler Protection.

5-7.1* For any structure protected by an automatic sprinkler system that fully meets the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems*, and NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Mobile Homes*, the fire department having jurisdiction may waive any requirement for additional water supply required by this standard. (*See Appendix F.*)

5-7.1.1* The water supply for automatic sprinkler systems referred to in 5-7.1 contemplates the use of outside hose lines; therefore, this water supply shall be available to the fire department outside the structure for manual fire fighting purposes.

5-7.1.2 Automatic sprinkler systems referred to in 5-7.1 and meeting the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems*, shall, in all cases, be provided with a fire department connection as described in NFPA 13, Section 2-7.

5-7.2 For a structure protected by an automatic sprinkler system that does not fully meet the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems*, and NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Mobile Homes*, the fire department having jurisdiction may reduce the minimum water supply required by this standard, for fire fighting purposes, in Section 5-2, 5-3, 5-4, or 5-5, whichever is applicable.

5-8 Structures with Other Automatic Fire Suppression Systems.

5-8.1* For any structure fully or partially protected by an automatic fire suppression system other than specified in 5-6.1, the fire department having jurisdiction shall determine the minimum water supply required for fire fighting purposes.

5-9 Precalculated Water Supply.

5-9.1 The following tables are included as a quick method for determining the water requirements suggested by this standard for structures without exposures. For structures with exposures, multiply the water requirements developed by the "quick method" tables by 1.5.

An example of the use of the tables:

A farm storage building housing a dairy barn (occupancy hazard classification number 4), constructed of ordinary construction (construction classification number 1.0) with a cubic area of 160,000 cu ft (4480 m^3) will produce, by the tables, a water requirement of 40,000 gal (151 400 L).

Table 5-9.1(a) Precalculated Minimum Water Supplies by Occupancy Hazard and Construction Classification
(no exposures)

Occupancy Hazard Class	3				4				5				6				7			
Construction Class	.5	.75	1.0	1.5	.5	.75	1.0	1.5	.5	.75	1.0	1.5	.5	.75	1.0	1.5	.5	.75	1.0	1.5
Cubic Feet	*Gallons*				*Gallons*				*Gallons*				*Gallons*				*Gallons*			
8,000		2,000	2,667	4,000			2,000	3,000				2,400				2,000				
12,000	2,000	3,000	4,000	6,000		2,250	3,000	4,500			2,400	3,600			2,000	3,000				2,571
16,000	2,667	4,000	5,333	8,000	2,000	3,000	4,000	6,000		2,400	3,200	4,800		2,000	2,667	4,000			2,286	3,429
20,000	3,333	5,000	6,667	10,000	2,500	3,750	5,000	7,500	2,000	3,000	4,000	6,000		2,500	3,333	5,000		2,143	2,857	4,286
24,000	4,000	6,000	8,000	12,000	3,000	4,500	6,000	9,000	2,400	3,600	4,800	7,200	2,000	3,000	4,000	6,000		2,571	3,429	5,143
28,000	4,667	7,000	9,333	14,000	3,500	5,250	7,000	10,500	2,800	4,200	5,600	8,400	2,333	3,500	4,667	7,000	2,000	3,000	4,000	6,000
32,000	5,333	8,000	10,667	16,000	4,000	6,000	8,000	12,000	3,200	4,800	6,400	9,600	2,667	4,000	5,333	8,000	2,286	3,429	4,571	6,857
36,000	6,000	9,000	12,000	18,000	4,500	6,750	9,000	13,500	3,600	5,400	7,200	10,800	3,000	4,500	6,000	9,000	2,572	3,857	5,143	7,714
40,000	6,667	10,000	13,333	20,000	5,000	7,500	10,000	15,000	4,000	6,000	8,000	12,000	3,333	5,000	6,667	10,000	2,857	4,286	5,714	8,571
44,000	7,333	11,000	14,667	22,000	5,500	8,250	11,000	16,500	4,400	6,600	8,800	13,200	3,667	5,500	7,333	11,000	3,143	4,714	6,286	9,429
48,000	8,000	12,000	16,000	24,000	6,000	9,000	12,000	18,000	4,800	7,200	9,600	14,400	4,000	6,000	8,000	12,000	3,429	5,143	6,857	10,286
52,000	8,667	13,000	17,333	26,000	6,500	9,750	13,000	19,500	5,200	7,800	10,400	15,600	4,333	6,500	8,667	13,000	3,715	5,571	7,429	11,143
56,000	9,333	14,000	18,667	28,000	7,000	10,500	14,000	21,000	5,600	8,400	11,200	16,800	4,667	7,000	9,333	14,000	4,000	6,000	8,000	12,000
60,000	10,000	15,000	20,000	30,000	7,500	11,250	15,000	22,500	6,000	9,000	12,000	18,000	5,000	7,500	10,000	15,000	4,286	6,429	8,571	12,857
64,000	10,667	16,000	21,333	32,000	8,000	12,000	16,000	24,000	6,400	9,600	12,800	19,200	5,333	8,000	10,667	16,000	4,572	6,857	9,143	13,714
68,000	11,333	17,000	22,667	34,000	8,500	12,750	17,000	25,500	6,800	10,200	13,600	20,400	5,667	8,500	11,333	17,000	4,857	7,286	9,714	14,571
72,000	12,000	18,000	24,000	36,000	9,000	13,500	18,000	27,000	7,200	10,800	14,400	21,600	6,000	9,000	12,000	18,000	5,143	7,714	10,286	15,429
76,000	12,667	19,000	25,333	38,000	9,500	14,250	19,000	28,500	7,600	11,400	15,200	22,800	6,333	9,500	12,667	19,000	5,429	8,143	10,857	16,286
80,000	13,333	20,000	26,667	40,000	10,000	15,000	20,000	30,000	8,000	12,000	16,000	24,000	6,667	10,000	13,333	20,000	5,715	8,571	11,429	17,143
84,000	14,000	21,000	28,000	42,000	10,500	15,750	21,000	31,500	8,400	12,600	16,800	25,200	7,000	10,500	14,000	21,000	6,000	9,000	12,000	18,000
88,000	14,667	22,000	29,333	44,000	11,000	16,500	22,000	33,000	8,800	13,200	17,600	26,400	7,333	11,000	14,667	22,000	6,286	9,429	12,571	18,857
92,000	15,333	23,000	30,667	46,000	11,500	17,250	23,000	34,500	9,200	13,800	18,400	27,600	7,667	11,500	15,333	23,000	6,572	9,857	13,143	19,714
96,000	16,000	24,000	32,000	48,000	12,000	18,000	24,000	36,000	9,600	14,400	19,200	28,800	8,000	12,000	16,000	24,000	6,857	10,286	13,714	20,571
100,000	16,667	25,000	33,333	50,000	12,500	18,750	25,000	37,500	10,000	15,000	20,000	30,000	8,333	12,500	16,667	25,000	7,143	10,714	14,286	21,429
104,000	17,333	26,000	34,667	52,000	13,000	19,500	26,000	39,000	10,400	15,600	20,800	31,200	8,667	13,000	17,333	26,000	7,429	11,143	14,857	22,286
108,000	18,000	27,000	36,000	54,000	13,500	20,250	27,000	40,500	10,800	16,200	21,600	32,400	9,000	13,500	18,000	27,000	7,715	11,571	15,429	23,143
112,000	18,667	28,000	37,333	56,000	14,000	21,000	28,000	42,000	11,200	16,800	22,400	33,600	9,333	14,000	18,667	28,000	8,000	12,000	16,000	24,000
116,000	19,333	29,000	38,667	58,000	14,500	21,750	29,000	43,500	11,600	17,400	23,200	34,800	9,667	14,500	19,333	29,000	8,286	12,429	16,571	24,857
120,000	20,000	30,000	40,000	60,000	15,000	22,500	30,000	45,000	12,000	18,000	24,000	36,000	10,000	15,000	20,000	30,000	8,572	12,857	17,143	25,714
124,000	20,667	31,000	41,333	62,000	15,500	23,250	31,000	46,500	12,400	18,600	24,800	37,200	10,333	15,500	20,667	31,000	8,857	13,286	17,714	26,571
128,000	21,333	32,000	42,667	64,000	16,000	24,000	32,000	48,000	12,800	19,200	25,600	38,400	10,667	16,000	21,333	32,000	9,143	13,714	18,286	27,429
132,000	22,000	33,000	44,000	66,000	16,500	24,750	33,000	49,500	13,200	19,800	26,400	39,600	11,000	16,500	22,000	33,000	9,429	14,143	18,857	28,286
136,000	22,667	34,000	45,333	68,000	17,000	25,500	34,000	51,000	13,600	20,400	27,200	40,800	11,333	17,000	22,667	34,000	9,715	14,571	19,429	29,143
140,000	23,333	35,000	46,667	70,000	17,500	26,250	35,000	52,500	14,000	21,000	28,000	42,000	11,667	17,500	23,333	35,000	10,000	15,000	20,000	30,000
144,000	24,000	36,000	48,000	72,000	18,000	27,000	36,000	54,000	14,400	21,600	28,800	43,200	12,000	18,000	24,000	36,000	10,286	15,429	20,571	30,857
148,000	24,667	37,000	49,333	74,000	18,500	27,750	37,000	55,500	14,800	22,200	29,600	44,400	12,333	18,500	24,667	37,000	10,572	15,857	21,143	31,714
152,000	25,333	38,000	50,667	76,000	19,000	28,500	38,000	57,000	15,200	22,800	30,400	45,600	12,667	19,000	25,333	38,000	10,857	16,286	21,714	32,571
156,000	26,000	39,000	52,000	78,000	19,500	29,250	39,000	58,500	15,600	23,400	31,200	46,800	13,000	19,500	26,000	39,000	11,143	16,714	22,286	33,429
160,000	26,667	40,000	53,333	80,000	20,000	30,000	40,000	60,000	16,000	24,000	32,000	48,000	13,333	20,000	26,667	40,000	11,429	17,143	22,857	34,286

Note: For structures with exposures, multiply results by 1.5 for water supply requirements.

SI units: 1 gal = 3.785 L, 1 cu ft = 0.0283 m^3

0767

Table 5-9.1(a) Continued

Occupancy*	3				4				5				6				7			
Construction**	.5	.75	1.0	1.5	.5	.75	1.0	1.5	.5	.75	1.0	1.5	.5	.75	1.0	1.5	.5	.75	1.0	1.5
Cubic Feet	*Gallons*				*Gallons*				*Gallons*				*Gallons*				*Gallons*			
175,000	29,167	43,750	58,333	87,500	21,875	32,813	43,750	65,625	17,500	26,250	35,000	52,500	14,583	21,875	29,167	43,750	12,500	18,750	25,000	37,500
200,000	33,333	50,000	66,667	100,000	25,000	37,500	50,000	75,000	20,000	30,000	40,000	60,000	16,667	25,000	33,333	50,000	14,286	21,429	28,571	42,857
225,000	37,500	56,250	75,000	112,500	28,125	42,188	56,250	84,375	22,500	33,750	45,000	67,500	18,750	28,125	37,500	56,250	16,071	24,107	32,143	48,214
250,000	41,667	62,500	83,333	125,000	31,250	46,875	62,500	93,750	25,000	37,500	50,000	75,000	20,833	31,250	41,667	62,500	17,857	26,786	35,714	53,571
275,000	45,833	68,750	91,667	137,500	34,375	51,563	68,750	103,125	27,500	41,250	55,000	82,500	22,917	34,375	45,833	68,750	19,643	29,464	39,286	58,929
300,000	50,000	75,000	100,000	150,000	37,500	56,250	75,000	112,500	30,000	45,000	60,000	90,000	25,000	37,500	50,000	75,000	21,429	32,143	42,857	64,286
325,000	54,167	81,250	108,333	162,500	40,625	60,938	81,250	121,875	32,500	48,750	65,000	97,500	27,083	40,625	54,167	81,250	23,214	34,821	46,429	69,643
350,000	58,333	87,500	116,667	175,000	43,750	65,625	87,500	131,250	35,000	52,500	70,000	105,000	29,167	43,750	58,333	87,500	25,000	37,500	50,000	75,000
375,000	62,500	93,750	125,000	187,500	46,875	70,313	93,750	140,625	37,500	56,250	75,000	112,500	31,250	46,875	62,500	93,750	26,786	40,179	53,571	80,357
400,000	66,667	100,000	133,333	200,000	50,000	75,000	100,000	150,000	40,000	60,000	80,000	120,000	33,333	50,000	66,667	100,000	28,571	42,857	57,143	85,714
425,000	70,833	106,250	141,667	212,500	53,125	79,688	106,250	159,375	42,500	63,750	85,000	127,500	35,417	53,125	70,833	106,250	30,357	45,536	60,714	91,071
450,000	75,000	112,500	150,000	225,000	56,250	84,376	112,500	168,750	45,000	67,500	90,000	135,000	37,500	56,250	75,000	112,500	32,143	48,214	64,286	96,429
475,000	79,167	118,750	158,333	237,500	59,375	89,063	118,750	178,125	47,500	71,250	95,000	142,500	39,583	59,375	79,167	118,750	33,929	50,893	67,857	101,786
500,000	83,333	125,000	166,667	250,000	62,500	93,751	125,000	187,500	50,000	75,000	100,000	150,000	41,667	62,500	83,333	125,000	35,714	53,571	71,429	107,143
525,000	87,500	131,250	175,000	262,500	65,625	98,438	131,250	196,875	52,500	78,750	105,000	157,500	43,750	65,625	87,500	131,250	37,500	56,250	75,000	112,500
550,000	91,667	137,500	183,333	275,000	68,750	103,126	137,500	206,250	55,000	82,500	110,000	165,000	45,833	68,750	91,667	137,500	39,286	58,929	78,571	117,857
575,000	95,833	143,750	191,667	287,500	71,875	107,813	143,750	215,625	57,500	86,250	115,000	172,500	47,917	71,875	95,833	143,750	41,071	61,607	82,143	123,214
600,000	100,000	150,000	200,000	300,000	75,000	112,501	150,000	225,000	60,000	90,000	120,000	180,000	50,000	75,000	100,000	150,000	42,857	64,286	85,714	128,571
625,000	104,167	156,250	208,333	312,500	78,125	117,188	156,250	234,375	62,500	93,750	125,000	187,500	52,083	78,125	104,167	156,250	44,643	66,964	89,286	133,929
650,000	108,333	162,500	216,667	325,000	81,250	121,876	162,500	243,750	65,000	97,500	130,000	195,000	54,167	81,250	108,333	162,500	46,429	69,643	92,857	139,286
675,000	112,500	168,750	225,000	337,500	84,375	126,563	168,750	253,125	67,500	101,250	135,000	202,500	56,250	84,375	112,500	168,750	48,214	72,321	96,429	144,643
700,000	116,667	175,000	233,333	350,000	87,500	131,251	175,000	262,500	70,000	105,000	140,000	210,000	58,333	87,500	116,667	175,000	50,000	75,000	100,000	150,000
725,000	120,833	181,250	241,667	362,500	90,625	135,938	181,250	271,875	72,500	108,750	145,000	217,500	60,417	90,625	120,833	181,250	51,786	77,679	103,571	155,357
750,000	125,000	187,500	250,000	375,000	93,750	140,626	187,500	281,250	75,000	112,500	150,000	225,000	62,500	93,750	125,000	187,500	53,571	80,357	107,143	160,714
775,000	129,167	193,750	258,333	387,500	96,875	145,313	193,750	290,625	77,500	116,250	155,000	232,500	64,583	96,875	129,167	193,750	55,357	83,036	110,714	166,071
800,000	133,333	200,000	266,667	400,000	100,000	150,001	200,000	300,000	80,000	120,000	160,000	240,000	66,667	100,000	133,333	200,000	57,143	85,714	114,286	171,429
825,000	137,500	206,250	275,000	412,500	103,125	154,688	206,250	309,375	82,500	123,750	165,000	247,500	68,750	103,125	137,500	206,250	58,929	88,393	117,857	176,786
850,000	141,667	212,500	283,333	425,000	106,250	159,376	212,500	318,750	85,000	127,500	170,000	255,000	70,833	106,250	141,667	212,500	60,714	91,071	121,429	182,143
875,000	145,833	218,750	291,667	437,500	109,375	164,064	218,750	328,125	87,500	131,250	175,000	262,500	72,917	109,375	145,833	218,750	62,500	93,750	125,000	187,500
900,000	150,000	225,000	300,000	450,000	112,500	168,751	225,000	337,500	90,000	135,000	180,000	270,000	75,000	112,500	150,000	225,000	64,286	96,429	128,571	192,857
925,000	154,167	231,250	308,333	462,500	115,265	173,439	231,250	346,875	92,500	138,750	185,000	277,500	77,083	115,625	154,167	231,250	66,071	99,107	132,143	198,214
950,000	158,333	237,500	316,667	475,000	118,750	178,126	237,500	356,250	95,000	142,500	190,000	285,000	79,167	118,750	158,333	237,500	67,857	101,786	135,714	203,571
975,000	162,500	243,750	325,000	487,500	121,875	182,814	243,750	365,625	97,500	146,250	195,000	292,500	81,250	121,875	162,500	243,750	69,643	104,464	139,286	208,929
1,000,000	166,667	250,000	333,333	500,000	125,000	187,501	250,000	375,000	100,000	150,000	200,000	300,000	83,333	125,000	166,667	250,000	71,429	107,143	142,857	214,286

*Occupancy Hazard Classification

**Construction Classification

Note: For structures with exposures, multiply results by 1.5 for water supply requirements.

SI units: 1 gal = 3.785 L; 1 cu ft = 0.0283 m³

Table 5-9.1(b)
Minimum Water Requirements
(Examples)

Paragraph	Type of Occupancy	Min. Gal. Water
5-2.1.1	Single Structures without Exposures	2,000 (7570 L)
5-3.1.1	Single Structures with Exposures	3,000 (11 355 L)
5-4.1.1	Multiple Structures — Single Water Point without Exposures	3,000 (11 355 L)
5-5.1.1	Multiple Structures — Single Water Point with Exposure Hazard	3,000 (11 355 L)

Table 5-9.1(c)
Minimum Capability of Fire Department to Transport and to Use Water

Total Water Supply Required (Gallons)	Rate Water Is Available to Fireground and Fire Department's Capability for Using Water (GPM)
up to 2,499 (up to 9459 L)	250 (946 L/min)
2,500 to 9,999 (9460 L to 37 849 L)	500 (1893 L/min)
10,000 to 19,999 (37 850 L to 75 699 L)	750 (2839 L/min)
20,000 or more (75 700 L)	1000 (3785 L/min)

Chapter 6 Water Supply

6-1 Water Supply for Fire Fighting. The water supplies for fire fighting purposes, as specified in Chapter 5, may be supplied from natural bodies of water and man-made sources of water. Natural bodies of water are defined as bodies of water contained by earth only and include ponds, lakes, rivers, streams, bays, creeks, springs, artesian wells, and irrigation canals. Man-made sources of water include aboveground tanks, elevated gravity tanks, livestock watering tanks, cisterns, swimming pools, wells, quarries, mines, reservoirs, aqueducts, tankers, and hydrants served by a water system. (*See Appendix B.*)

The surface at the pumper access point shall be adequate to support heavy vehicles at all times of the year. Provisions shall be made so that such water suction points are visible and usable in all weather conditions, including heavy snow, brush conditions, and mud slides.

Should a dry hydrant be close to vehicular traffic, suitable barriers shall be constructed to protect fire fighters, equipment, and the dry hydrant.

6-2 Water Supply Transfer. The transfer of water from [illegible]ter source to the scene of the fire can be done by a [illegible]nber of different methods. A few of these are tanker shuttles, pumper relays using large diameter [normally 3½ in. (89 mm) or greater] hose, pumper relays, portable piping, irrigation piping and ditching, helicopters, railroad tank cars, etc. (*See Appendices C, D, and E.*)

6-3 Minimum Water Supply. The minimum water supply from whatever source or combination of sources shall meet the requirements of Chapter 5.

6-4* Accessibility. Water supplies for fire fighting purposes shall be accessible to fire fighting equipment. The fire department having jurisdiction shall, as part of its property survey, determine maximum safe load limits of roadways, laneways, and bridges and various climatic conditions, to determine accessibility.

6-4.1 The fire department needs to determine the maximum safe load limits of bridges in its district. The state Department of Transportation (DOT), in most cases, can provide the fire department with a computer printout showing safe load limits for bridges located within the boundries of your city, town, county, fire district, etc. Any means of access shall be constructed in accordance with NFPA 1141, *Standard for Fire Protection in Planned Building Groups.*

6-5 Identification. An appropriate sign shall be erected at each water point identifying the site for fire department emergency use. (*See B-1-2.11.*)

Chapter 7 Reports and Records

7-1 Plans for New Construction and Additions.

7-1.1 Where the appropriate governmental entity has building laws that require plans to be submitted for review before building construction is started, the plans shall be submitted to the fire department for review and approval.

7-1.2 Where no building laws exist or plans are not required for review, the fire department shall request cooperation of property owner(s) in voluntary compliance with provisions of this standard.

7-2 Requirements for the Fire Department.

7-2.1 The fire department having jurisdiction for property surveys specified in Chapter 2, after completing the survey and computing the minimum water supply required, shall notify, in writing, the authority having jurisdiction of the results of the surveys and the minimum water supplies required. In all cases, the building(s) owner(s) shall be advised of the minimum water supply required. Fire department personnel shall be available to citizens for appropriate consultation.

7-3 Requirements for Property Owners or Occupants.

7-3.1 The property owner shall notify, in writing, the authority having jurisdiction before any structures are erected or any alterations are made to any existing structure that will increase the total cubic footage of the structure. The property owner shall provide for the authority having jurisdiction complete written plans and drawings of any proposed structure, including all measurements, construction, intended occupancy, and a description of contents.

7-3.2 The property owner or occupant shall notify, in writing, the authority having jurisdiction before any changes are made in the contents of a structure or occupancy of a structure, other than residential occupancies, that would materially affect the occupancy hazard classification number as specified in Section 3-2. The property owner or occupant shall provide the authority having jurisdiction with a complete written report of contents or occupancy changes.

7-4 Smoke Detector.

7-4.1* Each family living unit shall be provided with smoke detectors as required in NFPA 74, *Standard for the Installation, Maintenance, and Use of Household Fire Warning Equipment.*

7-5 Changes in Automatic Sprinkler Protection.

7-5.1 The property owner or occupant shall notify in writing the authority having jurisdiction whenever any alterations are made that would cause any change to an automatic sprinkler system covered in Section 5-7. The property owner or occupant shall provide the authority having jurisdiction with a complete written report of alterations to any existing sprinkler system or of the installation of a new sprinkler system.

7-5.2* The property owner or occupant shall promptly notify the authority having jurisdiction whenever any automatic sprinkler system or other automatic suppression system or portion of any system is shut off or is to be out of service for any reason.

7-6 Retention of Reports. The fire department shall file all plans, reports, and surveys by street address whenever possible and shall retain a copy of all reports specified in this standard.

Chapter 8 Referenced Publications

8-1 The following documents or portions thereof are referenced within this standard and shall be considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

8-1.1 NFPA Publications. National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

NFPA 13-1989, *Standard for the Installation of Sprinkler Systems*

NFPA 13D-1989, *Standard for the Installation of Sprinkler Systems In One- and Two-Family Dwellings and Mobile Homes*

NFPA 74-1989, *Standard for the Installation, Maintenance, and Use of Household Fire Warning Equipment*

NFPA 220-1985, *Standard on Types of Building Construction*

NFPA 1141-1985, *Standard for Fire Protection in Planned Building Groups*

NFPA 1901-1985, *Standard on Automotive Fire Apparatus.*

Appendix A

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

A-1-1 In some areas, water supply systems have been installed for domestic water purposes only. These systems may be equipped with hydrants that may not be standard fire hydrants, with available volume, pressure, and duration of flow being less than needed for adequate fire fighting purposes. Where such conditions exist, this standard and appendix may be applied in water supply matters.

A-2-1.1 Information needed to compute the minimum water supplies to be collected during the building survey includes:

(a) Area of all floors, including attics, basements, and crawl spaces.

(b) Height between floors or crawl spaces, and in the attics from floor to ridge pole.

(c) Construction materials used in each building, including walls, floors, roofs, ceilings, interior partitions, stairs, etc.

(d) Occupancy (occupancies) of buildings.

(e) Occupancy (occupancies) of yard areas.

(f) Exposures to buildings and yard storage and distances between them.

(g) Fire protection systems — automatic and manual protection systems, hydrants, yard mains, and other protection facilities.

(h) On-premises water supplies, including natural and man-made sources of water.

A-3-1.4 In addition to the storage of products potentially hazardous from the standpoint of increased fire load, farm properties present certain inherent dangers to the rural fire fighter that are not contemplated by the urban fire fighter. Storage of products potentially hazardous to fire fighters from the standpoint of increased fire volume, explosion, and toxicity exists at most rural fire locations. Among these are:

(a) Bulk storage of petroleum fuels, more frequently fuel oil, but often gasoline and propane. While some tanks are underground, many are aboveground and often located within 50 ft (15.2 m) of farm buildings.

(b) Many farmers use and store blasting agents such as dynamite, often extended with ammonium nitrate (the latter of greater explosive impact per unit weight).

(c) Nearly all farms use and store different pesticides. Some of these chemical compounds give off very toxic fumes when burning. Two compounds that are safe when independent of each other may be very hazardous to the fire fighter when mixed together in a fire situation.

(d) Localized problems also exist in corn growing areas; for instance, anhydrous ammonia is stored and used in large amounts during the early growing season.

The rural fire department needs to work with the farmer to reduce the fire and life potential hazard of these products by storing them safely. However, fire fighters of the rural fire departments must know the potential hazards presented by the products and the fire fighting precautions to be taken. The department membership should be forewarned of the above items through the survey of the farm by the water supply officer or other inspector, and appropriate provisions should be taken to protect the membership of the department from potential hazards.

A-3-2 The occupancy hazard classification number is a mathematical factor to be used in calculating minimum water supplies. The lowest occupancy hazard classification number is 3 and is assigned to the highest hazard grouping. The highest occupancy hazard classification number is 7 and is assigned to the lowest hazard grouping.

A-4-2 The construction classification number is a mathematical factor to be used in calculating minimum water supplies. The "slowest burning" or lowest hazard type of construction, fire resistive, takes a construction classification number of 0.50. The fastest burning or highest hazard type of construction, wood frame, takes a construction class number of 1.50. All dwellings shall be assigned a construction classification number of 1.0 or lower when construction is noncombustible or fire resistive.

A-4-2.4 Due to cost savings, many Type III (ordinary) and Type V (wood frame) constructed buildings may have wood trusses as a lightweight preengineered framing system used in the roof and floors. As long as the integrity of all members of the unit is intact, the unit is a stable building item. However, this may not be the case should one of the outer members be destroyed or damaged. Should this happen during a fire, the roof or floor supported by the unit may be weakened to the point where it will be unsafe to support fire fighters.

Another weak point found in the lightweight preengineered truss during a fire is the joint formed by metal gussets. The use of metal gussets has reduced the cost and increased production of wood trusses; however, the metal gussets may not retain their strength and integrity when exposed to heat or fire.

Therefore, during the survey of the buildings for water requirements, fire prevention, or prefire planning purposes, the fire department should be aware of such structural fire fighting hazards, take appropriate steps to make all fire fighters aware of the condition, and plan alternate fire tactics.

A-4-2.5 See A-4-2.4.

A-5-2.1 Examples of Calculating Minimum Water Supply. Single- and two-family dwellings — 1,200 sq ft (111.8 m²) and under (without exposure hazard).

(a) Residential:

Dwelling: 50 ft by 24 ft; 2 stories, 8 ft each; pitched roof, 8 ft from attic floor to ridge pole; wood frame construction.

50 × 24 = 1,200 (sq ft)
Heights 8 + 8 + 4* = 20 (ft)
1,200 × 20 = 24,000 (cu ft)
Occupancy Hazard Classification Number 7
Construction Classification Number 1.0 (frame dwelling)
24,000 ÷ 7 × 1.0 = 3,429 gal
Minimum Water Supply = 3,429 gal

For SI Units: 1 ft = 0.305 m; 1 sq ft = .092 m²; 1 cu ft = .028 m³; 1 gal = 3.785 L.

If a structure is of occupancy hazard classification number 3 or 4, it is considered an exposure hazard if within 50 ft (15.2 m), regardless of size. (*See 5-3.1.*) For a dwelling, construction classification number is no larger than 1.0.

(b) Commercial:

Farm equipment shed: 125 ft × 100 ft; height 14 ft; 1 story; flat roof; noncombustible construction.

125 × 100 = 12,500 (sq ft)
Height = 14 (ft)
12,500 × 14 = 175,000 (cu ft)
Occupancy Hazard Classification Number 5
Construction Classification Number 0.75
175,000 ÷ 5 × 0.75 = 26,250
Total Water Supply = 26,250 gal

For SI Units: 1 ft = 0.305 m; 1 sq ft = .092 m²; 1 cu ft = .028 m³; 1 gal = 3.785 L.

If a structure is of occupancy hazard classification number 3 or 4, it is considered an exposure hazard if within 50 ft (15.2 m), regardless of size.

A-5-3.1 Single- and two-family dwellings — 1200 sq ft and under (with exposures).

(c) Residential:

Dwelling 50 ft × 24 ft; 1 story, 8 ft high; pitched roof, 8 ft from attic floor to ridge pole; brick construction and exposed on one side by a frame dwelling with a separation of less than 50 ft and with areas greater than 100 sq ft.

50 × 24 = 1200 (sq ft)
Heights 8 + 4* = 12 (ft)
1200 × 12 = 14,400 (cu ft)
Occupancy Hazard Classification Number 7
Construction Classification Number 1.0 (brick dwelling)
14,400 ÷ 7 × 1.0 = 2,057

As the dwelling is exposed by a frame dwelling, multiply by the exposure factor of 1.5

2,057 × 1.5 = 3,086
Minimum Water Supply = 3,086 gal

For SI Units: 1 ft = 0.305 m; 1 sq ft = .092 m²; 1 cu ft = .028 m³; 1 gal = 3.785 L.

If a structure is of occupancy hazard classification number 3 or 4, it is considered an exposure hazard if within 50 ft (15.2 m), regardless of size. For a dwelling, construction classification number is no larger than 1.0.

A-5-4.1 All Structures Except Dwellings (with Exposures).

(d) Assembly:

Church: 130 ft × 60 ft; height 25 ft to ridge pole (15 ft from ground to eaves with ridge pole 10 ft above the

*For pitched roofs, figure half the distance from attic floor to ridge pole

B-6-1) and to install dry hydrants (*see B-5-1*).

If called upon, the WSO should be available to consult with the owner in the design of a water source on a property to be protected.

B-1-2.5 Water Source Cards. A recommended practice is to prepare individual water source cards for each water point. This is a job that lends itself ideally to computers. There may be one or more water source applicable to a given potential fireground. In addition to the computer, the water sources should be noted on master grid map of the area. Thus, the grid map will show the index location of water source cards on which pertinent data will be noted. This data should include type of source (stream, cistern, domestic system, etc.), point of access ["100 ft (30.4 m) north of barn," etc.] gallonage available ["flows minimum 250 gpm (946 L/min)," "10,000 gal (37 850 L/min) storage," etc.] and any particular problem such as weather condition or seasonal fluctuations that may make a source unusable. It is a good practice to attach a snapshot of the water point to the card. Also, it is advisable to note an alternate source.

These water source cards should be used as the basis of regular inspections to make sure the source continues to be available and to note any improvement or deterioration of its usefulness. A program to develop additional sources as needed, including water sources for new construction as it evolves, should be an ongoing program in an alert organization.

B-1-2.6 Water Usage Agreement. The water supply officer must make arrangements with the owner of water supplies before a fire develops. Such agreements should be made in writing in close cooperation with the municipal, town, or county attorney. Also, it is highly desirable that the agreement be reviewed by a representative of the highway or the county road department or other persons who will be required to build, service, and maintain the access road to the supply, including such things as snow plowing in certain areas of the country. The property owner also should have a copy of the agreement. Following is an example of such a document that has been used by several fire departments with the approval of their county or town attorney.

ANYTOWN FIRE DEPARTMENT, U.S.A.
WATER USAGE AGREEMENT

I, We the undersigned owner(s) of a lake or pond located at ________
do hereby grant the Anytown Fire Department permission to erect and maintain, at its expense, a dry hydrant and access roadway to said lake or pond to be utilized for emergency fire suppression purposes.

All other uses of said pond or lake shall be after notification and permission of the owners.

The Anytown Fire Department shall be responsible for any and all damages to property resulting from fire department exercises.

This contract can be cancelled at any time by written notice thirty days in advance to the Anytown Fire Department located at Scott and College Road, Anytown, U.S.A.

____
OWNER DATE

____
PRESIDENT
ANYTOWN FIRE DEPARTMENT

____
OWNER DATE

____
SECRETARY
ANYTOWN FIRE DEPARTMENT

____
CHIEF
ANYTOWN FIRE DEPARTMENT

Agreement provided by Guilford College Fire Department, Guilford, College, North Carolina.

B-1-2.7 Water Map. Each water supply officer should maintain a map showing the location and amount of water available at each water site. A copy of this map should be located in the fire alarm dispatcher's headquarters when such an alarm facility is available and should be carried on at least one pumper and the chief's car and by the water supply officer. Any problems that may be encountered at the supply should be recorded. (*Also see B-5-3.2.*)

B-1-2.8 Inspection of Water Supplies. It is the responsibility of the water supply officer to make inspections of all water sources available as often as conditions warrant and note any changes in the facilities. This is particularly true during adverse weather conditions, such as droughts, very wet periods, heavy freezing, and following a snowstorm.

B-1-2.9 Reliability of an Impounded Supply. For an impounded supply, cistern, tank, or storage facility, the quantity to be considered available is the minimum available [at not over 15-ft (4.5-m) lift] during a drought with an average 50-year frequency (certified by a registered professional engineer). The maximum rate of flow is determined by testing using the pumper(s), hose arrangement, and dry hydrant normally used at this site.

B-1-2.10 Reliability of a Flowing Stream. For a supply from a flowing stream, the quantity to be considered available is the minimum rate of flow during a drought with an average 50-year frequency (certified by a registered professional engineer). The maximum rate of flow is determined by testing using the pumper(s), hose arrangement, and dry hydrant normally used at this site.

B-1-2.11 Sign. The water supply officer should see that an appropriate sign is erected at each water point identifying the site for fire department emergency use and including the name, or a number, for the water supply. Letters and/or numbers should be at least 3 in. high, with a ½-in. strobe and reflective.

B-2.12 Water Operations. The water supply officer and the training officer, in conjunction with the fire chief, should develop standard operating procedures for hauling water to fires. The standard operating procedures should be put in motion for all structural fires; however, they may be discontinued after the officer in charge has evaluated the fire and determined that water hauling capabilities will not be needed.

B-2 First-Aid Fire Protection Using On-Site Water Systems.

B-2-1 General. The individual domestic water supply system provided in many rural homes and business establishments, if properly equipped and maintained, is an effective "first-aid fire extinguisher." For large establishments, an elevated water storage tank or reservoir connected to hydrants and standpipes could provide substantial fire streams as well.

B-2-2 Domestic Water Systems. For domestic (farm) water systems to have some degree of reliability in case of fire, the pump or pumps should be placed in a fire resistive location. The electric power supply should have the maximum protection from being deenergized by fire or other cause. In some cases, standby power and pumps may be justified.

B-2-3 Delivery of First-Aid Fire Protection. For first-aid fire protection to be effective, every portion of the dwelling and outlying buildings should be within reach of a hose stream. This may require some additional pipelines beyond those needed for other purposes. A garden hose long enough to reach any point in a structure is often valuable for fire fighting use. Care should be taken so that water is drained from hose or pipes that could be subject to freezing weather.

B-2-4 In-Depth Fire Protection. To provide for in-depth fire protection, three types of water supplies may be needed: (1) first-aid via the domestic water system, (2) a bulk water supply at the property, which may be a stream, pond, elevated tank, ground level tanks, or cistern, or (3) an area system of static water supplies with drafting points and means for transporting the water to the fire site.

B-3 Natural Water Sources.

B-3-1 Streams. Streams, including rivers, bays, creeks, and irrigation canals, may represent a continuously flowing source of substantial capacity. Factors for the fire department to determine when considering water from flowing streams as potential water sources include the following:

(a) *Flowing Capacity.* The stream should deliver water in capacities compatible with those outlined in the water requirements of this standard. (*See Chapter 5.*)

(b) *Climatic Characteristics.* Streams that deliver water throughout the year and are not susceptible to drought are desirable for fire protection. However, where such streams are not available, a combination of supplies may be necessary. In many sections of the country, streams cannot be relied upon during drought seasons. If the stream is subject to flooding or freezing, special evolutions may be necessary to make the stream usable under such conditions. Similar circumstances may exist during wet periods or when the ground is covered with snow.

(c) *Accessibility.* A river or other source of water may not be accessible to the fire department for use during a fire. Distance and terrain from the all-weather road to the source must be such as to make the water readily available. In some cases, special equipment must be used to obtain the water. (*See B-6 and Appendix E, Portable Pumps.*) Where roadways are provided to the water supply, they should be constructed in accordance with B-6-2.

B-3-2 Ponds. Ponds may include lakes or farm ponds used for watering livestock, irrigation, fish culture, recreation, or other purposes while serving a secondary function for fire protection. Valuable information concerning design of ponds may be obtained from county agricultural agents, cooperative extension offices, county engineers, etc. Most of the factors listed in B-3-1 relative to streams are pertinent to ponds also, with the following additional items to be checked:

(a) Minimum annual level must be adequate to meet water supply needs of the fire problem the pond serves.

(b) Freezing of a stationary water supply, contrasted with the flowing stream, presents a greater problem.

(c) Silt and debris may accumulate in a pond or lake, reducing its actual capacity, while its surface area and level remain constant. This may provide a deceptive impression of capacity and calls for at least seasonal inspections.

(d) Accessibility should always be considered. Many recreational lakes are provided with access by roads, driveways, and boat launching ramps and are available for fire department use. Some large lakes, formed by a dam on a river, may have been constructed for such purposes as to generate power, for flood control, or to regulate the flow of a river. During certain periods of the year (droughts, drawdowns, etc.), such bodies of water may have very low water levels. The water under such conditions may not be accessible to the fire department for drafting by the fire department pumping unit even where a paved road, for boat launching, has been provided and extended into the water at normal water levels for several feet. Under such conditions, other provisions should be made to make the water supply fully accessible to the fire department.

B-3-3 Other Natural Sources. These might include springs and artesian wells. Individual springs and occasional artesian water supplies exist in some areas and, again, while generally of more limited capacity, may be useful for water supply subject to reasonable application of the factors listed for ponds and streams. In many cases, it may be necessary to form a temporary natural pool or form a pond with a salvage cover, for instance, to collect water for the use of the fire department when using a spring or an artesian well.

B-4 Man-Made Sources of Water.

B-4-1 General. The man-made sources of water supplies adapted for fire fighting are limited only to the innovative nature of the fire department. They range from cisterns, swimming pools, quarries, mines, automotive sprinkler system supplies, stationary tanks, driven wells, and dry hydrants, to the occasions when fire fighters have drafted water out of the basement of a burning building into which it was pumped only minutes before to the fight the fire.

B-4-2 Cisterns. Cisterns are one of man's oldest sources of emergency water supply, both for fire fighting and drought storage. They are very important sources of water for fire fighting, domestic consumption, and drought storage in many rural and beach areas.

Cisterns should have a minimum usable volume as determined by the department having jurisdiction using the methods described in Chapter 5 of this standard, and there is no real limit to the maximum capacity. A cistern should be accessible to the fire truck or other pumping device but should be located far enough from the hazard that one is not endangered when in use.

The water level of a cistern can be maintained by rainfall, water pumped from a well, water hauled by a tanker, or by the seasonal high water of a stream or river. The cistern can present a freezing problem in that its surface is often relatively inaccessible and the water is stagnant. One method to minimize freezing is to use a dry hydrant protruding into the water at a point below the local frost line.

Cisterns should be capped for safety, but they should have openings to permit inspections and use of suction hose when needed. [*See B-4-1 and Figure B-4-6(h).*]

B-4-3 Protection from Freezing.

If a dry hydrant is not installed in a cistern, then, depending on local conditions, a heavy pipe or a pike hole may be adequate to break an ice formation. In fact, the weight of the suction hose itself may be sufficient provided there is no danger of damaging the strainer or the hose.

There are several methods of providing an ice-free surface area in a cistern or other water source. These include, but are not limited to:

(a) Floating a log, a bale of hay or straw, etc. on the surface of the water.

(b) Placing a barrel filled with nonflammable, nontoxic antifreeze on the surface of the water.

B-4-4 Guide to Cistern Capacity. A ready guide to the capacity of cisterns with vertical sides is given in Table B-4-7.

B-4-5 Construction of Cisterns. Construction of cisterns is governed by local conditions of soil and material availability. Practical information can be obtained from local governmental departments or agricultural agencies.

Some engineering considerations to be used in designing cisterns include:

(a) Base, walls, and roof should be designed for the prevailing soil conditions and for the loads encountered when heavy vehicles are parked adjacent.

(b) If groundwater conditions are high, it should not float when empty.

(c) Suction piping should be designed to minimize whirlpooling.

(d) Vent piping must be of sufficient size.

Maintenance factors to be considered by the fire department include the danger of silting, evaporation or other low water conditions, and freezing problems previously discussed.

B-4-6 Cistern Specifications. Some political districts, where water systems are not available and water for water hauling fire departments is inadequate, are requiring developers to provide cisterns with all subdivisions that are constructed. As each cistern may provide fire protection for a number of buildings, the capacity is rather large and represents a substantial investment. The following are specifications for cistern design and construction that one political district is using.

Specification of Cistern Design and Construction.

1. Cisterns should be located no more than 2200 feet (671 m) truck travel distance from the nearest lot line of the furthermost lot.

2. The design of a cistern should be trouble-free and last a lifetime.

3. The cistern should be 30,000 gallons (113 550 L) minimum, available through the suction piping system.

4. The suction piping system should be capable of delivering 1000 gpm (3800 L/min) for three-quarters of the cistern capacity.

5. The design of the cistern should be submitted to the authority having jurisdiction for approval prior to construction. All plans should be signed by an acceptable registered professional engineer.

6. The entire cistern should be rated for highway loading, unless specifically exempted by the authority having jurisdiction.

7. All drawings are for estimating purposes only and are not intended for use as design.

8. Each cistern should be sited to the particular location by a registered engineer and approved by the authority having jurisdiction.

9. Cast in place concrete should achieve a 28-day strength of 3000 psi (20 700 kPa). It should be placed with a minimum of 4-in. (102-mm) slump and vibrated in a workmanlike manner.

10. The concrete should be mixed, placed, and cured without the use of calcium chloride. Winter placement and curing should follow the accepted American Concrete Institute (ACI) codes.

11. All suction and fill piping should be American Society for Testing and Materials (ASTM) Schedule 40 steel. All vent piping should be ASTM Schedule 40 PVC with glued joints.

12. All PVC piping should have glued joints.

13. The 8 in. × 5 in. (204 mm × 127 mm) eccentric reducer is available from suppliers.

14. The final suction connection should be 4½-in. (114-mm) National Hose male thread. It must be capped.

15. The filler pipe siamese should have 2½-in. (65-mm) National Standard female threads with plastic caps.

16. The entire cistern should be completed and inspected before any backfilling is done.

17. All backfill material should be screened gravel with no stones larger than 1½ in. (38 mm) and should be compacted to 95 percent ASTM 1557.

18. Bedding for the cistern should be a minimum 12 in. ¾- to 1½-in. crushed, washed stone, compacted. No fill should be used under stone.

19. Filler pipe siamese should be 36 in. (914 mm) above final backfill grade.

20. Suction pipe connection should be 20-24 in. (510-610 mm) above the level of the gravel where vehicle wheels will be located when cistern is in use.

21. Suction pipe should be supported either to top of tank or to a level below frost.

22. Base should be designed so that cistern will not float when empty.

23. Perimeter of tank at floor/wall joint should be sealed with 8-in. (20-cm) PVC waterstop.

24. After backfilling, tank should be protected by fencing or large stones.

25. Backfill over the tank should be:

(a) 4 ft (1.2 m) of fill; or

(b) The top and highest 2 ft (0.6 m) of sides of cistern insulated with vermin-resistant foam insulation, and 2 ft (0.6 m) of fill.

(c) All backfill should extend 10 ft (3 m) beyond the edge of the cistern, then maximum 3:1 slope, loamed and seeded.

26. Bottom of suction pipe to pumper connection should not exceed 14 ft (4.25 m) vertical distance.

27. Pitch of shoulder and vehicle pad from edge of pavement to pumper suction connection should be 1-6 percent downgrade.

28. Shoulder and vehicle pad should be of sufficient length to permit convenient access to suction connection when pumper is set at 45-degrees to road.

29. All construction, backfill, and grading material should be in accordance with proper construction practices and acceptable to the authority having jurisdiction.

30. All horizontal suction piping should slope slightly uphill towards pumper connection.

31. Installer is responsible for completely filling cistern until accepted by the authority having jurisdiction.

Specifications furnished by the New Boston Fire Department, New Boston, NH.

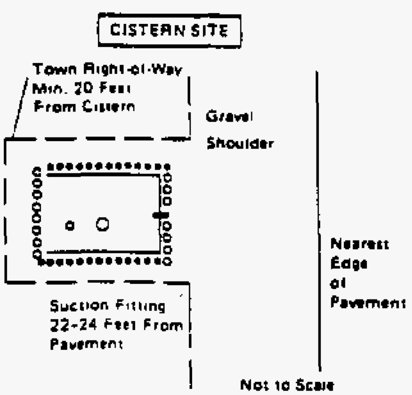

Figure B-4-6(a).

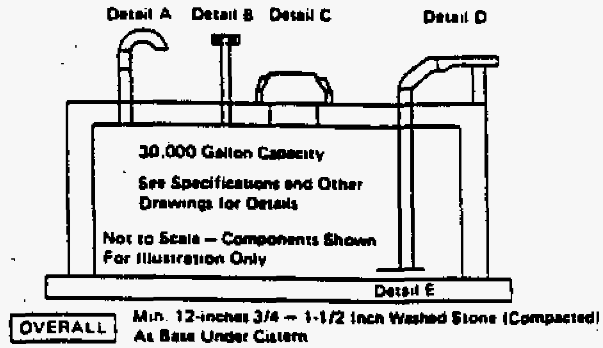

Figure B-4-6(b).

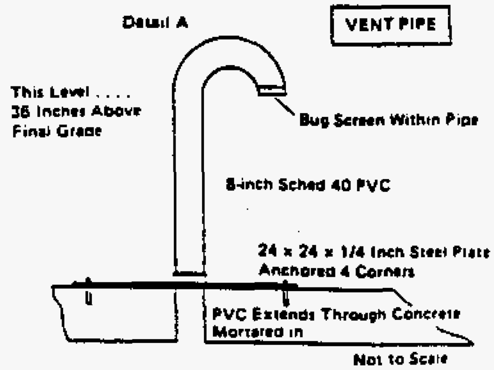

Figure B-4-6(c).

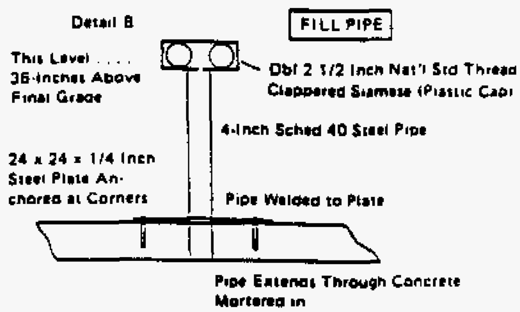

Figure B-4-6(d).

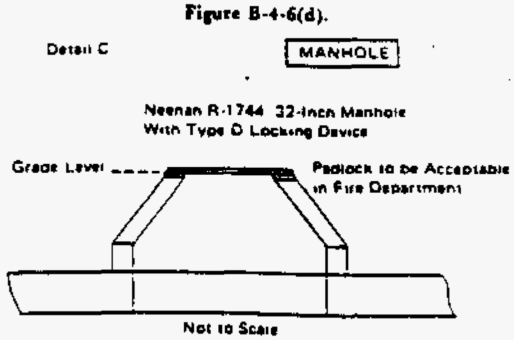

Figure B-4-6(e).

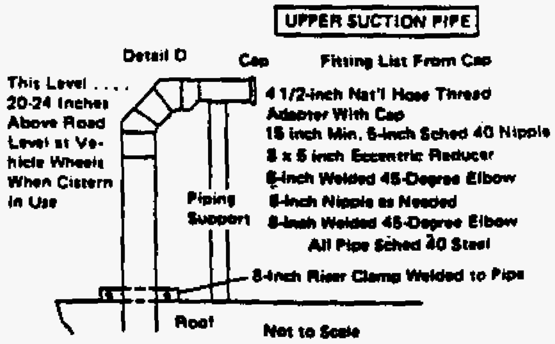

Figure B-4-6(f).

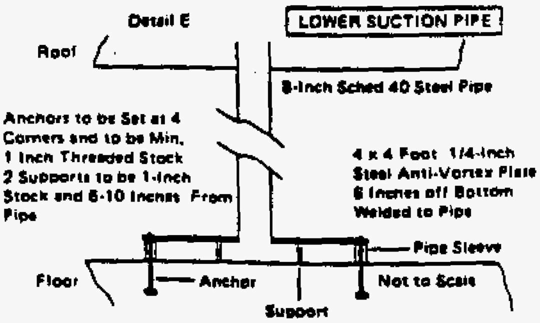

Figure B-4-6(g).

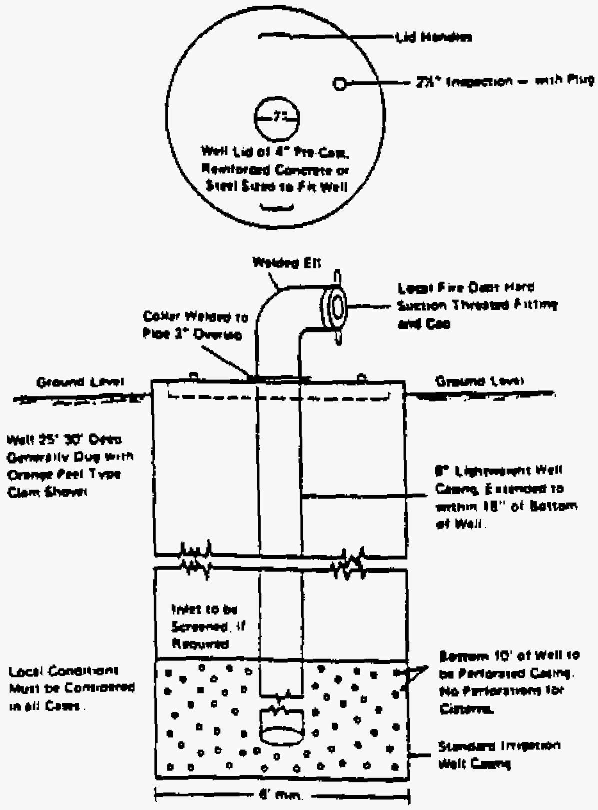

Figure B-4-6(h) Typical well (cistern) with dry hydrant installed. Same design suitable for cistern if bottom of casing is not perforated. For usable water depth, see B-4-7 warning.

B-4-7 Guide to Circular Cistern Capacity. A ready guide to the capacity of cisterns with vertical sides is given in Table B-4-7.

Table B-4-7
Cistern Storage Capacity

Inside Diameter in Feet	Storage Capacity per Foot of Depth
6 (1.8 m)	212 gal (802 L)
7 (2.1 m)	288 gal (1090 L)
8 (2.4 m)	376 gal (1425 L)
9 (2.7 m)	476 gal (1801 L)
10 (3.0 m)	588 gal (2226 L)

NOTE: One cubic foot = 7.48 gallons of water.

WARNING: Reference is made to water depths in cisterns, swimming pools, streams, lakes and other sources in a number of places in this Appendix. It should always be remembered that the depth with which the fire fighter is concerned is the *usable* depth. (*See B-5-4.*) In a cistern, a bottom bed of gravel protecting a dry hydrant inlet, for instance, decreases the usable depth to the area above the gravel.

B-4-8 Swimming Pools. Swimming pools are an increasingly common source of water for fire protection. Even in some areas with normally adequate hydrant water supplies, they have been a factor in providing protection, such as instances in which water demands have exceeded availability because of wildfire disasters, etc. They have an advantage in that they are sources of clean water, but have a major drawback in normally poor accessibility for large apparatus. There are some areas of the country in which swimming pool distribution is better than hydrant distribution. Should the water supply officer intend to use a swimming pool as a supply of water, it is a good practice to develop these water sources through working with property owners and preplanning. It should be required that the fire department be notified in the event of drainage of such pools.

B-4-8.1 Pool Accessibility. If fire department accessibility is considered with the design of the pool, a usable water supply may be available to the fire department for supplying direct hose lines or a source of water for tanker supply. Most swimming pools are built in areas requiring security fencing or walls, and these can complicate the problem of accessibility. Fences and walls can be designed for fire department use (*see Figure B-4-8.1*) or, depending on constructon, are susceptible to forcible entry by cutters, sledgehammers, etc. In most cases, a solution to the problems of accessibility can be arrived at through preplanning and may call for long lengths of suction hose, portable pumps, dry hydrants, or properly spaced gates. Portable (or floating) pumps designed for large volume delivery at limited pressures delivering water to portable folding tanks or fire department pumpers are frequently ideal where accessibility problems exist. (*See Appendix E-1-2.6.*)

A swimming pool virtually under the eaves of a burning house may be a very poor location from which to pump if there are problems of fire exposure to the work area, etc. Pumping from a neighboring pool, if it is close enough, or setting in motion the water hauling program is frequently preferable to pumping from the pool of the burning house.

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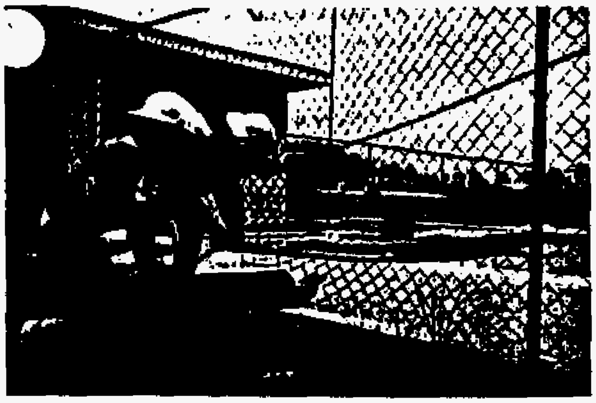

Figure B-4-8.1 Pool accessibility. Where plans are made before a fire, it may not take elaborate preparation to use a swimming pool as a water supply.

B-4-8.2 Pool Capacity. A short-form method of estimating pool capacity is:

L × W × D × 7.5 = estimated capacity (in gallons).

L = length in feet.

W = width in feet.

NOTE: These dimensions may be estimated or rounded off if pool is of stylized construction.

D = estimated average depth in feet, from water line.

cu ft water = 7.5 gallons

Consideration should be given for providing more suction hose on engines responding in areas dependent on swimming pools. Fast rigging of such suction hose demands special training. Using long lengths of hose over walls and other obstacles typical of swimming pools demands techniques other than those used for drafting from ponds or streams. Adequate prefire planning requires knowledge of individual pools so that the method of obtaining water at the property is known. Lightweight or flexible-type suction hose can be advantageous for this purpose.

B-4-8.3 Care in Use of Pools. Care must be exercised to be sure structural damage will not be done to a pool and the surrounding area if the water is used for fire fighting. Lightly built cement, gunite, or poured concrete pools may present danger of structural damage, cracking, or collapse when drained. There is a further possibility that a pool in extremely wet soil will tend to float upwards when drained; therefore, it may be necessary to refill the pool as soon as the fire is under control and tankers can be released from fire duties.

Some pools are compacted earth covered by a plastic surfacing or light-gauge metal panels placed against such earth or a special fill. Such pools may collapse internally if emptied. It may be possible to use a limited portion of such water sources but not possible to use the entire depth apparently available. It may be prudent not to use these pools at all.

'other consideration is whether the ground surround- pool will support the weight of a fire department vehicle without collapsing. The water supply officer should study and know the various pool limitations within the area he serves by consulting with the builders and installers of these pools.

B-4-9 Livestock Watering Ponds and Tanks. Many farms have livestock water tanks and other similar facilities. If the owner is aware of the water needs for the farm's buildings for fire fighting purposes, such tanks and ponds may be so sized as to be adequate in volume for both farm and fire department use and so located as to be readily available to the fire department. Tanks may be placed on the edge of the barnyard and on a side accessible to the fire department with the pumper or pump taking suction through a connection on the tank or by suction hose. These watering tanks and ponds are often filled and maintained full by a pump operated by a windmill or by an electric pump.

When a well fitted with an electric pump is used for irrigation or industrial use, the fuses may be pulled for periods of time when the farmer or plant does not need the water supply. Therefore, the fire department should carry fuses for all of the pumps in their district, and provisions should be made for an electrician or a power company employee or someone well-versed in pumps to respond on all alarms of fire.

B-4-10 Sprinkler Systems. In some rural areas, the only large water supply may be storage provided for use of a sprinklered building. The supply may be from an underground water distribution system, a pond or suction tank with pumps, an elevated tank, or a combination of these. In many cases, preplan arrangements can be made to use the water. This is particularly true if the property owner is contacted before he installs his sprinkler protection, as it may be necessary to increase the capacity of the storage or to install a hydrant that is accessible to the fire department and connected to the private yard distribution system.

Extreme care must be exercised in the use of water supplies provided for sprinkler protection. A certain amount of water must be retained in these systems for minimum sprinkler protection. A careful study and preplan must be made to determine such use.

Some states and municipalities may have special ordinances requiring sprinkler protection for certain properties such as nursing homes. Frequently, the water supplies for these systems are minimal and may be from pressure tanks of limited capacity. Where this is the case, it is suggested that the fire department not consider such supplies in their planning, as the rural fire department must be careful that it does not disrupt the protection at such a property. *(See Appendix F for additional information on sprinkler systems.)*

B-4-11 Driven Wells. Wells and well systems are becoming increasingly popular as water supplies for fire fighting purposes at industrial properties, shopping centers, subdivisions, and farm houses located in rural areas beyond the reach of a municipal water distribution system.

In areas with suitable soil conditions, for instance those of a very sandy nature, it may be possible to use driven wells to obtain water for fire fighting. These wells are, in essence, pipes, usually with perforations about the base to permit entry of water, driven into the ground. From the threaded pipe head (or a fitting attached to the body of the pipe) a pump connection may be made to draft water much as from a well hydrant. Material on this technique is available from the U.S. Forest Service. A high water table is a prerequisite to using this method. Fire fighting units in areas conducive to this technique should have the necessary equipment for such installations.

B-5 Dry Hydrants.

B-5-1 General. The use of natural water sources and man-made water sources requires an understanding of dry hydrant construction, as the dry hydrant provides a ready means of suction supply without the longer time often involved in direct drafting. Although most rural fire departments are equipped to draft water directly from farm ponds or streams, and all should be, a dry hydrant [*see Figure B-5-1(b)*] with an all-weather road access is preferable.

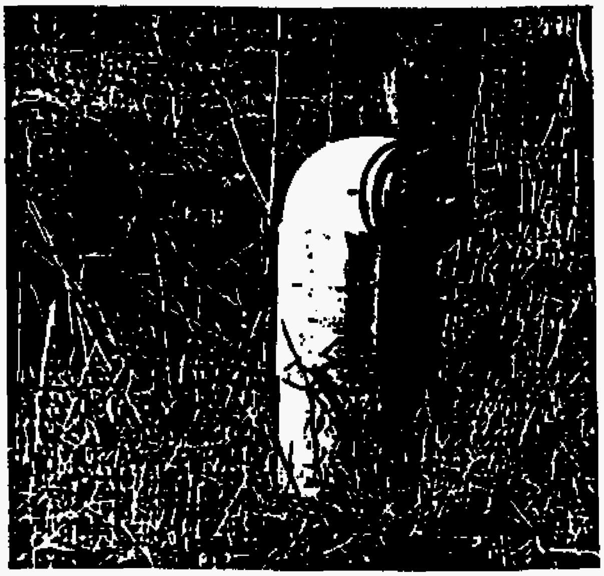

Figure B-5-1(a) Dry hydrant.

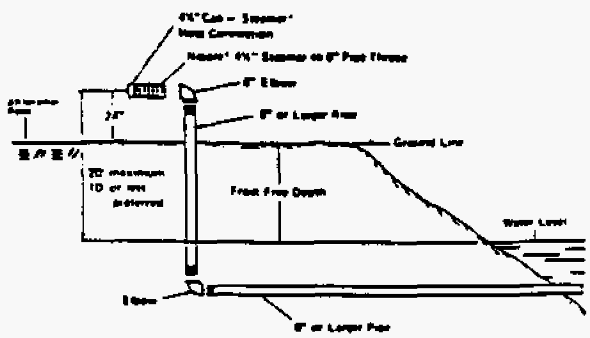

Figure B-5-1(b) Dry hydrant construction. [*See Figure B-5-2(c)*]

NOTE: Riser should be protected by post if subject to damage by auto or fire equipment.

*Steamer should be fire department's hard suction hose size and thread type.

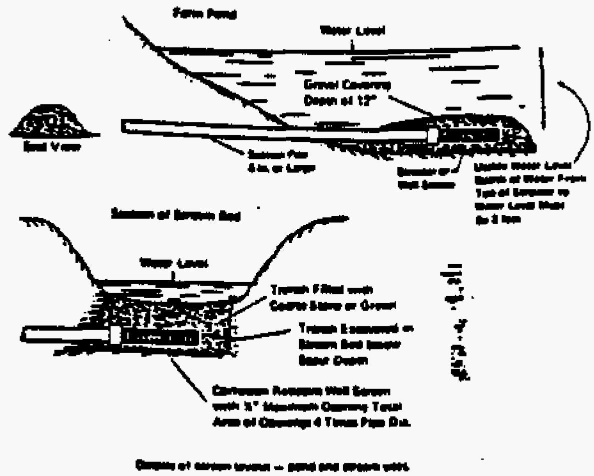

Figure B-5-1(c) Details of screen layout — pond and stream sites.

B-5-2 Dry Hydrant Construction. Depending upon the desired flow, the distance to the water, and the difference in elevation between the hydrant and water source, a 6-in. (152-mm) or larger pipe is necessary. The pipe and material should be suitable for the use and installed to manufacturer's standard. In some areas of the country, PVC pipe is being used for the construction of dry hydrants. (*See B-5-2.2.*) However, in other areas of the country, brass or bronze caps and steamer connections are being used along with iron pipe elbows and risers with asbestos cement or bituminized fiber pipe between risers and the water supply. Pipe and material used should be based on local conditions and common usage.

Table B-5-2 may be used to determine pipe size of a given hydrant line basing the flow upon 10 psi or 20 ft of head.

Table B-5-2
Gallons per Minute Flow at 20 Feet of Head on Typical 6-in. Pipe

Length	Bituminous Fiber or Steel (C = 120)	Cast Iron (C = 110)	Asbestos Cement (C = 130)
25 ft	3,400	3,060	3,650
50 ft	2,300	2,100	2,500
100 ft	1,600	1,475	1,700
500 ft	660	615	720
1000 ft	460	425	495

For SI Units: 1 ft = 0.305 m; 1 gpm = 3.785 L/min.

Based upon the Hazen-Williams formula with estimated values of C.
Courtesy of Dr. Gilbert Levin.

A strainer or well screen is needed for the suction end of the pipeline to keep foreign materials out of the pipe and the pumper using the dry hydrant. A well screen as a strainer is shown in Figure B-5-1(c). However, a strainer may be constructed by boring ¼-in. (6.4-mm) or ⅜-in. (9.5-mm) holes through the pipe. The holes should be spaced on ½-in. (12.7-mm) centers, with at least 12 rows drilled. Total area of strainer holes must exceed four times the area of the diameter of the pipe. The end of the pipe should be plugged, placed in the deepest portion of the pond or other water source, and raised off the bottom about 2 ft (0.6 m) so it will be above any silt that may accumulate. The strainer should be covered with crushed rock to exclude marine growth and to prevent mechanical damage.

For stream bed installations, the strainer must be buried deep enough to prevent scouring action of the stream during periods of high runoff from exposing the strainer and tearing it loose from the supply pipe. The depth at which the pipe is installed should be below the frost free depth for the area. This depth may be obtained from a hydraulic engineer, university extension service, or the U.S. Soil Conservation System. [*See Figure B-5-1(b).*]

For a dry hydrant, the pipe should be laid at a minimum slope [2 or 3 in. (50.8 or 76.2 mm) per 100 ft (30.5 m)] up to the hydrant riser. The riser on a dry hydrant should be exposed above ground approximately 24 in. (610 mm).

B-5-2.1 Pressurized Dry Hydrant Sources.

There can be two types of pressurized dry hydrants—those flowing through a dam (or dike) and those coming from an uphill water source emptying at a point downhill from the source. Although the water source uphill can be of extreme advantage when flowed to a downhill source, a major disadvantage could lie in the burying of the PVC pipe below the frost level. For a pressure hydrant, the pipe should be sloped downhill to the hydrant riser and be fitted with a gate valve. Where the supply line passes through the dike of a pond, anti-seep collars should be attached to the pipe to prevent water from seeping and channeling outside the pipe.

B-5-2.2 Design Features and Step-by-Step Procedures for Installing a Dry Hydrant Using PVC Pipe.

The design of dry hydrant installations have been carefully planned to incorporate several desirable advantages that tend to bring the installation of the PVC dry hydrant within the manpower and financial resource of a large number of rural fire departments or the property owners; however, in areas where other types of material are used, such materials may be substituted for the PVC pipe and fittings. The design features are listed here to simplify the understanding of the installation of the dry hydrant.

I. Design Features for Dry Hydrant.

A. It is recommended that dry hydrants be constructed of 6 in. (152 mm) or larger piping and fittings; however, for very short lengths of pipe, 5 in. (127 mm) may be considered.

B. No PVC piping or fittings of less than schedule 40 should be considered.

C. All piping or fittings exposed to sunlight should be primed and painted.

D. A minimum number of 90 degree elbows, preferably no more than two, are suggested to be used in the total system.

E. All connections should be cleaned and properly cemented so as to have all connections airtight.

F. The strainer may be formed in the end of the pipe by drilling 960, ⅜-in. (9.5-mm) holes along piping. A 4-in. (102-mm) strip should be reserved on the pipe to be installed on top to reduce the possibility of whirlpool during drought periods.

Figure B-5-2.2(a) A dry hydrant innovation has eliminated the top 90° or 45° elbow on each hydrant.
(*Photo by Nakomis Volunteer Fire Department, North Carolina*)

Figure B-5-2.2(b) Hard suction hose is connected to the pumper. The driver maneuvers the truck as the fire fighter walks the suction end of the hose to the dry hydrant. An "O" ring in the plastic "L" provides a tight fit and allows the operator to draft. This is a quick and simple method to connect the pumper to a dry hydrant.

II. Step-by-Step Procedures for Installing a Dry Hydrant.

(Installation is made easy by some simple preplanning.)

A. Consider average water level at piping entry location.

B. Lift in excess of 15 ft (4.5 m) needs to be avoided [22 ft (6.8 m) maximum].

C. It is recommended that a backhoe or similar ditching equipment be utilized to excavate entire ditch to a horizontal elevation 3 ft (0.9 m) below water level.

D. The ditch should be excavated beginning at the most distant point from the water (riser location). Maintain a reasonable level and dig the ditch into the pond.

E. The horizontal and vertical portion (pipe and riser) should be assembled and lowered in one piece, as ditch should now have water its entire length.

F. Back-filling should begin at the riser. It is suggested

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that the soil around the riser be tamped so it is rigidly supported with surrounding soil.

G. The ditch water is automatically forced back to the water source as back-filling is completed. This area should be firmly packed so as not to have low areas occur at a later date due to the settling of the soil.

H. At this point is is necessary to have personnel enter the water and place cement blocks, gravel, or other permanent supports underneath pipe in the water. The support should be heavy and prevent piping from coming in contact with bottom of water source. The strainer or well screen is now to be covered with 12 in. (305 mm) of coarse gravel to secure it in place and to prevent movement and must be at least 2 ft (0.6 m) under water. The supports can also be secured to the pipe with copper wire to stabilize piping.

I. In rapidly moving streams, the pipe will need to have special protection against the rapidly flowing water and various debris and materials washing down the stream against the pipe.

B-5-3 Maintenance of Dry Hydrant. These facilities require periodic checking, testing, and maintenance at least quarterly. Checking and testing by actual drafting should be a part of fire department training and drills. Thorough surveys should reveal any deterioration in the water supply situation in ponds, streams, or cisterns.

Particular attention should be given to streams and ponds. They may need frequent removal of debris, dredging or excavation of silt, and protection from erosion. The hydrants should be tested at least annually with a pumper. Back flushing, followed by a pumper test at a maximum designed flow rate, with records kept of each test, is highly desirable. Tests of this kind will not only verify proper condition but also keep the line and strainer clear of silt and the water supply available for any fire emergency.

The pond should be maintained as free of aquatic growth as possible. USDA Farmer's Bulletin, "Waterweed Control on Farms and Ranches," is a source of good information on this subject. At times it may be necessary to drain the pond to control this growth.

Inspections should include safety procedures such as posting warning signs and seeing that life preservers, ropes, etc., are available. Particular attention should be given to local authorities' regulations governing such water points.

It is important to consider appearance of this water point. Grass should be kept trimmed and neat. The hydrant should be freshly painted as needed. The cap can be painted a reflective material to improve visibility during emergencies. All identification signs should be approved by the Department of Transportation prior to installation if they are to be on the right of way or come under state laws.

Location and Directions: ______________________

____

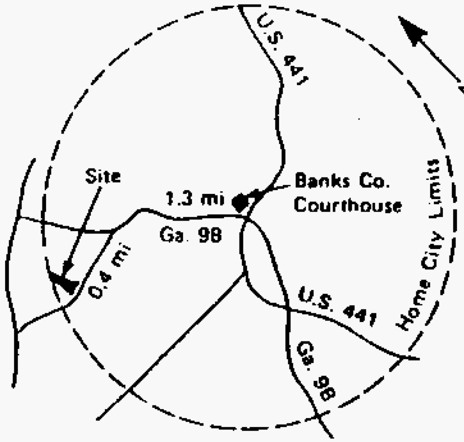
____

Depth of Water Above Intake ________

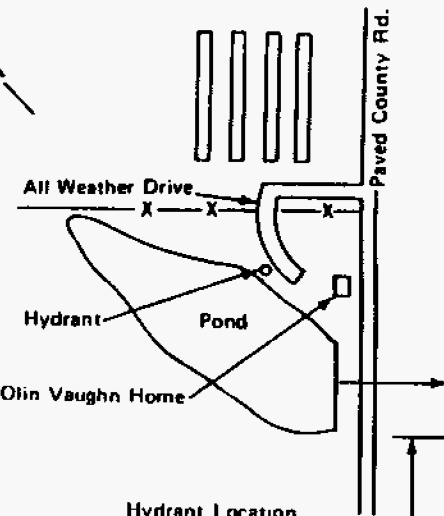
Date ________

DATE OF INSP.	BY	DEPTH OF WATER	AMOUNT OF WATER AVAILABLE	CONDITION OF WATER	EROSION	DRY HYDRANT		WEED CONTROL	ROAD CONDITION	SIGN	REMARKS
						TEST	FLOW				

Figure B-5-3.1.



General Location



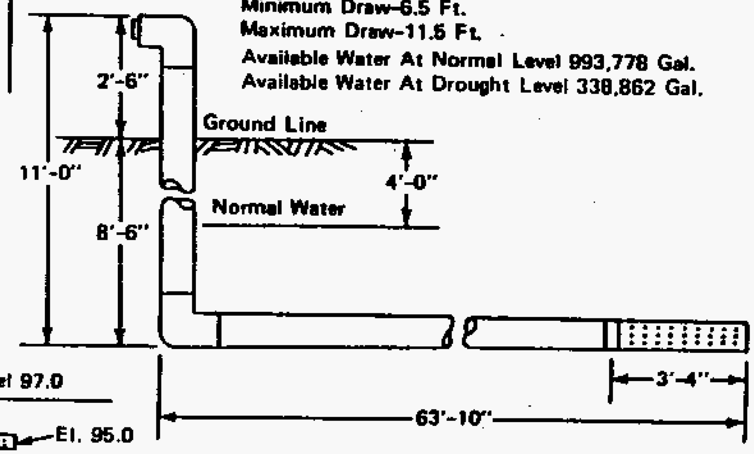
Hydrant Location

Bill of Materials

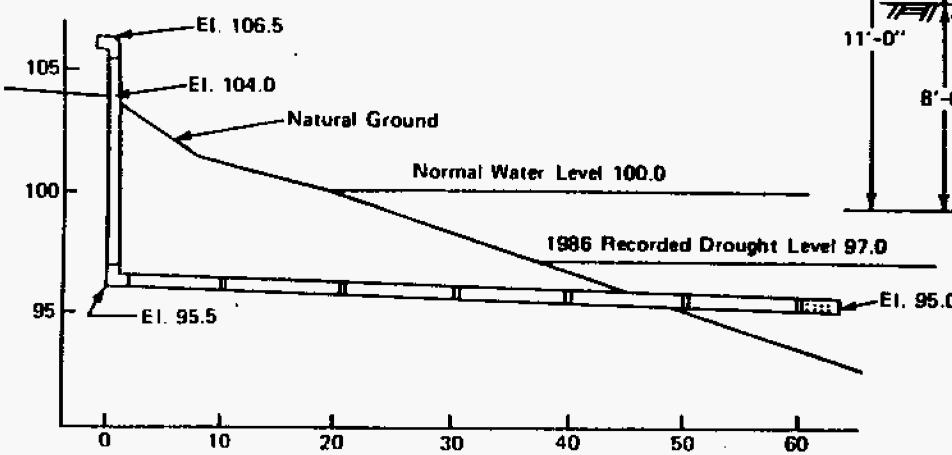
Quantity	Item
1 Ea.	Dry Hydrant Adapter-Sch 40 PVC 6" To 4½" Suction Line 90° Bend
1 Ea.	Strainer with Snap Ring
1 Ea.	Hydrant Cap
1 Ea.	6"x 3'-4" PVC Strainer
1 Ea.	6" Sch 40 PVC 90° Bend
70 L. Ft	6" Sch 40 PVC Pipe
6 Ea.	6" PVC Couplings-Sch 40
1 Ea.	Can PVC Glue

Quantities

Source of Water-Pond and Stream
Size of Normal Pool 0.84 AC.
Size of Drought Pool 0.38 AC.
Minimum Draw-6.5 Ft.
Maximum Draw-11.5 Ft.
Available Water At Normal Level 993,778 Gal.
Available Water At Drought Level 338,862 Gal.



Pipe Line Dimensions



Profile of Pipeline

Figure B-5-3.2(a).

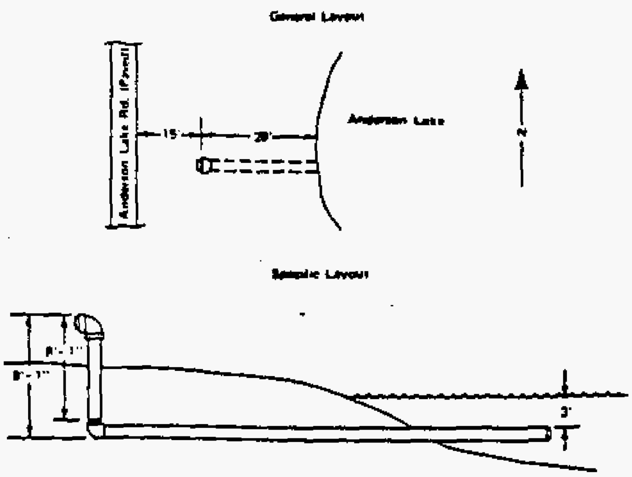


Figure B-5-3.2(b).

B-5-3.1 Maintenance Record for Dry Hydrant. It is suggested that a record of inspection be maintained with a separate card on each dry hydrant. (*See Figure B-5-3.1.*)

B-5-3.2 Map and Location/Detail Drawing. An official record should be kept of all pertinent information recommended for each dry hydrant area. An example of one type is Figure B-5-3.2(a). Additional information could be kept in format such as shown in Figure B-5-3.2(b). Both will provide invaluable information whenever the need for such is required.

B-5-4 Useful Depth of Water Sources. Careful note must be made of the fact that installation of dry hydrants, as noted in Section B-5, calls for care in measuring water storage capacities. The useful depth of a lake with a dry hydrant installation, for instance, is from the minimum foreseeable low-water surface level to the top of the suction strainer, not to the bottom of the lake, and must be not less than 2 ft (0.6 m) of water. This becomes a very important point where hydrants are installed on a body of water affected by tide or on a lake that is lowered to maintain the flow of a river during drought conditions or to generate power. A pump suction requires a submergence below the water surface of 2 ft (0.6 m) or more, depending upon the rate of pumping, to prevent the formation of a vortex or whirlpool. Baffle and anti-swirl plates may be added to minimize vortex problems and allow additional water use. The vortex allows air to enter the pump, which may cause the loss of the pump prime. Therefore, pumping rates must be adjusted as the water level is lowered. This factor should be considered by the water control officer when estimating the effective rate at which water can be drawn from all suction supplies. Floating strainers may reduce the need for a 2-ft (0.6-m) usable depth.

B-6 Access to Water Supplies.

B-6-1 General. The fact that an adequate water supply is in sight of the main road does not assure that the water can be used for fire fighting purposes. Many times, it is necessary that a suitable approach be provided to reach within 10 ft (3.05 m) of the water supply. This needs to be done and the department trained in the use and limitations of the water supply before the fire occurs. A suitable approach may call for a roadway. However, at some sites and in some areas of the country, it may not be necessary that a roadway be constructed due to soil conditions. Other sites may already have roadways provided or pavement installed with the construction of an entrance way or a gate necessary to give access to the water supply. Other sites may be reached by foot only and may necessitate that a path be constructed and maintained so that portable pumps may be carried to the site. Each site must be evaluated by the water supply officer to determine the best way, within the fire department's means, for using the water supply.

B-6-2 Roadway Access. Most man-made lakes are constructed with heavy earth-moving equipment. In order for the property owner to construct a roadway for fire department use, the water supply officer should make the property owner aware of the needs of the fire department while the heavy equipment is still on the job. Table B-6-2 details considerations that should be kept in mind when planning access.

Table B-6-2
Recommendations for Roads to Water Supplies

Width:	Roadbed — 12 ft (3.7 m) Tread — 8 ft (2.4 m) Shoulders — 2 ft (0.6 m)
Alignment:	Radius center line curvature — 50 ft (15.2 m).
Gradient:	Maximum sustained grade — 8 percent.
Side Slopes:	All cut and fill slopes to be stable for the soil involved.
Drainage:	Bridges, culverts, or grade dips at all drainageway crossings. Roadside ditches deep enough to provide drainage. Special drainage facilities (tile, etc.) at all seep areas and high-water-table areas.
Surface:	Treatment as required for year-round travel.
Erosion Control:	Measures as needed to protect road ditches, cross drains, and cut and fill slopes.
Load Carrying Capacity:	Adequate to carry maximum vehicle load expected.
Condition:	Suitable for all-weather use.

B-6-2.1 While the roadway is being developed to the water supply, consideration should be given to providing an 80-ft diameter turn around for the tankers. Where conditions at the supply do not make a turn around feasible, a large underground pipe transmission line may be laid from the water supply to the highway and the tankers filled on the highway right-of-way. However, a turn around or looped facility will still need to be provided at the fill point on the right-of-way.

B-6-2.2 Bridges Used as Water Points. In some states, a fire department cannot use a bridge to park a tanker while it is being filled, thereby blocking traffic on a state road. However, the fire department may be able to use the water source by moving the fill point off of the bridge to the right-of-way. Therefore, the department needs to check with the

Appendix C Water Hauling

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

C-1 Moving Water by Mobile Water Supply (Tanker).

C-1-1 General. The fire service has always experienced fire control difficulties in isolated areas. The difficulties have been many and varied, but one of the big factors is the lack of an adequate water supply. An adequate amount of water for control and extinguishment is a major consideration of most rural fire chiefs and influences the majority of their fire fighting decisions. A portion of the training of the rural fire department is taken up with engraving on the mind of the membership the need for the conservation of the meager water supply that is available in many areas.

This situation of a limited water supply at a working fire in a rural area demands the best in all phases of fire fighting. Therefore, this Appendix discusses the procedures for moving water in those areas where there are no municipal-type water distribution systems with fire hydrants.

Should the water supply be a dry hydrant, a lake, a cistern, a swimming pool, etc., some means must be provided for transporting the water from the supply to the fire. Most fire departments are using a fire department pumper (having a pump capacity of 750 gpm or more and having a minimum 500 gallon tank).

As this vehicle is always assigned to the supply, some departments provide it with little equipment beyond the pumps, the necessary hose for loading the tanker and some preconnected hand lines.

Several departments report that they have developed water supplies where the pumper is actually driven into shallow water at the water supply. Others have developed a trailer with a pump and the trailer is pulled to the water supply. Still other departments have received good service from a permanently installed pump at the supply.

Over the years, rural departments depending on hauled water have tended to utilize anything that will carry water and have exercised a great deal of ingenuity to make it work. Recently, there has been a trend in fire departments in rural areas to use "standard" pumpers and tankers with tanks in the 1000 to 1500 gal (3785 to 5678 L) range. Giant steps have been made in such tanker techniques as loading, unloading, and maintaining a continuous fire stream, based on the fire flow study, during the entire fire fighting operations. In this publication, a tanker is defined as a fire apparatus, the primary purpose of which is to move water from a source to the fire site. This is in contrast to a fire engine having a booster tank (no matter how large the tank), which will be placed at the fire to supply fire lines or placed at the water source to load the tankers.

Tankers are necessary for most rural departments and may be a big asset to a department having a weak municipal-type water system. While specially built and designed tankers are ideal, many fire chiefs are facing fires without adequate standard equipment. Since the job of putting out fires will require, on occasion, water-carrying capacity far above normal capability, a sound mutual or automatic aid program is necessary and far superior to makeshift equipment that is not designed for emergency service and is unsafe.

In building and buying nonstandard apparatus, utmost care must be exercised to consider safety and serviceability of the equipment as well as the safety of the membership of the department. A department having to depend on a mixture of tankers designed primarily for other use may need expert assistance in checking the equipment for safety before putting it in service.

If satisfactory service is going to be obtained from tankers, the size of chassis necessary to safely carry the load, the horsepower of the engine necessary to perform on the road and at the fire site, the completed vehicle's weight distribution, and the gear train combination best suited for the operation in that specific locale are items that must be carefully considered in the purchase or construction of the apparatus. The apparatus components, such as baffling of tank and center of gravity, are just as important as the engine, axles, and other drive line components and must not be overlooked.

Some fire departments, where their pumpers are equipped with large booster tanks, have retrofitted these pumps with a dump system.

C-1-2 Purchase or Construction of a Tanker. In the planning or construction of a tanker, it is necessary that careful attention be given to assure that engine, chassis, baffling, center of gravity, and brakes of adequate specifications are obtained. NFPA 1901, *Standard on Automotive Fire Apparatus*, covers tankers, and it is suggested that this standard be carefully followed. The tank should be properly constructed and baffled. Particular attention should be paid to flow rates to and from the tank. Consideration should be given to discharging the tanker to the receiving vehicle, portable tank, or other equipment as rapidly as possible to get back on the road and bring another load of water to the fireground. Some departments are installing very large dump valves with gravity flow; while other departments are providing a pump with a jet dump arrangement to reduce the time of emptying tankers.

Terrain to be traveled, weather to be encountered, and bridge and road conditions must be considered in buying or building safe tankers.

It is suggested that, for a tanker with a capacity greater than 1,500 gal (5678 L), it may be necessary to utilize a semitrailer or tandem rear axles, depending on tank size and chassis characteristics. Certain types of chassis may not provide safe carrying capabilities, and a dangerous vehicle could result from assembly. Safe, reliable equipment that at least meets the minimum standards is a must.

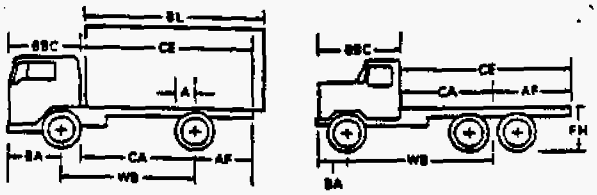
It is further recommended that the maximum water tank capacity for tankers should not exceed 4,800 gal (18 168 L or 20 tons of water). In some cases, it may even be found that the cost of two smaller tankers will be little more, if any, than the cost of one large tanker. The mobility, cost of upkeep, and highway bridge weight restrictions may convince many rural fire departments of the need to restrict the weight of their mobile water supply tanker.

Each load bearing tire and rim of the apparatus should carry a weight not in excess of the recommended load for truck tires of the size used, as published by the tire manufacturer's rating, when apparatus is loaded. Compliance should be determined by weighing of the loaded apparatus.

C-1-7 Weight Distribution. Weight distribution is all-important in the handling of a heavy piece of fire apparatus and should be properly designed into the unit and then verified by actual weighing of each axle. Only a slight change in the load carried or the distribution of the load may cause the design limits of the truck to be exceeded and turn a safe vehicle into an unsafe vehicle.

Figure C-1-7 provides information as to data necessary to figure accurate weight distribution and how to use this data to make the weight distribution calculation.

Data required pertains to "as is" weights of the chassis to be used, dimensions of the chassis, and weights to be placed on the chassis. "As is" weights are best determined by weighing the chassis, with separate weights obtained on front and rear axles. If the unit has dual rear axles they should be weighed together. In some cases, particularly in using a new chassis, this data may be obtained from the agency providing the chassis, but it should be noted that such items as changes in tire size, lengthening, shortening, or reinforcement may alter such standard factory-provided data, and it is consequently preferable to weigh the chassis upon starting construction planning.



BBC	=	Bumper to back of cab
BA	=	Bumper to center line of front axle
CE	=	Back of cab to end of frame
CA	=	Back of cab to center line of real axle or tandem suspension
AF	=	Center of rear axle to end of frame
FH	=	Frame height
BL	=	Body length
FA	=	Front axle weight
RA	=	Rear axle weight
B	=	Body weight — Weight of complete body to be installed on chassis
PL	=	Payload weight — Weight of commodity to be carried
A	=	Distance from center line of rear axle to center line of body or payload Center line of body (at ½ body length)
WB	=	Wheelbase distance — Distance between center line of front and rear axle or tandem suspension.

Terms:
Chassis — Basic vehicle cab, frame, and running gear
Curb Weight — Weight of chassis only
Gross Vehicle Weight (GVW) — Total of curb, body, and payload weight

The weight carried by the front and rear axle may be calculated from the following formulas:

$$\frac{(B + PL)\,A}{WB} = \text{FA (Front Axle Weight)}$$

$$(B + PL) - FA = \text{RA (Rear Axle Weight)}$$

Figure C-1-7 Weight distribution for tankers.

Dimensional data is easily obtained by use of a tape measure or carpenter's ruler. Again, it may be available from the source providing the chassis but should be verified.

Weight of the body to be added to the chassis is a combination, primarily, of the steel and other materials used in the body, the water in the tank itself, and the components added to that basic list: such items as, for example, any reels, hose, or miscellaneous equipment planned. While it is not necessary to make an individual calculation for minor items (minor in terms of weight), it is certainly important to calculate weight distribution of items of a few hundred pounds or more.

This appendix does not attempt to provide complete information on tanker construction or the weight distribution of such a tanker. The chassis manufacturer's recommended weight distribution — generally expressed as a percentage of total weight, including both chassis and the weight placed on that chassis for front and rear axle(s) — is a prudent guideline as to the final weight distribution desired. Component weights may be obtained from the manufacturers of those components. Steel weights may be obtained from the steelyard providing the material.

C-1-8 Turning Radius and Wheelbase. An important consideration in tanker shuttle operations is the area available for turning. Since the tanker may be called upon to reverse direction or to maneuver for position at the water source or the fire site, a multiple of small single axle tankers with 12-in. (305-mm) quick dump or 6-in. (152-mm) jet dumps may actually move more water to the fire location than longer wheelbase tractor trailers and dual tandem axle tankers.

C-1-9 Tanker Modification. A warning is in order that special care must be used when modifying a tanker built for one purpose to use for another purpose, such as the prevalent practice of adapting an oil tanker to fire service. The majority of oil or gasoline tankers are constructed to carry a volatile liquid whose specific gravity is less than that of water. When utilized as a water tanker, the weight may exceed the manufacturer's permissible gross vehicle weight limits. For this reason, it may be prudent to reduce the tank's size to avoid undesirable effects on weight distribution. However, in doing so, special attention should be paid to the problem of altering the center of gravity, which makes the vehicle's cornering characteristics more hazardous.

Special attention should be paid to the baffling of such tankers, and the truck should be rejected if it does not meet the demands of cornering, braking, and acceleration required by the fire service.

Other special considerations: A stainless steel milk tanker may be made out of very light gauge metal with no baffling whatever and be difficult to baffle crosswise and lengthwise.

The steel used in gasoline tankers will corrode extremely fast due to the uncoated interior of such tanks. In addition, the steel used is not of the copper-bearing or stainless type used in most fire apparatus tanks.

Aluminum fuel oil tanks have been found to be subject to corrosion from chlorinated water and corrosive rural water supplies. They may have a life expectancy less than that of steel if not properly coated and protected.

There is an inherent danger in modifying gasoline tankers — that of an explosion. All gasoline tanks should be thoroughly steam cleaned before modifications requiring welding are undertaken.

The gasoline and milk tanker are usually designed to be filled with the product each morning and to distribute that product during the day under normal traffic conditions rather than emergency conditions as is the case with fire equipment. An oil tanker or milk tanker is not required to stand in the station fully loaded day after day.

Weights of Various Fluids

Milk	— 8.5 lbs/gal
Water	— 8.3 lbs/gal
Gasoline	— 6.2 lbs/gal

C-1-10 Driver Training. An important consideration frequently missed by the rural fire department is that of driver training. There are few people trained to drive a tractor trailer combination under emergency conditions, and the fire department planning to use one must train for it. Even a two- or three-axle vehicle used as a tanker will probably have driving characteristics highly unlike other apparatus, and driver training is a must.

C-1-11 Calculating Water-Carrying Potential. Two primary factors to be considered in the development of tank water supplies are the amount of water carried on initial responding units and the amount that can be continuously delivered thereafter.

A number of fire departments have developed water hauling operations to the point where they have a maximum continuous flow capability (a sustained fire flow) of 1,000 to 2,000 gpm (3785 to 7570 L/min) at the fire scene. This, of course, requires a number of tankers to haul such large quantities of water, with a developed water source near the fire site. To improve the safety factor by reducing congestion on the highways, the departments often send the tankers to the water source by one road and use another route for the tankers to return to the fire scene. Therefore, the time for the department to travel from the fire to the water source (T_1) may be a different time than the travel time back to the fire (T_2). The reduction of congestion on the highway provides for a safer operation and may increase the actual amount of water hauled.

An appropriate formula to calculate the maximum continuous flow capability at the fire scene is:

$$Q = \frac{V}{A + (T_1 + T_2) + B} - 10\%$$

Where:

Q	=	Maximum continuous flow capability in gallons per minute;
V	=	Tanker capacity in gallons;
A	=	Time in minutes for tanker to drive 200 ft (61 m), dump water into a drop tank, and return to starting point;
T_1	=	Time in minutes for tanker to travel from fire to water source, given by formula $T_1 = 0.65 + XD_1$ [*see Table C-1-11(b)*];
T_2	=	Time in minutes for same tanker to travel from water source back to fire, given by formula $T_2 = 0.65 + XD_2$ [*see Table C-1-11(b)*];
B	=	Time in minutes for tanker to drive 200 ft (61 m), fill tanker at water source, and return to starting point,
- 10%	=	Amount of water supply (tanker capacity) considered not available due to spillage, underfilling, and incomplete unloading.

The dumping time (A) and filling time (B) for the formula may be determined by drill and by close study of water sources. Equipment does not have to be operated under emergency conditions to obtain travel time (T), as this may be calculated from the following equation:

$$T = 0.65 + XD.$$

T = Time in minutes of average one-way trip travel.

D = One-way distance.

When an apparatus is equipped with an adequate engine, chassis, baffling, and brakes, a safe constant speed of 35 mph can generally be maintained on level terrain, in light traffic, and on an adequate roadway. Where conditions will not permit this speed, the average safe constant speed should be reduced.

Using an average safe constant speed of 35 mph.

$$X = \frac{60}{\text{average safe constant speed}} = \frac{60}{35\text{ mph}} = 1.70$$

Precalculated values for "X" using various mph have been inserted into the preceding formula (T = 0.65 + XD) as follows:

Table C-1-11(a)

T = 0.65 + 1.7 D	Constant Speed of 35 mph
T = 0.65 + 2.0 D	Constant Speed of 30 mph
T = 0.65 + 2.4 D	Constant Speed of 25 mph
T = 0.65 + 3.0 D	Constant Speed of 20 mph
T = 0.65 + 4.0 D	Constant Speed of 15 mph

These formulas make it possible to plan water available at any point in an area. As an example of how to calculate the water available from a supply where the water must be trucked to the fire scene, consider the following applications of the formula:

If tank capacity (V) is 1500 gallons (5678 L), time (A) to fill the tanker with water is 3.0 minutes and the time (B) to dump the tanker load of water into a portable tank is 4.0 minutes.

The distance (D_1) from the fire to the water source is 2.10 miles. As the tanker returns by a different road, the distance (D_2) from the water source is 1.80 miles.

First, solve for T_1, the time for the tanker to travel from the fire to the water source and then for T_2, the time for the tanker to travel from the water source back to the fire:

Due to good weather and road conditions, the average tanker speed going from the fire to the water source is 35 mph.

Therefore:

$T = 0.65 + XD_1$
$X = 1.7$
$D_1 = 2.10$ miles
At a contrast speed of 35 mph
$T_1 = 0.65 + 1.7\ D_1$
$T_1 = 0.65 + 17 \times 2.10$
$T_1 = 0.65 + 3.57$
$T_1 = 4.22$ minutes

[*Also see Table C-1-11(b).*]

At a constant speed of 35 mph, a tanker traveling 2.1 miles will take 4.22 minutes. Due to traffic lights, the average tanker speed between the fire and the water source is 30 mph.

Therefore:

$$T_2 = 0.65 + XD_2$$
At 30 mph
$$X = 2.0$$
$$D_2 = 1.80 \text{ miles}$$
$$T_2 = 0.65 + 2.0\ D_2$$
$$T_2 = 0.65 + 2.0 \times 1.8$$
$$T_2 = 0.65 + 3.60$$
$$T_2 = 4.25 \text{ minutes}$$

Substituting in the formulas

$$Q = \frac{V}{A + (T_1 + T_2) + B} - 10\%$$

Q = Maximum continuous flow capability in gpm with V = 1500
A = 3.0
T_1 = 4.22
T_2 = 4.25
B = 4.0

$$Q = \frac{1500}{3.0 + (4.22 + 4.25) + 4.0} - 10\%$$

$$Q = \frac{1500}{3.0 + 8.47 + 4.0} - 10\%$$

$$Q = \frac{1500}{15.47} - 10\%$$

Q = 97 − 10% = 87 gpm maximum continuous flow capacity available from this 1500 gallon tanker.

To increase the maximum continuous flow capability of a tanker, any of the following changes can be made:

1 — Increase the capacity of the tanker
2 — Reduce the fill time
3 — Develop and provide additional fill points, thus reducing travel time
4 — Reduce the dump time.

With rural fire response distances normally being very long, the number and size of tankers available to the department is of paramount importance. This information will assist the department in calculating the probable tanker gallonage that will be available at various fire locations. Equally important in increasing the maximum continuous flow capacity of a tanker is to reduce the distance between the source and the building or fire. This can be accomplished by increasing the number of water supplies and/or the drafting points.

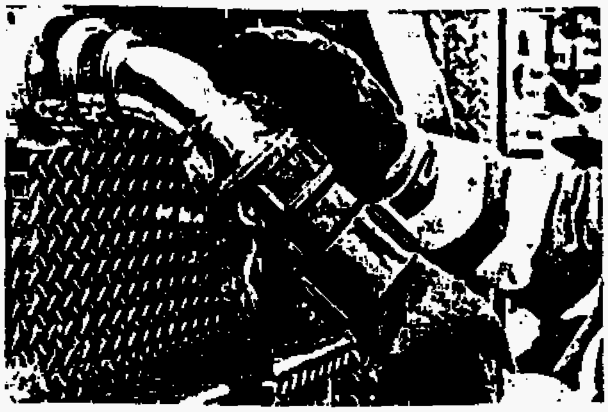


Figure C-1-11 One way to increase water hauling capacity is to reduce the fill time of the tanker. Here is one type of quick coupling that may help to reduce the fill time.

C-1-12 Discharging the Mobile Water Supply (Tanker). During water hauling operations, tanker dump/fill rates directly affect the fire flow capabilities established at the fire scene. Local needs usually determine tanker configuration and the water hauling protocols adapted. A wide variety of off-loading and filling systems are currently in use. Some departments prefer to pump off their water into portable tanks, while others utilize a nursing type of operation. An increasing number of fire departments are incorporating the use of large dump valves or jet-assisted dump arrangements. To decide which system is best requires an evaluation of effectiveness, efficiency, and overall compatibility with other segments of the water delivery.

During a comprehensive evaluation many factors must be considered. Travel distances, operating site location, and topography greatly affect water hauling turnaround time periods. Usually, the most significant time can be saved during the filling and discharge segments of the tanking operation. Normally, greater quantities of water are made available as filling/discharge rates increase. Of course, increased quantities must be logistically supported by ample water source locations and tanking vehicles.

As with other segments of fireground operations, strategic pre-planning is vital to water hauling evolutions. Preplanning and practice reduce unnecessary actions and minimize unsafe practices. For example, a properly established dump site should eliminate or substantially reduce the need to back vehicles (an act that not only requires precious time but causes 33 percent of all vehicle accidents). The use of flexible discharge tubing or side dumps in conjunction with properly set-up dump sites can often eliminate the necessity of backing.

Because two of the key periods for saving time during water hauling operations center around tanker filling and discharge, many fire departments have incorporated the use of large gravity dump valves or jet dump valve arrangements.

C-1-12.1 Mobile Water Supplies (Tanker) Equipped with Large Gravity Dumps. A number of rural fire departments have increased the size of their gravity discharge dumps to reduce the time necessary to empty other water

Table C-1-11(b) Time Distance Table
Using an Average Safe Constant Speed of 35 mph
$T = 0.65 + 1.70\ D$

Distance, Miles	Time, Minutes	Distance, Miles	Time, Minutes	Distance, Miles	Time, Minutes	Distance, Miles	Time, Minutes
0	0						
0.1	0.82	2.6	5.07	5.1	9.32	7.6	13.57
0.2	0.99	2.7	5.24	5.2	9.49	7.7	13.74
0.3	1.16	2.8	5.41	5.3	9.66	7.8	13.91
0.4	1.33	2.9	5.58	5.4	9.83	7.9	14.08
0.5	1.50	3.0	5.75	5.5	10.00	8.0	14.25
0.6	1.67	3.1	5.92	5.6	10.17	8.1	14.42
0.7	1.84	3.2	6.09	5.7	10.34	8.2	14.59
0.8	2.01	3.3	6.26	5.8	10.51	8.3	14.76
0.9	2.18	3.4	6.43	5.9	10.68	8.4	14.93
1.0	2.35	3.5	6.60	6.0	10.85	8.5	15.10
1.1	2.52	3.6	6.77	6.1	11.02	8.6	15.27
1.2	2.69	3.7	6.94	6.2	11.19	8.7	15.44
1.3	2.86	3.8	7.11	6.3	11.36	8.8	15.61
1.4	3.03	3.9	7.28	6.4	11.53	8.9	15.78
1.5	3.20	4.0	7.45	6.5	11.70	9.0	15.95
1.6	3.37	4.1	7.62	6.6	11.87	9.1	16.12
1.7	3.54	4.2	7.79	6.7	12.04	9.2	16.29
1.8	3.71	4.3	7.96	6.8	12.21	9.3	16.46
1.9	3.88	4.4	8.13	6.9	12.38	9.4	16.63
2.0	4.05	4.5	8.30	7.0	12.55	9.5	16.80
2.1	4.22	4.6	8.47	7.1	12.72	9.6	16.97
2.2	4.39	4.7	8.64	7.2	12.89	9.7	17.14
2.3	4.56	4.8	8.81	7.3	13.06	9.8	17.31
2.4	4.73	4.9	8.98	7.4	13.23	9.9	17.48
2.5	4.90	5.0	9.15	7.5	13.40	10.0	17.65

hauling tankers. Gravity dumping with discharge valves of 10 in. (254 mm), 12 in. (305 mm), or larger are often used. It must be remembered that dump valve discharge rates will vary as the depth of the water in a given tank decreases. Adequate air intakes and tank baffle cuts must be provided or inefficiency and possible tank damage can result. To check the efficiency of a dump system, actual weight tests must be conducted to determine discharge rates.

C-1-12.2 Mobile Water Supplies (Tankers) Equipped with Jet-Assisted Dumps. Basically, a jet is a pressurized water stream used to increase the velocity of a larger volume of water that is flowing by gravity through a given size dump valve. The water jet principle used to expel water from tankers has also been effectively applied to several other devices that can transfer water between portable dump tanks, fill tankers from static water sources, and reduce suction losses at draft. Water jets properly installed in the discharge piping of a tanker or tanker pumper can more than double their water hauling efficiency. Effective jet-assisted arrangements have exceeded a 1000 gpm (3785 L/min) discharge rate when using 6-in. (152-mm) discharge piping and valve. Pumps supplying such jet arrangements should be capable of delivering a minimum of 250 gpm (946 L/min) at 150 psi (1034 kPa). The size and design of the jet nozzle and the diameter and length of the dump valve piping directly affect unit efficiency.

C-1-12.3 Traditional In-line Jet-Assist Arrangement. Figure C-1-12.3(a) points out how the traditional jet is installed. A smooth tipped jet nozzle is supplied by a pump capable of delivering at least 250 gpm (946 L/m) at 150 psi (1034 kPa). Nozzle jets range in size from ¾ in. (19 mm) to 1¼ in. (32 mm). The diameter of the tip will be determined by the capacity of the pump being used and the diameter of the discharge piping and dump valve.

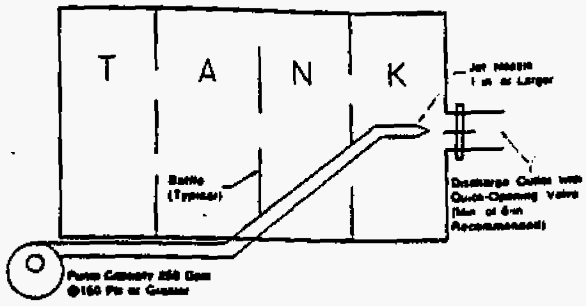


Figure C-1-12.3(a) Traditional internal jet dump.

The installation of a jet dump requires several important considerations to be made. In what location will the dump prove to be most useful, the side or the back? Will the fixed piping need to be 1½ in. (38 mm) in diameter or 2 in. (51 mm) in diameter? What is the preferable location for the jet, in-line or at the rear of the tank? The answers to these and other questions should be resolved before construction begins.

In the interests of site versatility, many departments are utilizing lightweight flexible discharge tubes equipped with quick lock or quarter-turn couplings. Such tubing arrangements allow rapid discharge of water to either side of the vehicle and reduce the need for hazardous backing at the dump site.

The rate of discharge will be governed by the size of the dump valve and piping, which can range from 4 in. (102 mm) to 12 in. (305 mm). Normally a 6-in. (152-mm) or 8-in. (203-mm) diameter dump configuration permits adequate flow capacities where water jet systems are employed. Again, it must be stressed that adequate air exchange and water flow passages must be provided for a jet-assisted dump arrangement to function properly. Tanks can collapse when air exchange is restricted. Lack of adequate gravity water flow to the jet area will also adversely effect the discharge efficiency of the water hauling unit.

Although some authorities recommend that the nozzle of the in-line jet be up to 6 in. (152 mm) from the center of the discharge opening, other effective designs have included placement of the nozzle inside the discharge piping. Figure C-1-12.3(b) details how the traditional jet ar-

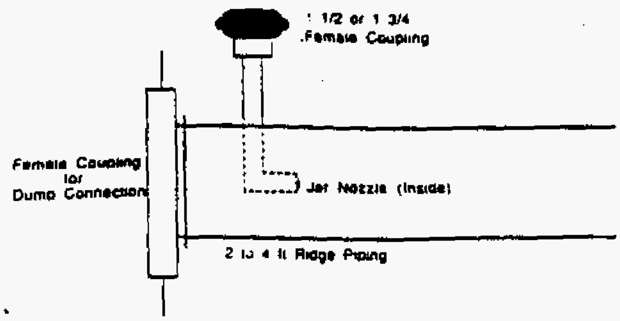


Figure C-1-12.3(b) Traditional external jet dump.

rangement can be externally added to an existing dump valve. A short length of 1½-in. (38 mm) hose is attached to the female on the jet device. The length of the added dump piping can be anywhere from 2 ft to 4 ft (0.6 m to 1.2 m) depending on whether or not a flexible tube is utilized during the dump process.

To properly operate, a jet must be able to produce between 50 psi (345 kPa) and 150 psi (1034 kPa) pressure. Higher pressures normally increase operational effectiveness. The diameter of the jet selected must be appropriate for the capacity and pressure capabilities of the pump being utilized. Also important is the size of the piping and valves that make up the jet dump system. External jets do have several advantages over internally fixed units, particularly in terms of system maintenance. Disadvantages might include the need to provide for adequate air exchange during water flow, more time for the initial setup to affix appliances, the restriction of movement around the vehicle, and the general appearance of such extensions.

C-1-12.4 Peripheral Jet Assist Arrangement. The peripheral application of jet assist nozzles has proven highly effective. This approach utilizes two or more jets installed in the sides of the discharge piping just outside the quick dump valve. In addition to the reported discharge advantages of peripheral jet streams, the externally fed system is easier to plumb and has fewer maintenance problems. The jets, installed 25 to 30 degrees from the piping wall, contact more surface area of the discharging water, thereby increasing water discharge efficiency. Because the water is drawn through the dump valve, less turbulence is created and the eddy effect often present with traditional in-line jets is overcome. Nozzles made of welding reducer pipe fittings work very effectively as jets. Two thousand gallons per minute (7570 L/min) flow rates have been obtained using a 300 gallons per minute (1136 L/min) pump to supply two ¾-in. (19-mm) nozzles in a 6-in. (152-mm) dump valve configuration. Figures C-1-12.4(a) and C-1-12.4(b) represent a typical installation.

C-1-12.5 Other Jet Assist Devices. Innovative fire organizations have put syphons and jet-related devices to good use. Some syphons use only water level differential to transfer water from one tank to another. Normally constructed of PVC pipe, such syphons are placed between portable tanks to equalize water levels. Transfer is initiated by filling the U-shaped tubing with water, placing the caps on the tubing until it is put in place, then removing the caps to allow water flow. Such an arrangement, though useful, have often proven too slow for the type of transfer operations required. A modification of the syphon transfer piping using a jet was developed and has proved useful to many departments. Although 4-in. (102-mm) PVC and aluminum piping have been used for such devices, 6-in. (152-mm) units usually are more practical. Using a ½-in. (12.7-mm) jet nozzle supplied by a 1½-in. (38-mm) hose makes possible transfer flows of 500 gpm (1900 L/min). Some departments merely add the jet to a length of suction. [*See Figures C-1-12.5(a) and C-1-12.5(b).*]

Syphons are commercially available that use the jet principle and are in some cases supplied by 2½-in. (64-mm) hose. These devices are used to remove water from basement areas or increase water supply to fire department pumpers.

In-line jets have also been developed to reduce suction losses during drafting operations. In-line and peripheral jets supplied by 1½-, 1¾-, or 2½-in. (38-, 43-, or 61-mm) hose lines can increase the output capacity of a centrifugal pump at draft up to 40 percent. The jets are placed at the intake and at every 10 ft (3 m) of suction in use. Some departments have developed a jet system for delivering water from a static source to tankers through 4-in. (102-mm) or 6-in. (152-mm) lightweight pipe. This supply piping concept is used to fill tankers through their discharge gates or via top loading or large inlets capable of filling tankers at the rate of 1000 gpm or greater.

C-1-12.6 Testing Dump Valve Capacity. Departments using large gravity dump valves or jet-assisted dump valve arrangements need to determine the flow rate at which they can dump and fill each tanker in use. Generally accepted procedures* for determining flow capacities have been suggested and should be accomplished as follows:

1. Weigh the tanker without any water on board.

2. Again weigh the tanker when it has been completely filled with water.

3. Using only gravity, off-load the tanker for one minute.

4. Reweigh the tanker and determine the gallons off-loaded by gravity.

5. Again refill the tanker and weigh it.

6. Now off-load the tanker for one minute using the jet arrangement.

7. Reweigh the tanker and determine the gallons off-loaded via the jet.

8. Make a comparison of the gallons used by gravity and those depleted using the jet.

9. Once again, fill the tanker and weigh it.

10. Now, for one minute, off-load the tanker by opening the gravity dump and pumping through a 2½-in. (61-mm) discharge.

11. After weighing the tanker, determine the number of gallons off-loaded by pumping and dumping.

An effective jet-assisted dump arrangement should produce at least twice the gpm that would be expected when off-loading by gravity. A good jet arrangement will exceed the gpm experienced during the dumping and pumping test. Whether using large dumps or jet dump arrangements, turnaround drop times and ease of operations must serve as primary considerations.

C-1-13 Portable Drop Tanks. There are, generally, three types of drop tanks: the self-supporting tank, the fold-out frame tank, and a high-sided fold-out tank for helicopter bucket-lift tanker service. The self-supporting tank is built with the sides reinforced to support the water inside the tank. The fold-out frame-type tank is similar to a child's wading pool — an open tank supported by a steel frame — and is the most common in fire service use. Tanks are available with an inlet and/or outlet built into the side of the tank. Capacities of drop tanks normally run from

*General procedure referenced from Larry Davis, *Rural Firefighting Operations Book II*, Chapter 15, page 342, IFSFI, Ashland, Mass 1986

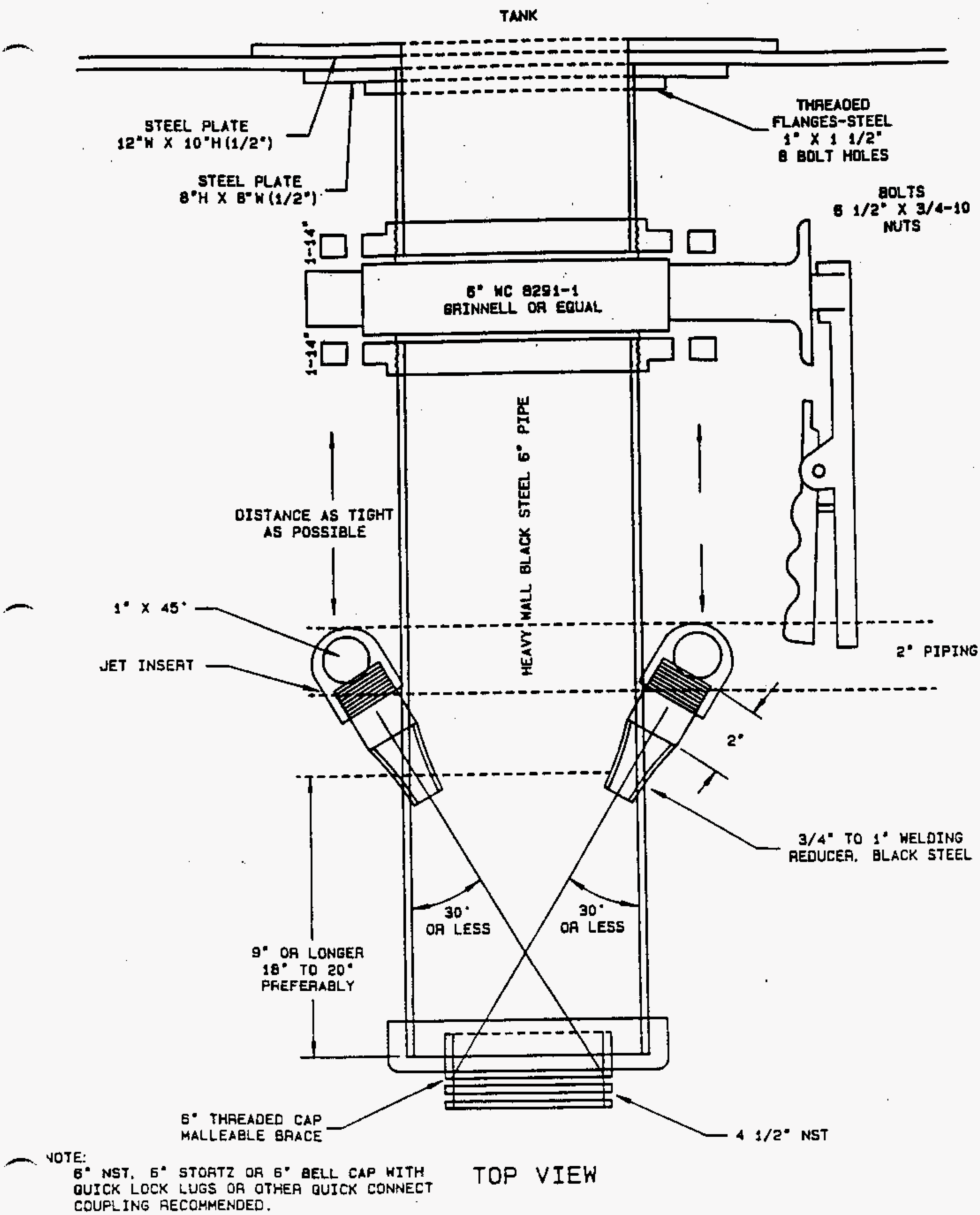
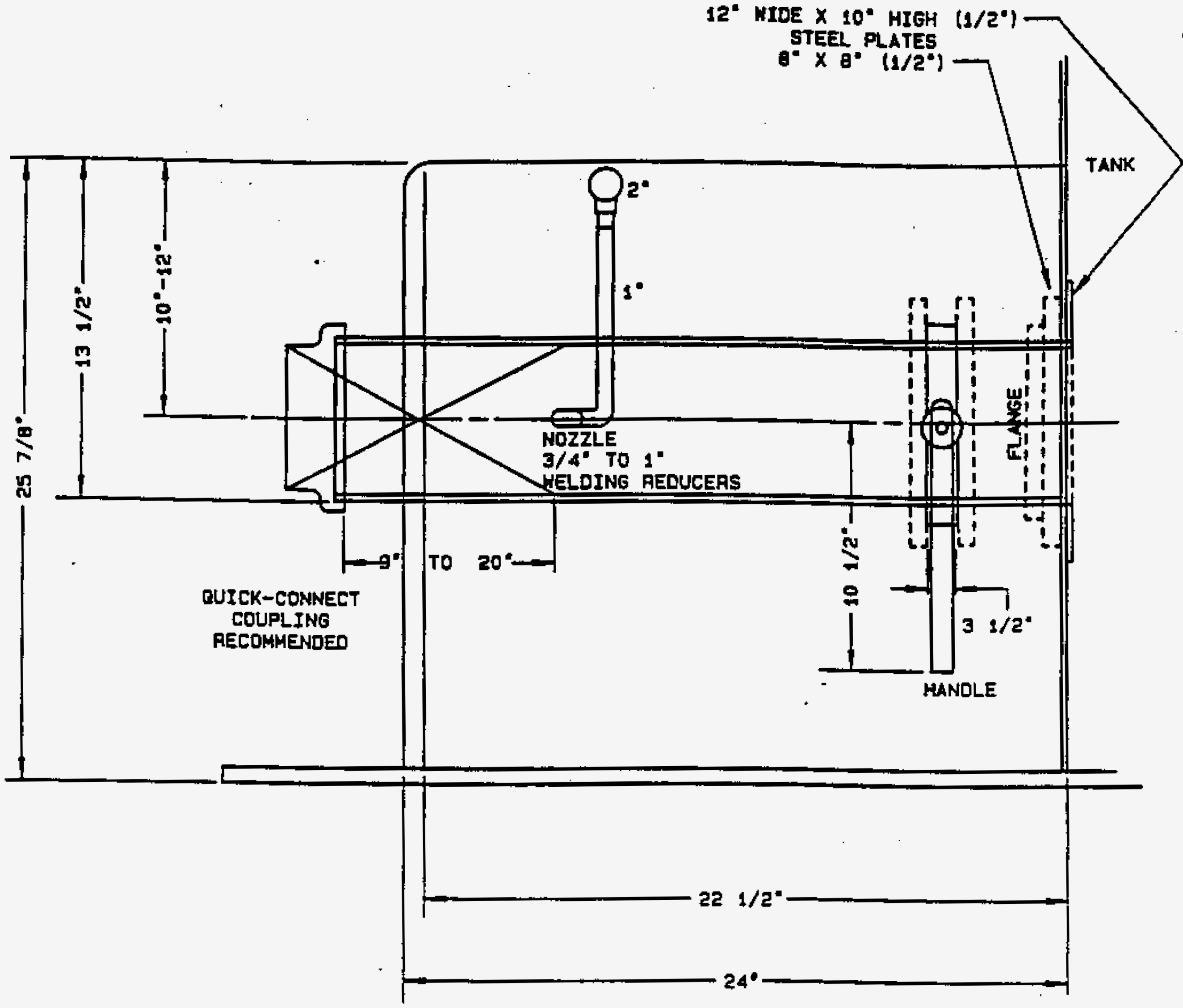


Figure C-1-12.4(a).



SIDE VIEW

Figure C-1-12.4(b).

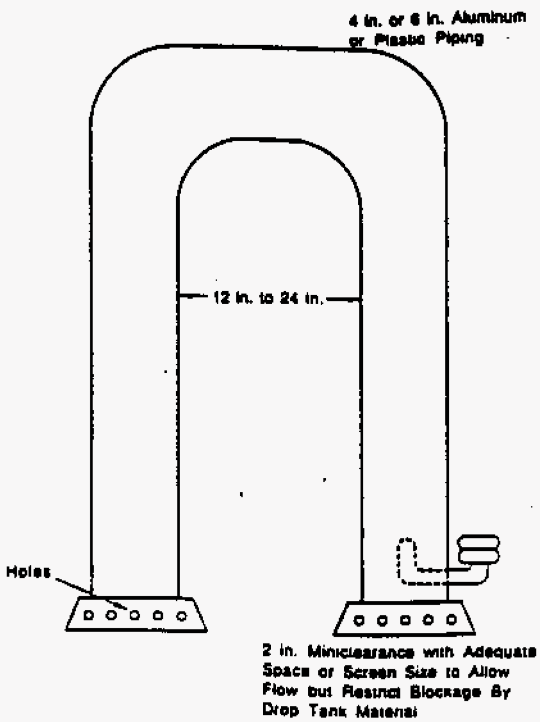


Figure C-1-12.5(a) Jet-assisted transfer syphon.

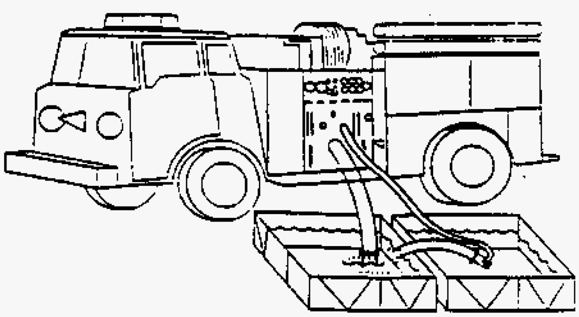


Figure C-1-12.5(b) Modified hard suction jet syphon.

1000 to 2500 gal (3785 to 9463 L) with 1500- to 2000-gal (5676- to 7570-L) tanks as the more popular. The addition of the drop tank for "stockpiling" water has yielded highly desirable results. This "stockpiling" allows for the continuous operation of low-volume supplies and creates a source from which a pumper may draft for supplying hose lines in a direct fire attack.

C-1-14 Use of Portable Drop Tanks and Mobile Water Supply Vehicles (Tankers). The development of the portable drop tank or portable folding tank and the jet assisted dump or large gravity dump to assist the tanker to quickly discharge its load of water has enabled many rural fire departments to utilize isolated water supplies and for the first time to obtain sufficient water for effective fire fighting. Following is a brief outline of how the system is being employed by some departments:

Figure C-1-13(a) Portable drop tanks should be simple to set up. Note the portable tank compartment (door open) on the tanker. (*Photo by [illegible] Volunteer Fire Department, North Carolina*)

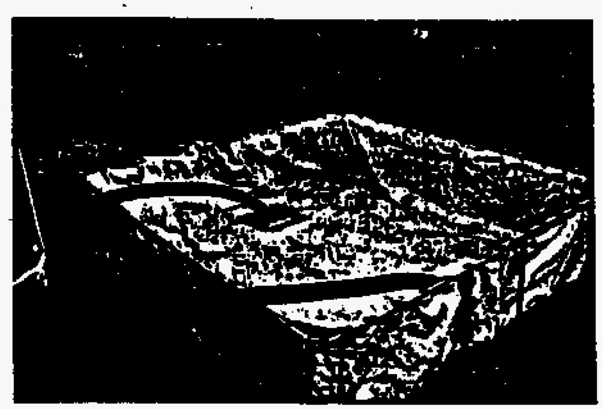


Figure C-1-13(b) Each tanker should carry a portable tank that is 40 percent greater than the capacity of the tanker. Note the strainer that minimizes whirlpooling and allows departments to draft to a depth of 1-2 in. in the portable tank.

When an alarm of fire is received, equipment is dispatched on a preplanned basis determined by such factors as fire flow needs, hazards involved, water supply available, etc. (*See Chapter 5.*) A minimum of one tanker and one pumper respond to the fire, and the pumper begins the fire attack with water from its booster tank. The first responding tanker may act as a nurse tanker or may set up a portable drop tank and begin discharging its load of water into the drop tank. With the use of a jet-type pump, discharging through a 5- or 6-in. (127- or 152-mm) discharge pipe, or a large 12-in. (305-mm) quick dump valve, the water in the tanker can be transferred to the portable drop tank at a rate of approximately 1000 gpm (3785 L/min). A short piece of aluminum pipe with an "L" on one end gives the tanker the flexibility to discharge into the drop tank with the tanker backed up to the drop tank or with the drop tank located on either side of the tanker. As soon as the tanker has emptied its load, it immediately heads to the water supply. In the meantime, another fire department pumping unit has responded to the water supply, connected to the dry hydrant, and primed its pump. When the empty tanker arrives at the water supply, the pumper is ready to fill the tanker. The refilled tanker returns to the fire site, discharges its water, and the cycle is repeated.

It is suggested that it is more efficient to fill one tanker at a time rather than to fill two or more tankers at a slower rate. Also, if all tankers in the department have the same capacity, they will not "stack up" at the source of supply or the fire while waiting for a large tanker to be filled at the source or to discharge its water at the fire. Although preplanned, each step of this hauling operation is under the direction of the water control officer, and local conditions may dictate variations in this basic system.

As additional tankers arrive at the fire site and dump their water, they fall into the water-hauling cycle. Of course, it may be necessary for the water supply officer to open up additional water supply points with additional pumpers. Portable pumps can sometimes be used in this operation if the additional supply is not readily accessible; however, refill time may be greatly increased. The water supply officer at the fire site needs to be in radio contact with the officer in charge of each water supply or suction point. He will also advise the drivers which route to take to the fire site. Whenever possible, an alternate route should be selected for returning vehicles so that emergency vehicles will not be meeting on sharp turns or narrow country roads.

The initial alarm response to certain occupancies that require a large volume of water, based on the study producing the water flow requirements, may be beyond the ability of the local department to produce. Automatic aid pumpers and tankers may be set up to run automatically on first alarm, thereby conserving valuable time and delivering fire flows calculated in Chapter 5.

It is desirable that each tanker carry a portable drop tank with a capacity in excess of the tanker capacity.

Figure C-1-14 The aluminum irrigation discharge pipe, in the shape of an "L," allows discharge from either side or rear of the tanker. Four hard suction hose lines are used to minimize any clogging of the strainers.

C-1-15 Chemical Additive and Water Supply.

C-1-15.1 General. Fire departments are using chemicals to increase their fire fighting capacity. This is important to the rural fire fighter working with a limited water supply because these chemicals can give more extinguishing capability per gallon of water. Since the chemical additives will create an additional expense, it becomes very important to be aware of the various capabilities and characteristics of chemical additives, as well as their advantages and disadvantages, relating to the types of fires encountered by each fire department.

C-1-15.2 Foam. The need for fire fighting foams occurs on surfaces when the cooling effect of water is needed and whenever continuous film-coating characteristics of a light, opaque form of water, capable of sealing vapors, are needed. The most important use of foam is in fighting fires involving flammable or combustible liquids; foam becomes the only permanent extinguishing agent used on fires of this type. Fire fighting foam is lighter than the aqueous solution from which it is formed and lighter than flammable liquids; therefore, it floats on all flammable or combustible liquids, producing an air-excluding, cooling, continuous layer of vapor-sealing, water bearing material for purposes of halting or preventing combustion. (*See NFPA 11, Standard for Low Expansion Foam and Combined Agent Systems.*)

The appropriate listings on the label should be consulted to determine proper application rates and methods. If there are no listings for application rates and methods, do not assume any. However, the word "foam" appears in the usage of wetting agent instructions as well as in the use of water expansion system (WES) units.

C-1-15.3 Other Water Additives (Wetting Agents). A wetting agent is a chemical compound that, when added to water in amounts indicated by the manufacturer, will materially reduce the water's surface tension, increase its penetrating and spreading abilities, and may also provide emulsification and foaming characteristics. Decreased surface tension disrupts the forces holding the film of water together, thereby allowing it to flow and spread uniformly over solid surfaces, also allowing it to penetrate openings and recesses that it would normally flow over. Water treated in this manner not only spreads and penetrates, but displays increased absorptive speed and superior adhesion to solid surfaces. Because of the above, leaks in plumbing and pump packing may occur that would not have occurred if the additive had not been used. Visual inspection should be made during wet water operations.

Wet water should be applied directly to the surface of the combustible. These agents do not increase the heat absorption capacity of water, but the greater spread and penetration of the wet water increase the efficiency of the extinguishing properties of water as more water surface is available for heat absorption and run-off is decreased.

Wetting agents are broadly defined as being surfactants (surface acting agents). All wetting agents are concentrated and are mixed with a liquid at varying percentages. The wetting agent can be liquid or powder. The liquid into which it is mixed for fire fighting purposes is water. However, the primary sales for some wetting agents are for use as a carrier for liquid fertilizers, fungicides, insecticides, and herbicides. Thse wetting agents can be, and are, used for fire fighting purposes. They don't have additives that will protect tanks, pumps, valves and bushings, etc., and it is recommended that unused mixtures be drained out of the tank and a flush of all parts be made with plain water. With all wetting agents, hard water usually does require a greater amount of additive to produce the same results.

Wetting agents designed for fire department use will normally contain rust inhibitors to protect the tank, pump, piping, and valves. Generally, the mixture will lose some of its rust-inhibiting characteristics if left in the tank.

Wetting agents are available in both liquid and powder form. Both forms will result in the same extinguishment characteristics.

The use of wetting agents is as a soaking or penetrating agent into forest fuels, sawdust, cotton (bales, bedding, upholstery), rags, paper, etc. These agents are used very effectively on smoldering or glowing combustibles. All of the commercially available products that fall into the above category will satisfactorily suppress Class A type fires.

Many of the wet water additive products will have instructions that make note of the production of a foam material through increasing the amount of the product.

No additional equipment is needed for the production of this foam. Caution should be exercised, as well as actual on-site testing performed, in order to determine what the resultant foam will display in terms of extinguishment and fire fighter safety.

Additionally, a few wet water additives will produce a foam through the use of a foam gun (generally a tube-type aerator and some nozzles. The instructions will indicate this is generally a Class A fire extinguishing agent. As above, local on-site testing should be performed to determine the product's capabilities.

There is commercially available a water additive that will suppress Class A and B fires. The product accomplishes the extinguishment of Class B fires by altering the water properties in such a manner that the increasing heat converts the water to a vapor, rather than steam, thereby cooling the fire.

Appendix D Large Diameter Hose

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

D-1 Transporting Water through Large Diameter Hose.

D-1-1 General. The advent of large diameter hose as an accepted tool of fire fighting has major significance in the field of rural water supplies. This hose is viewed as an aboveground water main from a water source to the fire scene, and its use is growing in the United States. Where delivery rates exceed 500 gpm (1893 L/min) and water must be moved long distances, large diameter hose provides a most efficient means of minimizing friction losses and developing the full potential of both water supplies and pumping capacities. NFPA has held that, for practical purposes, large diameter hose is that with an inside diameter of 3½ in. (89 mm) or larger.

D-1-2 Characteristics. Large diameter hose is available in either single or double jacketed construction, generally in the following sizes: 3½ in. (89 mm), 4 in. (102 mm), 4½ in. (114 mm), 5 in. (127 mm), and 6 in. (152 mm). The lower friction loss characteristics of such hose increases the usable distance between water source and fire. The department now unable to use water sources more than 1,000 ft (305 m) from a potential fire site may find that 3,000 ft (914 m) or more can become a reasonable distance when taking advantage of large diameter hose.

The basic reasons larger diameter hose moves water more efficiently are its increased size, its lower friction loss, and the relationship of these factors. They may be explained by studying the carrying capacities and friction loss factors shown in Tables D-1-3(a) and D-1-3(b).

D-1-3 Carrying Capacity of Large Diameter Hose. Tables D-1-3(a) and D-1-3(b) show, for example, that one 5-in. (127-mm) hose line delivers a volume of water approximately equivalent to six 2½-in. (65-mm) lines or four 3-in. (76-mm) lines at a given pressure and distance. [To use Table D-1-3(a) to obtain these numbers, read horizontally from the 5-in. (127-mm) hose column on the far left. Thus, the table shows one 5-in. (127-mm) length of hose to have the carrying capacity of 6.2 lengths of 2½-in. (65-mm) hose, 3.83 lengths of 3-in. (76 mm) hose, 2.56 lengths of 3½-in. (89-mm) hose, and so forth.]

Table D-1-3(a) Relative Carrying Capacity of Fire Hose in Hose Lengths

	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.	6 in.
2½ in.	1	.617	.413	.29	.213	.161	0.1 in.
3 in.	1.62	1	.667	.469	.345	.261	.162
3½ in.	2.42	1.5	1	.704	.515	.391	.243
4 in.	3.44	2.13	1.42	1	.735	.556	.345
4½ in.	4.69	2.90	1.94	1.36	1	.758	.469
5 in.	6.20	3.83	2.56	1.8	1.32	1	.619
6 in.	10	6.19	4.12	2.9	2.13	1.61	1

This table shows the relative carrying capacities of hose, 2½ in. to 6 in. in diameter, for the same friction loss. The values in the table are based on the Hazen-Williams equation.

For SI Units: 1 in. = 25.4 mm.

Table D-1-3(b) Approximate Friction Losses in Fire Hose (psi per 100 feet)

Internal diameter of hose:	2½ in.	3 in.	3½ in.	4 in.	5 in.	6 in.
Flow in GPM:						
250	15	6	2	-	-	-
500	55	25	10	5	2	-
750	-	45	20	11	4	1.5
1000	-	77	36	19	6	2.5
1500	-	-	82	40	14	6
2000	-	-	-	70	25	10

D-1-3.1 Selecting Large Hose. The size and the amount of hose to be carried by the fire department should be selected to fit the needs of the area served and the financial resources of the department. To assist in this selection of hose, Table D-1-3.1 may be helpful. The table is designed to be used primarily in relaying water with pumps discharging at 150 psi (1034 kPa) and at 20 psi (138 kPa) residual pressure at the point receiving the flow.

D-1-4 Load Capacity. Another important item to consider is hose load capacity. Most large diameter hose is of a lightweight design, which results in a coupled 100 ft (30.5 m) length of 5-in. (127-mm) hose weighing approximately 105 lb (48 kg) — little heavier than a length of 100 ft (30.5

Table D-1-3.1 Distance in Feet that a Given Size Hose Can Deliver a Quantity of Water

GPM Discharge at 150 psi Pump Pressure

GPM Discharge at 150 PSI Pump Pressure

Hose Size Inches	250 gpm	500 gpm	750 gpm	1000 gpm	1500 gpm	2000 gpm
2½	866 ft	236 ft				
3	2166 ft	520 ft	288 ft	168 ft		
3½	6500 ft	1300 ft	650 ft	361 ft	158 ft	
4		2600 ft	1181 ft	684 ft	325 ft	185 ft
5		6500 ft	3250 ft	2166 ft	928 ft	520 ft
6			8666 ft	5200 ft	2166 ft	1300 ft

Example: A 750-gpm fire flow is needed on the fire that is located 6,500 ft from the water supply. A pumper rated 750 gpm at 150 psi can relay 750 gpm at 20 psi discharge for a distance of only 650 ft if 3½-in. (89-mm) hose is used or 8,666 ft if 6-in. (152-mm) hose is used. Therefore, the department should consider using 6-in. (152-mm) hose to deliver its needed water requirements.

For SI Units: 1 in. = 25.4 mm; 1 gpm = 3.785 L/min; 1 ft = 0.305 m.

m) of conventionally constructed 2½-in. (65-mm) hose, which may weigh approximately 100 lb (45 kg).

One engine company, laying large diameter hose instead of multiple smaller lines, is much more efficient in its water-moving capacity. The use of the large diameter hose with one engine speeds up the operation that would otherwise involve multiple smaller lines with additional pumpers, men, and equipment to accomplish the same job.

D-1-5 Large Cities Using 5-in. (127-mm) Hose. Use of large diameter hose is not limited to the rural fire service. Because of its increased water-carrying capacity and efficiency, 40 percent of the 200 largest cities throughout the U.S. now employ large hose, and it may be one of the fastest growing items of technology in the fire service. It has demonstrated further utility as, literally, a portable pipeline used to bridge the gap in a water system when a main ruptures and is being repaired. It has further been used in some drought-stricken areas to bring water to the scene of a fire from a distant lake or stream, conserving

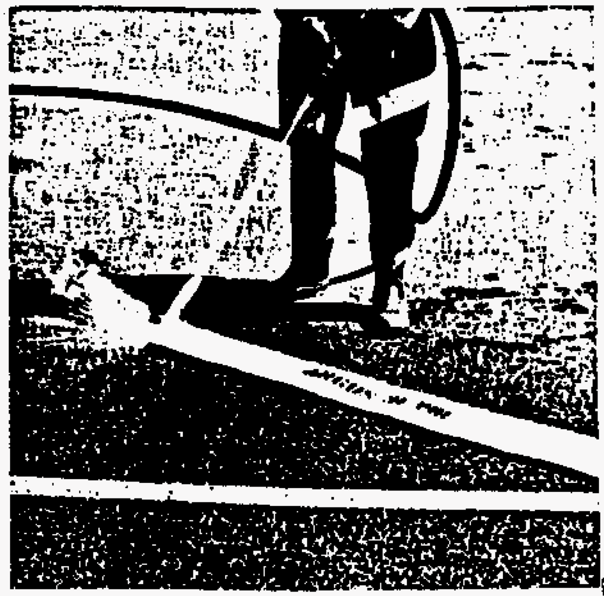


Figure D-1-6(a) Field cleaning large diameter hose.

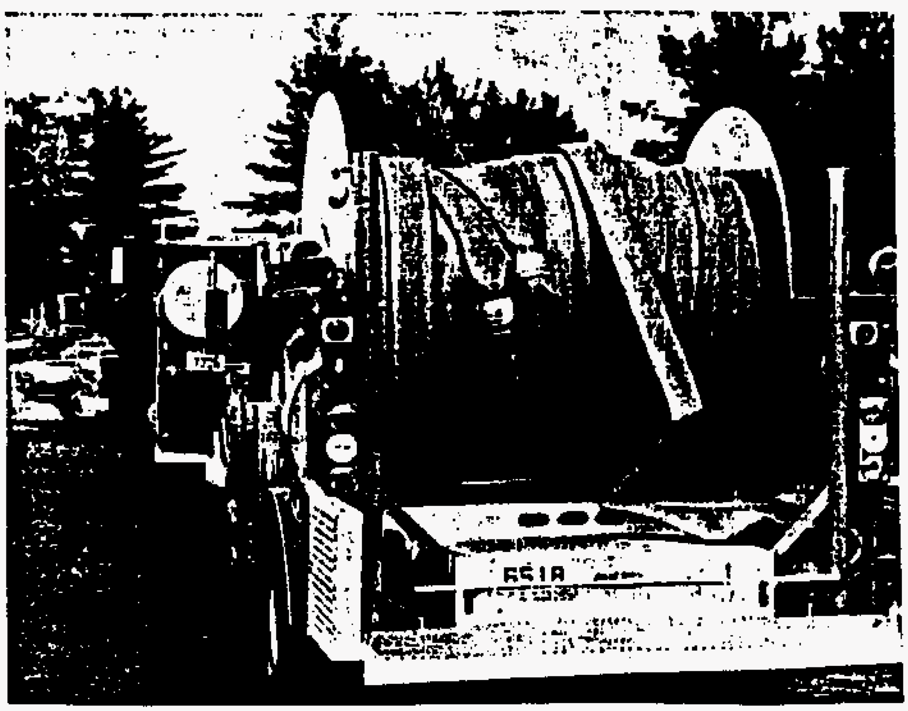


Figure D-1-6(b) Apparatus with reels for large diameter hose.

municipal water supplies that would otherwise be used. Several communities have installed as much as two miles of 5-in. (127-mm) hose for this purpose. While the large diameter hose is being laid, the initial fire attack is made from hydrants. When the large hose carrying the water from the lake is available at the fireground, the hydrants are shut down and supplies in the municipal water system are conserved.

D-1-6 Hose Reels. A number of powered "reel trucks" with various hose load capacities are now in use.

Much of the lightweight, large diameter hose now available is of a construction that permits field cleaning and does not require drying. The use of the "reel truck" permits rapid reloading with minimum personnel (two), and the unit is in service within minutes.

Double reels mounted in the hose bed of a reel truck can produce a carrying capacity of large diameter hose of up to 6,000 ft (1829 m) over a mile of aboveground water main.

Such reel trucks generally require special power-driven systems to rewind the hose. The size of the reels is not conducive to fitting on most standard fire department pump bodies. Therefore, trucks specially designed for this operation are generally used as hose reel vehicles.

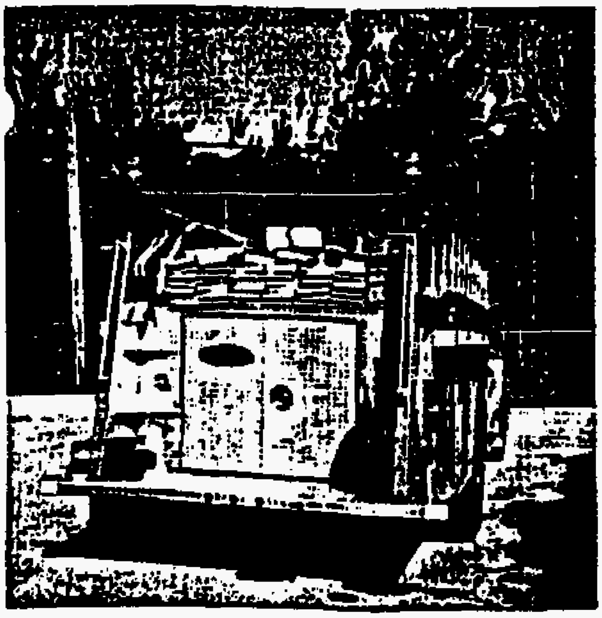


Figure D-1-6(c) Many departments have installed large diameter hose with a flat lay in the hose bed.

D-1-7 Fittings. Large diameter hose is available from many fire hose manufacturers with either standard threaded couplings or quick-connect hermaphrodite type fittings that eliminate the "male-female" aspect of couplings and, consequently, many adapters.

Special fittings (described below) have been developed to be used with large diameter hose.

Figure D-1-6(d) Fire fighters quickly reload 5-in. hose as the driver straddles the hose. Note that the hose is loaded over the bar between the stanchions.

D-1-7.1 Clappered Siamese with Indicator. *(See Figure D-1-7.1.)* This valve is added to the supply line one length from the hydrant or pumper at draft and allows for the addition of a second pumper without shutting down the flow of water. The indicator shows the position of the single clapper.

D-1-7.2 Line Relay Valve. *(See Figure D-1-7.2.)* Should relay pumping be required, a line relay valve is inserted during the hose lay. This valve has a straight-through waterway so water delivery can be started upon completion of the lay. The valve contains a gated outlet and a clappered inlet. Upon arrival of the relay pumper, a line is attached from the gated outlet to the suction of the pump, with a discharge line connected from the pump discharge into the clappered inlet. The pump pressure closes the clapper, and the full flow is relayed to the fireground or another relay pumper. In addition, this valve contains an automatic air bleeder and a pressure dump valve set at 150 psi (1034 kPa). It is important to note that the relay pumper can be added to or removed from the line without shutting down the flow of water to the fireground.

D-1-7.3 Hydrassist Valve. This versatile valve can be utilized on a hydrant when water is available but pressure

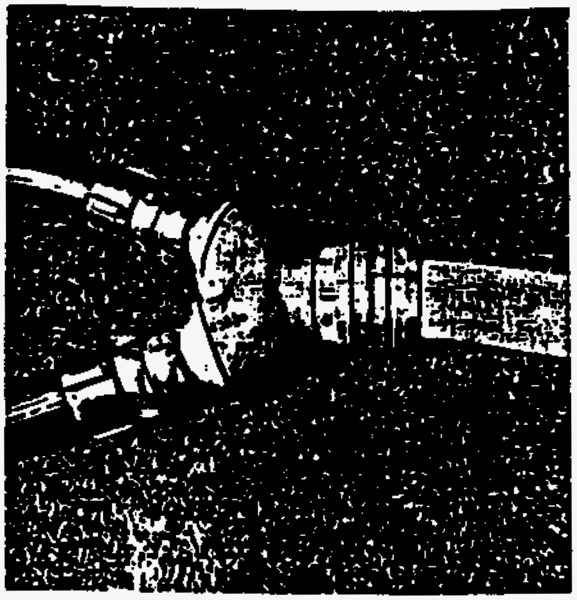


Figure D-1-7.1.

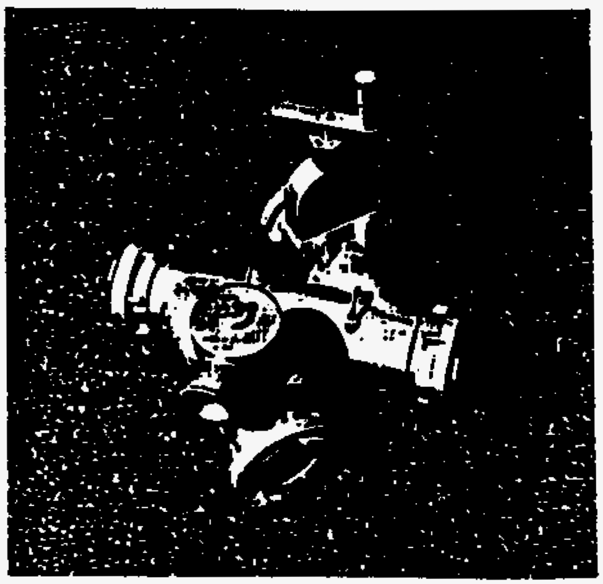


Figure D-1-7.2.

is limited. The valve is attached to the hydrant and the normal lay of supply line is initiated. When additional pressure is required, a pumper is attached to the valve and begins boosting pressure to the fire scene without interrupting the flow of water from hydrant to fire. In rural applications this valve can be equipped to lay in a line during hose lay and to allow a pumper to hook into the line and boost pressure without interrupting flow to the fire scene.

D-1-7.4 Manifold Valve. This valve contains a 4-in. (102-mm) or 5-in. (127-mm) inlet and four 2½-in. (65-mm) gated, threaded male or female outlets as well as a gated

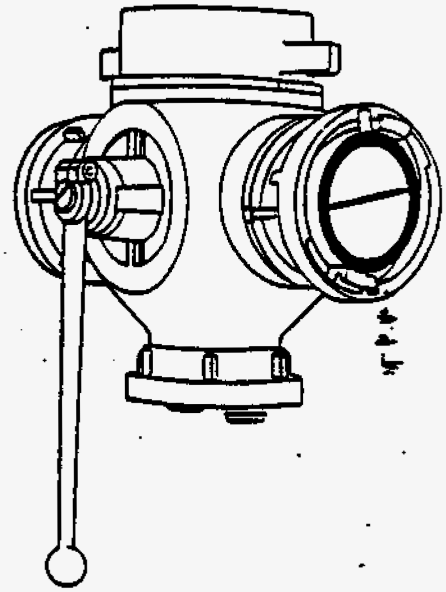


Figure D-1-7.3 Hydrassist valve.

4-in. (102-mm) or 5-in. (127-mm) outlet. The manifold is available with relief valve adjustable from 50 to 200 psi (345 to 1379 kPa). A pressure gauge is optional. The manifold is portable, allowing the fire department to establish its own portable hydrant.

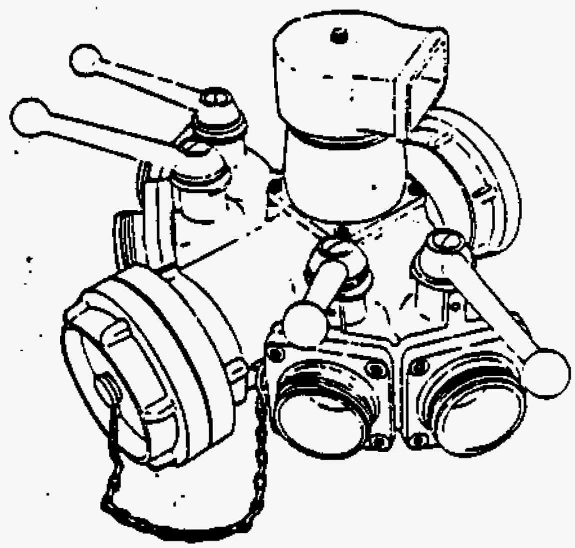


Figure D-1-7.4 Manifold valve.

D-1-7.5 Distributor Valve. (*See Figure D-1-7.5.*) This valve contains a 4-in. (102-mm) opening and waterway with two 2½-in. (65-mm) threaded male outlets. It is placed at the end of the supply line at the fireground allowing distribution of water to one or more attack pumpers. The valve utilizes ball shutoffs plus an adjustable dump valve.

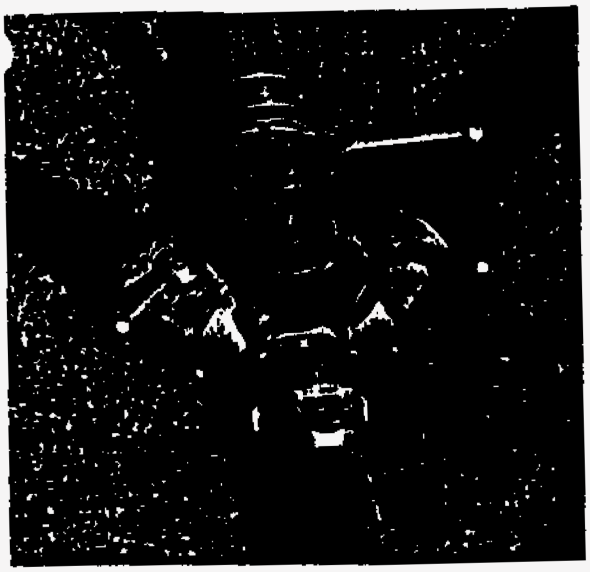


Figure D-1-7.5 Distributor valve.

D-1-7.6 Incoming Gated Relief Valve. (*See Figure D-1-7.6.*) This valve is attached to the large suction inlet of the pumper. The supply line is connected directly to the valve. It is equipped with a fine-threaded, slow-acting gate valve, an automatic air bleeder, and an adjustable dump valve. The gate valve allows connection to the supply line while utilizing the booster tank water. It is also used to control the volume of water from the supply line to the pump. The dump valve helps protect the pumper and supply line against sudden pressure surges and water hammer.

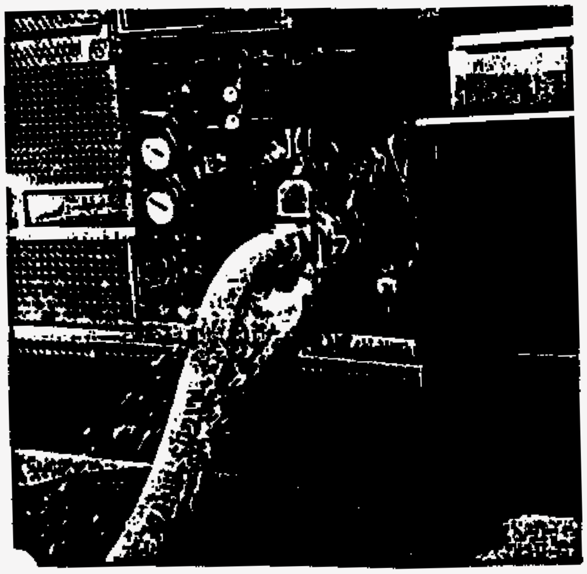


Figure D-1-7.6 Incoming gated relief valve.

D-1-7.7 Automatic Air Bleeder. (*See Figure D-1-7.7.*) Required at all points where a large diameter hose is connected to an engine inlet or at any distribution point.

Figure D-1-7.7.

D-1-8 Irrigation Piping.

D-1-8.1 General. While certainly not large diameter hose, the topic of this section of the appendix, irrigation piping, shares many of its characteristics of low friction loss and capability of transferring large volumes of water. Irrigation is increasing throughout the country, which has resulted in much lightweight aluminum pipe being available to the fire service. It may be carried on vehicles or found on the fireground in farming areas. The fire department should know which of its potential hazards may be served by such a system.

The pipe can be coupled, but usually the couplings are not a type that permits drafting. The pipe has the advantage of being a relatively permanent installation for long duration fire fighting jobs and is not susceptible to the rupture problems of fire hose. Generally, it is an excellent tool for major disaster situations but is less often used for conventional fire fighting evolutions, especially since the introduction of large diameter fire hose.

Departments working in an area in which piped irrigation systems are used should be alert to the adapters, etc., that may be necessary to turn the conventional agricultural fittings into useful fireground fittings. Adapters from the pipe coupling to fire department threads may be required and can be easily fabricated in local machine shops. They are not offered by either pipe or fire hose manufacturers. Minimum requirements are for one supply adapter; for instance, four 2½-in. (65-mm) NH (American National Fire Hose Connection Screw Thread) thread female inlets x pipe section, and one discharge adapter; or, four 2½-in. (65-mm) NH thread gated male outlets x pipe section.

Additional fittings to provide discharge gates at 100- to 300-ft (30- to 90-m) intervals [one or more 2½-in. (65-mm)

NH x pipe section] may be desirable. In areas where large diameter hose is available, adapters permitting its integration with the pipe are highly recommended.

Appendix E Portable Pumps

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

E-1 Portable Pumps.

E-1-1 General. Both diesel and gasoline driven portable pumps are available. The use of portable pumps is a common method for moving water by the rural fire department. The rural fire fighter should not be required to be a pump expert; however, the fire fighter should have the skill to place all portable pumps used by the department in operation, obtain draft, and perform each procedure in a minimum amount of time.

E-1-1.1 Evaluating Portable Pump Needs. In order to get the maximum benefit from portable pumps, the officers of the rural fire department must carefully study the needs of the department, taking into consideration the potential fire hazard, available water supplies, and the capabilities of the department to use portable pumps. The accessibility and the reliability of water supplies are determining factors in the need for and use of portable pumps. Many rural fire departments have found that both a low pressure pump and a high pressure pump are required to fill their needs.

Portable pump selection should fit the fire fighting system of which it is to be a component; if direct hose streams are to be taken from a portable pump, the nozzles and hose size determine the required pump discharge vs. pressure characteristics.

E-1-1.2 Portable Pumps. A portable pump in the fire service means a pump that can be carried to a source by fire fighters, sometimes over difficult terrain. In general, two people should be able to conveniently carry the pump. It should not weigh over 150 to 175 lb (68 to 79 kg), and should have carrying handles, be so constructed as to be easily carried in a compartment on the apparatus, and be capable of supplying at least two 1½-in. (38-mm) hand lines. Heavier pumps, perhaps trailer or truck-mounted or otherwise made mobile, are valuable but used less commonly.

Although a number of rural fire departments have used portable-type pumps that are securely mounted on their apparatus as the sole means of pumping, few fire departments consider this to be a permanent arrangement and plan to buy a fire department pumper, in addition to the portable pump(s), when finances permit.

E-1-2 Classification for Portable Pumps. Portable pumps for the fire service are covered under NFPA 1921, *Standard for Fire Department Portable Pumping Units*, which sets forth specifications to be followed when obtaining portable pumps. This standard classifies portable pumps by capacity and operating pressure.

E-1-2.1 Rating of Portable Pumps.

(a) *Small Volume — Relatively High Pressure.* This pumping unit should be capable of pumping 20 gpm (76 L/min) at 200 psi (1380 kPa) net pressure through a 1-in. (25.4-mm) discharge outlet while taking suction through a 1½-in. (38-mm) suction inlet. This class of portable pumps is especially useful to fire departments for forest fire fighting, which frequently requires long ¾-in. (19-mm) to 1½-in. (38-mm) hose lines and pumping uphill in rugged terrain. Such an arrangement will provide good nozzle reach.

(b) *Medium Volume — Medium Pressure.* This pumping unit shall be capable of discharging 60 gpm (227 L/min) at 90 psi (621 kPa) net pressure and 125 gpm (473 L/min) at 60 psi (414 kPa) net pressure through a 1½-in. (38-mm) discharge outlet while taking suction through a 2½-in. (65-mm) suction inlet. This class of portable pump has limited utility for small structural fires and may supply a 60-gpm (227-L/min) fog nozzle through 250 ft (76 m) of 1¾-in. (44-mm) hose. It can be used to fill booster tanks or be used with 2½-in. (65-mm) hose to move water a long distance.

(c) *Large Volume — Relatively Low Pressure.* This pumping unit shall be capable of supplying 125 gpm (473 L/min) at 60 psi (414 kPa) net pressure and 300 gpm (1136 L/min) at 20 psi (138 kPa) net pressure through a 2½-in. (65-mm) discharge outlet while taking suction through a 3-in. (76-mm) or 4-in. (102-mm) suction inlet. This class of portable pumping unit is frequently used for tank filling when a pumper cannot get close to a source of water. It is also suitable for draining cellars, manholes, and other areas where water has accumulated. It may be used to supply two 1½-in. (38-mm) or 1¾-in. (44-mm) hose lines of short length with 60-gpm (227-L/min) fog nozzles. This may result in fire streams of reduced quality and quantity that may not be suitable flows for interior fire fighting.

Among the common types of pumps used are:

E-1-2.2 Gear Pumps. Gear pumps (high pressure, low volume) are of positive displacement type with gears having very close tolerances between gears and case. They may be used safely in clear water only. Dirty water will cause damage to gears and case. They are not very useful for tank filling or relay work as they are generally of low capacity in the lighter models.

They are very good for fire fighting where high pressures are desired. These pumps have a shorter life span than the centrifugal type, are widely used by the U.S. Forest Service, and are easily packed on the back. They should never be operated without water and must be equipped with a relief valve.

E-1-2.3 Piston Pumps. Piston pumps (high pressure, low volume) are operated by a piston, sleeve, or cylinder with two check valves. They can be either single or double action with one or more cylinders. They are positive displacement type and must be operated with clean water. They are usually high pressure pumps. Piston-type pumps are limited to small capacities and weigh more than centrifugal or gear pumps. They are capable of very high lift and must be equipped with a relief valve.

E-1-2.4 Low Pressure Centrifugal Pumps. The low pressure centrifugal portable pumps (high volume) generally are rated at 200 to 300 gpm (757 to 1136 L/min) and are capable of discharge at pressures of 50 to 80 psi (345 to 552 kPa). Usually these pumps will not discharge rated capacities when operating with suction lift in excess of 5 ft (1.5 m).

Some of these pumps do not use running rings or seal rings. These types do not have close tolerances so they may be used in dirty water where some debris or abrasives are encountered. These pumps require little maintenance.

Other types of portable pumps in this category do have water or seal rings, which will not hold up as long when pumping water containing substantial amounts of abrasive materials.

At lower discharge pressures this type pump may deliver larger volumes, which at times have been metered at from 400 gpm (1514 L/min) to 600 gpm (2272 L/min) with adequate size hard suction hose at very low discharge pressures and high pump rpms. (Example: Relay from portable pump into fire pump on apparatus or portable drop tank; or relay from water source to drop tank where tanker is filled for relay to fire site.)

Operation of these pumps depends on centrifugal force to move water, and they are very effective for relay operations to pumper or for booster tank or tanker filling. There are no special operating problems to watch out for, and the pump will not heat up as rapidly as others if run without water.

E-1-2.5 High Pressure Centrifugal Pumps. High pressure portable pumps (small volume) generally have a small capacity, with an average of 30 to 40 gpm (114 to 151 L/min) discharge and operating pressures in the 125 to 150 psi (862 to 1030 kPa) range.

The impeller is usually geared twice as fast as the engine to get the pressure at single stage. This type uses running rings or seal rings the same as larger fire pumpers and usually incorporates closed volutes in the impeller.

E-1-2.6 Floating Pumps. Pressure and volume floating pumps are available. A more recent development in portable pumps is the floating pump that primes and pumps automatically when placed in water. This type of pump is constructed to set inside a float that resists breakage and needs no maintenance. Some entire units weigh under 50 lb (23 kg), including fuel, and provide from 60 to 90 minutes of operating time from the 5-qt (4.73-L) fuel tank.

The pump serves a need for a lightweight, easy-to-operate, portable fire pump that may be placed in the water and does not need suction hose or strainers. However, such pumps tend to pick up leaves and other trash that may stop up nozzles and strainers of a pump being supplied by the floating pump. (*See Figure E-1-2.6.*)

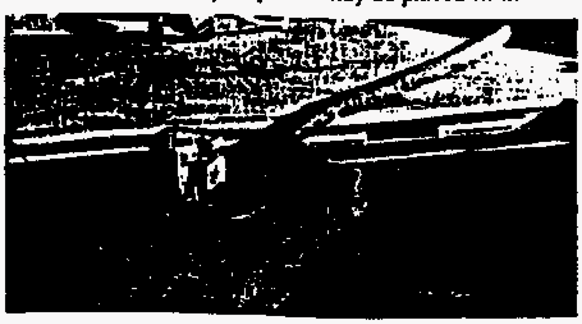


Figure E-1-2.6 Floating 500-gpm pump in swimming pool supplying the department pumper through large diameter hose.

E-1-2.7 High-lift Pumps. The high-lift pump is a small, portable pump that uses water to drive a water motor, which in turn drives an impeller and pumps water to high elevations into a fire pumper for relay into hose lines for fire fighting.

The high-lift pump is designed to obtain a water supply from a river, lake, stream, swimming pool, etc., when not accessible by a pumper or conventional portable pump for drafting operations.

The water used to power the water motor of a high-lift pump is taken from the booster tank of the pumper and discharged at high pressure through the fire pump into the hose to the high-lift pump water motor. This, in turn, drives the water motor, which is connected to the high-lift pump impeller, thus forcing volumes of water back into the intake side of the fire pump and on into the fire fighting hose lines.

High-lift pumps may be hooked into hose lines and lowered or tossed into water sources at the lower levels without fire fighting personnel having to go down to set the pump.

E-1-2.8 Dewatering-type Pumps. Dewatering pumps, also known as trash pumps, are pumps specifically designed to handle muddy, sandy, or otherwise contaminated water. Some are built to handle spherical solids up to 1½ in. (38 mm) in diameter. These pumps could be used in the fire service to pump water out of basements, tubs, or catchalls during salvage operations.

E-1-2.9 Diaphragm Pump. The diaphragm pump uses a piston-type action employing a diaphragm that moves water with each stroke and is capable of handling trashy water without damaging the pump.

E-1-3 Methods of Using Portable Pumps.

E-1-3.1 General. Some of the many problems of supplying water in rural areas can frequently be overcome through the use of the proper portable pump. Many departments, through area prefire planning, locate water sources where portable pumps are the only suitable means of using the water supply for filling tankers or for supplying fire fighting hose lines.

Departments should, when locating pumping sites for portable pumps, determine whether the site is available year-round or whether it can be used certain times of the year only. Further determination should be made as to availability under weather conditions anticipated and, if such conditions may make their use difficult, how to prepare the sites for all-weather utilization.

Centrifugal pumps are usually preferred over other types because of their ability to handle dirt and abrasives with less damage and because of their desirable volume-pressure ratio. Similarly, four-cycle engines are considered more suitable for fire service use, although two-cycle or the new turbine driven pumps may be used. However, four-cycle engines must be used with the engine in a level position or the engine will be damaged, whereas two-cycle engines can be used with the engine in any position (as long as gasoline is available to the engine) without damage to the engine.

A wood pallet or other firm base can be useful under soft ground conditions.

E-1-3.2 Uses of Pumps. Portable pumps can be used in single or multiple combinations to accomplish many of the following:

(a) Filling truck tanks when no fire pumper is available;

(b) Supplying fire fighting hose lines;

(c) Relaying water from a source in a variety of combinations or hook-ups;

(d) Dewatering operations;

(e) Pump and roll operations.

E-1-3.3 Under conditions where a fire department pumper cannot get to a source of water and there is considerable distance between the source and the fire (several miles), low pressure portable pumps of larger gallonage have proved to be very satisfactory when used to relay water to a tanker fleet that shuttles water to a portable drop tank at the fire. A fire department pumper takes suction from the portable drop tank for discharge onto a fire. (*See C-1-13.*)

A few of the ways in which a fire department may make use of portable pumps are:

E-1-3.4 Pumping Directly onto the Fire. The portable pump may be used to pump water into hose lines directly onto a fire. They may be carried to nearby sources of water, say, a swimming pool, out of reach of regular fire apparatus. Where these water sources are close to the fire, only small amounts of hose are needed and may be quickly carried into position for rapid attack on the fire.

An effective portable pump for this purpose would need to be of at least a medium volume type with enough discharge pressure to give an effective fire fighting stream.

An example of this type of operation is:

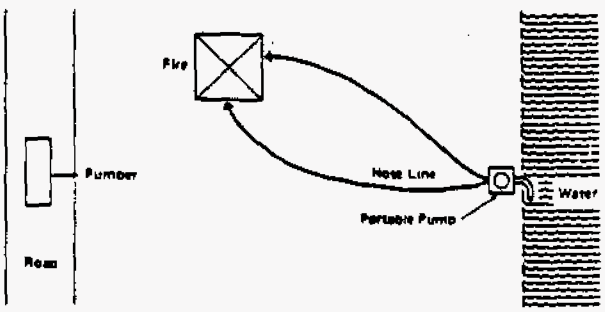


Figure E-1-3.4 Pumping directly onto the fire.

E-1-3.5 Single Relay from Portable Pump to Pumpers. Under conditions when a normal fire truck cannot get to a source of water, low pressure portable pumps of larger gallonage have proved to be very satisfactory when used to relay water to pumpers. This becomes feasible at a greater distance from water, as large diameter hose, for instance, is used.

A single portable pump often can supply enough water to keep a pumper supplied with good fire streams. The portable pump may be at the water source and a line (lines) laid from the portable pump to the pumper.

One of the big advantages of the portable pump is that it can be placed close to the water supply for operation at minimum lift and minimum friction loss in the suction hose, provided adequate size suction hose is used. Regular pumpers can accept water from portable pumps and increase water pressure for fire streams or use the water in a combination of fire streams and booster tank filling.

A method commonly used is for a pumper to lay hose lines from the fire to the water supply and start pumping from the booster tank into the hose line and onto the fire while the portable pump is being placed and water supply and hose lines from the portable to the regular pumper are being hooked up.

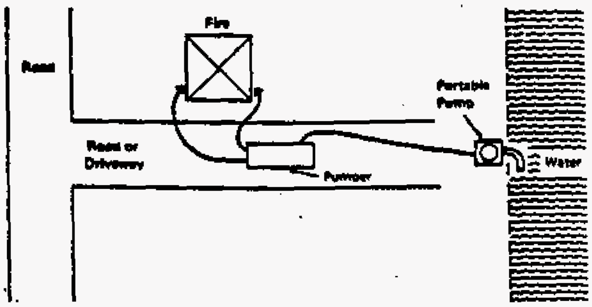


Figure E-1-3.5 Single relay from portable pump to pumper.

E-1-3.6 Use of Portable Pumps to Fill Tankers or Booster Tanks. Many rural fire departments are overcoming problems of limited water supply by using tankers to relay water to pumpers working at a fire. Should the water supply be a stream with a small flow, for instance 150 gpm (568 L/min), or inaccessible by fire apparatus, the water may be obtained with a portable pump placed at the water supply. This pump supplies a portable folding tank that is used to stockpile water, and tankers are filled from the portable folding tank for shuttle to the fire. At the fire, the tanker will discharge its water into another portable folding tank that is used to stockpile water from which the pumper (pumpers) takes suction and discharges water onto the fire. (*See C-1-13.*)

It is not prudent to put the discharge line from portable pumps into the tops of booster tanks or tankers unless no other way is possible or a special filling device is provided. Placing lines into tops of tankers or booster tanks is a slow way of filling the tank and may be dangerous to those working on apparatus. Hooking the portable pump discharge line directly into intake piping of large pumpers or tankers has proven to be the quickest and safest method of filling tanks.

Any of the portable pumps may be used for filling tankers in place of a pumper; however, the low pressure, high volume type pumps will do the job more quickly than others. When pumping into tanks, strainers should be used to prevent passage of trash and debris. Floating strainers have proved to be very effective.

Where the water supply has the capacity, multiple portable pumps for filling tankers are suggested. A 200- to 300-gpm (757- to 1136-L/min) rate results in a slow filling time; therefore, two or three portable pumps should be moved into the operation as mutual aid tankers arrive for a 500-gpm (1893-L/min) filling rate. Multiple portable pumps also act as a backup in case of engine failure.

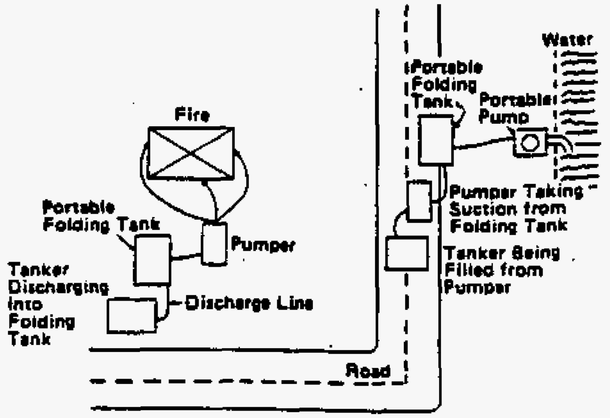


Figure E-1-3.6.

E-1-3.7 Fire Fighting from Tanker in Motion. Some departments have installed pipes or hard suction lines from their tankers to portable pumps on the apparatus so they can pump from the tank into discharge lines while the tanker is in motion. The portable pump may be quickly disconnected and taken off the tanker for use in other locations. This use is particularly effective for grain, grass, and brush fires, as it provides uniform pressures regardless of the gear the vehicle may require to negotiate the terrain. Since rigging a hard suction line from a pump to the vehicle carrying that pump is frequently awkward, it may be essential to carry a specially prepared length of hard suction hose for this purpose or to otherwise prepare the vehicle or the pump to make the evolution rapid and practical.

E-1-3.8 Summary of Portable Pump Evolutions. There are many choices that a fire department may make in deciding what size and type of portable pump will best fill its needs.

Consideration must be given to the capabilities of the pump and the uses to which the pump will be put.

Appendix F Automatic Sprinkler Protection

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

F-1 Automatic Sprinkler Protection.

F-1-1 Sprinkler Protection of Rural Buildings.

F-1-1.1 General. Farsighted rural fire departments are big boosters of automatic sprinkler protection. With more sprinklered buildings being constructed in rural areas, many rural fire departments are just beginning to learn what a friend the fire service has in automatic sprinkler protection. The sprinkler system provides the fire department with built-in hose line protection. The sprinkler heads and piping are in place and ready to put water (other extinguishing agents may be used) on any unfriendly fire. Also, the record of the sprinkler system is enviable. NFPA records show that 96 percent of all fires in sprinklered buildings are controlled or extinguished by the sprinkler system with a large percentage of these fires controlled by no more than two or three heads. In the 3 to 4 percent with unsatisfactory performance, the following human failures have been noted:

1. Sprinkler system was shut off and not in service.
2. Fire department shut off water to sprinkler heads before fire was completely extinguished.
3. Fire department robbed sprinkler system of water supply.
4. Fire department did not use fire department connection.

F-2 Water Supply for Automatic Sprinkler System.

F-2-1 Sprinklered Building a Possible Water Source. Sprinklered buildings are usually provided with a water supply such as an elevated tank or a ground level suction tank or pond equipped with a fire pump. In a number of cases, a distribution system with hydrants is also provided.

Ground level tanks, as well as elevated tanks, can be used by the fire department to supply water-hauling operations. Adequate provisions should be made by the fire department so as not to deplete the tank supply without also making provisions for refilling the tank at the conclusion of water-hauling operations.

When building and sprinkler plans are being reviewed, the fire department has an excellent opportunity to make contact with the property owner for permission to use the water supply in the elevated tank in water-hauling operations. In case a certain quantity of water must be reserved for the sprinkler system, a riser, serving a hydrant available to the fire department, may be installed that extends into the tank and allows the fire department to use the water above that which is reserved for the sprinkler system.

In some municipalities (as well as some states), certain types of occupancies may be required by law to install sprinkler systems. In a number of cases, very limited water supplies, such as pressure tanks, have been provided as the sole water supply for these systems. Such properties should not be considered as a water source for a water-hauling operation for a rural fire department.

F-3 Supervision for Sprinkler System.

F-3-1 In rural areas where sprinklered properties may be isolated with good possibility that the outside sprinkler alarm will not be heard in case of fire, it is desirable that automatic sprinkler systems referred to in Section 5-7 be fully supervised by either a competent guard on premises or by an alarm system with all signals transmitted directly to a central station or a fire alarm center.

F-3-1.1 Where guard service is provided, it should meet the requirements of NFPA 601, *Standard for Guard Service in Fire Loss Prevention.*

F-3-1.2 It is desirable that the alarm system include supervision of sprinkler water flow, sprinkler control valve tamper, building temperature, low air pressure on dry sprinkler systems, fire pump operation, fire pump electric power, fire pump battery charger, temperature of water in tanks, and level of water in tanks where any of these items exist.

F-3-1.3 The central station should meet the requirements of NFPA 71, *Standard for the Installation, Maintenance, and Use of Signaling Systems for Central Station Service*.

F-3-1.4 Fire alarm centers should meet the requirements of NFPA 1221, *Standard for the Installation, Maintenance, and Use of Public Fire Service Communications* (formerly NFPA 73).

F-3-1.5 Where not specified in NFPA 71 or NFPA 1221, on-premises components of the alarm system should meet the requirements of NFPA 72B, *Standard for the Installation, Maintenance, and Use of Auxiliary Protective Signaling Systems*; NFPA 72C, *Standard for the Installation, Maintenance, and Use of Remote Station Protective Signaling Systems*; or NFPA 72D, *Standard for the Installation, Maintenance, and Use of Proprietary Protective Signaling Systems*, whichever is applicable.

F-3-1.6 In some situations, guard service or fire alarm centers referred to in F-3-1.2 and F-3-1.5 may not be feasible due to unavailability, economic considerations, or both. It is, however, very important that sprinkler alarms be supervised and signal transmitted rapidly to the fire department. In some rural areas where public telephone lines are the primary means of alarm transmittal, some sprinkler systems are "supervised" by using combinations of water flow indicators, microswitches, and the like, with direct telephone lines or automatic phone dialers. Typically, the signal or prerecorded alarm message is sent to a "fire phone" location, police dispatch, or similar location where alarms are handled. In no case should automatic phone dialers be allowed on the circuit used by the public to report emergency messages (fire, police, or ambulance).

F-4 Fire Department and the Sprinkler System.

F-4-1 Water supplies for the automatic sprinkler system referred to in 5-7, which consist of pumps and tank combinations feeding yard mains and a hydrant system, should be installed in accordance with NFPA 20, *Standard for the Installation of Centrifugal Fire Pumps*; NFPA 22, *Standard for Water Tanks for Private Fire Protection*; and NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*.

F-4-1.1 In addition to NFPA 13, *Standard for the Installation of Sprinkler Systems*, referred to in 5-7, the following NFPA standards may apply where applicable: NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*; NFPA 16, *Standard on Deluge Foam-Water Sprinkler and Foam-Water Spray Systems*; NFPA 231, *Standard for General Storage*; and NFPA 231C, *Standard for Rack Storage of Materials*.

F-4-1.2 **Use of Fire Department Connection.** The standard operating procedures (SOP) of each rural fire department should call for one of the first due pumpers to pump to the fire department connection of the sprinkler system. In this way, water pressure and volume to the system may be increased, making the sprinklers more effective. Also, the fire department connection ties into the system beyond all valves that might be shut off; therefore, even with the valve controlling the water supply to the sprinkler system shut off, sprinkler heads may always be supplied with water through the fire department connection. After size-up by the officer in charge, the word to charge the system may be warranted. The pressure available from the fire department pumper will not burst the piping or heads of the sprinkler system as all parts of the system are designed and tested to withstand at least 200 psi (1380 kPa).

F-4-1.3 **Shutting Off Sprinkler System in Case of Fire.** The sprinkler system should not be shut down until the chief officer is convinced that the fire is extinguished or controlled and hand lines are in place for overhauling operations. Even then, the fire department pumper should not be disconnected from the fire department connection to the sprinkler system. Make sure that the fire is out. Station a person at the control valve of the sprinkler system, ready to reopen the valve in case of a flare-up during fire department mop-up operations.

Appendix G Secondary Water Supply

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

G-1 Secondary Water Supply.

G-1-1 **General.** The water supply for fire fighting purposes, as specified in Chapter 5, are considered the minimum water supply. They presuppose water is available to the fire department from a single water point, often using a tanker shuttle or tanker relay and in conjunction with a portable folding tank or dry hydrant, etc.

The authority having jurisdiction may determine that an additional, secondary water supply is warranted. This determination may be made as a result of on-site survey of buildings by the fire department having jurisdiction or by review of architectural plans of proposed construction and/or planned development.

G-1-2 **Determination of Secondary Water Supply.** The determination of a secondary water supply anticipates a large-scale fire situation. Where such conditions exist, this would require a water supply delivery system consisting of multiple water points. Generally this can best be achieved by a water system that would include hydrants, a distribution system, storage, and a source of supply capable of delivering a minimum flow of 250 gpm (946 L/min) at 20 psi (139 kPa) residual pressure for a two-hour duration.

G-1-3 **Procedure for Developing Secondary Water Requirement.** Construction and occupancy hazard classification tables have been compiled from equation information derived from the formula discussed under paragraph G-1-4. These are tables printed in this Appendix as Tables G-1-3(a), Wood Frame Construction, Table G-1-3(b), Ordinary Construction, Table G-1-3(c), Noncombustible

Construction, and Table G-1-3(d), Fire Resistive Construction.

The factors considered in developing the secondary water requirement for a building are as follows:

(a) *Type of Construction (Ci).* Combustibility and fire resistance of the building itself greatly influence the development and spread of a fire and, to a large extent, will determine the amount of water needed to control and extinguish a fire.

(b) *Size of Building (Ai).* The greater the story height and larger the undivided floor area, without walls or other fire separation, the greater is the potential for a large fire and the greater is the secondary water requirement.

(c) *Occupancy (Oi).* A fire in a building having highly combustible contents will require a higher rate of water application than a fire in a building with low-combustible contents. Examples would be a wastepaper warehouse at one end of the scale, and a steel pipe warehouse at the other, with many variations in between.

(d) *Exposures (Xi) and Communications (Pi).* Besides the water needed on the fire in the building under consideration, additional water may be needed to prevent the fire from spreading to nearby buildings. The amount of this extra water will depend on such factors as the distance between buildings and the type of construction and size of the exposed and/or communicating buildings.

The method of determining secondary water requirement is not intended to provide details for calculating an adequate amount of water for large, special fire protection problems such as lumber yards, petroleum storage, refineries, grain elevators, and large chemical plants. For suggested protection, see appropriate NFPA standards.

For any building or structure protected by an automatic sprinkler system that fully meets the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems*, the fire department having jurisdicton may waive any requirement by this standard for additional water supply. (*See Appendix F.*)

G-1-4 Calculation. The calculation of a secondary water supply for a subject building in gallons per minute (gpm) considers the construction (Ci), Occupancy (Oi), Exposure (Xi), and Communication (Pi) factors of each selected building or fire division and is done as outlined below:

1. Construction Factor (Ci):

NOTE: There follows a brief digest of the calculation of the secondary water requirement for a given facility. An example of an actual calculation is included in the paragraph on Examples. That portion of the secondary water requirement attributed to the type of construction and area of the selected building or fire division is determined by the following formula:

$$Ci = 18F(Ai)0.5$$

F = Coefficient related to the class of construction:

F = 1.5 for wood frame construction
= 1.0 for ordinary construction
= 0.8 for noncombustible construction
= 0.6 for fire resistive construction

Ai = Effective Area

The effective area is the total square-foot area of the largest floor in the building plus the following percentage of the other floors:

(a) Buildings of Constructon Type II, III, IV, and V, 50 percent of all other floors.

(b) Buildings of Construction Type I.

1. If all vertical openings in the building have 1½-hour or more protection, 25 percent of the area not exceeding the two other largest floors.

2. In other buildings, 50 percent of the area of not exceeding other floors.*

NOTE: Do not include basements and subbasement areas that are vacant or are used for building maintenance, or that are occupied by light-hazard or low-hazard occupancies. (*See below.*)

The maximum value of (Ci) is limited by the following:

8,000 gpm (30,280 L/min) for wood frame and ordinary construction;
6,000 gpm (22,710 L/min) for noncombustible and fire resistive construction;
6,000 gpm (22,710 L/min) for a 1-story building of any type of construction.

The minimum value of (Ci) is 250 gpm (945 L/min). The calculated value of (Ci) shall be rounded to the nearest 250 gpm (945 L/min).

2. Occupancy Factor (Oi).

The factors below reflect the influence of the occupancy in the selected building on the secondary water requirement.

Occupancy Hazard Classification Number	Occupancy Factor (Oi)
No. 7 Light Hazard	0.75
No. 6 Low Hazard	0.85
No. 5 Moderate Hazard	1.00
No. 4 High Hazard	1.15
No. 3 Severe Hazard	1.25

Representative lists of occupancies by classification of occupancy hazard are given in Chapter 3 of this standard.

NOTE: Tables G-1-3(a) through G-1-3(d) are printed with the occupancy factors (Oi) applied for each type of construction.

3. Exposure (Xi) and Communication (Pi) Factors.

The factors developed in this item reflect the influence of exposed and communicating buildings on the secondary water requirement. A value of (Xi + Pi) shall be developed for each side of the building:

$$(X + P)i = 1.0 + \frac{n}{i = 1}(Xi + Pi)$$, maximum 1.55, where n = number of sides of subject building.

NOTE: The exposure factor shall apply to only one side of the subject building. It is determined by the following method.

(a) Factor for Exposure (Xi):

*If division walls are rated 1-hour or more with labeled Class B fire doors on openings, subdivide a floor. The maximum area on any one floor used shall be the largest undivided area plus 50 percent of the second largest undivided area on that floor

The factor for (Xi) depends upon the construction and the length-height value (length of wall in feet times height in stories) of the exposed building and the distance between facing walls of the subject building and the exposed building, and shall be selected from Table G-1-3(e).

NOTE: The following buildings shall not be charged as exposures:

- Buildings fully protected by automatic sprinklers;
- Buildings with a residential occupancy;
- Building that are Type I Construction;
- Buildings with a blank masonry wall.

(b) Factor for Communications (Pi):

The factor for (Pi) depends upon the protection for the communicating party-wall openings and the length and construction of communications between fire divisions and shall be selected from Table G-1-3(f). When more than one communication type exists in any one side wall, apply only the largest factor (Pi) for that side. When there is no communication on a side, (Pi) = 0.

(c) Calculation of Secondary Water Supply (SWSi):

$$SWSi = (Ci)(Oi)(X + P)i$$

Where wood shingles as a roof covering are permitted by the authority having jurisdiction (on the building being considered or on the exposed buildings) 500 gpm is added to the secondary water requirements unless such shingles are listed Class C or better.

The secondary water requirement shall not exceed 12,000 gpm (45 420 L/min) nor less than 250 gpm (945 L/min).

The secondary water requirement shall be rounded off to the nearest 250 gpm (945 L/min) if less than 2,500 gpm (9462 L/min) and to the nearest 500 gpm (1892 L/min) if greater than 2,500 gpm (9462 L/min).

Table G-1-3(a) Wood Frame Construction
Occupancy Hazard Classification

AREA (sq ft)	7	6	5	4	3
	Oi = 0.75	Oi = 0.85	Oi = 1.00	Oi = 1.15	Oi = 1.25
500	250 gpm	500 gpm	500 gpm	500 gpm	500 gpm
1.100	500	750	750	750	1,000
1,700	750	750	1,000	1,250	1,250
2,600	1,000	1,000	1,250	1,500	1,500
3.600	1,250	1;250	1,500	1,725	2,000
4,800	1,250	1,500	1,750	2,000	2,250
6,200	1,500	1,750	2,000	2,250	2,500
7,700	1,750	2,000	2,250	2,500	2,750
9.400	2,000	2,250	2,500	2,750	3,000
11.300	2,000	2,250	2,750	3,250	3,500
13.400	2,250	2,500	3,000	3,500	3,750
15.600	2,500	2,750	3,250	3,750	4,000
18,000	2,750	3,000	3,500	4,000	4,500
20,600	2,750	3,250	3,750	4,250	4,750
23,300	3,000	3,500	4,000	4,500	5,000
26.300	3,250	3.500	4,250	5,000	5.250
29.300	3.500	3,750	4.500	5,250	5,500
32,600	3,500	4,000	4,750	5,500	6,000
36.000	3,750	4,250	5.000	5,750	6,250
39,600	4.000	4.500	5,250	6,000	6.500
43.400	4,250	4,500	5,500	6,250	6,750
47.400	4,250	5,000	5,750	6,500	7,250
51.500	4,500	5,000	6,000	7,000	7,500
55.700	4,750	5,250	6,250	7,250	7,725
60.200	4,750	5,500	6,500	7,500	8,000
64.800	5,000	5,750	6,750	7,750	8,000
69.600	5,250	6,000	7,000	8,000	8,000
74.600	5,500	6,250	7,250	8,000	8,000
79.800	5,750	6,250	7,500	8,000	8,000
85,100	5,750	6,500	7,750	8,000	8,000
Over	6,000	6,750	8,000	8,000	8,000

Table G-1-3(b) Ordinary Construction
Occupancy Hazard Classification

F = 1.0

AREA (sq ft)	7	6	5	4	3
	Oi = 0.75	Oi = 0.85	Oi = 1.00	Oi = 1.15	Oi = 1.25
1,200	250 gpm	500 gpm	500 gpm	500 gpm	500 gpm
2,400	500	750	750	750	1,000
3,900	750	750	1,000	1,250	1,250
5,800	1,000	1,000	1,250	1,500	1,500
8,200	1,250	1,250	1,500	1,725	2,000
10,900	1,250	1,500	1,750	2,000	2,250
13,900	1,500	1,750	2,000	2,250	2,500
17,400	1,750	2,000	2,250	2,500	2,750
21,300	2,000	2,250	2,500	2,750	3,000
25,500	2,000	2,250	2,750	3,250	3,500
30,100	2,250	2,500	3,000	3,500	3,750
35,200	2,500	2,750	3,250	3,750	4,000
40,600	2,750	3,000	3,500	4,000	4,500
46,400	2,750	3,250	3,750	4,250	4,750
52,500	3,000	3,500	4,000	4,500	5,000
59,100	3,250	3,500	4,250	5,000	5,250
66,000	3,500	3,750	4,500	5,250	5,500
73,300	3,500	4,000	4,750	5,500	6,000
81,100	3,750	4,250	5,000	5,750	6,250
89,200	4,000	4,500	5,250	6,000	6,500
97,700	4,250	4,500	5,500	6,250	6,750
106,500	4,250	5,000	5,750	6,500	7,250
115,800	4,500	5,000	6,000	7,000	7,500
125,500	4,750	5,250	6,250	7,250	7,725
135,500	4,750	5,500	6,500	7,500	8,000
145,800	5,000	5,750	6,750	7,750	8,000
156,700	5,250	6,000	7,000	8,000	8,000
167,900	5,500	6,250	7,250	8,000	8,000
179,400	5,750	6,250	7,500	8,000	8,000
191,400	5,750	6,500	7,750	8,000	8,000
Over	6,000	6,750	8,000	8,000	8,000

Table G-1-3(c) Noncombustible Construction
Occupancy Hazard Classification

F = 0.80

AREA (sq ft)	7	6	5	4	3
	Oi = 0.75	Oi = 0.85	Oi = 1.00	Oi = 1.15	Oi = 1.25
1,900	250 gpm	500 gpm	500 gpm	500 gpm	500 gpm
3,700	500	750	750	750	1,000
6,100	750	750	1,000	1,250	1,250
9,100	1,000	1,000	1,250	1,500	1,500
12,700	1,250	1,250	1,500	1,725	2,000
17,000	1,250	1,500	1,750	2,000	2,250
21,800	1,500	1,750	2,000	2,250	2,500
27,200	1,750	2,000	2,250	2,500	2,750
33,200	2,000	2,250	2,500	2,750	3,000
39,700	2,000	2,250	2,750	3,250	3,500
47,100	2,250	2,500	3,000	3,500	3,750
54,900	2,500	2,750	3,250	3,750	4,000
63,400	2,750	3,000	3,500	4,000	4,500
72,400	2,750	3,250	3,750	4,250	4,750
82,100	3,000	3,500	4,000	4,500	5,000
92,400	3,250	3,500	4,250	5,000	5,250
103,100	3,500	3,750	4,500	5,250	5,500
114,600	3,500	4,000	4,750	5,500	6,000
126,700	3,750	4,250	5,000	5,750	6,000
139,400	4,000	4,500	5,250	6,000	6,000
152,700	4,250	4,750	5,500	6,000	6,000
166,500	4,250	5,000	5,750	6,000	6,000
Over	4,500	5,000	6,000	6,000	6,000

Rounded off to 250 gpm

Table G-1-5(d) Fire Resistive Construction Occupancy Hazard Classification

F = 0.60

AREA (sq ft)	7	6	5	4	3
	Oi = 0.75	Oi = 0.85	Oi = 1.00	Oi = 1.15	Oi = 1.25
3,300	250 gpm	500 gpm	500 gpm	500 gpm	500 gpm
6,600	500	750	750	750	1,000
10,900	750	750	1,000	1,250	1,250
16,200	1,000	1,000	1,250	1,500	1,500
22,700	1,250	1,250	1,500	1,725	2,000
30,200	1,250	1,500	1,750	2,000	2,250
38,700	1,500	1,750	2,000	2,250	2,500
48,300	1,750	2,000	2,250	2,500	2,750
59,000	2,000	2,250	2,500	2,750	3,000
70,900	2,000	2,250	2,750	3,250	3,500
83,900	2,250	2,500	3,000	3,500	3,750
97,700	2,500	2,750	3,250	3,750	4,000
112,700	2,750	3,000	3,500	4,000	4,500
128,700	2,750	3,250	3,750	4,250	4,750
145,900	3,000	3,500	4,000	4,500	5,000
164,200	3,250	3,500	4,250	5,000	5,250
183,400	3,500	3,750	4,500	5,250	5,500
203,700	3,500	4,000	4,750	5,500	6,000
225,200	3,750	4,250	5,000	5,750	6,000
247,700	4,000	4,500	5,250	6,000	6,000
271,200	4,250	4,750	5,500	6,000	6,000
295,900	4,250	5,000	5,750	6,000	6,000
Over	4,500	5,000	6,000	6,000	6,000

Rounded off to 250 gpm

Appendix H Referenced Publications

H-1 The following documents or portions thereof are referenced within this standard for informational purposes only and thus are not considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

H-1-1 NFPA Publications. National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

NFPA 11-1988, *Standard for Low Expansion Foam and Combined Agent Systems*

NFPA 13-1989, *Standard for the Installation of Sprinkler Systems*

NFPA 15-1985, *Standard for Water Spray Fixed Systems for Fire Protection*

NFPA 16-1986, *Standard on Deluge Foam-Water Sprinkler and Foam-Water Spray Systems*

NFPA 20-1987, *Standard for the Installation of Centrifugal Fire Pumps*

NFPA 22-1987, *Standard for Water Tanks for Private Fire Protection*

NFPA 24-1987, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*

NFPA 71-1989, *Standard for the Installation, Maintenance, and Use of Signaling Systems for Central Station Service*

NFPA 72B-1986, *Standard for the Installation, Maintenance, and Use of Auxiliary Protective Signaling Systems for Fire Alarm Service*

NFPA 72C-1986, *Standard for the Installation, Maintenance, and Use of Remote Station Protective Signaling Systems*

NFPA 72D-1986, *Standard for the Installation, Maintenance, and Use of Proprietary Protective Signaling Systems*

NFPA 231-1987, *Standard for General Storage*

NFPA 231C-1986, *Standard for Rack Storage of Materials*

NFPA 601-1986, *Standard for Guard Service in Fire Loss Prevention*

NFPA 1901-1985, *Standard on Automotive Fire Apparatus*

NFPA 1921-1987, *Standard for Fire Department Portable Pumping Units.*

Index

NFPA 24

Standard for the Installation of

Private Fire Service Mains

and Their Appurtenances

1987 Edition

This edition of NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*, was prepared by the Technical Committee on Private Water Supply Piping Systems, released by the Correlating Committee on Water Extinguishing Systems, and acted on by the National Fire Protection Association, Inc. at its Annual Meeting held May 18-21, 1987 in Cincinnati, Ohio. It was issued by the Standards Council on June 10, 1987, with an effective date of June 30, 1987, and supersedes all previous editions.

The 1987 edition of this standard has been approved by the American National Standards Institute.

Changes other than editorial are indicated by a vertical rule in the margin of the pages on which they appear. These lines are included as an aid to the user in identifying changes from the previous edition.

Origin and Development of NFPA 24

In 1903, the NFPA Committee on Hose and Hydrants first presented *Specifications for Mill Yard Hose Houses*, taken substantially from a standard published by the Eastern Factory Insurance Association. This text was revised and adopted in 1904. The NFPA Committee on Field Practice amended the Specifications in 1926, published as NFPA 25.

In 1925 the Committee on Field Practice prepared a *Standard on Outside Protection, Private Underground Piping Systems Supplying Water for Fire Extinguishment*, which was adopted by NFPA. It was largely taken from the 1920 edition of the NFPA *Automatic Sprinkler Standard*, Section M on Underground Pipes and Fittings. In September 1931, a revision was made with the resulting Standard designated as NFPA 24. In the 1981 edition the title was changed from *Standard for Outside Protection* to *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*.

In 1953, on recommendation of the Committee on Standpipes and Outside Protection, the two standards (NFPA 24 and NFPA 25) were completely revised and adopted as NFPA 24. Amendments were made leading to separate editions in 1955, 1959, 1962, 1963, 1965, 1966, 1968, 1969, 1970, 1973, 1977, 1981, 1983, and 1987.

Committee on Water Extinguishing Systems
Correlating Committee

Paul D. Smith, *Chairman*
Gage-Babcock & Assoc., Inc.

John K. Bouchard, *Secretary*
National Fire Protection Assn.
(Nonvoting)

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James W. Nolan, James W. Nolan Co.
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This list represents the membership at the time the Committee was balloted on the text of this edition. Since that time, changes in the membership may have occurred.

NOTE: Membership on a Committee shall not in and of itself constitute an endorsement of the Association or any document developed by the Committee on which the member serves.

Contents

NFPA 24

Standard for the Installation of

Private Fire Service Mains

and Their Appurtenances

1987 Edition

NOTICE: An asterisk (*) following the number or letter designating a subdivision indicates explanatory material on that subdivision in Appendix A.

Information on referenced publications can be found in Chapter 9 and Appendix C.

Chapter 1 General Information

1-1 Scope. This standard establishes the minimum requirements for installation of private fire service mains and their appurtenances supplying automatic sprinkler systems, open sprinkler systems, water spray fixed systems, foam systems, private hydrants, monitor nozzles or standpipe systems with references to water supplies, private hydrants, and hose houses. This standard also applies to "combined service mains" used to carry water for both fire service and other use. The authority having jurisdiction shall always be consulted before installation or remodeling of private fire service mains.

1-2 Purpose. The purpose of this standard is to provide a reasonable degree of protection for life and property from fire through installation requirements for private fire service main systems based upon sound engineering principles, test data, and field experience. Nothing in this standard is intended to restrict new technologies or alternate arrangements, providing the level of safety prescribed by the standard is not lowered.

1-3 Definitions.

Approved. Means "acceptable to the authority having jurisdiction."

NOTE: The National Fire Protection Association does not approve, inspect or certify any installations, procedures, equipment, or materials nor does it approve or evaluate testing laboratories. In determining the acceptability of installations or procedures, equipment or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization concerned with product evaluations which is in a position to determine compliance with appropriate standards for the current production of listed items.

Authority Having Jurisdiction. The "authority having jurisdiction" is the organization, office or individual responsible for "approving" equipment, an installation or a procedure.

NOTE: The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner since jurisdictions and "approval" agencies vary as do their responsibilities. Where public safety is primary, the "authority having jurisdiction" may be a federal, state, local or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department, health department, building official, electrical inspector, or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the "authority having jurisdiction." In many circumstances the property owner or his designated agent assumes the role of the "authority having jurisdiction"; at government installations, the commanding officer or departmental official may be the "authority having jurisdiction."

Listed. Equipment or materials included in a list published by an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

NOTE: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The "authority having jurisdiction" should utilize the system employed by the listing organization to identify a listed product.

Private Fire Service Main.* Private fire service main, as used in this standard, is that pipe and its appurtenances on private property between a source of water and the base of the riser (flange or flange and spigot piece or base tee) for automatic sprinkler systems, open sprinkler systems, water spray fixed systems, standpipe systems, inlets to foam making systems, or the base elbow of private hydrants or monitor nozzles. When connected to a public water system, the private service main begins at a point designated by the public water utility, usually at a manually operated valve near the property line. When connected to fire pumps, the main begins at the fire protection system side of the pump discharge valve. When connected to a gravity or pressure tank, the main begins at the inlet side of the tank's check valve.

Shall. Indicates a mandatory requirement.

Should. Indicates a recommendation or that which is advised but not required.

Standard. A document containing only mandatory provisions using the word "shall" to indicate requirements. Explanatory material may be included only in the form of "fine print" notes, in footnotes, or in an appendix.

1-4* Plans.

1-4.1 A layout plan shall be approved by the authority having jurisdiction in every case where new private fire service main is contemplated.

1-4.2 The plan shall be drawn to scale and shall include all essential details such as:

(a) Size and location of all water supplies.

(b) Size and location of all piping, indicating, where possible, the class and type and depth of existing pipe, the class and type of new pipe to be installed and the depth to which it is to be buried.

(c) Size, type, and location of valves. Indicate if located in pit or if operation is by post indicator or key wrench through a curb box. Indicate the size, type, and location of meters, regulators, and check valves.

(d) Size and location of hydrants, showing size and number of outlets and if outlets are to be equipped with independent gate valves. Indicate if hose houses and equipment are to be provided and by whom.

(e) Sprinkler and standpipe risers and monitor nozzles to be supplied by the system.

(f) Location of fire department connections, if part of private fire service main system, including detail of connections.

1-5 Installation Work. Installation work shall be done by fully experienced and responsible persons.

1-6 Units. Metric units of measurement in this standard are in accordance with the modernized metric system known as the International System of Units (SI). Two units (liter and bar), outside of but recognized by SI, are commonly used in international fire protection. These units are listed in Table 1-6 with conversion factors.

Table 1-6

Name of Unit	Unit Symbol	Conversion Factor
liter	L	1 gal = 3.785L
liter per minute per square meter	(L/min)/m²	1 gpm/ft² = (40.746L/min)/m²
cubic decimeter	dm³	1 gal = 3.785 dm³
Pascal	Pa	1 psi = 6894.757 Pa
bar	bar	1 psi = 0.0689 bar
bar	bar	1 bar = 10⁵ Pa

For additional conversions and information, see ASTM E380-1979, *Standard for Metric Practice*.

1-6.1 If a value for measurement as given in this standard is followed by an equivalent value in other units, the first stated is to be regarded as the requirement. A given equivalent value may be approximate.

1-6.2 The conversion procedure for the SI units has been to multiply the quantity by the conversion factor and then round the result to the appropriate number of significant digits.

Chapter 2 Water Supplies

2-1 Nature of Supply. The choice of water supplies shall be made in cooperation with the authority having jurisdiction.

2-2 Public Water Systems. (Applicable also to private supply systems.)

2-2.1 One or more connections from a reliable public water system of good pressure and adequate capacity furnishes a satisfactory supply. A high static water pressure shall not, however, be the criterion by which the efficiency of the supply is determined.

2-2.2 Adequacy of water supply shall be determined by flow tests or other reliable means. Where flow tests are made, the flow in gallons per minute (L/min) together with the static and residual pressures shall be indicated on the plan.

2-2.3* Public mains shall be of ample size, in no case smaller than 6 in.

2-2.4 No pressure regulating valve shall be used in water supply except by special permission of the authority having jurisdiction. Where meters are used they shall be of an approved type.

2-2.5* Where connections are made from public waterworks systems, it may be necessary to guard against possible contamination of the public supply. The requirements of the public health authority having jurisdiction shall be determined and followed.

2-2.6 Connections larger than 2 in. to public water systems shall be controlled by post indicator valves of a standard type and located not less than 40 ft (12.2 m) from the buildings protected.

Exception: If this cannot be done, the post indicator valves shall be placed where they will be readily accessible in case of fire and not liable to injury. (See Section 3-3 for details.) Where post indicator valves cannot readily be used, as in a city block, underground valves shall conform to these provisions and their locations and direction of turning to open shall be clearly marked.

2-3* Pumps. A fire pump installation consisting of pump, driver, and suction supply, when of adequate capacity and reliability and properly located, makes a good supply. An automatically controlled fire pump taking water from a water main of adequate capacity or taking draft under a head from a reliable storage of adequate capacity, may, under certain conditions, be accepted by the authority having jurisdiction as a single supply.

2-4* Tanks. When gravity, pressure, or suction tanks are to be used, the authority having jurisdiction shall be consulted.

2-5 Penstocks or Flumes, Rivers or Lakes. Water supply connections from penstocks, flumes, rivers, lakes, or reservoirs shall be arranged to avoid mud and sediment, and shall be provided with approved double removable screens or approved strainers installed in an approved manner.

2-6* Fire Department Connections.

2-6.1 A connection through which the public fire department can pump water into the sprinkler, standpipe, or other system furnishing water for fire extinguishment makes a desirable auxiliary supply. For this purpose, one or more fire department connections shall be provided.

Exception: Omission of fire department connections may be allowed by the authority having jurisdiction.

2-6.2 Fire department connections shall be properly supported.

2-6.3 There shall be no shutoff valve in the fire department connection.

2-6.4 An approved straightway check valve shall be installed in each fire department connection, located as near as practicable to the point where it joins the system.

2-6.5 The pipe between the check valve and the outside hose coupling shall be equipped with an approved automatic drip, arranged to discharge to a proper place.

2-6.6 Hose connections shall be of an approved type.

2-6.7 The fire department connection(s) shall have the NH internal threaded swivel fitting(s) having the NH standard thread, at least one of which shall be the 2.5-7.5 NH standard thread, as specified in NFPA 1963, *Standard for Screw Threads and Gaskets for Fire Hose Connections*.

Exception: Where local fire department connections do not conform to NFPA 1963, Standard for Screw Threads and Gaskets for Fire Hose Connections, the authority having jurisdiction shall designate the connection to be used.

2-6.8 Hose connections shall be equipped with standard caps, properly secured and arranged for easy removal by fire departments.

2-6.9 Hose connections shall be on the street side of buildings and shall be located and arranged so that hose lines can be readily and conveniently attached to the inlets without interference from any nearby objects including buildings, fences, posts, or other fire department connections.

2-6.10 Signs.

2-6.10.1 Hose connections shall be designated by a sign having raised letters at least 1 in. (25.4 mm) in size cast on a plate or fitting, reading for service designated: i.e., "AUTO SPKR," or "OPEN SPKR," or "STANDPIPE," etc.

2-6.10.2 If a hose connection does not serve all of the system an appropriate and durable sign shall be attached.

Chapter 3 Valves

3-1 Types of Valves.

3-1.1 All control valves shall be listed indicating type unless a nonindicating valve, such as an underground gate valve with approved roadway box complete with T-wrench, is acceptable to the authority having jurisdiction.

Such valves shall not close in less than 5 seconds when operated at maximum possible speed from the fully open position. This is to avoid damage to piping by water hammer.

The following may not incorporate indicating devices as part of the valve, but the valve assembly described shall qualify as an indicating valve.

(a) An underground gate valve of listed type equipped with a listed indicator post.

(b) A listed water control valve assembly which has a reliable position indication connected to a remote supervisory station.

3-1.2 Check valves shall be listed.

3-2 Valves Controlling Water Supplies.

3-2.1 At least one control valve shall be installed in each source of water supply except fire department connections.

3-2.2 Where there is more than one source of water supply, a check valve shall be installed in each connection, except that, where cushion tanks are used with automatic fire pumps, no check valve is required in the cushion tank connection.

3-2.3* A control valve shall be installed on each side of each check valve, except that, in the discharge pipe from a pressure tank or a gravity tank of less than 15,000 gal ($56.78\ m^3$) capacity, no control valve need be installed on the tank side of the check valve.

3-2.4* Where a gravity tank is located on a tower in the yard, the control valve on the tank side of the check valve shall be an outside screw and yoke or listed indicating valve; the other shall be either an outside screw and yoke, listed indicating or a listed valve having a post type indicator. Where a gravity tank is located on a building, both control valves shall be outside screw and yoke or listed indicating valves; and all fittings inside the building, except the drain tee and heater connections, shall be under the control of a listed valve.

3-2.5* When a pump is located in a combustible pump house or exposed to danger from fire or falling walls, or when a tank discharges into a private fire service main fed by another supply, either the check valve in the connection shall be located in a pit or the control valve shall be of the post indicator type located a safe distance outside buildings.

3-2.6 All control valves shall be located where readily accessible and free from obstructions.

3-3 Post Indicator Valves.

3-3.1* Every connection from the private fire service main to a building shall be provided with a listed indicating valve so located as to control all sources of water supply except fire department connections when arranged as specified in Section 2-6.

Exception: Omission of the post indicator may be allowed by the authority having jurisdiction in accordance with the provisions of 3-1.1 and 3-4.1.

3-3.2 Post indicator valves shall be located not less than 40 ft (12.2 m) from buildings.

Exception: When post indicator valves cannot be placed at this distance, they may be located closer, or wall post indicator valves used provided they are set in locations by blank walls where the possibility of injury by falling walls is small and from which people are not likely to be driven by smoke or heat. Usually, in crowded plant yards, they can be placed beside low buildings, near brick stair towers, or at angles formed by substantial brick walls which are not likely to fall.

3-3.3 Post indicator valves shall be set so that the top of the post will be 36 in. (0.9 m) above the final grade.

3-3.4 Post indicator valves shall be properly protected against mechanical damage where needed.

3-4 Valves in Pits.

3-4.1 Where it is impracticable to provide a post indicator valve, valves may be placed in pits through permission of the authority having jurisdiction.

3-4.2* When used, valve pits shall be of adequate size and readily accessible for inspection, operation, testing, maintenance, and removal of equipment contained therein. They shall be constructed and arranged to properly protect the installed equipment from movement of earth, freezing, and accumulation of water. Poured-in-place or precast concrete, with or without reinforcement, or brick (all depending upon soil conditions and size of pit) are appropriate materials for construction of valve pits. Other approved materials may be used. Where the water table is low and the soil is porous, crushed stone or gravel may be used for the floor of the pit. See Figures A-2-6(b) and A-2-6(c) for suggested arrangements.

Valve pits located at or near the base of the riser of an elevated tank shall be designed in accordance with Chapter 9 of NFPA 22, *Standard for Water Tanks for Private Fire Protection.*

3-4.3 The location of the valve shall be clearly marked and the cover of the pit shall be kept free of obstructions.

3-5 Sectional Valves.

3-5.1 Large private fire service main systems shall have sectional controlling valves at appropriate points, in order to permit sectionalizing the system in the event of a break, or for the making of repairs or extensions.

3-5.2 A valve shall be provided on each bank where a main crosses water, and outside the building foundation(s) where the main or section of main runs under a building (*see 8-3.1*).

3-6 Identifying and Securing. Identification signs shall be provided at each valve to indicate its function and what it controls. To assure that valves are kept open, see Chapter 6 of NFPA 26, *Recommended Practice for the Supervision of Valves Controlling Water Supplies for Fire Protection.*

Chapter 4 Hydrants

4-1* General.

4-1.1 Hydrants shall be of an approved type and shall have not less than a 6-in. connection with the mains. A valve shall be installed in the hydrant connection. The number, size, and arrangement of outlets, the size of main valve opening, and the size of barrel shall be suitable for the protection to be provided and shall be approved by the authority having jurisdiction. Independent gate valves on 2½-in. outlets may be used. (*See Chapter 3.*)

4-1.2 Hydrant outlet threads shall have the NH standard external threads for the size outlet(s) supplied as specified in NFPA 1963, *Standard for Screw Threads and Gaskets for Fire Hose Connections.*

Exception: Where local fire department connections do not conform to NFPA 1963, Standard for Screw Threads and Gaskets for Fire Hose Connections, the authority having jurisdiction shall designate the connection to be used.

4-2 Number and Location.

4-2.1 Hydrants shall be provided in sufficient number and be located in a manner that will enable the fire flow needed to be delivered through hose lines about any important structure. The fire flow needed and the hydrant locations shall be determined by the authority having jurisdiction, but in no case shall hose lengths be greater than 500 ft (152.5 m). Public hydrants are recognized as meeting all or part of the above requirements.

NOTE: Fire department pumpers will normally be required to augment the pressure available from public hydrants.

4-2.2* For average conditions, hydrants shall be placed at least 40 ft (12.2 m) from the buildings protected.

Exception: When hydrants cannot be placed at this distance, they may be located closer, or wall hydrants used (see Figure A-4-2.2) provided they are set in locations by blank walls where the possibility of injury by falling walls is small and from which people are not likely to be driven by smoke or heat. Usually, in crowded plant yards, they can be placed beside low buildings, near brick stair towers or at angles formed by substantial brick walls which are not likely to fall.

4-2.3 Hydrants shall not be placed near retaining walls where there is danger of frost through the walls.

4-3 Installation and Maintenance.

4-3.1 Hydrants shall be set on flat stones or concrete slabs and, if necessary, shall be provided with sufficient small stones (or equivalent) placed about the drain to ensure quick drainage.

4-3.2 Where soil is of such a nature that the hydrants will not drain properly with the arrangement specified in 4-3.1, or ground water stands at levels above that of the drain, the hydrant drain shall be plugged at the time of installation. If drain is plugged, hydrants in service in cold climates shall be pumped out after usage. Such hydrants shall be marked to indicate the need for pumping out after usage.

4-3.3* The center of a hose outlet shall be not less than 12 in. (305 mm) above final grade, or when located in a hose house, 12 in. (305 mm) above the floor.

4-3.4 Hydrants shall be fastened to piping by standard clamps or be properly anchored.

4-3.5 Hydrants shall be protected if subject to mechanical damage. The means of protection shall be arranged in a manner which will not interfere with the connection to or operation of hydrants.

4-3.6* To assure proper functioning, wet barrel hydrants shall be tested at least annually, and dry barrel hydrants tested semiannually in the early spring and fall, in accordance with the requirements of the authority having jurisdiction.

Chapter 5 Hose Houses and Equipment

5-1 General.

5-1.1* An adequate supply of hose and equipment shall be provided when hydrants are intended for use by plant personnel or a fire brigade. The quantity and type of hose and equipment will depend upon the number and location of hydrants relative to the protected property, the extent of the hazard, and the fire fighting capabilities of the potential users. The authority having jurisdiction shall be consulted.

5-1.2* Hose shall conform to NFPA 1961, *Standard for Fire Hose*.

5-1.3* Hose shall be stored so it is readily accessible and is protected from the weather. This may be done by storing hose in hose houses or by locating hose reels or hose carriers in weatherproof enclosures.

5-1.4 Hose Couplings. Hose coupling threads shall conform to the NH standard threads, as specified in NFPA 1963, *Standard for Screw Threads and Gaskets for Fire Hose Connections.*

Exception: Where local fire department connections do not conform to NFPA 1963, Standard for Screw Threads and Gaskets for Fire Hose Connections, the authority having jurisdiction shall designate the connections to be used.

5-2 Location.

5-2.1 When hose houses are used, they shall either be located over the hydrant or immediately nearby. Hydrants within hose houses shall be as close to the front of the house as possible and still allow sufficient room in back of the doors for the hose gates and the attached hose.

5-2.2 When hose reels or hose carriers are used, they shall be located so that the hose may be brought quickly into use at a hydrant.

5-3 Construction. Hose houses shall be of substantial construction on adequate foundations. The construction shall be such as to protect the hose from weather and vermin and designed so that hose lines can be quickly brought into use. Clearance shall be provided for proper operation of the hydrant wrench. Proper ventilation shall be provided. The exterior shall be painted or otherwise suitably protected against deterioration.

5-4* Size and Arrangement. Hose houses shall be of a size and arrangement to provide shelves or racks for the hose and equipment. For equipment details of hose houses, see Section 5-6 and 5-1.4.

5-5 Marking. Hose houses shall be plainly identified.

5-6 Equipment—General.

5-6.1* When hose houses are used in addition to the hose, each shall be equipped with:

2-Approved adjustable-spray solid-stream nozzles equipped with shutoffs for each size of hose provided
1-Hydrant wrench (in addition to wrench on hydrant)
4-Coupling spanners for each size hose provided
2-Hose coupling gaskets for each size hose.

5-6.1.1 Where two sizes of hose and nozzles are provided, reducers or gated wyes shall be included in the hose house equipment.

5-7 Domestic Service Use Prohibited. The use of hydrants and hose for purposes other than fire-related services shall be prohibited.

Chapter 6 Master Streams

6-1* General. Master streams are delivered by monitor nozzles, hydrant-mounted monitor nozzles, or portable deluge sets capable of delivering more than 250 gpm (946 L/min).

6-2 Application. Master streams shall be provided as protection for large amounts of combustible materials located in yards, average amounts of combustible materials in inaccessible locations or occupancies presenting special hazards as required by the authority having jurisdiction.

6-3 Special Consideration. The location of this apparatus, the size of piping supplying it, the arrangement of control valves, and the necessary water supplies all demand special considerations in each individual case, and the authority having jurisdiction shall be consulted.

Chapter 7* Pipe and Fittings

7-1 Selection of Pipe.

7-1.1* Piping. Piping shall be listed for fire protection service and comply with AWWA standards, where applicable.

7-1.2* The type and class of pipe for a particular in-stallation shall be determined through consideration of its fire resistance, the maximum working pressure, the laying conditions under which the pipe is to be installed, soil conditions, corrosion, and susceptibility of pipe to other external loads, including earth loads installation beneath buildings and traffic or vehicle loads.

7-1.3 Pipe used in private fire service shall be designed to withstand a working pressure of not less than 150 psi (10.3 bars).

7-2* Coating and Lining of Pipe. All ferrous metal pipe shall be lined, and steel pipe shall be coated and wrapped with joints field-coated and wrapped after assembly. Galvanizing does not meet the requirements of this section.

7-3* Joints. Joints shall be of an approved type.

7-4* Fittings. Fittings shall be of an approved type with joints and pressure class ratings compatible with the pipe used. Steel pipe fittings shall be coated, wrapped, and lined.

7-5 Sizes of Pipe.

7-5.1* No pipe smaller than 6 in. in diameter shall be installed as a private service main.

Exception: For mains that do not supply hydrants, sizes smaller than 6 in. may be used subject to the following restrictions:

1. The main supplies only automatic sprinkler systems, open sprinkler systems, water spray fixed systems, foam systems, or Class II standpipe systems.

2. Hydraulic calculations show that the main will supply the total demand at the appropriate pressure.

3. Main size shall be at least as large as the riser.

7-5.2 The size of the private fire service mains supplying fire protection systems shall be approved by the authority having jurisdiction, with due consideration being given to the construction and occupancy of the plant, to the fire flow and pressure of water required, and to the adequacy of the supply.

7-5.3* For purposes of estimating friction loss, see A-7-5.3.

Chapter 8* Rules for Laying Pipe

8-1 Depth of Cover.

8-1.1* The depth of cover over water pipes shall be determined by the maximum depth of frost penetration in the locality where the pipe is laid. The top of the pipe shall be buried not less than 1 ft (0.3 m) below the frost line for the locality. In those locations where frost is not a factor, the depth of cover shall be not less than 2½ ft (0.8 m) to prevent mechanical injury. Pipe under driveways shall be buried a minimum of 3 ft (0.9 m) and under railroad tracks a minimum of 4 ft (1.2 m). *(See A-8-1.1.)*

8-1.2 Depth of covering shall be measured from top of pipe to finished grade, and due consideration shall always be given to future or final grade and nature of soil.

8-2 Protection Against Freezing.

8-2.1 Where it is impracticable to bury pipe, it may be laid aboveground, provided the pipe is protected against freezing and mechanical injury, to the satisfaction of the authority having jurisdiction.

8-2.2 Pipes shall not be placed over water raceways or near embankment walls without special attention being given to protection against frost.

8-2.3 Where pipe is laid in water raceways or shallow streams, care shall be taken that there will be sufficient depth of running water between the pipe and the frost line during all seasons of frost; a safer method is to bury the pipe one foot or more under the bed of the waterway. Care shall also be taken to keep the pipe back from the banks a sufficient distance to avoid any danger of freezing through the side of the bank above the water line. Pipe shall be buried below frost line where entering the water.

8-3 Protection Against Damage.

8-3.1 Pipe shall not be run under buildings.

Exception: When absolutely necessary to run pipe under buildings, special precautions shall be taken which include arching the foundation walls over the pipe, running pipe in covered trenches, and providing valves to isolate sections of pipe under buildings. (See 3-5.2.)

8-3.2 Where a riser is close to building foundations, underground fittings of proper design and type shall be used to avoid pipe joints being located in or under the foundations.

8-3.3 Mains running under railroads carrying heavy trucking, under large piles of heavy commodities, or in areas subjecting the main to heavy shock and vibrations shall be subjected to an evaluation of the specific loading conditions and suitably protected, if necessary. *(See 7-1.2.)*

8-3.4* When it is necessary to join metal pipe with pipe of dissimilar metal, the joint shall be insulated, by an approved method, against the passage of an electric current.

8-3.5 In no case shall the pipe be used for grounding of electrical services.

8-4 Care in Laying.

8-4.1 Pipes, valves, hydrants, and fittings shall be inspected for damage when received and shall be inspected prior to installation. Bolted joints shall be checked for proper torquing of bolts. Pipe, valves, hydrants, and fittings shall be clean inside. When work is stopped, open ends shall be plugged to prevent stones and foreign materials from entering.

8-4.2 All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench with suitable equipment. They shall be carefully examined for cracks or other defects while suspended above the trench immediately before installation. Plain ends shall be inspected with special attention as these ends are the most susceptible to damage. Under no circumstances shall water main materials be dropped or dumped. Pipe shall not be rolled or skidded against other pipe materials.

8-4.3 Pipes shall bear throughout their full length and shall not be supported by the bell ends only or by blocks.

Exception: If ground is soft, or of a quicksand nature, special provisions shall be made for supporting pipe. For ordinary conditions of soft ground, longitudinal wooden stringers with cross ties will give good results.

8-4.4 Valves and fittings used with nonmetallic pipe shall be properly supported and anchored in accordance with the manufacturer's specifications.

8-5 Pipe Joint Assembly.

8-5.1 Joints shall be assembled by persons familiar with the particular materials being used and in accordance with the manufacturer's instructions and specifications.

8-5.2 All bolted joint accessories shall be cleaned and thoroughly coated with asphalt or other corrosion-retarding material after installation.

8-6 Anchoring Fire Mains.

8-6.1 Except for the case of welded joints and approved special restrained joints, such as provided by approved mechanical joint retainer glands or locked mechanical and push-on joints, the usual joints for underground pipe and fittings are expected to be held in place by the soil in which the pipe is buried. Gasketed push-on and mechanical joints without special locking devices have limited ability to resist separation due to movement of the pipe. All tees, plugs, caps, bends, and hydrant branches on pipe installed underground shall be restrained against movement.

8-6.2* Methods of Anchoring Fire Mains.

8-6.2.1 Pipe clamps and tie-rods, thrust blocks, locked mechanical or push-on joints, mechanical joints utilizing set screw retainer glands, or other approved methods or devices shall be used. The type of pipe, soil conditions, and available space determine the method.

8-6.2.2 Sizing the Clamps, Rods, Bolts, and Washers.

(a) Clamps shall be ½ by 2 in. (12.7 by 50.8 mm) for pipe 4 to 6 in.; ⅝ by 2½ in. (15.9 by 63.5 mm) for pipe 8 and 10 in.; ⅝ by 3 in. (15.9 by 76.2 mm) for pipe 12 in. Bolt holes shall be 1/16 in. (1.6 mm) diameter larger than bolts.

(b) Minimum rod size shall be ⅝ in. (15.9 mm) diameter. Table 8-6.2.2(b) gives numbers of various diameter rods required for a given pipe size. When using bolting rods, the diameter of mechanical joint bolts limits the size of rods to ¾ in. (19.1 mm).

When using clamps, rods shall be used in pairs, two to a clamp.

Exception: Assemblies in which an anchor is made by means of two clamps canted on the barrel of the pipe may use one rod per clamp if approved for the specific installation by the authority having jurisdiction.

When using combinations of rods greater in number than two, the rods shall be symetrically spaced.

Table 8-6.2.2(b)
Rod Number — Diameter Combinations

Pipe Size inches	Number of Rods ⅝ in. (15.9 mm)	¾ in. (19.1 mm)	⅞ in. (22.2 mm)	1 in. (25.4 mm)
4	2	-	-	-
6	2	-	-	-
8	3	2	-	-
10	4	3	2	-
12	6	4	3	2
14	8	5	4	3
16	10	7	5	4

Table has been derived using pressure of 225 psi (15.5 bars) and design stress of 25,000 psi (172.4 MPa).

(c) Clamp bolts shall be ⅝ in. (15.9 mm) diameter for pipe 4, 6, and 8 in.; ¾ in. (19.1 mm) diameter for pipe 10 in. and ⅞ in. (22.2 mm) diameter for pipe 12 in.

(d) Washers may be cast-iron or steel, round or square. Dimensions for cast-iron washers shall be ⅝ by 3 in. (15.9 by 76.2 mm) for pipe 4, 6, 8, and 10 in. and ¾ by 3½ in. (19.1 by 88.9 mm) for pipe 12 in. Dimensions for steel washers shall be ½ by 3 in. (12.7 by 76.2 mm) for pipe 4, 6, 8, and 10 in. and ½ by 3½ in. (12.7 by 88.9 mm) for 12 in. Holes shall be ⅛ in. (3.2 mm) diameter larger than rods.

8-6.2.3 Sizes of Anchor Straps for Tees. Straps shall be ⅝ in. (15.9 mm) thick and 2½ in. (63.5 mm) wide for pipe 4, 6, 8, and 10 in.; ⅝ in. (15.9 mm) thick and 3 in. (76.2 mm) wide for pipe 12 in. Rod holes shall be 1/16 in. (1.6 mm) diameter larger than rods. Dimensions in inches (mm) for straps are suitable either for mechanical or push-on joint tee fittings.

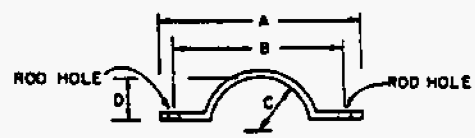


Figure 8-6.2.3 Anchor Straps for Tees.

Table 8-6.2.3 Anchor Straps for Tees

Pipe Size	A		B		C		D	
In.	In.	mm	In.	mm	In.	mm	In.	mm
4	12½	318	10⅛	257	2½	64	1¾	44
6	14½	368	12⅛	308	3 9/16	90	2 13/16	71
8	16¾	425	14⅜	365	4 21/32	118	3 29/32	99
10	19 1/16	484	16 11/16	424	5¾	146	5	127
12	22 5/16	567	19 3/16	487	6¾	171	5⅞	149

8-6.2.4 Sizes of Plug Strap for Bell End of Pipe. Strap shall be ¾ in. (19.1 mm) thick, 2½ in. (63.5 mm) wide. Strap length is the same as dimension *A* for tee straps given in Figure 8-6.2.3; distance between centers of rod holes is the same as dimension *B* for tee straps.

8-6.2.5* Material used for clamps, rods, rod couplings or turnbuckles, bolts, washers, anchor straps, and plug straps shall be of material having physical and chemical characteristics such that its deterioration under stress can be predicted with reliability.

8-6.2.6 After installation, rods, nuts, bolts, washers, clamps, and other restraining devices except thrust blocks shall be cleaned and thoroughly coated with a bituminous or other acceptable corrosion-retarding material.

8-6.2.7 Thrust blocks are satisfactory where soil is suitable. Table 8-6.2.7 gives bearing areas against undisturbed vertical wall of a trench in soil equivalent to sand and gravel cemented with clay. For other soils, the values in the table shall be multiplied by an appropriate factor. (*See Table A-8-6.2.8.*)

8-6.2.8* Thrust blocks or other suitable means of thrust restraint shall be provided at each change in the direction of a pipeline and at all tees, plugs, caps, and bends. The thrust blocks shall be of concrete of a mix not leaner than one part cement, two and one-half parts sand, and five parts stone. Backing shall be placed between undisturbed earth and the fitting to be anchored and shall be of such bearing area as to assure adequate resistance to the thrust to be encountered. In general, backing shall be so placed that the joints will be accessible for inspection and repair. Thrust blocks are not suitable for vertical pipe.

Table 8-6.2.7
Area of Bearing Face of Concrete Thrust Blocks

Pipe Size In.	¼ Bend Sq Ft	m²	⅛ Bend Sq Ft	m²	Tees, Plugs, Caps and Hydrants Sq Ft	m²
4	2	0.19	2	0.19	2	0.19
6	5	0.46	3	0.28	4	0.37
8	8	0.74	5	0.46	6	0.56
10	13	1.21	7	0.65	9	0.84
12	18	1.67	10	0.93	13	1.21
14	25	2.32	14	1.30	18	1.67
16	32	2.97	18	1.67	23	2.14

Areas in table have been derived using a water pressure of 225 pounds per square inch (15.5 bars) and a soil resistance of 2000 pounds per square foot (1.0 bars).

8-6.2.9 On steep grades, mains shall be properly anchored to prevent slipping. The pipe shall be anchored at the bottom of a hill and at any turns (lateral or vertical). The anchoring shall be done either to natural rock or by means of suitable piers built on the downhill side of the bell. Bell ends shall be installed facing uphill. Straight runs on hills shall be anchored as determined by the design engineer.

8-7 Backfilling.

8-7.1 Backfill shall be well tamped in layers under and around pipes (and puddled where possible) to prevent settlement or lateral movement, and shall contain no ashes, cinders, refuse, organic matter, or other corrosive materials.

8-7.2 Rocks shall not be placed in trenches. Frozen earth shall not be used for backfilling.

8-7.3 In trenches cut through rock, tamped backfill shall be used for at least 6 in. (152 mm) under and around the pipe and for at least 2 ft (0.6 m) above the pipe.

8-8 Flushing.

8-8.1 Underground mains and lead-in connections to system risers shall be flushed thoroughly before connection is made to sprinkler, standpipe, or other fire protection system piping in order to remove foreign materials which may have entered the pipe during the course of the installation.

8-8.2 Flushing of Piping. Underground mains and lead-in connections to system risers shall be flushed thoroughly before connection is made to system piping in order to remove foreign materials which may have entered the underground main during the course of the installation or which may have been present in existing piping. The minimum rate of flow shall be not less than the water demand rate of the system, which is determined by the system design, or not less than that necessary to provide a velocity of 10 ft per second (3 m/s), whichever is greater. For all systems, the flushing operations shall be continued for a sufficient time to ensure thorough cleaning. When planning the flushing operations, consideration shall be given to disposal of the water issuing from the test outlets.

Exception: When the flow rate as listed in Table 8-8.2 cannot be verified or met, supply piping shall be flushed at the maximum flow rate available to the system under fire conditions.

Table 8-8.2
Flow Required to Produce a Velocity of 10 Ft per Second (3 m/s) in Pipes

Pipe Size (In.)	Flow Rate (gpm)	Flow Rate (L/min)
4	390	1476
6	880	3331
8	1560	5905
10	2440	9235
12	3520	13323

8-9 Testing Underground System.

8-9.1* Before asking final approval of an installation by the authority having jurisdiction, the installing company shall furnish a Contractor's Material and Test Certificate countersigned by the property owner or representative. For a typical Contractor's Material and Test Certificate for Underground Piping, see Figure A-8-9.1.

8-9.2* The trench shall be backfilled between joints before testing to prevent movement of pipe. (*See A-8-9.2.*)

8-9.3 Hydrostatic Test Requirements.

8-9.3.1* All new private fire service mains shall be tested hydrostatically at not less than 200 psi (13.8 bars)

0819

pressure for two hours, or at 50 psi (3.4 bars) in excess of the maximum static pressure when the maximum static pressure is in excess of 150 psi (10.3 bars). (*See A-8-9.3.1.*)

8-9.3.2* The amount of leakage in piping shall be measured at the specified test pressure by pumping from a calibrated container. For new pipe, the amount of leakage at the joints shall not exceed two quarts per hour (1.89 L/h) per 100 gaskets or joints irrespective of pipe diameter.

8-9.3.3 The amount of allowable leakage specified in 8-9.3.2 may be increased by one fluid ounce per inch valve diameter per hour (30 ml/25 mm/h) for each metal seated valve isolating the test section. If dry barrel hydrants are tested with the main valve open, so the hydrants are under pressure, an additional five ounces per minute (150 ml/min) leakage is permitted for each hydrant.

8-9.3.4 Tests shall be made by the contractor in the presence of the authority having jurisdiction or the representative of the owner. The certificate shown in Figure A-8-9.1 is to be completed.

8-9.4 Operating Test.

8-9.4.1 Each hydrant shall be fully opened and closed under system water pressure and dry barrel hydrants checked for proper drainage. Where fire pumps are available, this shall be done with the pumps running.

8-9.4.2 All control valves shall be fully closed and opened under system water pressure to ensure proper operation.

Chapter 9 Referenced Publications

9-1 The following documents or portions thereof are referenced within this document and shall be considered part of the requirements of this document. The edition indicated for each reference shall be the current edition as of the date of the NFPA issuance of this document. These references shall be listed separately to facilitate updating to the latest edition by the user.

9-1.1 **NFPA Publications.** National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

NFPA 22-1987, *Standard for Water Tanks for Private Fire Protection*

NFPA 26-1983, *Recommended Practice for the Supervision of Valves Controlling Water Supplies for Fire Protection*

NFPA 1961-1987, *Standard for Fire Hose*

NFPA 1963-1985, *Standard for Screw Threads and Gaskets for Fire Hose Connections*

9-1.2 **AWWA Publications.** American Water Works Association, Inc., 666 West Quincy Avenue, Denver, CO 80235.

AWWA C104-85, *AWWA Standard for Cement Mortar Lining for Cast-Iron Pipe and Fittings for Water*

AWWA C105-82, *AWWA Standard for Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids*

AWWA C110-82, *AWWA Standard for Gray Iron and Ductile Iron Fittings, 2-in. through 48-in., for Water and Other Liquids*

AWWA C111-85, *AWWA Standard for Rubber Gasket Joints for Cast-Iron and Ductile Iron Pressure Pipe and Fittings*

AWWA C115-83, *AWWA Standard for Flanged Cast-Iron and Ductile Iron Pipe with Threaded Flanges*

AWWA C150-82, *AWWA Standard for the Thickness Design of Ductile Iron Pipe*

AWWA C151-81, *AWWA Standard for Ductile Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids*

AWWA C200-80, *AWWA Standard for Steel Water Pipe 6 in. and larger*

AWWA C203-78, *AWWA Standard for Coal-Tar Enamel Protective Coatings for Steel Water Pipelines*

AWWA C205-80, *AWWA Standard for Cement-Mortar Protective Lining and Coating for Steel Water Pipe*

AWWA C206-82, *AWWA Standard for Field Welding of Steel Water Pipe Joints*

AWWA C207-78, *AWWA Standard for Steel Pipe Flanges*

AWWA C208-83, *AWWA Standard for Dimensions for Steel Water Pipe Fittings*

AWWA C300-82, *AWWA Standard for Reinforced Concrete Pressure Pipe, Steel-Cylinder Type*

AWWA C301-79, *AWWA Standard for Prestressed Concrete Pressure Pipe, Steel-Cylinder Type*

AWWA C302-74, *AWWA Standard for Reinforced Concrete Pressure Pipe, Non-Cylinder Type*

AWWA C303-78, *AWWA Standard for Reinforced Concrete Water Pipe, Steel-Cylinder Type, Pretensioned*

AWWA C400-80, *AWWA Standard for Asbestos-Cement Pressure Pipe*

AWWA C602-76, *AWWA Standard for Cement-Mortar Lining of Water Pipe Lines in Place*

AWWA C900-81, *AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe.*

9-1.3 **ANSI Publication.** American National Standards Institute, 1430 Broadway, New York, NY 10018.

ANSI B16.1-75, *American National Standard for Cast-Iron Pipe Flanges and Flanged Fittings for 25, 125, 250 and 800 lb.*

Appendix A

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

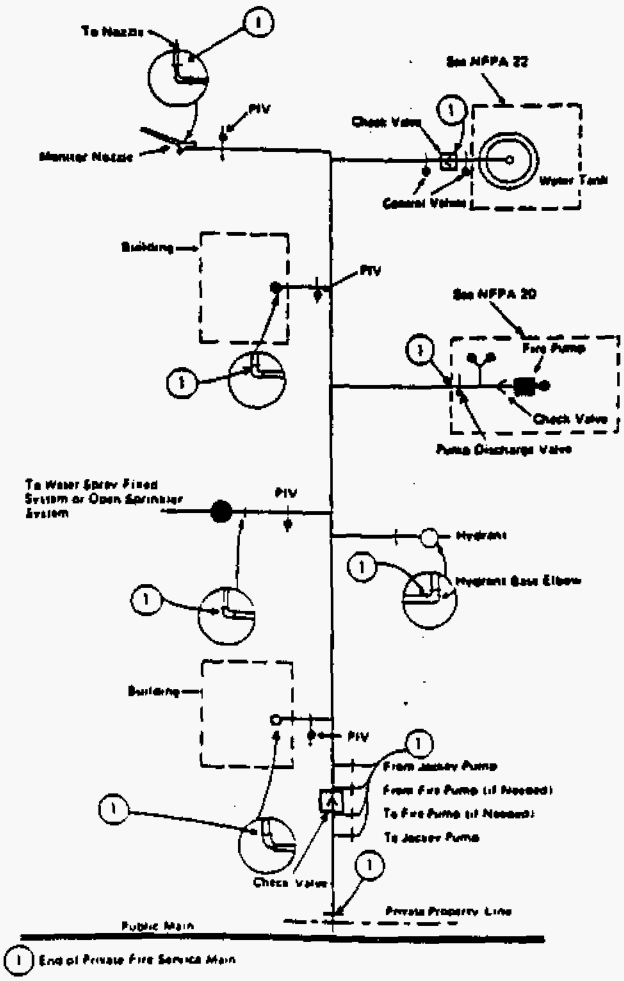


Figure A-1-3 Typical Private Fire Service Main.

NOTE: The piping shown is specific as to the end of the private fire service main and schematic only for illustrative purposes beyond. Details of valves and their location requirements are covered in the specific standard involved.

A-1-4 Piping should be laid so that the system can be extended with a minimum of expense. Possible future plant expansion should also be considered and the piping laid so that it will not be covered by buildings. One or more framed plans of the complete system (kept corrected and up to date) should be conspicuously posted for ready reference.

A-2-2.3 Dead-end mains should be avoided, if possible, by arranging for mains supplied from both directions. When private fire service mains are connected to dead-end public mains, each situation should be examined to determine if it is practical to request the water utility to loop the mains in order to obtain a more reliable supply.

A-2-2.5 Where connections are made from public waterworks systems, such systems should be guarded against possible contamination as follows (*see AWWA Manual 14*):

(a) For private fire service mains with direct connections from public waterworks mains only or with booster pumps installed in the connections from the street mains; no tanks or reservoirs; no physical connection from other water supplies; no antifreeze or other additives of any kind; and with all drains discharging to atmosphere, dry well, or other safe outlets, no backflow protection is recommended at the service connection.

(b) For private fire service mains with direct connection from the public water supply main plus one or more of the following: elevated storage tanks; fire pumps taking suction from aboveground covered reservoirs or tanks (all storage facilities are filled or connected to public water only, the water in the tanks to be maintained in a potable condition), an approved double check valve assembly is recommended.

(c) For private fire service mains directly supplied from public mains with an auxiliary water supply such as a pond or river on or available to the premises and dedicated to fire department use; or for systems supplied from public mains and interconnected with auxiliary supplies, such as: pumps taking suction from reservoirs exposed to contamination or rivers and ponds; driven wells, mills, or other industrial water systems; or for systems or portions of systems where antifreeze or other solutions are used, an approved reduced-pressure-zone-type backflow preventer is recommended.

A-2-3 See sections dealing with sprinkler equipment supervisory and water flow alarm services in NFPA 71, *Standard for the Installation, Maintenance, and Use of Signaling Systems for Central Station Service*; NFPA 72A, *Standard for the Installation, Maintenance, and Use of Local Protective Signaling Systems for Guard's Tour, Fire Alarm, and Supervisory Service*, NFPA 72B; *Standard for the Installation, Maintenance, and Use of Auxiliary Protective Signaling Systems for Fire Alarm Service*, NFPA 72C; *Standard for the Installation, Maintenance, and Use of Remote Station Protective Signaling*

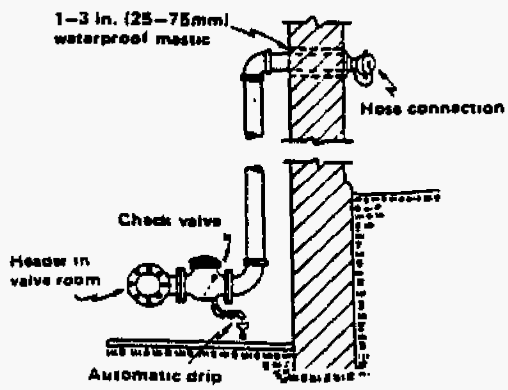
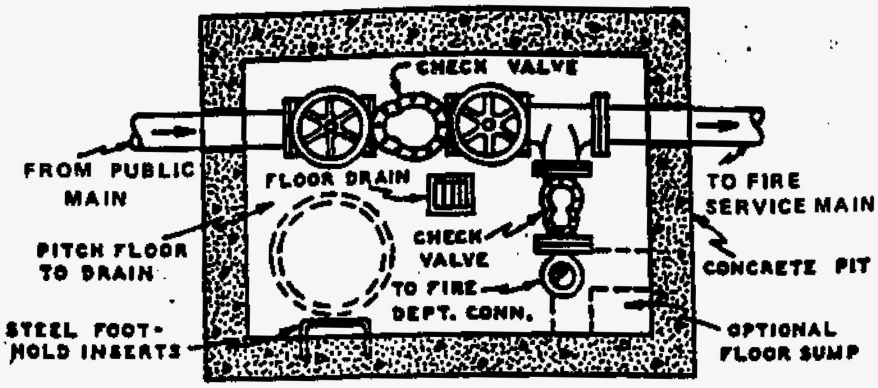


Figure A-2-6(a) Fire Department Connection.



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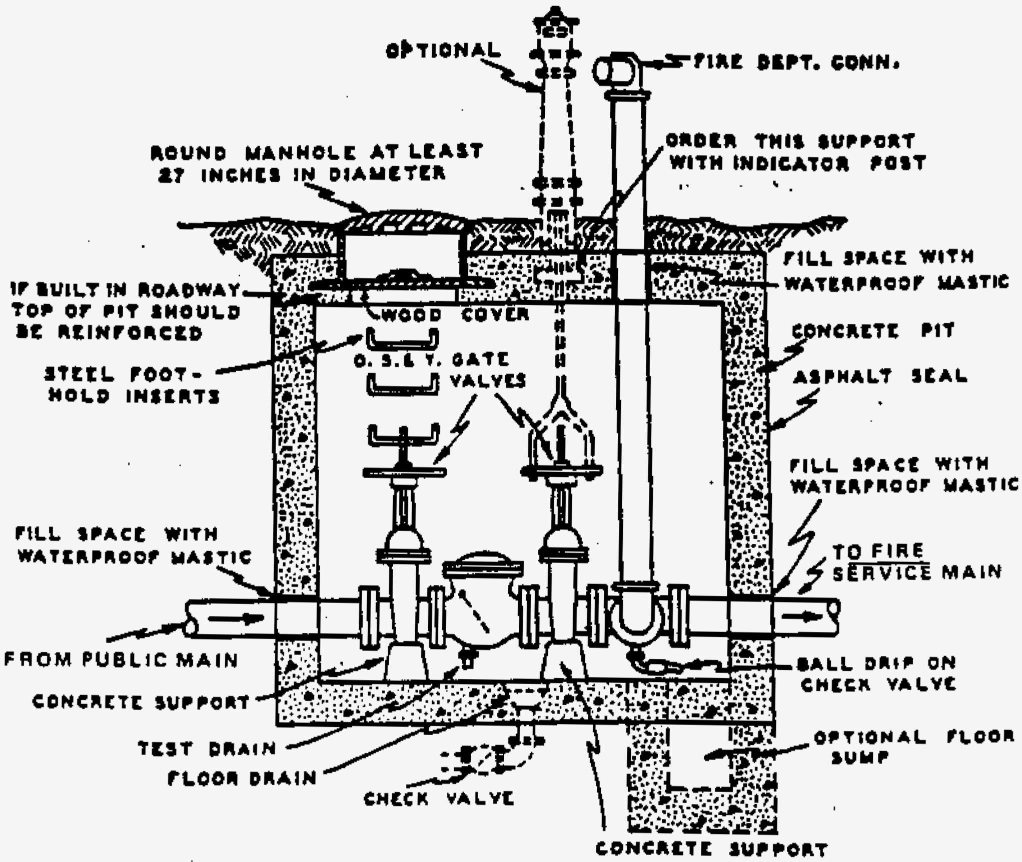

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Figure A-2-6(b) Typical City Water Pit — Single Check Valve Arrangement.

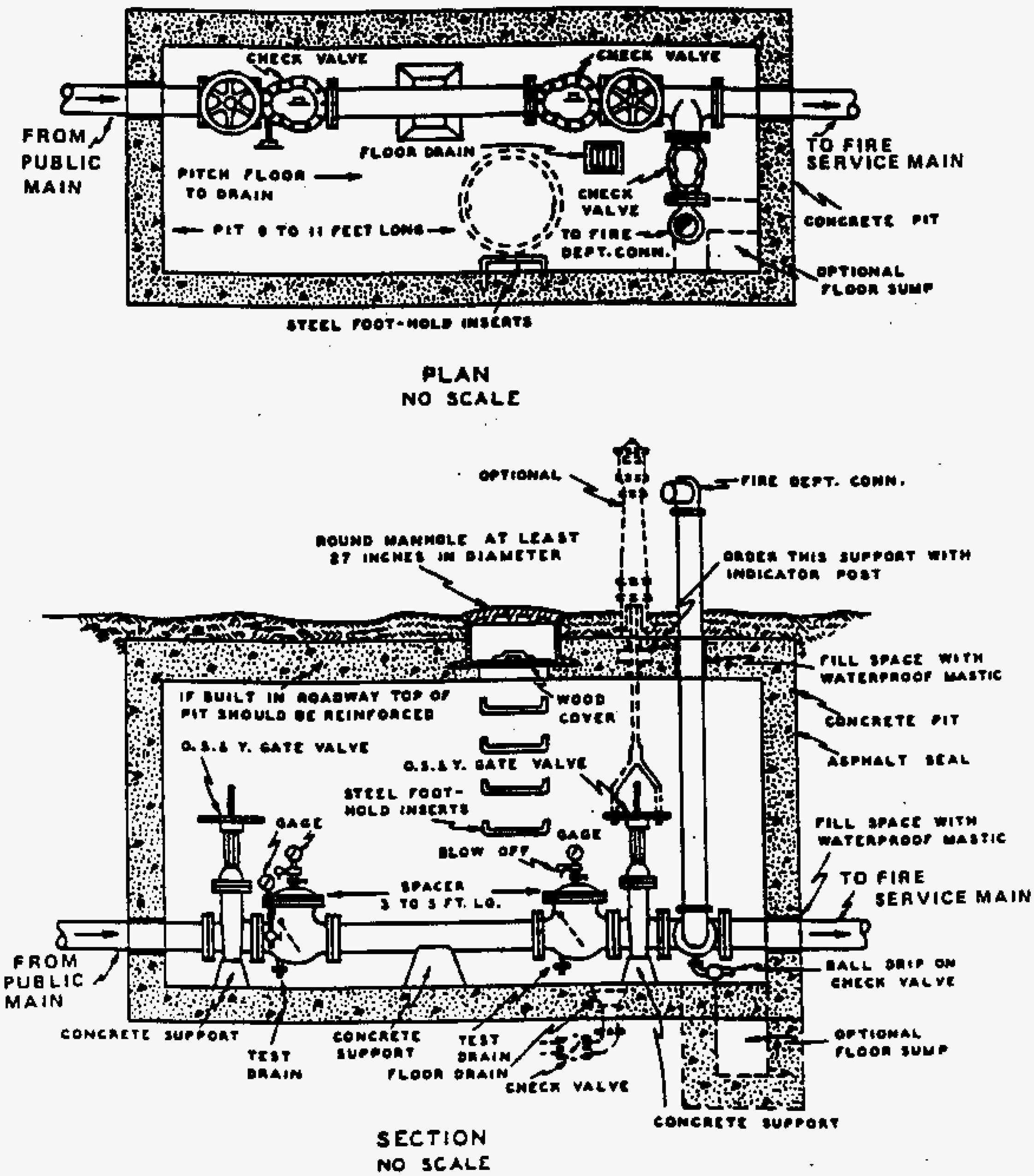


Figure A-2-6(c) Typical City Water Pit — Double Check Valve Arrangement.

Systems; and NFPA 72D, *Standard for the Installation, Maintenance, and Use of Proprietary Protective Signaling Systems.* See separately published NFPA 13, *Standard for the Installation of Sprinkler Systems,* and NFPA 20, *Standard for the Installation of Centrifugal Fire Pumps.*

A-2-4 See NFPA 22, *Standard for Water Tanks for Private Fire Protection,* when gravity, pressure, or suction tanks are to be used.

A-2-6 Typical fire department connections are shown in Figures A-2-6(a), A-2-6(b), and A-2-6(c). See NFPA 13E, *Recommendations for Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems.*

A-3-2.3, A-3-2.4 For additional information on controlling valves, see NFPA 22, *Standard for Water Tanks for Private Fire Protection*.

A-3-2.5 Check valves on tank or pump connections, when located underground, may be placed inside of buildings and at a safe distance from the tank riser or pump, except in cases where the building is entirely of one fire area, when it is ordinarily considered satisfactory to locate the check valve overhead in the lowest level.

A-3-3.1 Outside control valves are suggested in the following order of preference:

(a) Listed indicating valves at each connection into the building at least 40 ft (12.2 m) from buildings if space permits.

(b) Control valves installed in a cut-off stair tower or valve room accessible from outside.

(c) Valves located in risers with indicating posts arranged for outside operation.

(d) Key operated valves in each connection into the building.

A-3-4.2 A valve wrench with a long handle should be provided at a convenient location on the premises.

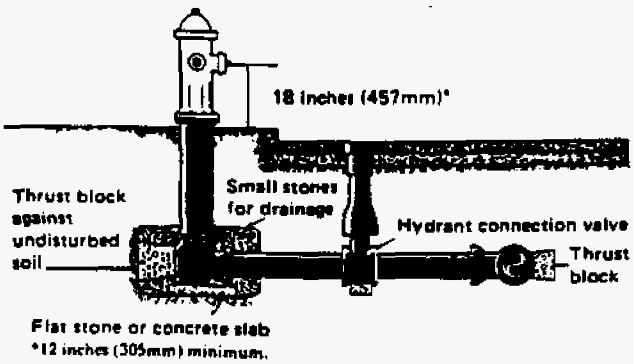


Figure A-4-1 Typical Hydrant Connection. (*See 4-3.3.*)

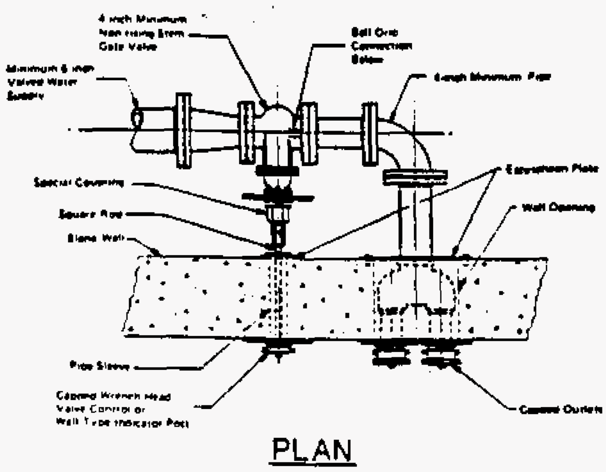


Figure A-4-2.2 Typical Wall Fire Hydrant Installation.

A-4-2.2 With use of wall hydrants, the authority having jurisdiction should be consulted regarding the necessary water supply and arrangement of control valves at the point of supply in each individual case.

A-4-3.3 In setting hydrants, due regard should be given to final grade line.

A-4-3.6 See AWWA Manual 17, *Installation, Operation and Maintenance of Fire Hydrants*.

A-5-1.1 All hose should not be removed from a hose house for testing at the same time because the time lost in returning it in case of fire might allow the fire to spread beyond control. See NFPA 1962, *Standard for the Care, Use, and Maintenance of Fire Hose Including Connections and Nozzles*.

A-5-1.2 Where hose may be subjected to acids, acid fumes, or other corrosive materials, as in chemical plants, the purchase of approved rubber-covered, rubber-lined hose is advised. For plant yards containing rough surfaces that will cause heavy wear or where working pressures are above 150 psi (10.3 bars), double-jacketed hose should be considered.

A-5-1.3 When hose houses are located over hydrants, it is good practice to have two or three lengths of hose connected together and attached to the hydrant ready for use.

A-5-4 Typical hose houses are shown in Figures A-5-4(a) through A-5-4(c).

A-5-6.1 Desirable optional equipment to be included in hose house equipment is as follows:

1-Fire axe with brackets

1-Crow bar with brackets

2-Hose and ladder straps

2-Electrical battery hand lights.

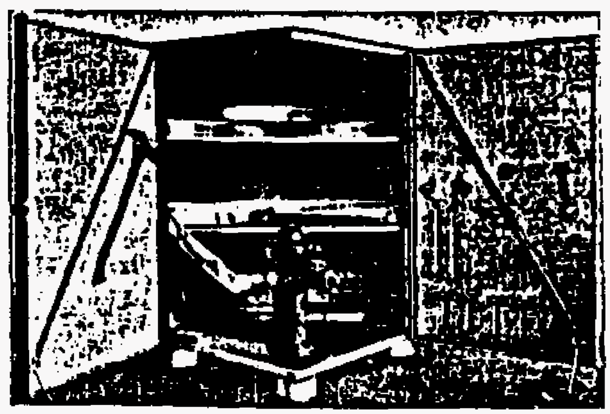


Figure A-5-4(a) House of five-sided design for installation over a private hydrant.

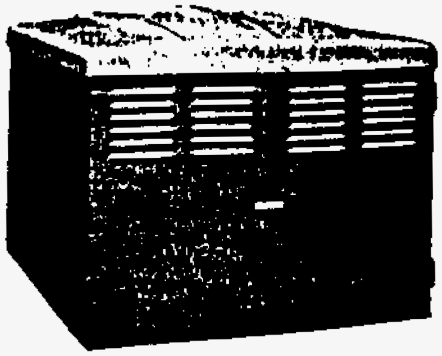


Figure A-5-4(b) Steel house of compact dimensions for installation over a private hydrant. House is shown closed. Top lifts up and doors on front side open for complete accessibility.

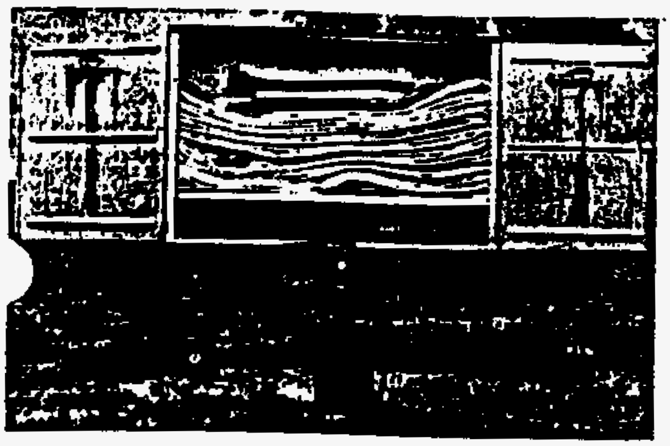


Figure A-5-4(c) This type of hose house can be installed on legs as illustrated or installed on a wall near, but not directly over, a private hydrant.

A-6-1 Typical Monitor Nozzles.

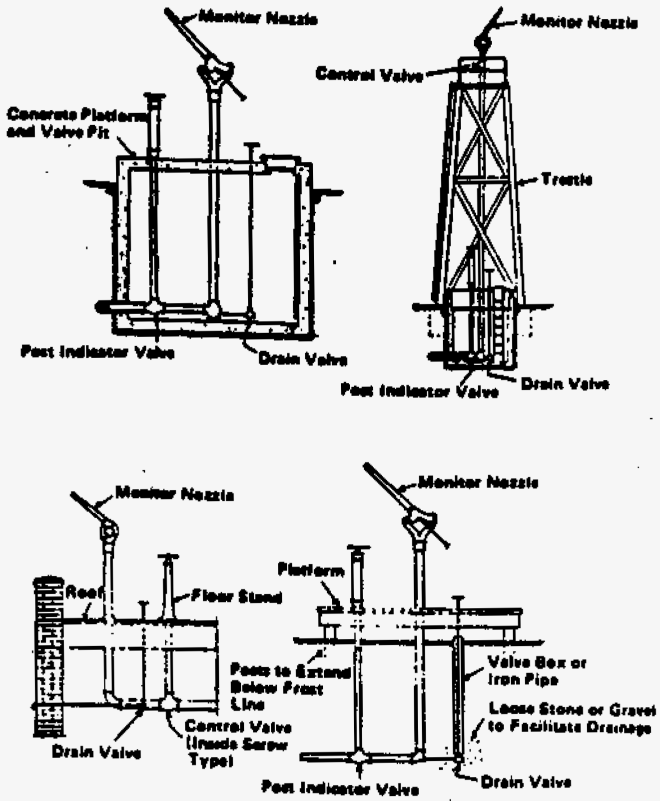


Figure A-6-1(a) Standard Monitor Nozzles. Gear control nozzles are also satisfactory.

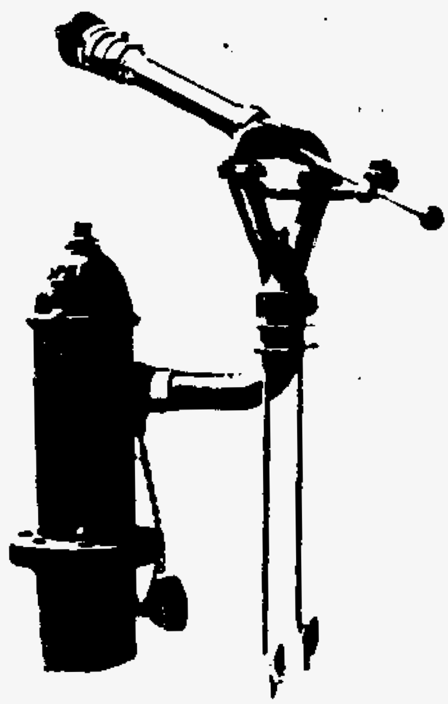


Figure A-6-1(b) Typical hydrant-mounted monitor nozzle

0825

A-7 This standard makes reference to codes and standards published by other organizations. The addresses are as follows:

ACPA
American Concrete Pipe Association
8320 Old Courthouse Road
Vienna, Virginia 20005

ANSI
American National Standards Institute
1430 Broadway
New York, New York 10018

ASSE
American Society of Sanitary Engineering
P.O. Box 9712
Bay Village, Ohio 44140

ASTM
American Society for Testing and Materials
1916 Race Street
Philadelphia, Pennsylvania 19103

AWS
American Welding Society
550 N. W. LeJeune Road
P. O. Box 351040
Miami, Florida 33125

AWWA
American Water Works Association, Inc.
6666 West Quincy Avenue
Denver, Colorado 80235

CSA
Candian Standards Association
178 Rexdale Boulevard
Rexdale, Ontario, Canada M9W 1R3

DIPRA
Ductile Iron Pipe Research Association
245 Riverchase Parkway, East
Suite O
Birmingham, AL 35244

A-7-1.1

(a) Testing laboratories list or label cast-iron and ductile iron pipe (cement-lined and unlined, coated and uncoated), asbestos-cement pipe and couplings, steel pipe, copper pipe, fiberglass filament-wound epoxy pipe and couplings, polyethylene pipe, and polyvinyl chloride (PVC) pipe and couplings. Underwriters Laboratories Inc. lists under reexamination service reinforced concrete pipe (cylinder pipe, nonprestressed and prestressed).

(b) *Pipe Standards.* The various types of pipe are usually manufactured to one of the following standards:

AWWA *Standard for Asbestos-Cement Pressure Pipe*, AWWA C400-80.

ASTM *Specifications for Asbestos-Cement Pressure Pipe*, ASTM C-296-81.

American National Standard for Ductile Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids, AWWA C151-81.

AWWA *Standard for Polyvinyl Chloride (PVC) Pressure Pipe*, AWWA C900-81.

AWWA *Standard for Reinforced Concrete Pressure Pipe, Steel-Cylinder Type*, AWWA C300-82.

AWWA *Standard for Prestressed Concrete Pressure Pipe, Steel-Cylinder Type*, AWWA C301-79.

AWWA *Standard for Reinforced Concrete Pressure Pipe, Non-Cylinder Type*, AWWA C302-74.

AWWA *Standard for Reinforced Concrete Water Pipe, Steel-Cylinder Type, Pretensioned*, AWWA C303-78.

AWWA *Standard for Steel Water Pipe 6 In. and Larger*, AWWA C200-80.

A-7-1.2 Pipe Design Manuals. The following pipe design manuals may be used as guides:

Standard Practice for the Selection of Asbestos-Cement Water Pipe, AWWA C401-83.

Concrete Pipe Handbook, American Concrete Pipe Association.

AWWA Standard for the Thickness Design of Ductile Iron Pipe, AWWA C150-82.

Steel Pipe Design and Installation, AWWA M11.

A-7-2 Coating and Lining Standards. The following apply to the application of coating and linings:

AWWA Standard for Cement Mortar Lining for Cast-Iron Pipe and Fittings for Water, AWWA C104-85.

AWWA Standard for Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids, AWWA C105-82.

AWWA *Standard for Coal-Tar Enamel Protective Coatings for Steel Water Pipelines*, AWWA C203-78.

AWWA *Standard for Cement-Mortar Protective Lining and Coating for Steel Water Pipe*, AWWA C205-80.

AWWA *Standard for Cement-Mortar Lining of Water Pipe Lines in Place*, AWWA C602-76.

A-7-3 Joint Standards. The following apply to joints used with the various types of pipe:

American National Standard for Rubber Gasket Joints for Cast-Iron and Ductile Iron Pressure Pipe and Fittings, AWWA C111-85.

AWWA *Standard for Field Welding of Steel Water Pipe Joints*, AWWA C206-82.

AWWA *Standard for Steel Pipe Flanges*, AWWA C207-78.

American National Standard for Cast-Iron Pipe Flanges and Flanged Fittings for 25, 125, 250 and 800 lb. ANSI B16.1-75.

AWWA Standard for Flanged Cast-Iron and Ductile Iron Pipe with Threaded Flanges, AWWA C115-83.

A-7-4 Fittings Standards. Fittings generally used are cast iron with joints to specifications of the manufacturer of the particular type of pipe. See *Joint Standards* listed following A-7-3. Steel fittings also have some applications. There are the following standards on fittings:

AWWA Standard for Gray Iron and Ductile Iron Fittings, 2-in. through 48-in., for Water and Other Liquids, AWWA C110-82.

AWWA *Standard for Dimensions for Steel Water Pipe Fittings*, AWWA C208-83.

American National Standard for Cast-Iron Pipe anges and Flanged Fittings for 25, 125, 250 and 800 lb., ANSI B16.1-75.

A-7-5.1 Loop systems for yard piping are recommended for increased reliability and improved hydraulics. Loop systems should be sectionalized by placing valves at branches and at strategic locations to minimize the extent of impairments.

A-7-5.3 Pipe friction losses should be determined on the basis of Hazen and Williams formula.

$$P = \frac{4.52\, Q^{1.85}}{C^{1.85} d^{4.87}}$$

P = Pressure in psi
Q = Flow in gpm
C = Hazen and Williams Coefficient
d = Actual pipe diameter, in inches

Table A-7-5.3

Pipe or Tube	Hazen-Williams "C" Value[1]
Unlined Cast or Ductile Iron	100
Asbestos Cement, Cement-Lined Cast or Ductile Iron, and Cement-Lined Steel	140
Fiberglass Filament Wound Epoxy, Polyethylene and Polyvinyl Chloride (PVC)	150

[1]These values may be reduced by the authority having jurisdiction to e consistent with design procedures.

A-8 Installation Standards. The following apply to the installation of pipe and fittings:

AWWA *Standard for the Installation of Asbestos-Cement Water Pipe*, AWWA C603-78.

AWWA *Standard for the Installation of Ductile-Iron Water Mains and Their Appurtenances*, AWWA C600-82.

Concrete Pipe Handbook, American Concrete Pipe Association.

Steel Pipe Design and Installation, AWWA M11, Steel Pipe Manual.

A Guide for the Installation of Gray Cast-Iron Water Mains, Ductile Iron Pipe Research Association.

A Guide for the Installation of Ductile Iron Pipe, Ductile Iron Pipe Research Association.

Thrust Restraint Design for Ductile Iron Pipe, DIPRA, 245 Riverchase Parkway, East, Suite O, Birmingham, AL 35244.

Handbook of PVC Pipe, Uni-Bell Plastic Pipe Association, 2655 Ville Creek Drive, Dallas, TX 75234.

A-8-1.1 As there is normally no circulation of water in private fire mains; they require greater depth of covering than do public mains. Greater depth is required in a loose gravelly soil (or in rock) than in compact, clayey soil. Recommended depth of cover above the top of underground yard mains is shown in Figure A-8-1.1.

A-8-3.4 Gray cast iron is not considered galvanically dissimilar to ductile iron. Rubber gasket joints

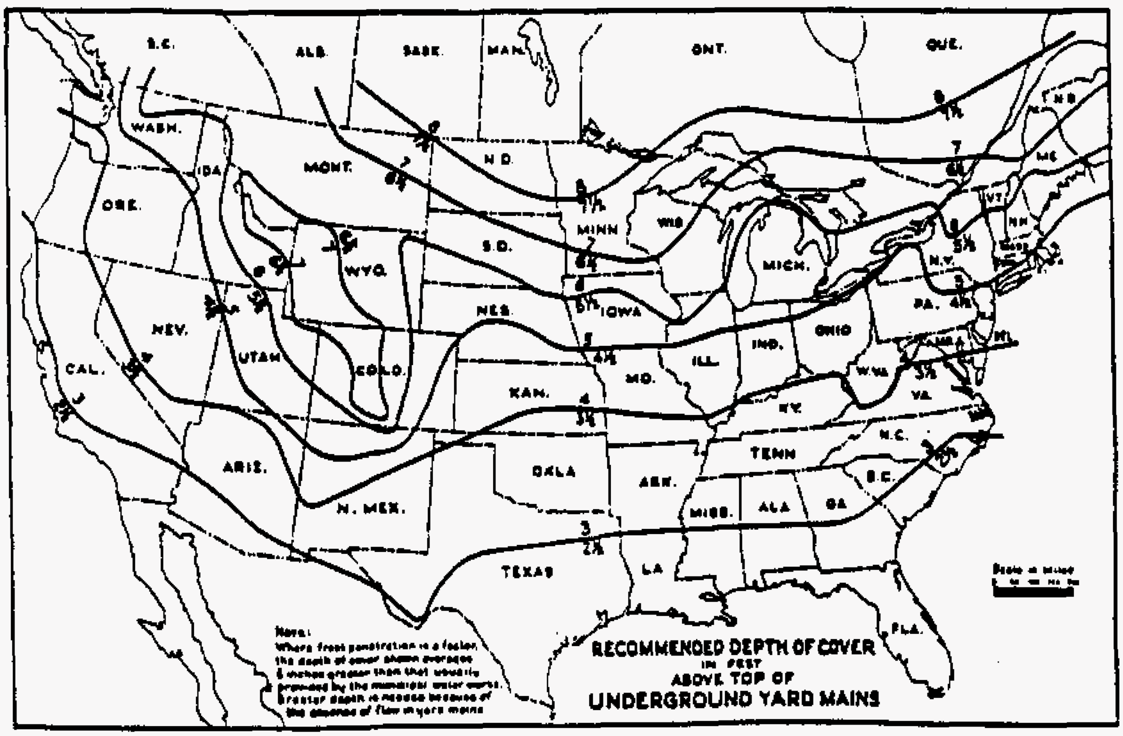


Figure A-8-1.1.

(unrestrained push-on or mechanical joints) are not considered connected electrically. Metal thickness should not be considered a protection against corrosive environments. In the case of cast-iron or ductile iron pipe for soil evaluation and external protection systems, see 9-1.2, AWWA C150-82.

A-8-6.2 It is a fundamental design principle of fluid mechanics that dynamic and static pressures, acting at change in size or direction of a pipe, produce unbalanced thrust forces at bends, tees, wyes, deadends, reducers, offsets, etc.

This procedure includes consideration of lateral soil pressure and pipe/soil friction, variables which can be reliably determined using present-day soils engineering knowledge.

Refer to A-7-1.1 for a list of references for use in calculating and determining joint restraint systems.

Thrust Blocking

Concrete thrust blocks are the most common method of restraint now in use, providing stable soil conditions prevail and space requirements permit placement. Successful blocking is dependent upon factors such as location, availability and placement of concrete, and possible disturbance through future excavation. Concrete blocks are readily utilized in combination with tie rods, structural anchoring, thrust collars, and restrained joints.

Thrust blocks are generally categorized into two groups: gravity and bearing blocks.

Gravity Blocks [Figure A-8-6.2(a)]: Important factors considered in design are:

- Horizontal and vertical thrust components
- Allowable bearing value of soil
- Combined weight of pipe, water, and soil prism
- Density of block material
- Block dimensions and volume.

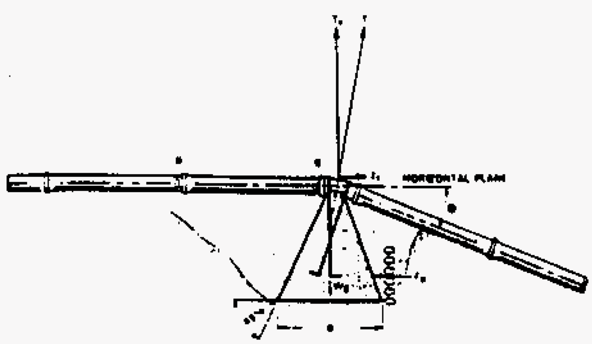


Figure A-8-6.2(a) Gravity Thrust Block.

\# Restrained joints may be used when $T_x > F_s$.

A thrust force analysis is conducted similar to Figure A-8-6.2(b).

Physical characteristics of the block are determined from the following formulas:

$$V_g = \frac{PA \sin \theta}{W_m} \text{ (neglecting } W_s\text{)}$$

$$V_g = \frac{T_y - W_s}{W_m} \text{ (including } W_s\text{)} \quad \text{where } W_s = \tfrac{1}{2} W_e L$$

Where V_g = Volume of thrust block (ft³)
P = Design pressure (psi)
A = Cross sectional area of pipe (inch²) = 36 π D″²
W_m = Density of thrust block material (lbs/ft³)
T = Resultant thrust force (lbs)
γ = Backfill soil density (lbs/ft³)
L = Minimum required restrained pipe length (ft)

Earth cover (W_e), is neglected when determining (W_s), if unstable conditions are anticipated. The horizontal thrust component (T_x) is counteracted by soil pressure on the vertical face of the block (F_s) or by joint restraint.

Allowable soil bearing pressure determines the minimum size of the block base.

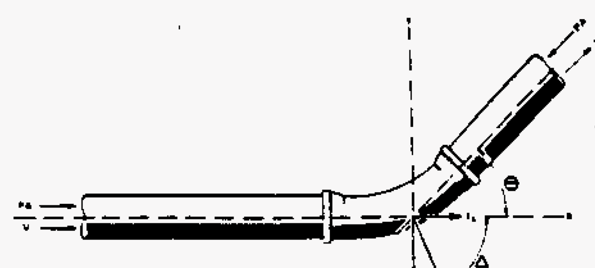
Table A-8-6.2
Thrust at Fittings at 100 PSI Water Pressure for Ductile Iron and PVC Pipe

Total Pounds					
Nom. Pipe Dia. In.	Dead End	90° Bend	45° Bend	22½° Bend	11¼° Bend
4	1,810	2,559	1,385	706	355
6	3,739	5,288	2,862	1,459	733
8	6,433	9,097	4,923	2,510	1,261
10	9,677	13,685	7,406	3,776	1,897
12	13,685	19,353	10,474	5,340	2,683
14	18,365	26,001	14,072	7,174	3,604
16	23,779	33,628	18,199	9,278	4,661
18	29,865	42,235	22,858	11,653	5,855
20	36,644	51,822	28,046	14,298	7,183
24	52,279	73,934	40,013	20,398	10,249
30	80,425	113,738	61,554	31,380	15,766
36	115,209	162,931	88,177	44,952	22,585
42	155,528	219,950	119,036	60,684	30,489
48	202,683	286,637	155,127	79,083	39,733
54	256,072	362,140	195,989	99,914	50,199

NOTE: To determine thrust at pressure other than 100 psi, multiply the thrust obtained in the table by the ratio of the pressure to 100.

For example, the thrust on a 12 inch, 90° bend at 125 psi is

$$19,353 \times \frac{125}{100} = 24,191 \text{ pounds.}$$



$T_x = PA(1 - \cos\theta)$
$T_y = PA \sin\theta$
$T = 2\,PA \sin\frac{\theta}{2}$
$\Delta = \frac{(90 - \theta)}{2}$

Figure A-8-6.2(b) Thrust Forces Acting on a Bend.

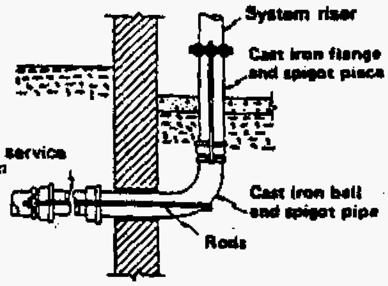


Figure A-8-6.2(c) Typical Connection to a Fire Protection System Riser.

This shows a common arrangement illustrating an acceptable anchoring method.

A-8-6.2.5 Examples of materials and the standards covering these materials are:

(a) *Clamps.* Steel (see Note).

(b) *Rods.* Steel (see Note).

(c) *Bolts.* Steel (ASTM A307-80).

(d) *Washers.* Steel (see Note 1). Cast Iron (Class A cast iron as defined by ASTM A126-79).

(e) *Anchor Straps and Plug Straps.* Steel (See Note).

(f) *Rod Couplings or Turnbuckles.* Malleable iron (ASTM A197-79).

NOTE: Steel of modified range merchant quality as defined in U.S. Federal Standard No. 66C.*Standard for Steel Chemical Composition and Harden Ability*, April 18, 1967, change notice No. 2, April 16, 1970, as promulgated by the U.S. Federal Government General Services Administration.

The above-listed materials do not preclude the use of other materials which will also satisfy the requirements of this section.

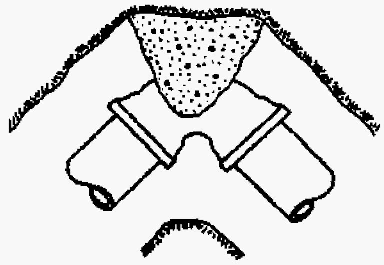
A-8-6.2.8 Illustrations of the use of thrust blocks: Figure A-8-6.2.8 top, at one-quarter bend; Figure A-8-6.2.8 bottom, at tee and plug. Publications of pipe and fitting manufacturers show methods for installing thrust blocks at other fittings. In each case, the trench is cut to provide a bearing surface on undisturbed soil, and concrete is poured to fit snugly against as much of the fitting as possible without interfering with access to fitting joints. In some cases, anchor rods may be used to hold the fitting against the blocks.

Table A-8-6.2.8

Suggested factors to be used in determining size of thrust blocks are:

Soft Clay	4
Sand	2
Sand and Gravel	1.33
Shale	0.4

BEARING AGAINST TRENCH WALL



BEARINGS AGAINST TRENCH WALLS

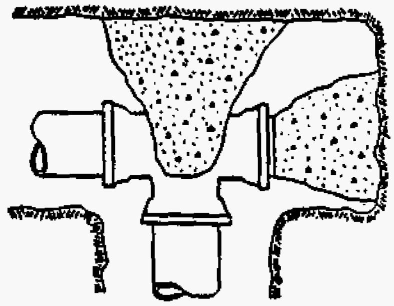


Figure A-8-6.2.8 Typical Thrust Blocks.

A-8-9.2

(a) Hydrostatic tests should be made before the joints are covered in order that any leaks may be readily detected. Thrust blocks should be sufficiently hardened before hydrostatic testing is begun. If the joints are covered with backfill prior to testing, the contractor remains responsible for locating and correcting any leakage in excess of that permitted in 8-9.3.2 and 8-9.3.3.

(b) The pipeline should be prepared 24 hrs prior to testing by filling it with water, in a manner to remove all air. The test pressure should be applied to stabilize the system. This should minimize losses due to entrapped air, changes in water temperature, distention of components under pressure, movement of gaskets, and absorption of air by the water and water by the pipe wall.

A-8-9.3.1 A recommended test procedure is as follows: The water pressure is to be increased in 50 psi (3.4 bars) increments until the test pressure described in 8-9.3.1 is attained. After each increase in pressure, observations are to be made of the stability of the joints. These observations are to include such items as protrusion or extrusion of the gasket, leakage, or other factors likely to affect the continued use of a pipe in service. During the test, the pressure is not to be increased by the next increment until the joint has become stable. This applies particularly to movement of the gasket. After the pressure has been increased to the required maximum value and held for one hour, the pressure is to be decreased to 0 psi while observations are made for leakage. The pressure is again to be slowly increased to the value specified in 8-9.3.1 and held for one more hour while observations are made for leakage and the leakage measurement is made.

Figure A-8-9.1 Typical Contractor's Material and Test Certificate for Underground Piping

CONTRACTOR'S MATERIAL & TEST CERTIFICATE FOR UNDERGROUND PIPING

PROCEDURE

Upon completion of work, inspection and tests shall be made by the contractor's representative and witnessed by an owner's representative. All defects shall be corrected and system left in service before contractor's personnel finally leave the job.

A certificate shall be filled out and signed by both representatives. Copies shall be prepared for approving authorities, owners and contractor. It is understood the owner's representative's signature in no way prejudices any claim against contractor for faulty material, poor workmanship, or failure to comply with approving authority's requirements or local ordinances.

PROPERTY NAME	DATE
PROPERTY ADDRESS	

PLANS	ACCEPTED BY APPROVING AUTHORITY(S) NAMES
	ADDRESS
	INSTALLATION CONFORMS TO ACCEPTED PLANS ☐ YES ☐ NO EQUIPMENT USED IS APPROVED ☐ YES ☐ NO IF NO, STATE DEVIATIONS
INSTRUCTIONS	HAS PERSON IN CHARGE OF FIRE EQUIPMENT BEEN INSTRUCTED AS TO LOCATION OF CONTROL VALVES AND CARE AND MAINTENANCE OF THIS NEW EQUIPMENT ☐ YES ☐ NO IF NO, EXPLAIN
	HAVE COPIES OF APPROPRIATE INSTRUCTIONS AND CARE AND MAINTENANCE CHARTS BEEN LEFT ON PREMISES ☐ YES ☐ NO IF NO, EXPLAIN
LOCATION	SUPPLIES BLDGS.
UNDERGROUND PIPES AND JOINTS	PIPE TYPES AND CLASS / TYPE JOINT
	PIPE CONFORMS TO ________ STANDARD ☐ YES ☐ NO FITTINGS CONFORM TO ________ STANDARD ☐ YES ☐ NO IF NO, EXPLAIN
	JOINTS NEEDING ANCHORAGE CLAMPED, STRAPPED, OR BLOCKED IN ACCORDANCE WITH ________ STANDARD ☐ YES ☐ NO IF NO, EXPLAIN
TEST DESCRIPTION	FLUSHING. Flow the required rate until water is clear as indicated by no collection of foreign material in burlap bags at outlets such as hydrants and blow-offs. Flush at flows not less than 400 GPM (1514 L/min) for 4-inch pipe, 600 GPM (2271 L/min) for 6-inch pipe, 750 GPM (2839 L/min) for 8-inch pipe, 1000 GPM (3785 L/min) for 8-inch pipe, 1500 GPM (5678 L/min) for 10-inch pipe and 2000 GPM (7570 L/min) for 12-inch pipe. When supply cannot produce stipulated flow rates, obtain maximum available. HYDROSTATIC. Hydrostatic tests shall be made at not less than 200 psi (13.8 bars) for two hours or 50 psi (3.4 bars) above static pressure in excess of 150 psi (10.3 bars) for two hours. LEAKAGE. New pipe laid with rubber gasketed joints shall, if the workmanship is satisfactory, have little or no leakage at the joints. The amount of leakage at the joints shall not exceed 2 qts. per hr. (1.89 L/h) per 100 joints irrespective of pipe diameter. The leakage shall be distributed over all joints. If such leakage occurs at a few joints the installation shall be considered unsatisfactory and necessary repairs made. The amount of allowable leakage specified above may be increased by 1 fl oz per in. valve diameter per hour (30 mL/25 mm/h) for each metal seated valve isolating the test section. If dry barrel hydrants are tested with the main valve open, so the hydrants are under pressure, an additional 5 oz per minute (150 mL/min) leakage is permitted for each hydrant.
FLUSHING TESTS	NEW UNDERGROUND PIPING FLUSHED ACCORDING TO ________ STANDARD ☐ YES ☐ NO BY (COMPANY) IF NO, EXPLAIN
	HOW FLUSHING FLOW WAS OBTAINED: ☐ PUBLIC WATER ☐ TANK OR RESERVOIR ☐ FIRE PUMP / THROUGH WHAT TYPE OPENING: ☐ HYDRANT BUTT. ☐ OPEN PIPE
	LEAD-INS FLUSHED ACCORDING TO ________ STANDARD ☐ YES ☐ NO BY (COMPANY) IF NO, EXPLAIN
	HOW FLUSHING FLOW WAS OBTAINED: ☐ PUBLIC WATER ☐ TANK OR RESERVOIR ☐ FIRE PUMP / THROUGH WHAT TYPE OPENING: ☐ Y CONN. TO FLANGE & SPIGOT ☐ OPEN PIPE

HYDROSTATIC TEST	ALL NEW UNDERGROUND PIPING HYDROSTATICALLY TESTED AT ______ PSI FOR ______ HOURS		JOINTS COVERED ☐ YES ☐ NO
LEAKAGE TEST	TOTAL AMOUNT OF LEAKAGE MEASURED ______ GALS. ______ HOURS		
	ALLOWABLE LEAKAGE ______ GALS. ______ HOURS		
HYDRANTS	NUMBER INSTALLED	TYPE AND MAKE	ALL OPERATE SATISFACTORILY ☐ YES ☐ NO
CONTROL VALVES	WATER CONTROL VALVES LEFT WIDE OPEN IF NO, STATE REASON		☐ YES ☐ NO
	HOSE THREADS OF FIRE DEPARTMENT CONNECTIONS AND HYDRANTS INTERCHANGEABLE WITH THOSE OF FIRE DEPARTMENT ANSWERING ALARM		☐ YES ☐ NO
REMARKS	DATE LEFT IN SERVICE		
SIGNATURES	NAME OF INSTALLING CONTRACTOR		
	TESTS WITNESSED BY		
	FOR PROPERTY OWNER (SIGNED)	TITLE	DATE
	FOR INSTALLING CONTRACTOR (SIGNED)	TITLE	DATE

ADDITIONAL EXPLANATION AND NOTES

85B BACK

A-8-9.3.2 New pipe laid with rubber gasketed joints should, if the workmanship is satisfactory, have no leakage at the joints. Unsatisfactory amounts of leakage usually result from twisted, pinched, or cut gaskets. However, some leakage might result from small amounts of grit or small imperfections in the surfaces of the pipe joints.

Appendix B Referenced Publications

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

B-1 The following documents or portions thereof are referenced within this document for informational purposes only and thus are not considered part of the requirements of this document. The edition indicated for each reference should be the current edition as of the date of the NFPA issuance of this document. These references should be listed separately to facilitate updating to the latest edition by the user.

B-1.1 NFPA Publications. National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

NFPA 11-1983, *Standard for Low Expansion Foam and Combined Agent Systems*

NFPA 13-1987, *Standard for the Installation of Sprinkler Systems*

NFPA 13E-1984, *Recommendations for Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems*

NFPA 14-1986, *Standard for the Installation of Standpipe and Hose Systems*

NFPA 15-1985, *Standard for Water Spray Fixed Systems for Fire Protection*

NFPA 16-1986, *Standard on Deluge Foam-Water Sprinkler and Foam-Water Spray Systems*

NFPA 20-1987, *Standard for the Installation of Centrifugal Fire Pumps*

NFPA 22-1987, *Standard for Water Tanks for Private Fire Protection*

NFPA 26-1983, *Recommended Practice for the Supervision of Valves Controlling Water Supplies for Fire Protection*

NFPA 71-1987, *Standard for the Installation, Maintenance, and Use of Signaling Systems for Central Station Service*

NFPA 72A-1987, *Standard for the Installation, Maintenance, and Use of Local Protective Signaling Systems for Guard's Tour, Fire Alarm, and Supervisory Service*

NFPA 72B-1986, *Standard for the Installation, Maintenance, and Use of Auxiliary Protective Signaling Systems for Fire Alarm Service*

NFPA 72C-1986, *Standard for the Installation, Maintenance, and Use of Remote Station Protective Signaling Systems*

NFPA 72D-1986, *Standard for the Installation, Maintenance, and Use of Proprietary Protective Signaling Systems*

NFPA 1961-1987, *Standard for Fire Hose*

NFPA 1962-1979, *Standard for the Care, Use, and Maintenance of Fire Hose Including Connections and Nozzles*

NFPA 1963-1985, *Standard for Screw Threads and Gaskets for Fire Hose Connections*

B-1.2 AWWA Publication. American Water Works Association Inc., 666 West Quincy Avenue, Denver, CO 80235.

AWWA Manual 17, *Installation, Operation and Maintenance of Fire Hydrants*

Index

0833

ORANGE COUNTY

- 1992 FPSC Filing -

ORANGE COUNTY FIRE DEPARTMENT

STANDARD 6003

FIRE HYDRANT PLACEMENT

DIVISION: Fire Loss Management Bureau			
Written	Authorized	Issued	Revised
6/82	E.J. Szahn	6/82	12/12/82
REV 5	[illegible]	—	6/13/90
REV 6	[illegible]	—	1/10/95

James C. Cragan, Fire Chief

ORANGE COUNTY FIRE DEPARTMENT

STANDARD 6003

FIRE HYDRANT PLACEMENT

BACKGROUND:

The placement and spacing of fire hydrants in the public right-of-way and determination of the appropriate fire flows for various occupancies is the responsibility of the public utilities companies and those other organizations which specify standards for the placement of such facilities. The Fire Department does not address the placement of fire hydrants in the public right-of-way except in an advisory capacity. Hydrant placement is discussed in certain portions of the Orange County Growth Management Plan and further referenced in other documents.

The Orange County Fire Department endorses the hydrant spacing requirements set forth in County Subdivision Rules and Regulations, April 1, 1984.

The placement of non-public fire hydrants is addressed in the Southern Standard Fire Prevention Code, 1982 Edition, Chapter 18. The placement of these hydrants and other appropriate private fire protection facilities in the unincorporated areas of Orange County is the ultimate responsibility of the Fire Official (the County Fire Department Deputy Chief of the Fire Loss Management Bureau).

The actual administration of fire hydrant placement occurs according to the following schedule:

1. Hydrants on fire mains not serving sprinkler or standpipe systems: County Engineering Department handles.
2. Hydrants on fire mains serving sprinkler/standpipe systems: County Fire Department handles.

DISCUSSION:

All premises where buildings or portions of buildings other than dwellings are located more than 150-feet from a public street providing access to such premises shall be provided with approved fire hydrants, as required by the Fire Official, connected to a water system capable of supplying the fire flow required by the Fire Official. As a practical matter, in those settings - private and/or public - wherein fire hydrants are affixed to mains to which no fire protections systems are directly attached, Orange County Engineering Department will administer the placement, testing and acceptance of these simple systems.

All private hydrants shall be equipped with a 4½ inch pumper connection and two 2½ inch hose connections. Threads and operating nuts shall be as specified by Orange County Utilities. They hydrants shall be purchased and installed in accordance with the same specifications set forth by Orange County Utilities for public fire hydrants. Special applications may allow other configurations if reviewed and approved by the Fire Official.

Should special hydrant configurations be required by insurance risk carriers these hydrants may be installed, as required, for "brigade" applications. Hydrants not in conformance with Fire Department specifications will not be generally granted credit by the Fire Official toward fire flow requirements. However, the Fire Department will reserve the right to credit such hydrants for minor flow contributions at the discretion of the Fire Official.

Needed fire flow shall be determined for occupancies and shall be delivered from area hydrants (area fire flow). Hydrants within 1000-feet of a risk may be considered as providers according to the following schedule:

1. Fire flow 500 - 1000 GPM
   Total fire flow provided by hydrants within 500-feet
2. Fire flow 1001 - 2000 GPM
   a. 50% of flow provided by hydrants within 300-feet.
   b. Balance of flow from hydrants up to 1000-feet distant according to Schedule A.

3. Fire flow 2001 - 4000 GPM
   a. 50% of flow provided by hydrants within 250-feet.
   b. Balance of flow from hydrants up to 1000-feet distant according to Schedule A.
4. Fire flow greater than 4000 GPM
   a. 50% of flow provided by hydrants within 250-feet.
   b. Balance of flow from hydrants within 500-feet according to Schedule A.

Exception: The Fire Official will determine special placement for those occupancies which are classified as "Hazardous."

All fire hydrants shall be accessible for fire apparatus. Distance from hard roadway or stabilized surface shall be less than 8 to 10-feet. The hydrant shall face the roadway.

INSTALLATION, MAINTENANCE AND INSPECTION:

The installation, maintenance and inspection of the hydrants shall be the responsibility of the owner. Yard systems shall be inspected annually by the Fire Department. The owner shall cooperate with the Fire Department during this annual inspection. In high hazard areas the inspection rate may be higher.

For further information the following Fire Department Standards are recommended: Standard 6004, Standard 6006 and Standard 6008.

COLORING OF HYDRANTS:

Fire hydrants shall be delivered by the contractor for testing and acceptance, painted with an appropriate paint type in accordance with the Schedule below:

1. Barrels of hydrants on public right-of-way colored to meet the need of the serving utility.
2. Bonnets of hydrants, regardless of utility, shall be painted according to the following Schedule:
   a. Flow 1000 GPM or greater = Green - Class A hydrant
   b. Flow 500 - 1000 GPM = Orange - Class B hydrant
   c. Flow less than 500 GPM = Red - Class C hydrant
3. All private hydrants shall be painted a maroon red - bonnett and barrel.

HYDRANT DISTRIBUTION

Distance From Risk	Flow Credit (GPM)
0 - 300 Feet	1000
301 - 600 Feet	670
601 - 1000 Feet	250 (Credit One Hydrant)

Exception: Hydrant physical features limit flow credit as follows:

1. Two or more hose outlets, no pumper connections, maximum credit - 750 GPM.
2. One hose outlet, maximum credit 500 GPM
3. Flow credit for any hydrant limited by actual test data on a specific hydrant based on Fire Department tests.

OSCEOLA COUNTY

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Osceola

KISSIMMEE

TELECOPY COVER SHEET

From
CITY OF KISSIMMEE
KISSIMMEE, FLORIDA

DATE: 3/18/91

NO. OF PAGES FOLLOWING THIS PAGE: 3

TO: Philip Story

FIRM NAME: Southern ~~[illegible]~~ States Utilities, Inc

FAX PH. NUMBER: 884-9116

FROM: Ross Bloomfield

CITY OF KISSIMMEE, DEPT: W&S

OFFICE PHONE: 847-2821

COMMENTS OR DELIVERY INSTRUCTIONS:

IF ANY DIFFUCULTY OCCURS IN THE TRANSMITTAL OF THIS TELECOPY, PLEASE CALL CITY OF KISSIMMEE AT (407) 847-2821 (X2310).

CITY ATTORNEY'S OFFICE
P.O. Box 421608
KISSIMMEE, FLORIDA 34742-1608

MACHINE LOCATION: 101 CHURCH STREET,
KISSIMMEE, FLORIDA 34742

FAX PHONE NUMBER: (407)847-9233

0842

MAINS

All water mains shall be constructed of evenly sized, C900 DR18 PVC or cement lined Cl 50 DIP.

All water mains shall be looped, therefore dead ends shall be minimized by making appropriate tie-ins whenever practical, as determined by the City.

All mains shall be located adjacent to a paved road (where available), within the dedicated street or alley right-of-way, or easement, with access, on private property.

Each tee shall include three (3) City approved valves.

Each cross shall include four (4) City approved valves.

In line valves shall be installed at intervals of either 600', at fire hydrant tees, or at street/alley intersections, whichever is appropriate for ease of location and operation as determined by the Department Engineer.

All valves less than or equal to fourteen (14) inches in diameter shall be resilient wedge. All valves greater than fourteen (14) inches in diameter shall be gear operated butterflies.

All valves on non-looped lines shall be tied to a dead-man type anchor in the direction of the source.

Fire protection is required on all commercial, industrial, and residential developments.

All master fire mains shall be a minimum of 8" in diameter and shall have a City approved back-flow prevention assembly installed a minimum of 18" and a maximum of 30" above final grade at the property line.

Fire hydrants in one and two family, two (2) stories or less, residential subdivisions (detached units with a minimum spacing of 15') shall be located at street intersections and complex entrances. Additional hydrants shall be spaced along roadways no greater than 500 linear feet apart measured within the right of way nor shall any structure be more than 250 feet from the nearest hydrant by lay of fire hose.

Residential fire hydrants shall be capable of providing fire flows of at least 1500 gallons per minute in addition to domestic peak day requirements at residual pressures of not less than 20 pounds per square inch, and shall provide capability for sufficient storage and/or emergency pumping facilities to such an extent that the minimum fire flows will be maintained for at least four (4) hours. Water mains that service fire hydrants shall be no less than six inches (6") in diameter. This does not apply to dead-end mains that ~~[illegible]~~ have no fire flow demand. Six inch (6") fire hydrants are required.

Fire hydrants in multi-family and one, two and greater than two (2) story commercial, institutional, industrial or other high density developments shall be spaced no greater than 300 feet apart measured within the right-of-way. Hydrants shall be placed at intersections in the development. Hydrants shall be placed at entrances and other strategic places within forty (40) feet of Fire Department Connections (FDC's). No structure shall be more than 150 feet from a hydrant by lay of fire hose.

Non-residential fire hydrants shall be capable of providing fire flows as determined by the Fire Official for the individual project or structure using ISO standards. Fire flows shall be in addition to domestic peak day requirements at residual pressures of not less than 20psi and shall provide for sufficient storage and/or emergency pumping facilities to such an extent that the minimum fire flows will be maintained for at least four (4) hours. Water mains shall be no less than eight inches (8") in diameter and service line to the hydrant shall be no less than eight inches (8") in diameter. 6"

All hydrants are to be placed along accessways prior to the property they are to protect. All locations shall be approved by the Fire Department Official.

Fire hydrants in mobile home districts shall be spaced no greater than 500 feet apart and within 250 feet of any mobile home site.

Parking shall comply with traffic laws and not be allowed within 15', either side, of a fire hydrant. No parking areas associated with a hydrant shall be marked "NO PARKING". An alternative parking arrangement may be allowed if all the following criteria is met: 1) a hydrant is placed at the end of a parking island and is clear of the rear of the vehicles expected to be parked there 2) there is a minimum of three (3) feet working clearance to the sides and rear of the hydrant 30 the permission of the Fire Official has been obtained, in writing, allowing the alternate parking arrangement.

All fire hydrants shall be installed in such a manner as to be easily accessed by the Fire Department at all times.

Hydrants shall be placed a minimum of 3' from roadways and driveways. They shall not be blocked by hedges, plantings, trees, parking, buildings, fences, light posts, receptacles, signs, etc. There shall be a minimum of 3' working clearance around every hydrant.

All fire hydrants within master metered systems shall be maintained in proper working order at all times by the person responsible for the property. This responsible person shall be required to assure that their hydrants meet all other clearances, requirements, routine repair and painting, and install/maintain blue road reflectors per Fire Department standards.

Fire hydrants in all developments shall be placed such that the use of the hydrant does not block or prevent the ingress or egress of other emergency responding vehicles.

Fire department connections (FDC's) for fire sprinkler systems, standpipe systems, and combined systems shall be placed within 40' from serviced separately from, and shall meet the same standards as fire hydrants and undergrounds which are applicable to FDC's.

beyond BFP

All fire pumps and piping shall meet NFPA 20 standards.

(OSCEOLA COUNTY ONLY) Fire protection requirements shall comply with those established by the Osceola County Fire Marshall.

All references to NFPA codes and standards shall mean the edition adopted for use by the Authority Having Jurisdiction.

There shall be a minimum of fifteen (15) feet of clearance between the main and any permanent building.

All dead end mains shall be fitted with an approved blowoff assembly constructed of 2" type "K" copper and brass or Eclipse #85, or equal, blow-off fire hydrant assembly.

Metallic marking tape shall be placed over the main and services at a depth of two (2) feet below the surface, and tied into all hydrants and valve boxes. Testing for continuity is required.

Off-site transmission watermains shall require Carsonite IDW-250, or equal, sand barbed water markers 5' in height, located at in-line valves, 1500' interval and/or changes of direction.

A minimum separation of ten (10) feet horizontal and eighteen (18) inches vertical shall be maintained between the water main and all sewer mains and force mains. If the horizontal conditions cannot be met, all mains shall be ductile iron until the minimum horizontal separation is achieved. If the vertical separation cannot be met, a 20'continuous length of ductile iron shall be centered at the water main. Concrete encasement shall not be acceptable.

All valves shall be supported by a square concrete slab at least 12" thick that extends at least 6" beyond all sides of the valve. The valve shall be tied down to the support by means of two (2) "U"-shaped #5 rebar, one each side, imbedded in the concrete.

ASST. CHIEF STEVE HENSLEY
HOME PHONE: 407-348-7541

CALL BOB JONES IN ~~[illegible]~~ Public Safety D

12-07-90

Private WTR CODE 1231 (NFPA)

250 gpm 2 HR. min.

-847-1405 Zoning Judy
- " 1479 ENV. Health etc. JOE [illegible]

Department
of
Public Safety

Emergency Management Division
Fire/Rescue Division
Fire Prevention Division
E-911 Administration & Addressing

ryan Street
...mmee, Florida 34741
(407) 847-1270

719 W. BRYAN ST.
KISSIMMEE, FL

933-7777

Kiss. U.A. /
City of Kiss. 847-2821
LT. JACKSON

Phil Story
Engineering, SSU Services

Phil: In reply to your inquiry of ordinances & fire flow requirements in Osceola County, the following apply.

Osceola County has adopted NFPA Pamphlet #1 and Life Safety 101, 1985 Edition.

Southern States Utilities as given to me via fax sheet does not sufficiently tell me exactly where they are located.

Osceola County Office - ?
Intercession City - Station #31 Phone # 933-5533
(Volunteers)
Tropical Park - Station 11 Phone # 348-5555
(Volunteers/ Paid)
Pine Ridge Estates - Station 21 Phone # 933-4000
(Volunteers)
Windsong - Station #11 Phone # 348-5555
(Volunteers/ Paid)
Bay Lake Estates - Station #51 Phone # 892-2005
(Volunteers)
Fountains - ? Possibly City of Kissimmee
Lake Ajay - Station #71 Phone # 892-1902
(Volunteers)

I spoke to Deputy Chief McCracken concerning this matter and he said the only station that would have the fire flow information needed might be Station #11.

Robert Jones
Fire Marshal

Osceola
...nty

SEMINOLE COUNTY

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WATER DISTRIBUTION AND FIRE HYDRANTS

PURPOSE

THIS SECTION SETS FORTH THE GENERAL REQUIREMENTS FOR DESIGN AND INSTALLATION OF WATER SYSTEMS.

WHEN REQUIRED

ALL STRUCTURES OR PORTIONS OF STRUCTURES, INCLUDING SUBDIVISIONS WITH 1 AND 2 FAMILY DWELLINGS, SHALL BE PROVIDED WITH APPROVED FIRE HYDRANT OR WATER STORAGE SUPPLY CONNECTED TO AN APPROVED WATER SUPPLY CAPABLE OF SUPPLYING THE FIRE FLOW.

STANDARD

WATER DISTRIBUTION SYSTEMS AND/OR WATER MAIN SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH FIRE PROTECTION REQUIREMENTS OF THE INSURANCE SERVICES OFFICE AS STATED IN THEIR PUBLICATION, "GUIDE FOR THE DETERMINATION OF REQUIRED FIRE FLOWS" AND "SEMINOLE COUNTY PLANNING GUIDELINES FOR WATER AND SEWER", IF NOT IN CONFLICT WITH THE FOLLOWING:

A. FIRE HYDRANT DISTANCE FOR SPACING OF HYDRANTS LOCATED IN LOW DENSITY RESIDENTIAL SUBDIVISIONS SHALL NOT EXCEED 800 FEET (MEASURED ALONG THE ROADWAY). THEY SHALL BE CONNECTED TO WATER MAINS OF SIX (6) INCHES MINIMUM SIZE WHICH ARE TO BE SATISFACTORILY LOOPED AND DESIGNED AND SHALL PROVIDE FIRE FLOW OF 500 GPM & 20 PSI.

B. FIRE FLOWS IN COMMERCIAL, INSTITUTIONAL, INDUSTRIAL AREAS AND APARTMENT, MULTI-UNIT OR MEDIUM DENSITY COMPLEXES SHALL PROVIDE 1250 GALLONS PER MINUTE AT A 20 PER SQUARE INCH RESIDUAL PRESSURE.

C. ALL STRUCTURES OR PORTIONS OF STRUCTURES, OTHER THAN ONE AND TWO FAMILY DWELLINGS HEREAFTER CONSTRUCTED, SHALL BE PROVIDED WITH WATER LINES OF NOT LESS THAN 8 INCHES IN DIAMETER.

D. FIRE HYDRANTS SHALL BE SO LOCATED AND AVAILABLE FOR DISTRIBUTION OF HOSE TO ANY PORTION OF ANY STRUCTURE ON THE PREMISES AND SHALL NOT EXCEED A DISTANCE OF 500 FEET VIA THE ROAD OR DRIVEWAY TO THE CENTER OF THE STRUCTURE.

E. FIRE HYDRANT LOCATIONS SHALL BE APPROVED BY THE FIRE OFFICIAL.

F. DURING CONSTRUCTION OF MULTI-FAMILY AND COMMERCIAL STRUCTURES WHEN COMBUSTIBLE CONSTRUCTION IS BEGUN, A SUITABLE WATER SUPPLY ACCEPTABLE TO THE FIRE OFFICIAL SHALL BE PROVIDED AND MAINTAINED.

G. FIRE HYDRANTS SHALL BE LOCATED WITHIN 200 FEET OF SPRINKLER/STANDPIPE CONNECTIONS.

H. FIRE HYDRANTS SHALL BE LOCATED IN THE DIRECTION OF TRAVEL ACCESS TO THE PROTECTED STRUCTURE.

VOLUSIA COUNTY

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the comprehensive plan, shall have adequate capacity to serve the proposed development prior to the approval of a development order.

~~105.06.~~ 419. *Adequacy of Fire Protection Systems.* The fire protection systems shall be adequate to serve the fire protection needs of the proposed development. A finding that adequate fire protection is available shall be based upon the following requirements:

419.01 *Water supply.* The fire protection water supply for the proposed development shall meet the following fire flow requirements:

(a) In the case of a single-family or duplex residential development of less than two hundred (200) dwelling units with lot sizes of one (1) acre or more, fire wells may be utilized.

(b) In the case of a single-family or duplex residential development with lot sizes of one (1) acre or more totaling two hundred (200) or more units, a central water system shall be utilized for fire protection water supply which meets the water flow requirements of table I.

(c) In the case of a single-family or duplex residential development with lot sizes of less than one (1) acre, the fire protection water supply shall be provided by a central potable or nonpotable water supply or a combination of central water supply, auxiliary supply or fire wells which will produce the water flows contained in table I. In no case shall the central water supply for fire protection be less than fifty (50) percent of the minimum required by table I. Auxiliary water supply may be provided by a combination of tank trucks, ground tanks, cisterns, elevated storage, drafting stations on canals or reservoirs, or other methods subject to approval by the department of fire services.

(d) In the case of a multifamily residential development, a business or industrial development, or a place of assembly, the fire protection water supply shall be as defined in the most current edition of NFPA 1231 - Standard on Water Supplies for Suburban and Rural

County of Volusia, Florida

R. M. BATEMAN
ASST CHIEF/SUPERVISOR
FIRE SAFETY MANAGEMENT DIVISION

DEPARTMENT OF FIRE SERVICES
123 WEST INDIANA AVENUE
DeLAND FLORIDA 32720-4619

DeLAND (904) 736-5941
DAYTONA 257-6000
NEW SMYRNA 423-3300
EXT 5941

0850

Fire Fighting. In all cases, the minimum fire flows shall not be less than required for dwellings in table I.

(e) A single water supply system may be used for both potable and fire protection supply provided the requirements of table I and/or NFPA 1231 are maintained, as applicable.

(f) The minimum time duration for required fire flows shall be in accordance with table II.

Table I

Fire Flows for Groups of Dwellings

Exposure Distances (Feet)	*Required Fire Flow* (Gallons per Minute)*
Over 100	500
31 to 100	750 - 1000
11 to 30	1000 - 1500
10 or less	1500 - 2000+

*Add 500 GPM where wood shingles could contribute to fire spread.

+Use 2500 GPM minimum if buildings are continuous.

Table II

Required Fire Flow Duration

Minimum Flow at Source of Supply (Hydrant, Fire Well), Drafting Point, etc.) (GPM)	*Minimum Duration Hours*
1,000 or less	2
1,250	2
1,500	2
1,750	2
2,000	2
2,250	2
2,500	2
3,000	3
3,500	3

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(b) In the c
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be insta
(300) fee

(c) In the ca
and/or s
stalled v
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size of e

Minimum Flow at Source of Supply (Hydrant, Fire Well, Drafting Point, etc.) (GPM)	*Minimum Duration Hours*
4,000	4
4,500	4
5,000	5
5,500	5
6,000	6
7,000	7
8,000	8
9,000	9
10,000	10
11,000	10
12,000	10

The calculations of required fire flows in gallons per minute (GPM) considers the construction, occupancy, exposure and communication as outlined in the NFPA Fire Protection Handbook (latest edition).

419.02 ~~(2)~~ *Fire hydrants.* Fire hydrants shall be installed according to the following requirements with distances measured along street rights-of-way or private access roads. No distance shall be measured across thoroughfares.

(a) In the case of a single-family or duplex residential development; one- or two-story motels, hotels or multi-family dwellings; or mobile home parks, hydrants shall be installed at intervals not to exceed five hundred (500) feet with a minimum main size of six (6) inches.

(b) In the case of a business or industrial development, excluding developments in 105.11(2)(a), hydrants shall be installed at intervals not to exceed three hundred (300) feet with a minimum main size of eight (8) inches.

(c) In the case of a building which will provide standpipe and/or sprinkler systems, a fire hydrant shall be installed within one hundred fifty (150) feet of the exterior fire department connection with a minimum main size of eight (8) inches.

(d) In the case of the development of a high-hazard area, including, without limitation, a large shopping center, a storage facility for flammable chemical or compressed gases or a manufacturing plant, the spacing and main sizes of hydrants shall be determined after computing the required fire flow, subject to review and approval by the department of fire services.

(e) All fire hydrants shall deliver the required gallonage with a residual pressure of twenty (20) p.s.i.

(f) *Uniform marking of fire hydrants.* Color coding of fire hydrants is of substantial value to water and fire departments and is based on water flow available from them. Fire hydrant bonnets and nozzle caps shall be painted according to the following chart which shall be used to classify fire hydrants according to flow:

Class	*Flow*	*Color of Bonnets and Nozzle Caps*
A	1001 GPM or greater	Green
B	500 GPM to 1000 GPM	Orange
C	Less than 500 GPM	Red

Barrels of fire hydrants shall be painted chrome yellow.

419.07 ~~(8)~~ *Fire wells.*

(a) Fire wells may be utilized where permitted by 105.08(1), providing they have a separate power source and meet one of the following criteria:

1. The minimum size of a designated fire well shall not be less than four (4) inches in diameter. A pump shall be attached capable of providing a minimum fire flow of two hundred fifty (250) GPM; or
2. A fire well less than four (4) inches in diameter may be utilized provided that it has been tested and certified by an engineer that the fire well can produce a minimum fire flow of two hundred fifty (250) GPM.

(b) Fire wells shall be located adjacent to rights-of-way, unless otherwise approved by the department of fire services and the DRC.

County of Volusia
Florida

County Manager
123 West Indiana Avenue
DeLand, Fl. 32720-4612
Telephone 904/736-2700
7365942

TELEFAX TRANSMITTAL COVER SHEET

TO: GARY S. MORSE

FROM: PALMER PANTON

DATE: 3-19-90

SUBJECT: FIRE INFO- LAND DEVELOPMENT CODE

NUMBER OF PAGES INCLUDING THE COVER SHEET: 6

capacity to provide for the needs of the proposed development and for all other developments in the service area which are occupied, available for occupancy, for which building permits are in effect or for which wastewater treatment or disposal capacity has been reserved. If existing wastewater services are unavailable, but will be made available, any development order shall be conditioned upon such availability. A finding that wastewater services will be made available must be based upon a demonstration that there is a feasible plan to construct or expand a wastewater system which will have sufficient capacity to provide for the collection, treatment and disposal needs of the proposed development and for all other developments in the service area which are occupied, available for occupancy, for which building permits are in effect or for which wastewater collection, treatment or disposal capacity has been reserved. The granting of a Development Order shall not be construed to effect a reservation of wastewater capacity.

105.07. Adequacy of Hazardous Waste Disposal Systems

The Hazardous Waste Disposal Systems shall be adequately maintained at existing levels of service for the proposed development. Standards for existing levels of service shall be developed pursuant to 105.01(3). Hazardous waste disposal services and facilities shall be provided for any proposed development where hazardous material is used or generated. Existing hazardous waste disposal and transfer sites, as described in the Hazardous Waste Element of the Comprehensive Plan, shall have adequate capacity to serve the proposed development prior to the approval of a Development Order.

105.08 Adequacy of Fire Protection Systems

The fire protection systems shall be adequate to serve the fire protection needs of the proposed development. A finding that adequate fire protection is available shall be based upon the following requirements:

(1) Water Supply

The fire protection water supply for the proposed development shall meet the following fire flow requirements:

(a) In the case of a single-family or duplex residential development of less than 200 dwelling units with lot sizes of one (1) acre or more, fire wells may be utilized.

(b) In the case of a single-family or duplex residential development with lot sizes of one (1) acre or more totaling two hundred (200) or more units, a central water system shall be utilized for fire protection water supply which meets the water flow requirements of Table I.

(c) In the case of a single-family or duplex residential development with lot sizes of less than one (1) acre, the fire protection water supply shall be provided by a central potable or non-potable water supply or a combination of central water supply, auxiliary supply or fire wells which will produce the water flows contained in Table I. In no case shall the central water supply for fire protection be less than fifty percent (50%) of the minimum required by Table I. Auxiliary water supply may be provided by a combination of tank trucks, ground tanks, cisterns, elevated storage, drafting stations on canals or reservoirs, or other methods subject to approval by the Department of Fire Services.

(d) In the case of a multi-family residential development; a business or industrial development; or a place of assembly; the fire protection water supply shall be as defined in the most current edition of NFPA 1231 - Standard on Water Supplies for Suburban and Rural Fire Fighting. In all cases the minimum fire flows shall not be less than required for dwellings in Table I.

(e) A single water supply system may be used for both potable and fire protection supply provided the requirements of Table I and/or NFPA 1231 are maintained, as applicable.

(f) The minimum time duration for required fire flows shall be in accordance with Table II.

TABLE I

FIRE FLOWS FOR GROUPS OF DWELLINGS

Exposure Distances (Feet)	Required Fire Flow* (Gallons per Minute)
Over 100	500
31 to 100	750 - 1000
11 to 30	1000 - 1500
10 or less	1500 - 2000+

* Add 500 GPM where wood shingles could contribute to fire spread.
\+ Use 2500 GPM minimum if buildings are continuous.

TABLE II

REQUIRED FIRE FLOW DURATION

Minimum Flow at Source of Supply (hydrant, fire well, drafting point, etc) gpm	Minimum Duration Hours
1,000 or less	2
1,250	2
1,500	2
1,750	2
2,000	2
2,250	2
2,500	2
3,000	3
3,500	3
4,000	4
4,500	4
5,000	5
5,500	5
6,000	6
7,000	7
8,000	8
9,000	9
10,000	10
11,000	10
12,000	10

The calculations of required fire flows in gallons per minute (GPM) considers the construction, occupancy, exposure and communication as outlined in the NFPA Fire Protection Handbook (Latest Edition).

(2) <u>Fire Hydrants</u>

Fire hydrants shall be installed according to the following requirements with distances measured along street rights-of-way or private access roads. No distance shall be measured across thoroughfares.

(a) In the case of a single-family or duplex residential development; one or two story motels, hotels, or multi-family dwellings; or mobile home parks, hydrants shall be installed at intervals not to exceed 500 feet with a minimum main size of six (6) inches.

(b) In the case of a business or industrial development, excluding developments in 105.08(2)(a), hydrants shall be installed at intervals not to exceed 300 feet with a minimum main size of eight (8) inches.

(c) In the case of a building which will provide standpipe and/or sprinkler systems a fire hydrant shall be installed within 150 feet of the exterior fire department connection with a minimum main size of eight (8) inches.

(d) In the case of the development of a high hazard area including, without limitation, a large shopping center, a storage facility for flammable chemical or compressed gases or a manufacturing plant, the spacing and main sizes of hydrants shall be determined after computing the required fire flow, subject to review and approval by the Department of Fire Services.

(e) All fire hydrants shall deliver the required gallonage with a residual pressure of 20 p.s.i.

(f) Uniform marking of fire hydrants.
Color coding of fire hydrants is of substantial value to water and fire departments and is based on water flow available from them. Fire hydrant bonnets and nozzle caps shall be painted according to the following chart which shall be used to classify fire hydrants according to flow:

Class	Flow	Color of Bonnets & Nozzle Caps
A	1001 GPM or greater	Green
B	500 GPM to 1000 GPM	Orange
C	Less than 500 GPM	Red

Barrels of fire hydrants shall be painted chrome yellow.

(3) Fire Wells

(a) Fire Wells may be utilized where permitted by 105.08(1), providing they have a separate power source and meet one of the following criteria:

(1) The minimum size of a designated fire well shall not be less than four (4) inches in diameter. A pump shall be attached capable of providing a minimum fire flow of 250 GPM, or,

(2) A fire well less than four (4) inches in diameter may be utilized provided that it has been tested and certified by an engineer, that the fire well can produce a minimum fire flow of 250 GPM.

(b) Fire wells shall be located adjacent to rights-of-way, unless otherwise approved by the Department of Fire Services and the DRC.

(c) Fire wells of sufficient capacity to serve adjacent development may be provided and, when so provided, may be included in a Public Services and Facilities Agreement pursuant to Section 102.06.

(d) Fire wells shall be considered as public improvements subject to all provisions of Article V of this Ordinance.

105.09 Adequacy of Protection of Environmental Resource Areas

(1) Proposed developments which will directly or indirectly impact Environmental Resource Areas, as provided in the Land Use Element of the Comprehensive Plan, shall produce minimal adverse effects on those areas. Acquisition of all applicable County, State and Federal environmental permits shall be prima facia evidence of compliance with this provision.

(a) An application for development of any land identified as an environmental resource area in the Comprehensive Plan shall include an environmental impact report identifying the effects that the proposed development would have on the area. The environmental impact report is to be reviewed by the Environmental Control Officer and considered and acted upon by the DRC. In assessing the impact of proposed development the Environmental Control Officer shall use guidelines adopted by the Compre-

WASHINGTON COUNTY

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ORDINANCE NUMBER ______________

AN ORDINANCE ESTABLISHING THE FEES TO BE CHARGED IN CONNECTION WITH THE FILING OF APPLICATIONS FOR SUBDIVISION APPROVAL.

BE IT HEREBY ORDAINED BY THE BOARD OF COUNTY COMMISSIONERS OF WASHINGTON COUNTY, FLORIDA AS FOLLOWS:

<u>SECTION ONE: FEE SCHEDULE</u> The following schedule of fees shall be charged by Washington County Florida for the purpose of partially defraying the cost of filing and acting upon Applications for Subdivision Approval:

1.1 <u>Application for Preliminary Plat Approval</u>

A fee of fifty dollars ($50.00) shall be paid to the Board of County Commissioners of Washington County for each Application for Preliminary Plat Approval.

1.2 <u>Application for Final Plat Approval</u>

A fee of twenty five dollars ($25.00) plus two dollars ($2.00) for each lot contained within the subdivision shall be paid to the Board of County Commissioners of Washington County for each Application for Final Plat Approval.

<u>SECTION TWO: EFFECTIVE DATE</u> This Ordinance shall become effective upon enactment by the Board of County Commissioners and filing with the Secretary of State of the State of Florida.

Enacted by the Board of County Commissioners of Washington County, Florida, this _________day of ____________, 1990.

BOARD OF COUNTY COMMISSIONERS
of WASHINGTON COUNTY, FLORIDA

By: ____________________________
Chairman

Attest:___________________
Clerk

ORDINANCE NUMBER ________

SUBDIVISION REGULATIONS

OF

WASHINGTON COUNTY, FLORIDA

<u>BOARD OF COUNTY COMMISSIONERS</u>

LOUIS TRACY, Chairman
District Five

JOHN PAUL COOK, Vice Chairman
District Three

PAT DAVIS
District One

ALBERT F. DAVIS
District Two

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District Four

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Clerk

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Attorney

<u>WASHINGTON COUNTY PLANNING COMMISSION</u>

HULON CARTER, Chairman
District Five

HARRELL M. SAPP, Vice Chairman
District Three

B. CLAYTON PHILLIPS
District One

PHILLIP PIPPIN
District Two

LARRY G. ENFINGER
District Four

ORDINANCE NO.________

Adopted

__________, 1990

Revised: 3/7/90

INDEX TO ORDINANCE NO. ________

ORDINANCE NUMBER ________

AN ORDINANCE RELATING TO WASHINGTON COUNTY; AMENDING EXISTING COUNTY ORDINANCE NO. 85-4; ESTABLISHING SUBDIVISION REGULATIONS IN WASHINGTON COUNTY, FLORIDA, RELATING TO THE ESTABLISHMENT OF STANDARDS FOR SUBDIVISIONS; TO PRESCRIBE STANDARDS OF IMPROVEMENTS TO BE PROVIDED BY THE DEVELOPER; TO ESTABLISH STANDARDS FOR THE EFFICIENT, ADEQUATE AND ECONOMIC SUPPLY OF PUBLIC FACILITIES; TO ESTABLISH CRITERIA FOR PREVENTION OF TRAFFIC HAZARDS; TO ESTABLISH SAFE AND CONVENIENT MEANS OR CIRCULATION OF TRAFFIC; TO ESTABLISH PROVISION FOR PROTECTIVE FLOOD CONTROL MEASURES AND DRAINAGE FACILITIES; TO ESTABLISH PROVISION FOR OPEN SPACES IN NEW LAND DEVELOPMENT; TO ESTABLISH PROVISION FOR MODIFICATION AND EXCEPTIONS TO SUBDIVISIONS; TO ESTABLISH PENALTIES FOR VIOLATION OF THE ORDINANCE; AND PROVIDING FOR AN EFFECTIVE DATE.

BE IT HEREBY ORDAINED BY THE BOARD OF COUNTY COMMISSIONERS OF WASHINGTON COUNTY, FLORIDA AS FOLLOWS:

SECTION ONE: SHORT TITLE This Ordinance shall be known as the "Subdivision Regulations of Washington County, Florida."

SECTION TWO: AUTHORITY As per Chapters 125, 163, and 177, Florida Statutes, incorporated municipalities and counties, individually or in combination, are authorized and empowered to adopt, amend or revise and enforce measures relating to subdivisions.

SECTION THREE: JURISDICTION The area subject to these regulations shall be all of Washington County, Florida, outside incorporated municipalities.

SECTION FOUR: PURPOSE AND INTENT The public health, safety, comfort, economy, order, appearance, convenience, morals and general welfare require the harmonious, orderly and progressive development of land within Florida. In furtherance of this general purpose, counties are authorized and empowered to adopt, amend or revise and enforce measures relating to land subdivision.

Such measures are intended to:

- Aid in the coordination of land development in accordance with orderly physical patterns, and discourage haphazard, premature or scattered land development.

- Insure safe and convenient traffic control and adequate utilities.

- Insure an economically stable and healthful community.

- Prevent periodic flooding.

- Insure that taxpayers will not have to bear the costs resulting from haphazard subdivision activities.

- Serve as an instrument of comprehensive planning.

SECTION FIVE: DEFINITIONS For the purposes of this ordinance certain words and terms used herein shall be defined as follows:

1) May - The word may indicates an action which is permissive.

2) Shall - The word shall indicates an action which is mandatory.

3) Abutting Property - Any property that is immediately adjacent or contiguous to, or immediately across any road or public right-of-way from the subdivision.

4) Alley - Any public or private right-of-way primarily designed to serve as secondary access to the side or rear of those properties whose principal frontage is on a street, and having a right-of-way width of thirty feet (30') or less.

5) Base Flood - The flood having a one percent chance of being equaled or exceeded in any given year.

6) Block - A piece of parcel of land entirely and immediately surrounded by streets or highways, railroad right-of-way, water courses, subdivision boundaries, or any combination thereof.

7) Building - Any structure designed or built for the support, enclosure, housing shelter or protection of persons, animals or chattel.

8) Building Setback - The minimum horizontal distance permitted between the front, rear or side of a building and the nearest street line or property line.

9) Cemetery - A place dedicated to and used or intended to be used for the permanent interment of human or animal remains. A cemetery may contain land or earth interment: mausoleum, vault, or crypt interment; columbarium or other structure or place to be used for the interment of cremated humans; or any combination of one or more of such structures or places.

10) County Engineer - A person currently licensed and registered to practice engineering in the State of Florida and retained by Washington County to oversee the appropriate provisions of this ordinance. The County Engineer may be employed directly by the County or retained on a consulting basis.

11) County Planning Department - The staff of the Washington County Planning Commission.

12) County Planner - A duly authorized representative of the County Planning Department.

13) Cul-de-Sac or Dead End Streets - A minor street having only one open end providing access to another street. The minimum outside roadway diameter of turning circles at the end of the cul-de-sac or dead end street shall be one hundred (100) feet, and the minimum outside right of way diameter shall be one hundred twenty (120) feet. For greater convenience to traffic and more effective police and fire protection, permanent dead end streets shall be limited to a length not exceeding 1,000 feet.

14) Developer - An individual, partnership, corporation or other legal entity, or agent thereof, who undertakes the activities covered by these regulations. The term "developer" may include "subdivider," "owner," and "builder."

15) DOT - Florida Department of Transportation.

16) Dwelling or Dwelling Unit - Any building, portion thereof, or other enclosed space or area used or intended for use as the home of one family, with separate cooking and housekeeping facilities, either permanently or temporarily.

A. Single Family - A detached building designed for and occupied by one family as a home, with cooking and housekeeping facilities.

B. Two Family - A detached building occupied by or designed for occupancy by two families only, with separate cooking and housekeeping facilities.

C. Multiple Family - A building designed for or occupied by three or more families, with separate cooking and housekeeping facilities for each.

17) Easement - A grant by a property owner of the use of land for a specific purpose or purposes by the general public, or a corporation or a certain person or persons.

18) Floodway - The channel of a natural stream or river and portions of the floodplain adjoining the channel, which are reasonably required to carry and discharge the floodwater or flood flow of any natural stream or river.

19) Flood Hazard Boundary Map (FHBM) - The map issued by the U.S. Dept. of Housing and Urban Development (HUD) and the Federal Insurance Administration showing flood prone areas. Drawn from U.S.G.S. maps. FHBM's do not provide flood elevations and are intended to be used only until the Flood Insurance Rate Maps (FIRM) are produced.

20) Flood Hazard Zone - Land subject to a one percent or greater chance of flooding in any given year.

21) Flood Insurance Rate Map (FIRM) - The official map of the County on which the Federal Insurance Administration has delineated both the areas of special flood hazard and the risk premium zones applicable to the County.

22) Flood Protection Elevation - The elevation of the base flood plus one (1) foot.

23) Frontage - The length of the front property line of the lot, lots, or tract of land abutting a public street, road, highway, or rural right-of-way.

24) Immediate Family - The father, mother, brother, sister, son, daughter or grandchild of a person deeding land without valuable consideration.

25) Improvements - Physical changes made to raw land, and structures placed on or under the land surface.

26) Land Surveyor - A land surveyor duly registered to practice in the State of Florida.

27) Limited Access Street - Streets or segments of streets designated in Washington County's Comprehensive Plan as being "limited access."

28) Lot - A portion of a subdivision intended as a unit or for development as a unit, or both, the boundaries of which have been clearly designated upon the plat according to Florida law.

A. Lot Depth - The distance measured in the mean (average) direction of the side lines of the lot from the midpoint of the front line to the midpoint of the opposite main rear line of the lot.

B. Lot Width - The mean horizontal distance between the side lot lines, measured at right angles to the lot depth, with the minimum to comply with this code to be measured at the front setback line.

C. Front Lot Line - The lot line separating the lot from the right-of-way of the principal street on which the lot abuts.

0868

D. Rear Lot Line - The lot line opposite to and most distant from the front lot line.

E. Side Lot Line - Any lot line other than a front or rear lot line. A side lot line of a corner lot, separating a lot from a street, is called a side street lot line. A side lot line separating a lot from another lot is called an interior lot line.

F. Interior Lot - A lot other than a corner lot.

G. Corner Lot - A lot abutting upon two or more streets at a street intersection, or abutting upon two adjoining and deflected lines of the same street.

H. Double Frontage Lot - A lot having two non-adjoining property lines abutting upon a street or streets.

I. Reverse Frontage Lot - A double frontage lot fronting on both a Minor Street and a Primary or Collector Street with access only permitted to the Minor Street. Rear access to the Primary or Collector Street shall be prohibited by means of a Non-Access Reservation strip or easement along the Primary or Collector Street.

29) Mobile Home - A dwelling unit provided with an undercarriage, axle(s) and wheels, capable of being towed on its own axle(s) and wheels, which can be utilized as a permanent residence, and which is 8 feet or more in width, and over 35 feet in length. This definition excludes recreational vehicles.

30) Mobile Home Space - A plot of ground within a mobile home park designated for the accommodation of one (1) mobile home or travel trailer.

31) Ordinary High Water Mark (Nontidal) - A line determined by examining the bed and banks of a water body and ascertaining where the presence and action of the water has marked upon the bed a character distinct from that of the banks with respect to vegetation or the nature of the soil itself. In the case of disputes over the location of the ordinary high water mark, the Planning Commission may require the subdivider to furnish data and/or studies establishing the location of such boundary.

32) Pedestrian Crosswalk - A right-of-way dedicated to the public for pedestrian use and which is designed to provide access to adjacent roads, lots or public use areas.

33) Plat - A map or drawing depicting a parcel of land or the division of lands into lots, blocks, parcels and containing a legal description of such lands.

34) Recreational Vehicle - A recreational vehicle-type unit used for temporary living quarters by individuals, and families during recreational, camping or travel use, which either has its own motive power or is mounted on or drawn by another vehicle. This category, in this ordinance is assumed to include also Travel Trailers, Camping Trailers, Truck Campers, Motor Homes and smaller Mobile Homes (up to a length of twenty-eight (28) feet exclusive of hitch) capable of being towed by a passenger motor car.

35) Recreational Vehicle or Campground Space - A plot of ground within a recreational vehicle park designated for the accommodation of one (1) individual trailer, camper, motorhome, etc.

36) Regulatory Floodway - A channel of a river or other watercourse and the adjacent land areas that must be unobstructed in order to discharge the base flood without increasing the water surface elevation of that flood more than one (1) foot at any point.

37) Street - A right-of-way provided for vehicular transportation purposes.

A. Primary Street - A street which has been or may be designed or designated for the movement of large volumes of traffic between distant points. Minimum right of way for primary streets shall be 100 feet.

B. Collector Street - A street designed or designated so as to connect a number of minor streets with primary streets. Minimum right of way for collector streets shall be 80 feet.

C. Minor Street - A street of limited continuity used primarily for access to abutting property and the local needs of the neighborhood. Minimum right of way for minor streets shall be 60 feet.

(1) Marginal Access Street - Minor streets which are parallel to and adjacent to arterial streets and highways; and which provide access to abutting properties and protection from through traffic.

D. Mobile Home Subdivision Streets - Minimum right of way of interior streets of mobile home subdivisions shall be 40 feet.

E. Mobile Home Park Streets - Minimum right of way of interior streets of mobile home parks shall be 40 feet.

F. Recreational Vehicle Park Streets - Minimum right of way of interior streets of recreational vehicle parks shall be 40 feet.

38) Setback Line - A line generally parallel with and measured from the lot line, defining the limits of a yard in which no building, other than accessory building or structure, may be located above ground, except as may be provided in Subdivision Regulations or Zoning Ordinances.

39) Sewer (Public or Community) - An approved sewage disposal system which provides a collection network an disposal system and central sewage treatment facility for a single development, community or region.

40) Sewer (On-Site) - A septic tank or similar installation on an individual lot which utilizes an aerobic bacteriological process or equally satisfactory process for the treatment of sewage and provides for the proper and safe disposal of the effluent, subject to the approval of health and sanitation officials having jurisdiction.

41) Subdivision - The division or redivision of a parcel of land for the purposes of sale, lease, rental, conveyance of title, or any use (including burial rights), into two (2) or more parcels, any one (1) of which is less than four and one-half (4.5) acres in size, except for exclusions provided for in Section Eight herein.

A. Cemeteries - A parcel of land dedicated to and used or intended to be used for the permanent interment of human or animal remains. Cemeteries shall be required to comply with all platting requirements of this ordinance, and shall be required to construct all applicable public facilities (streets, roads, drainage facilities) to the specifications required in this ordinance. Cemeteries shall have no minimum lot size or dimension.

B. Class "A" Subdivisions shall provide for central or common water and/or sewer systems and all streets shall be constructed to the standards set forth in this ordinance, including paving. Lots in a Class "A" Subdivision shall have an area of no less than twelve thousand five hundred (12,500) square feet and a minimum street frontage of one hundred feet (100'), except for lots which abut waterfront and interior lots on extreme curves or cul-de-sacs. Lots which abut waterfront shall have a minimum lot width of seventy-five feet (75') along the ordinary high water mark, and a minimum street frontage of forty feet (40'). Lots on extreme curves or cul-de-sacs shall have a minimum street frontage of forty feet (40').

C. Class "B" Subdivisions shall have minimum lot sizes of one (1) acre and all streets shall be constructed to the standards set forth in this ordinance, except paving.

D. Private Subdivision - Any subdivision that is to be maintained in a strictly exclusive manner by the developers/owners of the property within the subdivision. All private subdivisions must meet the criteria of a Class "A" or Class "B" Subdivision and all regulations as set forth in this ordinance, including the provision of recreation areas and fire protection systems. In addition to any other regulation, private subdivisions must be posted by signs at every entrance to such subdivision from existing County system road disclaiming any association of the roads within such subdivision and the County system. Any private subdivision or owners association of such private subdivision that wishes to have its roads or other facilities accepted into the County system will be required to meet any standards in effect at that time and shall not offer the argument that standards were met at the time of original filing. Private subdivision developers shall be required to file covenants/deed restrictions with the County at the time of plat filing which outline the developer's intent and method of notifying potential owners of the private status and nature of the subdivision, and shall place the disclosure required in Section 6.79 on the Final Plat.

E. Mobile Home Subdivision - A residential development designed for the accommodation of mobile homes on individually-owned lots or in condominium or common ownership, including recreation and open space areas held in common ownership, but not including developments serving tourists or vacation-oriented travel trailers, motor homes, campers, etc.

F. Mobile Home Park - A residential development on a parcel of land in one (1) ownership providing rental [illegible] on a long-term basis with recreation area and service facilities for the tenants. Mobile Home Parks shall have a minimum lot width of forty feet (40') and minimum lot depth of one hundred feet (100'). Each Mobile Home Park containing five (5) or more lots shall contain a recreation area not less than five percent (5%) of the total mobile home park area or a minimum of one-half acre, whichever is greater.

G. Recreational Vehicle Park - A development for the accommodation of tourist or vacationers on a short-term basis, providing rental spaces for each individual trailer, camper, motor home, etc., and recreation and service facilities for the use of tenants (See Chapter 513.01 Florida Statutes). For the purposes of this ordinance, the terms campground, RV resort, travel trailer park, travel resort, and travel park, or any variations of these terms shall be considered synonymous with the term Recreational Vehicle Park. Each Recreational Vehicle Park containing five (5) or more recreational vehicle spaces shall contain a recreation area not less than five percent (5%) of total park area or a minimum of one-half acre, whichever is greater. Recreational Vehicle Parks shall have no minimum lot size or dimensions.

42) Utility Company - Any private or public company engaged in providing a public service such as water, electricity, sewerage, garbage disposal, or telephone services.

SECTION SIX: PROCEDURES FOR SUBDIVISION PLAT APPROVAL

6.1 General

No person shall divide for the purposes of sale, lease, rental, or conveyance of title in any form except as permitted in Section 8 of this ordinance, a parcel of land into two (2) or more parcels, any one of which is less than four and one-half (4.5) acres, unless a plat has been filed and approved by the governing body. In addition, no street shall be accepted and maintained, nor shall gas, water, or sewers be extended; nor shall any permit be issued by a representative of the governing body for the construction of any building or other improvement requiring a permit for any subdivision without adherence to these regulations.

Any person refusing to comply or found to be resisting enforcement of this Regulation shall be subject to the penalties specified in Section Eleven.

6.2 Pre-Application Review

Whenever the subdivision of a tract of land within the jurisdiction of the Planning Commission is proposed, the subdivider should consult early and informally with the Planning Commission, the County's Engineer, the Department of Environmental Regulation, the Northwest Florida Water Management District, the Health Department, and other pertinent agencies for advice and assistance. The subdivider shall submit sketch plans and data showing existing conditions within the site and in its vicinity and the proposed layout and development of the subdivision. No fee shall be charged for the pre-application review and no formal application shall be required.

6.3 Procedure for Preliminary Plat Approval

Prior to the cutting or grading of any street or the making of any street improvements or the installation of utilities, the subdivider shall submit to the Planning Commission a Preliminary [illegible] proposed subdivision in accordance with the following procedure (NOTE: The subdivider shall ensure compliance with the Subdivision Criteria of the Florida Division of Health):

6.31 Application for Preliminary Plat Approval

6.311 Following the pre-application review of a proposed subdivision, the subdivider shall submit to the Planning Commission, at least thirty (30) days prior to their next regular meeting, a letter requesting review and approval of a Preliminary Plat, and nine (9) copies of the Preliminary Plat and other documents as specified in Section 6.4 herein.

6.312 If the proposed subdivision plat either abuts land within five hundred (500) feet of the County boundary or includes land into two (2) counties, the subdivider shall submit one (1) additional copy of the Preliminary Plat to the adjoining County for review and comment. The subdivider shall in turn furnish the Planning Commission with a copy of any and all such comments received from the adjoining County. If the adjoining County offers no comments, then correspondence from the adjoining County so stating shall be furnished to the Planning Commission. This information shall be submitted as part of the Application for Preliminary Plat Approval.

6.32 Review of Preliminary Plat The Planning Commission shall forward one (1) of said copies to the County Health Department and after review of the Preliminary Plat, the County Health Department shall submit written recommendation to the Planning Commission which shall afford an informal hearing on the Preliminary Plat.

6.321 Fees To partially defray the cost of filing said application, notifying interested parties, investigations, and holding a hearing upon the Preliminary Plat, a Preliminary Plat fee shall be paid to the Board of County Commissioners by the subdivider at the time of the filing of each application for Preliminary Plat approval. The Preliminary Plat processing fee shall be charged in accordance with amounts established by the Washington County Board of County Commissioners.

Eliminated the word "ordinance"

6.322 Preliminary Approval Following the hearing on the Preliminary Plat and other related material, the Planning Commission may express preliminary approval noting the conditions of such approval on nine (9) copies of the Preliminary Plat with one (1) copy being returned to the subdivider, one (1) copy to the County Health Department, and one (1) copy to the Office of the County Engineer; and one (1) copy will be added to the records of the Planning Commission. The additional five (5) copies shall be retained for use by the members of the Planning Commission. Approval of a Preliminary Plat does not constitute approval of a Final Plat, it indicates only approval of the layout as a guide to the preparation of the Final Plat.

6.323 Expiration Time Preliminary approval shall expire and be of no further effect twelve (12) months after the date of the preliminary approval unless the time is extended by the Planning Commission.

6.324 Disapproval Following the hearing on the Preliminary Plat and other related material, the Planning Commission may find reasons detrimental to the public safety, health, and general welfare, or in conflict with adopted plans of the Planning Commission which required the disapproval of the Preliminary Plat. A statement of the reasons for disapproval shall be made on two (2) copies of the Preliminary Plat with one (1) copy being returned to the subdivider and one (1) copy being added the record of the Planning Commission. The applicant may re-apply for Preliminary Plat approval in accordance with [illegible]

6.4 Preliminary Plat Specifications

6.41 Scale The Preliminary Plat shall be clearly and legibly drawn at a scale not smaller than one hundred (100) feet to one (1) inch.

6.42 Sheet Size Sheet size shall be twenty-four (24) inches by thirty-six (36) inches. If the complete plat cannot be shown on a sheet of this size, it may be shown on more than one (1) sheet with an index map on a separate sheet of enlarged scale.

6.43 Ground Elevations and Topographic Map The Preliminary Plat shall show ground elevations based on the datum plane of the United States Coast and Geodetic Survey. This information may be presented on a separate sheet or topographic map.

6.431 For land that slopes less than approximately two (2) percent, spot elevations shall be shown at all breaks in grade, along all drainage channels or swales, and at selected points not more than one hundred (100) feet apart in all directions.

6.432 For land that slopes more than approximately two (2) percent, contours shall be shown with an interval of not more than ten (10) feet if the ground slope is regular or with an interval or not more than two (2) feet if the ground slope is irregular. United States Government quadrangle maps may be used to meet the needs of this section, but must be referenced at time of submittal.

6.433 An exception to above requirements for showing ground elevations is a Preliminary Plat of a subdivision with the average size of the lots being greater than one (1) acre. A Preliminary Plat of such subdivision shall show only the location of streams (both perennial and intermittent), direction of flow of these streams, any areas subject to flooding, low, wet, or marshy land, and selected spot elevations. Quadrangle map elevations are required.

6.44 Information to be Provided on Preliminary Plat The Preliminary Plat shall contain the following information.

1) Name and address of owner of record and subdivider and name and registration number of surveyor or engineer.

2) Proposed name of subdivision and its acreage.

3) North point, graphic scale and date.

4) Vicinity map showing location and acreage of the subdivision.

5) Exact boundary lines of the tract by bearing and distance.

6) Existing streets, utilities and easements on and adjacent to the tract including the size and width of each.

7) Proposed layout including streets, alleys and easements with both dimensions and proposed street names; lot lines (including recreational vehicle space and cemetary lot lines) with approximate dimensions; land to be reserved for recreation and any land to be used for purposes other than single family dwellings. If the subdivision will utilize onsite sewage disposal systems (i.e. septic tanks) then [illegible] the area and mean width of the individual lots in accordance with Chapter 10D-6 FAC shall be presented.

8) Block and lot numbers.

9) Indication of zoning district boundaries. Such boundaries, if they exist, are to be shown and dimensioned on the plat.

10) Provisions for water supply, fire hydrants, sewerage and drainage, as required by the County Health Department,

0874

the Department of Environmental Regulation, the Northwest Florida Water Management District, this and other ordinances and regulations of Washington County, and other pertinent agencies.

11) Location and dimensions of land area utilized for replacement of onsite water source facilities for fire protection systems as required by Subsection 13.22 Subpart 2) of this ordinance. This land area and associated protection system may be held in common ownership of all owners in the subdivision, or may be dedicated to the County.

12) Minimum building front yard setback lines.

13) Location and dimensions of land area to be utilized for open space and/or recreational areas, whether to be in common ownership of all owners of the subdivision or to be dedicated to the County shall also be indicated.

14) Location of streams, lakes, swamps and land subject to flooding as determined from past history of flooding. Special flood hazard areas shall be shown where the proposed subdivision or any part thereof is in an area subject to 100 year flooding. Flood Hazard Boundary Maps (FHBM) or Flood Insurance Rate Maps (FIRM) for Washington County will be used to determine the 100 year flood hazard areas. The delineation of these 100 year flood hazard areas should be placed on the Preliminary Plat. A note should be included on the plat indicating the Community Panel Number(s) of the FHBM or FIRM from which the data was derived and a notation of the flood zone(s) in which the subdivision is located. Base flood elevations shall also be shown.

15) Inscription stating "NOT FOR FINAL RECORDING."

6.45 Approval from the Health Department A signed certificate of approval of the County Health Department shall be placed on the Preliminary Plat.

6.46 Certificate of Preliminary Approval A certificate of approval of the Preliminary Plat by the Planning Commission shall be inscribed on the plat as follows:

> "In that all the requirements of Preliminary Approval having been fulfilled, this subdivision plat was given Preliminary Approval by the Washington County Planning Commission on ____________, 19 ___. The Preliminary Approval does not constitute approval of the Final Plat. This Certificate of Preliminary Approval shall expire and be null and void on ____________, 19 ___."

________________ ____________________________

Date Chairman, Washington County Planning Commission

6.47 Initiation of Installing Physical [illegible] receiving a Certificate of Preliminary Approval by the Planning Commission, the subdivider may then proceed to grade the streets and install all improvements required under these Regulations and other applicable regulations of the County. In lieu of the completion of all improvements prior to submission of the Final Plat, the subdivider may post with the County a performance bond in the amount and with survey conditions satisfactory to it, or otherwise satisfy the conditions of Section Seven herein, providing for and assuring the County the actual construction and installation of such improvements within the period of time specified by the Planning Commission and stated in the bond.

6.5 Final Plat Procedure

After completion of the physical development of the subdivision or otherwise satisfying the conditions of Section Seven herein, the subdivider shall submit to the Planning Commission a Final Plat in accordance with the following procedure.

6.51 Application for Final Plat Approval After the Preliminary Plat of a proposed land subdivision has been given preliminary approval by the Planning Commission, the subdivider shall, within one (1) year or within such additional time as may be granted by the Planning Commission, submit to the Planning Commission, at least thirty (30) days prior to the next regular meeting of the Planning Commission the following:

6.511 A letter requesting review and approval of Final Plat.

6.512 Six (6) printed copies of the Final Plat with signed certifications and other documents as specified in Section Fourteen herein.

Took out original section 6.513

6.513 If the subdivision contains fifty (50) lots or more then the subdivider shall submit documentation as to the subdivision's registration with the Florida Division of Land Sales or an Advisory Opinion from the Florida Division of Land Sales indicating that the subdivision is exempt from registration.

6.52 Fees When application is made for Final Plat approval, the subdivider shall pay an additional fee to partially defray the expense of investigating, hearing, and acting upon the Final Plat. Final Plat processing fees shall be charged in accordance with the fee schedule established by the Washington County Board of County Commissioners.

Eliminate the word "ordinance"

6.53 Review of the Final Plat The County Engineer or authorized agent and the Planning Commission shall check the plat for conformance with the tentatively approved Preliminary Plat, and requirements as specified in Section 6.6.

6.531 Disapproval The Planning Commission or the County Engineer may find the Final Plat in conflict with the tentatively approved Preliminary Plat or with these Regulations requiring the disapproval of the Final Plat. A statement of the reasons for disapproval shall be placed on two (2) copies of the Final Plat with one (1) copy being returned to the subdivider and one (1) copy being added to the records of the Planning Commission. No certificate of approval shall be given. The Final Plat may be resubmitted for new application for Final Plat approval after the corrections noted by the Planning Commission are made. A letter of transmittal shall accompany returned Final Plats.

6.6 Final Plat Specifications

6.61 Conformance with the Preliminary Plat The Final Plat shall conform to the conditions of the tentatively approved preliminary Plat.

6.62 Original Tracing Specifications The Final Plat shall be clearly and legibly drawn on mylar. The scale shall be one hundred (100) feet or fifty (50) feet to an inch on a sheet twenty-four (24) inches by thirty-six (36) inches. If the complete plat cannot be shown on one (1) sheet of this size, it may be on more than one (1) sheet with an index map at an enlarged scale. The Final Plat shall have at least a one-half inch margin on each of three sides and a margin of 3 inches on the left side of the plat.

may be on more than one (1) sheet with an index map at an enlarged scale. The Final Plat shall have at least a one-half inch margin on each of three sides and a margin of 3 inches on the left side of the plat.

6.63 Additional Specifications The Final Plat shall contain the following information:

1) Name and address of owner of record and subdivider and name and registration number of surveyor or engineer.

2) North point, graphic scale and date.

3) Vicinity map showing location and acreage of the subdivision.

4) Names of owners of record of adjoining land with their approximate acreages.

5) Location of streams, lakes, swamps and land subject to flooding.

6) Municipal and County lines shall be accurately tied to the lines of the subdivision by distance and angles when such lines traverse or are reasonably close to the subdivision.

7) The closest land lot corner shall be accurately tied to the lines of the subdivision by distance and angles.

8) Location of land dedicated for parks, schools, fire protection systems, or other major public facility if applicable See Subsection 13.2.

9) Section, Township, and Range shall be shown. If in a land grant, the plat shall so state.

10) Exact boundary lines of the tract, determined by a field survey, giving distances to the nearest one-hundredth (1/100) foot and angles to the nearest second, shall be balanced and closed with an apparent error of closure not to exceed one in five thousand.

11) Name of subdivision in bold, legible letters, the name of the city, town, village, county and state in which the subdivision is situated, and the exact locations, widths, and names of all streets and alleys within and immediately adjoining the new subdivision shall be shown on the plat.

12) The location of deed restrictions applying to the plat for recording; for which space shall be provided immediately beneath the subdivision name as follows: Deed restrictions for this plat are filed in the Official Records Book ________, Page _______, and (are (are not) accompanied by deed convenants.

13) Street right-of-way lines shall show angles of deflection, angles of intersection, radii, and lines of tangents.

14) Lot lines shall be shown with dimensions to the nearest one-hundredth (1/100) foot and bearings.

15) Lots and blocks shall be numbered in numerical order, and the total land area (in acres) and land area located above the ordinary high water mark (in acres) shall be shown for each lot.

16) Location, dimensions, and purposes of any easements and any areas to be reserved or dedicated for public use shall be shown on the plat.

19) The Final Plat shall also include in a prominent place the following statement: "NOTICE: There may be additional restrictions that are not recorded on this plat that may be found in the public records of this county."

6.7 Final Plat Certifications

number changed

6.71 Surveyor's Certification A signed certification by a registered land surveyor and the appropriate seal certifying to the accuracy of the survey and the plat shall be placed on the Final Plat as follows:

Surveyor's Certification

"I hereby certify that this plat is a true and correct representation of the hereon described land which was recently surveyed and platted under my direction and supervision, and that permanent reference monuments have been set in accordance with Chapter 177, Florida Statutes. Survey data complies with all the requirements of Chapter 177, Florida Statutes. This plat meets the minimum technical standards set by the Florida Board of Land Surveyors."

By ______________________________ Date __________
Florida Registered Land Surveyor Number ____________

6.72 Owner's Certification of Dedication A signed certification of ownership shall be placed on the Final Plat as follows:

Owner's Certification

"The undersigned certifies that he or she is the owner of the land shown on this plat and acknowledges this plat and allotment to be his free act and deed, and does hereby dedicate to the perpetual use of the public all land areas indicated on this plat as roads, streets, alleys, other right of way, fire protection systems, parks and recreation areas, and all easements for utilities, drainage and other purpose incident thereto as shown and depicted hereon."

Witness this ______ day of ______________, 19_____.

______________________ ______________________
Witness Owner

Title Recorded in Official Records Book ____ Page ____

6.73 Mortgagee's Certification of Dedication A signed certification of dedication shall be placed on the Final Plat as follows by each and all mortgagees having a record interest in the lands subdivided:

Mortgagee's Consent to Dedication

"The undersigned hereby certifies that it is the holder of a mortgage, lien or other encumbrance upon the land shown on this plat, and the undersigned hereby joins in and consents to the dedication of the land described by owner thereof, and agrees that its

0878

mortgage, lien, or other encumbrances shall be subordinated to the owner's dedication.

Witness this ______ day of ________________, 19_____.

Witness	Mortgagee	Mortgage Recorded in Official Records Book ____ Page ____
Witness	Mortgagee	Mortgage Recorded in Official Records Book ____ Page ____

Numbers changed

6.74 Title Certification A signed certification of title opinion by an Attorney at Law or by a Title Company licensed in the State of Florida, shall be placed on the Final Plat as follows:

Title Certification

"It is my opinion as the undersigned Attorney at Law or as the Title Company representative, licensed in the State of Florida, that title to the land described hereon is in the name of the Dedicators as shown hereon and that there are no unsatisfied mortgages, liens, or other encumberances on the land except as noted hereon."

Signed this ____________ day of ____________, 19 ___.

Attorney at Law or Licensed Title Company Representative	Company Name

Numbers changed

6.75 Health Department Certification A signed certification of the County Health Department shall be placed on the Final Plat as follows:

Health Department Certification

"I certify that the general lot layout shown on this plat has been approved by the County Health Department for development with ____________ ____

Date	Health Officer or Representative

The blanks in the above certification statement shall be completed by the Health Officer, or his representative, so as to indicate whether approval is based upon the use of individual sewage disposal or water supplies, a community sewerage system, a community water supply or a combination thereof.

6.76 Certificate of The Subdividers Engineer

A signed certification by the subdividers engineer shall be placed on the Final Plat as follows:

New

"I certify that the owner, or his agent, has completed the construction and installation of the streets, drainage utilities and other improvements in accordance with the approved Preliminary Plat and in full compliance with Washington County Subdivision Regulations.

By ______________________ Date ____________
Florida Professional Engineer Number ____________

New

6.77 Certificate of Approval of the County Engineer A signed certification by the County Engineer or his authorized agent shall be placed on the Final Plat as follows:

> "I have performed the required inspections and certify that the owner, or his agent, has completed the construction, and installation of the streets, drainage utilities, and other improvements in accordance with the laws and specifications of Washington, County, Florida, or has posted appropriate bonds or cash in lieu thereof."

____________________	______________________________
Date	County Engineer or Agent

reworded

6.78 Certificate of Approval by the Planning Commission A signed certification of the Planning Commission shall be placed on the Final Plat as follows:

> "We certify that the owner, or his agent, has complied with all provisions and specifications of the Washington County, Florida, Subdivision Regulations or has posted appropriate bonds or cash in lieu thereof."

____________________	______________________________
Date	Chairperson, Washington County Planning Commission

6.79 Private Subdivision Disclosure All private subdivisions shall have a disclosure statement placed on the Final Plat as follows:

> "IMPORTANT: The ________________________ (fill in streets, water, and sewer facilities, or other subdivision improvements, as applicable) serving the lots in _____________________ (fill in name of subdivision) have not been accepted by Washington County for ownership or maintenance."

6.8 Final Plat Approval

Upon approval of the Final Plat by the governing body and upon certification of the Final Plat by all necessary parties, the governing body shall return four (4) copies to the subdivider, and shall provide one (1) copy for the Planning Commission and the County Engineer, and one (1) copy for the County Health Department.

6.81 Certificate of Final Approval by the Governing Body Certification of Final Approval by the Governing Body shall be placed on the Final Plat only after every item in Subsections 6.5, 6.6, and 6.7 (if applicable) of this Ordinance has been complied with and shall state the following:

> I certify that all the requirements for Final Approval of this Plat has been fulfilled in accordance with the Regulations of Washington County, Florida, and the requirements of the Washington [illegible] ...sion.

____________________	______________________________
Date	Chairman, Board of County Commissioners Washington County, Florida

6.82 General Requirements

6.821 No changes, erasures, modifications or revisions shall be made in any subdivision plat after final approval has been given and endorsed in writing on said plan. In by the subdivider in the Office of the Clerk of the Circuit Court prior to the sale of any lot in the subdivision. The subdivider shall provide two mylar (2) copies of the Final Plat for recording and shall pay all required recording fees to the Clerk of the Circuit Court. After final recording, the Clerk of the Court shall provide the property appraiser with a certified mylar copy and shall provide the Planning Commission with a paper copy of the certified Final Plat.

SECTION SEVEN: BONDING

No final plat of any subdivision shall be granted approval by the Board of County Commissioners of Washington County, Florida, until the subdivider has satisfactorily guaranteed that improvements required under this Ordinance shall be installed. Such improvements shall be made within a specified period of time, not to exceed two (2) years, unless the guarantee to install such improvements has been successfully renegotiated between the subdividers and the County. Said guarantee shall be made in one of the following ways.

- A surety bond executed by a company in Florida, payable to the Board of County Commissioners of Washington County, Florida, in sufficient amount to assure completion of improvements, as determined by the County Engineer.

- A cash deposit in an escrow account in sufficient amount to assure completion of improvements, as determined by the County Engineer.

- A construction loan agreement may be used, provided the subdivider and a qualified lending institution enter into an agreement with the County whereby the subdivider is bound to complete the work, and the lender is bound to advance the funds as the work is completed, thereby providing for completion of the work in event of the subdivider's default.

SECTION EIGHT: EXCEPTIONS

8.1 Inheritance

Any division of land directly from inheritance, either by testate or intestate, shall be exempted from the provisions of this ordinance, provided that such division is not accomplished through recorded plats.

8.2 Deed of Gift

Any deed for any parcel of land given with or without valuable consideration to any number of the donor's immediate family (see definition herein) shall be exempted from the provisions of the Ordinance provided that such division is not accomplished through recorded plats.

8.3 Non-Residential Subdivisions

Subdivisions designed and used exclusively for nonresidential purposes (except cemeteries) need meet only those standards specified by Chapter 177, Florida Statutes. Should any lot so exempted be used for residential purposes [illegible] pliance with the provision of this ordinance.

SECTION NINE: REDIVISION OF SUBDIVIDED LAND TO ACREAGE

9.1 Action of Owner

The owner of any land subdivided into lots wishing to have all or a portion of such land vacated and reverted to acreage shall file a Petition for Vacation with the Board of County Commissioners.

9.2 Action of the Board of County Commissioners

The Board of County Commissioners may order the vacation and reversion to acreage of all or any part of a subdivision within its jurisdiction, provided that:

- The plat was lawfully recorded not less than five (5) years before the date of such action.

- And that no more than ten percent (10%) of the total area of such subdivision has been sold as lots by the original subdivider or his successor in title and only then if all owners have agreed in writing.

9.3 Public Hearing

As per the requirements of Chapter 177, Florida Statutes, a public hearing shall be held on any proposal for vacation and reversion of land to acreage.

9.4 Access to Acreage

No owner of any parcel of land in a subdivision shall be deprived of reasonable access to such parcel as a result of reversion to acreage.

9.5 Filing and Recording New Final Plat

If the Petition for Vacation is granted and the reversion to acreage involves less than one hundred percent (100%) of the land area included on the plat previously recorded, then the owner shall file a new final plat for the subdivision for the portion of the land area not vacated by action of the Board of County Commissioners. This filing of the "new" final plat for the subdivision shall be in accordance with all provisions of this ordinance, and shall occur within 60 days of action by the Board of County Commissioners on the Petition for Vacation.

SECTION TEN: LEGAL PROVISIONS

10.1 Validity

If any section, clause or phrase of this ordinance is adjudicated to be void, such decision shall not affect the validity of the ordinance as a whole or any part thereof other than the part so declared to be invalid or unconstitutional.

10.2 Amendment

This ordinance may be amended by the Board of County Commissioners of Washington County, Florida, as specified in Chapter 163, Florida Statutes.

10.3 Conflicting Ordinances

Should the requirements of this ordinance conflict with those of any other regulation or ordinance of Washington County, Florida, the regulation or ordinance requiring the higher standards shall prevail.

10.4 Effective Date

These regulations shall be in effect from and after their passage, approval and publication according to the laws of the State of Florida. Any development plat submitted to the County prior to the effective date of this ordinance shall not be subject to the provisions of this ordinance.

SECTION ELEVEN: VIOLATION

11.1 Penalties

It shall be unlawful for any owner or the agent of any owner of land to lease, rent, transfer, sell, agree or negotiate to sell land without complying with the provisions of this ordinance, including Final Plat recordation.

Any person committing such an unlawful act shall be guilty of a misdemeanor of the first degree, punishable as provided under Sections 775.082 or 775.083, Florida Statutes.

SECTION TWELVE: VARIANCES

Where strict adherence to the provisions of this ordinance would cause an unnecessary hardship due to topographical or other conditions peculiar to the site, or strict adherence to this ordinance is impossible or impractical, the Planning Commission may recommend and the Board of County Commissioners may authorize a variance. Such a variance shall apply only to the requirements directly affecting the particular hardship and shall not be detrimental to the intent of this ordinance. Any request for a variance shall be submitted in writing to the County Planning Commission, review by their staff and then transmitted to the Board of County Commissioners.

SECTION THIRTEEN: DESIGN STANDARDS

13.1 General

The design of any subdivision in Washington County shall conform to the adopted County Comprehensive Plan as it relates to land uses, traffic circulation and the general development of the County. Subdividers should make every effort to conform to the natural topography and features of the tract in improving the tract, and in establishing the size and shape of blocks and lots. The subdivider should also take steps to insure the preservation of existing trees, water courses, and other natural features of the land.

13.2 General Public Facilities

13.21 Access to Natural Lakes

On all natural lakes of over twenty (20) acres in size, and navigable waterways, no Class "A" or "B" subdivision shall be approved by the Planning Commission unless acceptable public access to said lake is successfully negotiated between the Board of County Commissioners, Washington County, Florida, and the developer of said property.

13.22 Fire Protection Systems

Developers of subdivisions containing ten (10) lots or more shall provide an adequate water source for use in fire suppression. All subdivisions of this size, containing a central water system shall install fire hydrants [illegible] street right of ways at intervals of not greater than one thousand feet (1000'), apart and within 500 feet of any structure. All subdivisions of this size not containing a central water system and located greater than five (5) miles from a fire department station shall provide either of the following:

1) Public access sufficient for fire department needs to a natural water source (i.e. lake, stream, etc.) located within 5 miles of the subdivision and capable of providing a minimum of 6,000 gallons. Documentation shall be submitted as part of the Application for Preliminary Plat

0883

Approval providing evidence of the location and the viability of such access. Final determination as to the suitability of this access shall be made by the County Engineer or his designee.

2) An elevated water storage facility with a minimum height of six (6) feet above ground level elevation located at a readily accessible location within the subdivision, containing a minimum 3,000 gallon storage capacity, and served by a well and pumping system capable of replenishing the water storage facility at a rate of 125 gallons per minute. Final determination of the acceptability of the storage facility and the well and pumping system shall be made by the County Engineer or his designee.

Developers of subdivisions not containing a central water system and located five (5) miles or less from a fire department station shall submit evidence (maps) establishing the distance from such fire department stations as part of Application for Preliminary Plat Approval. All fire protection systems (except those located in private subdivisions) shall be dedicated to Washington County as part of Final Plat approval and will be maintained by Washington County.

13.23 Provision of Park and/or Recreational Land

All Mobile Home Parks and Recreational Vehicle Parks containing five (5) or more lots and/or recreational vehicle spaces shall set aside and maintain a minimum of one-half acre or 5 percent (5%) of the total land area subdivided (whichever is greater) for use as a recreational and/or park area.

13.24 Comprehensive Plan Designated Public Facilities

Where a proposed park, school site or other major public facility shown on the adopted Comprehensive Plan is located in whole or in part within a proposed subdivision, that portion of the plat encompassing the planned public site may have approval withheld for a reasonable time (not to exceed one hundred eighty (180) days), to provide for the appropriate public agency to acquire the site. Such approval of a plat may only be withheld by the County for the full 180 day period if the appropriate public agency initiates some action toward acquiring the planned public site within 90 days of filing of the Application for Preliminary Plat Approval.

13.3 Streets

The layout of streets in any subdivision shall conform to the official County Comprehensive Plan as well as existing streets and thoroughfares.

13.31 Proposed Alignment

A proposed street system shall be continuous and extended in alignment with existing or planned streets with which they are to connect.

13.32 Intersection Streets

Proposed streets shall intersect at angles no less than seventy-five (75) degrees. Unaligned intersections shall be separated by a minimum of one hundred twenty-five (125) feet between centerlines.

13.33 Access to Streets Designated as Limited Access Streets

Direct access from subdivisions to streets designated in the County's Comprehensive Plan as "limited access" shall be

0884

separated by a minimum distance of one thousand three hundred and twenty feet (1320') between centerlines of such access points.

Where a subdivision abuts or contains an existing or proposed arterial street, the Planning Commission may require marginal access streets, reverse frontage with screen planting contained in a nonaccess reservation along the rear property line, deep lots with rear service alleys, or such other treatment as may be necessary for adequate protection of residential properties and to afford separation of through and local traffic.

13.34 Right-of-Way

- Primary streets and thoroughfares shall have a minimum right-of-way width of one hundred feet (100').

- Collector streets shall have minimum right-of-way width of eighty feet (80').

- Minor streets shall have a minimum right-of-way width of sixty (60').

- Mobile Home Parks shall have a minimum right-of-way width of forty feet (40').

- Recreational Vehicle Parks shall have a minimum right-of-way width of forty feet (40').

- Cemeteries shall have a minimum right-of-way width of thirty feet (30').

13.4 Blocks

The length, width and shape of blocks shall be determined with regard to:

- Provision of adequate building sites suitable to the special needs of the type of use contemplated.

- Needs for convenient access, circulation, control, and safety of street traffic.

- Limitations and opportunities of topography.

13.41 Length

Residential blocks shall not be more than fifteen hundred (1,500) feet in length. Blocks more than eight hundred (800) feet in length shall be required to have a pedestrian crosswalk near the center of the block, which extends across the street and is at least twenty (20) feet wide.

13.42 Width

Blocks shall have sufficient width to provide for two (2) lines of lots except when prevent [illegible] natural conditions, or when reverse frontage is used.

13.5 Lots

For lots served by a central sewer and/or water system, the minimum area shall be twelve thousand five hundred (12,500) square feet and minimum lot width shall average one hundred (100) feet at the front building line. In those instances where lots abut waterfront, there shall be a minimum of twelve thousand five hundred (12,500) square feet above the ordinary high water mark, with a minimum construction setback line of fifty (50) feet from the ordinary high water mark, lot width of seventy-five (75) feet along the ordinary high water mark, and minimum street frontage of forty (40') feet;

0885

in addition to the lot meeting Sanitation Code requirements (see Chapter 10D-6 FAC). For lots not served by sewer or water systems, the minimum lot size shall be no less than one (1) acre above the ordinary high water mark.

13.51 Lot Lines

Lot lines shall be at approximate right angles to street right-of-way line on which they abut.

13.52 Corner Lots

Corner lots for residential use shall have sufficient additional width to comply with setback requirements on side streets.

13.53 Depth

Excessive depth in relation to width is to be avoided. Residential lots fronting on collector streets or primary roads shall have sufficient extra depth to permit a buffer zone between the building line and the street.

13.54 Frontage

Double frontage and reverse frontage lots are to be avoided.

13.55 Width

Residential lots shall average one hundred (100') wide at the building setback line. Mobile home subdivisions shall also average one hundred feet (100') at the building or mobile home setback line. All lots utilizing an onsite sewage disposal system (i.e. septic tank) shall additionally meet the requirements of Chapter 10D-6 FAC. Mobile Home Parks shall have a minimum lot width of forty feet (40') and lot depth of one hundred feet (100'). Recreational Vehicle Parks and cemeteries shall have no minimum lot size or dimension.

13.56 Setback Line

Minimum twenty-five feet (25') front, ten feet (10') sides and back. Mobile Home Parks ten feet (10') on all sides.

13.6 Improvements in Flood Hazard Zone

13.61 Building Site Improvements

13.611 No subdivision or part thereof shall be approved if proposed subdivision levees, fills, structures or other features will individually or collectively significantly increase flood flows, heights or damages.

13.612 Building sites for residences, motels, resorts or other dwelling or accommodation uses shall not be permitted in the Regulatory Floodway. Sites for these uses may be permitted outside the floodway if the sites are elevated or filled to a height at least one (1) foot above the elevation of the base flood [illegible] protection level) or if other provisions are made for elevating or adapting structures to achieve the same result. Required fill areas must extend ten (10) feet beyond the limits of intended structures and, if the subdivision is not to be sewered, must include areas for onsite waste disposal.

13.613 Cemeteries shall not be permitted in any area subject to flooding at any time.

0886

13.614 The following standards apply to watercourses in the Flood Hazard Zone for which no base flood data or regulatory floodway have been provided.

- No encroachments, including fill material or structures shall be located within a distance of the stream bank equal to five times the width of the stream at the top of the bank, or 50 feet from the top of each bank, which ever is greater, unless a registered professional engineer or land surveyor demonstrates and certifies that the encroachments will not result in any increase in flood levels in a base flood.

- New construction of or substantial improvements to structures shall be elevated or floodproofed to minimize risks of flooding reasonably to be expected based on the best available data.

13.615 If the review agency determines that only part of a proposed plat can be safely developed, it shall limit development to that part and shall require that development proceed consistent with this determination.

13.616 When the subdivider does not intend to develop the plat himself, and the review agency determines that additional use controls are required to insure safe development, it may require the subdivider to impose appropriate deed restrictions on the land. Such deed restrictions shall be inserted in every deed and noted on the face of the final recorded plat.

13.62 Drainage Facilities Storm drainage facilities shall be designed to store and convey the flow of surface waters from a fifty (50) year storm without damage to persons or property. The system shall insure drainage at all points along streets, and provide positive drainage away from buildings and onsite waste disposal sites. Plans shall be subject to approval by the Planning Commission. The Planning Commission may require a primarily underground system to accommodate frequent floods and a secondary surface system to accommodate less frequent floods. Drainage plans shall be consistent with local and regional drainage plans.

13.63 Roads The finished elevation of proposed streets shall be no less than two (2) feet above the regulatory flood protection elevation. The Planning Commission may require, where necessary, profiles and elevations of streets to determine compliance with this requirement. Drainage openings shall be sufficient to discharge flood flows without unduly increasing flood heights.

13.64 Sanitary Sewer Facilities

13.641 The Planning Commission may prohibit installation of sewage disposal facilities requiring soil absorption systems where such systems will not function due to high ground water, flooding, or unsuitable soil characteristics. The subdivider shall note on the face of the plat and in any deed or conveyance that soil absorption fields are prohibited in designated areas.

13.642 The developer must prescribe adequate methods for waste disposal. If a sanitary sewer system is located on or near the proposed subdivision, the developer shall provide sewage facilities to connect to this system where practical.

13.65 Water Facilities All water systems, including individual wells located in flood prone areas whether public or private, shall be floodproofed to a point at or above the flood protection elevation. If there is an existing public water supply system on or near the subdivision, the Planning Commission may require the subdivider to convert to this system.

13.66 Erosion and Sediment Control Measures The Planning Commission may require the subdivider to utilize grading techniques, subdivision design, landscaping, sedimentation basins, special vegetation cover, and other measures to reduce erosion and sediment.

SECTION FOURTEEN: MINIMUM REQUIREMENTS FOR THE INSTALLATION OF IMPROVEMENTS

14.1 General

All improvements and construction activities required under the Washington County Subdivision Regulations shall take place according to plans approved by the County Engineer. The plans submitted to the County Engineer shall bear the signature of the Professional Engineer responsible for the project.

14.2 Road and Street Construction

14.21 Clearing and Grubbing

Clearing and grubbing shall be done in accordance with applicable portions of Florida DOT "Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways," as amended.

14.22 Excavation and Embankment

Excavation and embankment shall be done in accordance with applicable portions of Florida DOT "Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways," as amended.

14.23 Pavement Widths

14.231 Primary streets shall have a pavement width (for moving lanes, excluding parking) of:

- twenty-four feet (24') for two-lane roads.
- sixty feet (60') for four-lane roads with paved median.
- two twenty-four feet (24') lanes and twenty-four feet (24') median for divided highways.

14.232 A collector street shall have a pavement width of twenty-two feet (22').

14.233 Minor streets shall have a pavement width of twenty feet (20').

14.24 Roadway Base

Roadway base shall be constructed of sand-clay, sand asphalt, hot mix, or shell stabilized base according to the specifications shown below. Upon approval of construction plans by the County Engineer, construction may begin, with testing of a six (6) inch minimum thickness occurring as follows:

The developer shall provide the County Engineer with certified copies of test results made by an independent laboratory of bearing capacities and compaction made at intervals of no more than three hundred feet (300') staggered to the left and right of centerline and of measurement of thickness of base made by measure of holes drilled no more than three hundred feet (300') at the time of coring of surface course.

Sand-Clay Base - The material and construction shall conform to Florida DOT Specifications as shown in "Manual of Uniform Minimum Standards for Design, Construction and Maintenance of Streets and Highways, as amended."

Shell Stabilized Base - The material and construction shall conform to Florida DOT Specifications as shown in "Manual of Uniform Minimum Standards for Design, Construction and Maintenance of Streets and Highways, as amended."

14.25 Surface Course

Surface courses for flexible pavements shall be an asphaltic-concrete surface, with a minimum thickness of one and one-half (1 1/2) inches.

This asphaltic-concrete surface shall be approved by the County Engineer. Testing of the surface course of compliance with specifications will be carried out by the County Engineer or his authorized representative. Test cores will be taken no more than three hundred feet (300') apart and staggered to the left, right, and on the centerline.

14.26 Required Inspection

Inspection of the following phases of street construction must be conducted by the County Engineer in addition to the testing procedures noted above:

Stabilized Grade
Curb and Concrete Work
Subgrade
Roadway Base
Surface Course
Drainage System

It is the developer's responsibility to notify the County Engineer twenty-four (24) hours before any of the above noted phases of construction are to be ready for construction. The developer shall pay for the cost of all testing provided by the County Engineer.

14.27 Street Names

Street names and markers shall be installed according to the specifications of the County Engineer. No names shall closely approximate any existing street names, and all street names shall be in accordance with Washington County Ordinance 89-5.

14.3 Drainage

14.31 Drainage Plan

A complete drainage plan shall be submitted by the subdivider and approved by the County Engineer. These plans shall show sufficient documentation to demonstrate the capability of the drainage system to collect, control, and dispose of storm runoff. The drainage system will include all catch basins, manholes, inlets, headwalls, bridges, pipes, settling basins, green belted open space, etc., deemed necessary by the County Engineer. The drainage system shall be based upon the facilities necessary to dispose runoff according to the recurrence frequencies listed below. Rainfall data shall be obtained from the Florida DOT rainfall curves.

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The drainage plan shall include a delineation of the major areas draining into the subdivision, sufficient topographical information to verify location of streams, drainage ways, etc., and existing drainage features (pipes, ditches).

Design Frequencies -

Drainage Facility	Design Frequency
Bridges and Bridge culverts (on Primary Streets and Roads)	50 years
Primary Cross Drains, Storm Sewers and Canals	25 years
Cross Drains and Ditches and Internal Subdivision Drainage	5 years
Sidedrains for Roadway ditches	5 years
Secondary Storm Sewers	5 years
Retention Basins	25 years

14.32 Material Specifications

Culverts and Storm Sewers - The following materials are acceptable for culverts and storm sewers provided they comply with Florida DOT Standard Specifications.

Reinforced Concrete Pipe
Corrugated Steel Pipe (Bituminous Coated)
Corrugated Aluminum Pipe (If Soil Conditions Permit)
Structured Steel Plate Pipe (Bituminous Coated)

[illegible] conform to Florida DOT Standard Specifications.

Manholes and Inlets - Manholes and inlets shall be constructed so as to conform to the standards shown in the Florida DOT "Manual of Uniform Standards for Design, Construction and Maintenance for Streets and Highways, as amended."

Curbs and Gutters - Curbs and gutters shall be constructed so as to conform to the standards appearing in the Florida subdivisions shall have minimum lot sizes of one (1) acre and all streets shall be constructed to the standards set forth in this ordinance except paving.

Class "A" subdivisions shall provide for central or common water and/or sewer systems and all streets shall be constructed to the standards set forth in this ordinance, including paving. Lots in a Class "A" subdivision shall have an area of no less than twelve thousand five hundred (12,500) square feet, a minimum street frontage of one hundred feet (100'), and an average lot width of one hundred feet (100') at the building setback line. Properties abutting waterfront shall have a minimum lot width of seventy five feet (75') along the ordinary high water mark, and a minimum street frontage of forty (40') feet. Interior lots on extreme curves or cul-de-sacs shall have a minimum street frontage of forty feet (40').

Subdivisions not meeting the standards specified in Section Fourteen above shall install a collection system and an approved sewage treatment facility. Such facility shall be designed so as to be capable of tying in with an operating central system when such a central system becomes available.

Recreational Vehicle Parks shall provide for disposal of sewage in accordance with Chapter 513.08 Florida Statutes, and all applicable Health Department Regulations.

<u>14.5 Administrative Procedures</u>

The administrative procedures for installing the subdivision improvements required herein shall be as follows:

<u>14.51 When Construction May Begin</u> Construction and installation of any required public improvements as described herein shall not begin until the Planning Commission has given Preliminary Approval of the new subdivision.

<u>14.52 Inspections and Approval by Governing Body</u> In order to facilitate inspection of required improvements during construction, the applicant shall notify the County Engineer or other authorized agents at least two (2) working days before proceeding beyond each of the following stages of construction:

(1) Rough grading completed.

(2) When excavations are ready for placing foundations, and when pipe trenches are shaped and prepared for laying pipe.

(3) Once the drainage and other facilities are installed, but before back-filling occurs.
(4) Upon completion of base course compaction.

(5) When placing and rolling of lower and surface pavements.

After completion of all the construction and installation of the required public improvements, County Engineer shall make a final inspection. If the said work has met the specifications as described herein, as determined by the County Engineer, the Engineer shall notify the subdivider and the Governing Body in writing of the approval or disapproval of said work.

<u>14.53 Official Acceptance by the Governing Body</u> The Governing Body shall officially accept the completed work on the construction and installation of required public improvements one (1) year from the date of the written acceptance by the County Engineer, subject to an inspection by

the Engineer, for Class "A" subdivisions, and immediately for Class "B" Subdivisions where paving is not required.

14.54 "As Built Drawings" At such time as the applicant has completed construction of all required improvements, he shall furnish to the County Engineer "As-Built" plans and profiles prepared by a licensed land surveyor or engineer on material designated by the County twenty-four (24) inches by thirty-six (36) inches in size or, if the areas to be shown do not fit on a sheet of that size, two (2) or more drawings shall be submitted, with suitable match lines, which drawings shall show the actual location of the paved streets, culverts, headwalls, drains, manholes, catchbasins, sidewalks, curbs, and the location of utilities and all other pertinent information, such as culvert and drain grades, sewer grades, sidewalk and curb grades, and elevations. If any one (1) of them does not conform to those shown on plans and profiles previously approved by the Governing Body, the Governing Body shall have the right to disapprove the release of the bond until such deficiency has been corrected. In any case, no bond shall be released by the Governing Body until such plans have been submitted.

14.55 Maintenance of Completed Work The subdivider shall maintain his completed work until the official acceptance by the Governing Body as described in Section 14.53 above.

(1) If the subdivider originally posted a performance bond covering the cost of construction, it shall be reduced to ten (10) percent of the original bond and shall be held as a maintenance bond.

(2) If the subdivider constructed and installed all required public improvements prior to final approval, then he shall post a maintenance bond equalling ten (10) percent of the construction costs and shall sign a bond agreement with the Governing Body.

At the end of maintenance period, the County Engineer shall make a final inspection and notify the subdivider and the bonding company of all corrections required. In cases where funds are being held in escrow, the cost of making such corrections shall be deducted from these funds, and the subdivider charged with any costs above the amount of escrow funds. If the work is acceptable at this time, the remaining ten (10) percent of the escrow funds shall be released to the subdivider.

14.56 Cost of Improvements

14.561 Subdivider's Responsibility The subdivider shall incur the cost of construction and installation of all required public improvements based on the following:

(1) Streets - Incur the cost for construction of streets up to twenty-four (24) feet in pavement width from back of curb, to back of curb.

(2) Water and Sewer Systems - Incur the cost for the installation of all water [illegible] required to serve the new subdivision and tie in with existing water and sewer system, based on the specifications set forth herein.

(3) Drainage System - Incur the cost for the installation of all drainage facilities required to serve the new subdivision and to tie in with existing drainage facilities, based on specifications set forth herein.

(4) Fire Protection Systems - Entire Cost. To meet specifications contained in Subsection 13.22 of this ordinance.

(5) Sidewalks - Entire Cost. When sidewalks are warranted they shall be a minimum of four (4) feet wide; four (4) inches thick; two thousand five hundred (2,500) pounds PSI; portland cement concrete.

(6) Monuments - Entire Cost.

(7) Street Signs - Entire Cost. The developer is to bear the entire cost of street signs.

(8) Striping - Entire Cost. To meet DOT specifications.

14.562 Governing Body's Responsibility The Governing Body shall partially participate in sharing the cost of construction and installation of required public improvements for the following conditions:

(1) Streets - Incur the cost for any additional pavement required to satisfy traffic generated from outside the subdivision which is in excess of twenty-four (24) feet and any additional grading and paving related thereto.

(2) Water and Sewer Systems - Incur the cost for any difference in the cost of the laying oversized pipe and outfall systems which are needed in excess of the required water and sewer facilities needed to serve exclusively the new subdivision as determined by the Planning Commission and the Governing Body.

(3) Street Signs - The Governing Body is to bear the expense of replacement.

14.563 Estimated Costs for Construction and Installation The current unit prices in effect at the time of submission of plans shall be used in determining the total estimated cost for construction and installation of required public improvements in new subdivisions.

SECTION FIFTEEN: This Ordinance shall become effective upon enactment by the Board of County Commissioners and filing with the Secretary of State of Florida.

Enacted by the Board of County Commissioners of Washington County, Florida this ______ day of __________, 19 ___.

BOARD OF COUNTY COMMISSIONERS
OF WASHINGTON COUNTY, FLORIDA

Attest: ____________________ By: ____________________
Clerk Chairman