

Guidelines for Preparation of
Reuse Feasibility Studies
for
Applicants Having Responsibility
for Wastewater Management



Use it Again, Florida!

November 1991

GUIDELINES FOR PREPARATION OF

REUSE FEASIBILITY STUDIES

for

APPLICANTS HAVING RESPONSIBILITY FOR WASTEWATER MANAGEMENT

Florida Department of Environmental Regulation

In Cooperation with:

Florida Public Service Commission
Northwest Florida Water Management District
St. Johns River Water Management District
South Florida Water Management District
Southwest Florida Water Management District
Suwannee River Water Management District

November 1991

The encouragement and promotion of
water conservation and reuse of reclaimed
water, as defined by the department,
are state objectives.

-- Section 403.064(1), Florida Statutes

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PURPOSE AND APPLICABILITY

Purpose

The purpose of this document is to define the contents of reuse feasibility studies. The following aspects of reuse feasibility study preparation are addressed:

1. Identification of alternatives to be evaluated;
2. evaluation of costs using present value analysis;
3. assessment of environmental impacts;
4. evaluation of resulting user charges and fees; and
5. evaluation of technical feasibility.

Applicability

These guidelines are to be used in the preparation of reuse feasibility studies by cities, counties, other governmental entities, authorities, utility systems, or other permitted entities that have responsibility for domestic wastewater management. The background section of the guidelines outlines circumstances in which reuse feasibility studies may be needed.

Entities Implementing Reuse Master Plans

A municipality, governmental entity, or utility that has developed and is implementing a reuse master plan may submit their master plan and documentation of implementation for consideration by the Department of Environmental Regulation and the water management districts. The Department of Environmental Regulation and water management districts shall accept the master plan in lieu of a reuse feasibility study report, if the following three conditions are met:

1. The scope and level of effort incorporated into the master plan are consistent with the guidelines contained in this document;
2. the master plan's goal is implementation of a reuse program in which at least 75 percent of the average annual daily flow of domestic wastewater will be reused in the design year; and
3. the master plan is being implemented and construction will be initiated no later than two years after the submittal date.

Report Submittals

Two copies of a reuse feasibility study should be submitted to the appropriate Department of Environmental Regulation district Office. In addition, it is suggested that a copy be provided to the appropriate water management district.

BACKGROUND

The encouragement and promotion of water conservation and reuse of reclaimed water are state objectives [Section 403.064(1), Florida Statutes].

The Department of Environmental Regulation has implemented a comprehensive reuse program designed to meet the state objective. The following are included in the reuse program:

1. A mandatory reuse program;
2. an Antidegradation Policy;
3. requirements for evaluation of reuse feasibility; and
4. comprehensive rules governing reuse of reclaimed water [Chapter 17-610, Florida Administrative Code (F.A.C.)].

Definitions

"Reuse," "reclaimed water," and "effluent" are defined in the rules of the Department of Environmental Regulation, as follows:

Reuse - the deliberate application of reclaimed water, in compliance with Department of Environmental Regulation and water management district rules, for a beneficial purpose.

Reclaimed Water - water that has received at least secondary treatment and is reused after flowing out of a wastewater treatment facility.

Effluent - water that is not reused after flowing out of any wastewater treatment facility or other works used for the purpose of treating, stabilizing, or holding wastes.

Mandatory Reuse Program

Rule 17-40.401(5), F.A.C., establishes a mandatory reuse program. This rule requires that the water management districts identify "critical water supply problem areas" (existing or anticipated during the next 20 years). Critical water supply problem areas must be designated by rule by November 1, 1991. Reuse of reclaimed water from domestic wastewater treatment facilities shall be required within these designated critical water supply problem areas, unless such reuse is not economically, environmentally, or technically feasible.

Rule 17-40.401(6), F.A.C., enables the water management districts to require reuse of reclaimed water outside of designated critical water supply problem areas if the following conditions are met:

1. Reclaimed water is readily available: and
2. the water management district has adopted rules for reuse in these areas.

Section 403.064. Florida Statutes

This statute requires that after January 1, 1992, all applicants for permits to construct or operate a domestic wastewater treatment facility in a critical water supply problem area shall evaluate the costs and benefits of reuse of reclaimed water as part of their application for the permit.

Antidegradation Policy

The Antidegradation Policy is contained in Chapter 17-4, F.A.C., "Permits," and Chapter 17-302, F.A.C., "Surface Water Quality Standards." These rules require an applicant for a new or expanded surface water discharge to demonstrate that the new or expanded discharge is clearly in the public interest. As part of the public interest test, the applicant must evaluate the feasibility of reuse of reclaimed water. If reuse is economically and technologically reasonable, it will be preferred over the surface water discharge.

Indian River Lagoon System and Basin Act

This Act, which is contained in Chapter 90-262, Laws of Florida, provides increased protection to the Indian River Lagoon System. Section 3 of this Act requires each owner of an existing sewage treatment facility within the Indian River Lagoon Basin to investigate the feasibility of using reclaimed water for beneficial purposes. These reuse feasibility studies are to be completed before July 1, 1992.

Reuse Rules

Chapter 17-610, F.A.C., "Reuse of Reclaimed Water and Land Application," contains detailed rules governing reuse. These rules address a wide range of reuse activities ranging from slow-rate land application systems (irrigation) to rapid-rate land application systems for ground water recharge.

Part III of Chapter 17-610, F.A.C., deals with irrigation of public access areas (parks, golf courses, cemeteries, highway medians, etc.), residential properties, and edible food crops. Higher levels of treatment and disinfection are needed for these types of reuse systems. Reclaimed water meeting the requirements of Part III also can be used for toilet flushing, fire protection, aesthetic purposes (such as use in decorative ponds and fountains), sprinkling for construction dust control, and other useful purposes requiring a high quality reclaimed water.

Reuse Feasibility Studies

As noted above, there are several rules, statutes, or laws that require preparation of reuse feasibility studies. This document presents comprehensive requirements for the preparation of reuse feasibility studies by applicants having responsibility for domestic wastewater management.

ALTERNATIVES

Normally, the reuse feasibility study shall identify and evaluate at least the following two alternatives:

1. The "no action" alternative, and
2. implementation of a public access/urban reuse system as described in Part III of Chapter 17-610, F.A.C.

AS described below, there are some circumstances in which one or more additional alternatives may need to be evaluated. In addition, the number of alternatives may be reduced in some cases (for existing reuse systems and for facilities that will be removed from service). All alternatives will be evaluated over a 20-year planning period.

No Action Alternative

This alternative will involve provision of water supply and wastewater management without implementation of additional reuse. If the utility has already implemented reuse, the existing level of reuse will continue, but no future reuse construction will be considered. Population, wastewater flows, and demands for water supply are to be fully considered for the 20-year period.

Reuse Alternative

This alternative will involve implementation of public access/urban reuse systems as described in Part III of Chapter 17-610, F.A.C. Three subalternatives will be considered based on the percentage of the total annual average daily flow in the design year (20 years in the future) that will be reused. The applicant will evaluate the following reuse subalternatives:

1. Maximum Reuse: Over 75 percent of the average annual daily flow of domestic wastewater reused in the-design year.
2. Medium Reuse: 40-75 percent reused.
3. Minimal Reuse: Less than 40 percent reused.

In evaluating this alternative and the three subalternatives, the objective is to identify the optimal level of reuse in the design year. Provisions for phasing implementation of reuse over the 20-year planning horizon should be considered.

Applicants may wish to evaluate the "Maximum Reuse" subalternative first. If this subalternative is found to be feasible and agreeable to the applicant, then the lesser levels of reuse utilization need not be evaluated.

The applicant shall contact the appropriate water management district early in the evaluation process to identify major users of water that could possibly use reclaimed water. Alternatives should be structured toward providing reclaimed water to major users of water or possible concentrations of major users of water. Major users may include golf courses, other institutions using large quantities of water for landscape irrigation, agricultural irrigation (including irrigation of edible crops), industrial users, and others. Irrigation of residential properties should be considered, especially in areas along potential transmission lines running to the major users. Development of dual distribution systems within new residential developments may be more cost-effective than retrofitting existing development.

If technical constraints (such as high chloride concentrations for landscape irrigation) limit the potential for use in a public access irrigation system, additional alternatives must be evaluated. This will include evaluation of an alternative that includes provision of appropriate technology to overcome the constraint (such as partial desalinization or sewer system rehabilitation to control salinity). Other reuse options available under Part III of Chapter 17-610, F.A.C., should be developed and evaluated. In addition, at least one other alternative, as described in the following section, should be evaluated.

Other Alternatives

The applicant may evaluate other reuse options if the applicant desires. As noted in the previous sections, there are some circumstances in which other alternatives may need to be evaluated. Other reuse options may include, but are not limited to,

1. Slow-rate land application systems with restricted public access (systems permitted under Part II of Chapter 17-610, F.A.C.);
2. rapid-rate land application systems (permitted under Part IV of Chapter 17-610, F.A.C.);
3. absorption field systems (permitted under Part V of Chapter 17-610, F.A.C.);

4. slow-rate land application systems using subsurface application systems (defined in Rule 17-610.200(45), F.A.C., and permitted under Part II of Chapter 17-610, F.A.C.); or
5. other reuse activities meeting the "reuse" definition in Chapter 17-610, F.A.C.

Small Wastewater Treatment Facilities (Less Than 0.1 mgd)

The minimum treatment system size requirements in Rule 17-610.451, F.A.C., must be considered in the analysis. Domestic wastewater treatment plants having capacities less than 0.1 mgd cannot make reclaimed water available for irrigation of public access areas. (Note: Some level of public access may be allowed for small systems using subsurface application systems.) For these small systems, the reuse system to be evaluated must be selected from the "Other Alternatives" section.

The reuse feasibility study must evaluate the potential for regionalization of a small treatment facility with other facilities such that a regional facility having a capacity of at least 0.1 mgd would result. These small facilities should evaluate the feasibility of connecting to an existing or planned wastewater treatment facility that makes reclaimed water available for reuse.

If the wastewater treatment facility could be expanded to a capacity of at least 0.1 mgd during the 20-year period of analysis, evaluation of a public access/urban reuse system (permitted under Part III of Chapter 17-610, F.A.C.) should be completed.

Facilities That Will be Removed from Service

A wastewater treatment facility that plans to cease service and be connected to a regional treatment facility may submit an abbreviated reuse feasibility study. The abbreviated study shall include a detailed schedule for the removal of the facility from service along with documentation from the owner of the facility who will provide future treatment service indicating concurrence with the plan to connect to his/her system. Additional reuse feasibility analysis will not be required if the treatment facility conclusively demonstrates that it will be removed from service by the following dates:

1. Treatment facilities located within the Indian River Lagoon Basin must be removed from service by July 1, 1995.
2. All other treatment facilities must be removed from service within five years after submittal of the reuse feasibility report.

Existing Reuse Systems

A wastewater treatment facility that sends its entire flow to a reuse system meeting the definition of "reuse" in Chapter 17-610, F.A.C., may prepare an abbreviated report. The abbreviated report will contain all chapters that are needed for a full report; however, the scope may be limited to assessment of a single "alternative" (continued reliance on the existing reuse system). Chapter 2 of the abbreviated reuse feasibility study report (Existing Conditions) shall assess compliance of the existing system with applicable rules, permit conditions, and ground and surface water quality standards. The alternative, described in Chapter 4 and evaluated in Chapter 5, must address the full 20-year period of analysis. Cost estimates for future modifications, replacement, and expansions shall be included and the appropriate worksheet for evaluation of rates and fees shall be completed. Of course, the owner may choose to evaluate other alternatives.

If the Department of Environmental Regulation concurs that the treatment facility has a reuse system and is in compliance with its permit and applicable rules, no further action will be needed by the wastewater treatment plant permittee. If the system is not a reuse system as defined in Chapters 17-600 and 17-610, F.A.C., the evaluation of alternatives described in this guidance document must be completed. If the facility provides reclaimed water to a legitimate reuse system, but the treatment or reuse system is not in compliance with its permits or applicable rules, the reuse feasibility study shall provide a detailed assessment of needed corrective measures and shall include a schedule for bringing the facilities into full compliance.

Evaluation of Alternatives

As described in the following sections, the feasibility analysis will include evaluation of the net present value, rates and fees, technical feasibility, and environmental impacts of the alternatives.

At the outset, it must be noted that the evaluation of "feasibility" is not to be equated with simply selecting the least cost alternative. The dictionary defines "feasible" as follows:

1. Capable of being done or carried out.
2. Capable of being used or dealt with successfully.

Obviously, the primary definition has no reference to cost or cost-effectiveness. In the secondary definition, some degree of cost consideration perhaps can be implied through the use of the word "successfully." As an example, the objective of placing a man on the moon was deemed to be feasible even though the costs associated with the space program were significantly greater than the cost of the no action alternative.

PRESENT VALUE ANALYSIS

Type of Analysis

Monetary costs and benefits will be identified and summarized as a net present value over the planning period. The analysis will be done for each alternative.

Present Value Calculations

Present value analysis is simply a method that can be used to compare alternatives that involve different cost components that are anticipated to occur at different times. Calculation of the present value for each alternative enables comparison of the costs of all alternatives using an equivalent basis (the present value). All costs anticipated during the planning period will be converted to an equivalent present value in Year 0. The sum of all component present value for an alternative yields the total present value of that alternative.

Table 1 lists the primary factors used in calculating present value. Factors for the interrelationships between uniform annual payments (R) future payments (S), and present value (P) are included. Figure 1 shows the basic relationship between these types of payments.

An example of present value calculations is included at the end of this chapter.

Period of Analysis

The period of analysis will be 20 years. The first year of the analysis (Year 1) should correspond to the year in which initial construction will be completed. This must be within five years of the date of submittal of the reuse feasibility study.

Discount Rate

The discount rate to be used in the analysis will be the current discount rate as developed annually by the federal government. The discount rate is published annually by the U.S. Environmental Protection Agency and by the American Consulting Engineers Council. The discount rate also is published in the Federal Register each December. The discount rate for federal Fiscal Year 1991 (October 1, 1990 - September 30, 1991) was 8.75 percent. The current rate for federal Fiscal Year 1992 (October 1, 1991 - September 30, 1992) is 8.5 percent.

(Revised 11/20/91)

TABLE 1

FACTORS USED IN PRESENT VALUE ANALYSIS

Conversion Factor		Given	To Find
Name	Symbol	Calculated as	
compound amount factor (single payment)	caf'	$(1-i)^n$	S
present worth factor (single payment)	pwf'	$\frac{1}{(1+i)^n}$	P
compound amount factor	Caf	$\frac{(1+i)^n - 1}{i}$	R
sinking fund factor	Sff	$\frac{i}{(1+i)^n - 1}$	S
present worth factor	Pwf	$\frac{(1+i)^n - 1}{i(1+i)^n}$	R
capital recovery factor	Crf	$\frac{i(1+i)^n}{(1+i)^n - 1}$	P

Notes: P = Present value (at Year = 0)

R = Uniform annual payment made in Years 1 through n

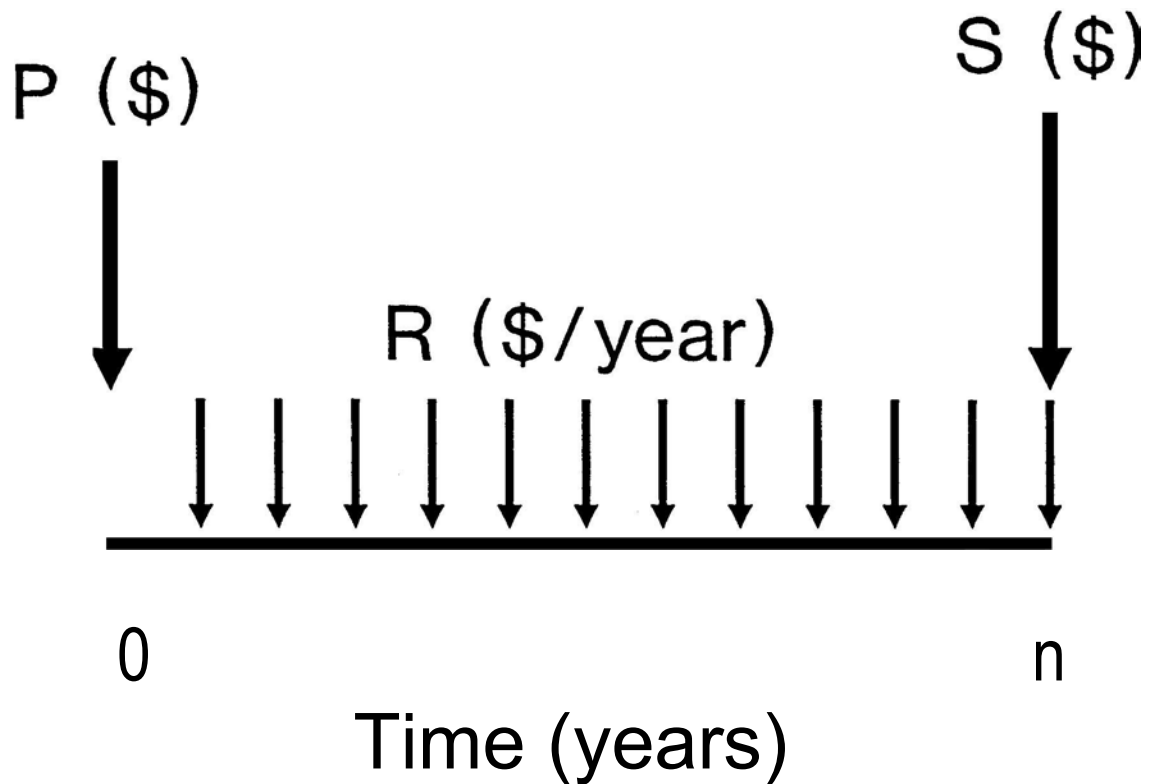
S = Future Value (at end of year n)

i = Discount rate, as a decimal (for example, use 0.10 for 10%)

n = Number of years considered

Figure 1

Present Value Concepts



P = Present value in Year 0

R = Uniform annual payments in
Years 1 through n

S = Future value at end of year n

Costs to be Considered

All costs associated with wastewater management will be considered. Capital construction costs will include the costs of wastewater collection and treatment and reclaimed water transmission to the point of delivery for the end users. Capital construction costs include the actual construction costs plus reasonable levels of other related costs (engineering, legal services, interest during construction, contingencies, etc.). Percentages used for these other related costs shall be identified and justified in the report and shall be consistently applied to all alternatives evaluated. costs of initial construction and future expansions, replacements, and needed upgrades of levels of treatment shall be included.

Reasonable assumptions are to be incorporated into the development and evaluation of alternatives. Levels of wastewater treatment during the 20-year planning period must be reasonable. Assumption of secondary wastewater treatment with surface water discharge as part of the no action alternative probably, is not appropriate in most of the state. The analysis must account for needed expansions and upgrades of levels of service over the entire 20-year planning period.

All wastewater and reclaimed water operation and maintenance costs will be considered.

Utilities Responsible for Water Supply and Wastewater Management

Applicants under the same ownership/control as a public water system may find it advantageous to consider evaluating combined water supply and wastewater management elements if an alternative chosen for evaluation displaces demand on the potable water supply system. Water management districts may require such combined evaluations in designated critical water supply problem areas when considering reuse feasibility evaluations related to consumptive use permit applications. Specifically, the evaluation should address the effect of reduced overall and peak demands on the need to upgrade or construct new water supply facilities during the evaluation period. If the appropriate water management district has not designated a specific supply source for the utility's expansion needs during the evaluation period, the applicant may rely upon its own expansion studies for sources, or the best available data.

Wastewater applicants also evaluating potable water supply costs must include the costs of water withdrawal, treatment, and transmission to the point where the potable water leaves the water treatment plant. Of course, all costs associated with wastewater management and provision of reclaimed water must be included in the analysis.

Sunk Costs

Construction costs of facilities previously constructed or under construction shall be considered as sunk costs and shall not be included in the cost analysis. Of course, all operation and maintenance costs for all existing and future facilities shall be included.

Revenues

Revenues received by the utility to be included in the present value analysis are limited to the following:

1. Estimated revenues from the sale of reclaimed water produced;
2. revenues from the sale of crops produced;
3. revenues from the lease of lands; and
4. revenues from connection fees for reclaimed water service (including any front-end fees directly related to initiation of reclaimed water service).

Revenues from normal user charges, impact fees, and connection fees not specifically associated with reclaimed water service will not be included in the present value analysis.

Salvage Values

The following useful lives will be used for facilities being considered in the present value analysis:

1. Piping - 50 years,
2. structures and concrete/steel tankage - 30 years,
3. process equipment and pumps - 15 years,
4. auxiliary equipment - 10 years, and
5. land - permanent.

The straight line method of depreciation will be used throughout the analysis.

For example, consider a pipeline costing one million dollars in the first year of the analysis. At the end of the 20-year period of analysis, 40 percent of its useful life will have been utilized. The salvage value is 60 percent of the initial capital investment (\$600,000). The salvage value (a revenue) would be shown in the 20th year of the analysis.

All land purchased during the period of analysis will have a salvage value in Year 20 equal to the estimated purchase price.

Replacement

The need to replace existing facilities or facilities anticipated to be constructed as part of the alternative being evaluated shall be considered in the analysis. The useful lives presented in the preceding section shall be used to determine when facilities will require replacement, unless replacement is required earlier to comply with any applicable rules or permit conditions.

Basis of Costs

All costs and revenues should be expressed in current dollars. The basis of costs used shall be clearly stated in the report.

Inflation during the 20-year period of analysis will not be included in the present value analysis.

Documentation of Costs, Revenues, and Assumptions

The basis for all costs, revenues, and assumptions used in developing, describing, and evaluating the alternatives shall be clearly presented. This could be accomplished using a detailed appendix to the reuse feasibility study report.

Water Savings

The analysis will include an evaluation of water saved by implementing the reuse alternatives. This analysis will include estimates of water used by customers of the water utility during each year of the planning period. Estimates of annual water use (other than reclaimed water) by other water users that could be served by reclaimed water, also will be prepared. Projections of total annual water use (other than reclaimed water) under the no action and reuse alternatives will be made. Subtracting the annual water use (other than reclaimed water) associated with a reuse alternative from the water use (other than reclaimed water) for the no action alternative, yields the annual water savings. This water savings will be valued at the average residential rate for potable water charged by the predominant water supply utility within the reuse service area. The average residential potable water rate used shall be justified in the report. The value of this water savings will be included in the analysis as a revenue (benefit) for the reuse alternative.

This method of valuing water savings is proposed solely for preparation of reuse feasibility studies.

Reporting of Present Values

Two present values will be calculated for each alternative and subalternative that is evaluated. First, the total net present value will be calculated for all costs and revenues with the exception of the estimated value of water saved.

Second, an adjusted present value will be calculated that includes the present value of water saved. An example of the calculation of total present value and adjusted present value is included in the next section.

Example Calculation

The following is a hypothetical example that is designed to demonstrate the basic application of present value analysis.

Given:

Initial Capital Investment:	\$3 Million in Year 0
	Useful life = 20 years
Expand facilities:	\$2 Million in Year 10
	Useful life = 20 years
Average annual operation and maintenance (O&M) costs:	
	Years 1-10 = \$500,000/year
	Years 11-20 = \$750,000/year
Planning Parameters:	Planning period = 20 years
	Discount Rate = 10%
	All costs are in 1991 dollars.
Water Savings: Years 1-10:	Reuse will save 0.5 mgd of potable water
Years 11-20:	Reuse will save 1.0 mgd of potable water
Average residential	
	water cost = \$1.00/1,000 gal.

Figure 2 graphically depicts the time sequence of estimated costs.

Determine: Present value of this alternative in 1991 dollars without consideration of the benefit of potable water saved. Repeat the analysis including consideration of the benefit associated with the water savings.

Calculations:

1. Initial capital construction cost = \$3,000,000

Present Value (PV) = \$3,000,000 (already at present value)

2. Capital construction cost of the expansion/upgrade

Cost = \$2,000,000 in Year 10

$$\begin{aligned} \text{PV} &= (\$2,000,000) (\text{pwf}'-10 \text{ yr.}-10\%) \\ &= (\$2,000,000) (0.3855) \\ &= \$771,000 \end{aligned}$$

3. Salvage Value (SV) of initial construction (at end of 20 year period of analysis)

SV = 0 (useful life = 20 years)

4. Salvage Value (SV) of the expansion

$$\begin{aligned} \text{SV} &= \frac{(\text{useful life remaining})(\text{capital construction cost})}{(\text{useful life})} \\ &= \frac{(10 \text{ years})(\$2,000,000)}{(20 \text{ years})} \\ &= \$1,000,000 \text{ (at the end of year 20)} \end{aligned}$$

$$\begin{aligned} \text{PV} &= (\$1,000,000) (\text{pwf}'-20 \text{ yr.}-10\%) \\ &= (\$1,000,000) (0.1486) \\ &= \$149,000 \text{ (note: rounded to nearest \$1,000)} \end{aligned}$$

5. O & M Costs (years 1-10)

$$\begin{aligned} \text{PV} &= (\$500,000) (\text{pwf}-10 \text{ yr.}-10\%) \\ &= (\$500,000) (6.144) \\ &= \$3,072,000 \end{aligned}$$

6. O & M Costs (years 11-20)

$$\begin{aligned} \text{PV} &= (\$750,000) (\text{pwf}-10 \text{ yr.}-10\%) (\text{pwf}'-10 \text{ yr.}-10\%) \\ &= (\$750,000) (6.144) (0.3855) \\ &= \$1,776,000 \text{ (note: rounded to nearest \$1,000)} \end{aligned}$$

7. Total Present Value

$$\begin{aligned} \text{PV (total)} &= \text{PV}_{\text{construction}} + \text{PV}_{\text{O\&M}} - \text{PV}_{\text{salvage}} \\ &= \$3,000,000 + \$771,000 + \$3,072,000 \\ &\quad + \$1,776,000 - \$149,000 \end{aligned}$$

$$\underline{\underline{\text{PV (total)} = \$8,470,000}}$$

8. Benefit of water savings (years 1-10)

$$\begin{aligned}\text{Water saved/yr.} &= (0.5 \text{ mgd}) (365 \text{ days/yr.}) (10^6 \text{ gal/mg}) \\ &= 182,500,000 \text{ gallons/yr.}\end{aligned}$$

$$\begin{aligned}\text{Value} &= 182,500,000 \text{ gal/yr. @ } \$1.00/1000 \text{ gal} \\ &= \$182,500/\text{yr.}\end{aligned}$$

$$\begin{aligned}\text{PV} &= (\$182,500) (6.144) \\ &= \$1,121,000 \text{ (note: rounded to nearest } \$1,000)\end{aligned}$$

9. Benefit of water savings (years 11-20)

$$\begin{aligned}\text{Water saved/yr.} &= (1.0 \text{ mgd}) (365 \text{ days/yr}) (10^6 \text{ gal/mg}) \\ &= 365,000,000 \text{ gal/yr.}\end{aligned}$$

$$\begin{aligned}\text{Value} &= 365,000,000 \text{ gal/yr. @ } \$1.00/1,000 \text{ gal} \\ &= \$365,000/\text{yr.}\end{aligned}$$

$$\begin{aligned}\text{PV} &= (\$365,000) (\text{pwf}-10 \text{ yr.}-10\%) (\text{pwf}'-10 \text{ yr.}-10\%) \\ &= (\$365,000) (6.144) (0.3855) \\ &= \$865,000 \text{ (note: rounded to nearest } \$1,000)\end{aligned}$$

10. Total benefit of water savings (at present value)

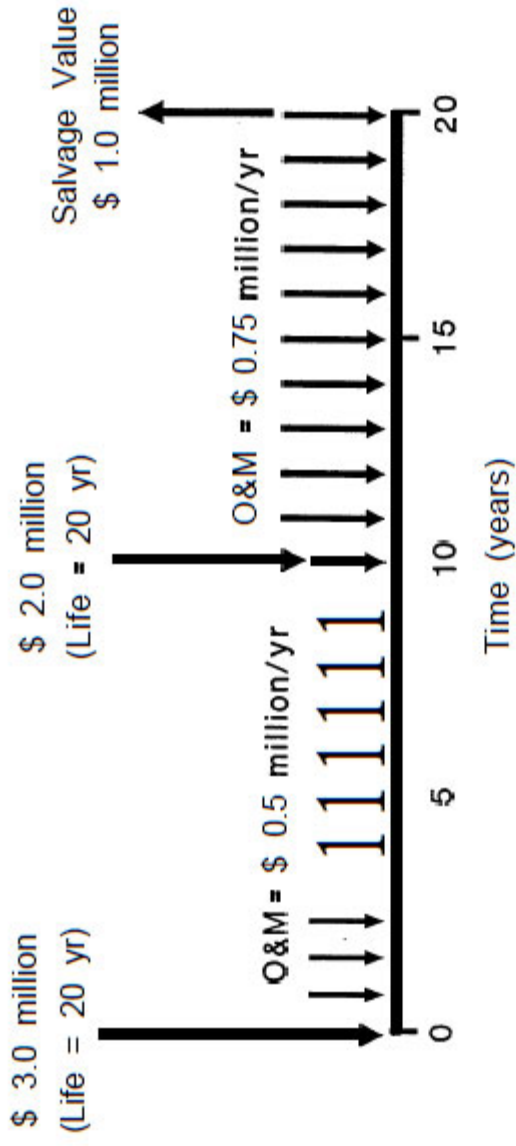
$$\begin{aligned}\text{PV (water saved)} &= \$1,121,000 + \$865,000 \\ &= \$1,986,000\end{aligned}$$

11. Adjusted Present Value

$$\begin{aligned}\text{PV (adjusted)} &= \text{PV (total)} - \text{PV (water saved)} \\ &= \$8,470,000 - \$1,986,000\end{aligned}$$

$$\underline{\underline{\text{PV (adjusted)} = \$6,484,000}}$$

Figure 2
Present Value Example



$n = 20$ years

$i = 10\%$

EVALUATION OF RATES AND FEES

As part of the feasibility analysis, the applicant shall evaluate the effects of the alternatives considered on rates, fees, and user charges. The worksheet to be used for publicly owned utilities is included in Appendix A. The worksheet for privately owned utilities is in Appendix B. The appropriate worksheet should be completed for each alternative and subalternative evaluated. The completed worksheets should be included in an appendix to the reuse feasibility study report. The results showing user charges, connection/impact fees, and charges for sale of reclaimed water should be summarized in the feasibility study report for all alternatives considered, including the no action alternative.

Expenses and revenues are to be estimated for Years 1, 5, 10, 15 and 20 of the 20-year planning period established for the present value analysis. All costs and revenues considered in the present value analysis should be reflected in the evaluation of rates and fees. Salvage values and the value of water saved will not be included in the evaluation of rates and fees.

Debt Service Calculations for Public Utilities

The previous chapter described the requirements for the present value analysis. This included use of a specified discount rate and the 20-year planning horizon for calculating present value.

In estimating annual expenses for debt service as part of the evaluation of rates and fees, the applicant must use the anticipated borrowing period (term of the loan) and interest rate that would be charged on a loan or bond issue. Total capital construction costs should be reduced by the amount of any grants or other front-end funds (such as property tax revenues, prepaid connection fees and betterment assessments, local funds/reserves available for the project, etc.) that can reasonably be expected to be available to reduce the amount to be financed.

Rates and Fees

The worksheets in the Appendices request information on anticipated expenses and revenues. Estimates of projected revenues from sales of reclaimed water, and from user fees and connection/impact fees are needed. Estimates of future unit rates and fees in terms of dollars/month/household, dollars/new connection, or dollars/1000 gallons are needed. Establishment of these unit rates and fees is an iterative process designed to ensure that projected total revenues equal or exceed total expenses. Costs should be allocated equitably and reasonably between wastewater customers and users of reclaimed water.

REUSE BENEFITS

Benefits associated with implementation of reuse projects shall be fully discussed in the report. The discussion of benefits associated with reuse shall include, but not limited to the following:

1. The public "good" associated with reuse (i.e., meeting a state objective).
2. The ability to conserve potable quality water. Sources of water saved should be discussed. This discussion should include identification of aquifers or surface waters from which withdrawals will be reduced and evaluations of stress impacts that may be mitigated by these reductions in withdrawals.
3. Conservation of water may postpone future expansions of water supply facilities and development of new sources of water.
4. The ability to recharge aquifers.
5. Provision of a water supply that will not be subject to restrictions during future droughts.
6. Improvement in surface water quality resulting from elimination of effluent discharge.
7. Fertilizer savings recognizing the nutrient content of reclaimed water used for landscape or agricultural irrigation.
8. Other benefits associated with reuse.

Discussion of benefits should be detailed and as quantitative as possible.

TECHNICAL FEASIBILITY

Each alternative must be evaluated in terms of its technical feasibility. A detailed discussion is to be included in the reuse feasibility study report. Technical problems or constraints that could render an alternative as being "technically infeasible" must be identified, evaluated, and discussed. Technical solutions must be included in the analysis. For example, a high chloride concentration in the reclaimed water may make landscape or agricultural irrigation using reclaimed water infeasible. However, chlorides could be controlled by partial desalination of the reclaimed water, or by rehabilitation of the sewer system to reduce infiltration of high-chloride ground water in coastal areas. Provisions of technical solutions should be evaluated and incorporated into the alternatives considered (including the associated costs).

Also, where technical problems or constraints exist, other alternatives should be developed and evaluated. A wide range of reuse activities can be developed and permitted under the provisions of Part III of Chapter 17-610, F.A.C. In addition, other types of reuse systems described in other parts of Chapter 17-610, F.A.C., may not be subject to the technical constraints identified and may be implementable.

Technical problems or constraints typically can be overcome. Of course, additional costs may be incurred. Such costs should be estimated and included in the analysis. Generalizations about technical infeasibility should be avoided. General claims, such as the following, should be avoided:

1. "High chloride concentrations makes reuse infeasible."
2. "There is no guarantee that any one will want to irrigate using reclaimed water."
3. "Reuse is prohibitively expensive."
4. "The ground water table is too high."
5. "Guidelines on allocation of costs are not available."
6. "The liability and risk associated with reuse are too large."

The 1990 Reuse Inventory identified about 200 treatment facilities that provide reclaimed water for one or more reuse activities. Obviously, reuse is an implementable and popular alternative to discharge and disposal of a valuable water resource.

REPORT OUTLINE

Table 2 presents the outline to be used for preparing the reuse feasibility study report. The following sections discuss the contents of the report.

Chanter I - Introduction

The introduction should include a detailed statement of the purpose of the reuse feasibility evaluation. If applicable, the statutory or rule requirement for preparation of the reuse feasibility study should be identified.

Chapter 2 - Existing Conditions

This chapter will be a detailed assessment of the current situation. The geographic area to be covered should include the existing service area as well as areas that are anticipated to be served by wastewater management facilities and reuse facilities in the alternatives that will be evaluated. This chapter will be divided into four subsections discussing general characteristics, existing wastewater management facilities, water supply and distribution facilities, and existing reuse facilities.

General Conditions - This section will provide a discussion of the existing environment within areas included in the current and future service areas. This will include current land use, identification of applicable flood plains, wetlands, and high recharge areas. Surface and ground waters; which are affected by water withdrawals, effluent discharge, or by reuse activities; should be fully described and characterized. Historical population trends should be presented.

Wastewater Management - The existing service areas for wastewater management should be delineated. Existing domestic wastewater facilities should be located and described. The description should include physical condition, age, levels of treatment, capacities, and effluent quality. This should include assessment of collection systems, treatment facilities, transmission facilities, discharge facilities, and residuals management facilities. Historical trends for wastewater flow should be included.

Water Supply - The service areas for provision of potable water supply should be identified. Historical trends for demand for water should be provided. Existing well fields, treatment, and storage facilities should be identified. Sources of water used should be discussed. Major users of water, including, but not limited to, golf courses, industrial installations, and power plants should be located. The average rate (user charges) for provision of potable water to residential customers within the service area must be identified. Information provided should be consistent with the water management district's needs and sources report.

Reuse Facilities - If reuse projects have been implemented, the reuse service areas shall be identified and facilities described. Facilities' descriptions shall include location, age, capacity, current flows and demands, and reclaimed water quality. Historical trends for use and demand for reclaimed water shall be presented. Current users of reclaimed water should be identified and flows presented. Current fees for use of reclaimed water shall be shown.

Chapter 3 - Future Conditions

This chapter will present the basic Constraints on planning for wastewater management and reuse in the area. Projections are needed for the entire 20-year planning period and must be consistent with the local comprehensive plan. This chapter will be subdivided into the same four sections used to describe existing conditions in Chapter 2.

General Conditions - This section will contain population and land use projections for the existing and projected service area throughout the 20-year planning period.

Wastewater Management - This section will include detailed flow projections for domestic wastewater within the projected service area. Projections are to be included as to when existing facilities will need expansion or upgrade. Constraints on wastewater management, particularly surface water discharge, should be clearly identified in consultation with the Department of Environmental Regulation. Limitations on quantities that can be discharged to surface streams as well as effluent quality limitations should be assessed.

Water Supply - This section shall include projections of demand for water supply and the sources of water anticipated to be used.

Reuse Facilities - Possible future users of reclaimed water should be identified and projections of potential water use should be made. This should be done in concert with the appropriate water management district. Current plans for expansion of existing reuse systems or implementation of new reuse systems should be identified.

Chapter 4 - Description of Alternatives Considered

The alternatives evaluated shall be presented and described. Guidance for development of alternatives was presented in a previous section of this guidance document dealing with alternatives. For the no action and reuse alternatives considered, maps showing service areas and locations of major reclaimed water distribution lines shall be provided. New wastewater management facilities should be located. Major users of reclaimed water as well as areas where residential irrigation will be practiced should be identified.

Chapter 5 - Evaluation of Alternatives

This chapter will contain a detailed evaluation of all alternatives considered (including no action and various reuse alternatives). The chapter will be subdivided into four subsections as described below. Each alternative will be discussed in detail within each of these sections.

Present Value Analysis - A detailed present value analysis will be completed and presented for each alternative. All data and assumptions used in the analysis shall be clearly presented. Detailed data may be included as an appendix. A listing of all costs and revenues, and the time when experienced shall be included. The initial present value will be calculated with no consideration given to the benefit associated with water savings related to reuse projects. An adjusted present value will then be calculated that also considers the value of water saved.

Evaluation of Rates and Fees - An evaluation of impact on rates and fees will be completed for each alternative evaluated (including the no action alternative). Worksheets will be completed for each alternative and should be included as an appendix to the reuse feasibility study report.

Technical Feasibility - A detailed evaluation of the technical feasibility of each alternative will be included in this section. Technical problems and constraints and proposed methods to overcome problems and constraints will be identified and discussed.

Environmental Assessment - This section will contain an assessment of the environmental impacts associated with the implementation of each alternative. This will address impacts on the physical, biological, and socioeconomic environments within the study area. Both the construction phase as well as project implementation shall be addressed. Detailed narratives discussing the benefits associated with reuse will be presented. Each alternative considered will be discussed in detail.

Chapter 6 - Summary and Conclusions

The pros and cons of each alternative considered will be summarized. Summary tables of the results of the present value analysis (with and without consideration of the value of water saved) and the results of the evaluation of rates and fees shall be presented. Narrative discussion should be provided for each alternative considered.

List of References

A detailed bibliographical listing of the sources and information used throughout the document should be presented. Throughout the text of the report, references to this list must be made so the reviewer can identify the sources of costs and other information used in the analysis.

Appendices

All information needed to support all costs, revenues, capacities, calculations, constraints, etc., should be incorporated as one or more appendix to the report. The worksheets for evaluation of rates and fees for each alternative should be included as an appendix. Other appendices may be included, as appropriate.

Utilities should include an appendix that provides support for proposed capital improvement costs and increases (or decreases) in revenues and expenses. An explanation of the system of accounts used should be included for private utilities.

Abbreviated Report

There are some circumstances under which a complete reuse feasibility study report is not required. Owners of treatment facilities that currently make reclaimed water available for reuse may prepare an abbreviated report. Owners of treatment facilities that will be removed from service also may prepare an abbreviated report. The following sections provide details on when an abbreviated report is acceptable, and on the content and format of the abbreviated report.

Existing Reuse Systems - A wastewater treatment facility that sends its entire flow to a reuse system meeting the definition of "reuse" in Chapter 17-610, F.A.C., may prepare an abbreviated report. The abbreviated report will contain all chapters that are needed for a complete report; however, the scope may be limited to assessment of a single "alternative" (continued reliance on the existing reuse system). Chapter 2 (Existing Conditions) shall assess compliance of the existing system with applicable rules, permit conditions, and ground and surface water quality standards. The alternative, described in Chapter 4 and evaluated in Chapter 5, must address the full 20-year period of analysis. Cost estimates for future modifications, replacements, and expansions shall be included and the appropriated worksheet for evaluation of rates and fees shall be completed. Of course, the owner may choose to evaluate other alternatives.

If the Department of Environmental Regulation concurs that the treatment facility has a reuse system and is in compliance with its permit and applicable rules, no further action will be needed by the wastewater treatment plant permittee. If the system is not a reuse system as defined in Chapters 17-600 and 17-610, F.A.C., the evaluation of alternatives described in this guidance document must be completed. If the facility provides reclaimed water to a legitimate reuse system, but the treatment or reuse system is not in compliance with its permits, applicable rules, or ground and surface water quality standards, the reuse feasibility study shall provide a detailed assessment of needed corrective measures and shall include a schedule for bringing the facilities into full compliance.

Facilities That Will be Removed from Service - The owner of a wastewater treatment facility who plans to cease service and have his/her facility connected to a regional treatment facility may submit an abbreviated reuse feasibility study. The abbreviated study shall include a detailed schedule for the removal of the facility from service, along with documentation from the owner of the facility who will provide future treatment service indicating concurrence with the plan to connect to his/her wastewater treatment facility. Additional reuse feasibility analysis will not be required if the owner of the treatment facility to be removed from service conclusively demonstrates that the facility will be removed from service by the following dates:

1. Treatment facilities located within the Indian River Lagoon Basin must be removed from service by July 1, 1995.
2. All other treatment facilities must be removed from service within five years after submittal of the reuse feasibility report.

TABLE 2

REUSE FEASIBILITY STUDY REPORT OUTLINE

- A. Chapter 1 - Introduction
 - 1. Purpose
- B. Chapter 2 - Existing Conditions
 - 1. General Description
 - 2. Wastewater Management
 - 3. Water Supply
 - 4. Reuse Facilities
- C. Chapter 3 - Future Conditions
 - 1. General Description
 - 2. Wastewater Management
 - 3. Water Supply
 - 3. Reuse Facilities
- D. Chapter 4 - Description of Alternatives Considered
 - 1. No Action
 - 2. Public Access Reuse Systems
 - a. Maximum Reuse
 - b. Medium Reuse
 - c. Minimal Reuse
 - 3. Other Reuse Alternatives (as needed)
- E. Chapter 5 - Evaluation of Alternatives
 - 1. Present Value Analysis
 - a. No Action Alternative
 - b. Public Access Reuse Alternatives
 - (1) Maximum Reuse
 - (2) Medium Reuse
 - (3) Minimal Reuse
 - c. Other Reuse Alternatives (as needed)

TABLE 2 (continued)

2. Evaluation of Rates and Fees
 - a. No Action Alternative
 - b. Public Access Reuse Alternatives
 - (1) Maximum Reuse
 - (2) Medium Reuse
 - (3) Minimal Reuse
 - c. Other Reuse Alternatives (as needed)
 3. Technical Feasibility
 - a. No Action Alternative
 - b. Public Access Reuse Alternative
 - (1) Maximum Reuse
 - (2) Medium Reuse
 - (3) Minimal Reuse
 - c. Other Reuse Alternatives (as needed)
 4. Environmental Assessment
 - a. No Action Alternative
 - b. Public Access Reuse Alternative
 - (1) Maximum Reuse
 - (2) Medium Reuse
 - (3) Minimal Reuse
 - c. Other Reuse Alternatives (as needed)
 - d. Include construction-related and operation-related impacts on physical, biological, and socioeconomic environment.
 - e. Detailed discussion of the benefits of reuse.
- F. Chapter 6 - Summary and Conclusions
- G. References
1. Listing of sources of information used
 2. Throughout text, references to this list of sources must be made such that the reviewer can identify where costs and other information used in the analysis were drawn from

TABLE 2 (continued)

H. Appendices

1. Narrative and detailed tables to support all projected capital construction costs, revenues, expenses, capacities, calculations, constraints, etc.
2. Evaluation of Rates and Fees Worksheets for all alternatives.
3. Description of system of accounts used (for private utilities).

APPENDIX A

Worksheet for Evaluation of Rates and Fees for Public Utilities

Use it Again, Florida!

**WORKSHEET FOR EVALUATION OF RATES AND FEES
FOR PUBLIC UTILITIES**

Applicant: _____

Date: _____

Alternative: _____

This form provides for complete evaluation of costs to be incurred and revenues generated by the wastewater management system. This form is to be completed for each alternative and subalternative evaluated.

A. Household Median Annual Income, Average Household Size, Number in the Service Area, and Population to be Served.

Population to be served is determined by the number of households multiplied by the household size. This data should be consistent with local comprehensive plan projections.

	Year 1	Year 5	Year 10	Year 15	Year 20
1. Enter calendar year that corresponds with Years 1, 5, 10, 15, and 20 of the analysis	()	()	()	()	()
2. Median household income (\$/year)	_____	_____	_____	_____	_____
3. Average household size (people/household)	_____	_____	_____	_____	_____
4. Number of households served by the sewerage system	_____	_____	_____	_____	_____
5. Served population (people) [multiply Line 3 by Line 4]	_____	_____	_____	_____	_____
6. Total number of homes served by reclaimed water	_____	_____	_____	_____	_____

B. Capital Construction Costs and Amounts to be Financed

In this block list all capital construction costs to be incurred by the wastewater system/utility. This should correspond directly to the costs included in the net present value analysis as described in another section of this document. List anticipated grants and other front-end sources of funds (property tax revenues, prepaid connection fees and betterment assessments, local funds/reserves available for the project, etc.) to be used to reduce the amount to be borrowed.

<u>Year</u>	<u>Project Description</u>	<u>Total Capital Construction Costs (\$)</u>	<u>Anticipated Grants and other front-end funds (\$)</u>	<u>Describe sources of Grants and other front-end funds</u>	<u>Capital Construction costs (\$) to be Financed</u>
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____
7.	_____	_____	_____	_____	_____
8.	_____	_____	_____	_____	_____
9.	_____	_____	_____	_____	_____
10.	_____	_____	_____	_____	_____
Totals (\$)		_____	_____	_____	_____

C. Financing of Capital Construction Costs

In this block, indicate what type of financing will be used (revenue bonds, general obligation bonds, etc.). Lines in this table should correspond to the lines in Block B and the costs to be financed are to agree with information in Block B. The interest rate and term (bonding period or loan period) should reflect the type of financing to be used.

Year	Description	Capital		Financing		
		Construction Costs (\$) to Be Financed	Type	Annual Interest Rate (%)	Term (yrs)	Annual Debt Service (\$/yr)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
Total (\$)						

D. Debt Service Schedule

The annual debt service shown in Block C should be distributed across the 20-year planning period. Lines in this table should correspond to lines in Blocks B and C. Be sure to show the debt service for each project (from BLock C) only in the appropriate years. For example, facilities to be constructed in Year 12 of the analysis and financed over 20 years, would have the debt service would be shown only for years 15 and 20.

	Description	Debt Service (\$/yr)				
		Year 1	Year 5	Year 10	Year 15	Year 20
1.	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____	_____
7.	_____	_____	_____	_____	_____	_____
8.	_____	_____	_____	_____	_____	_____
9.	_____	_____	_____	_____	_____	_____
10.	_____	_____	_____	_____	_____	_____
	Totals (\$)	_____	_____	_____	_____	_____

E. Other Anticipated Debt which will be Repaid from Operations of the Wastewater System/Utility.

Please show the debt service associated with other anticipated debt only in appropriate years (those within the term of the loan or bond issue).

	Description	Debt Amount (\$)	Annual Interest Rate (%)	Annual Debt Service (\$/yr)				
				Year 1	Year 5	Year 10	Year 15	Year 20
1.	_____	_____	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____	_____	_____
	Totals (\$)	_____	_____	_____	_____	_____	_____	_____

F. Existing Debt for the Wastewater System/Utility

Please show debt service associated with outstanding Loans or bond issues only in appropriate years (those within the term of the loan or bond issue).

	Description	Current Debt Amount (\$)	Annual Interest Rate (%)	Annual Debt Service (\$/yr)				
				Year 1	Year 5	Year 10	Year 15	Year 20
1.	_____	_____	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____	_____	_____
	Totals (\$)	_____	_____	_____	_____	_____	_____	_____

G. Annual Expenses for the Wastewater System/Utility.

Please enter annual expenses for operation and maintenance, depreciation and amortization, and taxes (other than income). Do not include debt service or expenses that are reported elsewhere in Blocks D, E, F, and H.

1. Existing facilities

Expense Category	Expenses (\$/yr)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Operating and Maintenance	_____	_____	_____	_____	_____
Depreciation and Amortization	_____	_____	_____	_____	_____
Taxes Other Than Income	_____	_____	_____	_____	_____
Totals (\$)	_____	_____	_____	_____	_____

2. Proposed facilities associated with this alternative

Expense Category	Expenses (\$/yr)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Operating and Maintenance	_____	_____	_____	_____	_____
Depreciation and Amortization	_____	_____	_____	_____	_____
Taxes Other Than Income	_____	_____	_____	_____	_____
Totals (\$)	_____	_____	_____	_____	_____

2. All existing and planned facilities (Total of 1 and 2 above)

Expense Category	Expenses (\$/yr)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Operating and Maintenance	_____	_____	_____	_____	_____
Depreciation and Amortization	_____	_____	_____	_____	_____
Taxes Other Than Income	_____	_____	_____	_____	_____
Totals (\$)	_____	_____	_____	_____	_____

H. Other Expenses

Please list and describe any other expenses to be incurred by the wastewater system/utility during this 20-year period.

Description	Annual Debt Service (\$/yr)				
	Year 1	Year 5	Year 10	Year 15	Year 20
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____
Totals (\$)	_____	_____	_____	_____	_____

I. Total Expenses

Total expenses shown in Blocks D, E, F, G, and H.

	Year 1	Year 5	Year 10	Year 15	Year 20
Total Expenses (\$)	_____	_____	_____	_____	_____

J. Reclaimed Water Connection Fees

Include in this block connection fees or impact fees to be obtained as major users and residential customers are added to the reclaimed water system. Do not include contributions from major users that were previously used to offset capital construction costs.

Description	Year 1	Year 5	Year 10	Year 15	Year 20
1. Number of new residential connections (connections/yr)	_____	_____	_____	_____	_____
2. Residential connection/impact fees (\$/connection)	_____	_____	_____	_____	_____
3. Revenue from residential connections (\$/yr) [multiply Line 1 by Line 2]	_____	_____	_____	_____	_____
4. Number of new major users (connections/yr)	_____	_____	_____	_____	_____
5. Revenues from connection fees from major users (\$/yr)	_____	_____	_____	_____	_____
6. Average major user connection fee (\$/connection)	_____	_____	_____	_____	_____
7. Total revenues from connection fees (\$/yr) [add Line 3 and Line 5]	_____	_____	_____	_____	_____

K. Revenues From Sale of Reclaimed Water

Included are anticipated revenues from the sale of reclaimed water in this block. Estimates should be realistic and conservative.

Description	Year 1	Year 5	Year 10	Year 15	Year 20
1. Sales to major users (1,000 gal/yr)	_____	_____	_____	_____	_____
2. Revenue from sales to major users (\$/yr)	_____	_____	_____	_____	_____
3. Average sale price to major users (\$/1,000 gal) [divide Line 2 by Line 1]	_____	_____	_____	_____	_____
4. Sales to residential customers (1,000 gal/yr)	_____	_____	_____	_____	_____
5. Revenues from sale to residential (\$/yr)	_____	_____	_____	_____	_____
6. Average price for residential service (\$/1,000 gal) [divide Line 5 by Line 4]	_____	_____	_____	_____	_____
7. Total revenue from sale of reclaimed water (\$/yr) [add Line 2 and Line 5]	_____	_____	_____	_____	_____

L. Wastewater Connection Fees

Include connection fees, impact fees, and related one-time assessments associated with provision of wastewater management services.

Description	Year 1	Year 5	Year 10	Year 15	Year 20
1. Total connection/impact fees for non-residential customers to be collected (\$/yr)	_____	_____	_____	_____	_____
2. Number of new non-residential connections (connections/yr)	_____	_____	_____	_____	_____
3. Average connection/impact fees for non-residential Customers (\$/connection) [divide Line 1 by Line 2]	_____	_____	_____	_____	_____
4. Number of new residential connections (connections/yr)	_____	_____	_____	_____	_____
5. Residential connection/impact fee (\$/connection)	_____	_____	_____	_____	_____
6. Residential connection fees collected (\$/yr) [multiply Line 4 by Line 5]	_____	_____	_____	_____	_____
7. Total revenues from connection fees [add Line 1 and 6]	_____	_____	_____	_____	_____

M. Wastewater User Fees		Year 1	Year 5	Year 10	Year 15	Year 20
Description						
1.	Revenue from wastewater user/service charges for Non-residential customers (\$/yr)					
2.	Wastewater from non-residential customers that is treated (1,000 gal/yr)					
3.	Average user charge for non-residential customers (\$/1,000 gal) [divide Line 1 by Line 2]					
4.	Number of households served [must agree with Line A4]					
5.	Revenue from residential user/service charges (\$/yr)					
6.	Average monthly residential user/service charge (\$/month/household) [divide Line 5 by Line 4 by 12]					
7.	Total revenues from wastewater user/service charges (\$/yr) [add Line 1 and Line 5]					

N. Other Revenues

Please List other sources of revenues anticipated to be received by the wastewater system/utility.

	Description	Other Revenue (\$/yr)				
		Year 1	Year 5	Year 10	Year 15	Year 20
1.	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____
	Totals (\$)	_____	_____	_____	_____	_____
0.	Total Revenues	_____	_____	_____	_____	_____

Please add the totals from Blocks J, K, L, M, and N to obtain total revenue to be received by the system.

	Year 1	Year 5	Year 10	Year 15	Year 20
Total Revenue (\$/yr)	_____	_____	_____	_____	_____
Total Surplus or Deficit	_____	_____	_____	_____	_____

P. Total Surplus or Deficit

The total costs shown in Block I are to be subtracted from the total revenues shown in Block O. The results for Years 1, 5, 10, 15, and 20 should be entered on line 1 if a surplus is indicated (revenues exceed expenses) or on Line 2 if a deficit is indicated (expenses exceed revenues).

	Year 1	Year 5	Year 10	Year 15	Year 20
1. Surplus (\$/yr)	_____	_____	_____	_____	_____
2. Deficit (\$/yr)	(_____)	(_____)	(_____)	(_____)	(_____)

Q. Existing Fees and Charges

Please identify existing fees and charges for connection and sale of reclaimed water, as well as user charges for wastewater services.

1. Wastewater user charges

- a. Residential user charge \$ _____/month/household
 - b. Average residential connection fee \$ _____
 - c. Average residential impact fee \$ _____
 - d. Average user charge for non-residential customers \$ _____/1,000 gallons
 - e. Non-residential customers connection/impact fees \$ _____
1. Sale of reclaimed water
- a. Residential user charge \$ _____/month/household or \$ _____/1,000 gallons
 - b. Initial connection fees for residential users \$ _____
 - c. User charges for non-residential customers \$ _____/1,000 gallons
 - d. Connection fees for non-residential customers \$ _____

R. Summary of proposed fees and charges

1. Wastewater user charges

	<u>Year 1</u>	<u>Year 5</u>	<u>Year 10</u>	<u>Year 15</u>	<u>Year 20</u>
a. Residential user charge (\$/month/household) [from Line M6]	_____	_____	_____	_____	_____
b. Average residential connection/impact fees (\$) [from Line L5]	_____	_____	_____	_____	_____
c. Average user charge for non-residential customers (\$/1,000 gallons) [from Line M3]	_____	_____	_____	_____	_____
d. Non-residential customers connection/impact fees (\$) [from Line L3]	_____	_____	_____	_____	_____
1. Sale of reclaimed water					
	<u>Year 1</u>	<u>Year 5</u>	<u>Year 10</u>	<u>Year 15</u>	<u>Year 20</u>
a. Residential user charge (\$/1,000 gallons) [from Line K6]	_____	_____	_____	_____	_____
b. Initial connection fees for residential customers (\$) [from Line J2]	_____	_____	_____	_____	_____
c. User charges for non-residential customers (\$/1,000 gallons) [from Line K3]	_____	_____	_____	_____	_____
d. Connection fees for non-residential customers (\$) [from Line J6]	_____	_____	_____	_____	_____

APPENDIX B

Worksheet for Evaluation of Rates and Fees for Private Utilities

Use it Again, Florida!

**WORKSHEET FOR EVALUATION OF RATES AND FEES
FOR PRIVATE UTILITIES**

Applicant: _____
 Date: _____
 Alternative: _____

This form provides for complete evaluation of costs to be incurred and revenues generated by the wastewater management system. This form is to be completed for each alternative and subalternative evaluated.

A. Household Median Annual Income, Average Household Size, Number in the Service Area, and Population to be Served.

Population to be served is determined by the number of households multiplied by the household size. This data should be consistent with local comprehensive plan projections.

	Year 1	Year 5	Year 10	Year 15	Year 20
1. Enter calendar year that corresponds with Years 1, 5, 10, 15, and 20 of the analysis	()	()	()	()	()
2. Median household income (\$/year)	_____	_____	_____	_____	_____
3. Average household size (people/household)	_____	_____	_____	_____	_____
4. Number of households served by the sewerage system	_____	_____	_____	_____	_____
5. Serviced population (people) [multiply Line 3 by Line 4]	_____	_____	_____	_____	_____
6. Total number of homes served by reclaimed water	_____	_____	_____	_____	_____

B. Existing Assets and Accumulated Depreciation

Identify all existing assets and the associated accumulated depreciation. Assets may be grouped by account type. An explanation of the system of accounts should be included in the appendix.

	<u>Description</u>	<u>Amount (\$)</u>	<u>Accumulated Depreciation (\$)</u>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
	Total (\$)	_____	_____

C. Existing Contributions in Aid of Construction (CIAC) and Accumulated Amortization

1. What is the current balance of CIAC? \$ _____
2. What is the current accumulated amortization? \$ _____

D. Existing Debt and Equity

1. Provide current balances of all existing long and short term debt, the year the debt was incurred, the interest rate, and the maturity date.

	Debt	Amount (\$)	Origination Date	Maturity Date	Annual Interest Rate (%)
a.	_____	_____	_____	_____	_____
b.	_____	_____	_____	_____	_____
c.	_____	_____	_____	_____	_____
d.	_____	_____	_____	_____	_____
e.	_____	_____	_____	_____	_____
	Total (\$)	_____			

2. Provide current balances of equity, the Last authorized rate of return on equity (if available), and the source of the authorization.

	Equity	Amount (\$)	Authorized Return of Equity (%)	Source of Authorization
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
	Total (\$)	_____		

E. Proposed Capital Construction Costs and Financing

In this block, list all capital construction costs to be incurred by the wastewater system/utility. This should correspond directly to the cost included in the net present value analysis as described in another section of this document. Indicate what type of financing will be used (revenue bonds, general obligation bonds, etc.). The interest rate and term (bonding period or loan period) should reflect the type of financing to be used.

Year	Description	Total Capital Construction Costs (\$)	Capital Construction Costs (\$) to be Financed	Financing		
				Type	Rate (%)	Term (yrs)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
Totals (\$)						

F. Other Anticipated Debt which will be Repaid from Operations of the Wastewater System/Utility.

	Description	Debt Amount (\$)	Annual Interest Rate (%)	Term (yrs)
1.				
2.				
3.				
4.				
	Totals (\$)			

G. Identify the projected annual expenses for the wastewater system/utility. All increases (or decreases) should be described in a narrative and attached as an appendix.

1. Existing facilities

Expense Category	Expenses (\$/yr)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Operating and Maintenance					
Depreciation and Amortization					
Taxes Other Than Income					
Income Taxes					
Totals					

2. Proposed facilities associated with this alternative

Expense Category	Expenses (\$/yr)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Operating and Maintenance					
Depreciation and Amortization					
Taxes Other Than Income					
Income Taxes					
Totals					

3. All existing and planned facilities (Total of 1 and 2 above)

Expense Category	Expenses (\$/yr)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Operating and Maintenance	_____	_____	_____	_____	_____
Depreciation and Amortization	_____	_____	_____	_____	_____
Taxes Other Than Income	_____	_____	_____	_____	_____
Income Taxes	_____	_____	_____	_____	_____
Totals	_____	_____	_____	_____	_____

H. Other Expenses

Please list any other expenses to be incurred by the wastewater system/utility during this 20-year period.

Description	Expenses (\$/yr)				
	Year 1	Year 5	Year 10	Year 15	Year 20
1. _____	_____	_____	_____	_____	_____
2. _____	_____	_____	_____	_____	_____
3. _____	_____	_____	_____	_____	_____
4. _____	_____	_____	_____	_____	_____
5. _____	_____	_____	_____	_____	_____
Totals (\$)	_____	_____	_____	_____	_____

I. Total Expenses

Total expenses shown in Blocks G and H.

	Year 1	Year 5	Year 10	Year 15	Year 20
Total Expenses (\$)	_____	_____	_____	_____	_____

J. Reclaimed Water Connection Fees and Property Contributions

Include in this block connection fees or impact fees and property contributions to be obtained as major users and residential customers are added to the reclaimed water system.

Description	Year 1	Year 5	Year 10	Year 15	Year 20
1. Number of new equivalent residential connections (ERCs/yr)	_____	_____	_____	_____	_____
2. Residential connection/impact fees and property contributions (\$/ERC)	_____	_____	_____	_____	_____
3. Total residential connection fees and property contributions (\$/yr) [multiply Line 1 by Line 2]	_____	_____	_____	_____	_____
4. Number of new major users (ERCs/yr)	_____	_____	_____	_____	_____
5. Total connection fees and property contributions from major users (\$/yr)	_____	_____	_____	_____	_____
6. Average major user connection fee and property Contributions (\$/ERC) [divide Line 5 by Line 4]	_____	_____	_____	_____	_____
7. Total connection fees and property contributions (\$/yr) [add Line 3 and Line 5]	_____	_____	_____	_____	_____

K. Revenues From Sale of Reclaimed Water

Include anticipated revenues from the sale of reclaimed water in this block. Estimates should be realistic and conservative.

Description	Year 1	Year 5	Year 10	Year 15	Year 20
1. Sales to major users (1,000 gal/yr)	_____	_____	_____	_____	_____
2. Revenue from sales to major users (\$/yr)	_____	_____	_____	_____	_____
3. Average sale price to major users (\$/1,000 gal) [divide Line 2 by Line 1]	_____	_____	_____	_____	_____
4. Sales to residential customers (1,000 gal/yr)	_____	_____	_____	_____	_____
5. Revenue from sale to residential customers (\$/yr)	_____	_____	_____	_____	_____
6. Average price for residential service (\$/1,000 gal) [divide Line 5 by Line 4]	_____	_____	_____	_____	_____
7. Total revenue from sale of reclaimed water (\$/yr) [add Line 2 and Line 5]	_____	_____	_____	_____	_____

L. Wastewater Connection Fees and Property Contributions

Include connection fees, impact fees, and property contributions associated with provision of wastewater management services.

Description	Year 1	Year 5	Year 10	Year 15	Year 20
1. Total connection/impact fees and property contributions for non-residential customers to be collected (\$/yr)	_____	_____	_____	_____	_____
2. Number of new non-residential connections (ERCs/yr)	_____	_____	_____	_____	_____
3. Average connection/impact fees and property contributions for non-residential customers (\$/ERC) [divide Line 1 by Line 2]	_____	_____	_____	_____	_____
4. Number of new equivalent residential connections for residential customers (ERCs/yr)	_____	_____	_____	_____	_____
5. Connection/impact fee and property contributions for residential customers (\$/ERCs)	_____	_____	_____	_____	_____
6. Residential connection fees and property contributions collected (\$/yr) [multiply Line 4 by Line 5]	_____	_____	_____	_____	_____
7. Total collections from connection fees and property contributions [add Lines 1 and 6]	_____	_____	_____	_____	_____

M. Wastewater Revenues		Year 1	Year 5	Year 10	Year 15	Year 20
Description						
1.	Revenue from wastewater user/service charges for non-residential customers (\$/yr)					
2.	Wastewater from non-residential customers that is treated (1,000 gal/yr)					
3.	Average user charge for non-residential customers (\$/1,000 gal) [divide Line 1 by Line 2]					
4.	Number of households served [must agree with Line A4]					
5.	Revenue from residential user/service charges (\$/yr)					
6.	Average monthly residential user/service charges (\$/month/household) [divide Line 5 by Line 4 by Line 12]					
7.	Total revenues from wastewater user/service charges (\$/yr) [add Line 1 and Line 5]					

N. Total Revenues

Please add the totals from Blocks K and M to obtain total revenue to be received by the System.

	Year 1	Year 5	Year 10	Year 15	Year 20
Total Revenue (\$/yr)	_____	_____	_____	_____	_____

O. Total Surplus or Deficit

The total costs shown in Block I are to be subtracted from the total revenues shown in Block N. The results for Year 1, 5, 10, 15, and 20 should be entered on Line 1 if a surplus is indicated (revenues exceed expenses) or on Line 2 if a deficit is indicated (expenses exceed revenues).

Description	Year 1	Year 5	Year 10	Year 15	Year 20
1. Surplus (\$/yr)	_____	_____	_____	_____	_____
2. Deficit (\$/yr)	(_____)	(_____)	(_____)	(_____)	(_____)

P. Existing Fees and Charges

Please identify existing fees and charges for connection and sale of reclaimed water, and user charges for wastewater services.

1. Wastewater user charges

- a. Residential user charge \$ _____/month/household
- b. Average residential connection fee \$ _____
- c. Average residential impact fee \$ _____
- d. Average user charge for non-residential customers \$ _____/1,000 gallons
- e. Non-residential customers connection/impact fees \$ _____

2. Sale of reclaimed water

- a. Residential users \$ _____/month/household or \$ _____/1,000 gallons
- b. Initial connection fees for residential users \$ _____
- c. User charges for non-residential customers \$ _____/1,000 gallons
- d. Connection fees for non-residential customers \$ _____

Q. Summary of proposed fees and charges

1. Wastewater user charges

	<u>Year 1</u>	<u>Year 5</u>	<u>Year 10</u>	<u>Year 15</u>	<u>Year 20</u>
a. Residential user charge (\$/month/household) [from Line M6]	_____	_____	_____	_____	_____
b. Average residential connection/impact fees (\$) [from Line L5]	_____	_____	_____	_____	_____
c. Average user charge for non-residential customers (\$/1,000 gallons) [from Line M3]	_____	_____	_____	_____	_____
d. Non-residential customers connection/impact fees (\$) [from Line L3]	_____	_____	_____	_____	_____

2. Sale of reclaimed water

	<u>Year 1</u>	<u>Year 5</u>	<u>Year 10</u>	<u>Year 15</u>	<u>Year 20</u>
a. Residential user charge (\$/1,000 gallons) [from Line K6]	_____	_____	_____	_____	_____
b. Initial connection fees for residential customers (\$/ERC) [from Line J2]	_____	_____	_____	_____	_____
c. User charges for non-residential customers (\$/1,000 gallons) [from Line K3]	_____	_____	_____	_____	_____
d. Connection fees for non-residential customers (\$/ERC) [from Line J6]	_____	_____	_____	_____	_____