SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Statement of Estimated Regulatory Cost for Mandatory Year-Round Landscape Irrigation Conservation Measures 40E-24, 40E-2, and 40E-20, F.A.C.

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SECTION 1: INTRODUCTION

1.1 Background

The South Florida Water Management District (SFWMD or District) has completed the rule-development process to modify the provisions and the geographic area of application of Chapter 40E-24, Florida Administrative Code (F.A.C.), Mandatory Year-Round Landscape Irrigation Measures for Lee, Collier, and Charlotte counties. Changes were also made to Chapter 40E-2, 40E-20, F.A.C. and the *Basis of Review for Water Use Applications within the South Florida Water Management District* ("Basis of Review"). The rule-development process is aimed at strengthening the year-round landscape irrigation measures and implementing these more comprehensive, conservation-driven, irrigation rules District-wide. As stated on the District's rule development Web site, "[t]he purpose of these mandatory measures is to provide a framework for consistent implementation, ensure the long-term sustainability of the water resources of the region, increase water use efficiency, and curtail or prevent wasteful water use practices through the adoption of ordinances that would include these measures, variance, and enforcement provisions." [1]

This Statement of Estimated Regulatory Costs (SERC) addresses these rules affecting Chapter 40E-24, 40E-2, and 40E-20, F.A.C. as posted by the District on its rule development Web site. The 40E-24 and 40E-2 amendment versions are dated October 7, 2008, while for 40E-20 amendment version is dated October 6, 2008. The District has chosen to develop this SERC prior to the publication of the rule in the Florida Administrative Weekly due to substantial input and concerns received during the rule development process. The District has not received a formal request to undertake this analysis nor has it received a proposed lower cost regulatory alternative. The SERC addresses all required topics as provided by Section 120.541, Florida Statutes (F.S.), and will be revised to address any proposed lower cost regulatory alternatives that may be submitted under Chapter 120, F.S., rule development procedures.

Six rule development workshops were held in April and May of 2008. Another workshop was held on July 30, 2008 in West Palm Beach. Issues identified for consideration in the SERC came from workshop summaries prepared by District staff; a compilation of written input submitted by interested parties; discussions with affected parties and with District staff involved in the rule development process; and an examination of this rule conducted as part of the SERC

[1]Available from: https://my.sfwmd.gov/portal/page?_pageid=1874,21152229&_dad=portal&_schema=PORTAL

development. Significant changes to the rule drafts have been made in light of the input received at these workshops. Therefore, not all of the issues raised in the workshops or in the written comments, which have been submitted are still current.

1.2 Requirements for a Statement of Estimated Regulatory Cost (SERC)

As specified by Section 120.541, F.S., "[a] statement of estimated regulatory costs shall include:

(a) A good faith estimate of the number of individuals and entities likely to be required to comply with the rule, together with a general description of the types of individuals likely to be affected by the rule.

(b) A good faith estimate of the cost to the agency, and to any other state and local government entities, of implementing and enforcing the proposed rule, and any anticipated effect on state or local revenues.

(c) A good faith estimate of the transactional costs likely to be incurred by individuals and entities, including local government entities, required to comply with the requirements of the rule. As used in this paragraph, "transactional costs" are direct costs that are readily ascertainable based upon standard business practices, and include filing fees, the cost of obtaining a license, the cost of equipment required to be installed or used or procedures required to be employed in complying with the rule, additional operating costs incurred, and the cost of monitoring and reporting.

(d) An analysis of the impact on small businesses as defined by Section 288.703, F.S., and an analysis of the impact on small counties and small cities as defined by Section 120.52, F.S.

(e) Any additional information that the agency determines may be useful.

(f) In the statement or revised statement, whichever applies, a description of any good faith written proposal submitted under paragraph (1)(a) and either a statement adopting the alternative or a statement of the reasons for rejecting the alternative in favor of the proposed rule."

1.3 Basis for Comparison of Costs and Impacts

In any economic analysis of costs and impacts, it is important to ask the question: "compared to what?" For this SERC, there must be a clear understanding as to the situation that is expected without the proposed rule that is being analyzed. In this regard, both the regulatory situation and the operating environment must be considered.

Regarding the regulatory situation as it affects landscape water use, it is important to recognize that a similar SFWMD rule has been in effect in Collier, Lee, and the portions of Charlotte County within the SFWMD since 2003. All local governments within those areas, except Sanibel and Ft. Myers Beach have adopted ordinances and are enforcing the ordinances within their jurisdictions. The main difference between that rule and the revised rule is the limitation of irrigation to two days per week instead of three. However, Cape Coral, and Lee County have already voluntarily enacted a more stringent landscape irrigation ordinance, restricting irrigation of individual properties to two days per week. The earlier rule development and its implementation in the Lower West Coast region were not controversial.

In addition, the Basis of Review requires public water supply water use permit applicants seeking a new, renewed, and/or modified permit provide the District with a conservation plan that includes the enactment of an ordinance limiting daytime irrigation hours. As a result, most local governments have existing year-round landscape irrigation ordinances that include time of day restrictions on outdoor watering. Many of the ordinances contain hour restrictions that are the same as, or very similar to, those in the proposed rule. Evaluations of the effects of this rule will not include provisions that are already in place, such as the daytime irrigation hour restrictions.

A unique situation has also developed as some form of landscape irrigation watering restrictions pursuant to water shortage orders have been in effect District-wide for more than one year. Restrictions contained in the water shortage order issued on April 10, 2008 are almost identical to those specified in the rule. Thus, the operating environment for landscape irrigation in this period before the rule is that required by the rule. Landscape owners in compliance with the water shortage restrictions will have already implemented these protocols and have seen the landscapes produced under the day and hour restrictions, which the District proposes to make permanent. As the proposed year-round rule will become effective upon rescission of current water shortage orders, this will lessen potential adjustments that would be immediately required.

It is also relevant to note that the SERC evaluates the impacts of the rule as proposed compared to the without rule conditions. The SERC is not a comparison of various preliminary versions of the rule. The draft rule has evolved substantially during rule development. Some of the issue areas have been addressed by wording modifications. In some cases, provisions have been removed from the rule. Areas of potential impact arising from provisions that are no longer a part of the rule are not discussed in this SERC. The major area in which provisions have been modified or removed relate to the regulation of reclaimed water.

Proposals to regulate the use of reclaimed water, including reclaimed water that has been mixed with water from other sources, have been removed from the

proposed rule, except for the disallowance of irrigation during the 10 a.m. to 4 p.m. period. Many comments had been received regarding these provisions. Effects related to the removed or amended provisions are not discussed further.

1.4 Economic Impact Framework for Estimating Costs of the Rule

Chapter 120.541, F.S., specifies that Subsection (c) of the SERC provide "transactional costs likely to be incurred by those who must comply with the rule." Transactional costs are statutorily described as "direct costs that are readily ascertainable based upon standard business practices." Thus, the core focus of Subsection (c) is on the impacts on those directly affected by and directly required to comply with the rule.

There are, however, two parties involved in any economic transaction. Economic entities are involved in transactions to obtain inputs to what they produce and they are involved in other transactions with their customers.

An economic framework for the impacts associated with a regulatory action would look at likely changes that flow through to the following linkages:

> Supplier Provides Inputs to → Directly Affected Regulated Party→ Sales to Customers

In this case, in so far as landscapes are final consumption products (i.e., not inputs to other products or services), the chain of effects ends on the right with the directly regulated party:

> Suppliers Provide Inputs to → Directly Affected Individuals Who Consume (Enjoy) Landscape.

Table 1 shows the major linkages that may pertain to the year-round irrigation rule.

Table 1. Major linkages between suppliers, those directly affected, and their customers.

Supplier provides inputs →		**→Sales to Customers – Values to Owners**
Water Suppliers	**Directly Affected (Irrigated Landscape Owners)**	Sales to customers who rent properties
Irrigation System Installation and Maintenance		Sales to customers who purchase properties
Landscape Plants and Maintenance		Business value of having attractive landscaping at business location
Providers of energy for irrigation		Homeowners enjoy landscapes

One viewpoint is that of the directly affected landscape owners. The question from this viewpoint will be how the landscape owners will choose to change their inputs or modify their outputs in response to the rule. The second viewpoint answers the question of what it means to the suppliers and customers to have the landscape owners change their actions because of the rule. In this SERC, the effects from the viewpoint of the directly affected are discussed in **Section 4** as transactional costs and the effects from the viewpoint of the suppliers and a subgroup of customers are included in **Section 6** as additional information the District considers relevant.

An underlying premise in this rule development is that landscapers, who are not already efficient, can and will "discover a better way." This means that it is the District's expectation that landscape owners will discover that a limited frequency and total amount of irrigation conforming with the schedule of the rule will produce an equivalent quality landscape. This view is bolstered by numerous University of Florida, Institute of Food and Agricultural Sciences (IFAS) Bulletins that make statements, such as "[b]y learning and practicing the basic principle of watering only as needed, you can have a beautiful, healthy lawn with less water." (Tichenor, Dukes, and Trenholm 2004)

In making such statements in extension publications, IFAS is providing advice that will be generally applicable. In the same way, when irrigators are restricted to specific strategies, as they will be under this proposed rule, it is expected that following the allowed strategies will provide "a beautiful, healthy lawn with less water" in most cases and at most times. It is also reasonable to expect that at times making this adjustment will not work, as well as desired and landscape owners may invest additional cost and effort to achieve the desired landscapes. The SERC identifies situations in which there may be significant impacts because of the rule. As will be seen in **Section 2**, which covers the number of entities affected, because the application of the rule is broad, the number of potentially affected parties is large. Thus, while on average, the chances of a landscape owner being negatively impacted can be small, there is a need to identify those for whom the impact can be significant.

Economic analysis focuses on rational solutions that reflect the attempts by the economic actors to effect what is in their self-interest. Thus, the responses to the rule will be evaluated with the expectation that those affected will seek to adjust to the mandates in a way that considers both the value of the landscape to them and the costs of various avenues of adjusting.

There are also likely to be some differences in rule effects in those jurisdictions, which the SFWMD shares with the St. John's River Water Management District or the Southwest Florida Water Management District. In those cases, the proposed rule allows the local government to propose an alternative schedule of measures to achieve a uniform schedule within its jurisdiction as long as that rule is at least as restrictive as Rule 40E-24.

1.5 Guide to Contents

This section has provided background and introductory material. **Sections 2** through **6** address the separate items as specified by statute and listed in **Section 1.2**. **Section 2** addresses the number of individuals and entities likely to be required to comply with the rule**. Section 3** outlines the costs to the District and the local governments in adopting ordinances and achieving compliance with the rule. **Section 4** focuses on the transactional costs, which are the costs incurred by irrigated landscape owners to comply with the rule. **Section 5** deals with the impacts of the rule on small businesses, cities and counties. **Section 6** contains additional useful information, which, in this case, focuses on impacts from the point of view of the suppliers of landscape irrigators. **Section 7** is reserved for discussions of lower cost regulatory alternatives, should any be received.

SECTION 2: NUMBER OF INDIVIDUALS AND ENTITIES LIKELY REQUIRED TO COMPLY WITH THE RULE

Section Addressing "(a) A good faith estimate of the number of individuals and entities likely to be required to comply with the rule, together with a general description of the types of individuals likely to be affected by the rule."

This rule affects all persons and entities who irrigate landscapes other than golf course play areas and other athletic play surfaces. Landscapes involved include those at single-family homes; duplexes; multifamily units; common areas of developments and commercial, industrial, and governmental facilities. Effects on users of reclaimed water for irrigation are limited only through the prohibition of use between the hours of 10 a.m. and 4 p.m.

In the subsections that follow, the number of individuals and entities likely to be directly required to comply with the rule are specified and discussed. The estimation is by rule section or groups of sections as appropriate.

2.1 Rule 40E-2.061, No-Notice General Permit by Rule

The creation of Rule 40E-2.061, F.A.C. provides all persons within the District with a No-Notice General Permit allowing them to irrigate the landscapes of single-family units and duplexes when the duplexes receive water from a single withdrawal facility. The persons so permitted would include the approximate 7.6 million residents of the South Florida Water Management District, as well as seasonal residents and visitors. This would encompass all residents, including users of potable water for irrigation, as well as those who are self-supplied. **Table 2**, which follows, lists permanent resident population by county for 2007 within SFWMD's jurisdiction. Seasonal residents and visitors also number in the millions. The no-notice general water use permit granted under the proposed Rule 40E-2.061 is used only when any of the aforementioned persons irrigates a single-family residence or a duplex that receives water from a single withdrawal facility (e.g., groundwater well or surface water pump).

2.2 Rule 40E-24.201, Year-Round Landscape Irrigation Measures

Year-round landscape irrigation measures apply to all landscaped properties. Water users who irrigate landscapes, other than those receiving the No-Notice

General Permit under Rule 40E-2.061, have been required to obtain a water use permit to perform landscape irrigation with water they withdraw for this purpose. To determine the approximate number of entities affected, the water use permit database of the SFWMD was queried to extract the number of landscape irrigation permits, which have been issued and are active. **Table 3**, which follows, lists the number of strictly landscape irrigation permits by county within the SFWMD. There are over 10,000 landscape irrigation permits, which have over 100,000 acres permitted for irrigation. Total project acreage of those permits with blanks in the acreage irrigated field was examined and indicated that the acreage irrigated may be 15 percent higher than stated. Based on experiences in permitting, permit enforcement, and water shortage enforcement, District staff believes that a very high percentage of the entities and acres, which should be covered by the permits are covered by the permits.

Entities that hold water use permits in categories other than landscape, but which also irrigate landscapes under the same permit, will be required to conform to the hours, days, and other restrictions of this rule when irrigating landscapes. A prime example would be those entities irrigating golf courses or athletic playing areas, which also irrigate non-playing landscapes at entrance areas, around clubhouses, etc. There are, for instance, over 400 golf courses that have landscape areas that will be so regulated and a significant number of parks and such areas. Whether this presents a problem to the entity will depend on whether the non-playing landscaped areas are zoned separately from the playfields and whether any areas not separately zoned can tolerate the irrigation schedule under the proposed rule or use microirrigation or low-volume irrigation.

Table 4 presents data on the number of residences whose landscapes are likely to be individually irrigated. The data are presented by "units in structure" for counties or portions of counties within the SFWMD. (For counties partially within the SFWMD the units were adjusted proportionally with the share of population within the District.) Data in this table indicate that, within the District, there are approximately 1.85 million single-family residences and 80,000 duplexes. The data also show that there are also about 175,000 mobile homes and, thus, in total, there would be approximately 2 million residences, which could be affected directly or indirectly by the proposed rule. The exceptions would be those that do not have or do not irrigate landscapes. The indirectly affected would be those whose irrigation is managed by an entity, such as a homeowners association, which would be among the 10,000 already permitted entities.

Table 2. 2007 permanent resident population within the SFWMD.

County	2007 District Pop
Broward	1,765,707
Charlotte	6,583
Collier	333,858
Glades	11,055
Hendry	39,651
Highlands	10,761
Lee	615,741
Martin	143,737
Miami-Dade	2,462,292
Monroe	78,987
Okeechobee	39,030
Orange	271,978
Osceola	264,526
Palm Beach	1,295,033
Polk	15,108
St. Lucie	271,961
Total	**7,626,008**

Source: Bureau of Economics and Business Research 2008. District estimated proportions used for counties shared with other water management districts.

Table 3. Landscape irrigation permits and number of permits by county within the SFWMD.

County	Number of Permits with Landscape Land Use Designation	Acres Permitted for Irrigation
Broward	2,260	16,238
Charlotte	3	6
Collier	825	13,060
Glades	11	26
Hendry	81	540
Highlands	5	17
Lee	2,091	33,210
Martin	587	3,061
Miami-Dade	748	4,600
Monroe	1	10
Okeechobee	75	206
Orange	150	2,246
Osceola	127	5,352
Palm Beach	3,015	22,888
Polk	9	65
St. Lucie	686	5,299
Total	**10,674**	**106,825**

Source: SFWMD Water Use Permit Database.

Not counted in the statistics presented in **Table 4** are non-residential water utility customers who irrigate landscapes on properties they own or rent, who are also affected by the proposed rule. Alternatively, over 80,000 residences, 112 parks, 51 schools, and a number of developments within the SFWMD would be exempted from the day of week provisions of the rule due to use of reclaimed water for irrigation, based on data from the Florida Department of Environmental Protection's 2006 Reuse Database.

Table 4. Dwelling unit estimates for the SFWMD - 2006.

County	1, detached	1, attached	2	Mobile home	Total Dwelling Units Potentially Affected
Broward	329,531	57,929	23,609	24,743	435,812
Charlotte	2,618	78	48	520	3,264
Collier	75,463	11,150	4,217	10,041	100,871
Glades	2,141	66	126	3,324	5,657
Hendry	6,230	177	521	5,821	12,749
Highlands	3,225	309	153	1,776	5,463
Lee	180,305	23,241	8,987	36,538	249,071
Martin	40,189	4,766	1,324	9,437	55,716
Miami-Dade	411,756	94,148	19,172	14,674	539,750
Monroe	26,202	5,051	2,501	7,792	41,546
Okeechobee	7,269	150	333	8,293	16,045
Orange	62,165	4,975	2,137	4,872	74,149
Osceola	67,227	2,948	1,951	12,417	84,543
Palm Beach	284,499	58,903	18,283	19,349	381,034
Polk	4,016	139	264	1,789	6,208
St. Lucie	81,319	3,393	4,582	13,197	102,491
Total	1,584,155	267,424	88,209	174,584	2,114,372

Source: U.S. Bureau of Census 2006, adjusted by proportion of county population in the SFWMD, except for Glades, Hendry, and Okeechobee, which are from the 2000 Census of Housing updated by county population growth.

2.3 Rule 40E-24.301, Local Government Option and Rule 40E-24.401, Enforcement

Based on data from the Water Supply Plans and implementation efforts resulting from those plans, it is estimated that 153 local governments will have to comply with the rule in terms of their landscape irrigation practices. In addition, they will be asked to assist in the enforcement of the plan either through:

- Responding to enforcement requests per Rule 40E-24.401, Enforcement.
- Adopting an ordinance incorporating the provisions of this rule per Rule 40E-24.401, Enforcement.
- Adopting local ordinances (Rule 40E-24.301, Local Government Option).

The number of entities directly affected by ordinance adoption and enforcement may be lessened because eight counties within the District are charter counties, and there may be an option for the county's adoption of an ordinance to cover multiple jurisdictions. In the same vein, enforcement of codes may be consolidated across jurisdictions.

2.4 Modifications to the Conservation Plan Requirements in the Basis of Review

Approximately 104 utilities will be required to amend water conservation plans to reflect the adoption of ordinances consistent with this rule. The adoption of the ordinances is referenced in **Section 2.3** previously, but the revisions in the Basis of Review will require response from permitted utilities.

SECTION 3: COST TO THE DISTRICT AND TO ANY STATE AND LOCAL GOVERNMENTS

> Section Addressing "(b) A good faith estimate of the cost to the agency, and to any other state and local government entities, of implementing and enforcing the proposed rule, and any anticipated effect on state or local revenues."

The cost to the District and state and local governments considered here are the costs of promulgating, implementing, and enforcing the rule. Each of these entities will also have to comply with the substantive provisions of the rule. The impacts and costs of compliance with the rule incurred by the District and state and local governments are addressed in **Section 4** with other transactional costs. The assessment in this section reflects what the District staff expects will be the most likely division of responsibility in the implementation of the rule, which is as follows.

Initially, the costs of promulgating, implementing, and enforcing this rule will fall on the District. Fairly quickly (in a matter of months), most local governments will adopt ordinances either following the District rule exactly or as modified by the local governments to reflect water supply issues while still maintaining mandated consistency with the rule. A few local governments may delay adoption of ordinances several years as implementation will not be required until water utilities owned by these local governments have to update their conservation plans to conform to the rule as part of their consumptive use permit requirements. A model ordinance developed in support of the rule should facilitate adoption by local governments.

3.1 Costs to the District

Tasks the District would have to perform associated with the initial implementation of the rule are presented in **Table 5**.

Discussions with SFWMD staff responsible for the rule development indicate that a high estimate of personnel time required during the initial year of implementation would be four person months, involving staff in the positions of attorney, conservation officer, and regulatory enforcement professional. The cost of this staff with fully loaded overhead (leave, benefits, and support) is estimated at close to $70,000. If local governments pass ordinances and take over implementation quickly, the District costs might be half of the high estimate. Costs after the first year should decline substantially as local governments will adopt and implement their own year-round ordinances.

Table 5. District tasks related to rule implementation.

Rule Aspect/Task	Task Description
Enforcement	
Develop Model Ordinance	The model ordinance will be appropriate for local governments to adopt under Rule 40E-24.401(2), Enforcement so they can enforce Rule 40E-24.201 within their jurisdictions. A model ordinance has already been developed.
Assist local governments in implementing 40E-24.401(2)	Four to six workshops are expected to be held throughout the SFWMD to assist local governments in implementing Rule 40E-24.401(2), as well as other matters related to this rule and water conservation in general.
Review Ordinances	Upwards of 150 ordinances will be reviewed prior to adoption. These reviews will check for consistency between the proposed local ordinance, the Model Ordinance, and the rule.
Enforcement Actions	District enforcement staff will undertake enforcement in areas in which local governments have not assumed responsibility. Initially, this will be a large portion of the District, but it is expected to change quickly as local governments adopt ordinances and undertake implementation. Issues related to enforcement are discussed in more detail at the end of this Section.
Variances	
Process Variance Requests	This would apply only to jurisdictions in which local governments are not yet enforcing their own year-round ordinances. The District will process variance requests submitted by affected entities in accordance with Chapter 120, F.S., and Chapter 28-104, F.A.C. Part of the SFWMD cost would be publication of the petition in the Florida Administrative Weekly. Based on the cost per line and expected lines needed, the cost would be about $25 per petition. Numbers of variance petitions are expected to be small in part because state statute sets a high standard for granting of variances (applicant has to demonstrate substantial harm or violations of the principle of fairness). The District also believes the number of petitions for variances to be minimal given that there are only 50 active variances from the current water shortage order, the provisions of which closely correspond to the provisions in the draft rule. On the other hand, the pool of potential variance applicants is quite large. There will be about 2 million affected residences and over 10,000 permitted users separate from the affected residences who would be directly affected by the rule. Commercial and industrial customers of water utilities may also apply for variances.
Local Ordinance Option Assistance and Implementation Reviews	
Assist governments exercising the Local Government Ordinance Option	District staff will work with local governments choosing to exercise the Local Government Ordinance Option to assure the proposed ordinances meet the requirements of the rule. This will simplify the ordinance review process. It is not clear how many local governments will choose this option. District staff believes most will adopt the Model Ordinance.
Review Ordinances	Review ordinances prior to adoption as per Rule 40E-24.301(4).
Review Ordinance Implementation Reports	Ordinance implementation report forms will be developed by the District and used by the local governments. This will simplify the review of ordinance implementation reports, which will be submitted per Rule 40E-24.301(5).

3.2 Costs to Other Local Governments

Sometime during the first year, it is expected that most local governments will adopt either the model ordinance developed by the SFWMD or their own ordinance as modified by the local government while meeting the requirements of the rule. Tasks that the local governments are expected to complete related to the adoption of the rule are specified in **Table 6**. Upon passage of the ordinances, it is expected that local governments will be enforcing the restrictions based on each ordinance.

Those local governments within a shared jurisdiction, such as those shared with the St. Johns River Water Management District, can exercise Rule 40E-24.301(3). They would need to provide a copy of their ordinance to the SFWMD for review. If their ordinance were at least as stringent as Rule 40E-24.201, the process would be similar to that discussed under "Adopt Ordinance of Own Choosing" in **Table 6**.

Table 6. Local government tasks related to rule implementation.

Rule Aspect/Task	Task Description
Ordinance Adoption	
Adopt Model Ordinance	Adopt Model Ordinance under Rule 40E-24.401(2), Enforcement. This will most likely be a straightforward procedure with low implementation costs. Potential costs may be those associated with noticing and reading the ordinance at council or commission meetings and publishing the ordinance.
Adopt Ordinance of Own Choosing	Exercise of the Local Government Ordinance Option by developing and adopting an ordinance of the government's own design to address local water supply concerns. Work with District to assure that the ordinance is consistent with the District rule. This will require more local government resources as provisions will have to be developed and reviewed and the local government will have to receive and consider input from affected parties, especially insofar as the impacts may be different than the impacts under the District rule.
Ordinance Implementation	
Enforce Provisions of the Ordinance	Local government code enforcement staff and law enforcement officers will undertake enforcement in areas in which local governments have assumed responsibility. Issues related to enforcement are discussed in more detail at the end of this Section.
Review and Issue Variances	The local governments will review and issue or reject variances submitted pursuant to their rules.
Prepare Ordinance Implementation Reports	Complete annual report on ordinance implementation to be submitted per Rule 40E-24.301(5) on the form provided by the District.

3.3 Discussion Regarding Enforcement

A number of aspects regarding enforcement, and costs and revenues to the District and other local governments warrant a more detailed discussion. They are contained in the following subsections.

3.3.1 Enforcement Effort Varies

The degree of enforcement effort for similar rules and orders has varied widely among governments and over time. This was seen both in the implementation of the present year-round rule and related local ordinances in the Lower West Coast region and during the current water shortage restrictions throughout the SFWMD. The large number of citations that have been issued in some cases indicates that the potential number of enforcement actions is great. For instance, Cape Coral has had strict enforcement of its year-round ordinance and issued thousands of citations and warnings. District-wide, during the water shortage, the number of enforcement actions often varied significantly from month to month. The number of citations issued compared to the number of warnings also varied greatly. The level of enforcement effort will be a decision of each local government and is likely to vary over time.

3.3.2 The Mix of Allowed and Not Allowed Irrigation Days and Hours Will Present Enforcement Difficulties

A natural economic question is how difficult (i.e., costly) it will be to catch and prosecute violators. Enforcement at the local level will be primarily by code enforcement officers and law enforcement officers. The former will tend to work regular daytime weekday hours. The latter will be on duty days and nights – weekdays and weekends. The expected strategy for catching violators is primarily to have them be cited by officers who observe violations while going about their regular duties. It is expected that the officer will cite the violator as long as no other immediate duty is more pressing.

Opportunities for code enforcement to catch violators because of this rule will be limited. First, virtually all local jurisdictions have daytime watering bans so that code enforcement would already (without rule) be catching those who violate the present ordinance. Only a very limited number of additional opportunities exist under this rule for code enforcement during regular weekday work hours. This implies that local governments will have either to offer overtime to code enforcement or switch them to work outside normal work hours or they will have to rely on law enforcement officers. The latter strategy would probably work fairly well in terms of the officers on patrol observing violations on nights and weekends. However, when law enforcement officers observe a violation, they will still have to decide (under guidance given them) as to whether issuing a citation is the priority use of their time.

3.3.3 Enforcement Will Also Be a Source of Revenue

One advantage to local governments of adopting a year-round ordinance is that they will retain the fines and penalties levied and collected from the citations. This provides the local government with a way to offset the costs associated with enforcement. One difference between the enforcement proposed under this rule, as compared to what local governments have recently experienced with the water shortage, is the local government will be enforcing the ordinance for landscape irrigators permitted by the District, as well as for utility customers and individual self-supplied users, as was the case during the water shortage.

SECTION 4: TRANSACTIONAL COSTS

Section addressing 120.541(c), F.S., "A good faith estimate of the transactional costs likely to be incurred by individuals and entities, including local government entities, required to comply with the requirements of the rule. As used in this paragraph, 'transactional costs' are direct costs that are readily ascertainable based upon standard business practices, and include filing fees, the cost of obtaining a license, the cost of equipment required to be installed or used or procedures required to be employed in complying with the rule, additional operating costs incurred, and the cost of monitoring and reporting."

4.1 Types of Landscape Irrigators

Those required to comply with the requirements of the rule are primarily landscape irrigators. Impacts on local governments were discussed in **Section 3**. Impacts on those indirectly affected are discussed in **Section 6**. The effect of the rule on landscape irrigators will depend on the present landscapes and the capabilities of the present irrigation systems. It will also depend on current irrigation practices.

In considering landscape irrigators and their landscapes, it is useful to divide them into three major groups in order to characterize impacts. This is in an effort to identify groups who are affected differently even though it is still recognized that there will be considerable variation in the impacts within each group. The three major groups are:

1. Group 1 - Those who place a large value on their landscapes, as well as irrigation convenience as evidenced by having well-maintained landscapes and in-ground irrigation systems with timers. These landscape water users also tend to have the largest unit areas, and would include most of the users with permits (This means they would include multifamily units and developments with irrigated common areas), as well as medium to high value suburban homes and more expensive homes in urban settings. This group would irrigate the majority of irrigated landscape acres.
2. Group 2 - Those who value their landscapes by having manually operated in-ground systems or who rely on hose and bib systems to irrigate, and who irrigate as indicated by the quality of the landscapes. These landscape water users would tend to have smaller irrigated areas, occupy more modestly valued properties, and are more likely to be in urban areas and to irrigate with utility water.

3. Group 3 - Those who irrigate very little or only irrigate selected areas. These would include lower value homes on smaller urban lots. Hose and sprinkler systems or hand-held watering would function for such users and in-ground systems that do exist would often be old, poorly functioning and not relied upon. Some residences in rural areas may also irrigate only small areas around the homes as landscapes even though the area of the property is much larger.

While data on actual irrigation water use sources, installations, use, and practices are extremely limited, the characterizations of each of the groups described previously and the additional descriptions that follow are reflective of the results of a random sample survey of outdoor water use conducted for the SFWMD by Florida Atlantic University. While this survey was conducted in 1992 and covered only Miami-Dade, Broward, and Palm Beach counties, both the structure of the questions and the tabulation of the responses is very instructive in considering how the year-round landscape rule may affect different users and how they may respond to the restrictions. [2] See Attachment A for a summary of salient points.

In order to evaluate the transactional costs as they apply to each landscape irrigation group, it is useful to consider the present situation of those irrigators. All users within SFWMD have been under water shortage restrictions for more than one year. The most recent water shortage restrictions, which have been effective throughout the SFWMD with a few exceptions, have involved two days per week allowed irrigation. Most irrigators have been required to follow the same days and hours as are permitted by this proposed rule. The exceptions have involved conditions that are more restrictive. The more restrictive conditions are generally in place where wellfields are located close to the saline water interface, where certain aquifers are approaching the maximum developable limit, or where the volume of water available is unable to meet users' demands.

The potential effects of the rule are now discussed for each of these groups.

4.2 Analysis for Group 1 Users

During this period of water shortage restrictions, Group 1 users have set their time clocks to comply with the day and hour restrictions. They also gained experience as to the length of time they wish to run their irrigation systems on the days when irrigation is allowed. Group 1 users also gained experience as to

[2] South Florida Water Management District Outdoor Water Use Surveys, Final Report, Social Science Research Laboratory, FAU/FIU Joint Center for Environmental and Urban Problems, Florida Atlantic University, 1992, Part I General Population Survey and Part II Permit Holders Survey.

whether they consider the allowed two days sufficient to provide the quality of landscape that they desire.

Those Group 1 landscape water users who are satisfied with the days and hours allowed during the current water shortage restrictions will not have to take action in order to meet the days and hours restrictions in the proposed rule. These users will have no costs associated with management of the irrigation system in order to comply with the rule. Those users who want to increase length of time they have set for some or all zones within the irrigation windows, which are permitted on assigned days, can adjust their controllers to provide longer irrigation times. Their transactional costs will be that of resetting the controller. Alternatively, users may choose to improve the uniformity of their irrigation systems as a way to maintain landscape quality.

When looking at the effects on Group 1 users who are complying with the days and hours restrictions of the rule, there are two important questions: 1) how much water can be usefully applied on an allowed irrigation day, and 2) is the amount of water applied sufficient so the landscape does not suffer ill effects before the next irrigation window.

4.2.1 Capabilities of Irrigation Systems and Root Zones

The amount of water that can usefully be applied depends on the capability of the irrigation system to apply water and the water holding capacity of the root zone. Discussions with those familiar with irrigation system designs indicate that systems with rotor zones emit about 0.5 inch per hour and systems with spray head zones emit 1 to 1.5 inches per hour. Few typical single-family residential systems designed with three to six zones would be unable to apply sufficient water to the root zones during the 18 hours allowed on irrigation days, even considering the lack of uniformity in application rates for irrigation systems.

These same persons also indicate that some of the larger systems, such as those that serve common areas of developments, may not have the capacity to supply adequate water to the root zone to provide water needed until the next irrigation period. This was the District's experience during the recent and current water shortage orders. The District received variance requests from irrigators of a number of large developments. While these variances were generally granted, provisions in the variance state that the recipients are expected to modify their irrigation systems in a manner that would allow them to provide adequate water during allowed days and hours as the recipients would not be eligible for a variance for the same reasons during future water shortages.

In light of the previous description, District variance records during 2008 water shortages, as well as permit records were evaluated to estimate the acreages of landscape users who received variances. A summary of variances during 2008 is presented in **Table 7**. The data identified more than 800 acres in permitted

landscape for which retrofit installations would be required in order to comply with water shortage orders and the proposed year-round landscape irrigation rules. The retrofits would focus on providing additional withdrawal facilities, pump capacities, and lines to deliver the additional water to appropriate locations within the distribution system. This would be much less than the cost of retrofitting a complete irrigation system. Note that the issues with these users came up within the context of water shortage restrictions. Furthermore, time and day restrictions under water shortages are more severe. Thus, it is very likely that these users would undertake increasing their capacities independent of the year-round landscape rule.

Table 7. Tabulation of water shortage variances – 2008.

Type of Entity	Reason for Variance	Number of Variances
Homeowner Associations	System Limitations	18
Individuals	Health Problems	9
	System Limitations	6
	Religious Reasons	3
	Using Advanced Technology	2
	Alternate Hours Due to Manual Irrigation System	15
Schools	Unable to access Irrigate During Non-School Hours	3
Total		**56**

In considering the incentives users have to increase application rates of their irrigation systems, it is important to recognize that capacities are generally planned around peak needs. The peak needs for application rate capacity occurred during the recent water shortages when irrigation was allowed one day per week for a time and subsequently two times per week with more restrictive hours than are proposed in the year-round rule. Thus, future decisions that landscape irrigators may take to have higher capacity systems will reflect the advantages during water restrictions, as well as any anticipated benefits under the year-round restrictions.

4.2.2 Capability of the Water Stored in the Root Zone to Meet ET Demands

The second consideration is how much water can usefully be stored in the root zone as compared to the evapotranspiration (ET) demands of the landscape between the allowed irrigation days. When the ET demands during a non-irrigation period approach the extractable water in the root zone and it has not rained, the landscape will exhibit symptoms of water stress. Then, the issues that must be addressed are: 1) how often the stress would occur; and, 2) whether there would be measurable consequences that extend beyond the immediate experience. Publications of the University of Florida Institute of Food and

Agricultural Sciences (IFAS) indicate that in the sandy soils that are prevalent in Florida water holding capacities are in the range of 0.66-inch to 1-inch per foot of soil. Root zone depths for St. Augustine grass, the most prevalent turf grass in South Florida, are usually discussed by IFAS as being in the 6-inch to 12-inch range, although 18-inches is sometimes discussed. In any case, the majority of the roots will be in the top 6 inches of the soil. Peak ET is estimated to be in the range of 0.2-inches to 0.25-inches per day. Such a peak ET rate over three- and four-day periods may exceed the water holding capacity, especially with the 6-inch zone where most of the roots occur.

An additional factor relates to the depth to the water table. For example, in much of the urbanized areas of Broward and Miami-Dade counties, water tables are close enough to the surface that groundwater may be a major source of water available to the plant, making overhead irrigation less important (Busey, pers. comm.).

Climatic data for the Lower East Coast of Florida were reviewed. Such data indicate that, on average, about 40 percent of the four-day periods in April and May have fewer than 0.1-inches of rainfall and between 8 percent and 9 percent of the four day periods from June through September also have fewer than 0.1-inches of rainfall. This tends to confirm that, in South Florida, the climatic conditions, which could cause water stress, occur fairly frequently.

It is important to note that some of the stress periods would occur during declared water shortages when existing regulations governing water shortages (and not the year-round landscape rules) would influence the water in the root zone.

Before continuing further, it is worthwhile to consider some additional factors that would mitigate the potential for impacts.

4.2.3 When Four Days is Three (and Three Days is Two)

One might normally expect that two days per week of allowed irrigation would imply that there would be alternating four-day and three-day periods between allowed irrigations. This remains true when considering calendar days. However, what is important for maintenance of landscapes are the daytime periods – the period when almost all evapotranspiration occurs. In this regard, a conforming strategy for any user who, for instance, irrigates in the morning and finds that his or her landscape is showing unacceptable stress by the afternoon before the next watering day, would be to add an afternoon irrigation. In essence, the user conducts additional watering on irrigation days when conditions that might cause this problem seem likely. Thus, the landscape will only need to have the extractable water for three days, or two, in order for the landscape to meet its evapotranspiration needs. The availability of this option will reduce the potential for significant impacts due to inadequate root zone storage to meet ET needs.

4.2.4 Conditioning the Turf

An often recommended procedure for extending the root zone in turf areas, thereby increasing the water available in the root zone, is to acclimate grass through less frequent irrigations. The extent to which this could occur will depend on having a soil that allows for deep root growth. For instance, much of southeast Florida has shallow soils underlain by rock. On the other hand, the high water table in that area sometimes allows roots to tap into water in the water table. The water shortages and the restrictions on irrigation days will have had the effect of accomplishing much of the improvements that can be achieved by this practice. This will also reduce the potential for impacts due to water holding capacity being inadequate to support normal ET in between irrigation days.

4.2.5 Long-Term Significance of Signs of Stress

A final consideration regarding the significance of potential impacts is to consider the significance of the initial signs of stress, which may appear during periods between allowed irrigations. IFAS publications describe the signs as follows:

"Look for these signs:

1. Lawns under drought stress will curl up their leaf blades in an attempt to minimize leaf area. When leaf blades reach the V-stage, it is the optimal time to water.
2. Drought-stressed lawns take on a blue-gray cast rather than remaining green.
3. Footprints or tire tracks remain visible on a drought-stressed lawn long after having been made." (Trenholm and Unruh 2003)

However, in many IFAS extension publications the recommended response is to irrigate only when 30 to 50 percent of the lawn shows signs of wilt and to even then consider waiting if rain is forecast in the next 24 hours. The implication is that the mere appearance of wilt is not a reason in itself to be overly concerned with the survivability or long-term condition of the lawn. From the economic impact assessment viewpoint in this SERC the implication is that the "damage" from short-term wilt, in otherwise healthy lawns, is likely to be limited to the lack of satisfaction while the wilt is evident. It does not imply that long-term damage or a degradation of turf quality, which would entail more serious economic loss, is to be expected. It has also been pointed out that, "While it is true that a healthy lawn will not be hurt from short-term drought stress, and should condition from it, repeated stress on areas that are suffering from another stress (compacted soil, nematodes, insect pressure, etc.) could lead to damage that would need to be replaced. Every situation might be somewhat different in this respect." (Trenholm 2008, pers. comm.)

Once again, it is important to point out that these are general recommendations, which are offered with the understanding that specific circumstances may call for alternative courses of action. For instance, IFAS publications specifically identify coastal conditions with higher winds and shallow soils over rock, both of which occur in South Florida, as being conditions that warrant alternative strategies. Under rule mandates, the ability to adjust to such circumstances is constrained unless variances or other relief is offered and this will tend to increase impacts in those situations and to those particular users. When adverse conditions occur, such as those mentioned previously, users may ultimately replace landscaping with material that is more suitable for special conditions.

4.2.6 Summary Assessment for Group 1 Users

What emerges from this discussion is the picture that almost all Group 1 users will have irrigation systems capable of putting down sufficient water to fill the root zones in their most susceptible "crop," their turf. For most of Group 1 users, the water in the root zone will be able to get the turf through to the next irrigation without visible water stress (three daytime periods) most of the time. A goodly number will occasionally experience some temporary stress. However, some landscapes, when they are subject to atypical conditions related to climate, root zone development, and soil water-holding capacity, will experience stress (and landscape degradation) to the extent that land owners would likely invest either in landscape improvements (e.g., change plants, modify soils, install low volume systems) or change operations. For instance, changes might include dual irrigation periods (morning and evening) on watering days and more extensive hand watering on a regular basis.

4.2.7 Effect of Year-Round Restrictions on Use of Conservation Devices

Some users may have additional incentives to make sure that the amount of water that they apply is very conservative and goes beyond what would be achieved with simple adherence to this rule. These additional incentives may be derived from a conservation ethic, the high costs of water, or other reasons. A key consideration for many users may be expected benefits during water shortages. For instance, users may install low-volume and micro-irrigation systems for all or a portion of their properties knowing that they will be benefit from the exemption, under both the year-round restrictions and water shortages, of irrigation conducted with such systems. Users may also invest in irrigation control systems, such as satellite-based irrigation scheduling, and ground soil moisture sensing devices or similar devices. Such users are eligible to apply for a variance so that the system can be operated as efficiently as possible. The granting of variances to these types of users is explicitly contemplated in Rule 40E-24.501(1)(c), F.A.C.

Other users may intensively manage irrigation applications using weather information and specific knowledge of each zone to schedule irrigations.

Rainfall sensor switches have been required by state law, under Section 373.62, F.S., upon the purchase or installation of automatic lawn sprinkler systems since May 1, 1991. [3] The statute also requires rainfall sensor devices be maintained and operated. Therefore, rainfall sensors are part of the without-rule condition and their use is not the basis of any special consideration under the proposed rule.

4.2.8 Implications of Irrigation System Problems

The limitation of days when irrigation is allowed has implications for Group 1 users when there are problems with the performance of the irrigation system. First, automatic systems are usually run in the early morning hours, when the performance of these systems is not regularly observed. Identification of a problem, such as a broken or misdirected head, might not occur until signs of water stress are visible. Without the imposition of restricted days, the reaction might be to fix the system problem and fully run the affected zone(s) to relieve the stress. With the mandated irrigation days, the full use of the irrigation system would have to wait until the next irrigation day, which might be several days away.

Therefore, Group 1 users will have an incentive to use the services of landscape irrigation contractors for preventive maintenance and adjustments and to make repairs when problems do occur. The allowed 10 minutes per zone for systems under maintenance or adjustment may help somewhat with immediate water stress. The user may also employ the use low volume hand watering methods, which are exempt from the day and time restrictions. The difficulty for Group 1 users with the low volume hand water methods is that they typically have the larger areas to irrigate. In addition, Group 1 users generally are not set up to use low-volume hand watering. Therefore, it would be more costly for Group 1 users to address the problem in this way.

4.3 Analysis for Group 2 Users

Those without an automatic irrigation system had to adjust their irrigation practices and schedule to meet the requirements of the recent and present water shortage order. If Group 2 users are satisfied with the condition of their landscape and the schedule, such users may continue to irrigate up to two days

[3] **373.62 Water conservation; automatic sprinkler systems.**--Any person who purchases and installs an automatic lawn sprinkler system after May 1, 1991, shall install, and must maintain and operate, a rain sensor device or switch that will override the irrigation cycle of the sprinkler system when adequate rainfall has occurred.

per week and follow the schedule that has been in effect. Alternatively, without the year-round restrictions, they may increase the number of days they irrigate or continue the same frequency and amount, but take advantage of opportunities to irrigate at times that are more convenient.

Estimates of flows from in-ground irrigation systems on utility water and a 0.625-inch meter are approximately 15 gallons per minute. A single hose and sprinkler might be able to apply about half of that, and with multiple hoses, a hose and sprinkler system could approach the flow of the in-ground system. As Group 2 users are expected to have smaller irrigated areas than the Group 1 users, probably in the 1,000 to 4,000 square foot range, they would be able to apply adequate water if they irrigated four or more hours of the 18 hours allowed on irrigation days. (With an application rate of 8 gallons per minute and an irrigated area of 4,000 square feet, about 0.75-inch would be applied over a four-hour period.)

Being able to irrigate during daylight hours is an issue for Group 2 users. Peak times for irrigation would tend to be in the late spring and summer when daylight savings time is in effect and daylight hours are longer. One irrigation day will be on a weekday and opportunities to irrigate during daylight hours would occur in the morning and in the evening, possibly from 6 a.m. to 8 a.m. before work and 6 p.m. to 8 p.m. after work. On the weekend watering day, more hours would be available if the residents did not work and were at home. However, manually operated systems would not function if the residents were away on the weekend irrigation day.

This brings the focus onto the major disadvantage of the year-round rule for those trying to maintain acceptable landscapes, while not relying on an automatic in-ground irrigation system. Without the restrictions, these users can adjust irrigations to meet their schedule, whereas, with the rule, restrictions on the days with allowed irrigation constrain the options available to Group 2 users. These users then have three paths to take in response to the restrictions. Under the first, they can adjust their schedules to match the restrictions, rely more on low volume hand watering to make up for times when allowed irrigation opportunities are missed and water stress occurs or make minor system improvements, such as using timers and time clocks for hoses. In this case, the major cost to the landscape irrigator will be the value of the time taken to make the adjustments. The cost of additional equipment would be the other cost.

A second option is to increase the user's convenience by installing, upgrading, and/or repairing an in-ground system so that it functions as an automatic system with appropriate application characteristics. Under this option, Group 2 users would become Group 1 users. The cost of choosing the second option would be the cost of the installation, upgrade, or repair to the irrigation system. Future the benefits of this option are the added reliability and convenience that such a

system would bring not only during the year-round restrictions, but also during future water shortages.

The third option is to let the quality of their landscape deteriorate. This may involve temporary effects, such as temporary wilting, or it may lead to plant damage and changes that are more permanent.

Data are not available from past experience to quantify the likelihood that users, individually or in general, would take a particular path or that, over time, they would not change their response pattern.

4.4 Analysis for Group 3 Users

Group 3 users are different in that, without the rule, a significant number of users are believed to rely almost entirely on hand-held watering. These Group 3 users will only be affected by the requirement that the hand-held watering be conducted "by one person, with one hose, fitted with a self-canceling or automatic shutoff nozzle." as defined in the rule. It appears that the orifice limitations of the automatic shutoff nozzles would limit flow volumes to the extent that it would take about 50 percent longer to apply the same amount of water using this type of device as it would an open hose. Alternatively, users that hand-irrigated were also required to use the self-canceling or automatic shutoff nozzle during the recent water shortage.

Group 3 users who depend on hose and sprinkler watering or an in-ground system would have the same three options as discussed for Group 2. Given the limited investment in landscapes by this user group, it seems unlikely that they would choose to invest in an automatic system or otherwise upgrade their irrigation methods. Because the size of their irrigated and acceptably maintained landscape will be limited, it will be less costly in terms of time for this subgroup of Group 3 users to increase their reliance on low volume hand watering, which is not subject to the schedules provided in the rule. If Group 3 users experience scheduling or other difficulties, they would be more likely to let landscapes deteriorate.

4.5 Effects on Establishment of Lawns and Landscapes

Population growth within the District is expected to be about 130,000 per year, which accounts for about 40,000 households. A significant portion of these households will be directly impacted each year by the rule's provisions affecting new installations. Homeowner's associations or apartment complex managers who maintain landscapes for newly constructed dwelling units will also be directly affected by these provisions. In addition, landscapes will be installed for newly constructed commercial, industrial, and office complexes. Finally, there will be refurbishment and changes to existing landscapes. All of these will have to deal with the establishment of lawns and landscapes.

The rule has special provisions that allow more frequent, but still limited opportunities for the establishment of lawns and landscapes. These limitations also apply to the replanting of existing landscapes. The limitations cover a 60-day establishment period with no irrigation restrictions on planting days and then irrigations allowed six days per week for the first 30 days and four days per week for the second 30 days. The 10 a.m. to 4 p.m. no watering ban applies during the establishment period. The other major provision is that only irrigation zones with at least 50 percent new landscaping can use these "establishment" provisions. The impacts of these day and time restrictions can be evaluated separately for lawns, trees, and shrubs. An assessment of the potential impacts of the rule for each of these types of plant materials is provided in **Table 8** as follows.

Table 8. Potential effects on establishment of lawns and landscapes.

Type of Landscape	IFAS Guidance	Assessment
Lawn	To ensure that roots don't die from lack of water following planting, irrigate a few times during the day until roots have pegged down into the soil. This will generally take five to 10 days. Only irrigate enough to wet the top few inches of soil for this period (5 to 15 minutes per zone). After roots are pegged down, reduce irrigation gradually over the next two weeks to two to three times weekly. In the summer months, under drought conditions, daily irrigation may be necessary for this period. (Trenholm 2002)	The rule prohibits use of irrigation systems 10 a.m. till 4 p.m., which would mean that hand watering would be a more likely response during the period right after planting when "during the day" waterings are needed. A similar effect might also be expected for bedding plants. Evening irrigation scheduled using the rationale presented in **Section 4.2.3** would also mitigate the impacts.
Shrubs	"*Newly installed shrubs* - Recent (2007) research shows that shrubs planted from 3-gallon containers in central and south Florida can be established by applying 1 gallon of water every other day. This regime provides for good root growth and some top growth during establishment…. Following these irrigation frequencies and volume, shrubs can be established in the landscape in five to six months." (Knox 2007)	Establishment periods extending well beyond the 60 days when more frequent irrigations would provide better growth make it more likely that hand watering will be used to supplement allowed irrigations. Hand watering would also be more likely when existing landscapes are being replanted, because the special provisions regarding establishment do not apply to zones with 50% or less of the area covered by new landscaping. This limitation also provides an incentive to implement low volume irrigation for trees and shrubs.
Trees	*Newly installed trees* - Recently planted trees, up to 3-inches in trunk diameter, can survive on 2 to 3 gallons irrigation per inch of trunk diameter applied to the root ball two to three times weekly. However, they grow best with more frequent irrigation until established. Establishment takes three to four months per inch trunk diameter. (Knox 2007)	Same effects as tor shrubs, but with even longer establishment periods as the caliper increases.

4.6 Costs and Cost Savings from Adjustment to Rule Provisions

The information presented previously shows that there is great uncertainty regarding the without-rule irrigation system designs and use. It also shows that the users can choose from many paths and employ a variety of options within each of these paths in adjusting to the provisions of the rule although what is chosen is likely to be greatly affected by the without-rule system and use.

In addition, for landscape water users, both their experience with water shortage conditions and the long-term conservation program have and will provide motivations regarding landscape water conservation that will be mixed with those engendered by this rule and will affect their irrigation decisions. The District recognizes that in order to meet the efficiency goals of the water conservation program, landscape irrigators will have to go beyond simply setting time clocks and watering generously on the allowed two days per week. The goal is to have users actively manage their irrigation use by varying the number of times they actually water based on seasonal conditions and antecedent and expected rainfall. The goal is also to have users modify landscape designs by implementing "Florida Friendly Landscape" practices, improving irrigation system uniformity, and changing cultural practices to reduce irrigation water applications.

In circumstances when the without-rule practices, impacts, and responses could be better defined, it would be reasonable to estimate the numbers of irrigation users affected in particular ways and to estimate the costs of the adjustments that they would be expected to make. The previously described uncertainties make this very problematic, even without considering uncertainties regarding the costs of making adjustments. This section presents a range of unit costs and cost savings that may be experienced by users depending on the actions they take or do not take.

4.6.1 Cost Reductions from Decreased Water Use

These measures are being undertaken for conservation reasons, and the actual use of water is expected to decline relative to what it would be without the rule, although the use reductions would be less than those achieved during the water shortage. This means there is less water use. Less water usage means less expense to the users in obtaining and applying the water. Two major cases predominate. In the first case, the irrigator uses utility water to provide outdoor irrigation. In such case, the cost of the additional water from the utility would have increased the utility bill by approximately $2.00–$5.00 per thousand gallons. This estimated range was derived from an analysis of changes in water and sewer bills for users as they increase the amount of water used from 6,000 gallons per month to 10,000 gallons per month. While the data on which this estimate is based are from a 1999 survey, it is still felt to represent a reasonable range for the charges

that individual users face on the margin (FPSC 1999). Spot checks using current rate structures obtained from Alternative Water Supply Grant application submittals confirmed this pattern.

There are two somewhat offsetting changes in marginal commodity charges as the amount of water consumed by an individual utility water user increases. Most utilities now have an increasing block water rate structure so that the amount that is paid per additional thousand gallons increases as the amount of water use rises. On the other hand, many utilities have a ceiling on the amount of water use for which a quantity charge for sewer is applied. Once this level has been reached, the marginal cost of sewer use may drop to zero and the user will then face only the water charge as his or her use increases.

The second case is when water is self-supplied. These users typically have a well and pump system or an intake from a surface water body with a pump installed to supply water to the irrigation system. In the short run, the only cost differences to the user will be pumping costs. Electrical pumping costs for self-supplied irrigation systems are estimated to be in the range of $0.04 to $.0.07 per thousand gallons (Developed using a range of pressure, flow, efficiency, and electric cost parameters and applying them to the calculator available from: http://www.wateright.org/site2/advisories/energy.asp). Users may also consider wear on the pump and motor in their decision of how much to irrigate, but even if the effect on pump replacement costs was considered, the cost for application of self-supplied water would be a small fraction of that for utility water.

Irrigated areas on most single-family landscapes vary in their range from 3,000 square feet to 10,000 square feet. Irrigation applications, under average rainfall conditions based on the SFWMD permitting model, are typically in the range of 40-inches per year. As an example, use reduction estimates due to the year-round rule of 5-inches to 10-inches of outdoor irrigation water use are used. **Table 9** provides estimates of the cost savings to utility water users and to self-supplied water users as a result of using less water due to this rule.

Table 9 reveals that application costs for self-supplied users are relatively small. While application costs may not be large to an individual homeowner, such costs will be much larger for a homeowner's association, which has many acres to irrigate. In addition, reductions in water use may reduce wear and tear on the pump/electric motor. However, the low unit costs are a reason why self-supplied irrigators will have tended to use applications of additional water as an economical approach to avoiding the consequences of under-watering, such as those from non-uniform applications of irrigation water. Such problems would become more evident if less water were applied.

Table 9. Potential utility bill reductions and self-supplied energy cost reductions from applying less water.

Source/sq. ft. irrigated	Annual reduction in Application (inches)	Low Estimate of Annual Cost Savings	High Estimate of Annual Cost Savings
Utility Water		**$2.00/per thousand gallons**	**$5.00 per thousand gallons**
3,000	5	$18.70	$46.75
3,000	10	$37.40	$93.50
5,000	5	$31.17	$77.92
5,000	10	$62.33	$155.83
7,500	5	$46.75	$116.88
7,500	10	$93.50	$233.75
10,000	5	$62.33	$155.83
10,000	10	$124.67	$311.67
20,000	5	$124.67	$311.67
20,000	10	$249.33	$623.33
Self-Supplied		**$.04 per thousand gallons**	**$.07 per thousand gallons**
3,000	5	$0.37	$0.65
3,000	10	$0.75	$1.31
5,000	5	$0.62	$1.09
5,000	10	$1.25	$2.18
7,500	5	$0.94	$1.64
7,500	10	$1.87	$3.27
10,000	5	$1.25	$2.18
10,000	10	$2.49	$4.36
20,000	5	$2.49	$4.36
20,000	10	$4.99	$8.73

Care must be taken in interpreting the estimate of utility bill effects. Short-term effects (without rate changes) are likely to be different from intermediate term effects (with rate changes, but without changes to capital investment), which will again be different from longer-term effects (with capital investment changes and likely rate changes). These are briefly discussed in **Table 10** and are explained in more detail from the utility point of view in Section 6.

Table 10. Utility rate and bill effects from the viewpoint of the utility customer.

Time Frame	Description	Rate and Bill Effects on Utility Customers
Short	Reductions in demand reduce customer commodity charges	Those who reduce use have lower bills because of lower quantities used and because, with lower use, they may move into less costly use blocks.
Intermediate	With continued reductions in overall demand, utilities have greater reduction in revenue than in costs. Utilities raise rates and/or impose surcharges	Those who reduce use more than average generally have higher rates and lower bills. Those who reduce use little or none see higher rates and have higher bills.
Long-Term (use reductions caused by conservation)	With continued reductions in demand, utilities can delay construction of capacity, which lowers costs and revenue needs	The utilities set rates to reflect the effects of lower costs and reduced revenue needs. Users generally have lower utility bills.
Long-Term (peaking of demands)	Demands are reduced. Concentrating the remaining outdoor use into four days results in offsetting needs for additional storage and/or treatment.	Utilities set rates to reflect changes in peak demands. Rate changes may partially or fully offset savings from demand reductions. Net effects on utility customer bills are indeterminate.

4.6.2 Other Cost Reductions

Reducing water use can also reduce other landscape costs. One example is that reducing excessive water applications will tend to reduce leaching of fertilizers, thus allowing less to be applied and reducing fertilization costs. Another is that excessive water applications tend to cause certain weed and disease problems, such as the appearance of dollar weed. While these types of impacts are identified in IFAS landscape management publications, they are not quantified and dollar savings estimates are not provided.

4.6.3 Costs of Compliance Actions

A variety of actions can be taken by landscape users to comply with the provisions of the rule, while trying to maintain the quality of landscape that they desire. If users do not take actions to maintain the previous quality of landscape, the interpretation would be that the cost of actions, over and above those that

were taken, exceeded the benefits of further reducing the impacts on the quality of their landscapes.

This subsection looks at some of the costs that might be incurred by landscape owners who decide to modify the actions they take in managing their landscapes because of the rule. To a great extent, landscape owners who comply with the provisions of the recently rescinded water shortage order and are satisfied with the resulting landscapes will not have to modify their actions because of the rule. Those who are dissatisfied will probably look first at changes in the operation of whatever method they use for irrigation. They can do this by spending time implementing the adjustments or by procuring professional services to make the changes. In either case, the value of work time will be the primary cost component and the first to be considered.

4.6.3.1. Value of Work Time

The value of work time is being considered first because it arises from a market transaction. In a typical case, the landscape owner would procure professional services from an irrigation system company to adjust an irrigation system that might include resetting the time clock, system cleaning maintenance and repair, and replacing heads. Most maintenance and repair services performed on-site tend to involve significant initial expense as the costs include time and travel to get to the site; overhead costs for licensing, bonding and insurance; scheduling; billing; and other headquarters costs, in addition to the direct wage and benefits costs of skilled technicians. For these reasons, minimum costs for an appointment tend to be in the $75 to $125 range. These are believed to be the main types of services where use would increase because of the rule. If the irrigation system is being maintained by on-site workers, for example, employees of a homeowners association, the opportunity costs of extra work time devoted to the irrigation system could be measured by the wage costs of this time. The mean hourly wage in Florida was $17.91 per hour with maintenance and repair workers in categories similar to irrigation maintenance generally have earnings of about $15.00 per hour (State Occupational Employment and Wage Estimates for Florida, May 2007, available from: http://www.bls.gov/oes/current/oes_fl.htm).

For business costs, benefits associated with the hourly wage are generally also included, so $18 per hour might be a reasonable value to use for applying employee time to additional irrigation system monitoring and maintenance. Cases in which the landscape owner makes system changes are discussed as follows.

4.6.3.2 Value of Non-Work Time

Economic evaluations need to consider the opportunity costs associated with actions and therefore attempt to value non-work time when it is a significant consideration in the matter being analyzed. Some types of studies, where values of non-work time play a significant role, include those addressing travel-cost and

highway congestion, values of non-work time lost to illnesses and time cost of travel for recreational purposes. Value of non-work time is important in the evaluation of this rule because many irrigation systems are maintained by the landscape owners and many landscape owners use time intensive sprinkler or hand-held hose irrigation methods. In addition, a major response direction exempted by this rule is additional low-volume hand watering. Hand watering normally used for landscape maintenance (for instance, a significant practice for Group 3 irrigators), would be part of the baseline and should not to be considered as an effect of the rule). In fact, users who, without the rule, rely entirely on hand-held watering, will be affected only by the requirement that the hand-held watering be conducted "by one person, with one hose, fitted with a self-canceling or automatic shutoff nozzle" as defined in the rule

In the economic literature, the general practice is to value non-work time as a percentage of the gross wage rate. In a summary, Kenneth Small states, "From this evidence, it appears that the value of time for personal journeys is almost always between 20 and 90 percent of the gross wage rate, most often averaging close to 50 percent." (Kenneth Small, Fundamentals of Economic Demand Modeling: Lessons from Travel Demand Analysis, available from: http://www.socsci.uci.edu/~ksmall/ASME%20paper.pdf.) Guidance issued by the U.S. Department of Transportation indicates that 35 percent to 60 percent of the wage rate is a plausible range for values of local personal travel using surface modes. The lower value of this range may be most appropriate for self-performed irrigation system management and low-volume hand watering because unlike unpredictable events, such as traffic jams on a journey to work, households can decide which member performs the tasks and when the tasks are performed. The 35 percent factor implies a time value for additional or saved owner-performed landscape irrigation and irrigation system management of about $6.25 per hour.

As an example showing the use of this value, consider the cost to homeowners of low-volume hand watering. Sample application rates showed rates of flow averaging about 6.5 gallons per minute. At that rate, it would take about two-and-a-half hours to apply 1,000 gallons. Using an hourly rate of $6.25, the estimated cost of application is $15.60.

4.6.3.3 Expenditures for Irrigation System Improvements

It is likely that some landscape owners or managers will fix or improve their irrigation systems for optimal function. In making a decision to fix or improve a system, the value of the effort during periods of water restrictions, as well as the value under the year-round landscape rule will both be considered. The year-round rule limits irrigation to two days per week, but allows up to 18 hours for each irrigation day. Water shortage restrictions, on the other hand, are likely to further limit the hours, which would increase the value of systems capable of high application rates or those exempt from restrictions.

Table 11 provides general costs for irrigation system parts and equipment, including an explanation of circumstances that support the need for improvements under the year-round irrigation rule. The costs are only for the parts and equipment. Some measures do not require installation and some labor will be done by the landscape owners or professional services. Installation of drip systems and replacing of timers/controllers would be the most likely to be done professionally. Costs for improvements that have little direct connection to the year-round landscape rule are not included. For instance, major revamping of irrigation system capacities and uniformities to apply water to fill root zones during a four-hour irrigation window would result from water shortage concerns rather than the year-round rule when 18-hour windows are available.

Table 11. Costs of parts and equipment for irrigation system improvements tied to the year-round irrigation rule.

System Improvement	Circumstances Favoring its Use (rule related)	Equipment Description	Illustrative Equipment Costs
Install a drip system in selected areas	Users getting poor performance with establishment of annuals, shrubs or trees	Kits available from home improvement stores	$40 to $60 to cover targeted locations within 500 sq.ft. of bedding area
Replace a timer/controller that has not been functioning	Users with in-ground systems with non-functioning timers/controllers who want flexibility in taking advantage of allowed windows	Equipment available from home improvement stores	$60 - $100
Purchase a timer for a hose-based irrigation system	Group 2 and 3 users who want to be able to start irrigations before arising in the morning or who are satisfied with irrigating the area covered during one setting of hose and sprinkler systems.	Equipment available from home improvement stores	$50 to $80
Purchase a hose shut-off valve	Group 2 and 3 users who want to be able to make additional use of evening irrigation hours	Equipment available from on-line irrigation equipment supplier	$20 to $30
Purchase a self-canceling or automatic shutoff nozzle	Users who do not have such a device and expect to do low-volume hand watering	Equipment available from home improvement stores	$8 to $12

SECTION 5: IMPACT ON SMALL BUSINESS, SMALL CITIES, AND SMALL COUNTIES

Section Addressing 120.541(d), F.S. "An analysis of the impact on small businesses as defined by s. 288.703, and an analysis of the impact on small counties and small cities as defined by s.120.52."

5.1 Number of Businesses

A small business is defined in Section 288.703(1), F.S., as "an independently owned and operated business concern that employs 200 or fewer permanent full-time employees and that, together with its affiliates, has a net worth of not more than $5 million or any firm based in this state that has a Small Business Administration 8(a) certification. As applicable to sole proprietorships, the $5 million net worth requirement shall include both personal and business investments."

In 2006, the Small Business Administration estimated that Florida had a total of 1,942,200 small businesses.[4] This estimate includes all those reporting business income on federal tax returns. Most of these are non-employer firms. Many of the non-employer firms are part-time occupations. The Bureau of the Census estimates that there were slightly over 1.5 million non-employer establishments. The remaining 0.5 million small business establishments are those with employees. While, for most economic and demographic categories, SFWMD has about 40 percent of the activity in Florida, the count of non-employer establishments is about 50 percent of the state total. Non-employer statistics available from: http://www.census.gov/epcd/nonemployer/2006/fl.

5.2 Number of Small Cities and Counties

A small city is defined in Section 120.52(16), F.S., as "any municipality that has an un-incarcerated population of 10,000 or less according to the most recent decennial census." A small county is defined in Section 120.52(17), F.S., as "any county that has an un-incarcerated population of 75,000 or less according to the most recent decennial census." Based on these definitions and results from the 2000 Census of population, **Table 12** identifies those municipalities that qualify as small cities by county. **Table 12** also identifies those counties that qualify as small counties.

4 Small Business Administration, Small Business Profile, Florida, 2006 http://www.sba.gov/advo/research/profiles/07fl.pdf.

Table 12. Identification of small counties and small cities within the SFWMD.

County	Small Counties	Small Cities
BROWARD		Hillsboro Beach, Lauderdale-by-the-Sea, Lazy Lake Village, Pembroke Park, Sea Ranch Lakes,
CHARLOTTE		(none within SFWMD)
COLLIER		Everglades
GLADES	Glades	Moore Haven
HENDRY	Hendry	Clewiston, LaBelle
HIGHLANDS		(none within SFWMD)
LEE		Ft. Myers Beach, Sanibel
MARTIN		Jupiter Island, Ocean Breeze Park, Sewall's Point
MIAMI-DADE		Bal Harbour, Bay Harbor Islands, Biscayne Park, El Portal, Florida City, Golden Beach, Indian Creek Village, Islandia, Medley, North Bay, Surfside, Virginia Gardens and West Miami
MONROE		Islamorada, Key Colony Beach and Layton
OKEECHOBEE	Okeechobee	Okeechobee City
ORANGE		Bay Lake, Lake Buena Vista, Windemere
OSCEOLA		
PALM BEACH		Atlantis, Briney Breeze, Cloud Lake, Glen Ridge, Golf Village, Gulf Stream, Haverhill, Highland Beach, Hypoluxo, Juno Beach, Jupiter Inlet Colony, Lake Clarke Shores, Lake Park, Lantana, Manalapan, Mangonia Park, Ocean Ridge, Pahokee, Palm Beach, Palm Beach Shores, South Bay, South Palm Beach and Tequesta Village
POLK		(none within SFWMD)
ST. LUCIE		St. Lucie Village

5.3 Impact Assessment

The focus of concern for small businesses, small cities, and small counties is to encourage the rule-developing agency to incorporate special provisions so that the proposed regulations do not impose an undue burden on small business entities and local governments. Favored approaches include the following:

(I) Establishing less stringent compliance or reporting requirements in the rule.

(II) Establishing less stringent schedules or deadlines in the rule for compliance or reporting requirements.

(III) Consolidating or simplifying the rule's compliance or reporting requirements.

(IV) Establishing performance standards or best-management practices to replace design or operational standards in the rule.

(V) Exempting small businesses, small counties, or small cities from any or all requirements of the rule.

This rule does not regulate businesses. It regulates landscape irrigation practices. Landscaping that is integral to the business is not regulated. For example, playing areas on golf courses and the growing of products for sale (nurseries, sod farms, and agriculture are examples) are not regulated under this rule. No permitting or reporting requirements are included.

Businesses will have to comply with the provisions of the rule to the extent that they irrigate landscapes at their place of business. All homeowners and homeowner associations, which are generally incorporated entities, must also comply with the rule. An example of businesses that could be directly affected would be those with rental properties (whether residential or commercial) who maintain the landscapes at those properties. The performance standards for businesses irrigating landscapes are the same as those for the several million homeowners who also irrigate landscapes.

While the proportion of total irrigated landscape areas located at business establishments is likely to be small, the effectiveness of this rule depends primarily on voluntary compliance, which is affected by perceptions of equity. The District is concerned that any special performance standards or best management practices that apply specifically to small businesses would be considered inequitable by the public. Thus, provisions of the rule exempting certain uses and related to variances are clearly tied to actions and conditions that would reduce the water resource impacts of the use. For instance, the use of reclaimed water for landscape irrigation, except for a daytime use limitation, is not regulated under this rule. Small businesses are held to the same standards as other users and have the same eligibility regarding exceptions and variances.

Another difficulty with any special considerations being given to small businesses concerns enforcement. Enforcement of the rule will primarily be conducted by code enforcement and law enforcement officers who spot violations while performing their regular duties. In most cases, the violation would be the use of an automatic irrigation system outside normal business hours. It is not feasible for enforcement officials to ascertain whether an apparent violator is a small business before issuing a citation. In addition, it would be difficult afterward to establish the status of anyone cited when the citation is adjudicated.

No data were located to determine the number of small business that are:

- Located in a complex or office building that does not possess landscaping (e.g., in a downtown high-rise).
- Located in a complex or office building in which they are not responsible for the irrigation of the landscape (e.g., the small business is a tenant in a shopping plaza).
- Located in a complex or office building in which they are responsible for the irrigation of the landscape (e.g., the small business owns the building or is the sole tenant and responsible for irrigation under the terms of a lease).

It is likely that most holders of the approximately 10,000 landscape irrigation permits identified in **Section 2** are either small businesses or homeowner associations. However, this count does not include small businesses who irrigate with utility water. Data to approximate the number of such users have not been found.

In the same manner, there are no specific exemptions or different requirements for small cities and counties. Small cities and counties have the same options regarding rule adoption and enforcement as do other governments. Small cities within larger counties would be more likely to contract for ordinance and enforcement services from surrounding larger jurisdictions in a manner similar to contracting for police and fire services.

SECTION 6: ADDITIONAL USEFUL INFORMATION

The following addresses Section 120.541(e), F.S., "Any additional information that the agency determines may be useful."

This section focuses primarily on those entities that supply the key inputs to urban landscaping. These include water utilities who sell water used, in part, for outdoor irrigation, and providers of irrigation systems and their components, including controllers and scheduling devices and services. Also included are those who service and repair irrigation systems, sellers of landscape plants, and others. The effect on each of these sectors will depend on and flow out of the transactional effects discussed in **Section 4**. To the extent that those directly affected increase or decrease expenditures as they follow particular avenues in adjusting to the rule, the effects from the viewpoint of the suppliers are discussed in this section.

6.1 Impacts on Water Utilities

Water utilities are expected to be impacted by the rule in several ways. These impacts will likely be similar in direction, but less in magnitude to those experienced during water shortage restrictions when compared to the situation before the water shortage declarations. However, as use reductions are expected to be smaller under the year-round rule and because some utilities have already adjusted rates, the apparent immediate revenue impacts on utilities are likely to be smaller. Primarily, the impacts arise because of reductions in demand for their product (i.e., water) and changes in the timing of those demands.

Table 13 presents the year-round irrigation restriction impacts and potential effects on water utilities.

Utilities will also be affected because they will be required to amend water conservation plans to reflect adoption of ordinances consistent with this rule. Those utilities with applications in-house at the time the rule becomes effective will have to submit a revised water conservation plan, a component of which is the passage of an ordinance consistent with 40E-24.201 or 40E-24.301, F.A.C. Those utilities not in-house with an application at the time the rule becomes effective, will have to comply with these new conservation regulations when they submit an application for renewal or modification or at the time of their five-year compliance review.

Table 13. Impacts on utilities from year-round irrigation restrictions (comparison to situation prior to water shortage restrictions and consequent use reductions).

Avenue for Impact	Economic Impact	Range of Impacts and Units
Short Term Impacts		
Users reduce demands for water compared to without rule situation	Utility water revenue from commodity sales is reduced. Utility sewer revenue is reduced for those users paying a commodity sewer charge on their increments of water affected by the rule	Revenue losses mostly in the range of $2.00 to $5.00 per thousand gallons of reduced sales. (Florida Public Services Commission 1999 and utility Alternative Water Supply grant application submissions) As users cut water use, users may also move to rate blocks with lower charges. These impacts mirror the initial costs saving of utility customers who use less water.
Utilities withdraw, treat, and deliver less water	Certain water system operating costs, such as electricity, chemicals, and replacement parts and materials, are reduced with the decrease in the production of water. Other costs, such as those for plant operation, may be reduced very little or not at all. Sewer operating costs would be unchanged. Cost reductions may be offset to the extent that non-revenue water increases are due to increased flushing to maintain disinfectant residuals.	$0.20 to $0.50 per thousand gallons cost reductions for conventional treatment and $0.50 to $0.90 for membrane processes. (Camp, Dresser & McKee 2006)
Reduction in net revenue after current costs	From the above, revenues drop significantly more than costs, reducing the net revenue available to cover fixed costs, including debt service and maintenance of financial ratios required by debt covenants. Utilities may raise rates or impose surcharges.	Much as some did during water shortage restrictions, utilities may raise rates, impose surcharges or restructure tiered rate structures to bring revenues in line with costs. Costs attributable to the rule are limited to those associated with the revenue shortfall resulting from the water use reductions caused by the rule.
Long-Term Impacts (Changes in Time Path of Capital Investments and Permanent Changes in Operating Costs and Revenues)		
Most, if not all, utilities experience lower demands than previously expected for each year going forward		

Table 13. Impacts on Utilities from Year-Round Irrigation Restrictions (Continued).

Avenue for Impact	Economic Impact	Range of Impacts and Units
Long-Term Impacts		
Utilities re-plan capital needs	Utilities delay investment in new facilities.	Treatment plant additions cost in the range of $2.00–$6.00 per gallon per day of capacity. (Camp, Dresser & McKee 2006) Annualized cost savings would be 10% to 15% of this capital cost saving. Cost savings from delaying new capacity will ultimately be passed on to customers.
Long-Term Impacts		
Some utilities experience higher peak demands		
Utilities re-plan capital needs	Utilities advance investment in new facilities to offset demand peaking. Storage and treatment capacities would most likely be affected.	Utility capacity needs are related to peak demands. Utilties experiencing higher peak demands will make additional investments and experience higher costs, which will be passed on to the ratepayers

6.2 Impacts on the Irrigation System Industry

By limiting the opportunities, days, and hours to use irrigation systems, and by more forcefully defining prohibited "wasteful and unnecessary" use, the year-round rule generally provides incentives for landscape owners to have properly functioning in-ground irrigation systems with automatic timers. It also provides an incentive to employ low-volume or microirrigation systems, which are exempt from the time and day restrictions of the rule. Limitations on the opportunities to use the irrigation systems place a higher value on properly working systems when they are permitted to operate. Limiting the times of irrigation also limits the freedom of those who had been manually operating their irrigation systems to schedule these activities around their own schedules and the needs of their landscapes. This provides an incentive for these users to "go automatic" to regain the flexibility in the use of their personal time. The effect of all these considerations is that there is expected to be some increase in the use of irrigation industry services. It is not believed that the year-round landscape rule will significantly influence the design capacities of new or retrofitted irrigation systems because the concern of the designers will be to meet irrigation system performance needs during the more limited windows allowed during water shortages.

6.3 Impacts on the Landscape Industry

It is expected that most landscape owners who irrigate will adjust to the restrictions primarily by adjusting irrigation processes and, in some cases, making

changes to the irrigation systems to improve performance under the restrictions of the rule. Relatively few are expected to make major changes to their landscapes. The rule provides an incentive to have root zone water-holding capacities, which can provide an adequate supply of water between allowed irrigations. Thus, some plants, such as annual bedding plants that may have limited root zones, even after establishment, may fall out of favor. On the other hand, sales of Florida-friendly or drought-tolerant plants and sales of materials designed to increase the water-holding capacity of soils may increase. It is believed that the potential for impacts related to establishment periods has been largely alleviated by working with industry during the water shortage to specify appropriate conditions, which will also work during implementation of the year-round irrigation rule.

Additional discussion regarding impacts of rule provisions during lawn and landscape establishment was provided in **Section 4.5**. It was pointed out that the limitations may be overcome by additional hand watering or by installation of low volume irrigation systems. When plants are self-installed or installed in occupied residences, the homeowner would have the advantage of being there and being able to observe the need. In this case, the industry would be more likely to negotiate with the landscape owner to provide any needed low volume hand watering. When unoccupied dwellings and commercial installations are involved, any additional watering responsibilities may fall on the industry, which after the planting is completed, would not normally visit the premises to observe conditions and complete low volume hand watering. In this case, the additional responsibility and costs would be more likely to fall on the industry.

6.4 Impacts on Homeowners and Businesses Dependent on Attractive Landscapes to Maintain Property Values and Business Sales

No evidence was found to suggest that, due to the year-round landscape restrictions, landscape irrigators presently maintaining high quality landscapes would tend to choose lower quality landscapes. To the extent that providing attractive landscapes to enhance property values and attract clients was part of a business strategy, landscape quality would likely be maintained. Exceptions might occur for properties, which are not being well maintained in the first place. In such situations, it would be difficult to separate landscape deterioration that may result from dry conditions from the changes that might result from the limitations imposed by the year-round landscaping rule.

SECTION 7. LOWER COST REGULATORY ALTERNATIVES

This section Addresses Section 120.541(f), F.S., "In the statement or revised statement, whichever applies, a description of any good faith written proposal submitted under paragraph (1)(a) and either a statement adopting the alternative or a statement of the reasons for rejecting the alternative in favor of the proposed rule."

No formal proposal for a lower cost regulatory alternative to this proposed rule has been received. If one is received, it will be addressed in a revision to the SERC developed in accordance with the requirements of Chapter 120, F.S.

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ATTACHMENT A

The Survey of Outdoor Water Use[5] and the Characterizations of Water Users in the SERC – Summary of Some Relevant Points

1. The survey, while scientifically conducted, took place 16 years ago (1992) and covered only Miami-Dade, Broward and Palm Beach counties.
2. The survey took place shortly after water shortages had been in effect in these counties.
3. Separate surveys were conducted for residences and for holders of general permits. Items 4–10 that follow pertain to the residential survey, while items 11–13 pertain to the general permit survey.

Residential Survey

4. It was a telephone based survey so a goodly number of respondents were not responsible for outdoor irrigation at their residence. Those responsible accounted for 55% to 69%. Interestingly the low percentage was in Palm Beach County, where, while the proportion of multi-family units was smaller, there must have had a much larger percentage in developments in which an association was responsible for landscape irrigation. (A confirmation of this comes from the current pattern of a disproportionate share of landscape irrigation permits and permitted acreage being in Collier and Lee counties, ~45%). Developments in which associations are responsible for irrigation are characteristic of these areas.)
5. Of those responsible for outdoor irrigation about 10% in each county reported that they did not do any outdoor irrigation. The outside area not needing irrigation followed by cost and lack of time were the most prevalent explanations.
6. 70% to 80% of households reported using municipal system water for irrigation.
7. One-half or more of those responsible for outdoor irrigation reported that they did not water all areas.
8. About 40% to 60% reported using "when the grass looked like it needed it" as the main method being used to decide when to water.

[5] South Florida Water Management District Outdoor Water Use Surveys, Final Report, Social Science Research Laboratory, FAU/FIU Joint Center for Environmental and Urban Problems, Florida Atlantic University, 1992, Part I General Population Survey and Part II Permit Holders Survey.

9. The most common watering frequency was twice per week and over half of the respondents reported that watering frequency varies during the year.

10. Equipment and practices vary by the value of the home. Those whose homes are least valuable are more likely to water, on average, only once per week, watering only some of the area, and only when the grass is dry. They more likely do not have an in-ground sprinkler system. Many water between 4 p.m. and 8 p.m. Those in homes that are more expensive are more likely to water all of the outside area, to use a sprinkler system and to water 4 a.m. to 8 a.m. These same patterns hold for household income.

Permit Holders' Survey

11. Permit holders irrigated larger areas, were more likely to be self-supplied, were highly likely to have in-ground sprinkler systems and to have them timer activated.

12. A modest percentage (17-21%) in Miami-Dade and Broward counties indicated their sprinkler systems were hand activated and many of these users cited "observed need" as the basis for watering.

13. Over 50% of respondents with automatic systems report they "usually" cancelled irrigations when it had been raining and an additional percentage of respondents report "sometimes" cancelling irrigations.