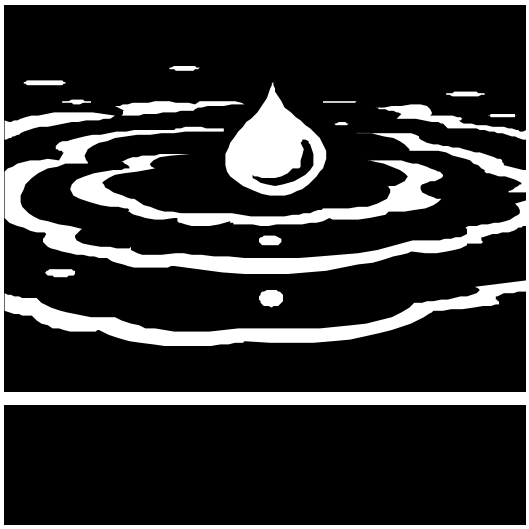
ROCK HILL

UTILITIES

WATER CONSERVATION
&
DEMAND MANAGEMENT
PLAN



August, 2003

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City of Rock Hill, South Carolina
Water Conservation & Demand Management Plan

Background

This plan was developed and written by the City of Rock Hill, Utilities Department and the Water Conservation Task Force. The Water Conservation Task Force was formed in March, 2003 to assist in revising the City's Drought Response Ordinance and to develop a conservation plan to encourage efficient uses of water by the City and its customers. The Water Conservation Task Force consists of interested citizens within the water system's service area.

The City of Rock Hill and the Water Conservation Task Force are committed to the promotion and implementation of this Water Conservation and Demand Management Plan by its industrial, commercial, and residential water system customers.

Task Force Mission

The mission of the Water Conservation Task Force is to develop and implement a system-wide approach to promoting efficient water use throughout the City's service area.

Purpose of the Plan

The purpose of this water conservation plan is to promote the environmental and economic benefits of using water wisely. Since water is the world's most valuable resource, the City of Rock Hill wants to encourage its water consumers to learn the importance of maximizing this resource. In addition, the City of Rock Hill, as a public water provider, can realize long-term capital savings through water conservation by reducing the cost of infrastructure expansion.

As in most communities, water consumption reaches its peak demand during summer months; this increased seasonal demand is driven primarily by landscape maintenance. Between 1997 and 2002, the entire state of South Carolina experienced varied degrees of drought conditions. During the Summer of 2002, the state declared extreme drought conditions in most of the state, including Rock Hill and York County. Based on the City's municipal code of laws regarding drought declaration, for the first time in its history as a water supplier, Rock Hill was required to implement and enforce mandatory water restrictions due to the state's extreme drought declaration for this area.

In 2003, the South Carolina Department of Natural Resources required all public water utilities to revise their ordinances governing drought declarations so that each utility could make its own territorial drought declarations based on system specific triggers.

The City of Rock Hill's revised Drought Management Plan and Drought Response Ordinance was adopted on August 25, 2003 and have become a part of the City of Rock Hill's Code of Ordinances. This water conservation plan is a supplemental document that stands alone

to support the ordinance during drought enforcement and to provide general water conservation and demand management goals and objectives for both the utility and its customers.

This document may be periodically updated as new and/or improved conservation technologies and initiatives surface, as regulatory requirements are changed or new regulatory mandates are issued or as otherwise needed based on the assessment and recommendation of management.

Focus of the Plan

The primary focus of this plan is for the City of Rock Hill and its water customers to become partners in year-round water conservation. Efficient water use on a voluntary basis, 365 days a year, will achieve effective short term demand management and support conservation measures on a much broader, long-term scale.

Goal and Objectives

The primary goal of this water conservation plan is to reduce City customers' per capita water consumption by increasing the number of people using water wisely.

Based on the purpose, focus and goal of this plan, the Water Conservation Task Force has established the following goals:

1. PUBLIC EDUCATION:

Take a leadership role in educating the public about water conservation, targeting all age and socio-economic groups. Raise public awareness of the area's water supplies and the need to use them efficiently with the objective of changing habits, not lifestyles, regarding water use.

2. CONSERVATION MEASURES:

Establish recommended conservation measures for both indoor and outdoor water use.

3. CONSERVATION INCENTIVES:

Create customer incentives (e.g. rebates, giveaways, recognition, etc.) to encourage water conservation.

4. REGULATORY AND GROWTH ISSUES:

Stay abreast of state and federal regulatory and growth issues and requirements that may have an effect on conservation measures and local water system expansion.

5. WATER RECLAMATION:

Identify both public and private opportunities for water reclamation projects and initiatives

6. DROUGHT RESPONSE RESTRICTIONS:

Effectively communicate and enforce water use restrictions during declared drought conditions.

Public Education

Encourage voluntary water conservation through public education.

To achieve this objective, the City of Rock Hill Utilities Department will conduct a comprehensive educational program involving media relations, advertising, demonstrations at public events and public speaking for school and civic groups. Other programs may include a video presentation, brochures and conservation initiatives on the City's website.

Objectives:

1. Develop a program theme that can be used as a catch phrase promoting water conservation. A theme could be chosen by conducting a contest among elementary school children. The City and area businesses could sponsor such a contest.
2. Teach customers how to read their bill. This would be accomplished through utility bill inserts, the City's web site and through speaking engagements.
3. Develop a brochure focusing on conservation guidelines for water efficient landscape maintenance, targeting customers with "remote" irrigation devices.
4. Develop a general purpose brochure on indoor & outdoor water conservation practices.
5. Observe the American Water Works Association's annual National Water Week in May. Hold a special public event each year focusing on the importance of water and using it wisely.
6. Take part in Rock Hill's annual Earth Day Birthday event. Set up an interactive booth or display on water conservation.
7. Develop partnerships with City departments, local and state agencies, local businesses, the Rock Hill School District and higher education institutions to promote water conservation. For example:
    a. The City's Parks, Recreation & Tourism Department, in conjunction with the Public Works' Clean & Green staff, currently conduct tours at RiverPark that focus on protecting our water sources, pollution & conservation. The Utilities Department could help support this program.
    b. Work with the School District to have a water conservation lesson built into a particular grade's curriculum.
8. Use all forms of media to promote water conservation awareness, including PSAs, print and radio advertisements, human interest stories, videos and general information posted on the City cable channel and web site.
9. Set up permanent public displays or information boards focusing on water conservation at local library, museum, schools and shopping centers.

Conservation Measures

Encourage voluntary water conservation
through indoor and outdoor conservation measures.

To achieve this objective, the City must educate customers on the many ways to conserve water around their homes. Customers can reap significant savings without significant lifestyle changes by using common sense. Since the habits we teach children now make them better environmental citizens in the future, customers will be encouraged to involve the entire family and think about all the different ways they use water. Most of these uses are listed below, along with reasonable conservation methods.

Objectives:

1. **Promote water conservation indoors.**[1]

Bathrooms

- Recycle water by placing a bucket inside the shower and collect "warm-up" and "grey" water. This otherwise wasted water is great for container plants.
- If all American households installed water-saving toilets, faucets, and showerheads, water savings would equal about 5.4 billion gallons per day.
- Turn off the water while brushing teeth or shaving. Run water only when you need to rinse.
- Repair leaks-one drop per second wastes 2,400 gallons of water a year.

Kitchens

- Scrape dirty dishes instead of using the dishwasher pre-rinse cycle.
- Run dishwashers and washing machines on full loads only.
- Fill a sink with soapy water and soak dishes. Turn off the water when scrubbing dishes. Run water only when you need to rinse.
- Limit disposal use by composting garbage. You'll save large amounts of water and improve your garden soil.
- Keep a pitcher of water in the refrigerator so you won't waste water to get it cool.

2. Promote water conservation outdoors.[1]

Landscaping

Gardeners looking for ways to cut down on the amount of water they use will benefit from these Water Wise guidelines.

- **Place plant in groups according to the amount of water they need.** This way, you won't end up over- or under-watering any part of your lawn or garden.
- **Consider establishing your garden with hardy, drought-resistant/tolerant plants that need less water.** Selecting plants with water efficiency in mind doesn't mean changing your tastes or the appearance of your landscape or garden.
- **Water plants when the soil is dry, not before.**
- **Establish watering priorities.** Remember that all new plants need water to become established. Take closer care of new and young plantings, then more mature trees and shrubs.

- **Watch the weather.** Don't water or irrigate if rain is predicted. Skip at least one watering after a good rain. Cut back watering times and frequencies in cool and/or humid weather.
- **Set a watering schedule based on the season. In the Spring, Fall and Winter**, check the soil surrounding plants every 5 to 7 days, or once a week. If the soil is dry, water thoroughly; if moist check again in a couple of days. **In the Summer**, check the soil surrounding the plant every 3 to 5 days, or twice a week. If the soil is dry, water thoroughly; if moist, check again in 2 to 3 days.
- **Map out a set watering schedule-you'll minimize water consumption this way.** Strive to water in early morning or evening to take advantage of the cooler temperatures and reduce evaporation.
- **Water slowly, deeply and infrequently to avoid water runoff and spot-water areas which dry out more quickly.** Inspect your hose or sprinkler system for leaks, and avoid placing watering devices where they waste water, such as on your driveway, deck or porch.
- **Don't forget your usual maintenance activities, such as mulching, pruning, composting and fertilizing.** Strong plants require less care than weaker ones; they also give a landscape or garden a more attractive look.
- **Control weeds.** They compete with useful plants for water.
- **Shelter container plants by moving them to shady areas.** This reduces water loss due to evaporation.
- **Use a drip watering system.** This can save up to 60 percent of the water used by sprinkler systems.
- **Consider letting your lawn go dormant;** most lawn grasses will rebound when rain returns.
- **If you have a slope, place lower-water-demand plants at higher elevations, and those needing more water at lower elevations.** The water from the higher areas will trickle down to plants that demand more moisture.
- **Water early in the day and spike and aerate lawns to ensure maximum penetration.** Don't be a gutter flooder.

<u>Around the House and Yard</u>

- Use a broom or blower on sidewalks and driveways instead of a hose.
- Don't let the water run while washing your car. Use a nozzle or hose-end turn off valve.
- Pool covers reduce evaporation. In arid climates, an average-sized swimming pool loses about 1,000 gallons of water per month if left uncovered.
- It's a sign of summer fun, but running through sprinklers or playing with hoses wastes gallons of water.
- Watering indoor and outdoor plants unwisely can waste water. Water infrequently but more deeply and loosen soil in containers occasionally or mulch the soil surface to cut down water evaporation. Move container plants to sheltered areas away from excess wind and sun.

Conservation Incentives

Encourage voluntary water conservation through conservation incentives.

To achieve this objective, the City of Rock Hill will create incentive programs that encourage the wise, efficient use of water, including rebate programs, utility bill drawings and lower utility rates.

Objectives:

1. Offer rebates on installation of indoor and outdoor water efficient appliances and components. Appliances might include dishwashers and washing machines. Components might include shower heads and rain sensors for irrigation systems.
2. Encourage customers to "harvest" rainwater to provide water for landscape use. Some towns and cities sell "rain barrels", which include screens to protect mosquito breeding. These barrels are typically 65 gallons and made from recycled plastic.
3. Conduct a monthly or quarterly drawing for a utility bill credit for customers using less water. Those who qualify might show that their water use has decreased by a certain percentage every month from the previous year; or, the City may qualify customers based on other historic consumption trends that show increased efficient water use per household.
4. Recognize water conscience customers in advertisements, articles, etc.
5. Partner with local home improvement, department and/or hardware stores to provide discounts and/or rebates on home products that promote water efficiency.
6. Offer rebates or other incentives for home builders who build homes with water efficient appliances.
7. Develop new residential water rate to encourage conservation.

Regulatory and Growth Issues

Focus on regulatory and growth issues that may impact the demand for water and the cost and ability to serve customers

Objectives:

1. Address Regulatory Issues

Public water systems are subject to numerous regulations by the South Carolina Department of Health and Environmental Control, the South Carolina Department of Natural Resources, the United States Environmental Protection Agency and other state and federal authorities. In addition to the fact that many states across the country continue to experience drought conditions, the federal government has identified that the demand for water is constantly increasing, however the ability to meet these demands is limited.

On both the state and national levels, source water availability will continue to be closely assessed in upcoming years. Assessments are more than likely to result in bottom-line mandates on water suppliers. The City of Rock Hill wants to have a voice in evaluating any new supplier requirements that may result from these assessments. Rock Hill Utilities is committed to staying informed on government studies, legislative action and ever-changing treatment, testing and distribution requirements set forth by these regulatory agencies.

2. Address System Growth

As the City's customer base grows, the increasing demand for water use has a bottom-line impact on the capital investments that will need to be planned and implemented. These capital investments affect every aspect of water supply - intake, treatment, distribution and maintenance. As these capital investments are required, the City must consider methods of recouping added costs to serve its customers, which may ultimately translate into increased product costs for customers.

Between 1990 and 2000, the population of Rock Hill has grown by 19.5%. Between 1992 and 2002, the number of water customers that the City serves has increased by 43%. Based on these growth figures, the City must increase raw water pumping capacity and add new treatment capacity at its filter plant, new elevated water storage and new distribution line capacity.[2]

As growth continues, the City might consider the following options to offset increased water demand:

a. Create incentives for home builders to install water efficient appliances in new homes.

b. Create a billing surcharge, applicable during high-demand months, for customers who fail to show water reduction efforts. The surcharge might apply to those customers who exceed 2.5 times their winter water consumption during high-demand months.

c. Consider mandating rain sensors, timers and other water saving options for newly installed irrigation systems through City Building Codes and Inspections.

As our City continues to grow, we must not only consider methods of meeting anticipated demand for services, but we could encourage the deferral of this increased demand through creative conservation, incentives, surcharges and/or changes in building and zoning laws.

Water Reclamation

Identify opportunities for water reclamation projects and initiatives

Water reclamation is the reuse of treated wastewater for purposes such as irrigation, cooling, manufacturing processes, street washing and construction site dust control. Using reclaimed water lessens the amount of treated water that winds up on landscaping and cuts the amount of wastewater discharged into rivers and streams. Pipes carrying reclaimed water are separate from water lines used to distribute treated potable water. Some of the strategic and economic benefits that can be derived from water reclamation include increasing effective drinking water supply and treatment capacity, managing wastewater discharge and postponing capital expenditures. Using a reclaimed water system can help the City manage their water and wastewater assets for their highest and best uses.[3]

Water reclamation is relatively new in the Carolinas. The City of Rock Hill will conduct a feasibility study to determine regulatory requirements, identify potential uses and users, analyze the economics of establishing a reclaimed water system, provide preliminary costs to establish a system and outline a plan for system implementation. The City will likely focus on specific geographic areas where large scale irrigation is needed or will be needed.

Drought Response Ordinance Restrictions

Enforce both voluntary and mandatory water restrictions during drought conditions.

The City of Rock Hill, SC has determined system specific triggers in the City's Drought Management Plan that will acknowledge that drought conditions exist in the City's service area. The Drought Management Plan allows for three different levels of drought.

These levels are:

Phase I. Drought/Precautionary Alert

Phase II. Drought/Restrictive Alert

Phase III Drought/ Emergency Alert

Each level of drought defines the need for voluntary and/or mandatory restrictions by the City's customers to met specific goals.

The City of Rock Hill's Drought Response Ordinance specifies water restrictions for each drought phase . The Drought Response Ordinance allows for the following voluntary and/or mandatory restrictions based on Phase I, II and II level droughts

Phase I. Drought/Precautionary Alert

During a **Phase I Drought** the City of Rock Hill will reserve the right to seek voluntary reductions from its customers in the use of water for all purposes and voluntary reductions on using water during certain peak water demand periods. Specifically, **the goal during this phase is to achieve a reduction in overall water use of 15%**.

The City may request its customers to:

1. Reduce their water use to a maximum of 350 gallons per household per day.

2. Reduce the washing down of sidewalks, walkways, driveways, parking lots, tennis courts, and other hard surfaced areas;

3. Reduce the washing down of buildings for purposes other than immediate fire protection.

4. Reduce the flushing of gutters.

5. Reduce the domestic washing of motor bikes, boats, cars, etc.

6. Reduce the use of water to maintain fountains, reflection ponds and decorative water bodies for aesthetic or scenic purposes, except where necessary to support aquatic life.

7. Reduce watering of lawns, plants, trees, gardens, shrubbery and flora on private or public property to the minimum necessary. Encourage outdoor watering to be done during off-peak hours. The City recommends that customers water landscaping 2 times per week during summer months.

The City **recommends** the following **voluntary** watering schedule during a Phase I drought:

Odd numbered addresses:

Water twice a week on Tuesday, Thursday and/or Saturday during the hours of 9:00 p.m. and 5:00 a.m.

Even numbered addresses:

Water twice a week on Wednesday, Friday and/or Sunday during the hours of 9:00 p.m. and 5:00 a.m.

8. Reduce the amount of water obtained from fire hydrants for construction purposes, fire drills or for any purpose other than fire-fighting or flushing necessary to maintain water quality.

9. Encourage the limitation of normal water use by commercial and individual customers including, but not limited to, the following:

a. Stop serving water in addition to another beverage routinely in restaurants.

b. Stop maintaining water levels in scenic and recreational ponds and lakes, except for the minimum amount required to support aquatic life.

The City shall:

1. Intensify maintenance efforts to identify and correct water leaks in the distribution system.

2. Continue to encourage and educate customers to comply with voluntary water conservation.

3. Cease water service to customers who have been given a 10-day notice to repair one or more leaks and have failed to do so.

Phase II Drought/Restrictive Alert:

During a **Phase II Drought** the City of Rock Hill will reserve the right to seek voluntary reductions from its customers in the use of water for all purposes and mandatory restrictions on non-essential usage and restrictions on times when certain water usage is allowed. **Specifically, the goal during this phase is to achieve a reduction in overall water use of 20%.**

The City may request its customers to:

1. Reduce their water use to a maximum of 300 gallons per household per day.

2. Use low volume, handheld watering devices for landscape design and maintenance.

The City may require its customers to:

1. Restrict the use of sprinklers, irrigation systems or other remote landscape devices **up to three (3) days per week**, staggering days based on odd and even addresses, during designated hours

The City might consider setting the following watering schedule during a Phase II drought:

Odd numbered addresses:

Water on Tuesday & Saturday during the hours of 9:00 p.m. and 5:00 a.m.

Even numbered addresses:

Water on Wednesday & Sunday during the hours of 9:00 p.m. and 5:00 a.m.

2. Water newly seeded/sodded lawns one time per day for the first two weeks during designated hours. After the first two weeks, newly seeded/sodded lawns may only be watered on designated days during designated times.

3. Eliminate water runoff from landscape irrigation and maintenance.

4. Limit water-based recreational activities that require filling newly constructed or drained structures such as swimming pools, water slides, or other water-based recreation equipment to one time per drought period.

5. Newly constructed public or private swimming pools may be filled one time during the drought period.

6. Recycled water must be in use for water slides and other water-related activities to continue operations.

7. Eliminate the washing down of sidewalks, walkways, driveways, parking lots, tennis courts, and other hard surfaced areas.

8. Eliminate the washing down of buildings for purposes other that immediate fire protection.

9. Eliminate the flushing of gutters.

10. Prohibit the use of water to maintain fountains, reflection ponds, and decorative water bodies for aesthetic or scenic purposes, except where necessary to support aquatic life.

11. Eliminate domestic washing of motorbikes, boats, cars, etc. Customers are encouraged to utilize automated, water efficient commercial car washes where water is recycled or reclaimed.

12. Discourage obtaining water from fire hydrants for construction purposes, fire drills or any purpose other than fire-fighting or flushing necessary to maintain water quality.

13. The City may encourage the limitation of normal water use by commercial, agricultural and individual customers including, but not limited to, the following:

a. Stop serving water in addition to another beverage routinely in restaurants.

b. Stop maintaining water levels in scenic and recreational ponds and lakes, except for the minimum amount required to support aquatic life.

c. Limit irrigating of golf courses and any portion of their grounds.

d. Allow professional and commercial landscaping, nursery and pressure washing businesses with a valid City of Rock Hill business license to continue normal operations using handheld hoses with spring-loaded nozzles or by use of recycled water.

e. Limit expanding commercial nursery facilities and placing new irrigated agricultural land in production.

f. Postpone the installation of landscaping when required by the site design review process.

g. Automated, water efficient commercial car washes may remain in operation. These operations are encouraged to implement conservation techniques and explore different water saving methods.

h. Agricultural and livestock operations are encouraged to implement conservation techniques, explore different water saving methods and use alternative sources.

The City shall:

1. Intensify maintenance efforts to identify and correct water leaks in the distribution system.

2. Publicize the penalties to be imposed for mandatory restrictions and the procedures to be followed if a variance to the restrictions is requested.

3. Cease water service to customers who have been given a 10-day notice to repair one or more leaks and have failed to do so.

4. Continue to encourage and educate customers to comply with voluntary water conservation.

Phase III Drought/Emergency Alert:

During a **Phase III Drought** the City of Rock Hill will reserve the right to impose mandatory restrictions in the use of water for all purposes and on times when water usage is allowed. An extreme water shortage can result in emergency conditions adversely affecting health, sanitation and fire protections for the public. **Specifically, the goal during this phase is to achieve a reduction in overall water use of 25%**.

The City shall require its customers to:

1. Strongly recommend limiting their water use to a maximum of 250 gallons per household per day.

2. Use only low volume, handheld watering devices with spring-loaded nozzles for landscape design and maintenance.

3. Restrict handheld landscape watering to **up to three (3) days per week,** staggering days based on odd and even addresses, between the hours of 9:00 p.m. and 5:00 a.m. The use of sprinklers, irrigations systems or other remote water devices is **strictly prohibited** during a Phase III drought.

The City might consider setting the following hand-watering schedule during a Phase III drought:

Odd numbered addresses:

Water on Tuesday & Saturday during the hours of 9:00 p.m. and 5:00 a.m.

Even numbered addresses:

Water on Wednesday & Sunday during the hours of 9:00 p.m. and 5:00 a.m.

4. Postpone planting of new landscaping until after the emergency drought period has ended.

5. Prohibit planting of new ornamental plants or seeding/sodding of lawns due to strict watering limitations. However, customers with new seeded/sodded lawns may to petition for a variance.

6. Cease operations of commercial and other service related businesses that consume water for non-industrial, non-essential purposes, including but not limited to car washing & pressure washing.

7. Prohibit the washing down of buildings for purposes other than immediate fire protection.

8. Prohibit the washing down of sidewalks, walkways, driveways, parking lots, tennis courts and other hard surfaced areas.

9. Prohibit the flushing of gutters.

10. Prohibit domestic washing of motorbikes, boats, cars and other motor vehicles.

11. Prohibit the use of water to maintain fountains, reflection ponds, and decorative water bodies for aesthetic or scenic purposes, except where necessary to support aquatic life.

12. Prohibit all filling, maintaining or topping off public or private swimming pools, water slides or other water-based recreational equipment.

13. Strictly prohibit obtaining water from fire hydrants for construction purposes, fire drills, or any purpose **other than firefighting or flushing necessary to maintain water quality**;

14. Prohibit normal water use by commercial and individual customers including, but not limited to, the following:

a. Stop serving water in addition to another beverage routinely in restaurants.

b. Stop maintaining water levels in scenic and recreational ponds and lakes, except for the minimum amount required to support aquatic life.

c. Prohibit irrigating golf courses and any portion of their grounds.

d. Prohibit expanding commercial nursery facilities and placing new irrigated agricultural land in production.

e. Prohibit the installation of landscaping when required by the site design review process.

f. Agricultural and livestock operations are required to implement conservation techniques, explore different water saving methods and use alternative sources. These operations are to restrict irrigation use to the hours of 7:00 p.m. to 7:00 a.m. and prohibit water runoff.

The City shall:

1. Intensify maintenance efforts to identify and correct water leaks in the distribution system.

2. Publicize the penalties to be imposed for mandatory restrictions and the procedures to be followed if a variance to the restrictions is requested.

3. Cease water service to customers who have been given a 10-day notice to repair one or more leaks and have failed to do so.

4. Place a moratorium on the issuance of all new water service connections and contracts for all new water main extensions. Notice of the moratorium will be provided to all developers.

5. Strongly encourage all residential use water customers to voluntarily reduce overall monthly water usage to 70% of the customer's monthly average.

6. Continue to encourage and educate customers to comply with voluntary and mandatory water conservation.

7. Publicize the penalties to be imposed for mandatory restrictions and the procedures to be followed if a variance to the restrictions is requested.

Conclusion

In an effort to be an environmental steward of our earth, the City of Rock Hill is eager to take a lead in promoting water conservation at all levels. By implementing the objectives of this plan, including public education, established conservation measures, drought response and water reclamation, the City and its customers can reap the environmental and economic benefits of conserving water. This Water Conservation and Demand Management Plan will be an important tool to help the City prepare for future growth and address vital environmental concerns about the supply and demand of our most valuable natural resource.

References

1. *Adapted from information provided by Rolling Hills Nursery & Landscaping, Inc.*
2. *Impact Fee Report, 12/17/02 by Raftelis Financial Consulting*
3. *Swartz Engineering Economics, Inc.*