WATER CONTINGENCY PLANNING TASK FORCE

SUBMISSIONS RECEIVED

FROM

TASK FORCE MEMBERS

AND

OTHER INTERESTED PARTIES

October-December 2009

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Harvesting rain is state's most viable solution

By Joe Clark, Steve Williams, and Russ Jackson

Atlanta's water wars and water woes are at the forefront of many of our minds, as Federal Judge Paul Magnuson's July 2012 deadline for an agreement for water withdrawal from Lake Lanier looms closer each day. Jay Bookman and the AJC editorial board have addressed some of the issues surrounding this controversial ruling ("Lopsided water task force isn't up to the task", Opinion Nov. 13) and have raised good questions regarding the GA Water Task Force and the controversial proposals the metro area faces as we seek answers to the water shortages we will undoubtedly face in the future.

According to Bookman's article, Governor Perdue's spokesman, Bert Brantley, said the task force is looking for, "the most readily available, and cost-effective available, options that you can bring online as fast as possible." The AJC's Dan Chapman has contributed an article, as well, detailing the results of polling data indicating the public's widespread desire for additional conservation methods, and for increasing the pool in both Lake Lanier and Lake Allatoona ("Poll: Put water conservation first", AJC Nov. 18).

The GA Water Contingency Task Force co-chairs, John Brock and Tom Lowe, have even given their viewpoint, too ("New statewide water task force is focusing on 3 fronts at once", Nov.17), stressing that there are "three areas of focus – enhancing conservation efforts, increasing the state's ability to capture rain and groundwater, and reviewing current control and management policies" and issuing a call for public input, saying "Any and all options under these three categories will be examined."

Here is our suggestion to the GA Water Task Force, Governor Perdue, the state legislature, and all local municipalities, as well as the reasons why we believe it should be a large part of Georgia's plan for mitigating water shortages in the future.

The Governor, EPD, and the New State Water Districts should work together to mandate the installation of, and provide economic incentives for, Rainwater Harvesting Systems (RHS) for new construction of both commercial and residential buildings, and provide economic incentives for existing commercial and residential users who install RHS at their existing homes for non-potable uses. Currently the Metropolitan North Georgia Water District only requires RHS as an educational option.

RHS should be promoted for the following reasons:

- RHS legislation that would mandate systems during new construction and provide incentives for homeowners to install RHS would create a new industry for Georgia, giving a boost to our economy, and creating employment opportunities for currently unemployed workers, while contributing to the tax base through additional sales and income taxes.
- RHS would mitigate the need for construction of new dams and evaporation-prone reservoirs, which would once again tend to place the Atlanta area's needs above Georgia's growing cities downstream, and save taxpayers billions of dollars in the process. This money could be distributed in the form of incentives for installing RHS. If we are going to

go into debt through bond sales for water solutions, we should share the burdens, and the rewards, equally.

- RHS is nothing new in Europe and Australia, and the capture, filtering, storage, and delivery technologies have been evolving to "state-of-the-art" for the past twenty years. Systems are used to capture rain and groundwater, are mandated in drought-stricken Australia, and are used to mitigate flood damage in Germany.
- RHS are part of the USGBC (United States Green Building Council) LEED (Leadership in Energy and Environmental Design) Standards, and essential to sustainable development in the Atlanta metro area, and throughout the state. Projects desiring LEED certification can gain up to 14 points by installing RHS.
- RHS could be installed and operational in hundreds of homes and businesses in a matter of months, and tens of thousands of homes and businesses in just a few years, whereas simply negotiating the environmental and legal issues surrounding construction of new dams, reservoirs, desalination plants, etc. would take years, and that does not even include the actual construction time. In addition, reservoirs lose water to evaporation, and destroy eco-systems both upstream and downstream, while desalination plants waste water, use a large amount of energy, and produce a toxic sludge that creates an ecological hazard.
- RHS would save millions of gallons of potable water that we are currently flushing down our toilets. That's right, we are currently flushing our toilets with drinking water. This wasteful practice would be mitigated by the installation of RHS for all new construction.
- RHS would allow irrigation for all landscaping installations (not just new) during drought conditions, and save millions of gallons of potable water in the process. Not to mention, RHS would provide economic benefits to many landscaping companies, that could risk failure as viable economic entities, should severe water restrictions be enacted in the future. All new construction with irrigation should be required to install RHS. Rainwater can also improve plant growth by as much as 30% over chlorinated municipal water.
- RHS for irrigation would help replenish the water table, rather than depleting it as well-water irrigation does. By capturing rainwater that would otherwise run-off downstream into the ocean (which benefits no one, not even Atlanta's downstream neighbors, due to pollution and flooding issues), and slowly releasing it back into the ground through irrigation or wastewater treatment facilities, RHS provide a means for replenishing the water table and preserving streams and rivers. Capturing rainwater at the source would also negate the need for expensive, wasteful, desalination plants and excessive energy usage to return processed seawater to the Atlanta area.

For all these reasons, and more, we believe Rainwater Harvesting Systems should be an integral part of any regional or statewide water plan. The development community is slowly recognizing this one simple fact: due to the growing population of our state, and the Atlanta metro area in particular, sustainable development is the only course of action that will allow us all to thrive and prosper. We simply cannot continue to have the narrow-minded focus that many developers have had in the past. We need to understand the tremendous benefits, especially to the local community, but also to the entire state, of harvesting rainwater and using it to augment the municipal supply. During the drought of 2007-2008, we saw the disastrous effects of over-development without a focus on sustainability, and the tremendous strain it put on our water resources. Conversely, the non-porous surfaces of our cities caused excessive run-off during the heavy rains this fall, resulting in widespread flooding throughout the region. Proper rainwater management is the key to solving both issues, and RHS can be designed to meet these needs.

Finally, we want to acknowledge that it would be wrong to pit developers against members of the sustainable development movement, or those who might be more ecologically minded, but who might mistakenly seek to shutdown growth in Atlanta. We are all in this together. The developers cannot continue developing if the cities and counties cannot issue building permits. The building permits cannot be issued unless there is the necessary infrastructure (in this case, water supply) to support the new development. As the sustainable development community and the ecologically aware understand, there simply is not enough water available, especially given the restrictions that will almost certainly be put on Lake Lanier in two and a half short years, to continue growing as we have in the past. However, according to the statistics, Georgia will continue to see an increase in population. We cannot wall off our state and tell newcomers they are unwelcome. Even if we could, our economy would go into free-fall. So, we all need to understand that we have the technology available to continue providing opportunities for growth in the region, and we all need to work together to get this message out through the grassroots level, until the political will exists to insist on sustainable development. We have already done too much damage to our streambeds, rivers, and other water resources to allow development to continue in an unsustainable way. It is time to insist that everyone commit to making the necessary changes to our development ideologies that will allow the economic engine of Georgia to continue to drive growth, but only the sustainable growth that will not rape our regions resources and leave a legacy of blight to our children and grandchildren.

With almost 50 inches of rain a year in the Metro Atlanta area a modest 2500 square foot 1 story house can realistically capture about 70,000 gallons of water per year. This could provide all the water needs for 2 people for a year. Why are we letting it go down the drain?

Joe Clark is the Business Development Director of RainbankUSA, and a member of the American Rainwater Catchment Systems Association of America (ARCSA). Visit www.rainbankusa.com or www.arcsa.org for more information.

Steve Williams, is The Rain Saver owner of Buildinggreener LLC and a lifetime member of the American Rainwater Catchment Systems Association of America (ARCSA), ARCSA Accredited Professional www.TheRainSaver.com and www.SavingWithRain.info

Russ Jackson, LEED AP, is Director of Sales for Rain Harvest Systems, a rain harvesting components wholesaler.

American Rivers
Thriving By Nature

Comments submitted via email to: info@gawatertaskforce.com
Comments copied to: hoddel.martin@bcg.com, kkirkpatrick@macoc.com, dmiell@gmail.com

November 19, 2009

Dear Georgia Water Contingency Task Force Members:

On behalf of American Rivers, thank you for the opportunity to provide the Task Force with our recommendations and input to help further inform your work as you develop a proposal to address the potential gap in supply that would exist should Judge Magnuson's ruling go into effect in July 2012.

We provide these recommendations in addition to the Georgia Water Coalition comments submitted on November 6, 2009 which we fully support and helped to formulate. These recommendations serve to elaborate and highlight particular points and complement the specific policy recommendations included in the Georgia Water Coalition document.

With Judge Magnuson's decision, Metro Atlanta is now faced with a very real water limitation, an urgent need to secure sustainable water supplies, and a clear opportunity to embark on a path towards sustainable water management to support future growth. There seems to be a popular perception that water conservation and efficiency and related "non-structural" water supply measures can provide only marginal benefits, not a substantial a source of supply as currently exists in Lake Lanier. The evidence and experience in many other cities strongly suggests otherwise. American Rivers urges the members of the Task Force to embrace sustainable water management policies and programs that are proven, cost-effective, timely and reliable. Specifically we recommend the following key steps as part of a comprehensive water supply program:

1. **Projecting and planning for population and economic growth** in conjunction with *decreased* per capita water supply needs;
2. **Aggressively pursuing water conservation and efficiency investments**, a cheaper, more reliable "hidden reservoir";
3. **Authorizing Lake Lanier for water supply purposes** with clear conservation and efficiency requirements; and
4. **Increasing capacity of existing dam/reservoir facilities,** rather than building new ones.
5. **Promoting development patterns, stormwater management strategies and infrastructure that preserves or mimics existing natural hydrology** (e.g. pervious pavement, rain gardens).

With these five steps, metro Atlanta can follow the path of other leading US and international cities that have successfully secured their immediate water needs, and also secured a more predictable and manageable future water supply, while guaranteeing sustainable and healthy flows for downstream communities and industries.

1. **Projecting and planning for population growth in conjunction with decreased water supply needs.** As metro Atlanta grows in population, the water supply needed to sustain that population does NOT necessarily need to grow. In fact, many communities across the country and the Southeast have successfully increased population while maintaining or actually decreasing the total amount of water they use. There is a hidden reservoir embedded in our current inefficient water use. Some notable examples include Seattle which between the early 1990s and 2009 achieved a total reduction in water consumption of nearly 20% (saving 31 MGD) and a 33% per capita reduction in water consumption while increasing their population by 16%. Cobb County, GA added 42,000 new customers between 2003 and 2008 and maintained their 65MGD water consumption through conservation efforts. And between 2000 and 2009, Clayton County, GA reduced their total water consumption by 15% (eliminating the need for 4.5 MGD) while increasing their service population by 42%.

   The Metropolitan North Georgia Water Planning District water demand projections do not plan for feasible decreases in per capita consumption or overall consumption. The population projections and the demand projections were the focus of a study conducted by the Pacific Institute in which both are criticized for being over-stated. [1] These same demand projections were used to determine the gap in water supply for 2012. We encourage the State of Georgia and metro Atlanta to follow the lead of other communities and plan for decreasing use of water supplies, tapping the hidden reservoir of efficiency to secure water for growing communities.

2. **Aggressively pursuing water conservation and efficiency, our hidden reservoir.** Metro Atlanta communities consume, on average, 89 gallons per capita per day (gpcd)[2]. A conserving household consumes 45.2 gpcd. An analysis conducted by the Alliance for Water Efficiency for American Rivers showed that proven, low-hanging fruit water efficiency measures could yield up to 210 millions of gallons a day (MGD), a 33% savings, for metro Atlanta. Total water saved could make up for all the withdrawals from Lake Lanier which is currently permitted for 178 MGD to metro Atlanta. In addition, metro Atlanta could save up to $700 million by pursuing water efficiency to secure water supply as compared to building new reservoirs. Moreover, with efficiency, the Metropolitan North Georgia Water Planning District could eliminate the need for all six of its planned reservoirs (totaling 108.4 MGD)[3] nearly two times over.

We encourage the State of Georgia and metro Atlanta to aggressively adopt the proven and effective programs listed below from American Rivers' "*Hidden Reservoir*[4]*"* study that would effectively secure the majority of the water supply needed for metro Atlanta if Judge Magnuson's decision were to go into effect.

Metro Atlanta Estimated Water Savings Ranges[5]	**Low**	**High**
Stop Leaks in the water utility distribution pipes. • In metro Atlanta 117 MGD are lost each day to leaks and unaccounted for uses. • Fixing leaks saves water and helps a utility's bottom line by eliminating the need to treat and pump lost water that they are not paid for producing.	29.34	58.68
Price water to encourage efficient use.	53.79	78.89

[1] Pacific Institute, *A Review of Water Conservation Planning for the Atlanta, Georgia Region, August 2006.*
[2] Metropolitan North Georgia Water District, *Water Supply and Conservation Management Plan*, 2009.
[3] Ibid.
[4] American Rivers, *Hidden Reservoir: Why Water Efficiency is the Best Solution for the Southeast*. October 2008. www.AmericanRivers.org/WaterEfficiencyReport
[5] Based on Metropolitan North Georgia Water Planning District 2003 consumption numbers, 652 MGD.

• Water is not priced at its true value and some utilities incentivize water waste. • Conservation pricing provides a price signal to the customer to conserve, while providing a price structure that protects the utility's solvency in times of plentiful water and drought.		
Meter all uses to measure water consumption. • Most multi-family/commercial buildings include water costs in monthly rent/fees thereby eliminating market signals to b more efficient. • Sub-metering reduces risk and costs for the building manager by making the water consumer accountable for their use.	5.87	9.39
Retrofit all buildings with water efficient fixtures. • Outdated fixtures and appliances waste water. Retrofitting building infrastructure through incentives such as rebates/tax holidays and through ordinances such as Retrofit on Reconnect generate proven, reliable and significant water savings. • A 35% decrease in water use is possible through retrofits alone.	36.35	54.52
Landscape to minimize waste. • On average 30% of household drinking water is used to water lawns, tree, and shrubs. On average 50% of that water is wasted. • Peaks in demand generated by outdoor water use drive the need to develop new water sources and expand water infrastructure. By reducing the peak, the life of infrastructure is extended, sometimes eliminating the need for new sources.	8.41	12.62
Total MGD Saved	133.76 MGD	214.10 MGD
Percent Savings	20.51%	32.84%

To take these water savings estimates to the next, more specific level, we recommend the affected utilities conduct an assessment of potential water efficiency policies and programs to determine which ones are best suited to their customer base and seasonal demand patterns. The Alliance for Water Efficiency recently designed a water tracking tool that can assess and compare over fifty different efficiency programs and supply options and compare costs and cost effectiveness. This is a valuable tool that City of Atlanta's Department of Watershed and Cobb County's Water System have started to use and we recommend the Task Force encourage all the affected utilities to take this next step to determine how best to secure water savings cost-effectively.

3. **Authorizing Lake Lanier for water supply purposes.** Lake Lanier is a readily available source of water supply. Authorizing Lake Lanier for water supply purposes is an economical and environmentally sound path to pursue, but only if the region commits to using the resource as efficiently as possible. Therefore, we encourage the State of Georgia and metro Atlanta to pursue the federal authorization of Lake Lanier for water supply purposes so long as the authorization also provides for healthy downstream flows, requires efficient use of the resource, and ensures that water supply not be prioritized over other authorized uses.

4. **Increasing capacity of existing facilities.** Georgia, and particularly north Georgia, has many water supply and agricultural reservoirs that could potentially be expanded to provide additional water supply. Increasing capacity within some of the existing reservoirs has the potential to increase existing water supplies at a lower cost, within a shorter timeframe, and with fewer environmental issues. Dredging and raising pool elevations are worthy of consideration and could possibly be done in such a way that will not cause unwanted negative consequences downstream. We encourage the State of Georgia and metro Atlanta to investigate the potential for

increasing the capacity of existing reservoirs and repurposing old quarries for water supply purposes.

5. **Promoting development patterns, stormwater management strategies and infrastructure that preserves or mimics existing natural hydrology.** A major contributor to our water problems is the way we develop land. As the impervious surfaces that characterize sprawling development – roads, parking lots, driveways, and roofs – replace meadows and forests, rain no longer can seep into the ground to replenish base flows to rivers (base flow accounts for about half of a stream's volume). In the 2002 report, *Paving Our Way to Water Shortages*[6], American Rivers, Natural Resources Defense Council and Smart Growth America, determined that Atlanta topped the list of cities that lost water supply to sprawl. Comparing the level of imperviousness in 1997 to 1982, we found that the potential amount of water not infiltrated annually ranged from 56.9 billion to 132.8 billion gallons in Atlanta. Atlanta's "losses" in 1997 amounted to enough water to supply the average daily household needs of 1.5 million to 3.6 million people per year.

   Using smart growth and green infrastructure approaches, we can reduce the impact of development. While there is no one-size-fits-all definition, smart growth generally entails integrated planning and incentives and infrastructure investments to revitalize existing communities, prevention of leapfrogging sprawl, providing more transportation choices, and protecting open space. Green infrastructure includes protecting healthy landscapes like forests and small streams that naturally sustain clean water supplies; restoring degraded landscapes like floodplains and wetlands so they can better store flood water and recharge streams and aquifers; and replicating natural water systems in urban settings, to capture rainwater for outdoor watering and other uses and prevent stormwater and sewage pollution[7]. We encourage the State of Georgia and metro Atlanta to utilize well-established smart-growth planning and practices that can transform our development patterns and infrastructure to support the protection and restoration of natural hydrologic cycles that protect our water supplies.

World-class cities like metro Atlanta should strive for the smartest and most cost-effective strategies for water supply, just as we would in any other aspect of our civic and economic life. The strategies described above can provide the basis for a more sustainable and certain future for the region.

Again, thank you for the opportunity to provide comments to the Task Force. Please do not hesitate to contact me with questions or for more information.

Sincerely,

Jenny Hoffner
Director, Water Supply
American Rivers

[6] American Rivers, *Paving Our Way to Water Shortages, 2002.* http://www.americanrivers.org/library/reports-publications/paving-our-way-to-water.html

[7] American Rivers, *Natural Security: How Sustainable Water Strategies Prepare Communities for a Changing Climate 2009.* http://www.americanrivers.org/our-work/global-warming-and-rivers/infrastructure/natural-security.html

Finding Water Through Rain

By Steven Andrew Williams

An Answer to the Atlanta, GA urban water quantity and quality problems

What We Have in the Metro N. GA Water Planning District!

- Population of Metro Atlanta - 5,723,788
- Metro Atlanta Area - 4832 Square Miles
- Water used per day - 600,000,000 gallons
- Amount of water produced in Atlanta from 1 inch of rain?

87,560,480,000 Gallons of water

FROM 1 INCH OF EVENLY DISTRIBUTED RAIN OVER THE 14 COUNTY METRO AREA.

It could supply Atlanta's water for 145 Days

Steve Williams

Urban Ecosystem Analysis
The City of Atlanta

Tree loss in the Atlanta metro area from 1974 to 1996 resulted in a 33% increase in stormwater runoff (from each 2-year peak storm event). This translates into an estimated 591 million cubic feet of water or 4,420,987,013 gallons. Costs to build engineered systems to intercept this runoff would cost $1.18 billion ($2/cubic ft. of storage) in 2001 dollars.

Data from the American Forests study
Urban Ecosystem Analysis, Atlanta, GA

The total stormwater retention capacity of our urban forest cover in 1996 was worth about $2.36 billion, down from 1974's value of $3.54 billion.

This translates to $85.9 million per year.

AT $85,900,000 PER YEAR FROM 1996 - 2006 PLUS INFLATION

$1.07 Billion

The CSO Consent Decree is $1.1 Billion

Water Runoff from Development

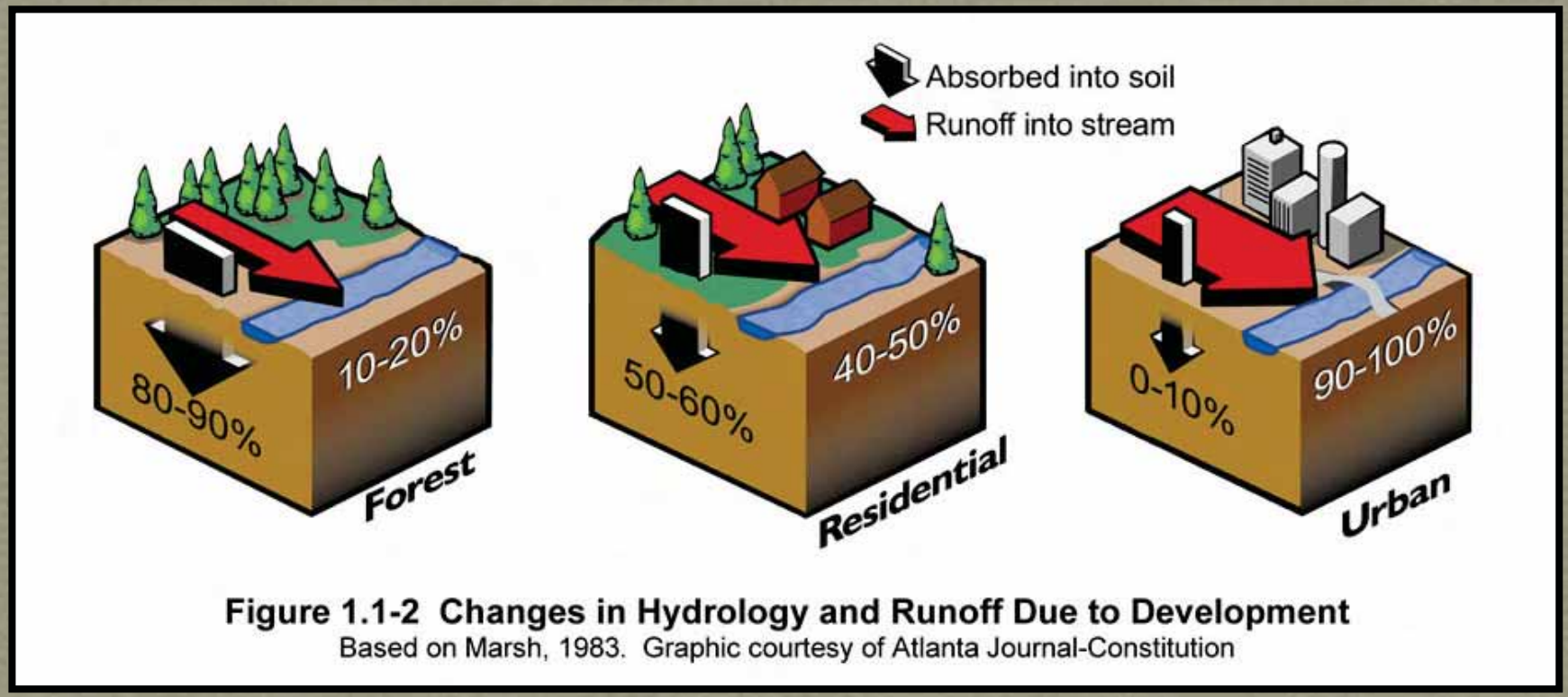


Figure 1.1-2 Changes in Hydrology and Runoff Due to Development
Based on Marsh, 1983. Graphic courtesy of Atlanta Journal-Constitution

Development in Atlanta, GA and surrounding counties contribute to a yearly loss of groundwater infiltration ranging from 57 to 133 billion gallons from 1982-1997.

If managed on site, some of this rainwater which could support annual household needs of 1.5 to 3.6 million people, can be captured in cisterns (reservoirs). The rest can be allowed to filter through the soil to recharge aquifers and increase underground flows to replenish rivers, streams and estuaries.

American Rivers, Natural Resources Defense Council and Smart Growth America, Report:

Paving Our Way to Water Shortages:
How Sprawl Aggravates the Effects of Draught

August 28, 2002

Where is the Water Going?

Traditional Solutions

- Retention Ponds
- Sidewalks to Sewer
- Streets to Sewers

Retention Ponds

Sidewalks to Sewers


Streets
to
Sewers

What is the Effect?

- Streets Flooding
- Erosion and Loss of Top Soil
- The Flooding of Creeks and Streams

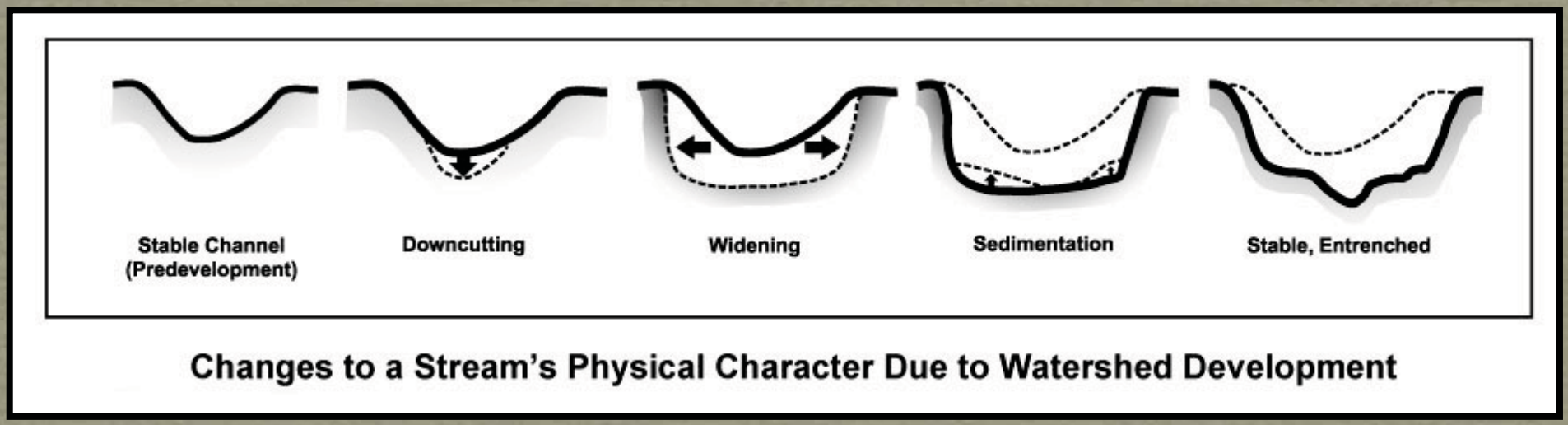
Flooding Streets

Erosion & Loss

Top Soil

Overflowing Creeks

Effects of Current Watershed Management

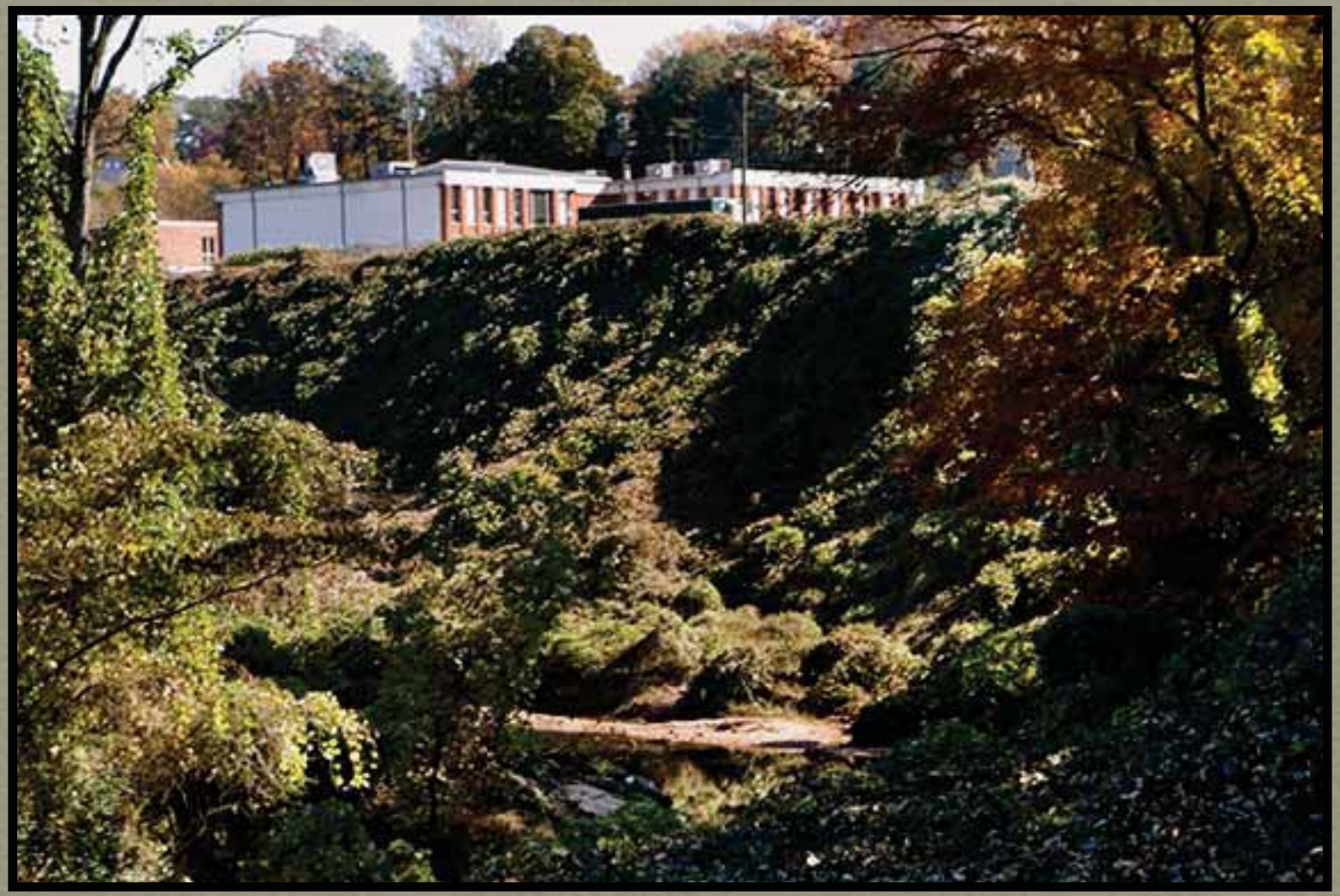


Changes to a Stream's Physical Character Due to Watershed Development

This is Arrow creek in Metro Atlanta showing REAL examples of Downcutting, Widening, Sedimentation and Stable, Entrenchment with in a 1/4 mile stretch.

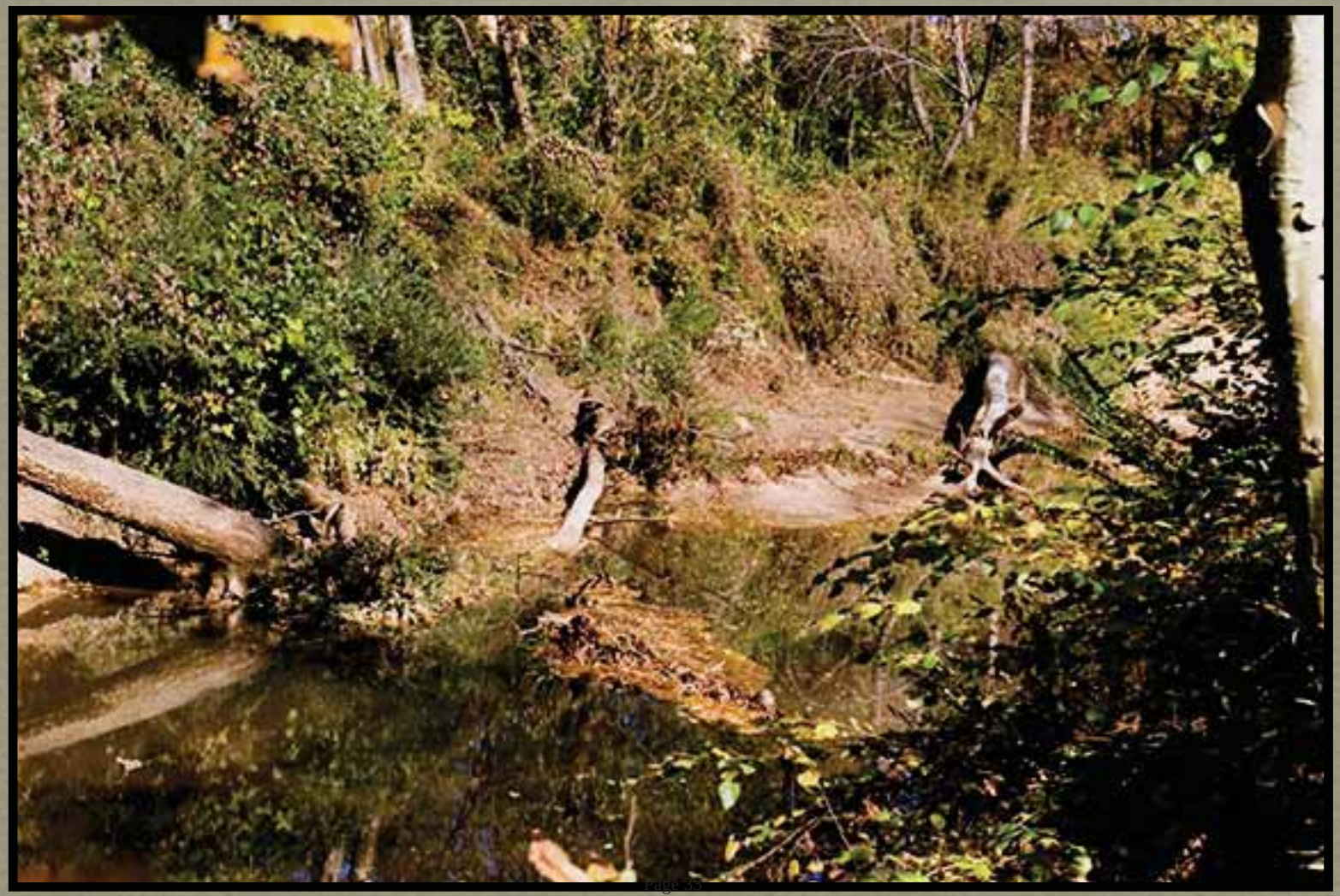
Downcutting

Widening



Sedimentation

Stable, Entrenchment

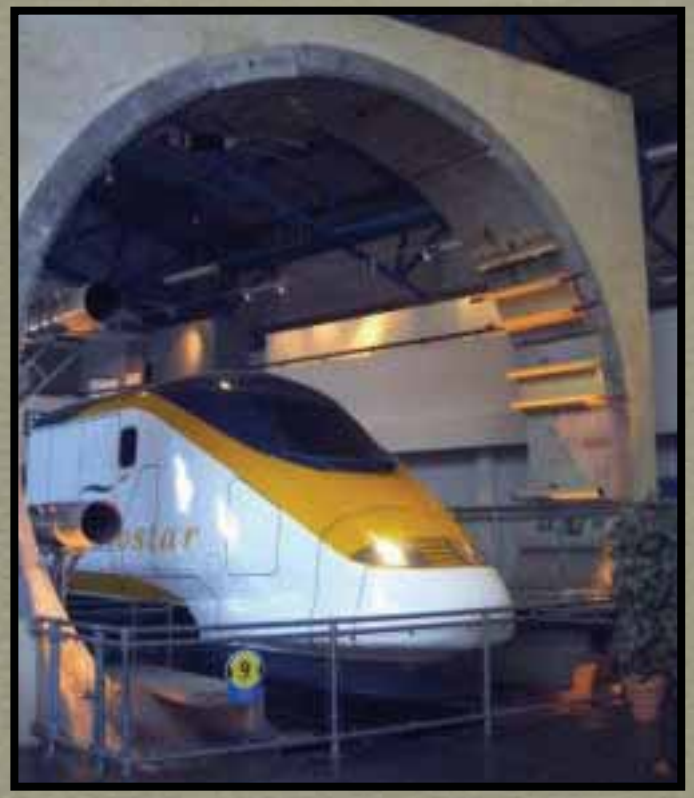


What do these Projects have in Common?

- The Massachusetts Turnpike Authority - The Big Dig Tunnel Project Connecting Downtown Boston to East Boston.
- The Chunnel connecting England and France, has become a classic example of a technological marvel that has been unable to justify the costs.
- The Clean Water Atlanta initiative, the capital improvement program underway to help resolve stormwater issues through underground tunnels.

Big Dig Problems

The Big Dig, the $14.6 Billion reconstruction of downtown Boston's roadways, had been rife with troubles since construction began 15 years ago.



The Chunnel

One of the Seven Wonders of the World?

The $27.5 billion Eurotunnel, nicknamed the Chunnel, has become a classic example of a technological marvel that has been unable to justify the costs of its creation.

The Atlanta CSO Project

Will it help and What will it cost?

Under the approved plan, all overflow volumes will be captured and treated, except for approximately **4 large rain events per year**, when the volume of overflow exceeds the storage capacity.

What can be done to bring these overflows Down to Zero?

many of the issues plaguing our water supply can be resolved in an economical and environmentally friendly way.

BIOMIMICRY

(from the Greek, bios - life and mimesis - imitation)

BIOMIMICRY

Nature as Model

A solar cell inspired by a leaf.

Nature as Mentor

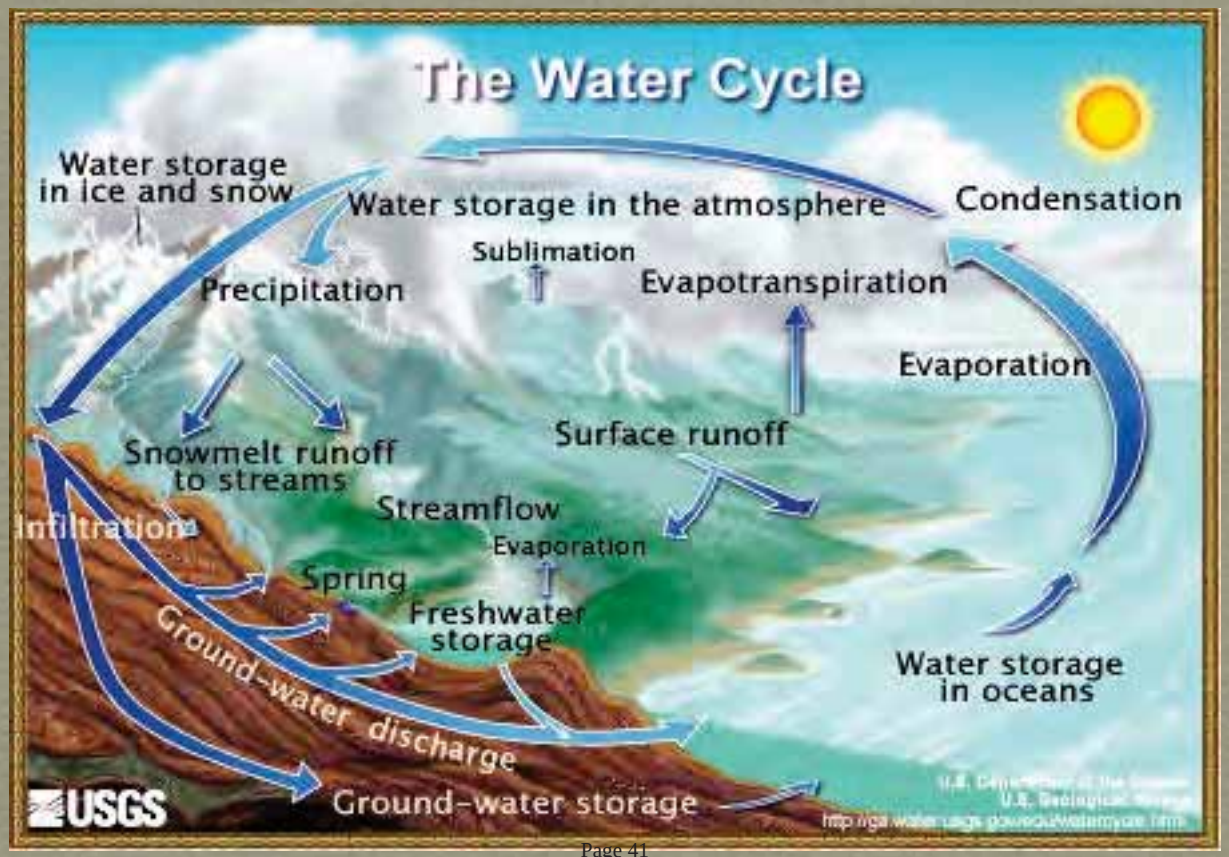
Biomimicry uses an ecological standard to judge the "rightness" of our innovations.

Nature as Measure

Biomimicry is a new way of viewing and valuing nature.

~Janine Benyus (1997) Biomimicry: Innovation Inspired by Nature.

By working with nature and trying to imitate the way nature works



How to Mimic Nature

Greenway Acquisition

Greenway Acquisition

Scientists know that headwater streams make up at least 80 percent of the nation's stream network.

- **Streams provide is a filtering process**
- **Small streams and wetlands play a key role in storing and modifying potential pollutants.**
- **64 percent of inorganic nitrogen entering a small stream is retained or transformed into a less harmful substance within 1,000 yards**

Atlanta's Greenway Acquisition Project

Targeted streams are Marked in red.

The $25 million Greenway Acquisition Project is to be implemented in the City of Atlanta and fourteen (14) counties in Metro Atlanta through March, 2007.

How to Mimic Nature

- Greenway Acquisition
- Wetlands

Wetlands or Detention ponds

Attractive Landscaping

A Hole to Store Stormwater.

Constructed wetlands provide protection against initial storm-flows which are typically high in pollutants.

- Plant uptake of dissolved compounds such as nitrogen and phosphorus.
- Filtering, settling, and retention of suspended particulate matter.
- Transformation of compounds in the soil and water column.
- Adsorption of metals into clay particles.

What are other benefits of using (constructed) wetlands for stormwater management?

- The negative water quality impacts of storm-flow to receiving streams is reduced.
- Wildlife habitat, especially waterfowl and warm water fisheries, is improved.
- Downstream channels are protected from scour, erosion and sedimentation by reducing peak flow.
- Aesthetic and landscaping value is enhanced.

How much does it cost to construct and maintain stormwater wetlands?

Capital Cost:

$ 1,500/impervious acre.

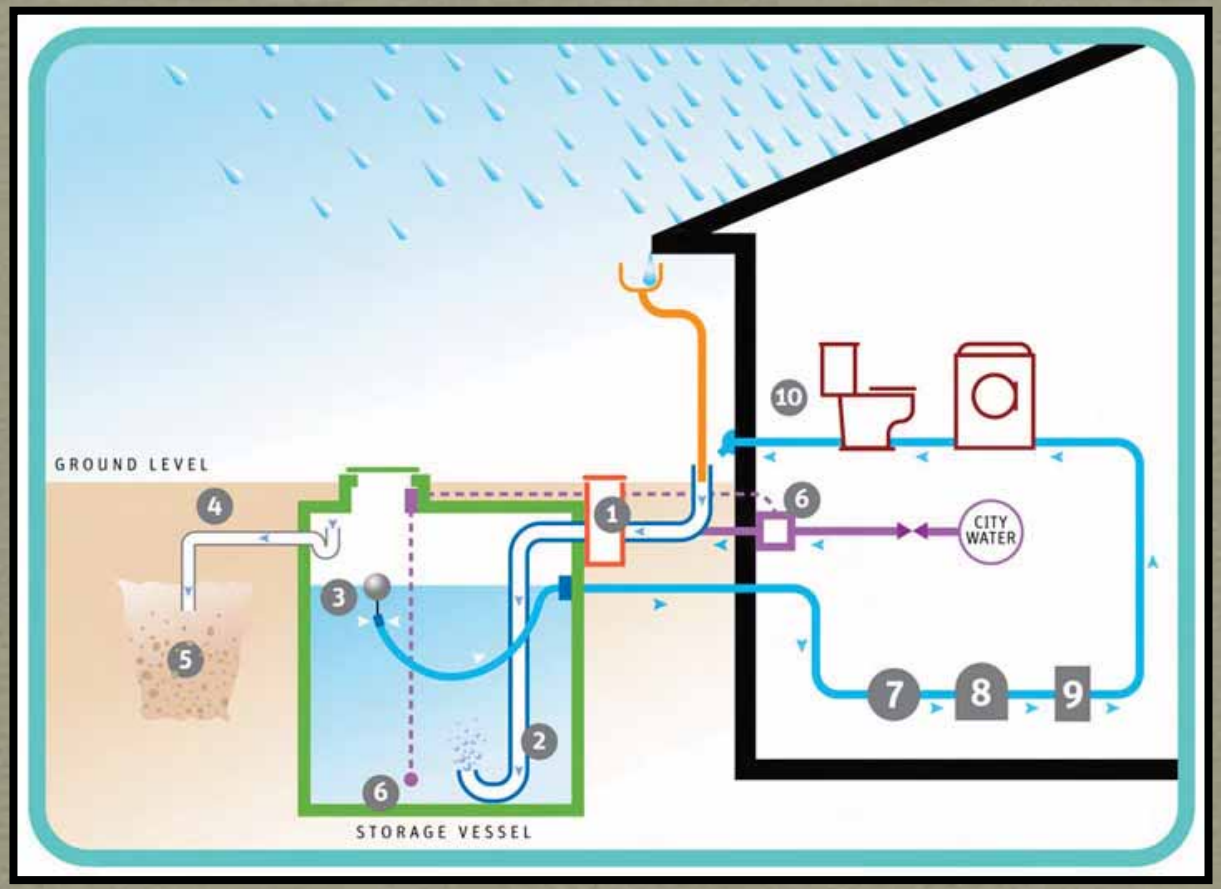
Maintenance:

Costs vary, but normally range from 3 to 5% of construction costs annually.

How to Mimic Nature

- Greenway Acquisition
- Wetlands
- Cisterns

Cisterns



A rain harvesting technique that can store water for shortages, reduce stormwater and replace potable water uses with non-potable water.

Reason for using cisterns to collect rainwater.

- The idea of collecting rainwater has been around for thousands of years.
- Treated water is an expensive resource.
- Rainwater is a healthier alternative to potable water for plants and irrigation.
- Of all the water on Earth, 3% is suitable for human consumption. And of that 3%, most is either locked in polar ice caps and glaciers or hidden beyond the reach of commercial technologies. A little less than 1% of our water is found in lakes, rivers, and approachable underground aquifers.
- By diverting rainwater during heavy rains, cisterns can store it for use during draught, this will also reduce stormwater run off.
- Technology is readily available and relatively inexpensive.
- Rainwater collection is insurance for your plants.

Domestic Usage

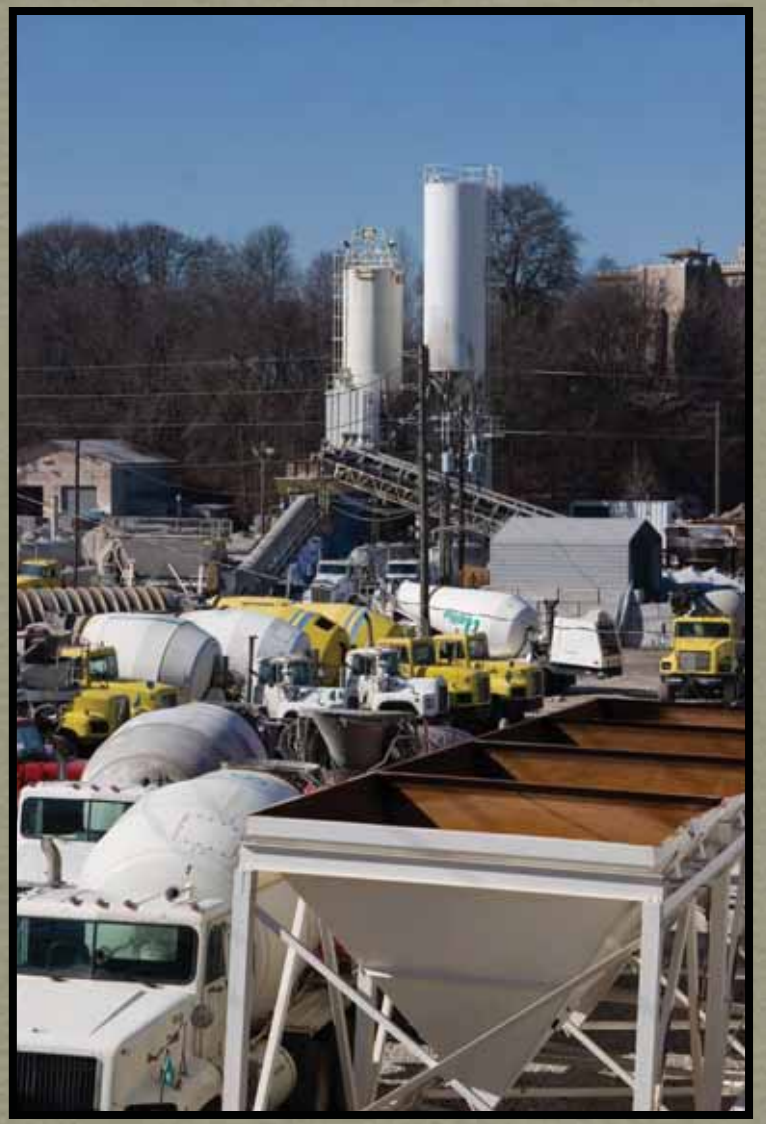
Less than 50% of American household water usage requires the purification of drinking water.

Rainwater Uses 63%
1: Toilets
2: Laundry
3: Outdoor
4: Other

Purified Water Uses 37%
5: Drinking/Cooking
6: Dishwashing
7: Shower and Bath

Industrial use

- Dust Control
- Agriculture and Animal Husbandry
- Specialized Cleaning Processes
- Washing Vehicles
- Manufacturing Processes
- Concrete and Construction



Commercial use

In large offices and public buildings, rainwater can be used for flushing toilets and urinals and for cleaning.

Another use for rainwater in the commercial sector is irrigation. Rainwater allows for an inexpensive and healthy way to water plants during droughts.

How to Mimic Nature

- Greenway Acquisition
- Wetlands
- Cisterns
- Pervious Concrete

Pervious Concrete

A solution to restoring groundwater and reducing stormwater runoff.

Pervious Concrete

ADVANTAGES

The advantages of using porous pavement include:

- Water treatment by pollutant removal.
- Reduces demand on stormwater infrastructure.
- Recharges local aquifers.
- Retrofit existing imperious areas.

Pervious Concrete

USES

A few ideas for Pervious Concrete

- Parking lots
- Driveways
- Paths and walkways
- Curbing for streets
- Retrofit existing imperious areas.

Pervious Concrete

CONCERNS

- Many pavement engineers and contractors lack expertise with this technology.
- Porous pavement has a tendency to become clogged if improperly installed or maintained.
- Porous pavement can have a high rate of failure.
- There is some risk of contaminating groundwater, depending on soil conditions and aquifer susceptibility.
- Some building codes may not allow for its installation.
- Anaerobic conditions may develop in underlying soils if the soils are unable to dry out between storm events. This may impede microbiological decomposition.

How to Mimic Nature

- Greenway Acquisition
- Wetlands
- Cisterns
- Pervious Concrete
- Contouring Land-Earthworks

Contouring Through Earthworks

- **Place swales and naturalistic rock walls through out the landscape to slow down the stormwater runoff and allow for ground water recharge.**
- **Watch the water when it rains**
- **Play and Experiment**

Earthworks

Use landscaping techniques that divert water to stay on the land, not run off on the side walk or the road.

Earthworks

Raise sidewalks and curbs to keep the water on the pervious land and off the streets and sidewalks.

Earthworks

By creating an oasis stormwater runoff can be treated and returned to the ground in an attractive way.

How to Mimic Nature

- Greenway Acquisition
- Wetlands
- Cisterns
- Pervious Concrete
- Contouring Land-Earthworks
- Green Roofs

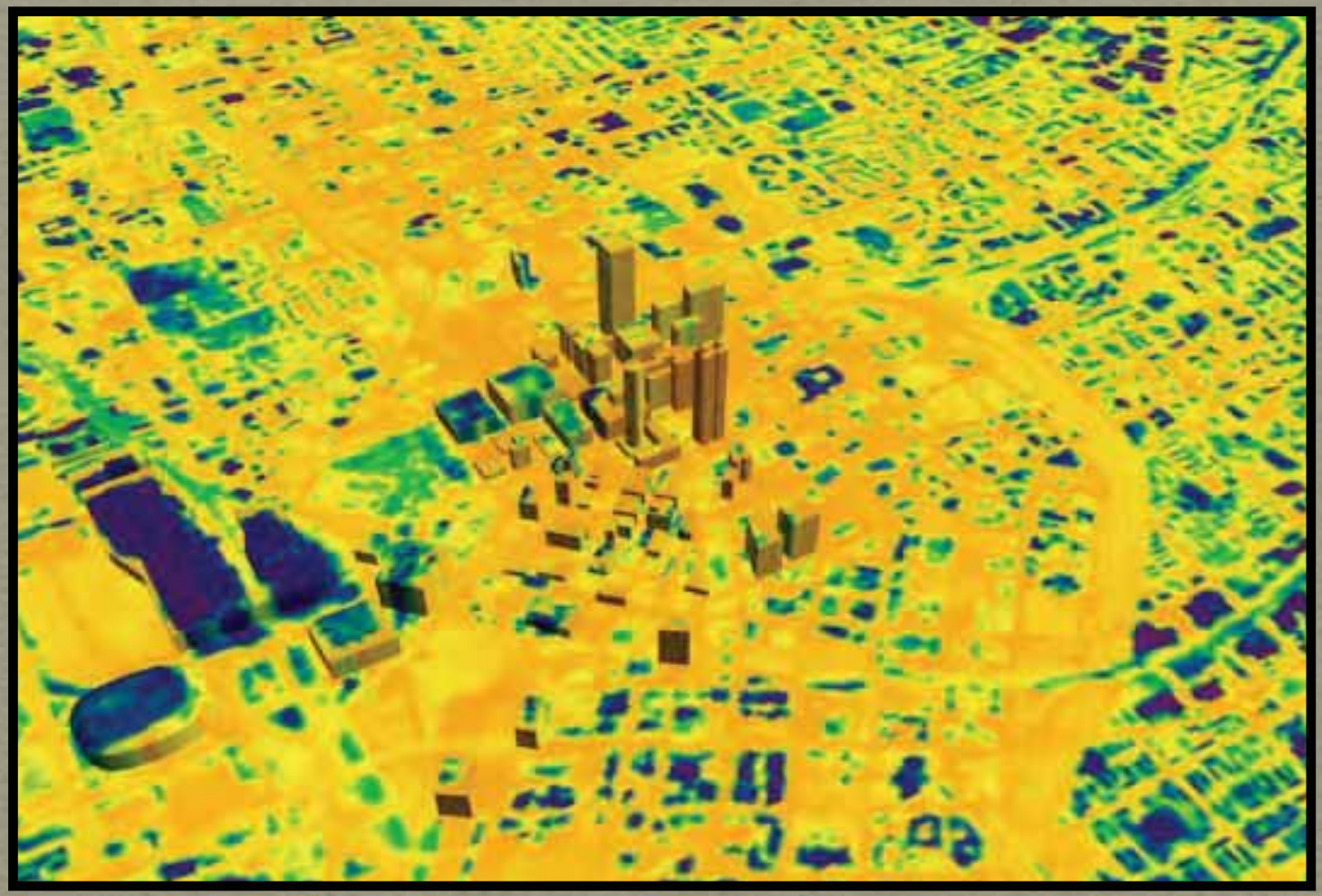
Why Green Roofs?

Economic Benefits

- Amenity Space and Aesthetics

Economic Benefits

- Moderation of the Urban Heat Island Effect



Economic Benefits

- Food Production

Economic Benefits

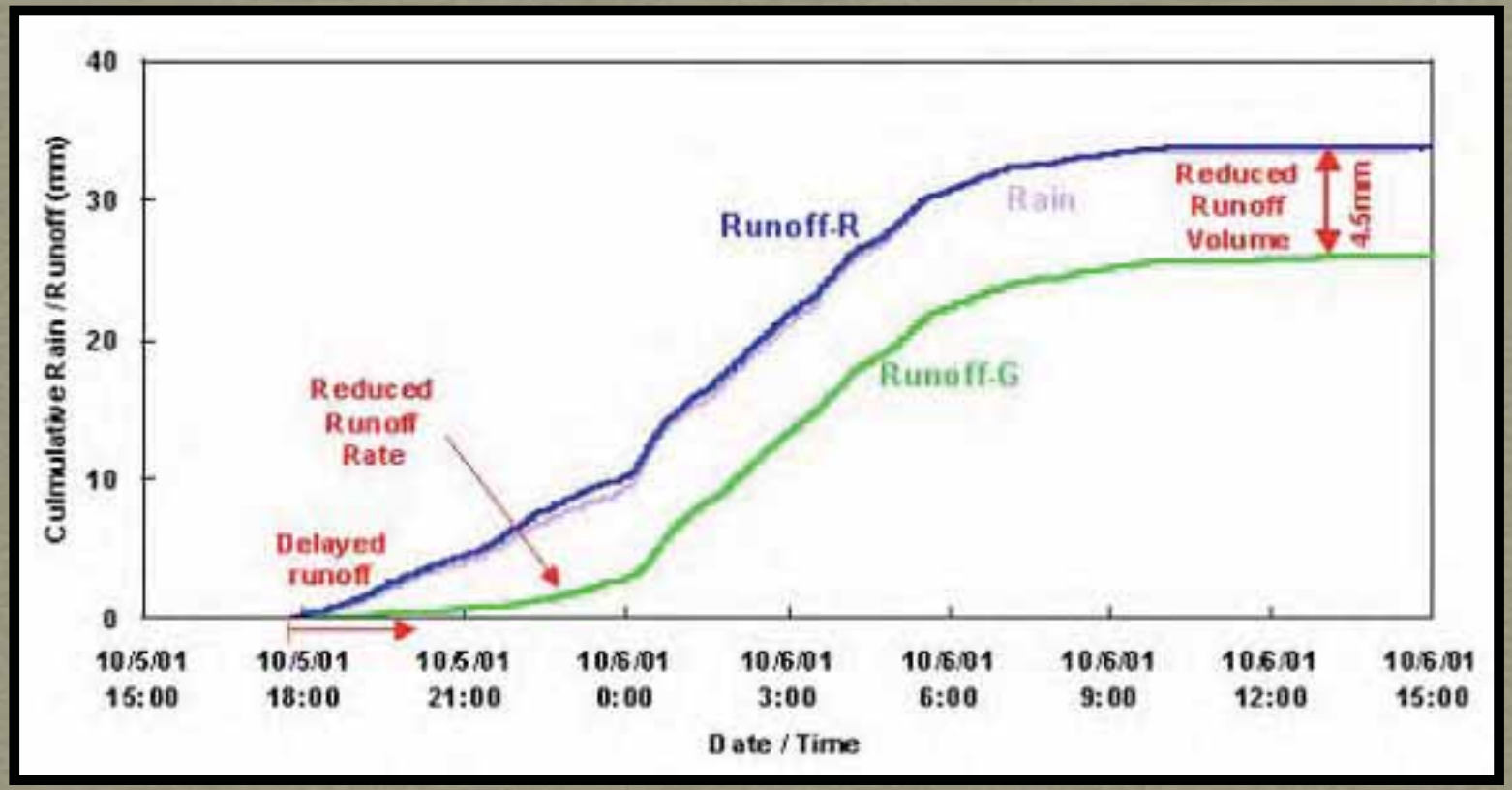
Sound & Temperature Insulation

Economic Benefits

- Improved Air Quality

Economic Benefits

- Stormwater Reduction



Conclusions

With almost 50 inches of rain a year. Atlanta has many options to extend the current water supply for decades

These options include:

- **Restoration of the natural environment in streams and rivers in urban, suburban and rural areas of at least 100 feet.**
- **Research, train, educate and reward professionals and the public in using landscaping and agricultural practices that manage and use stormwater more efficiently.**
- **Research traditional water management practices that have been used for thousands of years and merge them with modern technology, to use rainwater and stormwater more effectively.**
- **Evaluate construction of the stormwater tunnels success to see if the remaining cost of construction can be offset by more natural and cost efficient stormwater management practices.**
- **Finally and most important is the support of the Governor and Mayor for these measures of water use and influence the public to open their minds to new ways.**

Resources

H. David Thurston Professor Emeritus - Department of Plant Pathology, Cornell University, Ithaca, NY, 14850

Farming in Nature's Image by Judith D. Soule and Jon K. Piper, is a book about the science of sustainable agriculture. The authors, two professional ecologists at the Land Institute, Kansas USA.

Georgia Stormwater Management Manual: Volume 1: Atlanta Regional Commission

www.StarkEnvironmental.com

Wikipedia

Rainwater Harvesting for Drylands by Brad Lancaster

Construction Resources is Britain's first ecological builders' merchant, and a center for ecological building.

Urban Ecosystem Analysis, Atlanta Metro Area, Calculating the Value of Nature, AMERICAN FORESTS P.O. Box 2000 Washington DC 20013

Where Rivers Are Born.The Scientific Imperative for Defending Small Streams and Wetlands. American Rivers and the Sierra Club

American Rivers, Natural Resources Defense Council and Smart Growth America, Report

The Alcovy Watershed Protection Project, University of Georgia's Institute of Energy and the Northeast Georgia Regional Developmental Center

Brad Lancaster www.HarvestingRain.com Rainwater Harvesting for Drylands Vol. I&II

Steven Andrew Williams

Contact Info

404-234-1358

www.TheRainSaver.com

Ideas for Metro Atlanta Water Supply Contingency Planning

Short-Term Solutions (Implementable by 2012)
Mid-Term Solutions (Implementable by 2015)
Long-Term Solutions (Implementable post 2015)

Gwinnett County

- Current demand of 69 mgd (AA), 88 mgd (PM), 110 mgd (PD)[1]

Short-Term

- **Conservation** – reduces Average Annual demand from high of 72 mgd in 2007 to 68 mgd and Peak Month demand from 108 mgd in 2007 to 88 mgd or less.

- **Lake Lanier** – Continued withdrawals from Lake Lanier in the amount of 2 mgd (AA) and 3.2 mgd (PD).[2]

- **Hard Labor Creek Reservoir (Walton and Oconee Counties).**
  - The project is scheduled to start construction in Q1 2010.
  - Initial yield is in the range of 13 mgd (AA) and 21 mgd (PD)[3].
  - Walton County currently uses 4.3 mgd (AA) and 6.9 mgd (PD).
  - Project will have 8.7 mgd (AA) and 14.1 mgd (PD) available for short-term supply.
  - The project's yield can be increased to nearly 42 mgd (AA) and 62 (PD) with the construction of a raw water intake and pipeline from the Appalachee River.
  - If constructed, the project will have 38 mgd (AA) and 57 mgd (PD) available for short-term supply.
  - Gwinnett would have to find a long-term solution as water from this project will be needed to satisfy projected demand in Walton and Oconee Counties.
    - Requires transfer into the MNGWPD from outside.
    - IBT from Oconee to Ocmulgee or Chattahoochee basin
    - Water treatment plant needed
    - Transmission lines needed

- **City of Monroe Reservoir (Walton County).**
  - The project has a current yield of 10 mgd (AA)[4] and 16 mgd (PD).
  - Monroe has a current demand of 1.6 mgd (AA) and 2.7.

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[1] Uses EPD data to calculate AA and PM demand as average of January withdrawals for 2007 – 2009 (AA) and August withdrawals for 2007 – 2009 (PM).

[2] Under the Judges Order, the city of Buford may continue to withdraw 2 mgd (AA) from Lake Lanier.

[3] Peak day demand is calculated as 1.6 times AA

[4] Estimated

- Reservoir has 8 mgd (AA) and 13 mgd (PD) available immediately.
- Gwinnett would have to find a long-term solution as water from this project will be needed to satisfy projected demand in Monroe.
  - Water treatment plant needed
  - Transmission lines needed

- Indirect Reuse – Initiation of an indirect reuse program that does not utilize Lake Lanier for mixing.
  - Additional capacity of 27 mgd (AA)[5] and 43 mgd (PD)

- Total capacity of 75 mgd (AA) and 116 mgd (PD)

Mid-Term

- Expand Yargo State Park reservoir – According to the reservoir study funded by GEFA, the Yargo State Park reservoir can be expanded by approximately 3 billion gallons.

- Barrow County Reservoir – Barrow County Water & Sewerage Authority is considering two reservoirs totaling 16 mgd (AA) and 25 mgd (PD).

Long-Term

- Reallocation of storage in Lake Lanier
- New Walton County Reservoir
- New Hall County Reservoir
- New Jackson County Reservoir

Other Options

- **Lake Varner Reservoir (Newton County).**
  - The project has a current yield of 28 mgd (AA) and 45 mgd (PD).
  - Newton has a current demand of 6.7 mgd (AA) and 10.7 mgd (PD).
  - Reservoir has 21.3 mgd (AA) [6] and 34.3 mgd (PD) available immediately.
    - Requires transfer into the MNGWPD from outside.
    - Water treatment plant needed
    - Transmission lines needed

- **Newton County Bear Creek Reservoir.**
  - The project has a proposed yield of 28 mgd (AA) and 45 mgd (PD).
    - Requires transfer into the MNGWPD from outside.
    - Water treatment plant needed

[5] Assumes 60% returns

[6] Assumes, for calculation purposes, Walton County's 25% is met by the Hard Labor Creek reservoir project

        - Transmission lines needed

- **Proposed Glades Reservoir (Hall County).**
    - The project has a proposed yield of 6.5 mgd (AA) and 10.4 mgd (PD).
    - Potential pump storage options which would significantly increase the reservoir's yield are currently under review.
        - Water treatment plant needed
        - Transmission lines needed

DeKalb County

- Current Demand of 65 mgd (AA), 80 mgd (PM), 102 mgd (PD)[7]

Short-Term

- **Conservation** - reduces Average Annual demand from high of 69 mgd in 2007 to 65 mgd and Peak Month demand from 92 mgd in 2007 to 80 mgd or less.

- **Chattahoochee River** -- Continued withdrawals from the Chattahoochee River in the amount of 30 mgd (AA) and 48 mgd (PD).[8]

- **Big Haynes Creek Reservoir (Rockdale County).**
  - The project has a current yield of 27 mgd (AA) and 43 mgd (PD).
  - Rockdale has a current demand of 9 mgd (AA) and 14.4 mgd (PD).
  - Reservoir has 18 mgd (AA) and 28.6 mgd (PD) available immediately.
  - Gwinnett would have to find a long-term solution as water from this project will be needed to satisfy projected demand in Rockdale County.
    - Water Treatment Plant needed
    - Transmission lines needed

- **Indirect Reuse** – Initiate an indirect reuse program.
  - Additional capacity of 34 mgd (AA)[9] and 46 mgd (PD)

- Total capacity of 92 mgd (AA) and 122 mgd (PD)

Mid-Term

- **Expand Rockdale Reservoir** - according to the reservoir study funded by GEFA, Rockdale's Big Haynes Creek Reservoir can be expanded by approximately 5.4 billion gallons.

- **Lake Varner Reservoir (Newton County).**
  - The project has a current yield of 28 mgd (AA) and 45 mgd (PD).
  - Newton has a current demand of 6.7 mgd (AA) and 10.7 mgd (PD).
  - Reservoir has 21.3 mgd (AA)[10] and 34.3 mgd (PD) available immediately.
    - Requires transfer into the MNGWPD from outside.
    - Water treatment plant needed

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[7] Uses EPD data to calculate AA and PM demand as average of January withdrawals for 2007-2009 (AA) and August withdrawals for 2007 – 2009 (PM).

[8] Under the Judges Order, metro Atlanta may rely on 230 mgd of potential water supply from the Chattahoochee River downstream of Buford Dam. The four major users are Dekalb County, Fulton County, City of Atlanta, and Cobb County.

[9] Assumes 60% returns

[10] Assumes, for calculation purposes, Walton County's 25% is met by the Hard Labor Creek reservoir project

- Transmission lines needed

Long-Term

- Reallocation of Lake Lanier
- Expansion of Newton County's Cornish Creek reservoir
- Proposed Bear Creek Reservoir in Newton County

Fulton County (including the City of Atlanta)

- Current demand of 113 mgd (AA), 139 mgd (PM), 181 mgd (PD)[11]

Short-Term

- **Conservation** - reduces Average Annual demand from high of 121 mgd in 2007 to 113 mgd and Peak Month demand from 163 mgd in 2007 to 139 mgd or less.

- **Chattahoochee River** - Continued withdrawals from the Chattahoochee River in the amount of 80 mgd (AA) and 128 mgd (PD).[12]

- **Indirect Reuse** program that utilized a combination of the Chattahoochee River for mixing and the Bellwood Quarry for storage.
    - Additional capacity of 48 mgd (AA)[13] and 77 mgd (PD)

- Total capacity of 128 mgd (AA) and 205 mgd (PD)

Mid-Term

- South Fulton Reservoir
- Fayette County System interconnection

Long-Term

- New Dawson Forest reservoir
- New Etowah River reservoir
- Reallocation of Lake Lanier

Other Options

- Douglas County System interconnection
- Cobb County System interconnection

[11] Uses EPD data to calculate AA and PM demand as average of January withdrawals for 2007-2009 (AA) and August withdrawals for 2007-2009 (PM).

[12] Under the Judges Order, Metro Atlanta may rely on 230 mgd of potential water supply from the Chattahoochee River downstream of Buford Dam. The four major users are Dekalb County, Fulton County, City of Atlanta, and Cobb County.

[13] Assumes 60% returns

Cobb County

- Current demand of 66 mgd (AA), 87 mgd (PM), 106 mgd (PD)[14]

Short-Term

- **Lake Allatoona** - Continued withdrawals from Lake Allatoona.

- **Chattahoochee River** - Continued withdrawals from the Chattahoochee River in the amount of 30 mgd (AA) and 48 mgd (PD).[15]

- **Hickory Log Creek Reservoir**
    - The project has a permitted yield of 44 mgd (AA) and 70 mgd (PD).
    - Canton has a current demand of 2.5 mgd (AA) and 4 mgd (PD).
    - Reservoir has 42 mgd (AA) and 66 mgd (PD) available immediately.
        - Water Treatment Plant needed
        - Transmission lines needed

Mid-Term

- **Indirect Reuse**
    - An indirect reuse program that utilizes the Chattahoochee River for mixing
    - A program that utilizes Lake Allatoona for mixing.
- **Proposed Paulding County Reservoir**

Long-Term

- Reallocation of Lake Lanier
- Reallocation of Lake Allatoona
- New Dawson Forest Reservoir
- New Etowah River Basin reservoir

Other Options

- Cherokee County's Hollis Lathem Reservoir

[14] Uses EPD data to calculate AA and PM demand as average of January withdrawals for 2007 - 2009(AA) and August withdrawals for 2007 – 2009 (PM).

[15] Under the Judges Order, Metro Atlanta may rely on 230 mgd of potential water supply from the Chattahoochee River downstream of Buford Dam. The Four major users are Dekalb County, Fulton County, City of Atlanta, and Cobb County.

Hall County

- Current demand of 17 mgd (AA), 21 mgd (PM), 27 mgd (PD

Short-Term

- **Conservation** - reduces Average Annual demand from high of 18 in 2007 to 17 mgd and Peak Month demand from 25 mgd in 2007 to 21 mgd or less.

- **Lake Lanier** - Continued withdrawals from Lake Lanier in the amount of 8 mgd (AA) and 12.8 mgd (PD).[16]

- **Cedar Creek Reservoir** – 7.5 mgd (AA) and 12 mgd (PD)

- **Indirect Reuse** – An indirect reuse program that utilizes Lake Lanier for mixing.
  - Additional capacity of 9 mgd (AA)[17] and 15 mgd (PD)

- Total capacity of 24.5 mgd (AA) and 39 mgd (PD)

Mid-Term

- **Proposed Glades Reservoir (Hall County).**
  - The project has a proposed yield of 6.5 mgd (AA) and 10.4 mgd (PD).
  - Potential pump storage options which would significantly increase the reservoir's yield are currently under review.
    - Water Treatment Plant needed
    - Transmission lines needed

Long-Term

- Reallocation of Lake Lanier
- New Dawson Forest Reservoir

Other Options

- Jackson County Reservoir
- North Hall County Reservoir
- White County Reservoir

[16] Under the Judges Order, the City of Gainesville may continue to withdraw 8 mgd (AA) from Lake Lanier.

[17] Assumes 60% returns

Forsyth County

- Current demand of 13.5 mgd (AA), 21 mgd (PM), 21.6 mgd (PD)

Short Term

- **Conservation** - reduces Peak Month demand from 28 mgd in 2007 to 21 mgd or less.

- **Fulton County's** short-term options indicate as surplus of 15 mgd (AA) and 24 mgd (PD).

    - Transmission lines needed

Mid-term

- Proposed Russell Creek Reservoir
    - Projected yield of 10 mgd (AA) and 16 mgd (PD)

- Cherokee County's Hollis Lathem Reservoir
    - Cherokee has a current demand of 16 mgd (AA) and 26 mgd (PD)[18]
    - Reservoir has a permitted yield of 28 mgd (AA) and 45 mgd (PD)
    - Reservoir has 8 mgd (AA) and 19 mgd (PD) available immediately.

Long-Term

- Reallocation of Lake Lanier
- New Dawson Forest Reservoir
- New Etowah Basin Reservoir

[18] Assumes none of the demand is met by the Hickory Log Creek Reservoir

Association County Commissioners of Georgia
50 Hurt Plaza, Suite 1000
Atlanta, Georgia 30303
(404) 522-5022 FAX (404) 525-2477

MEMORANDUM

To: Mr. Lonice Barrett
Office of Governor Sonny Perdue

From: Jerry R. Griffin
Executive Director

Date: November 25, 2009

Subject: Recommendations to Georgia's Water Contingency Planning Task Force

The Association County Commissioners of Georgia (ACCG), representing all 159 counties, appreciates this opportunity to provide comment to the Water Contingency Planning Task Force as it embarks upon developing fact-based options for the consideration of state policymakers in addressing Georgia's water needs. ACCG has a long history of developing programs and tools to assist counties in their capacity as water stewards and in better understanding the importance of water resource management. We now stand ready to assist the Task Force, Governor, and General Assembly in meeting the water supply challenges brought on by Judge Magnuson's Lake Lanier ruling.

Throughout this process, ACCG will continue to engage its broad-based membership in an effort to reach consensus on technical, policy and political issues whereby no parts of Georgia's economic engine are unduly burdened. We believe that all public, private, state and local entities must play their part in accomplishing responsible and effective conservation, capture and control measures, and that all should share equally in their costs. We also believe that all will benefit as a result, ensuring that Georgia can continue to prosper while protecting and preserving our shared water resources in an environmentally responsible manner. While the majority of the options before the Task Force are technical in nature, there are also several highly-charged political issues. This is not and cannot be a zero-sum game where there will be winners and losers. Sensible political compromise must ultimately be reached.

While the paramount (and certainly least-costly) goal following Judge Magnuson's decision is to get Congressional authorization for Lake Lanier to be used as a drinking water source, we commend the Task Force's charge to explore alternatives for conservation, supply enhancement and water policy. On technical issues such as loss reduction, pipe replacement, water rates, conservation pricing, water reuse, and wastewater treatment plant upgrades, among others, ACCG has and will continue to rely in large part on the expertise and counsel of the Georgia Association of Water Professionals and those managing county water utilities and authorities. Accordingly, the comments below primarily focus on broader policy and political issues that are likely to be addressed by the General Assembly in 2010 and beyond.

Again, we thank you for this opportunity to provide comment.

ACCG Recommendations for Task Force/Legislative Consideration

Keeping GEFA a Viable Low-interest Funding Option for Local Government

ACCG has partnered with the Georgia Environmental Facilities Authority (GEFA) since its inception in the mid-1980s to provide low-interest water and sewer loans to local governments. This financing mechanism has been greatly successful in developing the environmental infrastructure that has allowed Georgia's economic growth and development to flourish in recent decades.

ACCG is greatly concerned with current proposals that would securitize GEFA's state-funded loan portfolio, require the actual sale of GEFA loans, or implement some other mechanism that puts GEFA's reserves at risk. While these scenarios are too complex to describe here, the concept is to actually sell all or part of the loan portfolio or to securitize it whereby the proceeds (or cash flow coming into GEFA from local governments paying off their loans) is sold to investors. Monies earned from this would go to the state treasury to assist the state in balancing its budget. Such a move, in turn, would require that the repayment stream coming into GEFA from local governments go instead to these investors rather than being used to make future loans. Taking GEFA out of the lending business would force local governments to go to investment bankers, with the counsel of bond attorneys, to issue bonds for future water and sewer projects. Not only will this come at an increased cost to local governments, ratepayers and taxpayers, but it will also significantly hamper counties' ability to fund critical infrastructure as they have a 10-percent debt ceiling. GEFA's loans, considered "intergovernmental agreements", do not count toward this ceiling.

Throughout the Task Force's preliminary options are proposals that would come at a considerable cost to local government utilities. Now is not the time to require utilities to take out more loans on one hand, and then cripple GEFA as a low-cost lending source on the other. Such a move would jeopardize local governments' ability to continue to construct the environmental facilities on which Georgia's future economic prosperity so much depends. ACCG urges the Governor and General Assembly to keep GEFA as a viable low-interest funding option for local government water and sewer projects.

Water Permit Fees

ACCG believes that implementing a water permit fee (whereby those obtaining water withdrawal or discharge permits are charged a fee to help fund EPD's water quality and quantity programs) is a viable funding mechanism for the cash-strapped state agency. However, ACCG strongly opposes such a fee that counties (thus county tax- and ratepayers) would pay into unless it is enacted via a constitutional amendment in order to safeguard it from being redirected to fund unrelated state budget items – as is so very often the case with environmental fees collected in Georgia.

Outdoor Water Use Reduction

ACCG continues to work with local governments, the public and other urban agriculture stakeholders to find reasonable, yet meaningful measures by which to reduce unessential outdoor water use. As the Task Force, Governor and General Assembly contemplate

requiring all water utilities to achieve certain water conservation targets (conditioning their permits on compliance), it is imperative that local governments are not denied the tools necessary to come into compliance. This includes their ability to enact outdoor watering restrictions.

One significant impediment to local governments' ability to accomplish water conservation goals/mandates and ensure adequate water supply to meet human consumption and fire suppression needs (to preserve the public health, safety and welfare) was the adoption of HB 1281 during the 2008 legislative session. A provision of this law requires local governments to obtain the EPD's permission, on a case-by-case basis, in order to enact stricter outdoor watering restrictions than the state during times of drought. There are numerous reasons why this is poor public policy; however, our primary concerns are that:

- any decision by the Director to grant this permission can be appealed under the Administrative Procedures Act and be stayed for up to one year as water supplies dwindle;
- this reflects poorly on Georgia's willingness to employ the conservation measures necessary to meet current and future drought conditions; and
- this sends a bad message to our state's "downstream" communities if upstream areas' ability to conserve water is hindered.

House Bill 1281's provision on local outdoor watering restrictions will sunset on July 1, 2010. ACCG urges the General Assembly and Governor not to reauthorize it.

In other outdoor water use reduction areas, ACCG supports legislation that would encourage (or not impede) the planting of native/water-conserving species landscaping; prohibit HOA or CC&R covenants that mandate the use of turf in developments; require swimming pool covers; and encourage a host of other water conservation measures. ACCG discourages the General Assembly from adopting piecemeal legislation exempting various special interests from outdoor watering restrictions. Again, we must all play our part.

Small Water Systems are also Part of the Equation

ACCG believes that whatever water conservation measures are required of local government water utilities should also apply to neighborhood and community water systems as well so that all water providers and users share equally in conservation responsibilities.

Additionally, many counties are unaware of how many smaller, private water withdrawal permits exist in their jurisdictions. In order to increase this understanding and to facilitate coordination among counties, private water system permit holders, and the public toward meeting water conservation goals, it would be beneficial to develop a map outlining water permits that are held throughout the state. Such a map would also illustrate the importance of everyone working together to conserve.

Retrofitting

ACCG supports commercial and residential retrofitting on resale whereby water inefficient appliances (i.e., toilets, showerheads, faucets) are replaced with lower water-using fixtures when the property changes ownership. We recognize that many metropolitan Atlanta water utilities offer some sort of rebates for low-flow toilets and provide free shower heads or aerators; however, we believe that ultimately the costs/responsibility to retrofit should fall on the individual property owner/buyer, not the taxpayers or ratepayers at large.

Septic to Sewer Conversion

Many Georgia counties are, at great expense, extending sewer lines to residents and communities currently on septic tanks in order to more quickly return wastewater to treatment plants and ultimately back to our streams/rivers for downstream benefit. In this process, local governments currently have the authority to require a sewer connection to any existing address or community within a certain distance of the main being installed. ACCG respectfully requests that the General Assembly not usurp this authority as it will further complicate and increase the cost of this conversion.

ACCG supports legislation directing local boards of health to require the periodic inspection and/or maintenance of all on-site wastewater management systems within their jurisdiction, particularly applicable to systems located within water supply watersheds or other critical areas. This will ensure on-site systems do not pose environmental threats.

Stormwater Management

As evidenced by this year's floods in the Metro area, continued growth, development and increased impervious surface require enhanced stormwater management practices. Such practices also help keep reservoirs from filling with silt and sedimentation (thus less need to dredge them) and help keep our streams clean (thus lowering the cost to treat supplies to drinking water standards). ACCG encourages local governments to pursue stormwater utilities and stormwater utility fees as a financing mechanism to fund stormwater infrastructure construction, operation and maintenance. Note that local funding is also necessary to accomplish federal and state stormwater management mandates under the Clean Water Act.

Legislation (HB 316) was introduced during the 2009 session that would exempt state facilities from paying their fair share of stormwater utility fees. Proponents argue that this charge amounts to a tax and therefore the state should be exempt. However, in 2004, the Georgia Supreme Court specifically ruled in McLeod v. Columbia County that stormwater utility charges are, in fact, a fee for services and not a tax. Accordingly, there is no legal or logical basis for the State to exempt itself from paying valid fees for actual services rendered. If the state is successful in passing such legislation, it may well next argue that it does not have to pay water or sewer either. Secondly, if the state exempts itself, other tax-exempt properties will also seek exemption. Ultimately, the costs of treating and holding the stormwater which runs off of their impervious surfaces will be shifted to other property owners. We ask that the General Assembly please not pass this legislation.

Submetering

ACCG supports legislation requiring metering for individual units in multi-family/tenant complexes; however, the utilities' responsibility for instillation, repair, reading, and billing stops at the master meter. Responsibility beyond that rests with the property owner or manager.

ASR and Desalinization

ACCG commends the Water Contingency Planning Task Force for recognizing that desalinization and aquifer storage and recovery may be an important water supply management practice in the future. All options must remain open and we pledge to work with all stakeholders in minimizing any negative environmental impact that may result.

Interbasin Transfers

Understandably, the subject of interbasin transfers (IBTs) is the most difficult of all options being considered by the Task Force. That said, ACCG has great concern with discussion calling for a ban on IBTs, believing it irresponsible and dangerous. There are currently over 25 IBT permits issued involving six of Georgia's 14 river basins. These primarily take place in North Georgia where most of our state's population resides and where water is most limited. River basins in this part of the state are long and narrow and many of the cities/counties are spread out over more than one basin. As political and natural boundaries often do not coincide, the state cannot simply prohibit water transfer bans without having devastating consequences. Tightly-construed IBTs are absolutely essential for effective statewide water management in Georgia, and have been for many decades

ACCG believes it is appropriate for the state to consider further regulating IBTs, ensuring that of utmost importance is protecting the river basin of origin and structuring Georgia law to provide an efficient, effective and equitable IBT law that meets the water needs of both donor and recipient basins needs.

ACCG supported language in the current draft Statewide Water Management Plan that requires the EPD Director to consider over 23 new criteria in deciding whether or not to permit an IBT. Among these considerations are whether the transfer will negatively affect the current and reasonably foreseeable future water needs of the donor basin; the impact on water quality in the donor basin; if the potential receiving basin's request is reasonable; whether the receiving basin has attempted other supply options and made progress on conservation; and a list of several other considerations for both the donor and recipient basins.

ACCG pledges to work with our membership to provide adequate balance and information as the discussion over current and possible future IBTs progresses.

COWETA COUNTY
WATER & SEWERAGE
AUTHORITY

November 25, 2009

Honorable Lynn Smith
State Representative
Room 228 State Capital
Atlanta, GA 30334

Dear Lynn:

It is apparent the Water Task Force is grasping very quickly to come up with answers to what the State of Georgia will do to assist the North Metro Area. Based on information that we have obtained, the consultants undoubtedly based their information on withdrawal permits and have not identified jurisdictions with contracts in place for purchasing water. We have met with you and other legislators on this matter several times to offer some assistance in this matter, but we have run up against a road block. Coweta Water Authority has a contract with the City of Atlanta, but has not taken any water since 2007. Infrastructure is in place that could be utilized with very little expense to assist in the supply to the South Fulton Area. The water currently going to South Fulton could be diverted to the North Metro Area. We also know for a fact, Griffin has a large excess with their facilities.

We have a couple of questions: 1.) Why were the counties outside of Metro not contacted to share their input? 2.) Have any of the local water professionals been brought in to share any knowledge of their facilities?

We would also like to remind you that Coweta Water Authority has spent millions on leak detection and that will not be an option for achieving any additional water. The Authority does not need any additional conservation restrictions due to the bond indebtedness that requires significant portion of its revenues for debt service. We commend the Task Force for its work, but we also challenge you to allow us to assist in this endeavor.

As always the Authority is willing to discuss any and all matters that will assist in preserving our greatest resource. Please give me a call if we can be of assistance.

Sincerely,

Ellis P. Cadenhead
General Manager

cc: Authority Board Members
Dennis McEntire
Coweta County Commissioners
Water Task Force

230 East Newnan Road, Newnan, GA 30263
(770) 254-3710 / (770) 683-6441 fax

December 9, 2009

From: George Moore, Chair, Webster County Board of Commissoners
Joe Lee Williams, Chair, Stewart County Board of Commissioners
George Neal, Chair, Marion Board of Commissioners

To: Georgia Water Contingency Task Force

Subject: Water Proposal

Greetings:

As county commission chairs of three smaller and less wealthy counties in the Flint River Basin, we have have been studying an exciting concept that would enable the Flint River Basin to contribute materially to offsetting the volume of water now used out of Lake Lanier by the Atlanta metro area -- without the vexing problem of moving water from one river basin to another, and with portions of the preliminary work already completed.

As a side benefit, our proposal would aid substantially in improving the economic status of several of the state's smaller counties.

We learned recently that your task force is to present a list of proposed options this Friday. In view of this, we are emailing you this brief for possible inclusion, and will follow up with hard copies.

Background

Groundwork in this area was actually begun in the early 1960s, and it should be possible to capitalize on this earlier work to speed up the process considerably. . . .

In 1963, a United States Study Commission reported on a plan for the development of land and water resources of Southeastern river basins, including the Appalachicola, Chattahoochee and Flint River basins in Georgia. Six possible reservoir sites in these basins were studied.

The Study Commission recommended construction of three of these sites located within the eight-county area of what was then the Central Georgia Area Planning and Development Commission: the Lower Auchumpkee Project in Taylor and Crawford counties, the

Muckalee Project located in Schley County, and the Kinchafoonee Project in our three counties of Webster, Stewart and Marion.

This recommendation was seconded by the Area Planning and Development Commission, whose temporary chairman at the time was Georgia Sen. Jimmy Carter.

As small counties with limited staff and resources, we are not able to chronicle the histories of all of these proposed reservoirs -- or of the other three that were studied: Sprewell Bluff, Lazer Creek and Lower Flint. The purpose of this document is to concentrate on Kinchafoonee, for which we do have a body of knowledge, as an example of how the state could utilize research already done to speed up the reservoir planning and construction process -- while providing much-needed local and regional economic stimulus as an added benefit. With that in mind. . . .

Following the two recommendations to pursue construction of Kinchafoonee Lake, the U. S. Department of Commerce Economic Development Development Administration funded four separate, detailed studies: a 1972 overview, a 1973 evaluation of hydrology, soils and geology, a preliminary evaluation of environmental impact in 1974, and a 1975 development impact study.

These studies are available and should speed up considerably the process of developing Lake Kinchafoonee as a surface water source, should the state decide to go in this direction. And, while we have no direct knowledge, we would assume that similar materials are available for the other proposed reservoirs. (We do have some knowledge of the proposed Lazer Creek reservoir in Talbot County and feel that it would fit the same criteria applied to the three reservoirs mentioned earlier.)

Lake Kinchafoonee

Lake Kinchafoonee would be created by a dam a few miles northwest of Preston in Webster County. Water would back up for several miles into Marion County toward Buena Vista, and northwestward into Stewart County. The lake would be about 10 miles long and one mile wide, and would cover 4,450 acres. The area which would be inundated is mostly woodland and relocations should be minor.

While originally contemplated as a source for flood control and

recreation, it should be relatively simple to change the primary function of Kinchafoonee to that of a surface water reservoir.

This could be one of a series of such lakes, connected by computer to analyze weather, rainfall and other data and automatically release water as necessary to support the state's overall water system.

A corollary benefit of this particular lake would be the provision of a significant source of much-needed revenue for Webster, Stewart and Marion counties. The original Kinchafoonee proposal called for four recreational complexes to include marinas, wet and dry boat storage, picnic areas, restaurants and other retail activities.

Given the rapid expansion of Fort Benning and other areas just to the north, the lake also could be a prime location for lakeside first-and-second home and retirement communities -- rigidly controlled by a three-county zoning authority to prevent the type of helter-skelter growth that has damaged other lakes in the area.

One would anticipate the same type of regional economic stimulus from other lakes in the series.

Recommendation

As mentioned earlier, we represent three small counties with bold ideas but few resources with which to carry them out. Since timing is essential, we propose that the State of Georgia initiate immediately a study to study the feasibility of our proposal as it applies to both Kinchafoonee Lake and the other reservoirs mentioned in the 1963 Study Commission recommendations.

Respectfully submitted,
George Moore
Joe Lee Williams
George Neal

UNIFIED GOVERNMENT
OF WEBSTER COUNTY

Office: (229) 828-5775
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Post Office Box 29
Preston, Georgia 31824

George Moore, Chairman
Melvin Crimes
Jack Holbrook
Jonah McCluster
David Scott

MEMORANDUM

DATE: DECEMBER 14, 2009

TO: GEORGIA WATER CONTINGENCY TASK FORCE

FROM: GEORGE MOORE, CHAIRMAN

SUBJECT: PROPOSAL FROM WEBSTER, STEWART, MARION COUNTIES

The proposal submitted on December 9, 2009 by the Chairmen of the County Commissions in Webster, Stewart and Marion Counties implied a strategy for addressing metro Atlanta's water needs, but did not provide extensive narrative to explain it. Therefore, to assist the Task Force in more fully understanding the proposal tendered, I am offering the following comments.

The proposal attempted to suggest that if a system of reservoirs was built in the mid and lower Chattahoochee and Flint River basins, releases of water from those impoundments could be used to offset the withdrawals made from Lake Lanier and downstream of Buford Dam. We would hope that the system would include the construction of a reservoir on Kinchafoonee Creek, a major tributary to the Flint River. I would also note that the site referenced in the letter of December 9th is identified, along with a second site in Webster County, in the study titled Georgia Inventory and Survey of Feasible Sites for Water Supply Reservoirs, dated October 31, 2008, performed by Mactec Engineering and Consulting, Inc., as project number 6110-08-0257.

Any such system of reservoirs would, to be effective in managing flows in the two basins, need to be well coordinated across the system, likely using the most modern technology to control the structures, to account for rainfall throughout the basins, to predict demands upon water by other users such as agriculture, to monitor releases from Buford Dam, to monitor releases from other dams in the reservoir system, monitor in-stream flows, etc. It seems reasonable to believe that such a system could consistently and accurately supply the minimum volumes of water in the Apalachicola River requested by Florida.

The proposal seems to offer some advantages, one of which is it avoids the issue of inter-basin transfers. Others are that the construction of reservoirs in the mid and lower basin areas would create jobs, recreational opportunities and perhaps even prompt some further development activities in parts of the state that have not heretofore experienced much growth. Too, it might be less expensive to construct reservoirs in these areas, as opposed to North Georgia, since land prices are lower.

We are certainly cognizant of possible obstacles to any such plan, including potential opposition by mid and lower basin groups who might view the proposal as a transfer of water from downstream to upstream users. Too, as will be the case with any proposal to build reservoirs, environmental impacts would have to be mitigated.

I would like to thank the Task Force for considering my comments.

Memo To: Governor's Water Contingency Task Force

From: Frank Carl, Science Advisor, Savannah Riverkeeper, Inc.
Tonya Bonitatibus, Riverkeeper and Executive Director, Savannah Riverkeeper, Inc

Re: November 23, 2009 Report from the Task Force

Given the Governor's assigned timeline for the task force we can understand the accelerated schedule for providing information. Unfortunately, that accelerated schedule will inevitably lead to errors in the final product. We wish to take this opportunity to provide some input to minimize the errors and political fallout that are bound to happen with such an accelerated schedule. Maybe it should be impressed upon the Governor as the old saying goes that "failure to plan on your part does not constitute an emergency on my part."

At any rate we recognize that the Governor is simply providing himself with some alternatives that he should have provided himself much earlier instead of relying totally on winning the legal option. Unfortunately, taking a negotiated option off the table as a potential solution to the problem is a mistake. It would be very informative if we could compare the supply volumes and costs of a negotiated use of Lanier to the other options being considered. At this point we can only assume that the negotiated option would provide more water more cheaply than any other option except conservation. But of course that option cannot be evaluated in the current context because the Governor has taken it off the table.

It is also obvious that the task force has been tasked to consider only the economic drivers involved and to ignore the need for water for the health and welfare of the people of Georgia. Indeed, that priority has been prominent in the water planning process from the beginning back in 2005 when the mission statement put the economy ahead of the health and welfare of the people of Georgia. The mission statement for the Water Council states, "Georgia manages water resources in a sustainable manner to support the state's economy, to protect public health and natural systems, and to enhance the quality of life for all citizens." We need to get our priorities straight, starting now. We should use water to support the economy, but let's make sure that it is not at the expense of the people.

Maybe it is time to stop feeding the ravenous growth machine of the metro area, the growth that keeps developers happy but saddles the people of the metro area with sprawl, transportation issues, bad air, higher taxes, and a myriad of land use and water quality problems. Maybe it is time to allow the development in the metro area to run up against its natural constraints, a finite water supply and a 90 minute commute. Maybe it's time to allow development to follow the resources instead of commandeering the resources of others to allow us to continue to play the same old game, growing metro Atlanta.

The Task Force has made its conference with the Georgia Water Coalition a prominent part of its November 23 report, leaving the impression that the input of conservation groups had been included in the report. Unfortunately, the report did not use the information provided by the Georgia Water Coalition in its report and the inclusion of the GWC in the Task Force report seems to be just window dressing. In fact, the GWC has calculated that the water saved by

earnest conservation efforts in the metro district (and some already exist) would be much greater than the 35 MGD used in the Task Force report. Indeed, the GWC indicates that a combination of conservation and good faith negotiation with Alabama and Florida could easily produce enough water for current needs in the metro district. The inflated predictions of future needs used by the Task Force should be brought into perspective by the constraints mentioned in the previous paragraph. The growth industry needs to branch out and follow the resources. The current study should be used not only to find other sources of water but to understand the limits of growth in the metro area. The information the Task Force is generating can help us do that.

With the possible exception of West Point Lake the control options mentioned (Lake Burton, Lake Hartwell and the Tennessee River) would essentially be stealing someone else's water. And taking water from West Point Lake would re-open the same can of worms that the Task Force is trying to close. It would involve negotiations with Alabama and Florida.

Taking water from Lake Burton would likely involve negotiations with the Savannah/Upper Ogeechee Water Planning Council and they just passed (unanimously) a resolution to ban interbasin transfers. While the infrastructure for transferring the water may be relatively cheap, in this case the water itself may end up being politically expensive. In addition, it appears that currently a transfer from Lake Burton to the Chattahoochee would be illegal. Taking water from Lake Hartwell and transferring it into the North Georgia Metro District would also be illegal within Georgia, but more importantly might be challenged by South Carolina and by Georgia cities downstream (Augusta and Savannah).

Taking water from the Tennessee River is fraught with a myriad of problems, least of which is the expense. First, we do not think that it will matter much if the state line is successfully challenged to gain access to the river. Tennessee River water is highly allocated to a variety of uses downstream and downstream includes AL, TN, KY, IL, MO, AR, MS, and LA. Now, that is a lawsuit. While it may be possible to physically control water from the four sources under the control option, it may be much more difficult to legally control that water. We advise you to consider these comments when prioritizing the control options for the Governor. In fact, our advice would be to forget the control options. They are not really options.

We know that the Governor is partial to building reservoirs to capture water that is available in times of excess rainfall to be used in times of drought. While this mechanism can provide water to a water-starved city, there are major disadvantages to building reservoirs. First, the cheapest mechanism for building a reservoir is to dam a stream. Creating a reservoir where a stream once flowed completely changes not only the aquatic ecosystem but also the terrestrial ecosystem surrounding the new reservoir. Re-equilibration of an ecosystem takes generations, maybe centuries. These changes to nature should not be taken lightly. Second, there will be considerable pressure from the growth industry to use these newly built reservoirs as real estate amenities. I urge you to resist that pressure for two reasons. (1) Development on the shores of these new reservoirs will cause water quality problems that will have to be treated before the water can be used as a drinking water source. That treatment can become expensive. Indeed, New York City calculated that it would be cheaper for them to buy the watershed in the Catskills that supplies their drinking water than it was to treat the drinking water if they allowed development on the shores of their reservoir. (2) Making the land around the reservoir available

for real estate development will eventually lead to pressure to manage the water resource as a real estate resource. If you will be acquiring land to use for a reservoir for water supply, it would be disingenuous to allow the growth industry to drive up the cost of the water supply while profiting from development of land that was acquired for other reasons. And finally, if reservoirs are to be built, we recommend dedicated off-stream reservoirs where water is pumped into the reservoir during periods of excess and the reservoir does not interrupt the flow of an existing stream.

We wish you luck in providing a priority list for the Governor. We look forward to seeing that list. And we appreciate the opportunity to comment on your November 23 report.

Tim Lowe
Co-Chair
Georgia Water Contingency Planning Task Force

December 7, 2009

Dear Mr Lowe:

Desalinization & Hydrogen Production System Using Wave Energy

We wish to submit to your Task Force, for its consideration, preliminary details of a technical solution that we have developed that we believe will have application to the challenges being addressed by the Task Force.

Our solution, which will generate multiple outcomes, utilizes floats, placed in suitable, designated ocean areas that can generate:

- freshwater through Reverse Osmosis;
- hydrogen gas from the freshwater;
- electrical power to the grid; or
- for powering H2 production.
- With production of 250 million gallons of freshwater per day, the electric power cost savings would be $3,000,000 per day.
- No greenhouse gases, including CO_2

Our technology platform is a direct competitor to desalination technology, however, it has significant operational and capital cost advantages over that technology.

We are preparing to embark on proof-of-concept trials to validate the performance of our technology and would welcome the opportunity to partner with the State of Georgia in this endeavor.

While we understand that your Task Force will not be recommending the adoption of specific technology solutions, we would, however, like this technology to be considered for its relevance to the challenges being addressed by the Task Force.

We would welcome the opportunity to discuss this opportunity further with you or your staff team.

Sincerely,

Robert Rigby
Inventor

Milton R. Seiler
Physicist

Attachment: See below

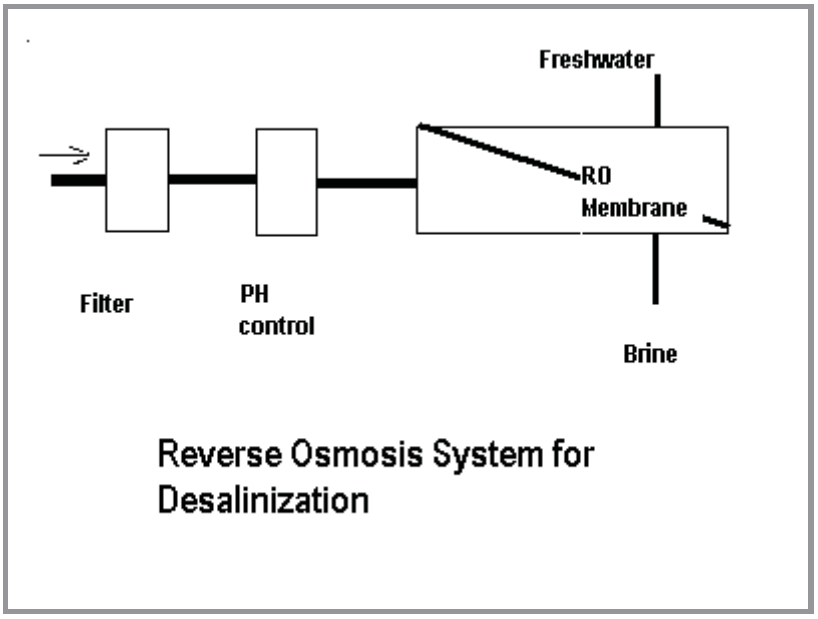
Desalinization & Hydrogen Production System Using Wave Energy

Robert Rigby, Inventor

Milton R. Seiler, Physicist

Overview of Technology Solution:
Floats, placed in suitable, designated ocean areas, can generate:

- Freshwater through Reverse Osmosis;
- Hydrogen gas from the freshwater;
- Electrical Power to the grid; or
- For powering H2 production.



Freshwater Production Details:

Reverse Osmosis requires about 900 psi to force seawater through the filters.

Consider a basic, 14 sq. ft. float. As the wave crest applies lifting force to the float, the first 1 foot of crest rise will generate 14 x 64 x 1 = 900 lbs. force.

If the float is connected rigidly to a reverse osmosis filter line of 1 sq. inch area, the pressure on the filter will begin to exceed 900 psi after a 1 foot rise. Assume wave crests occurring every 5 seconds (12 strokes per minute).

	2 ft crest	6 ft. crest
Water flow:		
Cu. inch per stroke	12	60
Cu. inch per day	207,360	1,036,800
Gallons per day	893	4464
Freshwater gallons per day	179	893

(20% recovery. This allows for periodic maintenance, reduced wave crests.)

Convert a 1 Million-Gallon/day System to Production of H2.

System designed to maximize H2 production. Electric power provided from grid.

Max. H2 per day, kg.	4E+05 (72 kg. of H2 per day from a 14 sq.ft. float)
Max. H2 per day, liters	4.5E+09
Electric power cost, per day.	$2,000,000

(This causes concern. Can electric power be produced directly by the floats? YES)

	2 ft. crest	6 ft. crest
Required float area, acres	1.8	0.36

One kg. of H2 is about 11,400 liters. One kg. of H2 is approx. energy equivalent of one gallon of gasoline. (per DOE)

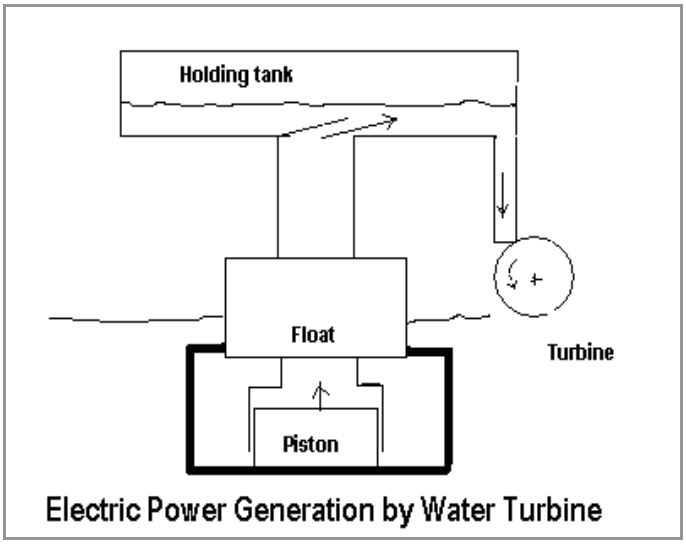
Use Designated Floats for Electric Power Generation
For direct sale to Power Company.
For driving the H2 generators, saving cost of electric power.

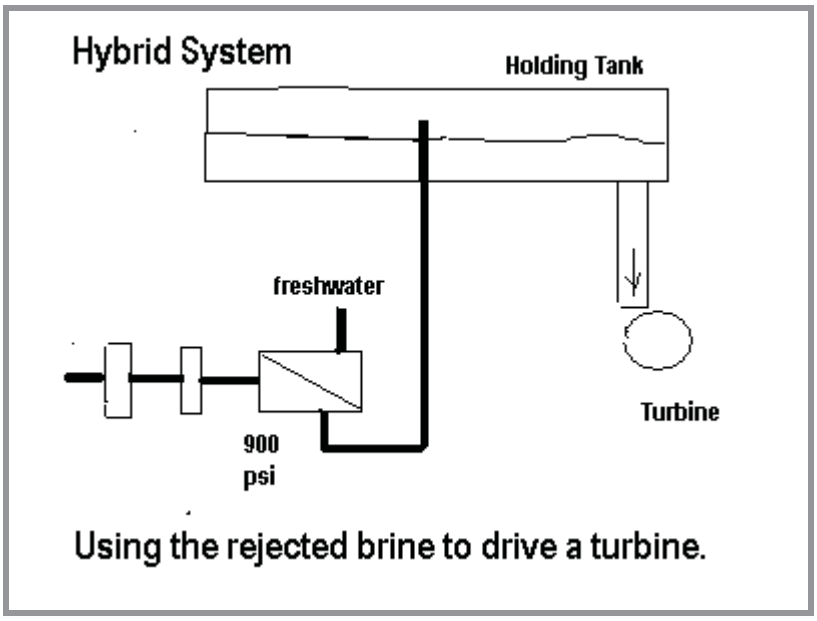
Consider a 14 sq. ft. float in 2 ft. swells.
Generate 1800 ft. lbs. energy per stroke, 12 strokes per minute.

1800 x 12 = 21600 ft. lbs. per minute. Pump to a 25 ft. head. (This is an arbitrary height, just for illustration purposes) 21600/25 = 864 lbs. of water delivered per minute.

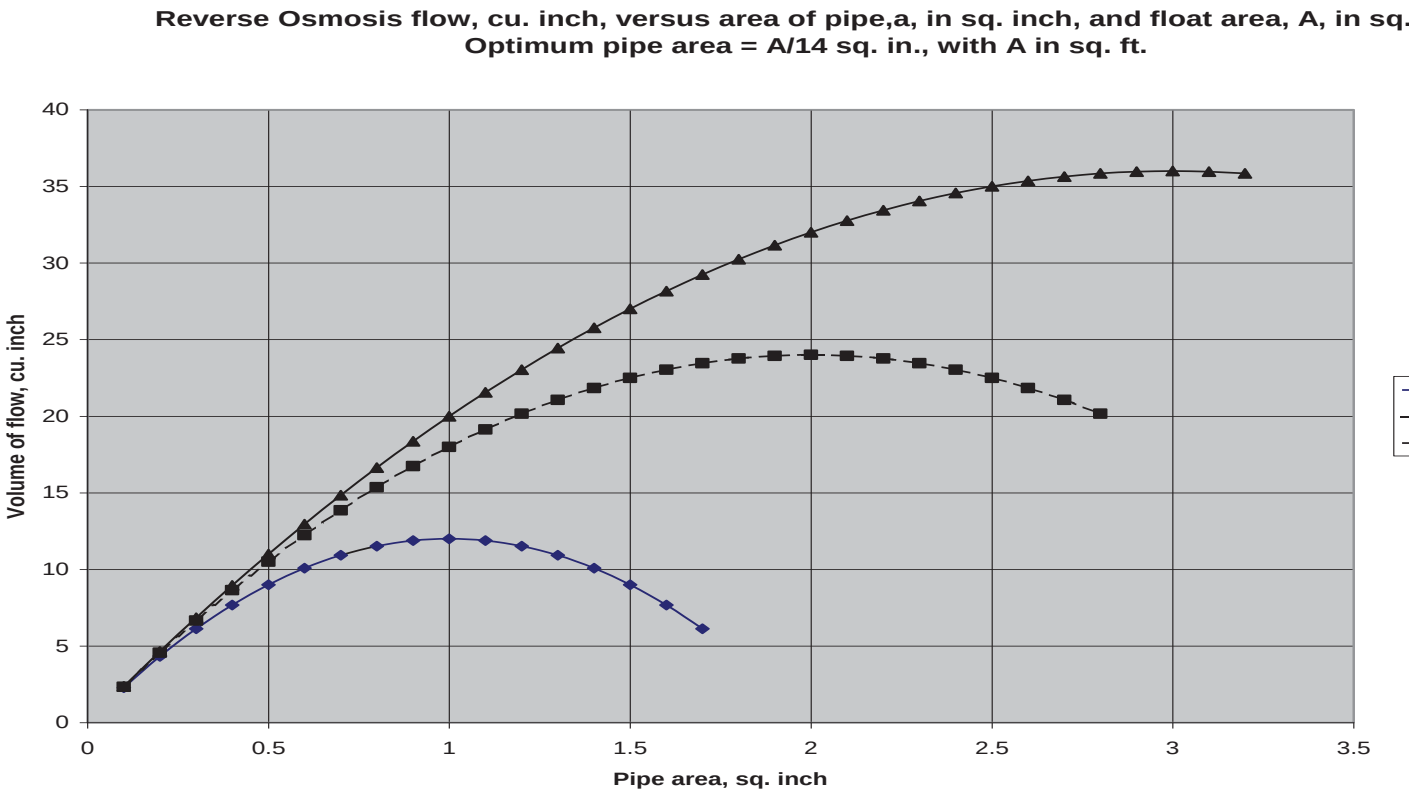
This equals 13.5 cu. ft./minute, or 100 gallons per minute.

Use Harris Turbine with a head of 25 feet. This would deliver 230 watts, or 0.23 kwhr. of energy per hour. A 14 sq. ft. float will deliver 3 kg. H2 per hour, requiring 147 kwhr. of energy. Hence we will need 147/0.23 = 639 floats, 14 sq. ft. each, to deliver the required power for one additional float.





Proprietary Information. Patent pending. Not to be disclosed outside the U.S. Government without permission of the author.



The above analysis assumes a 2-ft crest

Theoretical Predictions of the Wave Energy provided by analysis at a university in Florida

Assume 2.5 meter/second group velocity, 0.3 meter amplitude
Energy per meter of crest length = 96,208 kilojoules per day
This would produce 411771 kilojoules per day from a float 14 ft long.
Producing H2 at 100% purity the yield would be 3.5 kg. of H2 per day.

Conclusions.
A 14 sq. ft. float, requiring that it produce its own electricity for its H2 production, would produce 72 kg. / 640 = 0.11 kg of H2. (Remember that a 14 sq. ft. float would produce 72 kg. per day if all the power were supplied from the grid. It would take the output of 640 floats, each 14 sq. ft., to produce the same electric power)

0.11/3.5 = 0.031. Hence we are extracting about 3% of the wave energy.

Proprietary Information. Patent pending. Not to be disclosed outside the U.S. Government without permission of the author.

Some Options for System Design and Production

Baseline. 8960 sq. ft. of floats, 2 ft. crests, 20% freshwater recovery. Scale directly to other float areas. (this represents 640 floats, each of area 14 sq. ft.)

Option 1. Produce freshwater only. 114,278 gallons per day. Income $1485 per day @$0.013 per gallon

Option 2. Use all freshwater production to drive H2 generators. Pay power company for electric. About 46,000 kg of H2 per day. Income $230,000 per day at $5 per kg. Expense $225,792 per day for electric power at $0.10 per kwhr.

Option 3. Produce H2 only. Produce necessary electric power from 8946 sq. ft. of floats. Freshwater produced from remaining 14 sq. ft of floats, driving 72 kg. of H2 production per day. $360 income per day @ $5 per kg.

Option 4. Electric power production only. Sell 3533 kwhr per day to grid. Income: $177 per day at $0.05 per kwhr.

Option 5. Various combinations of the above.

Other cost issues. Staff requirements. Maintenance of the floats. Initial investment. Reverse osmosis maintenance. Turbine maintenance.

Summary of Potential Income Per Day
1 million gallon/day system. All power from floats. 20% recovery

Type of System	**Freshwater only system Option 1.**	**Hydrogen only system Option 3**	**Electric Power only. Option 4**
Sale of freshwater @ $0.013 per gallon	$13,000 per day	$0 (no sales)	$ 0
Sale of hydrogen @ $5 per kg.	$0	$3150 per day	$0
Sale of Electric power @ $0.05 per kwhr.	$0	$0	$1550 per day @ $0.05 per kwhr.

Suggested Feasibility Demonstration
Assume 2 ft. swell, every 5 seconds, with a 14 sq. ft. float.
Use wave tank or selected marine facility.
Drive a 1sq. inch line into reverse osmosis filter to produce freshwater.
Produce about 890 gallons per day (about 140 liters per hour).
Filter the freshwater.
Use Hgenerator model LM-200, or equivalent, to generate H2 gas
Feed LM-200 with 0.01 liter of freshwater per hour.
Generate about 12 liters of H2 per hour.
Dry the H2.
Demonstrate burning of H2.

Research & Design Issues
Float Design. Materials, operational requirements, maintenance.
RO Filter Design. Flat, spiral, material, maintenance.
Recovery Ratio. Trade-offs between recovery ratio and costs.
Overall System Design. Optimization for requirements and locality.
Hydrogen generation. Intended uses, requirements, storage.
Electric power generation. For grid, for H2 generation, other.
Site selection. Coordination with agencies and communities.
Safety. Hurricane shutdown. Worker procedures.

An Alternative System. Use Solar Cells to Produce the Electricity. Assumes 14 watts average from each square foot of solar cell.

Analysis of Freshwater Production with Floats Covered with Solar Panels

Float area, acres	**Fresh-water per day, gallons, 20% recovery (M = million)**	**Income from sale of water, per day, $0.013 per gal.**	**Potential kg of H2 per day (would require grid supply)**	**Req'd kwhr for full H2 produc-tion. per day**	**Max kwhr per 4 hour day available from solar cells**	**Income from sale of electric, per day, $0.10 per kwhr**	**Income from sale of H2, $6 per kwhr, per day**	**Total H2 produced per day, kg**	**Total sales, per day. Choose H2 or Electric) (M = million)**
1.8	1 M	$13.000	406,000	20 M	4390	$439	$538	90	$13,439-13,538
50	27.8 M	$361,000	11.3 M	553 M	122,000	$12,200	$14,900	2483	$373,200-375,900
100	55.6 M	$722,000	22.6 M	1110 M	244,000	$24,400	$29,900	4966	$746,400-751,900
500	278 M	$3.61 M	113 M	5530 M	1.22 M	$122,000	$149,000	24833	$3.73 M-3.76 M

The solar cells, occupying the same area as the total float area, can only supply 0.00022 of the total required power to produce the H2 that is potentially available from the freshwater generated by the floats.

Proprietary Information. Patent pending. Not to be disclosed outside the U.S. Government without permission of the author.

Georgia River Network

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STAFF
April Ingle
Doug Barnes
Ben Emanuel
Jesslyn Shields
Dana Skelton

MISSION:
Georgia River Network is working to ensure a clean water legacy by engaging and empowering Georgians to protect and restore our rivers from the mountains to the coast.

GOALS:
More people involved in protecting and managing Georgia's waters

Increasing awareness of the issues that threaten the health of our waters

Sharing resources to improve the protection of Georgia's waters

Providing the means to advocate for the health of our waters

November 20, 2009

Dear Georgia Water Contingency Task Force Members:

Georgia River Network thanks you for the opportunity to provide our input as you develop contingency recommendations in response to Judge Magnuson's ruling. Georgia River Network represents over 600 Georgia citizens and 30+ river protection organizations.

We provide these recommendations in addition to the comments submitted by the Georgia Water Coalition, of which we are a member.

With Judge Magnuson's decision, Metro Atlanta has an opportunity to embrace sustainable water management to support future water supply needs. To embrace this opportunity, Georgia River Network suggests the Task Force:

1. Focus strategies on aggressive use of water conservation and efficiency measures which will create a "hidden reservoir" of water at a price per gallon significantly less than other options, creating a true "Culture of Conservation" in Georgia.
2. Make reauthorization and reallocation of the water from Lake Lanier a central component of future water supply plans.
3. Use water demand projections that realistically reflect Metro-Atlanta's future water needs.
4. Not deprive downstream communities of the chance for future economic growth, prosperity and ecological health.

1. Focus strategies on aggressive use of water conservation and efficiency measures which will create a "hidden reservoir" of water at a price per gallon significantly less than other options.

Metro Atlanta could save between 130-210 million gallons of water per day by implementing water efficiency and conservation. Permitted Lake Lanier withdrawals equal 178 million gallons per day.

New reservoirs should be a last resort because they seriously impact downstream communities, fish and wildlife, property owners, and the recreational value of our streams, they are expensive, and they take a long time to provide drinking water. Dams can cost $4,000 per 1,000 gallons of capacity, while efficiency measures range from $0.46 to $250 per 1,000 gallons saved or new capacity. Before "Capture" and "Control" strategies are pursued, aggressive use of water conservation should be pursued first.

According to American Rivers and their "Hidden Reservoir" report:

- Metro Atlanta could save up to **$700 million** by pursuing water efficiency to secure water supply as compared to building new dams.
- This water savings could provide water for **790,000 to 1,280,000 new residents**.

- Metro Atlanta communities consume, on average, 89 gallons per capita per day (gpcd). A conserving household consumes 45.2 gpcd. Brisbane, Australia consumes 36 gpcd with the same high quality of life as Metro Atlanta.
- New York City completed the world's largest toilet replacement program during 1994-1997 (three years) resulting in 70-90 MGD of savings through the replacement of 1.3 million toilets. The program saved NYC over $200 million by deferring expansion of supply and wastewater infrastructure.

Here are the numbers on how water conservation and efficiency can meet Metro Atlanta's water supply needs with **5 proven water efficiency methods**:

	Low Projection of Water Saved	**High Projection of Water Saved**
Stop Leaks in the water utility distribution pipes. • 117 MGD are lost each day to leaks and unaccounted for uses in Metro Atlanta	29.34	58.68
Price water to encourage efficient use. • Up to 22% decrease in consumption is possible through conservation pricing.	53.79	78.89
Meter all uses to measure water consumption. • Most multi-family/commercial includes water costs in monthly rent/fees thereby eliminating market signals to conserve. • A 15% savings can be secured through this policy alone.	5.87	9.39
Retrofit all buildings with water efficient fixtures. • Up to 35% decrease in water use possible through retrofits alone.	36.35	54.52
Landscape to minimize waste. • On average 30% of household drinking water is used to water lawns, tree, and shrubs. On average 50% of that water is wasted. • At least 25% savings is possible through proven programs.	8.41	12.62
Total MGD Saved ** Source: American Rivers*	133.76 MGD	214.10 MGD

2. Make reauthorization and reallocation of the water from Lake Lanier a central component of future water supply plans.

We recommend the Task Force coordinate its efforts with the other prongs of the Governor's response strategy to negotiate with Florida and Alabama and gain Congressional reallocation and reauthorization of Lake Lanier. If Metro Atlanta commits to using its water resources as efficiently as possible, gaining authorization of Lake Lanier to use for water supply purposes is an economical and environmentally sound path to pursue. The authorization should also provide for healthy downstream flows, require efficient use of the resource, and ensure that water supply not be prioritized over other authorized uses.

3. **Use water demand projections that realistically reflect Metro-Atlanta's future water needs.**

   The Metropolitan North Georgia Water Planning District water demand projections do not plan for reasonable decreases in per capita consumption or overall consumption. The Pacific Institute criticized the Metro District's population and demand projections for being over-stated. These same demand projections were used to determine the gap in water supply for 2012.

4. **Not deprive downstream communities of the chance for future economic growth, prosperity and ecological health.**

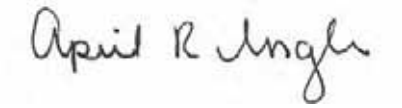
   The Task Force should be keenly aware of how they make decisions and how their decisions will affect the rest of the state because it is perceived as heavily weighted toward Metro Atlanta interests and is making decisions in meetings that are closed to the public.

   Solutions to Metro Atlanta's water supply needs must protect the water supplies of downstream communities, protect taxpayers from costly and unnecessary water supply projects and protect the health of our rivers, fisheries and wildlife.

Metro Atlanta has a significant opportunity to meet this challenge with inventive, progressive, cost-effective, and timely strategies like Seattle and Boston have, and also like our own Cobb and DeKalb counties have. We urge you to pursue those strategies too.

Thank you again for this opportunity to provide recommendations.

Sincerely,



April Ingle, Executive Director

GEORGIA ASSOCIATION OF REALTORS®, INC.

The Voice for Real Estate™ in Georgia

Georgia Association of REALTORS®

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November 9, 2009

Mr. Tim Lowe
2000 RiverEdge Parkway
Suite 400
Atlanta, GA 30328

Dear Mr. Lowe:

On behalf of the 34,000 members of the Georgia Association of REALTORS®, I would like to thank you for allowing GAR the opportunity to address Governor Perdue's Water Contingency Task Force. Our association understands how vital water is to the continued growth of our state and appreciates the long history of support the State of Georgia has displayed for private property rights. We look forward to working with the Governor, the members of the Task Force, and the General Assembly on common sense solutions to improve Georgia's water supply and to implement market-based water conservation measures.

A GAR Presidential Advisory Group (PAG) was created to address REALTOR® concerns with potential changes to Georgia water policy and to offer recommendations to the Task Force. GAR remains dedicated to the protection of private property rights and free enterprise in Georgia. With these core values in mind our PAG has carefully considered this issue and respectfully recommends the following policy positions:

- GAR supports a riparian water rights system and the water rights of property owners.
- GAR opposes the public trust doctrine.
- GAR supports efforts to increase water supply levels by expediting the permitting and construction of new water supply reservoirs and increasing the capacity of existing reservoirs.
- GAR supports responsible market-based water conservation measures such as conservation pricing and retrofit incentives such as rebates.
- GAR opposes inefficient point-of-sale government mandates such as retrofit at resale.

While we remain dedicated to water conservation, we strongly oppose any effort by local or state governments to impose an unfunded mandate that requires older plumbing fixtures to be retrofit as a condition of resale. Retrofit at resale creates unnecessary barriers in an already depressed real estate market, and places the burden of retrofit solely on those citizens wishing to buy or sell property. Proponents of retrofit at resale fail to recognize the inefficiency of the proposal due to slow turnover of affected properties and that older, less efficient homes are typically occupied by those least able to afford costly renovations. Prior to advocating for an inefficient unfunded mandate, we believe the Task Force should address lost water from failing infrastructure, advocate market-based conservation incentives, and push for increased conservation education efforts.

We understand there are vast nuances and fiscal challenges in the implementation of water policy. This is why we remain dedicated to working with all concerned parties to reach our common goal of protecting and conserving Georgia's water. On behalf of our membership, we appreciate the pro-active efforts of Governor Perdue to address our state's most pressing public policy issue. We thank you for your dedicated service to the state and look forward to working together to find solutions that do not impede private property rights or free enterprise in Georgia. If you require additional details or communication, please contact GAR Senior Director of Public Policy Keith Hatcher at khatcher@garealtor.com.

Sincerely,

Steven Fischer

Steven Fischer, 2009 President
Georgia Association of REALTORS®

FARM BUREAU GEORGIA

www.gfb.org

Georgia Farm Bureau Federation
P.O. BOX 7068 • MACON, GEORGIA 31209-7068
478-474-8411

December 11, 2009

Co-Chairmen John Brock and Tim Lowe
Governor's Water Contingency Task Planning Force
Georgia State Capitol
Atlanta, Georgia 30334

Dear Mr. Brock and Mr. Lowe:

Georgia Farm Bureau is the largest general farm organization in the state with over 380,000 members. We appreciate the opportunity to comment on the November 23 report of the Water Contingency Planning Task Force.

Like many Georgians, we were disappointed by Judge Magnuson's ruling prohibiting Atlanta's use of Lake Lanier. We agree with the statement in your report that Lake Lanier is the most environmentally and economically sensible water source for the City of Atlanta.

We believe reauthorization is the answer to this problem. However, that scenario is outside the scope of the task force. We commend the task force for researching the various solutions to Atlanta's water problems.

Conservation should be a first step in the process, and we applaud the task force's recommendations. We support water reuse efforts outlined in the report as significant conservation measures.

Georgia's horticulture industry has a large impact in the state's economy, particularly in the metro Atlanta area. Potential harm to this industry must be a consideration when evaluating watering restrictions. Georgia Farm Bureau supports an exemption for low volume irrigation from future outdoor watering restrictions.

According to the report, options to capture additional water provide the most cost effective way to meet the shortfall. The report lists expansion of existing reservoirs, building new reservoirs, and aquifer storage & recovery as possible options that are cost effective. Although time frame challenges remain, Georgia Farm Bureau supports efforts to capture and store more water. We believe Georgia should pursue these options even if reauthorization is achieved.

The task force studied various water transfers. These transfers present additional challenges. Whenever water is transferred, the needs of the donor regions or basins must be strongly considered. Access to water is key to economic progress in any region. If access to water is impaired, the future of the region is similarly impaired.

In many parts of the state, agricultural water use is significant. Any proposal that might result in limiting farmers' access to water is a cause for concern. Agriculture is the economic driver in about two thirds of Georgia's counties. Limits to farmers' timely access to water would have a devastating effect in many Georgia rural counties. Georgia Farm Bureau opposes water transfers that would result in limiting farmers' access to water.

Thank you for the opportunity to offer comments to this important task force. If our organization can be of assistance in your efforts, we are willing to help. Please call on us.

Sincerely,

Zippy Duvall

Zippy Duvall, President

We urge farmer representation

- Georgia's river basins have differing characteristics, and decisions should be made on a regional basis by the stakeholders in each particular region.
- Farmers should be represented and hold seats on all committees, boards, and councils that impact the use of water in Georgia.

We believe the right to use water is a private property right subject to state regulation only to the extent necessary to protect downstream users.

- Landowners have the basic right to use water located on (or under) their property. We oppose assertions that all citizens have an equal right to use water located on private property.
- If the right to use water is restricted by the state, landowners should be compensated for the loss.
- We oppose lowering the 100,000 gallons/day threshold for requiring agricultural withdrawal permits.

Farmers should have priority during times of drought.

- We oppose any change to OCGA 12-5-102 which states that "*during emergency periods of water shortage, the director shall give first priority to providing water for human consumption and second priority to farm use*."
- Of all stakeholders, farmers are most at risk. Without timely access to irrigation water, farmers lose their total investment.
- Once basic human needs are met, farmers should have priority for water use.
- Irrigation costs are effective incentives for farmers to conserve. Farmers will regulate themselves because of high fuel and electricity costs.
- Agriculture is Georgia's largest industry; damage to agriculture adversely affects the economy of the entire state.

We support all reasonable avenues for solving our water needs.

- Water conservation incentives should be enacted or broadened that would encourage landowners to voluntarily reduce water usage.
- Ways to increase our water supply should become a priority equal to conservation. We must find effective ways to bring new reservoirs into use, whether it be streamlining the process or utilizing different types of reservoirs (off stream reservoirs, increasing capacity of existing reservoirs, more farm ponds, aquifer storage & recovery, desalination, etc.)
- We support the use of existing reservoirs for electric power generation, irrigation, navigation, flood control, and municipal water supplies. We oppose releases of water that are not in accord with those uses.

We support reasonable water transfers.

- We support limitations on inter-basin and intra-basin transfers of water to maintain adequate supplies for agriculture.
- The needs of donor regions and basins must be protected.

The state should fund water planning entities.

- Public funding sources must be utilized to meet the data collection and staff needs associated with the development, implementation, and ongoing management of the water plan.
- We oppose the creation of huge bureaucracies to manage Georgia's water, and water planning entities should not have taxing authority.

November 25, 2009

GEORGIA WATER COALITION

The Georgia Water Coalition's Essential Steps to Ensure Sustainable Water Supply for Metro Atlanta

- Water must remain a public resource in Georgia, regardless of where we ultimately get additional supply.

- Any water management strategy for metro Atlanta must not deprive downstream communities of the chance for future economic growth and prosperity.

- Water management must be adaptive, based on sound science to ensure water withdrawals are timed and distributed to meet all instream flow and consumptive needs while allowing for uncertainty in the face of droughts, floods, and climate change.

- The Georgia Water Coalition supports the aggressive use of water conservation first, which will create a hidden reservoir of water at a price per gallon significantly less than that of constructing new reservoirs.

    - Aggressive conservation measures are those above and beyond those included in the Metropolitan North Georgia Water Planning District's regional water plans, including funding to fix leaking pipes and aging infrastructure, requiring low impact development techniques, toilet retrofits, submetering, etc., and should include interim and final deadlines to make sure that goals are reached. The Metro District can save millions of gallons of water, create new jobs and spend less money in the long term by implementing these measures now.

    - The Georgia Water Coalition is ready to work with state and federal agencies to secure funding necessary to repair aging infrastructure as well as support other aggressive conservation measures.

- The Georgia Water Coalition supports maximizing the use of existing water supply reservoirs, particularly Lake Lanier and Lake Allatoona.

    - The cheapest and most readily available sources of water are Lake Lanier and Lake Allatoona. Both must be controlled in a way that insures healthy downstream flows and minimizes withdrawal needs by maximizing both water conservation and water and energy efficiency.

    - The Georgia Water Coalition is willing to offer whatever assistance is needed to secure an agreement between the Governors or through Congress that assures metro Atlanta the continued use of Lakes Lanier and Allatoona at sustainable withdrawal levels.

- We must explore the feasibility of converting existing reservoirs built for other purposes to serve in part or in full as water supply sources. As part of a comprehensive assessment of these existing sources, quarries should also be explored as potential water storage facilities.

- Until the above options have been fully exhausted, new reservoirs, aquifer storage and recovery, desalinization, and interbasin transfers should not be pursued. All are expensive, time-intensive, and/or untested, and they are potentially detrimental to aquatic ecosystems and downstream users.

- New reservoirs and other supply sources will saddle state and local economies with massive debt in an already difficult economic climate.

- New reservoirs and other supply sources cannot be constructed by the July 2012 deadline set by Judge Magnuson, even in the absence of any downstream or environmental opposition.

- In order to unite all Georgians in a common water management strategy, we must codify the statewide water plan's suggestions for interbasin transfers and reservoirs into statute, so that these suggestions become binding principles that will govern future water supply proposals.

Georgia Water Coalition Partners

1.866.88WATER • www.georgiawater.org

Altamaha Riverkeeper
American Fisheries Society - Georgia Chapter
American Rivers
American Whitewater
Anthony W. Park & Associates, LLC
Apalachicola Riverkeeper
Appalachian Education and Rec. Services – Len Foote Hike Inn
Athens Grow Green Coalition
Athens Land Trust
Atlanta Audubon Society
Atlanta WAND (Women's Action for New Directions)
Atlanta Water Conservation
Atlanta Whitewater Club
Azalea Park Neighborhood
Bear Creek Bass Club
Benjamin E. Mays Center, Inc.
Berkeley Lake Homeowners Association
Bike Athens
Blue Heron Nature Preserve
Broad River Outpost
Broad River Watershed Association
Burnt Fork Watershed Alliance
Camden County Land Trust
CCR Environmental
Center for a Sustainable Coast
Central Savannah River Land Trust
Chattahoochee Hill Country Alliance
Chattahoochee Nature Center
Chattahoochee River Watch
Chattooga Conservancy
Cherokee Homeowners
Citizens for Clean Air and Water
Citizens for Environmental Justice
Clean Coast
Clear Rivers Chorus
Coastal Environmental Organization of Georgia
Coosa River Basin Initiative
Coosawattee Watershed Alliance
Creative Earth
DeKalb County Soil & Water Conservation District
Earthkeepers & Company
East Atlanta Community Association
Eco-Scrub Carpet & Floor Care
Ens & Outs, Unitarian Universalist Congregation of Atlanta
Environment Georgia
Environmental Community Action Inc. (ECO-Action)
Environmental Defense Fund, Southeast Regional Office
Flint Riverkeeper
Foundation for Global Community, Atlanta Chapter
Friends of Barber Creek
Friends of Georgia, Inc
Friends of McIntosh Reserve
Friends of the Apalachee
Friends of the Chattahoochee
Friends of the Savannah River Basin
Garden Club of Georgia, Inc.
Georgia Bass Chapter Federation
Georgia Canoeing Association, Inc.
Georgia Coalition for the People's Agenda
Georgia Coalition of Black Women
Georgia Conservancy
Georgia Conservation Voters
Georgia Erosion Control Center (GECC)
Georgia Forest Watch
Georgia Interfaith Power and Light
Georgia Green Industry Association
Georgia Kayak Fishing
Georgia Kids Against Pollution
Georgia Lakes Society
Georgia Land Trust
Georgia Onsite Wastewater Association
Georgia Organics
Georgia Poultry Justice Alliance
Georgia River Fishing
Georgia River Network
Georgia River Survey
Georgia Rural Urban Summit
Georgia Wildlife Federation
Glynn Environmental Coalition
GreenLaw
Hiwassee River Watershed Coalition
Hotlanta Adventures
Hydro Management Systems
IMPACT
Interface, Inc.
Intrenchment Creek Coalition
Jackson Lake Homeowners Association
Jett Ferry Manor Homeowners Association
Junior Bass Busters
Keller Williams Realty, Lanier Partners
Knottalotta Entertainment
Krull and Company
LaGrange Boaters, Anglers, Campers Association
Lake Allatoona Preservation Authority
Lake Blackshear Watershed Association
Lake Hartwell Association
Lake Homeowners Alliance
Lake Lanier Association
Lake Oconee Property Owners' Association
Lake Oconee Water Watch
Lake Yonah Association
League of Women Voters of Georgia
Little Tennessee Watershed Association
Long Island Creek Watershed Preservation Assn
Lula Lake Land Trust
Lumpkin Coalition
MBD Water Solutions
Melaver, Inc.
Middle Chattahoochee River Stewards
Middle Georgia Advisory Group
Minds Eye Scenic Arts
Mountain Park Watershed Preservation Society, Inc.
National Wildlife Federation
The Nature Conservancy
Neighborhood Planning Unit - W, Atlanta
Netlink IP Communications
New Echota Rivers Alliance
Nickajack Watershed Alliance
Norris Lake Community Benefits Corporation
North Georgia Trout Online
Nuclear Watch South
Oceana
Oconee River Land Trust
Ogeechee Audubon Society
Ogeechee - Canoochee Riverkeeper
Peavine Watershed Alliance
Presbytery of Greater Atlanta
Pulaski County Ocmulgee Watershed Stewardship Partnership
Rain Harvest Company, Inc.
REP America- Georgia Group
Richmond Hill Garden Club
Ridgeview Neighborhood Civic Association
Satilla Riverwatch Alliance, Inc. & Satilla Riverkeeper
Sautee-Nacoochee Community Association
Savannah-Ogeechee Canal Society, Inc.
Savannah Riverkeeper
Savannah Tree Foundation
Save Lake Oconee's Waters (SLOW)
Save Our Rivers, Inc.
Scenic Georgia, Inc.
Sierra Club- Georgia Chapter
Small Carpenters at Large
Solomon's Minds
Soque River Watershed Association
South Atlantans for Neighborhood Development
Southeastern Natural Sciences Academy
Southern Alliance for Clean Energy
Southern Environmental Law Center
Southface
SouthWings: Conservation through Aviation
Spring Creek Watershed Partnership
Sustainable Business Partners
Tallulah River Watershed Protection Committee
The Wilderness Society
Trout Unlimited - Georgia Council
Turner Environmental Law Clinic
Unicoi Outfitters
United Nations Association - Atlanta Chapter
Upper Chattahoochee Riverkeeper
Upper Oconee Watershed Network
Upper Tallapoosa Watershed Group
US Green Building Council - Atlanta Chapter
US Green Building Council - Savannah Chapter
Vegetarian Solutions
West Atlanta Watershed Alliance
West Point Lake Advisory Council
West Point Lake Coalition
World Wildlife Fund

GEORGIA MUNICIPAL ASSOCIATION

Water Contingency Policy Proposals

Economic Challenges = Increased Resources: Capital cost estimates to repair and upgrade aging water and sewer infrastructure in general are astronomical. Augmenting water supply in order to meet the challenge imposed by Judge Magnuson's ruling will definitely require an increased funding commitment from the state *and* individual communities. Before the draconian ruling was handed down, the recent EPA National Needs Survey estimated that Georgia's needs were over $3.2 billion for drinking water and $1.7 billion for wastewater.

With the water supply situation now faced by the metro Atlanta area, these infrastructure estimates are likely under-representing the actual costs. In acknowledgement of the need for increased water supply, the General Assembly in Fiscal Year 2008 appropriated $40 million in grant funds for local government reservoirs and water supply projects, but the governor ordered the funds to be returned to the general fund as the economy began to worsen. In addition, even though $30 million in loan funds were appropriated in FY 2009 for local government reservoirs and water supply projects at an average interest rate of 3.915%, only $2.4 million was actually used by local governments.

The governor and legislature should create a $500 million grant fund for local government water supply projects. In addition, GEFA loans to communities impacted by Judge Magnuson's ruling should be made at a zero interest rate.

In addition, using the Water Contingency Task Force's initial report as a starting point, the State of Georgia must fund a coordination and implementation effort, including taking measures to require the Environmental Protection Division to facilitate and streamline local government water supply permitting.

Conservation = Sustainability: Water conservation has tremendous potential as a water resource management tool and can significantly ease the burden on supply and wastewater treatment. To aid in achieving this benefit, the state must enhance and support incentives and technical assistance for aggressive local planning and implementation of water conservation programs.

The governor and General Assembly should create an Office of Conservation to provide technical assistance in implementing water conservation projects and to promote a greater water conservation ethic in local government, the development community and the general public.

Water Infrastructure Now (WIN) Tax = Action: Communities with existing water and wastewater infrastructure should have the option to pay for water supply augmentation by means other than rate increases, property taxes or increased debt-load.

The governor and legislature should allow communities to levy a one-cent Water Infrastructure Now (WIN) Tax to pay for the costs of water supply augmentation. Purposes of the sales tax could include reservoir construction, water supply projects such as interconnections, wells, and the implementation of sustainable conservation programs.

GSWCC
GEORGIA SOIL AND WATER CONSERVATION COMMISSION
4310 LEXINGTON ROAD P.O. BOX 8024 ATHENS, GEORGIA 30603 PHONE (706) 542-3065 FAX (706) 542-4242

October 26, 2009

Mr. Tim Lowe
Co-Chair, Water Contingency Task Force
Lowe Engineers
2000 RiverEdge PKWY
Suite 400
Atlanta, GA 30328

Dear Mr. Lowe;

Adequate water supply is an issue that, along with many other state agencies, local governments are facing. The Georgia Soil and Water Conservation Commission is working to assist local governments with these challenges. The Conservation Commission has recently completed an engineering study that examined the potential to convert previously-constructed flood control reservoirs to water supply purposes. An engineering firm was commissioned to examine approximately 160 flood control reservoirs with the final product for the study to be the identification of 28 reservoirs that have significant water yield, allowing moderate impacts to infrastructure and the environment.

To determine the water supply potential for these dams, study results included detailed information concerning long term demand / needs for water supply, reservoir yield and fill times, environmental concerns including stream impacts, threatened and endangered species, flora and fauna, trout waters, upstream impacts to infrastructure and construction cost to modify the reservoir to accommodate needed storage requirements. A copy of the Summary Executive Report is attached for your review.

Economic investments must be made to bring these structures in-line for water-supply use. Limited State grant assistance for water supply projects including modifying reservoirs was in the FY08 state budget through the Georgia Environmental Facilities Authority (GEFA), but as you know current economic conditions have eliminated the availability on these funds. The Commission also received the authority to provide cost share assistance for planning and implementing water supply reservoirs through Senate Bill 342 during the 2008 General Assembly Session.

Water supply planning is a long term process, with a need to look at many alternatives within the state. With the anticipation of funding in the future, we believe that it is important for Georgia to continue to research water supply options and develop strategies for a time when funding becomes available.

We at the Conservation Commission would like to discuss the study results with you. Please call our office at your convenience in order to establish a time and location for this purpose. Your contact will be Bob Fulmer, Program Manager, at 706-542-3065, or bfulmer@gaswcc.org.

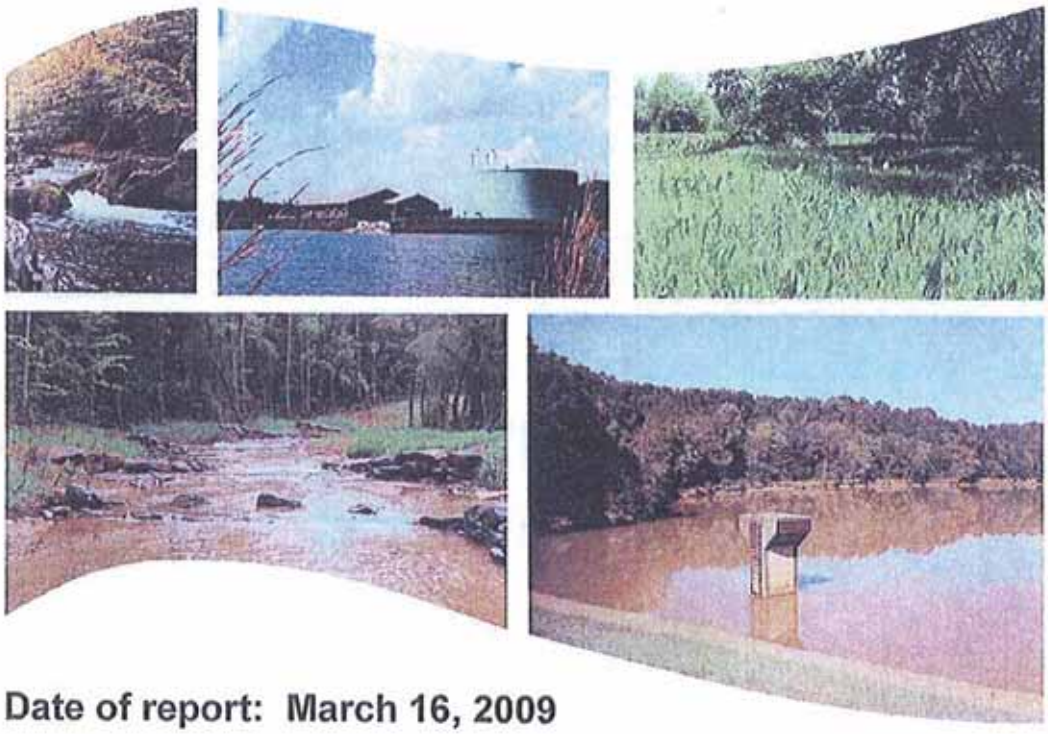
Respectfully,

Brent Dykes
Executive Director

Cc: Garland Thompson, Chairman, GSWCC Board
Steve Singletary, Vice-Chairman, GSWCC Board
Carl Brack, GSWCC Board
David Hays, GSWCC Board
Dennis Brown, GSWCC Board
Dave Eigenberg, GSWCC Deputy Executive Director
Bob Fulmer, GSWCC Rural Water Resources Program Director
Andy Dyar, GSWCC Watershed Technician
Matt Baxter, Office of Governor Sonny Perdue

Inventory and Assessment of USDA/Soil and Water Conservation District Watershed Dams

Summary Executive Report



Date of report: March 16, 2009

JORDAN JONES & GOULDING

Schnabel

Schnabel Engineering, LLC

EXECUTIVE SUMMARY

The Georgia Soil and Water Conservation Commission (GSWCC), in partnership with the Natural Resources Conservation Service (NRCS) and the Georgia Environmental Protection Division (EPD), initiated a study to evaluate 166 of the 350 watershed dams in Georgia, designed and constructed under federal laws PL 544 and PL 566, to establish if they could be modified to serve as water supply reservoirs. The initial phase of the study delineated 20 dams based upon a ranking matrix established by the study. Key components of the matrix was a minimum safe yield of 1 MGD, having a refill time of five years or less, proximity to primary trout streams, acceptable impacts on the local infrastructure and the environment. If a dam was located within 2 miles of an adjacent watershed having a minimum drainage basin of 50 square miles, the safe yield was based a pump diversion scheme from the adjacent watershed. Fifteen of the twenty dams were pump diversion schemes. This initial phase of work is documented in the Finding Report dated December, 2007 on file with the GSWCC.

In continuing with this initial phase of work, the selected 20 dams were studied in more detail to better define the safe yield and field verify wetland impacts. Each assessment included detailed assessment of yield potential to include pump diversion where applicable, reservoir stage storage information, historical and projected water usage and demand out to 2050, and environmental and infrastructure impacts. Where available, more detailed topographic maps were used to develop reservoir stage/ storage curves, the number of property parcels were identified, and opinion on projects costs were developed. Each of the twenty dams has individual published reports available through the SSWCC.

Following the completion of the twenty detailed dam assessment reports, the SSWCC decided to evaluate in more detailed eight additional dams that were in areas of the State where demand would exceed supply in the near future. The SSWCC, NRCS, and Schnabel reviewed the original selection criteria and decided to expand the distance boundary to acceptable pump diversion locations. Instead of the two mile limitation, the eight additional dams could have a contributing stream within five miles. Additionally, some pre-screening was performed to maximize storage/yield but keep the refill time less then five years, and minimize impacts on structures and roads. By extending the diversion distance to five miles, all eight dams were viable pump diversion candidates. The detailed reports on the eight dams are on file with the SSWCC.

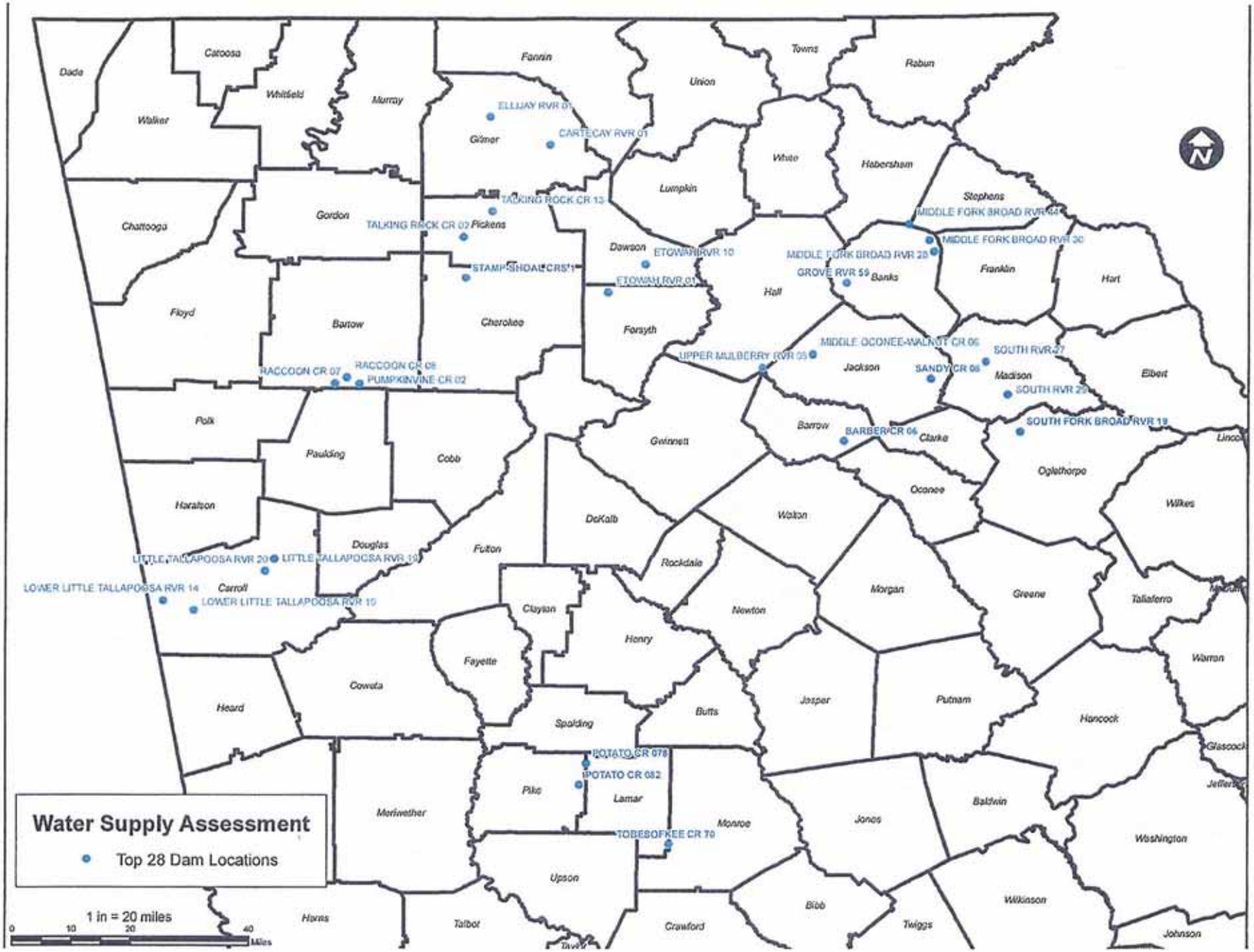
The locations of all 28 dams are shown on Figure 1. A summary of pertinent data for each of the 28 dams are contained in Table 1.

Table 1

Watershed Assessment
Top 20 Dams

	County	Safe Yield (mgd)	Refill Time (years)	Water Supply Storage Area (acres)	Project Costs			
					Dam/Pump Station	Land/Structures	Environmental	Rounded Total
Lower Little Tallapoosa 14 P	Carroll	7.5	4-5	526	$30,449,005	$16,866,400	$32,473,560	$79,789,000
Lower Little Tallapoosa 19 P	Carroll	9.9	4-5	548	$35,346,727	$18,184,000	$28,545,360	$82,076,000
Little Tallapoosa 20 P	Carroll	0.9	0.8	93	$16,259,410	$8,556,000	$25,730,100	$50,546,000
Little Tallapoosa 19 P	Carroll	5.5	4-5	933	$25,112,035	$44,808,000	$81,662,310	$151,582,000
Raccoon Creek 7 P	Bartow	4.1	4-5	343	$21,446,328	$16,176,000	$30,726,270	$68,349,000
Raccoon Creek 8 P	Bartow	11.5	4-5	149	$37,175,729	$7,338,000	$20,341,440	$64,855,000
Pumpkinvine Creek 2 P	Bartow	6.8	4-5	130	$24,732,106	$7,052,220	$24,044,970	$55,829,000
Ellijay River 1 P	Gilmer	9.6	2	230	$25,888,361	$11,875,500	$46,199,580	$83,963,000
Cartecay River 1 P	Gilmer	8.6	2	181	$26,132,116	$8,025,000	$22,103,820	$56,261,000
Talking Rock Creek 2	Pickens	1.0	4	124	$10,116,292	$5,444,000	$18,743,970	$34,304,000
Talking Rock Creek 13	Pickens	2.3	5	173	$24,518,911	$5,908,000	$22,005,030	$52,432,000
Etowah River 10 P	Dawson	17.8	4-5	516	$46,229,646	$25,765,000	$37,341,360	$109,336,000
Etowah River 1 P	Forsyth	24.3	4-5	663	$37,396,661	$89,102,500	$56,184,420	$182,684,000
Upper Mulberry River 8 P	Hall	2.6	4-5	193	$27,657,963	$26,215,000	$26,755,410	$80,628,000
Middle Oconee – Walnut Creek 6 P	Jackson	3.0	4-5	299	$22,255,785	$9,060,000	$25,114,290	$56,430,000
Middle Fork Broad River 28 P	Banks	8.0	4-5	451	$38,153,027	$13,392,000	$20,623,800	$72,169,000
Middle Fork Broad River 44	Habersham	1.5	2	94	$19,660,752	$4,328,000	$18,063,000	$42,052,000
Middle Fork Broad River 30 P	Banks	3.5	4-5	131	$17,276,708	$4,464,000	$18,860,850	$40,602,000
South River No. 27	Madison	3.9	5.5	992	$31,007,285	$31,596,000	$71,429,640	$134,033,000
South River No. 29	Madison	5.7	5.5	1410	$28,587,835	$48,192,000	$94,817,940	$171,598,000
Sandy Creek 8 P	Jackson	1.3	4-5	165	$17,535,431	$5,132,000	$26,673,000	$49,340,000
Barber Creek 6 P	Barrow	4.9	4-5	510	$36,963,772	$12,613,600	$40,030,950	$89,608,000
Grove River 59 P	Banks	6.9	4-5	530	$40,711,595	$5,916,000	$53,631,570	$100,259,000
South Fork Broad River 19 P	Oglethorpe	6.6	4-5	730	$40,248,364	$7,927,000	$63,281,340	$111,457,000
Tobesofkee Creek 70 P	Lamar	4.5	3	550	$24,622,561	$5,893,000	$62,697,900	$93,213,000
Potato Creek 78 P	Lamar	2	4-5	310	$16,637,074	$4,625,000	$34,815,510	$56,078,000
Potato Creek 82 P	Lamar	5.1	4-5	490	$29,062,999	$8,698,000	$39,995,640	$77,757,000
Stamp Shoal Creek 1 P	Cherokee	5.6	7	450	$27,823,575	$10,188,000	$52,829,580	$90,841,000

p - designates a pump diversion system
Rounded Total Costs does not include costs for engineering or any contingencies


Water Supply Assessment
Top 28 Dam Locations
1 in = 20 miles
0 10 20 40 Miles
Dade
Walker
Catoosa
Whitfield
Murray
Fannin
Union
Towns
Rabun
Gilmer
Chattooga
Gordon
Pickens
Lumpkin
White
Habersham
Stephens
Floyd
Bartow
Cherokee
Forsyth
Dawson
Hall
Banks
Franklin
Hart
Polk
Paulding
Cobb
Gwinnett
Barrow
Jackson
Clarke
Madison
Elbert
Oglethorpe
Oconee
Walton
Wilkes
Haralson
Douglas
Fulton
DeKalb
Rockdale
Morgan
Greene
Taliaferro
Warren
Carroll
Clayton
Henry
Newton
Heard
Coweta
Fayette
Spalding
Butts
Jasper
Putnam
Hancock
Glascock
Meriwether
Pike
Lamar
Monroe
Jones
Baldwin
Jefferson
Washington
Upson
Bibb
Twiggs
Wilkinson
Johnson
Harris
Talbot
Crawford
ELLIJAY RVR 01
CARTECAY RVR 01
TALKING ROCK CR 13
TALKING ROCK CR 07
STAMP SHOAL CRS 11
ETOWAH RVR 10
ETOWAH RVR 01
MIDDLE FORK BROAD RVR 44
MIDDLE FORK BROAD RVR 30
MIDDLE FORK BROAD RVR 28
GROVE RVR 59
UPPER MULBERRY RVR 05
MIDDLE OCONEE-WALNUT CR 06
SOUTH RVR 27
SANDY CR 06
SOUTH RVR 25
SOUTH FORK BROAD RVR 19
BARBER CR 04
RACCOON CR 07
RACCOON CR 08
PUMPKINVINE CR 02
LITTLE TALLAPOOSA RVR 20
LITTLE TALLAPOOSA RVR 18
LOWER LITTLE TALLAPOOSA RVR 14
LOWER LITTLE TALLAPOOSA RVR 10
POTATO CR 078
POTATO CR 082
TOBESOFKEE CR 70

The Georgia Water Coalition's Essential Steps to Ensure Sustainable Water Supply for Metro Atlanta

- Water must remain a public resource in Georgia, regardless of where we ultimately get additional supply.

- Any water management strategy for metro Atlanta must not deprive downstream communities of the chance for future economic growth and prosperity.

- Water management must be adaptive, based on sound science to ensure water withdrawals are timed and distributed to meet all instream flow and consumptive needs while allowing for uncertainty in the face of droughts, floods, and climate change.

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    - The Georgia Water Coalition is ready to work with state and federal agencies to secure funding necessary to repair aging infrastructure as well as support other aggressive conservation measures.

- The Georgia Water Coalition supports maximizing the use of existing water supply reservoirs, particularly Lake Lanier and Lake Allatoona.

    - The cheapest and most readily available sources of water are Lake Lanier and Lake Allatoona. Both must be controlled in a way that insures healthy downstream flows and minimizes withdrawal needs by maximizing both water conservation and water and energy efficiency.

    - The Georgia Water Coalition is willing to offer whatever assistance is needed to secure an agreement between the Governors or through Congress that assures metro Atlanta the continued use of Lakes Lanier and Allatoona at sustainable withdrawal levels.

- We must explore the feasibility of converting existing reservoirs built for other purposes to serve in part or in full as water supply sources. As part of a comprehensive assessment of these existing sources, quarries should also be explored as potential water storage facilities.

- Until the above options have been fully exhausted, new reservoirs, aquifer storage and recovery, desalinization, and interbasin transfers should not be pursued. All are expensive, time-intensive, and/or untested, and they are potentially detrimental to aquatic ecosystems and downstream users.

- New reservoirs and other supply sources will saddle state and local economies with massive debt in an already difficult economic climate.

- New reservoirs and other supply sources cannot be constructed by the July 2012 deadline set by Judge Magnuson, even in the absence of any downstream or environmental opposition.

- In order to unite all Georgians in a common water management strategy, we must codify the statewide water plan's suggestions for interbasin transfers and reservoirs into statute, so that these suggestions become binding principles that will govern future water supply proposals.

The Georgia Water Coalition

Principles for Sustainable Water Supply

1. Water is, and must remain, a public resource.

2. The existing ban on interbasin transfers within the Metropolitan North Georgia Water Planning District must remain inviolate.

3. Any water management strategy for metro Atlanta must ensure downstream communities of guaranteed instream flows so as not to deprive them of future economic prosperity.

4. Water policy decisions must be based on science and must protect all uses.

5. To meet water needs in the most efficient and cost-effective manner, only three reservoirs are needed: a reauthorized Lake Lanier and Lake Allatoona and a "Hidden Reservoir": the use of aggressive water conservation.

GEORGIA WATER COALITION

November 6, 2009

Georgia Water Contingency Planning Task Force
The Office of the Governor
State of Georgia
203 State Capitol
Atlanta, Georgia 30334

Dear Members of the Georgia Water Contingency Planning Task Force:

The Georgia Water Coalition appreciates the opportunity to participate in the important task of finding a sustainable and cost-effective water supply for metro Atlanta. The Water Coalition is comprised of 168 business, recreational, civic, conservation, and faith-based organizations representing hundreds of thousands of Georgians throughout the state, including numerous individuals and businesses who are reliant on a dependable water supply for Atlanta. We have attached our 2008 report in addition to a list of Water Coalition members. In our 2008 report, you will find a comprehensive set of recommendations that go beyond water conservation and that provide a fuller definition of the Water Coalition's work.

We have compiled for your information and review a list of recommendations for the least-cost alternatives to securing Atlanta's water supply. Each recommendation contains a brief background synopsis for context and includes explicit steps to be taken to realize the goal. Where possible, each recommendation also includes the projected water savings for metro Atlanta in both dollars and gallons of water consumed. As you will see, the prompt and aggressive implementation of water conservation and efficiency measures will more than offset the need for most if not all future water supply reservoirs currently being contemplated for metro Atlanta. This translates into millions of dollars in savings for a state that is already facing a looming budget crisis.

Please contact our members if you would like more information or have any questions. The Georgia Water Coalition stands ready to assist the state in implementing the recommendations that follow and looks forward to moving sustainable water management forward in Georgia.

Sincerely yours,

Georgia Water Coalition

817 West Peachtree Street
Suite 200
Atlanta GA 30308
1.866.88WATER
www.georgiawater.org

Georgia Water Coalition Partners

1.866.88WATER • www.georgiawater.org

Altamaha Riverkeeper
American Fisheries Society - Georgia Chapter
American Rivers
American Whitewater
Anthony W. Park & Associates, LLC
Apalachicola Riverkeeper
Appalachian Education and Rec Services – Len Foole Hike Inn
Athens Grow Green Coalition
Athens Land Trust
Atlanta Audubon Society
Atlanta WAND (Women's Action for New Directions)
Atlanta Water Conservation
Atlanta Whitewater Club
Azalea Park Neighborhood
Bear Creek Bass Club
Benjamin E. Mays Center, Inc.
Berkeley Lake Homeowners Association
Bike Athens
Blue Heron Nature Preserve
Broad River Outpost
Broad River Watershed Association
Burnt Fork Watershed Alliance
Camden County Land Trust
CCR Environmental
Center for a Sustainable Coast
Central Savannah River Land Trust
Chattahoochee Hill Country Alliance
Chattahoochee Nature Center
Chattahoochee River Watch
Chattooga Conservancy
Cherokee Homeowners
Citizens for Clean Air and Water
Citizens for Environmental Justice
Clean Coast
Clear Rivers Chorus
Coastal Environmental Organization of Georgia
Coosa River Basin Initiative
Coosawattee Watershed Alliance
Creative Earth
DeKalb County Soil & Water Conservation District
Earthkeepers & Company
East Atlanta Community Association
Eco-Scrub Carpet & Floor Care
Ens & Outs, Unitarian Universalist Congregation of Atlanta
Environment Georgia
Environmental Community Action Inc. (ECO-Action)
Environmental Defense Fund, Southeast Regional Office
Flint Riverkeeper
Foundation for Global Community, Atlanta Chapter
Friends of Barber Creek
Friends of Georgia, Inc
Friends of McIntosh Reserve
Friends of the Apalachee
Friends of the Chattahoochee
Friends of the Savannah River Basin
Garden Club of Georgia, Inc.
Georgia Bass Chapter Federation
Georgia Canoeing Association, Inc.
Georgia Coalition for the People's Agenda
Georgia Coalition of Black Women
Georgia Conservancy
Georgia Conservation Voters
Georgia Erosion Control Center (GECC)
Georgia Forest Watch
Georgia Interfaith Power and Light
Georgia Green Industry Association
Georgia Kayak Fishing
Georgia Kids Against Pollution
Georgia Lakes Society
Georgia Land Trust
Georgia Onsite Wastewater Association
Georgia Organics
Georgia Poultry Justice Alliance
Georgia River Fishing
Georgia River Network
Georgia River Survey
Georgia Rural Urban Summit
Georgia Wildlife Federation
Glynn Environmental Coalition
GreenLaw
Hiwassee River Watershed Coalition
Hotlanta Adventures
Hydro Management Systems
IMPACT
Interface, Inc
Intrenchment Creek Coalition
Jackson Lake Homeowners Association
Jett Ferry Manor Homeowners Association
Junior Bass Busters
Keller Williams Realty, Lanier Partners
Knottalotta Entertainment
Krull and Company
LaGrange Boaters, Anglers, Campers Association
Lake Allatoona Preservation Authority
Lake Blackshear Watershed Association
Lake Hartwell Association
Lake Homeowners Alliance
Lake Lanier Association
Lake Oconee Property Owners' Association
Lake Oconee Water Watch
Lake Yonah Association
League of Women Voters of Georgia
Little Tennessee Watershed Association
Long Island Creek Watershed Preservation Assn
Lula Lake Land Trust
Lumpkin Coalition
MBD Water Solutions
Melaver, Inc
Middle Chattahoochee River Stewards
Middle Georgia Advisory Group
Minds Eye Scenic Arts
Mountain Park Watershed Preservation Society, Inc.
National Wildlife Federation
The Nature Conservancy
Neighborhood Planning Unit - W, Atlanta
Netlink IP Communications
New Echota Rivers Alliance
Nickajack Watershed Alliance
Norris Lake Community Benefits Corporation
North Georgia Trout Online
Nuclear Watch South
Oceana
Oconee River Land Trust
Ogeechee Audubon Society
Ogeechee - Canoochee Riverkeeper
Peavine Watershed Alliance
Presbytery of Greater Atlanta
Pulaski County Ocmulgee Watershed Stewardship Partnership
Rain Harvest Company, Inc.
REP America- Georgia Group
Richmond Hill Garden Club
Ridgeview Neighborhood Civic Association
Satilla Riverwatch Alliance, Inc. & Satilla Riverkeeper
Sautee-Nacoochee Community Association
Savannah-Ogeechee Canal Society, Inc.
Savannah Riverkeeper
Savannah Tree Foundation
Save Lake Oconee's Waters (SLOW)
Save Our Rivers, Inc.
Scenic Georgia, Inc
Sierra Club- Georgia Chapter
Small Carpenters at Large
Solomon's Minds
Soque River Watershed Association
South Atlantans for Neighborhood Development
Southeastern Natural Sciences Academy
Southern Alliance for Clean Energy
Southern Environmental Law Center
Southface
SouthWings: Conservation through Aviation
Spring Creek Watershed Partnership
Sustainable Business Partners
Tallulah River Watershed Protection Committee
The Wilderness Society
Trout Unlimited - Georgia Council
Turner Environmental Law Clinic
Unicoi Outfitters
United Nations Association - Atlanta Chapter
Upper Chattahoochee Riverkeeper
Upper Oconee Watershed Network
Upper Tallapoosa Watershed Group
US Green Building Council - Atlanta Chapter
US Green Building Council - Savannah Chapter
Vegetarian Solutions
West Atlanta Watershed Alliance
West Point Lake Advisory Council
West Point Lake Coalition
World Wildlife Fund

GEORGIA WATER COALITION

GWC Recommendations to the Governor's Water Contingency Planning Task Force for Aggressive Water Conservation & Efficiency

November 6, 2009

CONTENTS:

INTRODUCTION:

Below we have compiled a list of recommendations for the least-cost alternatives to securing Atlanta's water supply for the Governor's Water Contingency Planning Task Force. Each recommendation contains a brief background synopsis for context and includes explicit steps to be taken to realize the goal. Where possible, each recommendation also includes the projected water savings for metro Atlanta in both dollars and gallons of water consumed.

Proven Water Efficiency Measures	Potential Water Savings (mgd)
Reduced leakage	59
Water Pricing	79
Metering	9
Retrofit with efficient fixtures	54
Landscaping	13
Other (e.g. energy efficiency, green infrastructure)	?
Total	**214**

As you will see, the prompt and aggressive implementation of water conservation and efficiency measures will more than offset the need for most if not all future water supply reservoirs currently being contemplated for metro Atlanta. This translates into millions of dollars in savings for a state that is already facing a looming budget crisis.

PROVEN WATER EFFICIENCY MEASURES COULD YIELD UP TO 214 MILLIONS OF GALLONS A DAY (MGD), A 33% SAVINGS.

Background:

- As outlined in this document, the total water saved through water conservation and efficiency could make up for all the permitted water withdrawals from Lake Lanier which currently provides 178 million gallons per day (mgd) to metro Atlanta.[1]
- Metro Atlanta could save up to $700 million by pursuing water efficiency to secure water supply as compared to building new dams.
- In addition, the Alliance for Water Efficiency (AWE) recently published a position paper with three major economic findings that are striking, including:
  (1) economic output ranges between $2.5 and $2.8 million per million dollars directly invested in water efficiency;
  (2) gross domestic product (GDP) benefits range between $1.3 and $1.5 million per million dollars directly invested in water efficiency; and
  (3) employment potential ranges between 15 and 22 jobs per million dollars directly invested in water efficiency.
- Metro Atlanta's Metropolitan North Georgia Water Planning District could eliminate the need for all six of its planned reservoirs (totaling 108.4 mgd) nearly two times over through aggressive water efficiency and conservation.
- This water savings could ensure enough clean water for ecological protection instream and for our neighbors downstream.

Resources:

- American Rivers: Hidden Reservoir: Why Water Efficiency is the Best Solution for the Southeast. October 2008.
- Alliance for Water Efficiency "Transforming Water: Water Efficiency as Stimulus and Long-Term Investment" Position Paper, December 4, 2008.
- Metropolitan North Georgia Water Planning District's 2003 and 2009 Water Supply and Water Conservation Plans, www.northgeorgiawater.org.

REDUCING THE WATER LOSS THROUGH LEAKS IN WATER DISTRIBUTION PIPES CAN SAVE FROM 29 TO 59 MILLION GALLONS PER DAY (MGD) IN METRO ATLANTA.

Background:

- Water loss and leak detection and abatement programs should be adopted by all utilities to reduce leaks to as close to zero percent as possible because 117 million gallons is currently lost daily from the system.
- Fixing leaks saves water and helps a utility's bottom line by eliminating the need to treat and pump wasted water that they are not paid for producing.

Recommendations:

- The Georgia Environmental Facilities Authority (GEFA) should continue to prioritize projects that fix leaks and secure cost-effective water efficiency savings in the Clean Water State Revolving Fund (SRF) and Drinking Water SRF programs.
- All utilities should use the American Water Works Association (AWWA)/ International Water Authority (IWA) water balance approach to track water consumption. This is the first step for a utility to understand where its water goes and how to address unaccounted for water, including leaks.

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[1] *See* the Metropolitan North Georgia Water Planning District's 2003 Water Supply and Water Conservation Plan at www.northgeorgiawater.org.

- All utilities should undergo a system-wide water audit every five years to assess progress with respect to progress on the AWWA/IWA water balance approach. More complex system audits may involve a more detailed investigation into actual policies and practices of the utility. Several areas should be reviewed including:
  1) proper metering of all authorized water uses;
  2) development of better estimates of water use by the fire department; for line flushing; for street cleaning; and during water main breaks;
  3) appropriate meter testing and main line maintenance, repair and replacement procedures; and
  4) leak detection programs. Leak detection programs can range from simply detecting in-home leaks, such as toilet or sprinkler system leaks, to the use of more sophisticated leak detection equipment, such as mechanical or electronic sound intensifying instruments that "hear" water escaping from the water system.

Resources:
- American Water Works Association's, M36 Manual: Water Audits and Leak Detection.

PRICING WATER RIGHT CAN SAVE ANYWHERE FROM 54 TO 79 MGD IN METRO ATLANTA.

Background:
- Water is not priced at its true value; in fact, some utilities even incentivize water waste. However, we could actually see up to a 22% decrease in consumption through meaningful conservation pricing.
- Conservation pricing 1) provides water at low prices for basic and essential needs, so all customers can afford it; 2) rewards conserving customers with lower rates for water; 3) encourages efficient use by sending a strong price signal; 4) assigns water supply and development costs proportionately to those customers placing the highest burden on the supply system and the natural supply sources; 5) provides a revenue source that can be used for other water conservation programs; 6) stretches existing water supplies farther to avoid much of the cost, delay, and controversy resulting from large new water development projects; and 7) can do all of the above, while still maintaining a stable flow of revenue to the utility.
- Although conservation pricing is required and exists in some form throughout most of the 15- county Metropolitan North Georgia Water Planning District, the Metro District still needs to ensure conservation pricing actually sends a price signal and applies to all uses. There is a lack of consistency in prices across the Metro District, and we see a large range of costs for the same volume of water. For example, some utilities charge as little as $4.00 for 3,000 gallons of water for residential customers while other utilities charge as high as $18.00 for the same volume. For 6,000 gallons, the minimum charge is $5.00 and the maximum is $35.00, and for 12,000 gallons the minimum is $10.00 and the maximum is $110.00.[2] Given the wide variation of costs for each additional tier and that decreasing pricing still exists in the Metro District, it is questionable as to whether the conservation pricing program in the Metro District is sending a price signal and therefore will result in the projected 19.8 mgd water savings by 2035.[3]

Recommendations:
- The state should fund technical positions at GEFA that can provide assistance on conservation pricing programs, specifically on rate making and billing programs, to give utilities the protection they need so that their revenue is less vulnerable to decreasing demand.
- The state should fund rate studies and rate making programs (through GEFA's SRF program and other state revenue streams) to implement effective conservation rate structures that require utilities to take the following actions:
  a. Use forward-looking data when establishing revenue requirements (a "future test year"), taking planned usage changes and all program implementation expenses into account (including ratemaking expenses).

[2] *See* the Metropolitan North Georgia Water Planning District's 2008 Water Rate Survey at www.northgeorgiawater.org.
[3] *See* the Metropolitan North Georgia Water Planning District's 2009 Water Supply and Conservation Management Plan at p. 4-5.

b. Conduct a demand analysis based on alternative plausible scenarios to more accurately predict usage after the introduction of water conservation programs.
c. Integrate findings from this demand analysis in a cost-of-service study to establish cost-based rates.
d. Implement a demand response/revenue-adjustment surcharge in order to make periodic (quarterly or otherwise) adjustments to base rates between major rate adjustments.
e. Consider the joint effects of both program-induced and price-induced conservation on usage and revenues.
f. Conduct regular audit and reconciliation procedures to ensure against over-collection of revenues from customers, particularly when adjustment surcharges are used.
g. Communicate the long-term benefits of conservation to water system customers and clearly explain the role of cost-based rates in achieving efficiency goals.
h. Avoid postponing necessary rate increases and practice gradualism in ratemaking to reduce "rate shock."
i. Evaluate revenue requirements on an annual basis to ensure that costs and rates are properly aligned.
j. Explicitly incorporate a degree of revenue uncertainty into the integrated planning and ratemaking processes, and the overall operation of the utility to better understand and manage its effects.
k. Fund long-term conservation programs through long-term financing. Financing water conservation programs must be incorporated through current operating expenses, similar to funding for dam construction.
l. The state should give preference to SRF applicants who have implemented conservation pricing successfully.
m. The state should outlaw decreasing pricing.

Resources:

- Agthe, D.E. and R.B. Billings. 1987. Equity, Price Elasticity, and Household Income under Increasing Block Rates for Water. American Journal of Economics and Sociology, vol. 46, No. 3.
- Alliance for Water Efficiency "Fundamentals of Water Rate Making 2008", AWE Clearinghouse Web Site, Water Rates and Charges, RATE MAKING 101, available at www.allianceforwaterefficiency.org/1Column.aspx?id=710.
- Alliance for Water Efficiency (AWE) Clearinghouse Web Site: Water Rates and Charges; Implementing a Conservation Oriented Rate Structure.
- American Water Works Association (AWWA) industry standards for rate structure designs available at www.awwa.org.
- Chesnutt, W. T. and J.A. Beecheer. 2004. Revenue Effects of Conservation Programs: The Case of Lost Revenue. A & N Technical Services, Inc.
- Environmental Protection Agency (EPA) Region 4, Environmental Finance Center Memo: "Water Price Signals in Georgia", November 28th, 2007 and http://www.efc.unc.edu/RatesDashboards/ga.htm
- Environmental Protection Agency's (EPA) guide "Setting Small Drinking Water System Rates for a Sustainable Future: One of the Simple Tools for Effective Performance (STEP) Guide Series", Office of Water, January 2006.
- Environmental Protection Division's (EPD) guidance document "Conservation-Oriented Rate Structures", developed by the GA EPD to support the "Coastal Georgia Water and Wastewater Permitting Plan for the Managing Salt Water Intrusion" dated August 2007.
- Olmstead, S.M. and R.N. Stavins. 2007. Managing Water Demand: Price v. Non-price Conservation Programs, Pioneer Institute White Paper, No. 39.

METERING ALL WATER USERS CAN SAVE FROM 6 TO 9 MGD IN METRO ATLANTA.

Background:

- Metering all water uses is critical to measuring water consumption. Accurate consumption measurement is influenced by the type and size of the meter as well as an appropriate testing and maintenance schedule.

- Individual metering of multiple dwelling unit buildings and businesses (also known as submetering) encourages accountability and allows individual customers to assess and modify their water usage. Submetering reduces risk and costs for the building or business owner by making the individual water consumers accountable for their use. Submetering new properties (through legislation or building code) can yield a 15% water savings.
- Water meters can also provide useful information for the management of irrigated landscapes, which constitute approximately 50% of municipal water use. When both landscape and domestic use are measured through the same meter, it is difficult to determine the consumption attributable to each category. Separate metering of landscape and domestic use provides new opportunities to identify and implement targeted practices to encourage more efficient water use in both categories.
- Submetering is cost-effective. For example, submetering new multi-unit properties (assuming 100 individual units) may have a capital cost of roughly $675.00 per unit but yield $3,428.00 per unit in annual savings, for a benefit/cost ratio of 5.1. In fact, once battery replacement and other maintenance costs are factored in over a twenty year period, the benefit/cost ratio may range from 3.1 to 5.1. Retrofitting existing multi-unit properties (again, assuming 100 units) will cost more, depending on the efficiency of the existing plumbing and fixtures, but the benefit/cost ratio is still in the range of 3.1-4.0 and any recurring costs can be covered thru an administration fee.[4]

Recommendations:
- Require new multi-family or multi-unit properties to submeter either through legislation or building codes.
- Require utilities to bill customers on a monthly basis to provide customers with timely consumption information.
- Provide financial incentives for meter technology that uses remote displays so that customers can calculate their consumption instantaneously.
- Provide financial incentives, such as rebates, to submeter existing residential and commercial buildings.

Resources:
- American Water Works Association (AWWA) Manual M22, "Sizing Water Service Lines and Meters." Produced by the Customer Metering Practices Committee of the AWWA.
- American Water Works Association (AWWA) "Water Distribution Operator Training Handbook" (2nd Ed.).
- Koplow, D. and Lownie, A. 1999. Submetering, RUBS, and Water Conservation. Prepared for the National Apartment Association (Alexandria, VA) and National Multi Housing Council (Washington, DC).
- Mayer, P. et al. 2004. National Multiple Family Submetering and Allocation Billing Program Study.

RETROFITTING ALL BUILDINGS WITH WATER EFFICIENT FIXTURES CAN SAVE 36 TO 55 MGD IN METRO ATLANTA.

Background:
- Up to 35% decrease in water use is possible through retrofits alone.[5]
- Metro Atlanta communities consume, on average, 69 gallons per capita per day (gpcd) for indoor water use. A conserving household consumes 45.2 gpcd for indoor water use.[6] Compare Brisbane, Australia which consumes 36 gpcd for indoor water use with the same high quality of life as metro Atlanta.

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[4] *See* Table 6.2 Cost and benefit per unit analysis for owners who chose to submeter at p. 189. P.W. Mayer et al. 2004. National Multiple Family Submetering and Allocation Billing Program Study. Study sponsored by Environmental Protection Agency, National Apartment Association, National Multi Housing Council, City of Austin, City of Phoenix, City of Portland, City of Tucson, Denver Water Department, East Bay Municipal Utility District, San Antonio Water System, San Diego County Water Authority, Seattle Public Utilities, and Southern Nevada Water Authority.

[5] *See* American Rivers: Hidden Reservoir: Why Water Efficiency is the Best Solution for the Southeast.

- New York City completed the world's largest toilet replacement program during 1994-1997 resulting in 70-90 mgd of savings through the replacement of 1.3 million toilets. The program saved NYC over $200 million by deferring expansion of supply and wastewater infrastructure. By analogy, Metro Atlanta has more than 800,000 outdated toilets,[7] which if replaced would yield 43-55 mgd of savings.
- Retrofitting building infrastructure through incentives such as rebates/tax holidays and through ordinances such as retrofit on resale/reconnect generates proven, reliable and significant water savings.

Recommendations:

- The Georgia Environmental Facilities Authority (GEFA) should continue to prioritize projects that support the retrofitting of inefficient plumbing fixtures through the Clean Water State Revolving Fund (SRF) and Drinking Water SRF programs.
- Provide incentives for water- and energy-efficient appliances (e.g., ENERGY STAR and WaterSense) including clothes washers, dishwashers, refrigerators, air conditioners, ceiling fans, dehumidifiers, programmable thermostats, windows, doors, fluorescent light bulbs, bathroom faucets, and high-efficiency toilets. Extend the current ENERGY STAR/WaterSense sales tax holiday for the entire month of October or add a weekend during the spring months. Costs for toilet rebate programs in Georgia per 1,000 gallons saved range from $0.42 to $1.74.[8]
- Require retrofit on resale/reconnect. DeKalb County has ordinances in place for both residential and commercial buildings.[9]
- Require utilities to offer a pre-rinse spray valve rebate program for restaurants (currently only an education program is required in the Metro District).[10] Costs for pre-rinse spray valve rebate programs in Georgia per 1,000 gallons saved range from $0.14 to $29.07.[11]
- Require utilities to establish both residential and coin-operated clothes washer and dishwasher rebate programs for the purchase of water- and energy-efficient clothes and dish washers.

Resources:

- Food Services Technology Center: www.fishnick.com.
- SBW Consulting, Inc. May 3, 2004. Report No. 040 "Evaluation, Measurement, and Verification Report for the CUWCC Pre-Rinse Spray Head Distribution Program. Submitted to the California Urban Water Conservation Council by SBW CONSULTING, INC. Bellevue, WA in conjunction with ASW Engineering Management Consultants.
- Environmental Protection Division's (EPD) Conserve Water Georgia Website: www.conservewatergeorgia.net

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[6] *See* the Metropolitan North Georgia Water Planning District's May 2009 Water Supply and Water Conservation Plan at www.northgeorgiawater.org. *See* also Vickers, A. 2001. Handbook of water use and conservation: homes, landscapes, businesses, industries, farms. Waterplow Press.

[7] This figure is based on the Metro District's assumption that more than 1.15 million homes were built before 1993, and since then, residents have replaced toilets at a "natural" replacement rate of 2% each year. Doing the calculation, you get more than 818,000 homes remaining to date. *See* the Metro District's 2007 Data Assessment of Pre-1993 Plumbing Fixtures.

[8] *See* Skeens, Brian. October 2007. Georgia Water Use and Conservation Profiles TM 3 – Water Conservation. CH2MHill Project No. 336822.WU.WC.

[9] *See* www.dekalbwatershed.com for more information.

[10] In Arizona, Project WET and the Abbott Fund partnered together to offer a water and money saving opportunity through the installation of high efficiency pre-rinse spray valves at Casa Grande commercial kitchens at no cost to the businesses. Businesses can expect to save up to 65 percent on their water bills alone. The Metro District estimated that a restaurant could save 30,492 gallons annually and $500-$600 of savings annually due to reduced water and wastewater, gas water heating, and electric water heating costs.

[11] *See* Skeens, Brian. October 2007. Georgia Water Use and Conservation Profiles TM 3 – Water Conservation. CH2MHill Project No. 336822.WU.WC.

LANDSCAPING TO MINIMIZE WATER WASTE CAN SAVE FROM 8 TO 13 MGD.

Background:

- On average, 30% of household drinking water is used to water lawns, tree, and shrubs. Of this water, 50% on average is wasted.[12]
- At least 25% savings is possible through proven outdoor water use programs.[13]
- The peaks in demand generated by outdoor water use drive the need to develop new water sources and expand water infrastructure. By reducing the peak, we extend the life of existing water infrastructure and can eliminate the need for new sources.
- Los Angeles plans to meet all new demand for water, equaling 32.6 billion gallons of water, via a combination of water conservation and water recycling. By 2019, half of all new demand will be filled by a six-fold increase in recycled water supplies, and by 2030, the other half will be met through ramped-up conservation efforts. Under the City's existing water conservation ordinance, it is illegal to:
  - Water using sprinklers on any day other than Monday and Thursday.
  - Water landscaping – including lawns - between the hours of 9 a.m. and 4 p.m.
  - Use water on any hard surfaces such as sidewalks, walkways, driveways or parking areas.
  - Allow runoff onto streets and gutters from excessive watering.
  - Allow leaks from any pipe or fixture to go unrepaired.
  - Wash vehicles without using a hose with a shut-off nozzle.
  - Serve water to customers in restaurants unless requested.

Recommendations:

- Institute a permanent, year-round ban on outdoor watering during the daytime (10:00 am – 4:00 pm). This is a common-sense way to manage water use, since most of the water applied to landscapes during these hours is lost to evaporation. Provide incentives that promote decentralized infrastructure such as cisterns and rain barrels to harvest rainfall and ensure outdoor spaces rely primarily on precipitation for irrigation.
- Require rain sensor shut-off devices throughout state (now required solely in the Metro District). Costs for rain sensor shut-off device programs in Georgia per 1,000 gallons saved range from $0.00 to $1.70.[14]
- Require that existing inefficient landscape irrigation systems be retrofitted in the Metro District.
- Incentivize drought-tolerant landscaping through regulatory and financial incentives. Texas passed House Bill 643 in 2003, which prohibits the creation or enforcement of certain restrictive covenants that undermine water conservation by promoting water-wasting landscapes. Florida has allowed residents in areas governed by homeowners associations to install drought-tolerant landscaping by statute since 2002. Los Angeles has a residential drought-resistant landscape incentive program which rebates a residential owner $1.00 per square foot of landscape.
- Establish a rebate program for Evapotranspiration (ET) Irrigation Controller Rebate/Direct Install Programs targeted at large landscapes and high water use customers.
- Incentivize programs that encourage all seven principles of Xeriscape.
  a. Planning and design for water conservation and beauty from the start
  b. Create practical turf areas of manageable sizes, shapes and appropriate grasses.
  c. Select low water requiring plants and group plants of similar water needs together and experiment to determine how much and how often to water the plants.
  d. Use soil amendments like compost or manure as needed by the site and the type of plants used.
  e. Use mulches such as woodchips, to reduce evaporation and to keep the soil cool.
  f. Irrigate efficiently - with properly designed systems (including hose-end equipment) and by applying the right amount of water at the right time.
  g. Maintain the landscape properly – by mowing, weeding, pruning and fertilizing properly.
  h. Irrigation schedule design and education.

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[12] *See* American Rivers: Hidden Reservoir: Why Water Efficiency is the Best Solution for the Southeast.
[13] *Ibid.*
[14] *See* Skeens, Brian. October 2007. Georgia Water Use and Conservation Profiles TM 3 – Water Conservation. CH2MHill Project No. 336822.WU.WC.

Resources:

- Vickers, 2001, Handbook of Water Use and Conservation. WaterPlow Press, Amherst, MA.
- Wade, Gary, L., Midcap, T., Coder, K., Landry, G., Tyson, A., Weatherly, N. Jr. May 2007. A guide to developing a water-wise landscape. Cooperative Extension, The University of Georgia's College of Agricultural and Environmental Sciences. www.marex.uga.edu/advisory/Library/CSCPpdfs/Xeriscape.pdf

INCREASE PUBLIC UNDERSTANDING

Background:

- Consumers who overwater lawns or do not recognize a leaking fixture as water waste usually need outreach and education. When a water use violation is reported, public outreach and education materials should be provided to the consumer. Explaining the importance of water conservation may be all that is necessary to change behavior. However, fines, reductions in service, or cessation of service may be necessary to deter repeat violators. One example of a reduction in service is to install a flow restrictor on the pipeline from the meter to the house or irrigation system.

Recommendations:

- Require utilities to provide timely reporting of water consumption that is available to the public on the internet.[15]
- Require utility bills to be issued on a monthly basis, provide water consumption data in gallons, include historical water consumption data (year to year, month to month), and provide comparisons to a benchmark for conserving household consumption. Georgia Power (http://www.opower.com/) has developed similar billing for home energy use and is currently working with the Georgia Water Wise Council on a water application.[16]
- Require that all governments pass a model "water waste" ordinance. Enforcement of water waste prohibitions is one of the most direct means a utility can use to change wasteful behavior. The City of Roswell has such an ordinance in place.[17]

Resources:

- Gaudin, S. 2006. Effect of price information on residential water demand, Applied Economics, 38, 383-393.

ENSURE POLICIES ARE IN PLACE TO FACILITATE IMPLEMENTATION OF WATER CONSERVATION PRACTICES.

Background:

- Although there are many local jurisdictions that are working hard to save water, there are often hurdles to ensuring that the most aggressive water conservation policies can move forward. There must be a comprehensive look at how to ensure that regulatory and financial support is in place so that the significant opportunity for water savings in metro Atlanta can be met.
- One of the primary causes of water loss in an area is the presence of impervious surfaces that prevent water from soaking into the ground and remaining available for maintaining healthy landscapes.

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[15] *See* NC example of weekly reporting: http://www.ncwater.org/Drought_Monitoring/reduction/weeklyreport.php).

[16] *See* http://latimesblogs.latimes.com/greenspace/2009/10/california-embraces-psychology-of-influence-to-reduce-energy-use.html. Contact Alex Laskey at OPower for more information (859-319-0604).

[17] *See* www.roswellgov.com/index.aspx?NID=658.

American Rivers found the groundwater annual infiltration "losses" in Atlanta to be 56.9 billion to 132.8 billion gallons due to impervious surfaces added from 1982-1997.

- From 1992-2001, Metro Atlanta lost as much as 54 acres of tree canopy to hard surfaces per day.[18]
- The current state water withdrawal permitting program only authorizes regulation of withdrawals of 100,000 gallons per day or more. This means that a substantial volume of water is unregulated and therefore more difficult to monitor with respect to the effects of conservation and efficiency measures.

Recommendations:

- Change the water withdrawal permitting threshold to less than 100,000 gallons per day.
- Implement the state's Water Conservation Implementation Plan with particular focus on the sixth foundational water goal to "integrate water and energy conservation" and the seventh goal to "secure funding to implement water conservation."
- Allow House Bill 1281 to sunset to restore local governments' ability to set locally-based water conservation policies if needed.
- Provide tax incentives and funding mechanisms for increasing and enhancing green infrastructure including the protection and restoration of wetlands, riparian buffers, flood plains, green space and the replacement of impervious surfaces with pervious surfaces.
- Provide technical assistance to utilities to identify the most relevant and cost effective water efficiency measures and programs to implement. This could be done through a state initiative by EPD or GEFA who could then license AWE's Water Conservation Tracking Tool for example.[19]
- Change state plumbing code or pass legislation to require true High Efficiency Toilets (HET-1.28 gpf) for new construction. Currently, the Metro District classifies 1.6 gpf as efficient, which is weaker than the national EPA WaterSense standard.[20] California and Texas both have examples of legislation that require HET phase-in to be completed by 2014.
- Prohibit the use of multiple showerheads and shower tower systems that are wasteful and designed to evade current regulations and efficiency codes. Multiple showerheads and shower towers can waste up to 21 gallons per minute; the national standard for a single showerhead is 2.5 gallons per minute. Instead, provide tax incentives for the installation of efficient (i.e., WaterSense) shower models.[21]
- Require industrial and commercial facilities to use performance-based contracts for the operation of cooling tower and boiler acquisitions within 24 months. Cooling towers and boilers are two of the largest energy and water using-processes.[22]
- Encourage energy efficiency in addition to water efficiency. In Georgia, half of all surface water goes to generate thermoelectric power, and it takes roughly one gallon of water to generate one kilowatt hour, so saving energy saves water.[23]
- Provide financial incentives for commercial and industrial users. For example, Los Angeles provides rebates for the following:
  - Cooling Tower pH/Conductivity Controller for $3,000.00.
  - Cooling Tower Conductivity Controller for $625.00.
  - High Efficiency Commercial Clothes Washer (coin and card operated) for $430.00.
  - Air-Cooled Ice Machine for $300.00.
  - Steam Sterilizer Retrofit for $2,300.00 per device.
  - Connectionless Food Steamer for $600.00 per compartment
  - Dry Vacuum Pump - (max 2.0 HP) for $125.00.

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[18] *See* http://www.ucriverkeeper.org/greenscapes-to-hardscapes.php.

[19] *See* Alliance for Water Efficiency. http://www.allianceforwaterefficiency.org/Tracking-Tool.aspx.

[20] *See* www.epa.gov/WaterSense/specs/het_spec.htm.

[21] For more information go to www.Allianceforwaterefficiency.org and www.epa.gov/WaterSense/pp/showerheads.htm.

[22] *See* Georgia's Environmental Protection Division's (EPD) Water Conservation and Implementation Plan (WCIP). May 2009. http://www.conservewatergeorgia.net/documents/wcip.html.

[23] *See* World Resources Institute. 2009. Southeast Energy Opportunities: Water and Watts, available at http://pdf.wri.org/southeast_water_and_watts_ga.pdf.

Resources:

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- East Bay Municipal Utility District. 2008. Watersmart Guidebook: A Water-Use Efficiency Plan-Review Guide for New Businesses. E-mail: rharris@ebmud.com.
- Upper Chattahoochee Riverkeeper. 2007. From Greenscapes to Hardscapes: A Study of Tree Canopy and Impervious Surface Change in the Metro Atlanta Area. A joint project of UCR and the University of Georgia.
- World Resources Institute. 2009. Southeast Energy Opportunities: Water and Watts.

ADDITIONAL SOURCES:

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- American Rivers: Hidden Reservoir: Why Water Efficiency is the Best Solution for the Southeast.
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Department of Water Resources

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678.376.6700
www.gwinnettcounty.com

gwinnettcounty

MEMORANDUM

THRU: Lynn Smarr, Acting Director
Gwinnett County Water Resources

TO: Georgia Water Contingency Planning Task Force

FROM: Frank Stephens for James H Scarbrough
Gwinnett County Water Resources

SUBJECT: Potential Water Supply Augmentation Ideas for Task Force Consideration

DATE: October 14, 2009

Please find attached some ideas for the Georgia Water Contingency Planning Task Force's consideration from Gwinnett Water Resources. Please contact me if you have questions. Should I be unavailable, contact Mr. Jim Scarbrough 678-376-7154 or Ms. Lynn Smarr at 678-376-7134.

C: Chairman Bannister
Glenn Stephens
Lynn Smarr
Jim Scarbrough

Proposals for Consideration by the Georgia Water Contingency Planning Task Force
October 14, 2009

Contact:
Frank Stephens, Gwinnett County Water Resources
frank.stephens @gwinnettcounty.com or 678-376-7133

1. Assemble funding from local governments to dredge silted-in areas of Lake Lanier upon receipt of a federal contract assigning the recovered volume as water supply storage to those who contributed funds. [Not likely, but the recovered storage from dredging Lake Lanier could be non-trivial. Irwin Topper (former Lake Lanier COE manager) has been advocating dredging because he believes the Corps' estimates of accumulated sediment are much lower than reality.]

2. Obtain a commitment from the Corps to raise the top of Lake Lanier's conservation pool to elevation 1073 if studies prove such feasible. Assemble funding from local governments to defray a portion of the cost of the study and to accomplish raising the top of the conservation pool as long as the Congressional action which authorizes raising the conservation pool and assigns a local cost share also authorizes Lake Lanier for water supply.

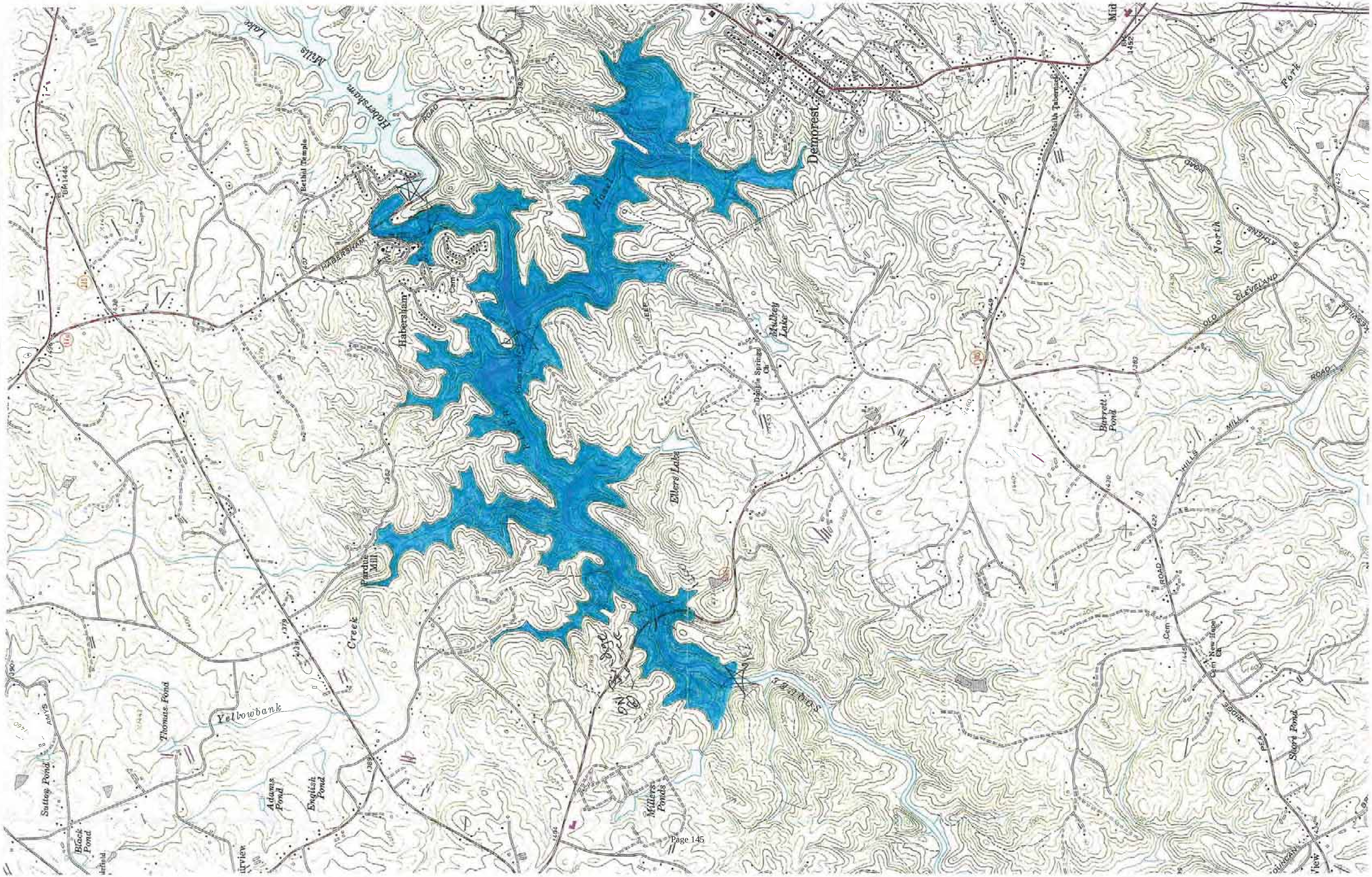
3. Import water into Lake Lanier from other sources (may be interbasin transfer such as harvest flood flows from Yellow River in Gwinnett County) or from down gradient of Buford Dam as long as the Corps allows equivalent amounts in withdrawal. Withdrawals equal to the volume of such imported flows do not rely upon storage and thus do not affect other project purposes. Although neither a storage contract nor hydropower compensation is appropriate for this arrangement, those entities withdrawing the amounts they imported into the lake should pay their prorated share of the lake's O&M costs. This concept does not require a change in existing federal policy regarding return flows as it relates to man-made imports.

4. Join funding and build a desalination plant and a pipeline from the Georgia coast to the Atlanta metro area.

5. Build a desalination plant on the coast of the Florida with a pipeline delivering water to the Apalachicola River (or as far north as Lake Seminole). Operate the plant only intermittently, i.e., only when flows in the lower ACF basin might otherwise be extracted from Lake Lanier, thus preserving Lake Lanier for local uses. For their support of this proposal obtain others' support to authorize Lake Lanier for water supply storage.

6. Create a market whereby irrigation withdrawal permits can be seasonally interrupted or otherwise curtailed under a temporary dry-up covenant and the consumptive use that would result from irrigation would be assigned to the water supply provider under contract with individual growers.

7. Assemble funds from water supply providers to purchase Buford Dam and Lake Lanier.


Habersham Mills Lake
Bethel Temple
HABERSHAM
ROAD
Habersham
Cem
Demorest
Faith Tabernacle
Mid
North Fork
ROAD
ATHENS
OLD CLEVELAND
ROAD
HILLS MILL
Barrett Pond
Mulkey Lake
Ellers Lake
Pardue Mill
Creek
Yellowbank
Thomas Pond
AMYS
Sutton Pond
Black Pond
Adams Pond
English Pond
Millers Ponds
Cem
New Hope Ch
PEA RIDGE
ROAD
Short Pond

Potential Project Description

Data

1. Approximate 720 acre reservoir along Soque River in Habersham County.
2. Approximate 30,000 acre-feet of new water storage capacity.
3. Maximum depth of 80 feet, average depth of 40-50 feet.

Benefits

1. New reservoir would provide much needed community water resources for Habersham County citizens.
2. New storage capacity, stabilizing streams flows into Lake Lanier.
3. Relatively minor existing development along proposed reservoir footprint.
4. Potential new "green" hydroelectric power generation project.

The WaterOptimizer makes the most of water supplies

Designed by water conservation professionals, the WaterOptimizer is a smart system that allows utilities better control over water resource use. It allows home or business owners to use the water they need, but no more.

The WaterOptimizer is designed for use by Regional Water Utilities and individual homeowners to monitor conditions in the water distribution system through custom designed software.

A seamless blend of new and tested technologies ensures that the system works whether someone is home or not.

The WaterOptimizer provides the water that's needed

Every water manager knows that anywhere from 50 – 75 percent of water demand goes to irrigation. In most cases, that's far more than is needed. This use of water for outdoor irrigation combined with an increase of in-ground irrigation systems has led to increased water waste.

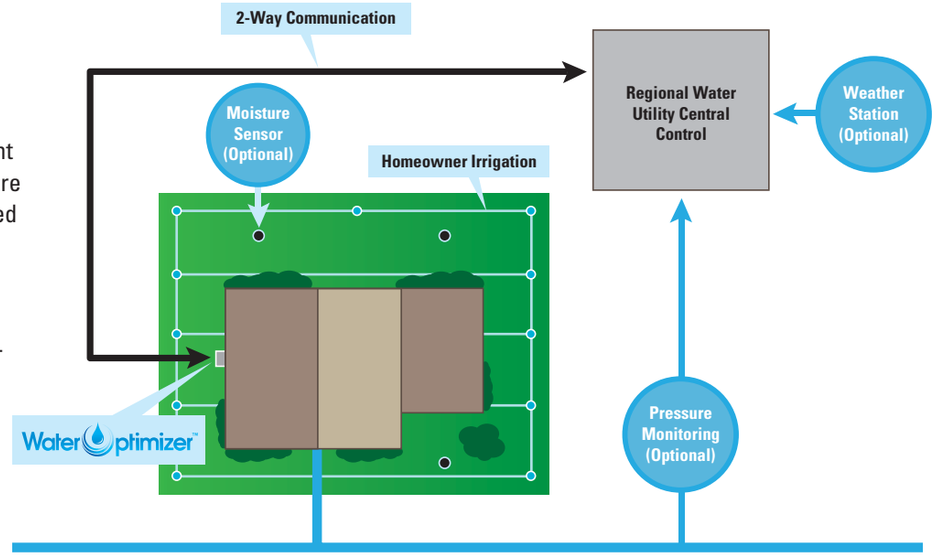
The Water Optimizer system allows homeowners and water managers to work together to provide more responsive, better-focused irrigation to home and business owners, and allows better monitoring of water use by utilities.

The WaterOptimizer provides a real management option

For Water Managers: The WaterOptimizer allows water managers to eliminate peaks and manage community supplies, while it provides users all the water they need for landscape maintenance.

Residents and Businesses: The WaterOptimizer connects to residential or individual irrigation systems, replacing any existing controller. Although connection is voluntary, local water utilities can then manage the system by allowing individual systems to operate, or by re-directing irrigation to times when there is less demand.

Regardless of the user, the WaterOptmizer protects system water pressure, provides the resource where it's needed. When it's not needed, it's saved for another day.



The WaterOptimizer operates in 6 ways

1 **Weather**
As the weather changes, the WaterOptimizer responds. If it's raining, the irrigation system simply will not activate.

2 **Sensor**
Each system has moisture sensors located throughout the property. It's easy to set a moisture level for the zone. When the moisture level is reached, the system moves to the next zone, or simply doesn't activate.

3 **Reclaimed Water (Force-on)**
Beyond conventional systems, the WaterOptimizer can be applied to the reclaimed water system. With the WaterOptimizer, utilities can manage reclaimed water like the valuable resource it is.

4 **Pressure**
The WaterOptimizer monitors pressure in the system. If the system's water pressure is too low, the WaterOptimizer automatically initiates a program to manage irrigation (a nonessential use) so that essential needs are met. Once pressure is restored, the irrigation system will continue where it left off.

5 **Fire Support**
In case of emergency, the fire department can interrupt irrigation to increase water pressure—with a phone call.

6 **Emergencies (optional)**
During emergencies like floods, hurricanes, or tornados, this system has the capability to sound an audible alarm that will alert citizens and improve emergency service response time.

It's OK to irrigate.

WaterOptimizer™ LLC
U.S. & Foreign Patents Pending
www.Water-Optimizer.com

LAKE LANIER ASSOCIATION, INC.
615-F Oak Street • Suite 100
Gainesville, GA 30501
(770) 503-7757
www.lakelanier.org

December 11, 2009

Governor Perdue
Office of the Governor
Georgia State Capitol
Atlanta, GA 30334

Dear Governor Perdue:

The Lake Lanier Association wishes you every success in your upcoming negotiations with Florida and Alabama on December 15. We are writing to plead our case on a single issue in your negotiations.

The disastrous draw-down of Lake Lanier in 2007, during the drought, was exacerbated by the required minimum flow of 5,000 cfs at the Chattahoochee Gauge imposed by the U.S. Army Corps of Engineers and the Fish and Wildlife Service. Had the minimum flow dropped to 4,000 cfs, Georgians would not have been so severely impacted by the drought.

As you know, the Fish and Wildlife Service relied on the wrong Environmental Baseline in its Biological Opinion. This hardened their resistance to any flow below 5,000 cfs, and they have now drawn a line in the sand at that level and are standing on Florida's side.

We ask that you obtain relief from the minimum flow requirement of 5,000 cfs to protect Lake Lanier in the event of another major multi-year drought. Compared to natural flows, the Corps' operations always benefit the protected species that have thrived for millennia when flows certainly dropped below 5,000 cfs.

We realize that Georgia's leverage has been compromised by Judge Magnuson's water supply ruling. However, the required minimum flow is the one factor that, no matter how well water is stored, can lead to another draw down during the next exceptional drought, when other ACF stakeholders will want us to provide augmentation flows. We support sharing reasonably and rationally this valuable resource. But 5,000 cfs (eleven times Atlanta's daily use) is not reasonable in an exceptional drought.

The businesses and taxpayers whose lives and livelihoods depend upon Lake Lanier are firm in their resolve on this issue. The Lake Lanier Association has fully supported the State of Georgia throughout the Tri-State Water Rights Litigation, and we ask for your support on this issue as the negotiations resume. Please do not hesitate to call on us if we can be of assistance.

Thank you in advance for your support.

Val M. Perry, Jr.
Executive Vice-President

cc: Lieutenant Governor Casey Cagle
Senator Saxby Chambliss
Senator Johnny Isakson
Congressman Nathan Deal
Secretary of State Karen Handel
State Senator Lee Hawkins
F. Allen Barnes, Director of EPD, Georgia

CITY OF ATLANTA

55 TRINITY AVENUE S.W.
ATLANTA, GEORGIA 30303
404-330-6100

SHIRLEY FRANKLIN
MAYOR

December 3, 2009

The Honorable Sonny Perdue
Governor
State of Georgia
Governor's Office
203 Georgia State Capitol
Atlanta GA 30334

RE: Water Contingency Planning Task Force – Survey

Dear Governor Perdue:

The City of Atlanta team has reviewed the materials from the second Task Force meeting and the Task Force Survey. I commend the group for assembling the package in such a remarkably short time. Given the importance of this issue to not only the Atlanta Metro Area but the entire State, I believe a letter response is appropriate. These issues are too critical to our current residents and the future of the State to be adequately addressed by the survey. My comments address three major issues: option & project prioritization, costs & cost allocation, and feasibility.

Option & Project Prioritization

The prioritization of options is presented on pages 46-50 of the Powerpoint stack. As the document states, the "initial analysis has focused on economics and impact." The other category that was not the initial focus is Stakeholder/Implementation. Unfortunately, a survey form cannot convey the complexity of the discussions necessary for prioritization. The choice is not whether "solutions should be prioritized first on the basis of minimizing environmental impact, secondly on cost efficiency." The options and projects are multi-faceted, and the evaluation must reflect the complexity.

Costs & Cost Allocation

While the cost estimates are preliminary, they are substantial. What is not discussed are the potential funding sources for the capital projects and the distribution of cost recovery via rate increases to customers. A host of questions arises in this vacuum: Will the State use its bond

rating and fund the projects? Will it form a Metro Area Water Authority to implement projects? Will costs be shared across the region, or will they be localized in specific communities? As you are aware, the $4 billion capital Clean Water Atlanta program has driven the City's water/sewer rates to among the highest in the U.S. There is little flexibility in our bonding capacity to do more.

Feasibility

I understand the extremely short schedule for producing this report. However, I am concerned about basing decisions on this preliminary data. More detailed costing may significantly shift prioritization. The presence of endangered species may well preclude cost-efficient projects. Obtaining Corps of Engineers permits will clearly change the optimistic implementation schedules included in the presentation. These factors will grossly influence the suites of projects listed for the 2015 and 2020 options. For example, it simply isn't possible to design, permit and build 150 miles of tunnels and obtain Corps permits in 4-5 years. Yet this indirect potable reuse option is the largest component in meeting the 2015 shortfall. I believe the analysis is best served if the feasibility of the projects, more accurate costs and realistic schedules are determined. We have stated that projects can't be built by 2012 to close the supply gap. It is also possible that the gap cannot be closed by 2015 or 2020.

I remain concerned that this exercise dilutes the focus on what must be the State's first priority: Congressional authorization of Lake Lanier for drinking water use. I anticipate that the final report will emphasize that priority and the overwhelming financial and environmental costs of other solutions. As you are aware, my term of office concludes on January 4, 2010. I will urge the next Mayor to fully engage in this essential discussion.

Sincerely,

Shirley Franklin
Mayor
City of Atlanta

cc: R. Hunter
Members, Governor's Water Contingency Planning Task Force

Randy Rooks
1244 Heritage Lakes Drive
Mableton, Georgia 30126

Lowe Engineers
ATTN; Tim Lowe
2000 River Edge
Suite 400
Atlanta, Georgia 30328

You agreed to co-chair the Governor's Water Contingency Task Force. I feel I may have part of the answer to the water problem. Last Sunday Big Creek in the Alpharetta area had a flow of 700 cubic feet per second and that produced about 450 million gallons of water that day. The rain was a couple of inches and that seems to be the normal fall during the rain season.

I'm sure you have seen on the news, every time we have a good rain Big Creek tends to over flow and flood. This is caused by hard surfaces such as roads, parking lots and roofs of buildings. The rain water has no place to soak in so, it runs into the streams and creeks. This surge of water tends to erode the creeks banks and cause trees to fall into the water, restricting the flow.

I feel if we could clean up the streams and creeks, removing fallen trees and remove the sedimentation from the bottom of the creeks. This would make them deeper (capable of handling more water) and flowing better.

Due to the urbanization of hard surfaces we need to form large bodies of water such as lakes or ponds for the spike in water flow to run into during heavy rain falls. This would help prevent flooding and could produce a more steady flow of water.

If you look at www.waterdata.usgs.gov/ga/nwis/uv/?site_no=02335700 this is the USGS sight for Big Creek near Alpharetta, just below this meter near Kimball Bridge Road is were it floods. On a map in the area of N Point PKWY and Old Milton PKWY you can see were the creek could be widen to form a long lake. This would stop the flooding and by storing the runoff water metering it from spikes of 700 to a thousand cubic feet per second to a steady flow of 70 cubic feet per second, we would provide Alabama and Florida water they want and maybe this could be a bartering for us to keep using water from our current reservoirs.

I realize Big Creek alone will not provide the water needed but, we have several more creeks like this one. Big Creek provides an average year flow of about 70 cubic feet per second. The flow will go as high as a thousand and as low as eight. When it flows eight cubic feet per second during the non-rain season (that's when our reservoirs are low). We need to capture and manage the water though out our water shed (creeks and streams) to feed our rivers which provide water to our reservoirs. Keep in mind once our reservoirs are at full pool all water flows down steam. These creeks need the clean up and the bill was passed for reservoirs. I read something

about dams on some of these streams are due for rework by The Corp of Engineers. A project like this would cost a great deal of money, for the reason its for Georgia, Alabama and Florida it should fall under Federal? Since its flood related would the FEMA money pay part?
I hope this will be of help to you.

Sincerely Randy Rooks

REGIONAL WATER ENTITY CONCEPT

BACKGROUND

One of the major issues associated with meeting the potential water shortage challenge created by Judge Magnuson's ruling is the efficient and timely access to all available permitted capacity and the re-allocation of this surplus capacity, wherever it might exist.

An associated challenge is the identification of suitable funding sources necessary to enable timely and cost effective implementation of all priority conservation and capture options that will meet not only the short-term goal of filling the potential gap that would arise, should Judge Magnuson's ruling take effect, but also long-term water infrastructure objectives that provide for ongoing community and industry growth across all of Georgia.

PROPOSAL

It is proposed to establish a Regional Water Entity with powers and authorities that could include:

- taking ownership and full control of unused water permits across the Metropolitan North Georgia Water Planning District;
- re-allocating water permits to ensure timely access to all available permitted resources;
- consolidating, by purchasing, the assets of existing water utilities and accept the bonding, financial and operational obligations associated with the ownership and management these enterprises;
- applying legislated mandates that would compel all water utilities to maximize water conservation;
- setting all fixed and variable water supply rates; and
- issuing water bonds to fund future water infrastructure requirements across the Metropolitan North Georgia Water Planning District as required.

OUTCOMES

- one entity to plan, manage, own and deliver water services across the Metropolitan North Georgia Water Planning District;
- immediate access to all surplus permitted capacity for re-allocation to areas of shortfall;
- efficiencies of scale and scope; and
- district-wide bonding capacity is enhanced.

NEXT STEPS

Conduct a feasibility study into the formation of a Regional Water Entity.

Georgia Natural Resource Resolution

Whereas: The State of Georgia is blessed with many natural resources governed by the regions they occupy - the mountains of North Georgia, the beaches and marshlands of Atlantic Coast, and fruitful plains of South Georgia; and

Whereas: The basic desire of all concerned is to continue the State's vibrant growth while continuing to manage its abundant natural resources properly; and

Whereas: The natural resources of the State should remain in the locations originally established by nature, and the water resources should remain in the river basins created by the various collection basins around the state; and

Whereas: Interbasin transfers fundamentally and irreversibly alter the natural flows in our rivers and streams and can harm the long-term prosperity and quality-of-life of the basin of origin, species dependant on specific water flows, and downstream and contributing communities that depend on certain flows for drinking water, recreation, navigation, industry, and economic growth; and

Whereas: Socialization of natural resources and redistribution of natural resource wealth are principles that are not in keeping with the basic principles of this great State and nation and are contrary to our basic beliefs.

Now Therefore, Be It Resolved: The Savannah-Upper Ogeechee Water Planning Council desires that present law by the General Assembly prohibiting Interbasin Water Transfers remain in force and are maintained for perpetuity. This law is necessary to ensure that the water supply across the State of Georgia remain as established by nature, and it remains stable, clean, and available for drinking water, recreation, navigation, industry, and economic growth.

Signed and sealed this 10th *day of* NOVEMBER 2009

Chairman

Vice Chairman

Wilkes County

Lincoln County

Franklin Co.

Stephens County

Banks

Richmond Co

Screven Co

Burke

Rabun Co.

Elbert Co

Elbert

Jackson Co.

Richmond

Madison Co

Jefferson Co

Oglethorpe Co.

HART

McDuffie Co

11/16/09 (DJW)

1. **General themes.**
    a. Water is most important issue facing Georgia over next three years.
    b. Shift thinking from "county centric" model to regional or statewide model.
    c. Take bold steps now to show court and other states Georgia is serious and to assure long term water supply.
2. **Raise Additional Revenue.**
    a. State Surcharge on water bills on per gallon basis - conservation pricing.
    b. Alternatively, convert transportation SPLOST to an infrastructure SPLOST that could be used for water or transportation.
    c. Put $ into GEFA, MNGWD, or authority/agency.
3. **Empower MNGWD or other authority/agency to Act on a Regional Basis**
    a. Empower District to Require Jurisdictions to Share Water (in emergency situation, i.e., if Judge's ruling were to be enforced)
    b. Empower District to require interconnectivity.
    c. How to credit water utilities that have been responsible?
4. **Conservation**
    a. Incentives for conservation and audits.
    b. Implement conservation pricing.
    c. Include farmers.
5. **Reservoirs**
    a. Convert existing reservoirs to regional reservoirs.
    b. Compensate utilities for investments in existing reservoirs.
    c. Build new reservoirs or raise existing reservoirs.
6. **Chattahoochie River – withdraw more water?**
7. **Tennessee River**
    a. Drawing water from TN River and returning waste water to Lanier and Altoona helps FL and AL.
    b. Drawing water from TN River does not hurt TN (2004 TVA study)
    c. Cost –
        i. ARC determined cost acceptable
        ii. Likely to be comparable to costlier reservoirs, but less than more expensive conservation measures.
    d. Legal case is strong.
    e. Force negotiation.
        i. Filing suit will bring TN to the table (they currently refuse to come to the table at all).
        ii. Negotiate a deal involving high speed transit and airport. Use money from #2 above for this purpose.
        iii. Filing suit puts TN at risk of losing some valuable property. Use this to negotiate settlement where Georgia gets water but not property.
    f. Time Delay will Hurt Georgia
        i. TVA's first-come first-serve policy.
        ii. Affirmative duty to FL and AL

iii. Set deadline for taking action.

RESOLUTION

BY THE SUWANEE-SATILLA WATER COUNCIL OF THE STATE OF GEORGIA

FOR THE HONORABLE SONNY PERDUE, GOVERNOR OF STATE OF GEORGIA

Whereas, the state of Georgia is blessed with many natural resources governed by both the State and the regions they occupy – the mountains of North Georgia, the beaches and marshlands of the Atlantic coast, and the fruitful plains of South Georgia; and

Whereas, the basic desire of all concerned is to continue the State's vibrant growth while continuing to manage its abundant natural resources properly; and

Whereas, the resources of the State should remain in the locations originally established by nature, and the water resources should remain in the river basins defined by the various watersheds around the state; and

Whereas, interbasin transfers fundamentally and irreversibly alter the natural flows in our rivers and streams, and can harm the long-term prosperity and quality of life in the basin of origin, species dependent upon specific water flows and quality, and downstream communities and economies that depend upon flows for drinking water, recreation, navigation, agribusiness, industry and economic growth; and

Whereas, artificial redistribution of natural resource wealth is not in keeping with the basic principles of free enterprise;

Now, therefore, we resolve: the Suwannee-Satilla Water Planning Council desires that the Administration through EPD place a moratorium on establishment of any interbasin transfers under current law, inside or outside of the MNGWMD, until the water planning process that we are laboring through, a process authorized by the General Assembly and signed by the Governor in 2008, is complete.

Attest _____

Chairman, Suwannee-Satilla Water Council, State of Georgia

With copies provided to: The Honorable Lt. Governor Casey Cagle

The Honorable House Speaker Glenn Richardson

Commissioner of Natural Resources Chris Clark

Director of EPD Alan Barnes

Members of the Georgia Senate

Members of the Georgia House of Representatives

Irrigation Association
6540 Arlington Boulevard
Falls Church, VA 22042
Tel: 703.536.7080
www.irrigation.org

Smart Water Application Technologies (SWAT) Performance Report

Testing Agency: Center for Irrigation Technology **www.californiawater.org**

Product: WaterOptimizer

Product Type: Climatologically Based Controller

Product Description: Tested in its weather-based mode, the WaterOptimizer adjusts runtimes with an optional wireless radio to a web portal service or local ET data (ex. CIMIS). The controller offers an optional soil moisture sensor-based mode (not tested; SWAT testing not currently available).

SWAT Protocol*: Turf and Landscape Equipment Climatologically Based Controllers 8th Draft Testing Protocol (Sept. 2008)

The concept of climatologically controlling irrigation systems has an extensive history of scientific study and documentation. The objective of this protocol is to evaluate how well current commercial technology has integrated the scientific data into a practical system that meets the agronomic needs of turf and landscape plants. The evaluation is accomplished by creating a virtual landscape subjected to a representative climate to evaluate the ability of individual controllers to adequately and efficiently irrigate that landscape. After initial programming and calibration the controller is expected to perform without further intervention during the test period. Performance results indicate to what degree the controller maintained root zone moistures within an acceptable range. If moisture levels are maintained without deficit, it can be assumed the crop growth and quality will be adequate. If moisture levels are maintained without excess it can be assumed that scheduling is efficient.

***All SWAT protocol may be viewed at www.irrigation.org**

WaterOptimizer SWAT Performance Summary

Irrigation Adequacy	Irrigation Excess
Minimum of 6 test zones: 100% **Maximum of 6 test zones: 100%** **Mean/Average of 6 test zones: 100%** **Irrigation Adequacy** represents how well irrigation met the needs of the plant material. This reflects the percentage of required water for turf or plant material supplied by rainfall and controller-scheduled irrigations. Research suggests that if this value is between 80% and 100%, the acceptable quality of vegetation will be maintained.	**Minimum of 6 test zones: 0%** **Maximum of 6 test zones: 0%** **Mean/Average of 6 test zones: 0%** **Irrigation Excess** represents how much irrigation water was applied beyond the needs of the plant material. This reflects the percentage of water applied in excess of 100% of required water according to data from CIMIS station #84 Browns Valley, Yuba during the test period.

Product Detail Supplied by Manufacturer

WaterOptimizer **www.water-optimizer.com**

Installation	Data Source	Data Link	Initial Purchase	Additional Hardware	Additional Fees
Replace existing controller or install on a new system.	SWAT tested with wireless Internet link to CIMIS weather station #84. Various weather stations or web portal service available.	2-way wireless radio using ZigBee technology	Purchase price includes system to control up to 12 zones	None	Monthly/annual fee for web portal service

Additional Features

Zones	Time of Day	Day of Week	Other	If Data Link is Discontinued
Base controls up to 12 zones, expandable to 48.	Capable of restricting watering during selected time of day.	Capable of restricting watering days by selection or interval.	❑ Modes operate with or without pulse (cycle-soak) ❑ Four automatic programs with up to four start times ❑ Remote over-the-air firmware/program updates ❑ Enclosure designed for indoor or outdoor installations ❑ Sensor-based controller mode included	If ET link is discontinued, it may be used as a standard irrigation controller.

WATER

Comments Submitted to Governor Perdue's Water Contingency Task Force By The Conservation Fund October 22, 2009

"...The conservation of natural resources is the fundamental problem. Unless we solve that problem it will avail us little to solve all others...." President Teddy Roosevelt, *Address to the Deep Waterway Convention, Memphis, Tennessee, October 4, 1907*

Perhaps President Roosevelt described it best over a hundred years ago. For centuries water has been at the center of great struggles and controversies. The water challenges facing the State of Georgia are in some ways no different as diverse jurisdictions are simply committed to meeting the water needs of their constituents and of the natural resources dependent on that water.

Governor Perdue has appropriately and very timely advocated a **Culture of Conservation** in Georgia, particularly through his new Conserve Georgia Program. The Conservation Fund applauds this leadership and commitment to land, water and energy conservation and we feel there is a prominent role for conservation in the planning for sustainable water use in Georgia.

The Conservation Fund is unique among national conservation organizations due to our dual purpose charter of land and water conservation and of economic development. The Conservation Fund understands and is committed to the business of conservation and to the business of economic development. While not an advocacy organization, The Conservation Fund (TCF) appreciates the opportunity to participate on Governor Perdue's Contingency Water Task Force and to offer suggestions for consideration.

We have had an active role in Georgia working in partnership with many others to protect over 83,000 acres of high priority land and water resources throughout the State, both on public lands and on private lands for the benefit and enjoyment of the public. All these public areas are now very popular for public recreational use and for natural resource protection and nearly all properties contain water features or contribute to water protection.

The Conservation Fund also operates the Freshwater Institute in Shepherdstown, West Virginia. The Institute works with government, industry, nonprofits and individuals to shape sustainably, environmentally responsible solutions to water resource management. The work of the Institute is focused on applied science, conservation engineering and training and education.

We feel that effective long-term conservation depends on a prosperous economy. Likewise TCF views planning for an adequate and sustainable water supply in the metropolitan Atlanta area as vital to the well being of the metropolitan Atlanta region and that an adequate dependable supply of water is critical to maintaining that prosperous economy. Likewise, a prosperous economy is vital to the well being of the non-metropolitan Atlanta region of Georgia. The challenges of maintaining a sustainable supply of water are complex as the needs of these two regions of Georgia must be considered and balanced appropriately. Downstream and non-metro Atlanta communities are closely and carefully watching the water planning activities within the metro-Atlanta area to determine what outcomes and impacts will affect their regions. Communities across America are facing similar challenges and many are turning to green infrastructure to address these challenges. We feel similar approaches should be effectively applied here in Georgia.

While considering the charge made to the Governor's Contingency Water Task Force, the primary focus appears to be on the future use of water in Lake Lanier and on meeting the future, increasing demands for water in the metropolitan Atlanta area. Contingency planning at the worst case scenario is one way to consider the water planning challenge. However, consideration of a series of scenarios seems to be a compelling way to prepare for outcomes. Through contact with fellow Task Force members, with a variety of technical resources, and with many diverse constituencies throughout Georgia and elsewhere, The Conservation Fund offers the following suggestions to the Task Force:

1. **Conservation and Water Efficiency**

Step one should be pursuit of a thorough and comprehensive focus on water conservation, water management and increased water efficiency. A study by American Rivers suggests that as many as 210 million gallons per day could be captured though a successful water conservation program implemented in the metro-Atlanta area. While there will likely continue to be debate over water supply and demand numbers for the metro-Atlanta region, this total of 210 million gallons per day seems to go a long way toward satisfying the need for additional water to meet the projected future needs.

A commitment to water conservation and water efficiency in metro-Atlanta demonstrates to all parties the sincere willingness of Georgia to pursue what is right and what is most cost effective first. Others have described this as capturing the "Moral High Ground" and perhaps that is a good description. We feel strongly that the focus should

start there. This is consistent with Governor Perdue's pursuit of creating a **Culture of Conservation** in Georgia.

Also, the implementation of a water conservation program in the metro-Atlanta region will have a profoundly positive economic impact. The jobs created to install and maintain the water efficiency measures suggested below will be extremely high.

How can this be done? Clearly additional analysis will be necessary to define and to fine tune the implementation of the most effective water conservation strategies and techniques necessary to capture the projected 210 million gallons per day. Below are suggested steps to be taken:

Reduce leaks in Metro District distribution systems by upgrading them according to American Water Works Association national standards. It is estimated that this alone could capture as much as 117 million gallons per day.

Establish prices for water usage to encourage efficient use and to reflect actual cost of service and provide funding to enable local governments to conduct the necessary studies to determine appropriate rates.

Meter all individual water uses to measure water consumption.

Retrofit all buildings with water efficient fixtures.

Improve billing for water service to inform users.

Landscape to maximize water efficiency. Current data indicate that as much as 30% of household drinking water is used to water lawns, trees and shrubs.

Provide authority to Metro District local governments to regulate all surface and ground water withdrawals in excess of 1,000 gallons per day during droughts.

Fund a study, and/or provide tax incentives, aimed at encouraging Metro District homes on septic tanks to use gray water for irrigation to reduce consumptive loss of water.

Require GEFA to prioritize use of Clean Water and Drinking Water State Revolving Fund programs in the Metro District to fund projects that eliminate water loss. We also understand that the GEFA State Revolving Funds can be used to fund water efficiency projects such as retrofits and metering and we suggest that GEFA prioritize these opportunities and fund them accordingly.

Provide technical assistance to utilities to identify the most relevant and cost effective water efficiency measures/programs to implement.

Reduce impervious surfaces to minimize stormwater runoff.

It is our understanding that the Alliance for Water Efficiency could be an excellent source of technical support for addressing the water conservation component of meeting the water supply needs. Based in Chicago, the Alliance is a non-profit organization dedicated to the efficient and sustainable use of water. The Alliance has created models for measuring and analyzing water consumption such that their cooperation with metro-Atlanta water utility practitioners could be very valuable. A training session and further discussions about application of the Alliance's principles and models might be very helpful and very valuable for metro-Atlanta.

Further detailed analysis would be necessary to determine the most effective and efficient way to implement these water efficiency measures. Some measures might best be required through statewide or regional legislation while other techniques might best be accomplished by encouraging local incentives. This would need additional study.

While the construction of additional reservoirs is often mentioned as a solution to the water supply needs of metro-Atlanta, the cost of these construction projects are extremely high. Studies indicate that a successful water conservation and water efficiency program could achieve the same results at a cost of $320 to $722 million less than reservoir construction. Reservoirs also create significant environmental impacts that must be carefully assessed. It is anticipated that the timeframe to create new reservoirs will be extremely long due to the extensive planning, review, permitting and construction process along with anticipated opposition and litigation.

2. Monitor Water Supply Needs

It is important to carefully project and monitor future supply needs to accurately plan for needs. Many communities have increased population while decreasing water usage. Examples include Seattle that grew 16% in population in late 1990's and early 2000's yet reduced their water consumption by nearly 20%. We understand that local examples include Cobb County that added 42,000 new customers between 2003-2008 yet maintained their same level of water consumption. Similarly we understand that Clayton County actually reduced their water consumption by 15% while increasing their service population by 42%. We encourage careful and constant analysis of projected water supply needs in the metro-Atlanta area.

3. Protect Water Sources Through Land Use

We feel that maximizing the natural recharge zones for water should be a component of the plan for sustained water supply. Continued expansion of impervious surface upstream of Lake Lanier and Lake Allatoona will add to increased water run-off and will negatively impact the water recharge opportunities. The Conservation Fund recommends establishing goals, priorities and incentives to maximize and maintain forested land use within the watersheds of Lake Lanier and Lake Allatoona to decrease stormwater run-off, to recharge streams and to increase baseflows and available water supplies.

4. Increase Capacity of Existing Facilities

The cheapest and most readily available sources of water are the continued use of Lake Lanier and Lake Allatoona. We feel that both should be managed in a way that meets water supply needs in the metro-Atlanta area as much as possible while also insuring healthy downstream flows and downstream water needs. The Conservation Fund feels there are potentially a variety of ways to increase capacity within these and other existing reservoirs and we would suggest further analysis be conducted of those opportunities.

Activities within these reservoirs such as dredging and raising pool elevations are worthy of consideration and could possibly be done in such a way that will not cause unwanted negative consequences downstream. It has also been suggested that quarries should be explored as potential water storage facilities.

Our sense is that a commitment to implementation of the above four areas of focus will yield a reliable and sufficient water supply. We continue to be concerned about the balance between metro-Atlanta water supply needs and the needs of downstream users and downstream natural systems. We feel that pursuit of the most cost effective solutions as proposed above will address that balance as much as possible. The other concern we have is about any potential need to allocate scarce statewide resources to addressing this challenge. Minimizing the cost to non-metro Atlanta citizens through the above proposed low cost solutions will hopefully minimize the need for allocation of other statewide funding to address this challenge.

THE NATURE CONSERVANCY
WATER CONSERVATION PRINCIPLES AND PRACTICES

1. Water is, and must remain, a public resource that requires thoughtful management to preserve it for current and future needs.
2. Water policy decisions must be based on accurately determining current and future needs and driven by objective, measurable science.
3. Any water management strategy for metro Atlanta must ensure downstream communities of guaranteed in-stream flows so as not to deprive them of future economic prosperity. Reauthorization of Lake Lanier, expansion of existing reservoirs, and using existing, but abandoned quarries are all techniques that keep in place current flow standards.
4. The Nature Conservancy (TNC) considers the current Statewide Water Management planning process one of the best examples of stakeholder water planning in the country. The Regional Water Councils setup through this process should continue to serve in their current format because any policy decisions affecting metro Atlanta's water usage have upstream and downstream implications. Utilizing these Councils, (appointed in part by the Governor) and the Science and Engineering Advisory Panel (an EPD appointed, nationally recognized scientists) not only ensures that policy decisions have statewide "sounding boards" and sound scientific footing, but it demonstrates to the federal government and the states of Alabama and Florida that others outside the metro Atlanta community are being heard.

   The two specific recommendations that affect upstream and downstream users outside metro Atlanta are the contraction of new reservoirs and inter-basin transfers. The Nature Conservancy specifically recommends the following:
   - New Reservoirs – cost, political viability, and timeframe are all critical factors that should make new reservoirs the option of last resort. Additionally, the fact there are major consumptive losses in evaporation and the need to move the water to Atlanta makes this an inefficient process.
   - Inter-Basin Transfers - Georgia should not invest in expensive, time consuming water capture and control policies. Moving water around does not solve the inherent problem AND it denies economic development opportunities to those communities who lose water in a transfer.
5. Georgians should expect credible, cost-effective, politically viable, and timely solutions to current and future water supply issues.

   Water conservation is a goal that all parties interested in solving Georgia's water dilemma can agree on – yet methods to capture this goal range from building new reservoirs to implementing water efficiency measures. All potential solutions have different costs, timelines, effectiveness, and political viability. GA EPD and CH2MHILL estimated that reservoir construction can cost $4,000 per 1,000 gallons captured – and this does not take into account ongoing maintenance and operations costs. In contrast, various water efficiency measures can cost between $0.46 and $250 per 1,000 gallons saved. Controls can (and will) be built into whichever solution, or variety of solutions, is adopted. For example, dam operation manuals control the release of water while tax incentives and other public policy prescriptions can control water efficiency goals.

   While there are many examples of local governments across the country including those in Georgia, realizing water savings through conservation, The Nature Conservancy has "on

the ground" experience working with the Flint River Soil and Water District and the Natural Resources Conservation Service (NRCS) to engage the agricultural community in southwest Georgia along the Flint River in an effort to conserve water through new, efficient technologies. Farmers, incentivized through Farm Bill cost-share programs and realized savings on water withdrawal costs, are changing their behavior which is conserving more water. Drawing on our experience in southwest Georgia, TNC recommends the following conservation tools – and we've provided the context that parallels our agricultural work with each specific recommendation.

A. REDUCE WATER LOSS BY FIXING LEAKS IN DISTRIBUTION PIPES AND RETROFITTING BUILDINGS WITH WATER EFFICIENT FIXTURES.

LOWER FLINTY EXAMPLE:

1) **Mechanical** – redesigning the structural components of existing irrigation systems to improve efficiency, i.e. low pressure drop nozzle retrofits. Water savings are achieved by: 1) improving uniformity of the irrigation systems to more than 80-% - this is simply a "leak check"; 2) applying irrigation nearer to the crop reducing evaporation and wind drift; and 3) installing an end gun shut off when applicable to keep irrigation inside field boundaries

YIELD: 22.5% in water savings per center pivot unit or approximately 6 million gallons annually.

COST: $10,000 per system

TIMING: Since 2003, 20% of farmers in 27 counties of southwest GA have completed which equals approximately 1,000 center pivot units.

B. METERING ALL WATER USES SO INDIVIDUAL ACCOUNTABILITY IS ENCOURAGED. REAL TIME INFORMATION MODIFIES BEHAVIOR

LOWER FLINT EXAMPLE:

2) **Technological** – Utilizing advanced technology applications on the farm to increase accuracy, efficiency and effectiveness of irrigation, i.e. variable rate irrigation and remote soil moisture monitoring. Variable rate irrigation (VRI) is a precision agriculture tool that conserves both water and soil while improving crop yields by mapping crop acres and defining irrigation patterns according to soil types, slope and hydrology. Remote soil moisture monitoring employs soil moisture sensors, temperature probes and rain gauges to record field conditions and upload 'real-time' data to the internet via a wireless broadband network, cell carrier or satellite system.

3)

YIELD: 17% per center pivot unit for VRI and 17% for remote soil moisture monitoring. The savings equal 4.5 million for both practices or 9 million a year for both – per center pivot.

COST: $16,500 per unit for VRI. $3,500 for remote soil monitoring.

TIMING: 20 units currently online; 30 additional units will be active by 2010

C. OUTDOOR LANDSCAPING INCENTIVES AND RULES IN ORDER TO MINIMIZE WATER WASTE SUCH AS A DAYTIME BAN ON OUTDOOR WATERING.

LOWER FLINT EXAMPLE:

4) **Ecological** – Changing the way farmers manage agricultural fields so that naturally occurring processes (ecosystem services) can replace production inputs such as water, fuel, fertilizers and pesticides, i.e. sod based rotation.
Sod based rotation incorporates

Sod based rotation incorporates rotations of a perennial warm season grass into a conservation tillage based row cropping system. The primary benefit of this practice is an increase in soil organic matter at a rate of .1% per year which yields improved water retention and soil health, supports a forty fold increase in crop roots and sequesters carbon.

YIELD: Conservation tillage creates a 17% in water savings annually or 4.5 million gallons per center pivot unit. Sod based rotation can reduce water use further by an additional 40% or 10.5 million gallons.

COST: $400/acre

TIMING: 100,000 acres in conservation tillage through NRCS – 200 acres on an EPA test site in sod based rotation.

NOTE:
All of these statistics are based on a 100-acre average field size in Georgia. Water is applied by acre/inch. 1 acre inch of water = 27,154 gallons. 1 complete pass of a center pivot system uses 2.7 million gallons of water. The number of passes made annually average 10 – so each year on average 1 center pivot uses 27 million gallons of water.

ADDITIONAL BENEFITS

ECONOMICAL: Demonstrating how water conservation improvise the farm economy by reducing agricultural inputs. For example, a 15-20% reduction in irrigation applications equates to a 15-20% reduction in energy costs. Farmers calculate cost on a per acre basis; if a conservation practice can reduce per acre expenses while sustaining or even improving crop yields, the farmer profits even if commodity prices stagnate. Input reduction via precision agriculture technology or ecosystem services is good business.

SOCIAL: The establishment of a rural broadband network that provides farmers with real time soil and water information – has the ancillary benefit of bringing wireless technology to schools, hospitals, and local governments in the 4 county pilot program area.

ENVIRONMENTAL: Farmers inherently understand the fact that water is a finite resource. If provided the technology, incentives, and education to conserve water – while potentially realizing increased profits over time - they will modify their behavior. By leaving more water in the Flint River all the ecological benefits associated with a healthy river system are realized

UPPER CHATTAHOOCHEE RIVERKEEPER®
Keeping Watch Over Our Waters
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Comments submitted via email to: info@gawatertaskforce.com
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November 13, 2009

Dear Georgia Water Contingency Task Force Members:

On behalf of Upper Chattahoochee Riverkeeper (UCR), I would like to thank you for the opportunity to provide information to help guide the Task Force's efforts to address the potential gap in our 2012 water supply due to a recent federal judge's ruling which invalidated Georgia's use of Lake Lanier for water supply.

As you know, we have worked with the Georgia Water Coalition (GWC) to draft an essentials document which outlines what we believe the priorities are for addressing the gap and moving Georgia into a sustainable future (attached). We also have worked with GWC to generate a comprehensive list of conservation and efficiency measures which we believe must be fully exhausted in concert with serious efforts to renegotiate a reallocation agreement authorizing use of Lanier for Georgia water supply ***prior*** to any efforts to expand or add other water supply sources (attached). Our comments here are supplemental to those submitted by the GWC which we also helped draft and strongly support.

Conservation and Efficiency then Reallocation Before Seeking New Supplies

The Task Force has been presented with information suggesting that by 2012 we will have a water shortfall of 251 MGD in light of the judge's ruling. The GWC has presented information illustrating that we can achieve a savings of roughly 210 MGD through proven, cost-effective conservation and efficiency measures, which significantly closes that gap. We also note that time, money, and the need to secure enough clean water for all users throughout the ACF basin all indicate that reallocation of Lake Lanier to allow for water supply is the cheapest, quickest, and most sustainable means of closing the rest of the "gap."

Accordingly, we again strongly urge the Task Force to focus on conservation, efficiency, and reallocation first and foremost, and disregard expensive, destructive, time-intensive, and unsustainable alternatives including construction of development/amenity lakes, aquifer storage and recovery (ASR), desalinization,

and piping water from the Tennessee River. In light of the severe economic downturn, Georgians simply cannot afford these risky alternatives in this generation or the next.

Accurately Characterizing the "Gap"

For several reasons, the "gap" the Task Force has derived is an erroneous one. First and foremost, in spite of a judicial ruling deciding that water supply is not an authorized purpose for Lake Lanier, the Task Force is assuming that Metro Atlanta can and will continue to grow at an accelerated rate as it grew back in the early 1990s. This assumption is entirely unreasonable. In fact, one "option" that does not appear to be on the table is a moratorium on growth for Metro Atlanta. From a business perspective, this solution would and should precede any other solution. A simple analogy makes this point—a business going bankrupt does not continue to add inventory and personnel and otherwise overextend itself in order to get out of bankruptcy. Rather, a business in trouble makes tough decisions that include scaling back. To our amazement, this solution is getting no attention from the Task Force.

Even if we assume that future rapid growth in the short-term can and will occur, the "gap" is derived by relying on the significantly flawed water demand projections found in the Metro North Georgia Water Planning District's 2009 Water Supply and Water Conservation Management Plan. These projections overstate future demand due to flawed input and assumptions, as outlined and discussed in these attached documents:

- Letter dated April 16, 2009 from UCR to the Metro District Governing Board regarding the 2009 draft Metro District Water Supply and Water Conservation Management Plan.

- Letter dated January 30, 2009 from UCR to Metro District Governing Board regarding the 2009 draft Metro District Water Supply and Water Conservation Management Plan.

- Report dated August 2006 by Pacific Institute, A Review of Water Conservation Planning for the Atlanta, Georgia Region.

One of the fundamental assumptions underlying the overstated water projections is the "adjusted base year profile" which is essentially the starting point for the projections. Simply stated, the projections are sensitive to that starting point because the higher the starting point, the higher the end point. The Metro District uses the year 2006, which they allege was "unnaturally depressed as a result of the

ongoing drought." Our criticisms aside as to the irrational nature of using what they themselves admit is an outlying point and their subsequent arbitrary adjustment to inflate its value, we note that nothing could be further from the truth.

- Water use in 2006 was anything but "depressed." We have attached a review conducted by the U.S. Army Corps of Engineers that shows water use in Metro Atlanta with respect to Lake Lanier and the Chattahoochee River (clearly relevant to the scope of work before the Task Force) was among the highest on record since 1990. In fact, only the year 2000 surpassed 2006 in terms of water use.

- We also note that the U.S. Geological Survey has released information on 2005 water use by sector and by county; Georgia county-specific data is available online at http://water.usgs.gov/watuse/data/2005/ as well as in Appendix C of the attached USGS Report, *Water Use in Georgia by County for 2005; and Water-Use Trends, 1980-2005*. Summing across the 15-county region, you get a total of 583 MGD for publically supplied water, which is roughly 100 MGD less than the ~690 MGD adjusted baseline water use on which the Metro District based its water demand projections.

- These two pieces of information cast considerable doubt on the validity of the base year chosen as well as the subsequent adjustment.

The other fundamental assumption underlying the overstated water projections is the high rate of population and employment growth. Simply stated, the projections also are sensitive to the slope over time because the higher the slope, the higher the end point.

- The Metro District fails to provide a range of growth scenarios, even in spite of the recent, severe economic downturn which has brought new construction and development to a virtual standstill in the region.

- In fact, a recent Atlanta Regional Commission report (attached) states that Metro Atlanta growth is the ***lowest*** it's been in twenty years.

- Again, the fact that growth is actually at a record low level rather than high, belies the fact that the Metro District projections grossly overstate future water demand.

A simpler and more valid approach to estimating water demand in 2012 is simply to look at water use dating back to 2004, the first full year following implementation of the Metro District water plans, and then project forward. For example, using the

Corps' historical annual average water use data (2004-2007) and forecasting forward, you project a 430 MGD need in 2012 (Lanier and Chattahoochee), leaving a shortfall of 200 MGD.

Alternatively, using EPD's water use data and selecting the monthly high water withdrawals for each facility in each year and then summing those, again focusing on the years following adoption of the 2003 Metro District water plans (2004-2008), you project a 428 MGD need in 2012 (Lanier and Chattahoochee), leaving a shortfall of 198 MGD.

By either accounting, the "gap" is overstated by at least 50 MGD.

Ensure Adequate Flows Protective of Instream Uses

As the Task Force considers water supply options for Metro Atlanta, a critical component of all water management decisions must be a commitment to adequate instream flows in the Chattahoochee River to protect designated uses, including drinking water, recreation, and ecological health.

Although water levels for Lake Lanier and West Point Lake have received considerable attention, the 120-mile stretch of river from Buford Dam to the headwaters of West Point Lake in Franklin, including the Chattahoochee River National Recreation Area and several state and local parks, has not received as much attention or analysis to determine flows sufficient to protect important instream values. There is one instantaneous flow requirement of 750 cubic feet per second (cfs) in this river section just upstream of the confluence of Peachtree Creek (PTC) and the Chattahoochee River that has been a part of Georgia's water quality regulations since the 1970s.

The PTC flow requirement was adopted to protect designated uses for downstream waters, and all wastewater discharge (NPDES) permits issued by the Georgia EPD assume that this flow will be met *at all times* for dilution purposes. In addition, the Corps of Engineers' operating guidelines for Buford Dam state that releases from the dam must consider this downstream requirement and release enough water to meet the flow target.

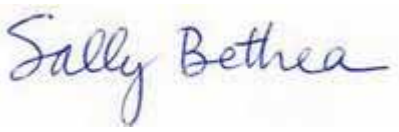
On several occasions in the past two years, the state has asked the Corps to reduce the target flow to 650 cfs in order to hold more water up in Lake Lanier—a difference of 65 million gallons per day at this location. As UCR has noted several times (attached), the state has yet to provide adequate water quality and flow monitoring at the compliance point *or* downstream of PTC to ensure that designated uses are met. Neither has an Environmental Impact Statement (EIS) been prepared

to assess the potentially significant impacts of the flow reduction on the human environment as required by the National Environmental Policy Act (NEPA).

To address these deficiencies, the state must undertake a comprehensive study, working with federal resources agencies, to determine if the 750 cfs flow is sufficiently protective now and will be sufficiently protective in the future given growth projections, to ensure that designated downstream uses will be met at all times. Until such time as an independent, peer-reviewed study is completed and a new regulation is adopted by the state, the 750 cfs flow at PTC must be met ***at all times***, even during droughts; in addition, the state must establish sufficient flow and water quality monitoring stations to ensure that target is met, and the data collected must be made easily available to the public.

Conclusion

The federal judicial ruling has provided the Metro Atlanta area with an unprecedented opportunity to demonstrate good water stewardship to our downstream neighbors. UCR strongly urges the Task Force to seize this opportunity by embracing aggressive water conservation and efficiency measures and then pursuing Lake Lanier reallocation for water supply at sustainable levels.



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An Advanced Sensor Technology Company

UgMO Saves Water, Saves Money, Saves Earth

UgMO is the most advanced, wireless underground monitoring system available today. UgMO's unique blend of state-of-the-art hardware, intuitive software and world-class agronomic support completely removes the guesswork of when and how much to water and how to manage other related resources like power and soil additives (fertilizers, pesticides, nitrates, etc.).

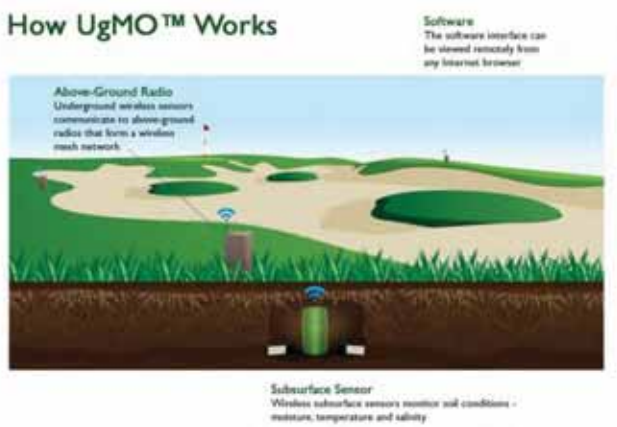
The system measures precisely how much water is in the soil and communicates that data in real-time, 24/7. UgMO delivers data to turf managers via its robust software platform so that they can make educated decisions on irrigation. UgMO can also communicate directly with irrigation systems to interrupt automated watering practices when irrigation is not needed.

Either way, the result is direct and immediate water conservation with UgMO placing its users at the forefront of environmental stewardship.

State-of-the-Art System

UgMO's patent-protected hardware package is compact and non-invasive. Plus, it's field-proven.

- **In-Ground Sensors –** Wireless subsurface sensors provide highly accurate, real-time data on soil moisture, temperature and salinity gradients. Sensor nodes are minimally invasive and easy to install (a standard cup cutter does the job) with battery life designed for 4+ years of consistent, uninterrupted service.
- **Above-Ground Radio –** Self-contained routers (aka radios) form a wireless mesh network with a one-mile range above ground, unobstructed.



- **Software Anywhere** -- UgMO's software interface displays real-time conditions and provides comprehensive intelligence plus corrective and predictive actions. It's accessible to UgMO users from any Internet browser on desktops, laptops, smart phones, etc.

Positive Returns

- **Environmental Benefits –** Water and energy savings reach 25% or more. Also reduces phosphate, nitrate and pesticide usage and the overall carbon footprint.
- **Regulatory Benefits*:*** UgMO's precise data can help meet water mandates and measure compliance; it also create savings that can be applied to contingency planning.

UgMO is Affordable

- UgMO hardware is a one-time purchase of $250 per sensor. UgMO software intelligence is sold on a subscription basis – the most basic level is approximately $8 per sensor monthly. ???
- Bottom line: With water savings averaging 25 percent or more, the payback period on UgMO technology can be one year or less.

December 8, 2009

Georgia Water Contingency Task Force
The Office of the Governor
State of Georgia
203 State Capitol
Atlanta, GA 30334

Submitted via email: info@gawatertaskforce.com

Dear Members of the Georgia Water Contingency Task Force,

Southern Alliance for Clean Energy (SACE) submits the following comments concerning the task force's directive to find a sustainable and cost-effective water supply for the Metro Atlanta region. We are a non-profit organization that works to advance clean energy policy in the Southeast and have members who are concerned about water quality and related environmental problems. Our comments focus solely on the electricity sector and energy issues where we have in-depth expertise. Regarding other topics unrelated to electricity and energy, we generally support the comments submitted in November by the Georgia Water Coalition of which our organization is a member.

The Water-Energy Connection
Georgia's power sector is the largest water user in the state, followed closely by agriculture.[i] Georgia's existing electricity system significantly degrades water quality (e.g. thermal pollution, emission and discharge of harmful chemicals and heavy metals) and reduces water availability for Georgians and our bordering neighbors. Georgia's existing electricity system already competes for water with other important uses vital to our state's economy and quality of life: drinking water supply, agriculture, industry, fishing, and recreational opportunities. Several major new power plants proposed for construction in Georgia will compete even more with other uses if approved by the state.

Power plants must have significant water resources continuously and readily available to create and condense steam to power their turbines. *Water use* refers to the amount of water that is withdrawn from the water body by the power plant. *Water consumption* refers to the amount of water that the power plant withdraws that is not returned to the water supply source, water that is "lost" or "consumed," primarily due to evaporation.

Water withdrawals and consumption figures depend heavily on what types of cooling technologies are used. Power plants that use once-through systems (i.e. do not have cooling towers) withdraw and heat very large volumes of water but consume little water because direct evaporation is low. In contrast, "closed cycle system" power plants that use cooling towers do not need to withdraw nearly as much water, but their cooling tower evaporation means a much higher rate of water consumption. Although cooling towers offer certain environmental and engineering advantages over once-through systems, they consume a lot of water. In Georgia, some power plants use cooling towers some or all of the time, while others do not.

For instance, coal-fired Plant Branch withdraws over a billion gallons of water per day from Lake Sinclair, but consumes a few million gallons of water because of its primary reliance on once-through condenser cooling water and only seasonal use of its cooling tower. Georgia's nuclear plants Hatch and Vogtle use cooling towers for condensing steam, resulting in less water withdrawn (around 60 million gallons per day) but with a much greater volume of water consumed or lost (between 34 and 43 million gallons per day). This ultimately results in these plants returning less than half of the water withdrawn to the Altamaha and Savannah rivers respectively. With the proposed expansion of Plant Vogtle, more water will be lost as steam from the two existing and two proposed reactors than is currently used by all residents of Atlanta, Augusta, and Savannah *combined.*[ii]

Less water used for power generation translates into more water for other life-dependent or life-enhancing uses in the region.

Less Water-Intensive Energy Solutions Exist

There is an established link between reduction in electricity use and reduction of water consumed. The Georgia Drought Response Unified Command (DRUC) highlighted the water-energy connection through its statewide press release in December 2007:

> *DRUC encourages Georgians to help save water by conserving electricity. Large amounts of water are required to generate electricity. In Georgia, each kilowatt hour (kWh) of electricity production consumes 1.65 gallons of water according to the National Renewable Energy Laboratory.*[iii] *To put it in context, the average Georgia household's electricity use is 1,148 kilowatt hours per month, requiring 1,894 gallons of water to generate.*
>
> *"One strategy for saving water is to reduce energy consumption," said Georgia Environmental Facilities Authority (GEFA) Executive Director Chris Clark. "Georgians can help the state through this drought by implementing a few practical energy efficiency measures in their homes. Not only will this help conserve water and energy, it will also help lower their utility bills."* [iv]

The actual specifics can vary on how a particular river basin in Georgia may benefit from water savings due to improved energy efficiency and fuel switching to less water-intensive energy technologies. Yet, given Georgia's current overreliance on water-intensive energy supply options, water in the region will be conserved when energy efficiency and water-conserving power supply technologies replace the existing highly water-intensive energy technologies. If a water-intensive coal fired power plant in Georgia does not have to run at full capacity because there has been a reduction in energy demand through far more effective energy efficiency programs and far more effective fuel switching to less water intensive energy supplies than currently exists, then less water will be required to run that plant and thus less water will be withdrawn from a particular resource. If all electric utilities in Georgia and the surrounding region were to adopt water-conserving rather than water-intensive technologies, the results would be quite significant.

A May 2005 study by ICF, Assessment of Energy Efficiency Potential in Georgia, done for the Georgia Environmental Facilities Authority as they began to craft the state's first energy strategy, showed that reducing the amount of water required for cooling at power plants could offer

significantly more water savings than by water conservation measures implemented by the end-user (e.g. low flow showerheads, among other measures). The study estimated that if moderately aggressive electric utility energy efficiency programs were implemented then the power sector could reduce its water consumption by 155 million gallons of water per day (mgd) by 2015.[v] Looking at all scenarios, the study estimated that water use for cooling purposes at power plants could be reduced by 58-224 mgd by 2010 (had these efforts been implemented after the 2005 study was released) versus 3-10 mgd reductions by implementing various efficiency measures to reduce water use by end users. As the Table 8 from the study shows, substantially greater water savings are estimated to be available in the power sector.

Table 8. Reductions in Power Sector and End Use Water Consumption in Georgia

Scenario	Consumption (Million Gallons per Day)	
	2010	2015
Power Sector		
Minimally Aggressive	58	121
Moderately Aggressive	123	155
Very Aggressive	224	159
End Use		
Minimally Aggressive	3	3
Moderately Aggressive	8	4
Very Aggressive	10	4
Total		
Minimally Aggressive	**61**	**124**
Moderately Aggressive	**131**	**159**
Very Aggressive	**234**	**164**

The Task Force should be aware that when comparing types of energy generation, regardless of whether cooling towers are used, nuclear power has higher rates of both water withdrawal and consumption than coal and natural gas and far more than renewables such as wind and solar.[vi] Though coal plants are not as water intensive as nuclear reactors, coal is typically the most water intensive choice among fossil fuel power generation options. Good wind resources exist in Georgia, particularly offshore along the coast.[vii] According to the Department of Energy's National Renewable Energy Laboratory, developing 1000 MW of wind in Georgia could save 1628 million gallons of water per year.[viii] Less water-intensive cooling technologies, such as dry cooling, are available but no existing or proposed power plants in Georgia are actively pursuing them.

Individual actions such as use of Energy Star appliances that use less energy and water can also achieve water savings. Energy Star washing machines, for example, require approximately 50% less energy per load and use 30-50% less water than a typical model. This saves water two ways and saves consumers money on both their water and energy bills. The recent report, Water and Watts: Water-Energy Links in the Southeast United States, April 2009 by the World Resources Institute, gives some useful background and has an example on p. 8 of how much energy savings can be gained by changing over 1 in 10 inefficient toilets with WaterSense labeled toilets – estimating it could save nearly 25 billion gallons of water annually (enough to meet Charlotte, North Carolina's entire public water supply needs for nearly eight months). Additionally, it could save residents about $150 million in water bills, and reduce electric power use (needed to treat, pump, and deliver the water) by more than 80 million kilowatt hours (kWh), which is about equal to the annual

electricity use for 7,500 homes.[ix]

Recommendations

Call for aggressive implementation of water-saving energy measures such as energy efficiency and energy conservation and advance less water-intensive electricity supplies such as wind and solar. If energy conservation and fuel switching to water conserving energy supplies were implemented such that reliance on water-intensive new power plants decreased, water resources in the region would also be conserved and available for life-supportive activities as a result.

- In comments we submitted to the Environmental Protection Division earlier this year for the Water Conservation Implementation Plan, we recommended that state agencies conduct energy audits by 2011 and that state agencies should match federal agencies' goal of 30% total energy reduction by 2015 in all public buildings using FY2003 as a baseline as outlined in the Energy Policy Act of 2005 and Energy Independence and Security Act of 2007 (see http://www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=US02R&State=federal¤tpageid=1&ee=1&re=1). Given the large number of state agencies and the respective facilities located in the Metro Atlanta area alone, this could provide significant water savings to the region given the generally energy-inefficient operation of State of Georgia buildings. For background on supportive policies, please see p. 5 under "Demonstrate leadership with energy efficient public buildings" in the 2009 Water and Watts report mentioned previously.
- Design and adopt utility incentives directed at both water and energy conservation and efficiency to apply within the region, including: incentives outlined in the ICF studies "Assessment of Energy Efficiency Potential in Georgia" and "Strategies for Capturing Georgia's Energy Efficiency Potential" done for the Georgia Environmental Facilities Authority; prioritization of state spending on energy and water projects, tax credits for the installation of devices that collect rain water in homes, and additional tax free holidays for EnergyStar and WaterSense qualifying appliances. See a recent article at http://www.wneg32.tv/index.php?option=com_content&view=article&id=1645:tax-free-appliances&catid=1:latest-news&Itemid=18 that highlights the water/energy connection and mentions some of these measures.
- Abandon pursuit of desalination. Desalination is an energy-intensive technology[x] which, given Georgia's water-intensive energy infrastructure, means that desalination efforts in Georgia will also be highly water-intensive. This reality alone negates any supposed benefits.

In favor of far more water-conserving energy solutions and cheaper alternatives, halt proposed utility plans to build more coal plants and nuclear reactors that seek to horde even more of Georgia's scarce water supplies.

- Evaluate proposed energy supply options based on their water impacts. It is critical to recognize and act on the fact that some supply side choices are less water-intensive than others and that electric utilities have clear portfolio choices to bring a combination of supply and demand resources. A utility resource package can be either highly water intensive or highly water conserving or somewhere in the middle, depending on which fuel combinations and technologies are chosen. The State of Georgia must conduct comparative analysis of the water requirements and water impacts of the range of electric generating technologies and policy

analysis to enable utility and environmental regulators to make well-informed decisions about new power supply options from a water perspective. All state governments in the region that are struggling with how to more effectively manage their own state's water resources should be placing very high priority on aggressively building a far more water-efficient electric system. The business-as-usual course that is harming our region's water resources that Georgia's electric power sector continues to pursue should not be allowed to continue.

Develop a coordinated campaign to educate the public. Electric utilities are among the largest water users in the state and are proposing new power plants that will be among the highest water consuming power plants that exist. There are less water intensive ways to produce the power Georgians need along with measures that can be implemented to save both energy and water resources.

- State agencies – EPD and GEFA – should be involved in addition to environmental and consumer groups with utility assistance as needed so that all can help communicate the benefits of water and energy efficiency as it relates to consumer behavior and technology adoption. The U.S. EPA has excellent information on both energy efficiency and water efficiency. Information such as the following, as presented on p. 3 of the Water and Watts referred to previously in our comments, is helpful for utility consumers and the public to know: "Southeast power plants withdraw an average of two full bathtubs of water to generate electricity needed to power a refrigerator for a day, losing about four gallons to evaporation in the process."

If you have any questions or comments on the information SACE has submitted, please do not hesitate to contact me at 912.201.0354 or sara@cleanenergy.org.

Sincerely,

Sara Barczak, Program Director
High Risk Energy Choices
Southern Alliance for Clean Energy

[i] Fanning, J.L. 2003. *Water Use in Georgia by county for 2000 and water-use trends for 1980-2000*. Georgia Geologic Survey Information Circular 106, 176.
[ii] Using 2005 Census figures and with the average per capita daily water use in GA at 75 gallons from surface and ground water sources, http://water.usgs.gov/watuse/tables/dotab.st.html. Water use figures for new reactors from Southern Nuclear Operating Company, Vogtle Early Site Permit Application, Environmental Report, August 2006.
[iii] National Renewable Energy Laboratory, *Consumptive Water Use for U.S. Power Production*, Paul A. Torcellini, Nicholas Long, & Ronald D. Judkoff, Dec. 2003.
[iv] DRUC Press Release, 12/11/07, at https://www.piersystem.com/go/doc/1619/185714/.
[v] Access the report at http://www.gefa.org/Index.aspx?page=347, scroll down to "Air Quality" and for the report "Assessment of Energy Efficiency Potential in Georgia." See p. 5-3 (or section 5.2. Impacts on Water Consumption).
[vi] Hoffmann, J., S. Forbes, T. Feeley. U.S. DOE, *Estimating Freshwater Needs to Meet 2025 Electrical Generating Capacity Forecasts*, June 2004 and U.S. DOE, *Energy Demands on Water Resources, Report to Congress on the Interdependency on Energy and Water*, December 2006.
[vii] U.S. DOE, Energy Demands on Water Resources, Report to Congress on the Interdependency of Energy and Water, December 2006.
[viii] National Renewable Energy Lab, *Economic Benefits, Carbon Dioxide (CO2) Emissions Reductions, and Water Conservation Benefits from 1,000 Megawatts (MW) of New Wind Power in Georgia*, June 2008. 300 MW land based and 700 MW offshore.
[ix] Access the report at http://www.rivernetwork.org/blog/7/2009/05/20/watts-and-water-new-report-water-energy-nexus-southeast.
[x] DOE, *Energy Demands on Water Resources, Report to Congress on the Interdependency on Energy and Water*, December 2006, p. 46.

Mac, Katie, Nels and Lonice--

Thanks very much for making time for our meeting this morning. We appreciate the opportunity to give you feedback and input. You have done an excellent job of packaging a lot of information and we generally agree with your main points.

Coming out of that meeting, we summarized the most critical points that we want you to hear from us:

1. THE GAP SHOULD BE PRESENTED AS A RANGE AND IS LIKELY BIGGER THAN 250 MGD. The analysis assumes that 230 mgd can be withdrawn from the river. This is not a safe assumption and it may even be misleading. The right number could be considerably less. There is no reason to credit 230 mgd even as a starting point for this analysis. The judge pulled this number from a document written in 1974 that included numerous outdated assumptions. 230 mgd is not guarantee by the Order—all that is guaranteed is that there will be no lake withdrawals (save 10 mgd) and that off-peak releases will be 600 cfs. We have asked Hydrologics to prepare a reasonable estimate of the water available to the Metro area assuming Buford is operated in accordance with the Order and will send that to you when we get it (we hope this afternoon). One way or the other, the “gap” should be presented as a range.

2. With regard to the "indirect potable reuse" option:

a. The consensus of the water managers is that the costs for the big pipeline project are significantly understated. George Barnes and the City of Atlanta looked hard at a similar, but different, project several years ago. George feels that the project, whether piping or tunnel, either one, would cost about $5-6 billion.

b. We suggest another name for the project, such as "lower to upper basin transfer." We don't want to focus the attention on the indirect potable reuse aspects--we are already doing that, on a large scale. What this project does is transport water from below Atlanta up to the head of the region, and the name should reflect that.

3. Cedar Creek needs to be taken off the list of potential water transfer options.

4. We think the issue with Morgan Falls is that "safe yield" is not the right point of comparison. That concept is not relevant to a reregulation project. The result is to understate the potential value of this alternative by a wide margin. We suggest you remove Morgan Falls from the chart that ranks projects by yield and discuss it on a different slide—potentially with other projects designed to skim peaking releases from Buford Dam. Lewis has worked up some information and discussion, which is attached, to demonstrate this point. We understand it presents significant environmental and social costs, but so does every other option. We want to ensure that the benefits of Morgan Falls dredging are understood and on the table when the priorities are determined.

5. The timelines are probably too optimistic. On the lower to upper basin transfer project, it would be unlikely to get such a massive multi-jurisdictional project in place by 2020. It certainly cannot be do in about 4 years, as shown on Slide 21 in the pre-read materials. That is the most glaring example, but we think the timeline on other projects, such as reservoirs, is not realistic.

6. We suggest that you have some additional discussion of the environmental consequences of the various options, taking a more nuanced view than that of the environmental groups, and also making the irrefutable point that reallocation of Lake Lanier is the best option from an environmental perspective. We are working on that and will send you something as soon as possible.

UNIFIED GOVERNMENT
OF WEBSTER COUNTY

Office: (229) 828-5775
Fax: (229) 828-2105

Post Office Box 29
Preston, Georgia 31824

MEMORANDUM

DATE: DECEMBER 14, 2009

TO: GEORGIA WATER CONTINGENCY TASK FORCE

FROM: GEORGE MOORE, CHAIRMAN

SUBJECT: PROPOSAL FROM WEBSTER, STEWART, MARION COUNTIES

The proposal submitted on December 9, 2009 by the Chairmen of the County Commissions in Webster, Stewart and Marion Counties implied a strategy for addressing metro Atlanta's water needs, but did not provide extensive narrative to explain it. Therefore, to assist the Task Force in more fully understanding the proposal tendered, I am offering the following comments.

The proposal attempted to suggest that if a system of reservoirs was built in the mid and lower Chattahoochee and Flint River basins, releases of water from those impoundments could be used to offset the withdrawals made from Lake Lanier and downstream of Buford Dam. We would hope that the system would include the construction of a reservoir on Kinchafoonee Creek, a major tributary to the Flint River. I would also note that the site referenced in the letter of December 9th is identified, along with a second site in Webster County, in the study titled Georgia Inventory and Survey of Feasible Sites for Water Supply Reservoirs, dated October 31, 2008, performed by Mactec Engineering and Consulting, Inc., as project number 6110-08-0257.

Any such system of reservoirs would, to be effective in managing flows in the two basins, need to be well coordinated across the system, likely using the most modern technology to control the structures, to account for rainfall throughout the basins, to predict demands upon water by other users such as agriculture, to monitor releases from Buford Dam, to monitor releases from other dams in the reservoir system, monitor in-stream flows, etc. It seems reasonable to believe that such a system could consistently and accurately supply the minimum volumes of water in the Apalachicola River requested by Florida.

The proposal seems to offer some advantages, one of which is it avoids the issue of inter-basin transfers. Others are that the construction of reservoirs in the mid and lower basin areas would create jobs, recreational opportunities and perhaps even prompt some further development activities in parts of the state that have not heretofore experienced much growth. Too, it might be less expensive to construct reservoirs in these areas, as opposed to North Georgia, since land prices are lower.

We are certainly cognizant of possible obstacles to any such plan, including potential opposition by mid and lower basin groups who might view the proposal as a transfer of water from downstream to upstream users. Too, as will be the case with any proposal to build reservoirs, environmental impacts would have to be mitigated.

I would like to thank the Task Force for considering my comments.

Town of Alto

P.O. Box 215
Alto, Georgia 30510
Phone 706-778-8035 • FAX 706-778-3357

December 8, 2009

The Honorable Sonny Perdue
Governor, State of Georgia
State Capitol
Atlanta, Georgia 30334

Subject: Proposal by the Water Contingency Planning Task Force

Dear Governor Perdue,

It is with respect and honor that we write this letter to you. We understand that there are so many needs and demands in this great State of Georgia in which we are privileged live, but we are compelled to voice a negative response to the aforementioned proposal. As we have been made aware of the outline of this plan, we are very much opposed to the drawing of water from Lake Burton and Lake Hartwell to meet the needs of the metro Atlanta area. This is going to adversely affect our water levels and availability involving an interbasin transfer. To provide water to areas that have not been forced to observe the stringent restrictions that we have been made to implement during the drought is very much against the grain of what is right. We had to press our consumers to conserve, but there were less restrictive measures in the metro area as they were pulling water from our resources to themselves. This is an unacceptable proposal to those who live in our areas. While we are not in a position to offer an acceptable solution, we are more than willing to help find one. It is astonishing that there are no members on the Task Force from the Northeast Georgia area. One would think that the representation is not quite fair in that regard.

If you have any concerns or questions, please feel free to contact us.

Sincerely,

Audrey Turner
Mayor Audrey Turner

Margaret Beaupre
Mayor Pro-Tem Margaret Beaupre

Gary Terrell
Councilman Gary Terrell

Kathy Clark
Councilwoman Kathy Clark

Loretta Bosco
Councilwoman Loretta Bosco

Cathy Armour
Councilwoman Cathy Armour

Cc: Senator Jim Butterworth
Representative Rick Austin
Representative Michael Harden

Finally, Water Works

Standard irrigation controls use preset irrigation times, which don't take into account local irrigation restrictions or rainfall. Additionally, they don't take into account the homeowners' knowledge of the irrigation system.

The WaterOptimizer uses state of the art moisture sensors tested in both the laboratory and the field. Forget zone irrigation, users can irrigate according to the needs of the plants or sod – needs that are identified by this smart irrigation control system. And, if interrupted for demand control, the Water Optimizer picks up where it left off, it doesn't "reset" like conventional irrigation systems.

By limiting peak day usage, utilities and users can save and conserve a valuable resource.

Using the WaterOptimizer to manage heavy users, utilities can substantially reduce peak water requirements, delaying the need for expensive alternative supplies. Some utilities may offer rebates, free installation and equipment maintenance to homeowners to support voluntary participation.

Homeowners that use the WaterOptimizer will see lower monthly water bills and landscape that gets all the water it needs, but no more.

Homeowners may also see a more attractive lawn! The WaterOptimizer will deliver the proper amount of water to your lawn and garden, resulting in optimum growing conditions. Homeowners will see a significant reduction in weeds resulting from overwatering and soggy plant beds.

The WaterOptimizer can be locally controlled, allowing homeowners to override the utility. But given the results and cost savings, they are far more likely to maximize its use.

Austin
TEXAS

Tarpon Springs
FLORIDA

Pinellas County
FLORIDA

Salt Lake City
UTAH

Our Locations

- Austin, Texas
- Dallas, Texas
- Jacksonville, Florida
- Sarasota, Florida
- Tampa, Florida
- Miami, Florida

WaterOptimizer™ LLC
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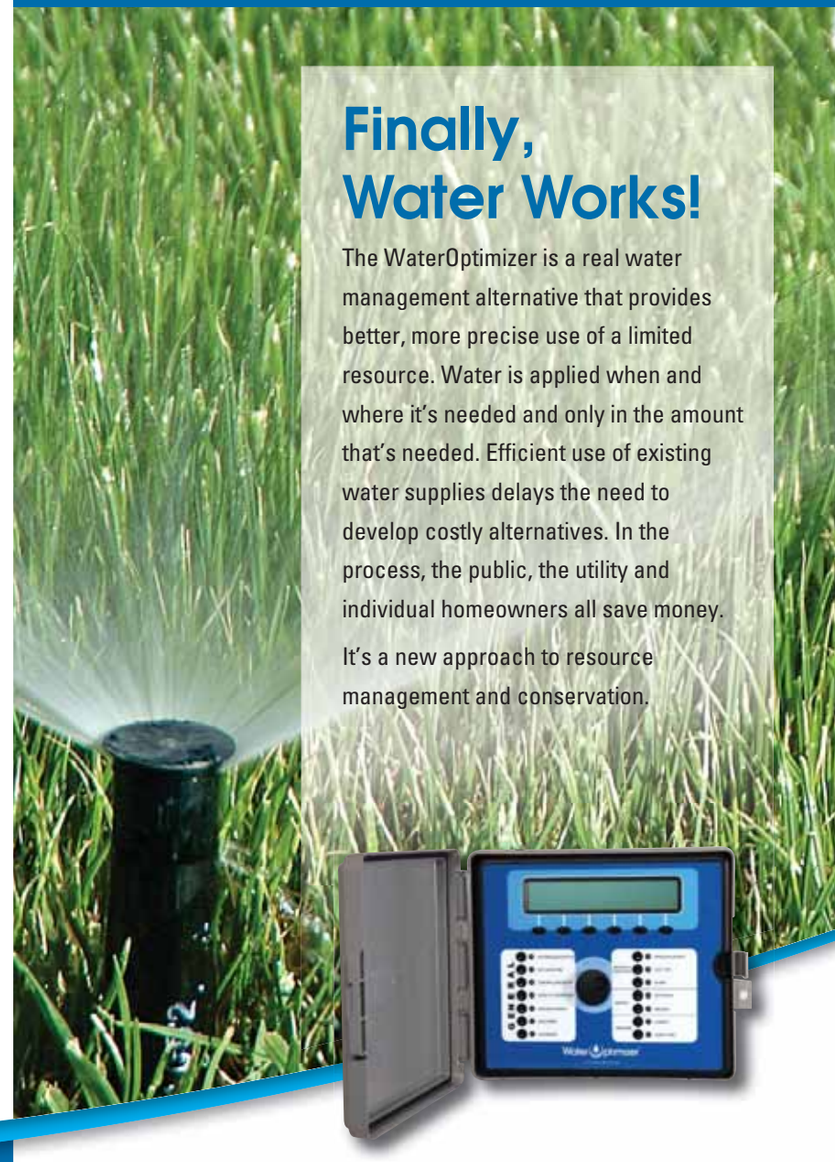
866 880-4030 (ph) • 866 657-3665 (fax)
www.Water-Optimizer.com

www.Water-Optimizer.com



Finally, Water Works!

The WaterOptimizer is a real water management alternative that provides better, more precise use of a limited resource. Water is applied when and where it's needed and only in the amount that's needed. Efficient use of existing water supplies delays the need to develop costly alternatives. In the process, the public, the utility and individual homeowners all save money.

It's a new approach to resource management and conservation.

WaterOptimizer™ LLC
U.S. & Foreign Patents Pending

The WaterOptimizer makes the most of water supplies

Designed by water conservation professionals, the WaterOptimizer is a smart system that allows utilities better control over water resource use. It allows home or business owners to use the water they need, but no more.

The WaterOptimizer is designed for use by Regional Water Utilities and individual homeowners to monitor conditions in the water distribution system through custom designed software.

A seamless blend of new and tested technologies ensures that the system works whether someone is home or not.

The WaterOptimizer provides the water that's needed

Every water manager knows that anywhere from 50 – 75 percent of water demand goes to irrigation. In most cases, that's far more than is needed. This use of water for outdoor irrigation combined with an increase of in-ground irrigation systems has led to increased water waste.

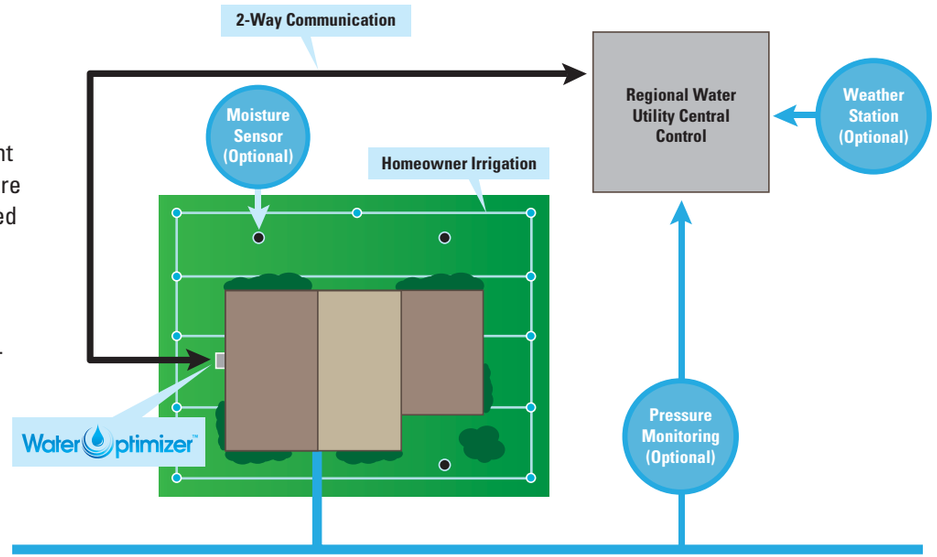
The Water Optimizer system allows homeowners and water managers to work together to provide more responsive, better-focused irrigation to home and business owners, and allows better monitoring of water use by utilities.

The WaterOptimizer provides a real management option

For Water Managers: The WaterOptimizer allows water managers to eliminate peaks and manage community supplies, while it provides users all the water they need for landscape maintenance.

Residents and Businesses: The WaterOptimizer connects to residential or individual irrigation systems, replacing any existing controller. Although connection is voluntary, local water utilities can then manage the system by allowing individual systems to operate, or by re-directing irrigation to times when there is less demand.

Regardless of the user, the WaterOptmizer protects system water pressure, provides the resource where it's needed. When it's not needed, it's saved for another day.



The WaterOptimizer operates in 6 ways

1 **Weather**
As the weather changes, the WaterOptimizer responds. If it's raining, the irrigation system simply will not activate.

2 **Sensor**
Each system has moisture sensors located throughout the property. It's easy to set a moisture level for the zone. When the moisture level is reached, the system moves to the next zone, or simply doesn't activate.

3 **Reclaimed Water (Force-on)**
Beyond conventional systems, the WaterOptimizer can be applied to the reclaimed water system. With the WaterOptimizer, utilities can manage reclaimed water like the valuable resource it is.

4 **Pressure**
The WaterOptimizer monitors pressure in the system. If the system's water pressure is too low, the WaterOptimizer automatically initiates a program to manage irrigation (a nonessential use) so that essential needs are met. Once pressure is restored, the irrigation system will continue where it left off.

5 **Fire Support**
In case of emergency, the fire department can interrupt irrigation to increase water pressure—with a phone call.

6 **Emergencies (optional)**
During emergencies like floods, hurricanes, or tornados, this system has the capability to sound an audible alarm that will alert citizens and improve emergency service response time.

It's OK to irrigate.

WaterOptimizer™ LLC
U.S. & Foreign Patents Pending
www.Water-Optimizer.com

The new law changes everything

Smart Irrigation. Real Smart.

- Save Water
- Save Money
- Irrigate up to 7 days per week

Just made law, **Chapter 373.62** creates new options for CDD's, HOA's, Water Authorities, Districts, managers and local governments throughout Florida.

By employing **"smart irrigation technology"** entire communities can receive a variance from irrigation restrictions.

Our system features:

- Internet based monitoring and control
- Moisture sensors
- Precision lawn management

WaterOptimizer™, LLC

U.S. & Foreign Patents Pending

(866) 880-4030 • www.WaterOptimizer.com

Make Your Own Irrigation Rules!

Recent legislation in Florida allows the flexibility to water up to seven days a week with the proper technology. The WaterOptimizer™ is a smart irrigation system that meets the requirements of this legislation and saves a significant amount of water. Between the cost of water and the cost of getting water allocated, it makes sense to use the best available techniques and technology to be efficient while delivering the landscaping that Floridians love.

Technology rules!

New landscape irrigation technologies are designed to use water more efficiently. A new law in Florida, Chapter 373.62 (SB494) underscores how smart irrigation systems that use soil moisture sensors can actually save landscapes, water and money.

Moisture sensors allow landscapes to get the water they need, but only when they need it. The result: less water used with the same outcome. While the new technology applies to any landscape, the new law allows HOA's, community development districts and large property owners to apply for a variance to local watering restrictions.

Show me the savings!

The WaterOptimizer™ is an irrigation system that is so smart, homeowners really can set it and forget it. Soil moisture sensors allow landscapes to receive the amount of water they need, taking the "guess work" out of irrigation. "It's easy to set a moisture level for the zone," said Tierra Vista Communities Development Manager Rick Brubaker. "When the set moisture level is reached, the system moves to the next zone, or simply doesn't activate."

Residents and businesses currently using the WaterOptimizer™ have seen benefits including saving water and money and improved landscape appearance. "One of our clients saved up to 60 percent of their water consumption using the WaterOptimizer,™" said Clear Water PSI Owner Judy Benson. These results are from a conservation professional—someone already employing conservation strategies.

Online access allows water managers or homeowners to remotely monitor and make changes to the system. "My favorite features are the remote monitoring and reporting capabilities," said Benson. "The online monitoring feature provides us with the ability to correct irrigation issues before the landscape is damaged or unnecessary water use has occurred."

The WaterOptimizer™ is user-friendly.

It connects to any residential irrigation system, replacing existing controllers. Beyond conventional systems, the WaterOptimizer™ can also be used with a reclaimed water system. This allows utilities to manage reclaimed water more efficiently and to expand the customer base. And as the weather changes, the WaterOptimizer™ responds. If it's raining, the system won't run.

But there's more

The WaterOptimizer™ can work in six operational modes: weather, sensor, reclaimed water, pressure, fire support and emergency. Each mode was designed to meet a specific need. The WaterOptimizer™ can manage heavy users, allowing utilities to reduce peak water requirements.

If the system's water pressure is too low, the WaterOptimizer™ can automatically initiate a program to manage irrigation so that essential water needs are met. Once system pressure is restored, the irrigation system will pick up where it left off. In case of an emergency situation, the fire department can make a phone call to interrupt irrigation and increase water pressure. And during an emergency the WaterOptimizer™ even has the capability to sound an alarm that will alert citizens and improve emergency response time.

Learn More

To learn more about the WaterOptimizer™ system, visit www.WaterOptimizer.com or call (866) 880-4030.

CALL (866) 880-4030 FOR MORE INFORMATION.